Kennedy/Jenks Consultants

530 South 336th Street
Federal Way, WA 98003

Remedial Investigation/ Feasibility Study Report Former Tacoma Metals Facility

Volume 1 of 3

19 June 2001

Prepared for

Portland Avenue Associates, LLC
c/o Eisenhower & Carlson, PLLC
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19 June 2001

Panjini Balaraju, P.E.
Department of Ecology
Toxics Cleanup Program
P.O. Box 47775
Olympia, WA 98504

Subject: Remedial Investigation/Feasibility Study Report
Tacoma Metals, Inc. Site
Agreed Order No. DE 97-5435
K/J 996080.00

Dear Mr. Balaraju:

Please find enclosed two copies of the Remedial Investigation/Feasibility Study Report for the Tacoma Metals, Inc. site located at 1919 Portland Avenue in Tacoma, Washington. This report is submitted in accordance with the requirements of the Agreed Order (No. DE 97-5435) between the Washington Department of Ecology (Ecology) and Mr. & Mrs. Leslie Sussman and Portland Avenue Associates LLC.

This report has been prepared in accordance with the existing Model Toxics Control Act (MTCA) cleanup regulations (Chapter 173-340 WAC). We request a timely review of this report in order to facilitate approval of the recommended remedial alternative and preparation of the Corrective Action Plan (CAP) prior to the MTCA amendments which will become effective on 15 August 2001. As discussed in our telephone conversation of 12 June 2001, Kennedy/Jenks Consultants will prepare the CAP in order to facilitate this process and assist Ecology in completion of the required documents prior to 15 August 2001.

Should you have any questions regarding this report, please call me or Ty Schreiner at (253) 874-0555.

Very truly yours,

KENNEDY/JENKS CONSULTANTS

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Enclosure

cc: Guy Sternal, Eisenhower & Carlson, PLLC

Kennedy/Jenks Consultants

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List of Acronyms

Abbreviation	Description
ARARs	Applicable, relevant, and appropriate requirements (ARARs for plural)
ARI	Analytical Resources, Inc.
ASTM	American Society for Testing and Materials
bgs	Below ground surface
BTEX	Benzene, toluene, ethylbenzene, and total xylenes
CAP	Corrective Action Plan
CCI	CCI Analytical Laboratories, Inc.
CEC	Cation exchange capacity
CFR	Code of Federal Regulations
C_g	Chemical concentration in the vapor phase
C_l	Dissolved concentration in soil water
CLARC II	Cleanup Levels and Risk Calculations
cm/hr	Centimeters per hour
cm/s	Centimeters per second
COC	Chemical of concern (COCs for plural)
cPAH	Carcinogenic polycyclic aromatic hydrocarbon (cPAHs for plural)
C_s	Chemical concentration sorbed to soil
DF	Dilution Factor
D_i	Free air diffusion coefficient
E&E	Ecology and Environment, Inc.
Ecology	Washington State Department of Ecology
EPA	United States Environmental Protection Agency
EPH	Extractable petroleum hydrocarbon (EPHs for plural)
FESI	Forrester Environmental Services, Incorporated.
F_{oc}	Fraction of organic carbon
ft/min	Feet per minute
g/ml	Grams per milliliter
GC-MS/SIM	Chromagraph/mass spectrometer with select iron monitoring
HTTD	High temperature thermal desorption
K_d	Equilibrium partitioning factor
Kh	Horizontal hydraulic conductivity
K_h	Henry's Law Constant
K_{oc}	Organic carbon-normalized soil partition coefficient
Kv	Vertical hydraulic conductivity
LDRs	Land disposal restrictions
LNAPL	Light non-aqueous phase liquid
LTTD	Low temperature thermal desorption
meq/100 g	Milliequivalants/100 grams
mg/kg	Milligrams per kilogram
mg/l	Milligrams per liter
Morris	Morris Environmental Services
MSL	Mean sea level
MTCA	State of Washington Model Toxics Control Act

Abbreviation	Description
NPDES	National Pollutant Discharge Elimination System
NTR	National Toxics Rule
PAH	Polycyclic aromatic hydrocarbon (PAHs for plural)
PCB	Polychlorinated biphenyl (PCBs for plural)
PGG	Pacific Groundwater Group
POTW	Publicly owned treatment works
PQL	Practical quantification limit (PQLs for plural)
PVC	Polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
Rosa	Rosa Environmental and Geotechnical Laboratory L.L.C.
RWC	Revised Washington Code
Simpson	Simpson Tacoma Kraft
SPLP	Synthetic Precipitation Leaching Procedure
Struthers	Garry Struthers Associates, Inc.
SVE	Soil vapor extraction
SVOC	Semivolatile organic compound (SVOCs for plural)
SWQ	Surface Water Quality Standard
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total dissolved solids
TNT/DNT	Trinitrotoluene/Dinitrotoluene
TOC	Total organic carbon
ToC	Top of well casing
TPH	Total petroleum hydrocarbon (TPHs for plural)
USCS	Unified Soil Classification System
UST	Underground storage tank
VOC	Volatile organic compound
WAC	Washington Administrative Code
Work Plan	*Final Work Plan/Sampling and Analysis Plan* (Kennedy/Jenks Consultants 1998)
µg/l	Micrograms per liter

Executive Summary

This report presents the results of a remedial investigation and feasibility study (RI/FS) conducted at the former Tacoma Metals site. The purpose of the RI was to identify the distribution of chemicals in soil, groundwater, and surface water exceeding the Model Toxics Control Act (MTCA) cleanup levels and/or applicable, relevant, and appropriate requirements (ARARs) for sites located in an area zoned for industrial land use. The FS identified potential receptors and exposure pathways for chemicals of concern (COCs) identified during the RI and proposed "site cleanup levels" and "points of compliance" where the proposed site cleanup levels must be attained. Various remediation technologies and process options were screened in the FS. Technologies/process options that passed the initial screening were used to develop possible remediation alternatives for the site. The alternatives were then evaluated with respect to their ability to attain the proposed site cleanup levels at the points of compliance and their ability to meet various threshold requirements, expectations, and criteria defined in MTCA.

The site is located adjacent to the Puyallup River. Tidal influences of the river affect shallow zone groundwater flow directions at the site; however, the net groundwater flow direction is toward the river. Surface water flow in the eastern portion of the site is generally directed toward existing storm water catch basins. Surface water discharges from the site at several locations along Portland Avenue and along western and eastern property boundaries, respectively. Due to the presence of a man-made levee, there is no interaction between site surface water runoff and the adjacent Puyallup River.

The following COCs were identified in site soil at concentrations exceeding MTCA cleanup levels and/or ARARs: lead, chromium, polychlorinated biphenyls (PCBs), carcinogenic polycyclic aromatic hydrocarbons (cPAHs), and petroleum hydrocarbons in the diesel- and oil-ranges. Impacted soil exceeding MTCA cleanup levels and/or ARARs can be divided into two broad categories. The first category is referred to as "metals-impacted" soil, typically identified at 3 feet or less below ground surface (bgs). Lead is the most widespread COC in this category of soil, but chromium, PCBs, cPAHs, and petroleum hydrocarbons are also present above cleanup levels and/or ARARs at locations within the limits of the lead-impacted areas. The metals-impacted soil is most widespread on the eastern portion of the site. The second category is referred to as "petroleum hydrocarbon-impacted" soil. This soil also contains cPAHs above MTCA cleanup levels and/or ARARs. Soil in this category extends down to the water table. Two main areas of petroleum hydrocarbon-impacted soil were identified on the western portion of the site. Light nonaqueous phase liquids (LNAPLs), also referred to as free product, were identified on the water table in these same areas.

The following two COCs were consistently identified in site groundwater beneath the western portion of the site at concentrations exceeding MTCA cleanup levels and/or ARARs: naphthalene and petroleum hydrocarbons in the gasoline-range. Other compounds (cPAHs, PCBs, dissolved selenium, and dissolved cadmium) were detected in either reconnaissance or wells samples collected at the site. These compounds were not considered to be representative of site groundwater quality due to their one time occurrence and/or lack of reproducibility, the possible effects of suspended entrained soil particles in the samples, and the low aqueous solubility's of these COCs in the environment. Metals, PCBs, and cPAHs were identified in surface water discharging from the site.

The fate and transport of COCs identified in unsaturated soil and groundwater at concentrations exceeding MTCA cleanup levels and/or ARARs was evaluated using the VLEACH and BIOSCREEN computer models, respectively. Modeling of the unsaturated zone was used in conjunction with leachability testing data to evaluate whether COCs identified in the shallow soil above the MTCA cleanup levels and/or ARARs pose a threat to groundwater. Groundwater migration modeling was directed specifically at the western portion of the site to evaluate the extent to which COCs above MTCA cleanup levels and/or ARARs could potentially migrate beyond the northern property boundary. Very conservative assumptions were used in both model simulations.

The unsaturated zone modeling and leachability testing indicate that COCs identified in the shallow soil are essentially immobile, provided surface water recharge is minimized or eliminated. Groundwater migration modeling indicated that naphthalene is not expected to extend beyond the northern property boundary toward the Puyallup River. Carcinogenic PAHs and benzene were also included in the groundwater modeling as surrogates for petroleum hydrocarbons. These compound were not detected in site groundwater at concentrations above MTCA cleanup levels and/or ARARs. Groundwater migration modeling indicated that cPAHs are not expected to extend beyond the northern property boundary. Benzene, the most mobile of the compounds modeled, may be present beyond the northern property boundary at concentrations below MTCA cleanup levels and/or ARARs.

Proposed cleanup standards for the site were identified in the FS. The site is currently vacant and approximately 80% of the site has been paved during previous site uses. Future potential receptors at the site may include workers and authorized visitors. The only complete exposure pathways identified for human receptors were via dermal adsorption of site soil, and ingestion and/or inhalation of chemicals adsorbed to fugitive dust particles. Groundwater ingestion via the shallow saturated zone was not considered a viable exposure pathway given the proximity of the site to the Puyallup River and the tidal influences of the river on site groundwater. Onsite potential ecological receptors include birds, reptiles, and mammals. Exposure pathways for ecological receptors include ionic uptake in plants, ingestion of contaminated soil or surface water by ground-feeding organisms, direct contact, or indirect contact through bioconcentration in the food chain. Some aquatic organisms could potentially ingest or dermally adsorb surface water or shallow zone groundwater discharging to the Puyallup River. However this is considered unlikely, since there is no interaction between site surface water and the Puyallup River and the groundwater migration modeling indicates that groundwater exceeding MTCA cleanup levels and/or ARARs is not anticipated beyond the northern property boundary. The site was excluded from a terrestrial ecological evaluation since all the proposed remedial alternatives identified in the FS include a low permeability cap and institutional controls.

Site cleanup levels for soil, groundwater, and surface water have been proposed based on MTCA cleanup levels and/or ARARs that are most appropriate to site conditions. The proposed site cleanup levels are based on an industrial land use scenario. Given the proximity of the site to the Puyallup River, site groundwater cleanup levels have been based on surface water criteria. The most restrictive of either the MTCA Method B surface water cleanup level or ARARs have been proposed. ARARs include the National Toxics Rule, Ecology's Acute Freshwater Surface Water Quality Standard, or Ecology's Model National Pollutant Discharge Elimination System Permit Standard. Soil cleanup levels based on the protection of potable water are not applicable to the site. Since there are no soil cleanup standards available for

protection of surface water, the Method A or C industrial cleanup levels established under MTCA or calculated using Ecology's Total Petroleum Hydrocarbon Interim Policy have been proposed. However, MTCA does allow concentrations above site cleanup levels to remain on a site if it can be demonstrated that higher soil concentrations are protective of groundwater. The fate and transport modeling and leachability testing indicate that shallow-impacted soil above the proposed site cleanup levels does not pose a threat to groundwater, provided surface water recharge is minimized or eliminated.

The following points of compliance have been identified for soil, groundwater, and surface water, based on potential exposure pathways. The point of compliance for soil will be throughout the site to a depth of 15 feet bgs. Since the proposed groundwater cleanup levels are based on surface water criteria, a conditional point of compliance may be established in surface water as close as possible to the point of groundwater discharge to surface water. Since no seeps were identified along the riverbank adjacent to the site, for practical purposes a conditional point of compliance in the shallow groundwater zone along the northern property boundary is proposed. Since site surface water runoff does not discharge to the river, the proposed points of compliance for surface water will be those points where surface water discharges from the site.

The following three remedial action alternatives were developed for the site that could be expected to attain the proposed site cleanup levels at the points of compliance.

- Alternative 1: Source Control (Free Product Removal and Petroleum Hydrocarbon-Impacted Soil Excavation with Offsite Disposal), Asphalt Cap with Stormwater Control, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater/Surface Water Compliance Monitoring, and Periodic Review.

- Alternative 2: Source Control (Free Product Removal and Petroleum Hydrocarbon-Impacted Soil Excavation with Offsite Disposal), Limited Metals-Impacted Soil Excavation with Onsite Consolidation, Asphalt Cap with Stormwater Control, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater/Surface Monitoring, and Periodic Review.

- Alternative 3: Source Control (Free Product Removal and Petroleum Hydrocarbon-Impacted Soil Excavation), Limited Metals-Impacted Soil Excavation, Onsite Treatment & Reuse of Excavated Soil, Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater/Surface Monitoring, and Periodic Review.

Various technologies were screened as part of the development of the remedial alternatives, and evaluated with respect to the MTCA hierarchy of preferred remedial methods. Development of the alternatives gave consideration to Ecology's various requirements and expectations for cleanup actions. A detailed and comparative analysis of the three alternatives was performed with respect to the MTCA threshold criteria required for cleanup actions. Alternative 2 was identified as the most appropriate remedial action for the site.

Section 1: Introduction

This report presents the results of a remedial investigation and feasibility study (RI/FS) conducted at the former Tacoma Metals property (site) located in Tacoma, Washington. The RI/FS was performed in accordance with the Agreed Order (No. DE97-5435) between the Washington State Department of Ecology (Ecology) and Mr. and Mrs. Leslie Sussman and Portland Avenue Associates, LLC (owner). This RI/FS was performed in accordance with Ecology's Model Toxics Control Act (MTCA) regulations published in Washington Administrative Code (WAC) 173-340 (Ecology 1996a).

The purpose of this RI was to identify the distribution of chemicals in site soil, groundwater, and surface water. Based on these data, the FS compared the analytical results with established cleanup levels published by Ecology and other applicable and relevant and appropriate standards (ARARs) to evaluate the potential risks posed to human health and the environment. The FS also evaluated a range of potential remedial solutions to address site conditions and recommended a remedial alternative to address site conditions

1.1 Site Location and Description

The site is located at 1919 Portland Avenue in Tacoma, Washington, in an industrial-zoned area along the southern bank of the Puyallup River (refer to Figures 1-1 and 1-2). The site is separated from the river by a man-made levee with an approximate height of 20 feet that was constructed by the Army Corps of Engineers. The Lincoln Avenue Bridge, which crosses the Puyallup River, is adjacent to the site to the east. Other adjacent properties include a wood waste landfill operated by Simpson Tacoma Kraft (Simpson) to the west and various warehouse and shipping facilities to the south.

(Note: The Tacoma Metals site is geographically oriented with the long axis of the property trending northwest to southeast. To simplify descriptions of site locations in this report, the property boundary located along Portland Avenue will be considered the southern property boundary, and the property boundary along the Puyallup River will be considered the northern property boundary.)

The site covers an area of approximately 5.9 acres. Figure 1-2 provides an overview of the site layout including the location of previous structures identified in historical aerial photographs and Sanborn Fire Insurance Maps (Sanborn Maps). Approximately two-thirds of the site was paved with asphalt some time between 1976 and 1981. The majority of the asphalt pavement is in poor condition, with multiple cracks and holes. The remaining one-third of the site, located along the northern fence line, is unpaved.

The site was reportedly developed as a coke furnace in the 1940s by the federal government; however, it was never used for this purpose. In the early 1950s, Mr. Leslie Sussman purchased the site from the federal government. Mr. Sussman leased the site to General Metals, Inc., which operated a metal recycling facility at the site until approximately 1982. In 1983, Mr. Sussman leased the site to Tacoma Metals, Inc., a recycler of primarily nonferrous metals. In May 1998, Tacoma Metals' lease was terminated. Tacoma Metals, Inc. vacated the property by Fall of 1999.

The site has been used for recycling ferrous and nonferrous metals since the early 1950s. The principal original activities conducted onsite included automobile scrapping and recycling. Automobile recycling was reportedly discontinued more than 30 years ago; since then, primarily nonferrous metals have been handled.

Recent site activities by Tacoma Metals, Inc. have included processing and storage of various materials including, but not limited to, aluminum cans and scrap, wheels, radiators, engine blocks, computer cases, and other scrap metal. Materials were stored directly on the ground surface in piles or stacks. General site activities included compacting material in balers, cutting larger pieces into manageable sizes, sorting and grouping similar materials, and general shipping and receiving activities.

1.2 Historical Review

1.2.1 Sanborn Fire Insurance Maps

Sanborn Maps for the years 1912, 1950, and 1965 were obtained from Environmental Resources Data, Inc., of Southport, Connecticut, and were used to develop the RI sampling program presented in the Final WorkPlan/Sampling and Analysis Plan (Work Plan) prepared by Kennedy/Jenks Consultants (1998). Based on the 1912 Sanborn Map for Tacoma, Washington, the site and surrounding area was used by the St. Paul and Tacoma Lumber Company in 1912. The 1912 Sanborn Map shows a creosoting plant located in the approximate southwestern corner of the current site, and a bunkhouse and boarding house located in the approximate central portion of the current site. A bunker is shown east of the creosoting plant location, and a small office structure is located west of the creosoting plant area. An oil tank is shown within the creosoting plant area. In addition, various wood platforms, slabs, inclines, and tramways are shown in the approximate area of the current site, primarily along the current southern property boundary. A wharf and oil house shown on the Sanborn Maps may have been located near the northwest corner of the current site. Several additional small structures are shown on the Sanborn Maps, but are not labeled.

The creosoting plant, bunkhouse, boarding house, wharf, and oil house are not shown on the 1950 Sanborn Map. (Note: A notation on the 1950 Sanborn Map indicates that the Tacoma Metals site area was not updated after 1941.) The main warehouse building and red brick building are shown on the 1965 Sanborn Map. The dates of construction, operation, and demolition of the creosoting plant and other features shown on the 1912 Sanborn Map are unknown. The approximate former locations of the creosoting plant, bunkhouse, boarding house, and bunker are shown on Figure 1-2. Copies of the 1912, 1950, and 1965 Sanborn Maps are provided in Appendix A.

1.2.2 Aerial Photographs

Historical aerial photographs for the years 1965, 1971, 1976, 1981, 1985, 1989, and 1995 were also reviewed during development of the RI sampling program presented in the Work Plan. Additional aerial photographs for the years 1941, 1946, and 1961 were reviewed as part of the RI activities. Aerial photograph observations are summarized below.

The creosoting plant structure identified on the 1912 Sanborn Map was not observed on the aerial photographs; however, a faint outline of the former plant location was visible on the 1946 aerial photograph. The locations of the wharf and oil house structures identified on the Sanborn Maps were identified on the 1946 aerial photograph, although the structures were not intact. Other site structures shown on the 1912 Sanborn Map were not observed on the aerial photographs.

A variety of structures located on the site were observed on aerial photographs from the years 1941 through 1995. The former main warehouse building and red brick building were identified on the 1941 aerial photograph, and may have been under construction at the time. (Note: The scale of the 1941 photograph did not allow for detailed site observations.) Approximately eight additional structures were present on the western portion of the site, primarily near the western property boundary, on the 1946 aerial photograph. In addition, several linear structures that may have been platforms, tramways, walkways were present on the 1946 aerial photograph to the south and east of the main warehouse building, and other small outbuildings were located throughout the site. Most of the structures identified on the 1946 aerial photograph were likely associated with the coke furnace constructed in the 1940s. These structures are not readily apparent on the 1961 aerial photograph (except for the main warehouse building and red brick building), although the foundations of several structures are visible in the southwestern portion of the site, most notably a hexagonal concrete foundation. Foundations of two additional structures located in the northwestern corner of the site are visible on the 1965 aerial photograph.

Four railroad spur lines are present on the southern portion of the site on the 1946 aerial photograph. A main line parallels Portland Avenue near the southern property boundary, and three spur lines are parallel to the main line between Portland Avenue and the main warehouse building. Of these four rail lines, only the main line and the western portion of one of the spurs was identified on the 1961 aerial photograph. Two new spur lines are present on the western portion of the property on the 1961 aerial photograph, and additional rail spurs are present on the northern and eastern portions of the site on the 1965 aerial photograph.

Structures apparently associated with the handling and processing of metal materials were observed on aerial photographs from 1965 and later. A small shed is present west of the red brick building location on the 1965 and later photographs. The furnace building and existing small storage building located east of the main warehouse building are present on the 1976 aerial photograph in addition to several small shed structures. Several additional shed structures were present on the 1981 aerial photograph. These shed structures were located mainly on the western portion of the site and appeared to contain metal processing equipment such as balers and shears.

Metal materials stored on the ground surface throughout the site were identified on aerial photographs from years 1961 and later (refer to the Work Plan for additional description of materials storage and staging areas). Metal materials processing machinery is evident on the site on photographs from the years 1965 and later. Machinery visible on the photographs included cranes, trucks, and rail cars.

The southern bank of the Puyallup River was the northern boundary of the site on the 1946 aerial photograph. On the 1961 aerial photograph, the existing levee is present and the Puyallup River is located on its current course.

1.3 Previous Investigations

This section provides a summary of the findings from previous environmental activities performed at the site. More detailed information is provided in the documents cited in this section.

1.3.1 Environmental Protection Agency/Ecology and Environment, Inc.

In March 1988, representatives of the Environmental Protection Agency (EPA), Ecology, and Ecology and Environment, Inc. (E&E) inspected the site. As part of the inspection, Ecology and E&E collected samples of surface soil, surface residue on paved surfaces, catch basin sediment, and storm drain sediment. The storm drains and catch basins were all located on the eastern half of the property. Concentrations of lead, cadmium, chromium, barium, copper, mercury, nickel, and zinc were detected in the soil and sediment samples at concentrations exceeding Ecology's MTCA Method A or C industrial soil cleanup levels (E&E 1998). Concentrations of extractable lead [extracted by Toxicity Characteristic Leaching Procedure (TCLP)] and cadmium were detected above designated state dangerous waste levels (WAC 173-303). Elevated concentrations of iron and aluminum were also detected in soil samples. In addition, polychlorinated biphenyl (PCB) concentrations above the MTCA Method A industrial soil cleanup level were detected in soil samples collected from behind the main warehouse building near the northern fence line.

1.3.2 Hart-Crowser

In 1990, Hart-Crowser performed a limited subsurface investigation to evaluate site soil and groundwater conditions (Hart-Crowser 1990). Elevated concentrations of lead, chromium, cadmium, arsenic, extractable lead, PCBs, carcinogenic polycyclic aromatic hydrocarbons (cPAHs), and total petroleum hydrocarbons (TPHs) exceeding applicable MTCA Method A or C industrial soil cleanup levels were detected in test pit soil samples collected from the northern unpaved area of the site. [Note: PAH compounds that are classified by EPA as potentially carcinogenic include benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene.] In addition, elevated lead, chromium, cadmium, extractable lead, and TPH concentrations were detected in the vicinity of the existing furnace building (Hart-Crowser 1990). TPHs were also present at concentrations above the MTCA Method A industrial soil cleanup levels in soil samples collected from the former location of an underground storage tank (UST) at the eastern end of the main warehouse building (refer to Figure 1-2). The Hart-Crowser report indicated that army shells were formerly disposed of near the northeastern corner of the site; however, they did not provide further details regarding site conditions that might have resulted from the army shells.

Hart-Crowser also performed reconnaissance groundwater sampling in the northern unpaved area and in the former UST location. Elevated concentrations of lead, arsenic, cadmium, PCBs, cPAHs, and TPHs were documented in groundwater samples collected from the northern

unpaved area. Elevated TPH and cPAH concentrations were also documented in the area of the former UST location.

1.3.3 Morris Environmental Services

The findings of Hart-Crowser's 1990 limited subsurface investigation were reviewed by Morris Environmental Services (Morris) and summarized in a letter report dated 9 July 1991 (Morris 1991). After reviewing the limited subsurface investigation data, visiting the site, and interviewing Tacoma Metals personnel, Morris postulated some possible contaminant sources, including the following:

- Motor blocks salvaged onsite may be a source of TPH concentrations.
- Incomplete combustion of lead-acid battery cases may be a possible source of PAH-impacted soils behind the former red brick building location.
- Creosote on buried piling may be a possible source of PAH concentrations.
- Radiator salvage may be a possible cadmium source.

Between August and December 1991, 53 soil samples were collected by Morris and analyzed for total lead (Morris 1992). The samples were collected from the unpaved section of the site along the northern property boundary. Morris indicated that the approximate western extent of lead contamination, but not the eastern extent, was identified during the first sampling event. Three additional sampling events were performed in an unsuccessful attempt to determine the approximate eastern extent of lead contamination in near-surface soil. No attempt was made to identify the northern and southern extents of lead contamination; however, Morris identified the potential existence of lead-impacted soil north of the existing fence line and south of the existing unpaved area.

Locations and lead concentrations of soil samples collected by Hart-Crowser and Morris are shown on Figure 1-3. (Note: These concentrations may not be indicative of current site conditions since surface soils were extensively disrupted during grading activities that were performed by the past site tenant.)

1.3.4 Pacific Groundwater Group

In 1992, Pacific Groundwater Group (PGG) conducted a groundwater investigation on the site including the installation and sampling of eight shallow groundwater monitoring wells installed in the uppermost saturated zone (PGG 1992).

Gasoline-range petroleum hydrocarbon compounds were detected at concentrations above the MTCA Method A groundwater cleanup level of 1.0 milligram per liter (mg/l) in samples collected from two of the existing site monitoring wells (MW-4 and MW-5). In addition, cPAHs were detected in samples collected from wells MW-7 and MW-8 at concentrations exceeding the MTCA Method A groundwater cleanup level of 0.1 micrograms per liter (µg/l).

PGG also performed short-term pump tests on wells screened in the wood debris and deltaic sand units. Hydraulic conductivities of 3.8 to 4.6 feet per day were reported for two wells screened in the wood debris unit (MW-4 and MW-5, respectively), and hydraulic conductivities of 100 to 140 feet per day were reported for wells MW-1 and MW-2 screened in the deltaic sand unit.

1.3.5 Garry Struthers Associates, Inc.

Garry Struthers Associates, Inc. (Struthers) prepared a Drainage Report concerning the site for the City of Tacoma Public Works Department (Struthers 1995a). The purpose of the report was to assess surface runoff conditions and address site improvements related to surface runoff including, but not limited to, the paved area. Struthers summarized site surface drainage conditions as follows:

- Approximately 2.6 acres in the eastern half of the site drains to an existing catch basin and conveyance storm system that discharges to a municipal storm drain located on the eastern side of Portland Avenue.
- Approximately 2.0 acres in the western half of the site drains by surface runoff (overland flow) to storm sewers in Portland Avenue or surface water ponds onsite.
- Approximately 1.3 acres along the northern property boundary is unpaved.

Struthers indicated that there is no additional drainage onto the site from surrounding properties. Surface water runoff to offsite points other than Portland Avenue was not mentioned in the report, except for a notation that there was no apparent offsite drainage from the unpaved area. Struthers indicated that runoff from the site does not interact with the Puyallup River, which is separated from the site by a man-made levee.

Based on the capacity of the existing municipal drain system (15-inch diameter concrete pipe located along Portland Avenue), Struthers concluded that detention of surface runoff onsite would be necessary as part of any site improvements. They also indicated that treatment may be necessary for surface runoff quality control, and that Shoreline Permits for the City of Tacoma would be required. Quality control for surface runoff is addressed in detail in Struthers' Technical Memorandum for Storm Runoff – Best Management Practices (Struthers 1995b).

1.4 Report Organization

This report is organized as follows:

- Section 2 summarizes the objectives and specific activities conducted as part of the RI. Section 2 also identifies approximate sampling locations and analytical methods for sample analyses performed during the RI.
- Section 3 summarizes the hydrogeologic conditions encountered at the site, including a summary of stratigraphic conditions encountered and the estimated direction of groundwater flow.

- Section 4 summarizes the analytical results of soil sampling performed during the RI activities.
- Section 5 summarizes the analytical results of reconnaissance and monitoring well groundwater sampling performed during the RI activities.
- Section 6 summarizes the analytical results of surface water sampling performed during the RI activities.
- Section 7 summarizes the findings and provides conclusions based on the results of the investigative activities performed during the RI.
- Section 8 summarizes the chemical fate and transport of chemicals of concern (COCs).
- Section 9 presents the FS performed for the site and recommends a remedial alternative to mitigate site conditions.
- Section 10 lists the references cited in this report.

Section 2: RI Objectives and Activities

2.1 Objectives

The principal objective of the RI was to identify the horizontal and vertical distribution of regulated chemicals that may pose a threat to human health and the environment. An additional objective was to develop adequate information to conduct a FS to select a remedial alternative to mitigate adverse site conditions and protect human health and the environment. During previous site investigations (refer to Section 1.3) issues of potential environmental concern were identified based on current site conditions and historical site practices. During the RI, investigative activities were performed to assess impacts to the site resulting from these and other potential environmental issues.

2.2 RI Activities Performed

The remainder of this section identifies the specific activities performed during the RI. This section also identifies the location of samples that were collected and the types of analyses performed. The RI was performed in accordance with the Work Plan (Kennedy/Jenks Consultants 1998). The investigative activities are summarized below.

2.2.1 Sampling and Characterization Activities

The horizontal and vertical extent of chemical impacts to soil and groundwater were characterized during the RI. Sample analyses were based on previous site findings regarding potential chemical impacts to site media as described in the Work Plan, and through ongoing RI findings. Specific analyses for some samples were based on field screening results of soil samples as described in the Work Plan.

Sampling and characterization were performed using a grid-based sampling approach in accordance with Ecology guidance (Ecology 1995). Sampling was also performed at specific suspect locations based on current and historical site conditions, and on grid-sample location results.

The RI included the following activities:

- Excavating 65 test pit trenches (TP-1 through TP-65) to depths of up to 12 feet below ground surface (bgs), and collecting and analyzing soil samples to assess soil impacts at areas of specific concern identified in the Work Plan.

- Advancing 18 soil probe borings (RGW-1 through RGW-18) to shallow groundwater depths (typically 10 to 15 feet bgs), and collecting reconnaissance groundwater samples for chemical analysis.

- Replacing two previously existing shallow monitoring wells [MW-4(R) and MW-8(R)] and installating four new monitoring wells (MW-9 through MW-12). During monitoring well

installation, soil samples were collected from soil borings for chemical and geotechnical analyses.

- Sampling 11 existing, replaced, and new shallow monitoring wells [MW-1 through MW-2, MW-4(R) through MW-7, and MW-8(R) through MW-12], and analyzing groundwater samples for chemical and general water quality parameters.
- Conducting hydraulic investigations, including water level monitoring, performing slug tests, and testing selected soil samples for geotechnical parameters.
- Sampling and analyzing surface water runoff from two locations (SW-1 and SW-2), and mapping of primary surface water flow pathways.

Soil, reconnaissance groundwater, groundwater, and surface water sampling locations are depicted on Figure 2-1.

2.2.2 Demolition Activities

Prior to the sampling and characterization activities, existing site structures (excluding one storage building) and approximately 1,800 feet of railroad track were demolished. The demolished structures included the main warehouse and office building, the red brick building, and various equipment and storage structures (refer to Figure 1-2). Solid waste materials generated from demolition activities included concrete, brick, glass, metal, wood, and other debris. In addition, liquid wastes were generated from several vault structures located below or in the vicinity of the red brick building (refer to Figure 1-2). These vaults were pumped, cleaned, and backfilled with clean imported soil material.

Waste materials derived from the demolition of site structures were transported offsite for disposal during 2000. Nonhazardous wastes were transported to Rabanco for landfill disposal. Hazardous waste materials were characterized, and hazardous waste profiles and shipping manifests were prepared. Hazardous waste streams were transported by licensed hazardous materials handlers to appropriate facilities for disposal. Disposal of these hazardous waste materials is documented in the 2000 Hazardous Waste Report submitted to Ecology. A copy of the 2000 Hazardous Waste Report is provided in Appendix B.

2.3 Investigative Methods

This section provides a brief summary of methods used to investigate soil and groundwater during the RI. Field sampling activities were conducted between March 2000 and April 2001. Detailed descriptions of the investigative activities performed and methods used are provided in the Work Plan.

2.3.1 Test Pit Soil Sampling

Test pit sampling was performed between 27 September 2000 and 15 November 2000. Test pits were excavated using a rubber-tired backhoe or trackhoe. Soil samples were collected directly from the test pit sidewalls at shallow depths of less than 3 feet bgs, and from the

backhoe bucket at greater depths. Most test pits were excavated to approximately 10 feet bgs, with some as deep as 12 feet bgs.

Test pit soil samples were typically collected at depth intervals of 0 to 1 foot, 2 to 3 feet, 4 to 6 feet, and 6 to 10 feet in each test pit. At each test pit location, the vertical soil sequence from 0 to 10 feet bgs (where excavated to that depth) is represented in soil samples. Soil material was collected in 1-foot increments through the entire depth interval as follows:

- Samples designated as 0-1 foot included soil material collected from 0-1 foot bgs
- Samples designated as 2-3 feet included soil material collected from 1-2 and 2-3 feet bgs
- Samples designated as 4-6 feet included soil material collected from 3-4, 4-5, and 5-6 feet bgs
- Samples designated as 6-10 feet included soil material collected from 6-7, 7-8, 8-9, and 9-10 feet bgs.

For each sample, soil material from each applicable depth interval was transferred to a stainless steel bowl. The soil material was thoroughly mixed using a stainless steel spoon before being transferred to appropriate laboratory-supplied sample containers. The spoon and mixing bowl were decontaminated prior to each use.

Soil encountered in the test pits was logged in approximate accordance with the Unified Soil Classification System (USCS) by a Kennedy/Jenks Consultants' geologist. In addition, soil was subjected to field screening tests (i.e., visual inspection, hydrocarbon sheen tests, and headspace screening) to assess the potential for chemical impact. During test pit sampling, information regarding the occurrence and estimated depth of visible chemical impact, if encountered, was recorded on the field log along with the field screening results. Test pit conditions and field screening results are summarized Appendix C.

Soil samples collected for chemical analysis were placed in glass sampling jars and submitted to Analytical Resources, Inc. (ARI) of Seattle, Washington under standard chain-of-custody procedures. Soil samples were submitted for a variety of chemical analyses in accordance with the Work Plan. Specific chemical analyses were dependent upon field observations, field screening results, and the sampling plan described in the Work Plan. Test pit soil analyses typically included:

- Diesel- and oil- range petroleum hydrocarbons by Ecology Method NWTPH-diesel (extended)
- Resource Conservation and Recovery Act (RCRA) eight total metals plus copper by EPA Methods 6010/7000 series
- Volatile organic compounds (VOCs) by EPA Method 8260
- PCBs by EPA Method 8082
- Extractable Petroleum Hydrocarbons (EPHs) by Ecology's TPH Interim Policy methods

- PAHs by EPA Method 8270B using gas chromagraph/mass spectrometer with select ion monitoring (GC-MS/SIM)

- Trinitrotoluene/dinitrotoluene (TNT/DNT) by EPA Method 8330.

Test pit soil sample analysis was performed using an iterative process. Initially, the uppermost sample (0-1 foot interval) from each test pit was submitted for laboratory analysis. Additionally, specific samples that displayed positive field screening test results (visible staining, chemical odor, high vapor head-space readings) were submitted for laboratory analysis. These samples were typically analyzed for metals, petroleum hydrocarbons, and VOCs, although analysis of samples for VOCs was discontinued based on the analytical results for previous samples (refer to Section 4). Samples were submitted for PCB analysis from every other test pit location. Samples were collected from each depth interval, and those that were not included in the initial analyses were held frozen at the analytical laboratory for possible later analysis.

Additional sample analyses were performed based on exceedances of cleanup levels in the initial samples that were analyzed (refer to Section 4 for discussion of soil cleanup levels). Additional samples that were submitted for analyses were typically selected from the depth interval immediately below the sample in which the cleanup level exceedance was identified. These samples were typically analyzed only for the particular analyte that exceeded the cleanup level in the original sample, although samples in which petroleum hydrocarbon concentrations exceeded cleanup levels were also submitted for EPH and PAH analysis. This process was repeated until analyte concentrations were below the cleanup level, or the deepest sample collected at the test pit was analyzed. In the case of PCB analyses, samples from test pits adjacent to those in which exceedances were identified were also submitted for laboratory analysis.

Select soil samples were also analyzed for extractable metals and PAHs using TCLP and Synthetic Precipitation Leaching Procedure (SPLP) methods for use in the chemical fate and transport evaluation and FS (refer to Sections 8 and 9, respectively). Analytical results for test pit soil samples are discussed in Section 4.

2.3.2 Reconnaissance Groundwater Sampling

Reconnaissance groundwater samples were collected from 18 sampling locations (RGW-1 through RGW-18) on 25 and 26 May 2000. Reconnaissance groundwater samples were collected by installing a sampling line (equipped with a stainless steel screen sampling tip) to the base of the drilling rods and pushing the drill rods to the approximate depth of shallow groundwater. A sample was collected by pumping groundwater to the surface using a peristaltic pump through dedicated polyethylene tubing.

The groundwater samples were placed in appropriate sample containers (containing preservative as appropriate) provided by the analytical laboratory. Reconnaissance groundwater samples were submitted to CCI Analytical Laboratories, Inc. (CCI) of Everett, Washington under standard chain-of-custody procedures for the following analyses:

- PAHs by EPA Method 8270B GS-MS/SIM

- PCBs by EPA Method 8082
- RCRA eight dissolved metals by EPA Methods 6010/7000 series
- Gasoline-, diesel-, and oil- range petroleum hydrocarbons by Ecology Methods NWTPH-gas and NWTPH-diesel (extended)
- VOCs by EPA Method 8260.

Analytical results for reconnaissance groundwater monitoring are discussed in Section 5.1.

2.3.3 Monitoring Well Installation

Six groundwater monitoring wells were installed during the RI, including two replacement wells at locations of previously existing wells that site tenants had inadvertently destroyed [MW-8(R) and MW-4(R)], and four wells at new locations (MW-9 through MW-12). Three of these wells were installed on 9 May 2000, and three were installed on 10 November 2000 (refer to Figure 2-1 for monitoring well locations). [Note: One other well (MW-3), inadvertently destroyed by previous site tenants, was not replaced during the RI.]

Soil borings for monitoring well installation were drilled using hollow-stem auger drilling techniques. Soil samples were typically collected at 2.5- to 5-feet intervals using a split-spoon drive sampler for laboratory analysis and lithologic logging purposes. Recovered soil samples were logged using the USCS in general accordance with American Society of Testing and Materials (ASTM) Method D 2488. Selected soil samples were submitted to the laboratory for analysis based on field screening results. Lithological descriptions, sample designations, and field screening observations are provided on the boring and monitoring well construction logs in Appendix D.

Monitoring wells were constructed using 2-inch [MW-4(R), MW-8(R), MW-9, and MW-10] or 4-inch (MW-11 and MW-12) diameter Schedule 40 polyvinyl chloride (PVC) pipe. Each well consisted of a section of factory-slotted (0.01-inch or 0.02-inch slot size) screen and a section of blank PVC casing above the screened interval. Monitoring wells were completed above-grade using locking steel standpipe well enclosures [MW-4(R), MW-8(R), and MW-9] or at grade using flush-mount monuments enclosed in 4-inch-high boxes constructed of concrete (MW-10, MW-11, and MW-12). Protective bollards were installed around the three new aboveground enclosures and around two of the existing wells (MW-5 and MW-6). Construction details for monitoring wells are provided on the boring and monitoring well construction logs in Appendix D. Construction details for all site wells (new, replaced, and existing) are summarized in Table 2-1.

Following well installation, the wells were developed to remove fine-grained sediment placed in the filter pack during well installation. Well development consisted of surging with a vented surge block and over-pumping with a submersible pump in accordance with procedures identified in the Work Plan. Field documentation of well development is provided in Appendix E.

2.3.4 Groundwater Monitoring

Groundwater monitoring included the collection and laboratory analysis of groundwater samples from wells located on the site. Several groundwater monitoring events were conducted at the site. Five existing monitoring wells (MW-1, MW-2, MW-5, MW-6, and MW-7) were sampled in March 2000. The two replacement monitoring wells [MW-4(R) and MW-8(R)] and one new monitoring well (MW-9) were sampled in May 2000. All 11 monitoring wells were sampled in November 2000 and March 2001. Three of the monitoring wells [MW-8(R), MW-10, and MW-11) were resampled in May 2001. Carcinogenic PAH compounds were detected in unfiltered sampled collected from these three wells during previous monitoring events. Samples collected during the May 2001 monitoring event were field filtered prior to cPAH analysis (refer to Section 5.2 for a discussion of cPAH results).

Field procedures followed during the groundwater sampling are summarized in the Work Plan. Field parameters including temperature, pH, and specific conductivity were monitored during purging of the wells. Groundwater purge and sample field forms for each monitoring event are provided in Appendix E.

Groundwater samples collected during the March, May, and November 2000 and March 2001 monitoring events were analyzed for the following parameters:

- PAHs by EPA Method 8270B GC-MS/SIM
- PCBs by EPA Method 8082
- RCRA eight total and dissolved metals plus copper by EPA Methods 6010/7000 series
- Gasoline-, diesel-, and oil-range petroleum hydrocarbons by Ecology Methods NWTPH-gas and NWTPH-diesel (extended)
- VOCs by EPA Method 8260.

Samples collected from wells MW-8(R), MW-10, and MW-11 during the May 2001 monitoring event were analyzed only for PAHs, and were field filtered to minimize the inclusion of entrained soil particles in the sample.

Groundwater samples collected from select wells during the November 2000 and March 2001 monitoring events were also analyzed for general water quality parameters including sulfate, total dissolved solids (TDS), hardness, iron, manganese, potassium, sodium, calcium, pH, and conductivity.

Groundwater samples were submitted to ARI or CCI for chemical analysis under standard chain-of-custody procedures. Analytical results for groundwater monitoring are discussed in Section 5.2.

2.3.5 Hydraulic Testing

Rising-head slug tests were performed on monitoring wells MW-1, MW-2, MW-5, MW-7, MW-8(R), and MW-9 to provide an approximate estimate of the hydraulic conductivity of the

shallow zone. Slug tests were performed by inducing a head (water level surface) fluctuation in the well and monitoring the rate of water level recovery over time. Head fluctuations were induced by submergence and removal of a 5-foot length of solid PVC pipe (slug). Water level changes were monitored by a pressure transducer suspended below the slug and recorded by a data logger. Five rising head tests (removal of the slug and recovery of the water level) were conducted at each well. The downhole slug test equipment was decontaminated prior to use at each well. Slug test results are discussed in Section 3.4.

2.3.6 Well Survey and Water Level Monitoring

The top-of-well casing elevation [relative to mean sea level (MSL)] and horizontal location of each monitoring well were surveyed by EarthTech, Inc. of Federal Way, Washington. This information was used in conjunction with water level depth data to assess the direction and magnitude of the hydraulic gradient at the site.

2.3.6.1 Groundwater Elevation Monitoring

Groundwater elevation monitoring of each site well was performed on 31 January 2001, 13 February 2001, and 28 February 2001. Water levels were measured in all site wells using electronic water level depth probes and converted to elevations using the surveyed top-of-casing elevations discussed above. If light non-aqueous phase liquid (LNAPL) was present, attempts were made to measure the approximate thickness of the LNAPL. Groundwater elevation monitoring results are discussed in Section 3.3.1.

2.3.6.2 Continuous Water Level Monitoring

Continuous groundwater level monitoring was performed in selected onsite groundwater monitoring wells MW-1, MW-2, MW-5, MW-7, MW-8(R), and MW-9 on 21 and 22 February 2001 to evaluate the range of tidally induced water level fluctuations from the Puyallup River. Monitoring was performed using pressure transducers equipped with battery-powered data loggers. The results of the continuous water level monitoring are discussed in Section 3.3.2.

2.3.7 Surface Water Monitoring

Surface water monitoring included observing water drainage pathways during rainfall events at the site, and collecting surface water samples at two locations where surface water discharges from the site (excluding discharges to Lincoln Avenue, which flow into the City of Tacoma storm sewer). Surface water samples were collected on 13 March 2001 and 29 April 2001. Surface water drainage monitoring is discussed further in Section 3.3.3.

Surface water samples collected during the RI were analyzed for the following parameters:

- PAHs by EPA Method 8270B GC-MS/SIM
- PCBs by EPA Method 8082
- RCRA eight total and dissolved metals plus copper by EPA Methods 6010/7000 series

- Diesel-, and oil-range petroleum hydrocarbons by Ecology Method NWTPH-diesel (extended).

Surface water samples were submitted to ARI for chemical analysis under standard chain-of-custody procedures. Analytical results for surface water monitoring are discussed in Section 6.

Section 3: Geologic and Hydrogeologic Conditions

This section presents the findings of hydrogeologic investigations performed at the site. The regional geologic setting is discussed first, followed by a discussion of the hydrogeologic conditions encountered.

3.1 Regional Geologic Setting

The site is located in the Tacoma tideflats, which are part of the Puyallup River delta. Typical stratigraphy of the Tacoma tideflats includes up to 10 feet of hydraulic fill (dredge) deposits of gravel, sand, silt, and organic debris underlain by silty and sandy deltaic sediments deposited by the Puyallup River. Glacial deposits underlie the Puyallup River sediments. The following descriptions are based on information provided by Hart-Crowser (1975).

The uppermost deltaic deposits in the Tacoma tideflats include an upper silt unit and a middle sand unit. The upper silt is composed of tidal marsh deposits and occurs as a surface layer and as interbedded layers within the underlying middle sand unit. The typical thickness of the silty surface layer is several feet to greater than 20 feet, with the thickest sections located in the central part of the delta. The silt layer is generally composed of sandy silt to clay, with silt and clayey silt being most common.

The upper boundary of the middle sand unit occurs at depths of several feet bgs to approximately 25 feet below MSL. The base of the unit is gradational with an underlying silt unit (lower silt) and is encountered at approximately 70 to 100 feet below MSL. Sand material is typically poorly graded and locally silty. The middle sand unit is locally interbedded with silty material.

3.2 Site Geology and Hydrogeology

The discussion presented below is based primarily on the observations of soil and groundwater conditions encountered by Kennedy/Jenks Consultants' geologists during the RI activities that included test pit excavations and soil borings. In addition, information was reviewed from soil boring logs from previous site investigations (PGG 1992).

3.2.1 Soil Stratigraphy

Soil materials encountered on the site include sandy and gravelly fill materials that typically contain abundant wood, metal, or other debris, and native materials including sand, silt, and clay. The materials encountered and their relative stratigraphic positions are described below. Generalized geologic cross sections based on site observations are provided on Figures 3-1, 3-2, and 3-3.

3.2.1.1 Mixed Fill Unit

The mixed fill unit is encountered throughout the site and is exposed at the surface or covered by asphalt and several inches of crushed surface top course gravel material. The mixed fill unit

is approximately 3 to 9 feet thick and is underlain by fill material that contains abundant wood debris (wood fill unit).

The mixed fill unit primarily includes sand and gravel that is typically well graded, although poorly graded sands are locally present on the western portion of the site. Fine-grained materials, including clay, silt, and fine sand, are locally present and intermixed with coarse sand and gravel materials. The overall texture of the unit is highly variable across the site, and individual textural layers are generally not laterally traceable between test pit locations, with the exception of a metal debris layer described below. Metal, glass, wood, and other miscellaneous debris are present in the mixed fill unit throughout the site, most commonly in the upper portions of the unit, and are most abundant in the western portion of the site. The surfaces of unpaved areas of the site are typically strewn with metal and other debris.

3.2.1.2 Metal Debris Layer

A layer of abundant metal and other debris is locally present in the upper portion of the mixed fill unit. This metal debris layer contains abundant (typically 70 to 90 percent) metal, glass, concrete, brick, rubber, and other miscellaneous debris. Interstitial material is typically sand or gravel. The abundance of debris material distinguishes this layer from other portions of the mixed fill unit where debris material is less common. The metal debris layer is typically underlain by sand and gravel material of the mixed fill unit.

The metal debris layer is encountered primarily in the eastern portion of the site in the vicinity of a former railroad track, and in the northern portion of the site where asphalt pavement is not present. In the eastern portion of the site, the metal debris layer thins to the north and south (toward the Puyallup River and Portland Avenue, respectively) and is not readily apparent along the southern property boundary (refer to Figures 3-1, 3-2, and 3-3). The metal debris layer appears to extend beyond the eastern property boundary (refer to cross sections A-A' and B-B' on Figure 3-2).

3.2.1.3 Wood Fill Unit

The wood fill unit is encountered throughout the site and is located stratigraphically below the mixed fill unit, with the upper surface at depths of 3 to 9 feet bgs. The wood fill unit thickness observed in test pit excavations is typically 1 to 8 feet, and test pits excavated in the western portion of the site commonly were terminated in the wood fill unit at depths of 10 to 11 feet bgs. The unit is thickest in the western portion of the site, and soil boring observations indicate that wood fill may extend to depths of up to 18 feet bgs. The wood fill unit in the eastern and south-central (along Portland Avenue) portions of the site is approximately 1 to 4 feet thick. In the western and north-central (adjacent to the Simpson property) portions of the site, itis generally at least 4 feet thick and typically greater than 6 feet thick. Where the base of the wood fill unit was identified, it was underlain by apparently native materials including silt, clay, and sand.

The wood fill unit contains from 80 to 100 percent wood debris, depending on location, with interstitial silt, clay, and sand material. The size and texture of the wood material are highly variable, typically including wood dust, wood chips, wood scrap material, logs, planks, and large timbers. Wood fragments appear to be randomly oriented, although some of the material encountered appears to be vertically oriented pilings and horizontal planks. Interstitial matrix material is variable, but is most typically fine grained and includes silt, clay, and sand.

3.2.1.4 Native Materials

Apparently native sediment materials encountered at the site include clayey sandy silt with organic plant material and poorly graded sand with fine gravel. Native materials are stratigraphically below the wood fill unit and are initially encountered at depths of approximately 7 to 18 feet bgs. Where both the native silt and native sand layers are present, the silt layer is stratigraphically above the sand.

3.2.1.4.1 Native Silt Layer

The native silt layer was encountered primarily in the eastern and southern portions of the site. On the eastern half of the site, the silt layer was encountered in most of the test pits that were excavated in the central and southern portions of the site, but was present only locally in test pits excavated close to the northern property boundary. On the western half of the site, the silt layer was observed locally in test pits excavated along the southern property boundary, but was rarely encountered in test pits excavated in the central and northern portions of the site.

Portions of the site where the silt layer is not encountered correspond reasonably well with areas where the wood fill unit is thickest. Some of the interstitial materials observed within the wood fill unit are texturally similar to the silt layer material, indicating that wood debris might have been mixed with silt layer materials. Where the wood fill unit is less than approximately 3 feet thick, the silt layer is typically present.

The thickness of the silt layer observed in test pit excavations is 1 to 3 feet; however, test pits in which the silt layer was encountered were typically terminated within the silt layer. The silt layer was encountered in soil borings MW-2 and MW-9 at an approximate thickness of 3 feet. The native sand layer was present below the silt layer in these soil borings.

3.2.1.4.2 Native Sand Layer

The native sand layer is typically encountered in monitoring well soil borings at initial depths of 8 to 17 feet bgs. The sand layer is located stratigraphically below the native silt layer, if present, or the wood fill unit. The lower boundary of the native sand unit was not identified in any soil borings at the site. The native sand unit identified locally in test pits was located primarily in the northeastern portion of the site, but was generally not encountered in test pit excavations on other portions of the site. Most test pit excavations were terminated within the silt layer or wood fill unit.

3.2.2 Geotechnical Soil Properties

Four soil samples were collected from the pilot borings for monitoring wells MW-4(R), MW-8(R), and MW-9 and were submitted for geotechnical testing for parameters including vertical hydraulic conductivity (Kv), porosity, and grain size. The samples, which were collected at depths ranging from 0 to 15 feet bgs, were submitted to Rosa Environmental and Geotechnical Laboratory, L.L.C. (Rosa).

The measured vertical hydraulic conductivity ranged from 8.3×10^{-7} to 2.0×10^{-2} centimeters per second (cm/s). The lowest vertical hydraulic conductivity (8.3×10^{-7} cm/s) was measured in a sample collected from boring MW-8(R) at 6 to 6.5 feet bgs. The soil material was sandy silt with

clay, and contained abundant wood fragments. A sample collected from boring MW-9 at 10.5 to 11 feet bgs had a vertical hydraulic conductivity of 3.2×10^{-5} cm/s and consisted of fine sand with silt and minor gravel and clay. Samples collected from boring MW-9 at 15 to 16 feet bgs and MW-4(R) at 0.5 to 1 foot bgs consisted primarily of medium to fine sand material and had vertical hydraulic conductivities of 3.8×10^{-3} cm/s and 2.0×10^{-2} cm/s, respectively. The sample collected from boring MW-4(R) contained abundant metal, glass, and other debris. Measured porosity values for the four samples ranged from 0.39 (39 percent) to 0.552 (55.2 percent).

Selected soil samples were also analyzed for total organic carbon (TOC) and cation exchange capacity (CEC). The percent of TOC ranged from 0.47 to 16. Measured CEC ranged from 2.4 to 26 milliequivalants/100 grams (meq/100 g), with an average CEC of 10 meq/100 g.

The results of geotechnical tests are summarized in Table 3-1. The analytical report sheets for these tests are provided in Appendix F.

3.3 Water Level Monitoring

This section discusses the results of periodic water level monitoring used to construct potentiometric surface contour maps, and the results of continuous water level monitoring performed in selected site wells.

3.3.1 Potentiometric Surface Contour Maps

Water elevations for site monitoring wells were calculated using water level data collected on 31 January 2001, 13 February 2001, and 28 February 2001 at the approximate published times for high and low tide (refer to Table 3-2). Potentiometric surface contour maps for these monitoring events are provided on Figures 3-4A, 3-4B, 3-5A, 3-5B, 3-6A, and 3-6B. Groundwater elevations at each well location are summarized in Table 3-2.

The direction of the hydraulic gradient at the site appears to be influenced by tidally induced fluctuations in the level of the Puyallup River. The direction of the hydraulic gradient appears to fluctuate by approximately 90 degrees between high and low tidal conditions.

At high tide conditions, the hydraulic gradient appears to be generally to the south. The magnitude of the gradient is highest (approximately 0.003 feet/foot) in the central portion of the site, and lowest (approximately 0.0008 feet/foot) in the eastern portion of the site. In the vicinity of well MW-4(R), the gradient appears to be to the northeast, toward the Puyallup River. This northeast gradient was most evident during the 13 February 2001 monitoring event and may indicate a local hydraulic divide.

At low tide conditions, the general hydraulic gradient appears to be to the east, although the gradient direction in the western portion of the site may be to the northeast. The northeast gradient was most evident during the 31 January 2001 monitoring event. The gradient on the eastern portion of the site is between northeast and southeast, but cannot be resolved further with the current monitoring wells. A slight hydraulic mound appears to present during low tide conditions in the vicinity of well MW-9. This feature was observed during all of the monitoring events. The hydraulic gradient magnitude at low tide conditions is highest (approximately

0.004 feet/foot) in the central and western portions of the site, and lowest (approximately 0.001 feet/foot) in the eastern portion of the site.

The hydraulic gradient is slightly higher during low tide conditions where the gradient directions are approximately toward the Puyallup River than during high tide conditions where gradient directions are generally away from the Puyallup River. This suggests that the net groundwater flow is approximately toward the Puyallup River.

3.3.2 Continuous Water Level Monitoring

Continuous water level monitoring was performed in six monitoring wells [MW-1, MW-2, MW-5, MW-7, MW-8(R) and MW-9] during a 24-hour period between 21 and 22 February 2001. Wells MW-2, MW-5, MW-8(R), and MW-9 are located on a transect along the northern property boundary approximately parallel to the Puyallup River. Wells MW-1 and MW-7 are located along the southern property boundary adjacent to Portland Avenue. A hydrograph displaying the continuous water level monitoring results is provided on Figure 3-7.

The tidal influence on water levels is apparent in five of the six wells monitored. The wells on the river transect fluctuated by 1.40 to 2.58 feet, with the highest fluctuation at well MW-5. The water elevation in well MW-1 fluctuated by 1.29 feet; however, the elevation in well MW-7 fluctuated by only 0.11 foot. The apparent lack of tidal influence on water elevation in well MW-7 is consistent with groundwater elevations measured during the three monitoring events described in Section 3.3.1. The tidal fluctuation during the monitoring period, based on the published tide levels for Tacoma, Washington, was 12.4 feet. (Note: The published tide levels are for Commencement Bay. Tidally induced fluctuation of the Puyallup River stage near the site may be less than these published tidal levels. In addition, the highest and lowest water elevations at the site were measured approximately 1½ to 2 hours after the published times for high and low tide.)

The continuous groundwater monitoring results suggest that net groundwater flow is toward the Puyallup River, as indicated by elevation monitoring results (refer to Section 3.3.1). The water elevation in well MW-7, located near the southwestern corner of the site, is higher than the water elevation in well MW-8(R), located north of well MW-7, except under the highest tidal conditions. The water elevation in well MW-1, located in the south-central portion of the site, is consistently higher than the water elevation in well MW-9, located north of well MW-1 near the northern site boundary.

3.3.3 Surface Water Monitoring

Surface water flow pathways were observed during rainfall events at the site. Figure 3-8 shows the primary surface water flow pathways observed during rainfall events, and areas where ponded water was observed. Runoff on the eastern portion of the site is generally directed toward existing stormwater catch basins, and runoff on the western portion of the site generally flows offsite to the west. No catch basins are present on the western portion of the site.

Surface water discharges from the site at several locations along Portland Avenue, and flows into the City of Tacoma storm sewer catch basins located in Portland Avenue. Surface water also discharges from the site at two locations on the eastern and western property boundaries

(refer to Figure 3-8). The discharge from the western property boundary (SW-1) flows west into a wide, shallow depression located on the adjacent property. The discharge from the eastern property boundary (SW-2) flows through a 6-inch culvert and discharges into a vegetated area on the adjacent property.

Due to the presence of a man-made levee, surface water runoff from the site does not discharge toward, or interact with, the Puyallup River. Based on this fact, Ecology did not require sediment sampling along the Puyallup River.

3.4 Hydraulic Testing

Rising-head slug tests were performed at six monitoring wells [MW-1, MW-2, MW-5, MW-7, MW-8(R) and MW-9] at the site to estimate the approximate hydraulic conductivity of shallow soils. The method of data analyses and the results of these tests are summarized in the following sections.

3.4.1 Slug Test Data Analysis Methods

The Bouwer and Rice (1976) method was used to evaluate the slug test data generated from wells installed at the site. This method is applicable to unconfined aquifers with completely or partially penetrating wells. Slug test data were analyzed using the AQTESOLV software package (HydroSOLVE, Inc. 1996). The solution equations were accomplished using visual-manual curve matching. Data analysis plots for the slug test solutions are provided in Appendix G.

In general, slug test results are useful to the extent to which the aquifer meets the assumptions established for the equation. Factors such as well construction, aquifer heterogeneity and anisotropy, and the degree of well development may affect the analytical results. The assumptions on which slug test analyses are based are rarely completely met by the saturated zone and well being tested. Therefore, it is generally accepted that slug tests are accurate to within one to two orders of magnitude.

3.4.2 Results of Slug Test Data Analyses

Results of the slug test data analyses are summarized in Table 3-3. The table identifies a horizontal hydraulic conductivity (Kh) value estimated for each individual slug test run and then provides an average value (calculated as a geometric mean) for the well. For the purposes of this report, the estimated average horizontal hydraulic conductivity value is considered to be representative of the saturated zone conditions surrounding that well. However, because of the procedures for performing slug tests, the results (in some cases) may be more indicative of the filter pack surrounding the tested well.

Average horizontal hydraulic conductivity values estimated for wells tested ranged from 1.2×10^{-3} cm/s [2.4×10^{-3} feet per minute (ft/min)] at well MW-5 to 1.7×10^{-2} cm/s (3.4×10^{-2} ft/min) at wells MW-1 and MW-2. The mean horizontal hydraulic conductivity value (geometric mean) for all tested wells is 6.8×10^{-3} cm/s (1.3×10^{-2} ft/min). These values are consistent with those calculated from short-term pump tests in a previous study, which ranged from 1.3×10^{-3} cm/s to 4.9×10^{-2} cm/s (PGG 1992, refer to Section 1.3.4).

The average horizontal hydraulic conductivity values calculated from the slug test data are generally consistent with published values (Freeze and Cherry 1979) expected for clean sand and silty sand soil types. These soil types are generally consistent with those encountered on the site at monitoring well depths. These data provide a reasonable (within two orders of magnitude) estimate of the horizontal hydraulic conductivity of the upper saturated zone.

Groundwater seepage velocities were estimated for each slug test well based on the calculated horizontal hydraulic conductivity values, an average porosity of approximately 0.49 for soil materials in the upper saturated zone (based on analyses by Rosa), and the average estimated hydraulic gradient of 0.004 feet/foot based on groundwater elevation monitoring. Estimated groundwater seepage velocities ranged from 10 to 147 feet/year, with an average seepage velocity for all slug test wells of 82 feet/year. Groundwater seepage velocities are listed in Table 3-3.

3.5 Additional Field Observations

The following additional conditions and features were observed during the RI activites:

- LNAPL (up to 2 inches thick) was encountered in two test pits (TP-11 and TP-55) and one monitoring well (MW-12) located west of the former red brick building, and in two test pits (TP-2 and TP-49) located in the vicinity of the former creosoting plant in the southwestern corner of the site. A sheen or film was present on excavation water in four additional test pits (TP-48, TP-51, TP-52, and TP-53) located around the former creosoting plant. LNAPL and sheen were not identified in monitoring wells MW-7, MW-10, and MW-11 located in the vicinity of the former creosoting plant.

- Steel pipes with diameters of 3 to 12 inches were encountered in test pits TP-14, TP-55, TP-63, and TP-64. Soil that was slightly to moderately impacted with petroleum hydrocarbon odor and/or stains was encountered in these test pits, suggesting that these pipes may have been used to transfer petroleum product.

- Battery casings were present in test pit TP-16, located immediately south of the former red brick building. This is consistent with the reported battery disposal areas identified during previous site investigations.

- An hydraulic shear located in a machine shed approximately 100 feet west of the red brick building contained hydrocarbon product that appeared to be clean hydraulic oil. The hydraulic oil was reportedly removed from the shear prior to removal, but a fluid reservoir was not identified. Structures and/or piping potentially associated with containment of hydraulic oil were not encountered in test pits near the shear location including TP-11 where LNAPL (possibly hydraulic oil) was encountered.

Section 4: Soil Analytical Results

This section summarizes the analytical results for soil samples collected and analyzed during the RI. Chemical concentrations detected in soil samples were compared to the MTCA Method C industrial cleanup levels published in Ecology's Cleanup Levels and Risk Calculations (CLARC II) database (Ecology 1996b). Where MTCA Method C industrial cleanup levels were not available (e.g., lead and chromium) the analytical results were compared to the MTCA Method A industrial cleanup levels. The analytical results for petroleum hydrocarbons were compared to the proposed amended MTCA Method A industrial cleanup level (Ecology 2001). Samples exceeding the amended MTCA cleanup level were further evaluated using the TPH Interim Policy guidance (Ecology 1997a). The use of these industrial cleanup levels in evaluating the need for removal action(s) at the site is discussed further in Section 9.1.5 of the FS.

Analytical results for soil samples are summarized in Tables 4-1 through 4-5. TPH Interim Policy (Ecology 1997a) analyses are summarized in Tables 4-6 and 4-7, and TCLP/SPLP analytical results for select metals and PAHs are summarized in Tables 4-8A and 4-8B.

Figures 4-1 through 4-4 depict soil sample results where analyte concentrations exceed the applicable MTCA cleanup level. In addition, the approximate exceedance areas for selected analytes at specific depth intervals are also shown on the figures.

Analytical reports and chain-of-custody documents for soil sample analyses are provided in Appendix H.

4.1 Metals

Analytical results for metals are presented in Table 4-1 and summarized below.

Arsenic was detected at concentrations above the laboratory reporting limits in 38 of 107 soil samples submitted for laboratory analysis. Arsenic concentrations ranged from 5 to 100 mg/kg. The MTCA Method C industrial soil cleanup level for arsenic of 219 mg/kg was not exceeded in the analyzed soil samples; however, the reporting limit for one sample (TP-21-2-3; reporting limit of less than 300 mg/kg) was above the cleanup level.

Barium was detected in 107 soil samples submitted for laboratory analysis at concentrations of 27.2 to 4,190 mg/kg. These concentrations are below the MTCA Method C industrial soil cleanup level of 245,000 mg/kg.

Cadmium was detected above the laboratory reporting limits in 93 of 125 samples submitted for laboratory analysis at concentrations ranging from 0.2 to 130 mg/kg. The MTCA Method C industrial soil cleanup level of 3,500 mg/kg was not exceeded in the soil samples analyzed.

Chromium was detected in 111 soil samples submitted for laboratory analysis at concentrations of 0.9 to 2,520 mg/kg. The MTCA Method A industrial soil cleanup level of 500 mg/kg was exceeded in seven soil samples at concentrations of 564 to 2,520 mg/kg. Soil sample locations

where the chromium concentrations exceed the cleanup level are shown on Figure 4-1. Cleanup level exceedance areas for chromium are discussed in Section 4.1.1.2.

Copper was detected at concentrations above the laboratory reporting limit in 107 samples submitted for laboratory analysis. Copper concentrations ranged from 13 to 20,200 mg/kg. These concentrations are below the MTCA Method C industrial soil cleanup level of 130,000 mg/kg.

Lead was detected at concentrations above the laboratory reporting limits in 162 of 166 samples submitted for laboratory analysis. Lead concentrations ranged from 6 to 14,700 mg/kg. The lead concentration in 45 samples exceeded the MTCA Method A industrial soil cleanup level of 1,000 mg/kg, with concentrations ranging from 1,040 to 14,700 mg/kg. Soil sample locations where the lead concentrations exceed the cleanup level are shown on Figure 4-1. Cleanup level exceedance areas for lead are discussed in Section 4.1.1.1.

Mercury was detected at concentrations above the laboratory reporting limits in 94 of 120 samples submitted for laboratory analysis. Mercury concentrations ranged from 0.04 to 77 mg/kg. These concentrations are below the MTCA Method C industrial soil cleanup level of 1,050 mg/kg.

Selenium was detected above the laboratory reporting limit in 14 of 107 samples submitted for laboratory analysis at concentrations of 5 to 40 mg/kg. These concentrations are below the MTCA Method C industrial cleanup level of 17,500 mg/kg.

Silver was detected at concentrations above the laboratory reporting limit in 48 of 107 samples submitted for laboratory analysis. Silver concentrations ranged from 0.3 to 198 mg/kg. These concentrations are below the MTCA Method C industrial soil cleanup level of 17,500 mg/kg.

4.1.1 Metals Cleanup Level Exceedance Areas

Lead and chromium were detected in test pit soil samples at concentrations above their respective MTCA Method A industrial soil cleanup levels. The lateral and vertical distribution of affected soil material indicated by the analytical results for lead and chromium are discussed below.

4.1.1.1 Lead

Lead concentrations exceeding the MTCA Method A industrial soil cleanup level of 1,000 mg/kg were detected in soil samples collected from depth intervals of 0-1 foot, 2-3 feet, and 4-6 feet. The approximate areal extent of the lead exceedance areas for each depth interval are shown on Figure 4-1. [Note: The areal extent of the 0-1 foot exceedance area includes data from previous site investigations (refer to Section 1.3).]

The 0-1 foot depth interval exceedance area includes four separate regions, the largest of which is located on the eastern and north-central portion of the site. Three smaller exceedance regions are located on the western portion of the site. The approximate surface area of the 0-1 foot exceedance area is 142,534 square feet, and the approximate volume of affected material is up to 5,279 cubic yards.

The 2-3 feet depth interval exceedance area includes two separate regions. The larger of the two is located in the eastern and north-central portion of the site and roughly overlaps the 0-1 foot exceedance area, although it is smaller in extent. The smaller of the 2-3 feet exceedance regions is located south of the former red brick building location, and corresponds with part of the 0-1 foot exceedance area. The approximate surface area of the 2-3 feet exceedance area is 70,538 square feet, and the approximate volume of impacted soil is up to 5,225 cubic yards.

The lead cleanup level was exceeded in samples collected from two test pit locations in the 4-6 feet depth interval. These test pits (TP-34 and TP-46) are located on the eastern portion of the property. The approximate surface area of the 4-6 feet exceedance area is 8,318 square feet, and the approximate volume of impacted soil is up to 924 cubic yards.

The estimated volume of soil material that exceeds the MTCA Method A industrial soil cleanup level for lead of 1,000 mg/kg is 11,428 cubic yards (refer to Table 4-9). This estimate is based on analytical results for soil samples collected from test pits and previous investigation data and does not necessarily represent the maximum volume or extent of lead-impacted soil present on the site.

4.1.1.2 Chromium

Chromium concentrations exceeding the MTCA Method A industrial soil cleanup level of 500 mg/kg were detected in soil samples collected from depth intervals of 0-1 foot and 2-3 feet. The chromium cleanup level was exceeded in the 0-1 foot depth interval at five test pit locations. Three of these test pits (TP-40, TP-43, and TP-46) are located in the eastern portion of the site within the metal debris layer described in Section 3.2.1.2, and two of the test pits (TP-21 and TP-22) are located near the northern property boundary in the central portion of the site. The cleanup level was also exceeded in the 2-3 feet depth interval in test pits TP-21 and TP-22. Soil exceeding the chromium cleanup level is included within the limits of the lead cleanup level exceedance area.

4.2 PCBs

PCBs (Aroclors 1242, 1248, 1254, and 1260) were detected at concentrations above the laboratory reporting limits in 62 of 66 soil samples submitted for laboratory analysis. Total PCB concentrations ranged from 0.14 to 40.11 mg/kg. Total PCB concentrations were calculated by summing the concentrations of individual Aroclors in each sample. Where an Aroclor was not detected, a value of one-half the laboratory reporting unit was used. The MTCA Method C industrial soil cleanup level for total PCBs of 17 mg/kg was exceeded in six soil samples, with total PCB concentrations of 19.8 to 40.11 mg/kg. Analytical results for PCBs are summarized in Table 4-2.

PCB concentrations exceeded the MTCA Method C industrial soil cleanup level in samples collected at depth intervals of 0-1 foot and 2-3 feet. The 0-1 foot depth interval exceedance area is located on the eastern portion of the site with a surface area of approximately 20,945 square feet. The 2-3 feet depth interval exceedance area is also located on the eastern portion of the site within the horizontal boundaries of the 0-1 foot exceedance area. The approximate surface area of the 2-3 feet exceedance area is 3,503 square feet. The estimated

volume of PCB-impacted soil is up to 1,035 cubic yards (refer to Table 4-9). This estimate is based on analytical results for soil samples collected from test pits and does not necessarily represent the maximum volume or extent of PCB-impacted soil present on the site. Test pit locations where the MTCA Method C industrial soil cleanup level was exceeded, and the approximate areal extent of the exceedance areas, are shown on Figure 4-2. The total PCB exceedance area is within the limits of the metals-impacted exceedance area in the eastern portion of the site.

4.3 PAHs

PAH compounds were detected in 19 soil samples submitted for laboratory analysis. Detected PAH compounds included cPAHs and noncarcinogenic PAHs. Concentrations of noncarcinogenic PAHs did not exceed the applicable MTCA Method C industrial soil cleanup level for any of the analytes (refer to Table 4-3). Individual cPAH analyte concentrations exceeded the MTCA Method C industrial soil cleanup level of 18 mg/kg in samples collected from four test pit locations. Specific cPAH compounds detected at concentrations above the MTCA Method C industrial soil cleanup level are listed in Table 4-3.

The total cPAH concentration exceeded the MTCA Method C industrial soil cleanup level of 18 mg/kg in six soil samples collected from six test pit locations (refer to Table 4-3 and Figure 4-3). Total cPAH concentrations were calculated by summing the concentrations of individual cPAH analytes in each soil sample. Where an analyte was not detected, a value of one-half the laboratory reporting limit was used. Total cPAH concentrations ranged from 0.169 to 730 mg/kg. Total cPAH concentrations in samples where the MTCA Method C industrial soil cleanup level was exceeded ranged from 19.71 to 730 mg/kg.

Total cPAH concentrations exceeded the MTCA Method C cleanup level of 18 mg/kg in samples collected at depth intervals of 0-1 foot, 2-3 feet, and 6-10 feet. Total cPAH concentrations exceeded the cleanup level for the 0-1 foot depth interval in two test pit locations. One test pit is located south of the former red brick building location (TP-16), and the other is located in the eastern portion of the site (TP-40). The approximate surface area of the 0-1 foot exceedance area is 6,209 square feet. The 2-3 feet depth interval exceedance area is located around TP-61 in the eastern portion of the site, and has an approximate surface area of 2,750 square feet. The 6-10 feet depth interval exceedance area is located in the southwestern corner of the site in the vicinity of the former creosoting plant, and has an approximate surface area of 7,540 square feet. The estimated total volume of soil impacted by cPAHs is 1,551 cubic yards (refer to Table 4-9). This estimate is based on analytical results for soil samples collected from test pits, and does not necessarily represent the maximum volume or extent of cPAH-impacted soil present on the site.

4.4 Petroleum Hydrocarbons

Petroleum hydrocarbons in the diesel- and oil- ranges were detected in soil samples collected at the site. Diesel-range petroleum hydrocarbons were detected above the laboratory reporting limit in 121 of 127 soil samples submitted for laboratory analysis at concentrations of 6.2 to 23,000 mg/kg. Oil-range petroleum hydrocarbons were detected above the laboratory reporting limit in 122 of 127 soil samples at concentrations of 15 to 12,000 mg/kg. Analytical results for petroleum hydrocarbons are presented in Table 4-4.

Diesel-range petroleum hydrocarbon concentrations equaled or exceeded the MTCA Method A industrial soil cleanup level of 2,000 mg/kg in 13 soil samples, with concentrations ranging from 2,000 to 23,000 mg/kg. Oil-range petroleum hydrocarbon concentrations equaled or exceeded the MTCA Method A industrial soil cleanup level of 2,000 mg/kg in 29 soil samples, with concentrations of 2,000 to 23,000 mg/kg. [Note: The MTCA Method A industrial soil cleanup level for diesel- and oil- range petroleum hydrocarbons is based on the concentrations given in the MTCA Adopted Amendments (Ecology 2001) anticipated to become effective in August 2001.] Soil sample locations with petroleum hydrocarbon concentrations greater than 2,000 mg/kg are shown on Figure 4-4.

Diesel- and oil- range petroleum hydrocarbon concentrations exceeded the MTCA Method A industrial soil cleanup level of 2,000 mg/kg in samples collected at depth intervals of 0-1 foot, 2-3 feet, 4-6 feet, and 6-10 feet. The approximate areal extent of the exceedance areas for each depth interval is shown on Figure 4-4.

Petroleum hydrocarbon concentrations exceeded the MTCA Method A industrial soil cleanup level in the 0-1 foot depth interval in five separate regions of the site with a total surface area of approximately 36,223 square feet. Petroleum hydrocarbon concentrations exceeded the MTCA Method A industrial soil cleanup level in the 2-3 feet depth interval in four separate regions with a total surface area of approximately 22,268 square feet. The petroleum hydrocarbon cleanup level exceedance area for the 4-6 feet depth interval includes three separate regions of the site, and the exceedance area for the 6-10 feet depth interval includes two separate regions. The estimated total volume of soil containing diesel- and oil- range petroleum hydrocarbon concentrations above the MTCA Method A industrial soil cleanup level of 2,000 mg/kg is 6,671 cubic yards (refer to Table 4-9). This estimate is based on analytical results for soil samples collected from test pits, and does not necessarily represent the maximum volume or extent of petroleum hydrocarbon-impacted soil present on the site.

Exceedance areas for petroleum hydrocarbons are located throughout the site, and each area typically includes one to three test pit locations, although exceedance areas on the eastern portion of the site include up to five test pit locations. Exceedance areas at different depth intervals overlap locally. Petroleum hydrocarbon exceedance areas are typically relatively small in areal extent and vertically continuous to depths of greater than 10 feet bgs on the western portion of the site, particularly in the vicinity of the former creosoting plant location in the southwestern corner of the site, and west of the former red brick building location. On the eastern portion of the site, petroleum hydrocarbon exceedance areas are larger in areal extent but do not appear to extend below approximately 3 feet bgs, with the exception of one isolated area up to 6 feet bgs that is located near the eastern property boundary. This location corresponds to an area where lead-impacted soil was encountered at the same depth interval.

Soil samples where diesel- or oil- range petroleum hydrocarbon concentrations exceeded the MTCA Method A industrial soil cleanup level of 2,000 mg/kg were evaluated using Ecology's TPH Interim Policy (Ecology 1997a).

4.5 TPH Interim Policy Analyses

Based on the results of petroleum hydrocarbon analyses, 19 soil samples containing diesel- and oil- range petroleum hydrocarbon concentrations above the proposed amended MTCA

Method A industrial soil cleanup level of 2,000 mg/kg were analyzed for EPHs. The analytical methods used were those identified in Ecology's TPH Interim Policy (Ecology 1997a). The sample with the highest petroleum hydrocarbon concentration from each test pit where the cleanup level was exceeded was selected for EPH analysis. These 19 samples were also analyzed for PAHs as discussed in Section 4.3. Analytical results for EPH analyses are summarized in Table 4-5 and discussed below.

Aliphatic and aromatic EPH analytes were detected at concentrations above the laboratory reporting limits in the 19 samples submitted for laboratory analysis. Both aromatic and aliphatic compounds were detected in the C10-C12 through C21-C34 ranges. The highest concentrations of both aromatics and aliphatics were in the C21-C34 range.

According to Ecology's TPH Interim Policy, compliance with MTCA industrial soil cleanup levels is evaluated on a sample-by-sample basis using established risk assessment procedures identified in the TPH Interim Policy. The procedure includes calculation of a hazard index for noncarcinogenic compounds and a total risk for carcinogenic compounds (including cPAHs). The MTCA industrial soil cleanup level is exceeded when the noncarcinogenic compound concentrations exceed a hazard index of 1.0, or the total carcinogenic risk exceeds 1 in 100,000 (1×10^{-5}) under an industrial scenario. In addition, the hazard quotient (the hazard index is the sum of hazard quotients) cannot exceed 1.0, and the carcinogenic risk cannot exceed 1×10^{-5} for any individual substance.

Ecology's TPH Interim Policy also uses a calculated "concentration at well" to determine if a soil cleanup level is protective of groundwater. The "concentration at well" is an estimate of the petroleum hydrocarbon concentration in a well located adjacent to the source area, and is calculated using a default dilution factor (DF) of 20 for soil in the unsaturated zone. A DF of 1 is applicable where petroleum hydrocarbon-impacted soil is present in the groundwater smear zone where impacted soils are intermittently in contact with groundwater (personal communication, Mr. Charles San Juan, Ecology 2000). Based on this, a DF of 20 was used for soil samples collected from the 0-1 foot, 2-3 feet, and 4-6 feet depth intervals, and a DF of 1 was used for soil samples collected from the 6-10 feet depth interval, where intermittent saturated conditions may exist on portions of the site. The MTCA industrial soil cleanup level is exceeded where the calculated "concentration at well" exceeds 1 mg/l. The TPH Interim Policy is not applicable to petroleum hydrocarbon-impacted soil where saturated conditions are continuous.

Using Ecology's spreadsheet, hazard indices, risks, and "concentrations at well" were calculated for each of the 19 soil samples. The spreadsheet used to perform the TPH Interim Policy calculations was obtained directly from Ecology through its Internet site. Calculation spreadsheets for each sample are provided in Appendix I. Aliphatic and aromatic hydrocarbon concentrations were used in the calculations, as were cPAH concentrations. Benzene, toluene, ethylbenzene, and total xylenes (BTEX) concentrations were used for those samples that were included in previous analyses for VOCs. TPH Interim Policy evaluation results are summarized in Table 4-6.

The MTCA industrial soil cleanup level was met for 12 of the 19 samples evaluated under the TPH Interim Policy using the industrial exposure scenario. For these 12 samples, the maximum calculated hazard index was 0.04, the maximum total carcinogenic risk was 8.23×10^{-6}, and the maximum "concentration at well" was 0.1 mg/l using a DF of 20 and 0.2 mg/l using a DF of 1.

Seven samples evaluated under the TPH Interim Policy using the industrial exposure scenario did not meet the MTCA Method C industrial soil cleanup level. These soil samples were from the following test pits:

- TP-2, TP-5, and TP-49 located in the southwestern corner of site in the vicinity of the former creosoting plant
- TP-10 located approximately 100 feet west of the former red brick building
- TP-16 located immediately south of the former red brick building
- TP-40 and TP-61 located in the eastern portion of the site.

The hazard index criterion of 1.0 was not exceeded in any of the samples. The total carcinogenic risk criterion of 1×10^{-5} was exceeded in six of the seven samples with the total carcinogenic risks ranging from 1.10×10^{-5} to 3.55×10^{-4}. The criterion was not exceeded in the sample from TP-10. The six locations correspond to those locations where cPAHs exceed the MTCA Method C industrial soil cleanup level of 18 mg/kg (refer to Section 4.3 and Figure 4-3).

The "concentration at well" criterion of 1 mg/l was exceeded in four of the seven samples from TP-2, TP-5, TP-10, and TP-49. These results correspond to those areas of the site where petroleum hydrocarbon- and cPAH-impacted soil has been identified down to the water table (refer to Sections 4.3 and 4.4 and Figures 4-3 and 4-4, respectively). These results also correspond to areas of the site where groundwater impacts have been identified (refer to Section 5.2 and Figures 5-2, 5-3).

4.6 VOCs

Individual VOC analytes were detected at concentrations above the laboratory reporting limits in 23 soil samples submitted for laboratory analysis. However, VOC concentrations did not exceed the applicable MTCA Method C industrial soil cleanup level for the VOC analytes. (Note: MTCA soil cleanup levels are not available for all VOC analytes.) Analytical results for VOCs are summarized in Table 4-4.

4.7 TNT/DNT

TNT and DNT analytes were not detected in five soil samples collected from test pits TP-39 and TP-40 at concentrations above the laboratory reporting limits. Analytical results for TNT and DNT analyses are summarized in Table 4-7.

4.8 TCLP/SPLP Analyses

TCLP and SPLP analyses were conducted on a select number of samples to evaluate leaching potential of metals and PAHs and to assist in characterizing impacted soil at the site with respect to state and federal waste disposal regulations.

Based on analytical results for total metals concentrations in soil samples, five samples were submitted for TCLP and SPLP analyses for lead to assist in waste disposal characterization.

Six additional samples were submitted for TCLP analysis for lead to assist in waste disposal characterization. Soil samples containing the highest detected concentrations of arsenic, barium, cadmium, chromium, copper, mercury, selenium, and silver were also submitted for TCLP and SPLP analyses. Three samples were submitted for TCLP and SPLP analysis for PAHs.

Analytical results for TCLP and SPLP analyses are summarized in Table 4-8A (metals) and Table 4-8B (PAHs). TCLP and SPLP analytical reports are provided in Appendix J. The results of TCLP and SPLP analyses are summarized below and discussed further in Section 8 (Chemical Fate and Transport) and Section 9 (Feasibility Study) of this report.

TCLP lead was detected above the laboratory reporting limit in 10 samples at concentrations ranging from 0.13 to 74.7 mg/l. Ecology's dangerous waste criterion (WAC 173-303-100) of 5 mg/l for TCLP lead was exceeded in eight samples at concentrations of 6.9to 74.7 mg/l. SPLP lead was detected in three samples at significantly lower concentrations of 0.03 to 0.07 mg/l.

TCLP barium, cadmium, copper, and mercury were detected at concentrations above the laboratory reporting limits, but below Ecology's dangerous waste criterion threshold values of the metals. (Note: A dangerous waste criterion threshold value is not available for copper.) SPLP barium, copper, and mercury were detected at low concentrations above the laboratory reporting limits.

TCLP and SPLP PAH compounds were detected in one of the samples submitted for laboratory analysis at a low concentration above the laboratory reporting limits. However, none of the TCLP or SPLP PAH compounds detected were cPAH compounds.

4.9 Summary of Soil Analytical Results

Analytical results for soil samples collected during the RI indicate that lead, chromium, cPAH, PCB, and petroleum hydrocarbon concentrations exceed the applicable MTCA Method A and C industrial soil cleanup levels. Soil exceeding the MTCA cleanup level for chromium, cPAHs, and PCBs is generally included within the exceedance areas identified for lead and petroleum hydrocarbons. Exceedance areas and volumes of soil material that may require remediation are summarized in Table 4-9.

Soil samples with lead, chromium, cPAH, and PCB concentrations exceeding the applicable MTCA Method A and C industrial soil cleanup levels were identified at various depth intervals from the surface to 10 feet bgs at test pit locations throughout the site. The lead exceedance areas are the most extensive for the 0-1 foot and 2-3 feet depth intervals (refer to Figure 4-1) and generally encompass the exceedance areas for chromium, PCBs, and cPAHs at those depths (refer to Figures 4-2 and 4-3), with the exception of cPAH concentrations in TP-61 at the 2-3 feet depth interval. Lead was also detected above the soil cleanup level at the 4-6 feet depth interval in two isolated areas in the vicinity of TP-34 and TP-46. At the 6-10 feet depth interval, cPAHs exceed the MTCA Method C industrial soil cleanup level in the southwestern corner of the site, in the vicinity of the former creosoting plant, in an area where lead concentrations above the cleanup level were not identified in test pit samples.

Petroleum hydrocarbon concentrations exceeded the MTCA Method A industrial soil cleanup level of 2,000 mg/kg in samples collected from the surface to 10 feet bgs at test pit locations throughout the site (refer to Figure 4-4). Petroleum hydrocarbon exceedance areas on the eastern portion of the site are confined to the uppermost 3 feet of soil and generally correspond with the lead exceedance areas. On the western portion of the site, petroleum hydrocarbon exceedance areas generally do not correspond with lead exceedance areas (with the exception of test pit locations TP-9, TP-16, TP-55, and TP-57 in the 0-1 foot depth interval). Petroleum hydrocarbon exceedances extend to the water table (10 feet bgs) in two areas on the western portion of the site, in the vicinity of the former creosoting plant and west of the former red brick building. Petroleum hydrocarbon exceedance areas throughout the site include the exceedance areas for total cPAHs.

The combined lead and petroleum hydrocarbon exceedance areas include the exceedance areas for other analytes detected in test pit samples at concentrations above the applicable MTCA industrial soil cleanup levels. The estimated volume of soil in the lead-impacted exceedance areas is approximately 11,400 cubic yards, and the estimated volume of soil in the petroleum hydrocarbon-impacted exceedance areas is approximately 6,700 cubic yards. (Note: Estimated volumes have been rounded to the nearest one hundred cubic yards.) These estimates are based on soil samples collected from test pits that were advanced to maximum depths of 12 feet bgs, but typically to depths of 10 feet bgs. Analyte concentrations above applicable cleanup levels may be present at locations where test pits were not excavated, and at depths below the maximum test pit depths.

Based on the evaluation of soil samples using Ecology's TPH Interim Policy, the petroleum hydrocarbon exceedance areas may be less extensive than described above. Based on TPH Interim Policy evaluation, the petroleum hydrocarbon exceedance areas may include only seven test pit locations, six of which correspond with the cPAH exceedance areas.

Section 5: Groundwater Analytical Results

This section summarizes the analytical results for reconnaissance and monitoring well groundwater samples.

Analyte concentrations detected in groundwater samples were compared to the MTCA Method B and C surface water cleanup levels published in Ecology's CLARC II database (Ecology 1996b) where cleanup levels are available for the given analyte. In addition, the groundwater analytical results were compared to other ARARs including:

- Ecology's Acute Freshwater Surface Water Quality Standard (SWQS) (WAC 173-201A, Ecology 1997b)
- National Toxics Rule (NTR) for Consumption of Organisms Only [40 Code of Federal Regulations (CFR) 131.36]
- Ecology's Model National Pollution Discharge Elimination System (NPDES) Permit Standards (WAC 173-226) for petroleum hydrocarbons.

Use of the above mentioned cleanup levels meets the requirements of MTCA established in WAC 173-340-720(6)(d) for protection of shallow groundwater discharging to an adjacent surface water body. The use of these cleanup levels and/or ARARs in evaluating the need for remedial action(s) at the site is discussed further in Section 9.1.5 of the FS.

Ecology's Acute Freshwater SWQS values for cadmium, chromium, copper, lead, and silver were calculated based on the average hardness of groundwater samples (refer to Section 5.2.7) using a computer spreadsheet obtained from Ecology.

Figure 5-1 summarizes reconnaissance and monitoring well groundwater analytical results for samples exceeding one or more of the cleanup levels and/or ARARs.

5.1 Reconnaissance Groundwater Analytical Results

Eighteen reconnaissance groundwater samples were submitted for laboratory analysis. Results of these analyses are summarized in Tables 5-1 through 5-4 and discussed below. Analytical reports and chain-of-custody documents for reconnaissance groundwater samples are provided in Appendix K.

Reconnaissance groundwater analytical results are typically used as a screening tool to evaluate the need for permanent groundwater monitoring wells. The analyte concentrations in reconnaissance samples are typically biased high due to the relatively high amount of suspended entrained soil particles in the samples.

5.1.1 Dissolved Metals

Dissolved metals detected in reconnaissance groundwater samples at concentrations at or above the laboratory reporting limit included barium, cadmium, and mercury. Complete analytical results are provided in Table 5-1, and detected analytes are summarized below.

- Dissolved barium was detected in all 18 reconnaissance groundwater samples at concentrations of 4 to 120 µg/l. MTCA surface water cleanup levels, Ecology's Acute Freshwater SWQS, and NTR criterion for barium are not available.

- Dissolved cadmium was detected in three of the 18 reconnaissance groundwater samples at concentrations of 5 to 9 µg/l, below the MTCA Method B and C surface water cleanup levels of 20.3 and 50.6 µg/l, respectively. The cadmium concentration in sample RGW-1 (9 µg/l) exceeds Ecology's Acute Freshwater SWQS of 7.0 µg/l (based on a hardness of 180 mg/l). An NTR criterion for cadmium is not available.

- Dissolved mercury was detected in one reconnaissance groundwater sample at a concentration of 0.2 µg/l. This concentration is below Ecology's Acute Freshwater SWQS of 2.10 µg/l and the NTR criterion of 1.5 µg/l. MTCA surface water cleanup levels for mercury are not available.

5.1.2 PCBs

PCB Aroclors were not detected in the 18 reconnaissance groundwater samples at concentrations above the laboratory reporting limits. Analytical results for PCBs are presented in Table 5-2.

5.1.3 PAHs

PAH compounds were detected in 18 reconnaissance groundwater samples submitted for laboratory analysis. Detected PAH compounds included cPAHs and noncarcinogenic PAHs. Concentrations of noncarcinogenic PAHs did not exceed the MTCA Method C surface water cleanup level, Ecology's Acute Freshwater SWQS, or NTR criteria for PAH compounds (where the particular ARAR was available for the given compound). One reconnaissance groundwater sample (RGW-2; 1,000 µg/l) exceeded the MTCA Method B surface water cleanup level for acenaphthene of 643 µg/l. Analytical results for PAHs are summarized in Table5-3.

Individual cPAH compound concentrations were detected in eight reconnaissance groundwater samples above either MTCA Method B and/or C surface water cleanup levels of 0.0296 and 0.740 µg/l, respectively, or above the NTR criterion of 0.31 µg/l. Total cPAH concentrations in the eight samples exceeded the MTCA Method B surface water cleanup level. The total cPAH concentrations in five samples exceeded the MTCA Method C surface water cleanup level and NTR criterion. Ecology's Acute Freshwater SWQS for cPAHs are not available.

5.1.4 Petroleum Hydrocarbons

Gasoline-, diesel-, and oil- range petroleum hydrocarbons were detected at concentrations above the laboratory reporting limits in reconnaissance groundwater samples. Analytical results for petroleum hydrocarbons are summarized in Table 5-4 and discussed below.

- Gasoline-range petroleum hydrocarbons were detected in three reconnaissance groundwater samples at concentrations of 0.09 to 0.33 mg/l
- Diesel-range petroleum hydrocarbons were detected in three reconnaissance groundwater samples at concentrations of 0.86 to 1.7 mg/l
- Oil-range petroleum hydrocarbons were detected in one reconnaissance groundwater sample at a concentration of 0.96 mg/l.

MTCA surface water cleanup levels, Ecology's Acute Freshwater SWQS, and NTR criteria are not available for petroleum hydrocarbons. The concentrations detected were below Ecology's Model NPDES Permit Standard of 1 mg/l for gasoline-range petroleum hydrocarbons and 10 mg/l for diesel- and oil- range petroleum hydrocarbons.

5.1.5 VOCs

Reconnaissance groundwater samples were analyzed for BTEX compounds and naphthalene [Note: Naphthalene is included in the compound list for both PAHs and VOCs (refer to Section 5.1.3).] Benzene and total xylenes were not detected above the laboratory reporting limits. Toluene (two samples) and ethylbenzene (one sample) were detected at or slightly above the laboratory reporting limits. Naphthalene was detected in four samples at concentrations ranging from 23 to 210 µg/l. None of the analytical results exceeded the MTCA Method B and C surface water cleanup levels, Ecology's Acute Freshwater SWQS, or NTR criteria. Analytical results for VOCs are summarized in Table5-4.

5.2 Monitoring Well Groundwater Analytical Results

Groundwater samples were collected from 11 monitoring wells located on the site. Up to four monitoring events were conducted as part of the RI (refer to Section 2.3.4). The highest analyte concentrations detected during these monitoring events are discussed below. Analytical results for monitoring well groundwater samples are provided in Tables 5-5 through 5-10. Analytical results for samples exceeding cleanup levels and/or ARARs are summarized on Figure 5-1, and concentration contour maps for select analytes are provided on Figures 5-2 and 5-3. Analytical reports and chain-of-custody documents for groundwater monitoring well samples are provided in Appendix L.

5.2.1 Total Metals

Total metals including barium, cadmium, chromium, copper, and lead were detected at concentrations above the laboratory reporting limits in groundwater samples. Analytical results for total metals are summarized in Table 5-5 and discussed below.

- Total barium was detected in the groundwater samples collected from 11 monitoring wells at concentrations of 2 to 90 µg/l. MTCA surface water cleanup levels, Ecology's Acute Freshwater SWQS, and NTR criterion are not available for barium.

- Total cadmium was detected in the groundwater sample collected from well MW-6 at a concentration of 3 µg/l. This concentration is below the MTCA Method B and C surface water cleanup levels of 20.3 µg/l and 50.6 µg/l, respectively, and below Ecology's Acute Freshwater SWQS of 7.0 µg/l (based on a hardness of 180 mg/l). An NTR criterion is not available for cadmium.

- Total chromium was detected in the groundwater samples collected from five monitoring wells at concentrations of 20 to 190 µg/l. These concentrations are below Ecology's Acute Freshwater SWQS of 888.04 µg/l (based on a hardness of 180 mg/l). MTCA surface water cleanup levels and NTR criterion are not available for total chromium. Chromium was detected only during the 14 March 2000 monitoring event. Chromium was not detected at concentrations above the laboratory reporting limits in subsequent monitoring events.

- Total copper was detected in the groundwater samples collected from eight monitoring wells at concentrations of 3 to 20 µg/l. These concentrations are below the MTCA Method B and C surface water cleanup levels of 2,660 and 6,660 µg/l, respectively, and below Ecology's Acute Freshwater SWQS of 29.61 µg/l (based on a hardness of 180 mg/l). An NTR criterion is not available for copper.

- Total lead was detected in the groundwater samples collected from three monitoring wells at concentrations of 6 to 20 µg/l. These lead concentrations are below Ecology's Acute Freshwater SWQS of 121.7 µg/l (based on a hardness of 180 mg/l). MTCA surface water cleanup levels and NTR criterion are not available for lead.

5.2.2 Dissolved Metals

Dissolved metals including barium and selenium were detected in groundwater samples at concentrations above the laboratory reporting limits. Analytical results for dissolved metals are summarized in Table 5-6 and discussed below

- Dissolved barium was detected in the groundwater samples collected from 11 monitoring wells at concentrations of 9 to 102 µg/l. MTCA surface water cleanup levels, Ecology's Acute Freshwater SWQS, and NTR criterion are not available for barium.

- Dissolved selenium was detected at a concentration of 70 µg/l in the groundwater sample collected from well MW-9 during the 21 November 2000 monitoring event. This concentration is above the Ecology's Acute Freshwater SWQS of 20 µg/l. MTCA surface water cleanup levels and NTR criterion are not available for selenium. The laboratory reporting limit for dissolved selenium for the other groundwater samples of 50 µg/l is above Ecology's Acute Freshwater SWQS. Dissolved selenium was not detected in subsequent monitoring event and total selenium (refer to Table 5-5) was not detected above the laboratory reporting limit in the samples collected from any of the site monitoring wells. The detection of dissolved selenium appears to be anomalous and is not considered

representative of groundwater quality at the site since the results do not appear to be reproducible.

5.2.3 PCBs

PCB Aroclors 1242, 1248, and 1254 were detected in a duplicate groundwater sample collected from well MW-8(R) at concentrations of 5.6 µg/l, 1.9 µg/l, and 1.3 µg/l, respectively. PCB Aroclor 1242 was also detected in the groundwater sample collected from well MW-11 at a concentration of 2.0 µg/l. These concentrations were flagged "Y" by the analytical laboratory, indicating that the reported values represent a raised reporting limit due to matrix interference. The "Y" flag is essentially a "U" or "ND" flag at a slightly elevated reporting limit, and does not necessarily indicate the presence of an analyte.

These "Y" flagged reported values do not appear to be representative of PCB concentrations in site groundwater. PCB Aroclors were not detected during other monitoring events, and in the case of the well MW-8(R) duplicate sample, were not detected in the original sample collected from well MW-8(R). In addition, no PCB Aroclors were detected in the reconnaissance groundwater samples. Consequently, the detection of PCBs in groundwater appears to be anomalous and is not considered representative of groundwater quality at the site since the results do not appear to be reproducible.

PCB analytical results for groundwater samples are summarized in Table5-7.

5.2.4 PAHs

PAH compounds were detected in the groundwater samples collected from each of the 11 groundwater monitoring wells. Detected PAH compounds included cPAHs and noncarcinogenic PAHs. PAH analytical results for groundwater samples are summarized in Table 5-8.

With the exception of naphthalene, concentrations of noncarcinogenic PAHs did not exceed the MTCA Method B and C surface water cleanup levels, Ecology's Acute Freshwater SWQS, or the NTR criteria for PAH compounds (where the particular ARAR was available for the given compound).

Naphthalene was detected in the groundwater samples collected from 11 monitoring wells at concentrations of 0.07 to 6,200 µg/l. The naphthalene concentrations detected in samples from well MW-8(R) ranged from 4,000 to 6,200 µg/l during four monitoring events. These concentrations exceed Ecology's Acute Freshwater SWQS of 2,300 µg/l, but are below the MTCA Method B and C surface water cleanup levels of 9,880 and 24,700 µg/l, respectively. An NTR criterion is not available for naphthalene. A concentration contour map for naphthalene in site groundwater is provided as Figure 5-2. [Note: Naphthalene is included in the compound list for both PAHs and VOCs (refer to Section 5.2.6); concentrations shown on Figure 5-2 are the highest naphthalene value detected regardless of the particular analysis.]

Individual cPAH compound concentrations were detected in the groundwater samples collected from monitoring wells MW-8(R), MW-10, and MW-11 at concentrations of 0.05 to 4.8 µg/l. Individual cPAH analyte concentrations were above the MTCA Method B surface water cleanup

level of 0.0296 μg/l. Some individual cPAH concentrations exceeded the MTCA Method C surface water cleanup level of 0.740 μg/l and the NTR criterion of 0.31 μg/l (refer to Table 5-8 for specific compounds and concentrations). Ecology's Acute Freshwater SWQS values are not available for cPAHs.

Total cPAH concentrations in the groundwater samples collected from monitoring wells MW-8(R), MW-10, and MW-11 exceeded the MTCA Method B and C surface water cleanup levels of 0.0296 and 0.740 μg/l, respectively, and the NTR criterion of 0.31 μg/l.

PAH compound concentrations were generally lowest in the samples collected from monitoring wells MW-8(R), MW-10, and MW-11 during the 14 May 2001 monitoring event. The groundwater samples collected during this event were field filtered. Noncarcinogenic PAH compound concentrations, with the exception of naphthalene, were lower in the filtered samples. Carcinogenic PAH compounds were not detected in any of the filtered samples, with the exception of a low concentration of benzo(a)anthracene (0.11 μg/l) slightly above the laboratory reporting limit in the filtered groundwater sample collected from well MW-10. This suggests that the cPAHs previously detected in the unfiltered samples were likely an artifact of suspended entrained soil in the samples and do not necessarily indicate the presence of cPAHs in site groundwater, especially since cPAHs have very low aqueous solubility's and are relatively immobile in groundwater.

5.2.5 Petroleum Hydrocarbons

Gasoline-, diesel-, and oil- range petroleum hydrocarbons were detected at concentrations above the laboratory reporting limits in groundwater samples collected from 9 of the 11 monitoring wells. Groundwater analytical results for petroleum hydrocarbons are summarized in Table 5-9 and discussed below.

- Gasoline-range petroleum hydrocarbons were detected in the groundwater samples collected from monitoring wells MW-8(R), MW-10, and MW-11 at concentrations of 0.39to 39 mg/l.

- Diesel-range petroleum hydrocarbons were detected in the groundwater samples collected from monitoring wells MW-4(R), MW-5, MW-6, MW-7, MW-8(R), MW-9, MW-10, MW-11, and MW-12 at concentrations of 0.33 to 4.1 mg/l.

- Oil-range petroleum hydrocarbons were detected in the groundwater sample collected from monitoring well MW-12 at a concentration of 1.4 mg/l.

MTCA surface water cleanup levels, Ecology's Acute Freshwater SWQS, and NTR criteria are not available for petroleum hydrocarbons. The concentrations of gasoline-range petroleum hydrocarbons exceeded Ecology's Model NPDES Permit Standard of 1 mg/l for groundwater samples collected from wells MW-8(R) and MW-11; diesel- and oil- range petroleum hydrocarbon concentrations were below Ecology's Model NPDES Permit Standard of 10 mg/l in all site wells. A concentration contour map for gasoline-range petroleum hydrocarbons in site groundwater is provided as Figure 5-3.

LNAPL was present in well MW-12 during each monitoring event, although petroleum hydrocarbons were not detected in groundwater samples at concentrations above Ecology's NPDES Permit Standards. Measured LNAPL thickness in this well was approximately 2 inches. Areas where LNAPL was observed/measured in monitoring wells and test pits are shown on Figure 5-3.

5.2.6 VOCs

Twenty VOCs were detected in monitoring well groundwater samples. Except for naphthalene, compound concentrations do not exceed the MTCA Method B or C surface water cleanup levels, Ecology's Acute Freshwater SWQS or the NTR criteria, where values are available for the given compound. Analytical results for VOCs are summarized in Table5-9.

Naphthalene was detected at concentrations above the laboratory reporting limits in groundwater samples collected from wells MW-8(R), MW-9, MW-10, MW-11, and MW-12. The naphthalene concentration in the groundwater sample from well MW-8(R) ranged from 2,000 to 8,500 µg/l during the monitoring events and exceeded Ecology's Acute Freshwater SWQS of 2,300 µg/l. Naphthalene concentrations were below the MTCA Method B and C surface water cleanup levels of 9,880 and 24,700 µg/l, respectively. An NTR criterion for naphthalene is not available. A concentration contour map for naphthalene in site groundwater is provided on Figure 5-2. [Note: Naphthalene was included in the compound list for both VOCs and PAHs (refer to Section 5.2.4); concentrations shown on Figure 5-2 are the highest naphthalene value detected regardless of the particular analysis.]

5.2.7 Water Quality Parameters

Analytical results for general water quality parameters are summarized in Table5-10. The average of the laboratory-reported hardness values (180 mg/l) was used to calculate Ecology's Acute Freshwater SWQS values for cadmium, chromium, copper, lead, and silver using a computer spreadsheet obtained from Ecology.

5.3 Summary of Groundwater Analytical Results

Naphthalene and gasoline-range petroleum hydrocarbons, exceeding applicable cleanup standards and/or ARARs, were identified in groundwater samples collected from site monitoring wells. Naphthalene concentrations exceeding Ecology's Acute Freshwater SWQS of 2,300 µg/l were identified in the groundwater samples collected from monitoring well MW-8(R) (refer to Figure 5-2). Gasoline-range petroleum hydrocarbon concentrations exceeded Ecology's Model NPDES Permit Standard of 1 mg/l in the groundwater samples collected from wells MW-8(R) and MW-11 (refer to Figure 5-3). Diesel- and oil-range petroleum hydrocarbon concentrations did not exceed Ecology's Model NPDES Permit Standard of 10 mg/l.

The highest concentrations of naphthalene and gasoline-range petroleum hydrocarbons were identified in groundwater samples collected from well MW-8(R). The approximate exceedance areas of these analytes are located in the northwestern portion of the site, downgradient of the former creosoting plant.

LNAPL was present in well MW-12 during all monitoring events, although detected petroleum hydrocarbon concentrations in groundwater samples collected from the well were below cleanup levels and/or ARARs. LNAPL was not encountered in well MW-8(R) where the highest petroleum hydrocarbon concentrations were identified, or in well MW-11 where LNAPL was encountered in nearby test pits.

Total cPAH concentrations exceeding the MTCA Method B and C surface water cleanup levels of 0.0296 and 0.740 μg/l, respectively, and the NTR criterion of 0.31 μg/l were identified in groundwater samples collected from monitoring wells in the western portion of the site. However, cPAHs (with the exception of a low concentration of benzo(a)anthracene just above the laboratory reporting limit) were not detected in groundwater samples which were filtered, suggesting that suspended entrained soil particles in the unfiltered groundwater samples may have imparted a high bias to the analytical results. Filtered sample analytical results are believed to be more representative of groundwater quality at the site with respect to cPAHs.

Dissolved selenium (reported in one sample) and PCBs (reported in two samples) concentrations also exceeded applicable cleanup levels and/or ARARs. However, as discussed in Sections 5.2.2 and 5.2.3, respectively, these results do not appear to be representative of site groundwater.

Section 6: Surface Water Analytical Results

This section summarizes the analytical results for surface water samples collected during two sampling events.

Surface water runoff on the eastern portion of the site is generally directed toward existing storm water catch basins, while runoff on the western portion of the site generally flows offsite to the west. Surface water samples (SW-1 and SW-2) were collected at two locations, on the western and eastern property boundaries, respectively (refer to Figure 3-8). Discharge on the western property boundary (SW-1) flows onto the ground surface and into a wide, shallow depression located on the adjacent property. Discharge on the eastern property boundary (SW-2) flows through a 6-inch culvert and discharges into a vegetated area on the adjacent property.

Analyte concentrations detected in surface water samples were compared to the MTCA Method B and C surface water cleanup levels published in Ecology's CLARC II database (Ecology 1996b) where cleanup levels are available for the given analyte. In addition, the surface water analytical results were compared to other ARARs including:

- Ecology's Acute Freshwater SWQS (WAC 173-201A, Ecology 1997b)
- NTR for Consumption of Organisms Only (40 CFR 131.36)
- Ecology's Model NPDES Permit Standards (WAC 173-226) for petroleum hydrocarbons.

The use of these cleanup levels and/or ARARs in evaluating the need for remedial action(s) at the site is discussed further in Section 9.1.5 of the FS.

Ecology's Acute Freshwater SWQS values for cadmium, chromium, copper, lead, and silver were calculated based on the average hardness for surface water samples (31 mg/l) using a computer spreadsheet obtained from Ecology.

Surface water analytical results and cleanup levels and/or ARARs are summarized in Table 6-1. Analytical reports and chain-of-custody documents are provided in Appendix M.

6.1 Total Metals

Total metals including barium, cadmium, chromium, copper, lead, mercury, and zinc were detected at concentrations above the laboratory reporting limits in surface water samples. Total metals concentrations exceeding one or more cleanup levels and/or ARARs are listed below.

- Total cadmium was detected in both surface water samples at concentrations of 2 to 8 μg/l. These concentrations exceed Ecology's Acute Freshwater SWQS of 1.04 μg/l (based on a hardness of 31 mg/l). These concentrations are below the MTCA Method B and C surface water cleanup levels of 20.3 and 50.6 μg/l, respectively. An NTR criterion is not available for cadmium.

- Total copper was detected in both surface water samples at concentrations of 231 to 2,070 µg/l. These concentrations are below the MTCA Method B and C surface water cleanup levels of 2,660 and 6,660 µg/l, respectively, but above Ecology's Acute Freshwater SWQS of 5.64 µg/l (based on a hardness of 31 mg/l). An NTR criterion is not available for copper.

- Total lead was detected in both surface water samples at concentrations of 250 to 8,090 µg/l. These concentrations are above Ecology's Acute Freshwater SWQS of 17.68 µg/l (based on a hardness of 31 mg/l). MTCA surface water cleanup levels and NTR criterion are not available for lead.

- Total mercury was detected in both surface water samples at concentrations of 0.3 to 9.4 µg/l. The total mercury concentration detected in surface water sample SW-1 collected during the March 2001 monitoring event was 9.4 µg/l, which is above Ecology's Acute Freshwater SWQS of 2.1 µg/l and the NTR criterion of 1.5 µg/l MTCA surface water cleanup levels are not available for mercury.

- Total silver was detected in surface water sample SW-1 collected during the March 2001 monitoring event at a concentration of 6 µg/l, which is above Ecology's Acute Freshwater SWQS of 0.46 µg/l (based on a hardness of 31 mg/l). The silver concentration of 6µg/l is below the MTCA Method B and C surface water cleanup levels of 25,900 and 64,800 µg/l, respectively. An NTR criterion is not available for silver.

6.2 Dissolved Metals

Dissolved metals including barium, cadmium, copper, and mercury were detected in surface water samples at concentrations above the laboratory reporting limits. Dissolved metals concentrations exceeding one or more cleanup levels and/or ARARs are listed below.

- Dissolved cadmium was detected in surface water sample SW-2 at concentrations of 5 and 8 µg/l. These concentrations exceed Ecology's Acute Freshwater SWQS of 1.04µg/l (based on a hardness of 31 mg/l), but are below the MTCA Method B and C surface water cleanup levels of 20.3 and 50.6 µg/l, respectively. An NTR criterion is not available for cadmium.

- Dissolved copper was detected in both surface water samples at concentrations of 90 to240 µg/l. These concentrations are below the MTCA Method B and C surface water cleanup levels of 2,660 and 6,660 µg/l, respectively, but above Ecology's Acute Freshwater SWQS of 5.64 µg/l (based on a hardness of 31 mg/l). An NTR criterion is not available for copper.

6.3 PCBs

PCB Aroclors 1254 and 1260 were detected in surface water samples ata maximum concentration of 2.7 µg/l. PCB Aroclors were not detected in surface water sample SW-2 collected during the April 2001 monitoring event. For those samples in which PCB Aroclors were detected, the total PCB concentrations ranged from 4.5 to 7.8 µg/l, which are above the MTCA Method B and C surface water cleanup levels of 0.000027 and 0.000674 µg/l, respectively. These concentrations also exceed Ecology's Acute Freshwater SWQS and NTR

criterion of 2 and 0.0017 μg/l, respectively. (Note: The total PCB concentrations are likely biased high due to the inclusion of nondetected PCB Aroclors in the totals at concentrations of one-half the laboratory reporting limit.)

6.4 PAHs

PAH compounds were detected in surface water samples SW-1 and SW-2 collected during the March 2001 monitoring event, and in sample SW-1 collected during the April 2001 monitoring event. Detected PAH compounds included cPAHs and noncarcinorgenic PAHs.

Concentrations of noncarcinogenic PAHs did not exceed the MTCA Method B and C surface water cleanup levels, Ecology's Acute Freshwater SWQS, or the NTR criteria for PAH compounds (where the particular ARAR was available for the given compound).

Individual cPAH compound concentrations were detected in surface water samples SW-1 and SW-2, although only benzo(a)anthracene and chrysene were detected in surface water sample SW-2. Individual cPAH compounds were detected above the MTCA Method B surface water cleanup level of 0.0296 μg/l in surface water sample SW-1. Some individual cPAH concentrations were also detected in surface water sample SW-1 above the MTCAMethod C surface water cleanup level of 0.740 μg/l and the NTR criterion of 0.31μg/l. The concentrations of benzo(a)anthracene and chrysene detected in surface water sample SW-2 exceeded the MTCA Method B surface water cleanup level of 0.0296 μg/l Ecology's Acute Freshwater SWQS values are not available for cPAHs.

Total cPAH concentrations in surface water sample SW-1 exceeded the MTCA Method B and C surface water cleanup levels, and the NTR criterion. Total cPAH concentrations in surface water sample SW-2 exceeded the MTCA Method B surface water cleanup level, and the NTR criterion. (Note: The total cPAH concentrations are likely biased high due to the inclusion of nondetected cPAHs in the totals at concentrations of one-half the laboratory reporting limits.)

6.5 Petroleum Hydrocarbons

Diesel- and oil- range petroleum hydrocarbons were detected at concentrations above the laboratory reporting limits in surface water samples. Diesel-range petroleum hydrocarbons were detected at concentrations of 1.8 to 3.2 mg/l, and oil-range petroleum hydrocarbons were detected at concentrations of 1.4 to 3.2 mg/l. These concentrations do not exceed Ecology's Model NPDES Permit Standard of 10 mg/l for diesel- and oil- range petroleum hydrocarbons. MTCA surface water cleanup levels, Ecology's Acute Freshwater SWQS, and NTR criteria are not available for petroleum hydrocarbons.

Section 7: Summary of RI Findings

Soil impacted by metals (lead and chromium), petroleum hydrocarbons, cPAHs, and PCBs above applicable MTCA Method A or C industrial soil cleanup levels has been identified in various areas of the site. The estimated volumes (rounded to the nearest 100 cubic yards) of soil impacted by COCs above MTCA cleanup levels are as follows:

- Metals (lead and chromium) exceeding 1,000 mg/kg and 500 mg/kg, respectively, approximately 11,400 cubic yards
- Petroleum hydrocarbons exceeding 2,000 mg/kg, approximately 6,700 cubic yards
- Total cPAHs exceeding 18 mg/kg, approximately 1,600 cubic yards
- Total PCBs exceeding 17 mg/kg, approximately 1,000 cubic yards.

Soil with diesel- and oil- range petroleum hydrocarbon concentrations above the proposed amended MTCA Method A industrial cleanup level of 2,000 mg/kg was further evaluated using Ecology's TPH Interim Policy. Based on the TPH Interim Policy evaluation, the petroleum hydrocarbon exceedance area can be limited to seven test pit locations, six of which coincide with cPAH exceedance areas. These test pit locations are located in the vicinity of the former creosoting plant in the southwestern corner of the site and west of the former red brick building where impacted soil extends to the water table. The remaining areas are located immediately south of the former redbrick building and in the eastern portion of the site within the metals exceedance area and are confined to the shallower soil (less than 3 feet bgs).

Metals and petroleum hydrocarbons are the most widespread of the COCs detected in site soil. Soil impacted by metals and petroleum hydrocarbons also includes those areas of the site where PCBs and cPAHs are present above their respective cleanup levels. The volumes of metals- and petroleum hydrocarbon-impacted soil potentially requiring remediation are discussed further in the FS portion of this report (Section 9).

A significant source of petroleum hydrocarbons and cPAHs detected in site soil appears to be the former creosoting plant located in the southwestern corner of the site. A former hydraulic shear, located approximately 100 west of the red brick building, may be a source of petroleum hydrocarbons as hydraulic oil. The former creosoting plant and hydraulic shear also appear to be likely sources for LNAPL encountered at the site.

Metal debris from historical site practices (scrapping and recycling) appear to be the source of the metals detected in site soil, particularly on the eastern portion of the site and on the northern unpaved area. Elevated concentrations of lead in the area immediately south of the former red brick building appears to correspond to the reported location of a lead-acid battery disposal area. Battery casing were discovered in the test pit at this location. PCB-containing transformers were reportedly destroyed and/or recycled during past activities at the site and are believed to be the most likely source of the PCBs detected in shallow soil on the eastern portion of the property. Metals- and PCB-impacted soil does not appear to be in contact with groundwater since the maximum depth interval in which concentrations exceed the cleanup

level is 4 to 6 feet bgs. In addition, most of the metals exceedance areas are located within the central and eastern portions of the site where groundwater elevations are typically lower than on the western portion of the site. Total and dissolved metals (RCRA eight and copper) concentrations above applicable cleanup levels and/or ARARs were not detected in groundwater samples collected from site monitoring wells except for an isolated detection of dissolved selenium in the sample collected from well MW-9 during the November 2000 monitoring event. This result appears to be anomalous, as total selenium was not detected in site groundwater and dissolved selenium was not detected during other groundwater monitoring events (refer to Section 5.2.2). Dissolved cadmium was detected in one reconnaissance groundwater sample at a concentration slightly above Ecology's Acute Freshwater SWQS; however, this result is likely biased high due to suspended entrained soil particles in the sample.

Carcinogenic PAHs were detected in unfiltered samples collected from site monitoring wells and in several reconnaissance groundwater samples. These compounds (with the exception of a low concentration of benzo(a)anthracene slightly above the reporting limit) were not detected in filtered samples. The unfiltered analytical results are believed to be biased high due to suspended entrained soil particles in the samples (refer to Section 5.2.4). Given the relatively low aqueous solubility and mobility of cPAHs in the environment, it is unlikely that cPAHs have impacted site groundwater. Similarly, it is unlikely that PCBs have impacted site groundwater. PCBs also have relatively low aqueous solubility and mobility in the environment. The low levels of PCBs detected in groundwater samples collected from monitoring wells MW-8(R) and MW-11 are considered to be anomalous. The PCBs results were detected in a single monitoring event and were not reproducible. The analytical results were also flagged by the analytical laboratory for matrix interference effects (refer to Section 5.2.3).

Naphthalene and gasoline-range petroleum hydrocarbons were detected at concentrations above cleanup levels and/or ARARs in samples collected from one monitoring well located in the northwestern portion of the site [MW-8(R)]. Gasoline-range petroleum hydrocarbon concentrations above cleanup levels and/or ARARs were also identified at upgradient well MW-11. Groundwater is in contact with soil that contains petroleum hydrocarbon and cPAH concentrations above cleanup levels at two locations within the western portion of the property. These locations include the former creosoting plant area in the southwestern corner of the site, and the area around a former hydraulic shear, located approximately 100 feet west of the former red brick building. LNAPL was identified in test pits at both of these locations. LNAPL was also present in well MW-12, located in the former hydraulic shear area; however, petroleum hydrocarbon concentrations above cleanup levels and/or ARARs were not detected in groundwater samples collected from well MW-12.

One source of groundwater contamination is believed to be the former creosoting plant located in the southwestern corner of the site. Petroleum hydrocarbons and PAHs (including cPAHs) were detected in the soil at 6 to 10 feet bgs in this portion of the site. Since groundwater is encountered at approximately 7 feet bgs in this portion of the site, the impacted soils are in direct contact with site groundwater.

Groundwater at the site is influenced by tidal fluctuations of the Puyallup River. During high tide the general groundwater flow direction is away from the river, while at low tide, the general groundwater flow direction is toward the river. Based on average groundwater gradients at high and low tide, the net groundwater flow direction is toward the Puyallup River. The highest concentrations of naphthalene and gasoline-range petroleum hydrocarbons were detected in

the groundwater samples collected from well MW-8(R), located downgradient of the former creosoting plant. The lateral distribution of chemicals in groundwater in the western portion of the site is reflective of the mobility of these compounds in groundwater. An average groundwater seepage velocity of 82 feet per year was calculated based on slug test results. Hydraulic conductivities based on slug test results are consistent with those based on short-term pump tests conducted in a previous study (PGG 1992). The fate and transport of these chemicals in groundwater are discussed further in Section 8.3.

Surface water runoff was observed to discharge along the western and eastern property boundaries as well as to the catch basins located within the eastern portion of the site. No surface water runoff was observed from the northern unpaved area to the north, beyond the northern property boundary. Surface water cleanup levels were exceeded for a number of compounds (metals, PCBs, and cPAHs) at locations were the surface water discharges from the site.

Remedial options to address the findings of the RI are evaluated, and specific potential additional data needs identified, in the FS (refer to Section 9).

Section 8: Chemical Fate and Transport

Due to the proximity of the site to the Puyallup River, the fate of chemicals in the environment and the rate at which they may travel toward potential receptors are of concern. Chemical fate and transport is also an important consideration in the evaluation of the effectiveness of remedial technologies (refer to Section 9). Computer modeling was used to assess the fate and transport of COCs identified at the site (refer to Sections 4 and 5).

The results of the computer modeling performed to evaluate migration of COCs present in the unsaturated soil (at concentrations exceeding soil cleanup levels) to the underlying shallow groundwater zone are presented in this section. Groundwater beneath the western portion of the site has been impacted with naphthalene and petroleum hydrocarbons. The potential for the shallow impacted groundwater from this portion of the site to reach the Puyallup River has also been assessed.

A general overview of the fate and transport in the subsurface is presented in Section 8.1. Unsaturated zone modeling and groundwater migration assessment are discussed in Sections 8.2 and 8.3, respectively.

8.1 Fate and Transport

Chemical fate refers to a chemical's transformation, inter-media transfer, and ultimate disposition in the environment. Transport mechanisms are defined as those mechanisms that result in the movement of a chemical from one location to another within environmental media (soil, water, or air). Because the site is adjacent to the Puyallup River, the fate of the chemicals identified at the site and the rate at which they may travel to potential receptors are of concern.

Factors affecting chemical behavior in the environment include mode of release, chemical properties, and site-specific characteristics of soil and groundwater. Properties that are important to chemical mobility include solubility and the tendency to distribute between soil solids and the aqueous and vapor phases. The distribution between the soil and water phases is characterized by an equilibrium partitioning factor, K_d. This factor relates the chemical concentration sorbed to soil (C_s) to its dissolved concentration in soil water (C_l), as follows (Karickhoff 1984):

$$K_d = \frac{C_s}{C_l}$$

Partitioning to soil will result in a significant decrease in the rate of chemical movement in soil water (pore-water) and groundwater. However, it will not totally immobilize the chemical in the subsurface.

Several mechanisms (i.e., specific types of chemical interactions with soil) can potentially contribute to an observed K_d value at a site. The importance of each mechanism is determined in part by the soil properties. One important mechanism involves the amount of organic carbon (or organic materials) in soil. Increasing amounts of natural organic materials (e.g., humic and fulvic acids) increase the capacity of the soil to sorb nonpolar organic chemicals. In general, the

amount of organic carbon tends to decrease with depth through a soil column. This appears to be case at the site, where the TOC content of the soil ranged from 16 percent near-surface to 0.47 percent at approximately 15 feet bgs (refer to Table 3-1). Research and numerous laboratory and field studies have shown that in many soil/water systems, K_d is related to the fraction of organic carbon, F_{oc}, in soil and a property of the chemical [organic carbon-normalized soil partition coefficient (K_{oc})], as shown below:

$$K_d = K_{oc} F_{oc} = \frac{C_s}{C_l}$$

Thus, a knowledge of F_{oc} for soils of interest and the K_{oc} value for a chemical allows calculation of C_s/C_l. If information on C_s is available, calculation of C_l is possible. K_{oc} is referred to as an organic carbon-normalized soil partition coefficient and may be experimentally determined from measured K_d and F_{oc} data for chemical/soil systems.

In the unsaturated soil above groundwater, the equilibrium distribution of an organic chemical between the aqueous (soil moisture) and vapor phases and subsequent vapor migration through molecular diffusion may be important for the more volatile compounds. This distribution is typically characterized through use of the dimensionless Henry's Law Constant, K_h, as defined below:

$$K_h = \frac{C_g}{C_l}$$

where C_g is the chemical concentration in the vapor phase.

The mobility of metals in soil and groundwater is often more difficult to understand and predict than that of organics. Some metals can be present in one or several oxidation states, and each state exhibits its own chemistry in interacting with soil particles, soil organics, and other inorganic constituents (Tessler et al. 1979).

The main process affecting the mobility of metals at the site is sorption to soil. The soil's capacity to sorb metal cations (positively charged ionic metals) is generally characterized by CEC. Surfaces of soil minerals possess negative charges. The negatives charges on soil mineral surfaces attract and accumulate dissolved cations. CEC is an aggregate quantity describing the degree to which cations will be retained on exchange sites. Soil exchange sites are typically occupied by the "major cations": (Ca, Mg, K, and Na) and not all these cations can be replaced by metal cations. When evaluating a given soil's relative capacity to retain metals, measured values from 5 to 15 milliequivalents of exchange capacity per 100 grams of soil (meq/100 g) are customarily regarded as medium CECs. Values greater than 15 meq/100 g are regarded as high CECs, while values less than 5 meq/100 g are considered to be low (EPA 1977). CEC values measured from samples collected at the site ranged from 2.4 (15 feet bgs) to 26 meq/100 g (6 feet bgs) (refer to Table 3-1). The mobility of heavy metals in soil is also strongly influenced by pH.

Metals such as arsenic and chromium are typically present in soil in anionic form (negatively charged ion). Anions are not retained on cation exchange sites, but instead may be retained in soil through other processes, including precipitation, formation of complexes, or anion exchange

sites. However, anions are retained less strongly by the soil matrix and are generally more mobile than cation metals.

Chemical transport in site soil and shallow groundwater is affected by chemical properties but is also governed by physical properties such as water recharge and groundwater flow rate. The rate of surface water infiltration is the principal driving force for downward movement of chemicals present in the unsaturated zone. The variables controlling the movement of water through the saturated zone are the hydraulic conductivity and porosity of the saturated zone material and the hydraulic gradient (collectively referred to as "aquifer parameters"). Once chemicals have reached the saturated zone, physical transport mechanism such as advection, dispersion, and diffusion dominate. The interaction of these physical transport mechansims is complex and dependent on the aquifer parameters.

Figure 8-1 depicts the conceptual site model showing the potential chemical migration pathways for the site. These pathways are as follows:

- Unsaturated (vadose) zone vertical migration to shallow zone groundwater
- Horizontal migration in the shallow zone groundwater from the site toward the Puyallup River (low tide scenario)
- Horizontal migration in the shallow zone groundwater from the Puyallup River toward the site (high tide scenario).

The soil/groundwater to air pathway was not considered significant because the COCs, detected at the site are more likely to partition into the liquid phase rather than the gaseous phase.

The surface water pathway to the Puyallup River was not investigated because surface water runoff from the site exits the site boundaries to the south, east, and west (refer to Figure 3-8). Due to the presence of the man-made levee, there is no interaction of surface water runoff flow between the site and the Puyallup River.

The chemicals detected in site soil and groundwater are identified in Sections 4 and 5 of this report, respectively. Chemicals detected in the soil above soil cleanup levels include metals, PCBs, cPAHs, and diesel- and oil-range petroleum hydrocarbons. Due to various attenuation mechanisms present at the site these chemicals are expected to be heavily adsorbed to soil, and their movement into the underlying shallow groundwater significantly retarded. This appears to be the case over the majority of the site, where chemicals are found predominantly within the uppermost 2 to 3 feet of soil (refer to Figures 4-1 through 4-4). The potential for these chemicals to leach from the shallow soil to the groundwater is discussed in Section 8.2.

Carcinogenic PAH compounds and diesel- and oil-range petroleum hydrocarbons are also detected at concentrations exceeding soil cleanup levels in the deeper unsaturated (vadose) zone within two areas in the western portion of the site. Most notably in the vicinity of the test pits TP-2, TP-5, TP-49 (former creosoting plant location in the southwestern corner of the site), and in the vicinity of test pits TP-10, TP-11, and TP-55 (west of the former red brick building location). The highest concentrations of petroleum hydrocarbons and cPAHs were detected in soil samples collected from these areas of the site. The deeper impacted soil intercepts site

groundwater, as a result groundwater in the western portion of the site has also been impacted with naphthalene and petroleum hydrocarbons (gasoline-range) above groundwater cleanup levels and/or ARARs (refer to Figures 5-2 and 5-3). The potential for these chemicals to migrate within the shallow groundwater zone from their respective source areas to the Puyallup River is discussed in Section 8.3.

8.2 Evaluation of Chemical Fate and Transport in Unsaturated Soil

This section presents a summary of the modeling conducted for unsaturated soil at the site. The modeling approach is presented first, followed by the model input parameter values, model sensitivity analysis, and a discussion of the model results.

8.2.1 Model Approach

The objective of the modeling was to evaluate whether concentrations of selected COCs in site soil would result in their leaching to groundwater under site-specific soil and recharge conditions. Computer modeling was conducted using conservative input values and assumptions to simulate scenarios for downward migration of these constituents toward groundwater.

8.2.1.1 Selected Chemicals

The compounds selected for unsaturated zone modeling represent the range of chemical groups (metals, PCBs, cPAHs) detected in soil at the site and represent:

- The highest (most conservative) chemical concentrations detected in soil samples.
- A range of mobility in soil and/or groundwater based on physical/chemical characteristics.
- Other chemicals that are of high environmental concern.

The metals, arsenic, chromium, copper, lead, and mercury were selected for analysis. Lead and chromium were detected throughout the site, predominantly in shallow soil at concentrations above soil cleanup levels. Arsenic and mercury were included for analysis as "other chemicals" that are typically of high environmental concern. Copper was also selected for analysis due to its presence in some areas of the site at elevated concentrations. It should be noted that these metals were not detected at the site at concentrations exceeding soil cleanup levels. Three PCBs (Aroclors 1248, 1254, and 1260) were selected for analysis because these were the Aroclors detected in shallow soil at the site. Carcinogenic PAHs have been detected in unfiltered groundwater samples collected from wells located in the western portion of the site, an area where elevated cPAH concentrations were detected in site soil. Since low levels of cPAHs were detected in the shallow soil and in unfiltered reconnaissance groundwater samples collected in the eastern portion of the site, the following cPAHs were selected for analysis: chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, dibenz(a,h)anthracene, and benzo(a)anthracene. The noncarcinogenic naphthalene was also selected as a surrogate for high mobility PAHs. The rationale for selection of these COCs for modeling is summarized in Table 8-1. (Note: It is believed that the cPAHs detected in

groundwater samples from wells in the western portion of the site and reconnaissance groundwater samples in the eastern portion of the site are the result of suspended entrained soil particles in the water samples, as discussed in Section 5; however, to be conservative they have been included in the modeling.)

8.2.1.2 Site Area Modeled

Migration modeling was conducted for selected COCs detected in soil samples that were collected from the eastern portion of the site (generally east of the line of monitoring wells MW-1 and MW-6). Soil sample results indicate that the eastern portion of the site contains higher metal and PCB concentrations compared to the western portion of the site. Carcinogenic PAH compounds are also present in shallow soil in this portion of the site. The modeled area represents impacted soil above cleanup levels that could potentially be left in place if migration modeling and leachability testing (SPLP) indicate that the COCs are unlikely to migrate beyond their initial zone of presence. As previously discussed, soil with COC concentrations above cleanup levels (cPAHs and petroleum hydrocarbons) have been identified to depths of 6 to 10 feet bgs in the western portion of the site that has already resulted in groundwater impact. The potential migration of COCs in groundwater is discussed further in Section 8.3.

8.2.1.3 Distribution of Chemicals in Unsaturated Soil Profile

The concentrations of COCs detected in soil samples collected during the RI were used as the initial distribution of COCs in the soil profile. In some cases, soil samples were not collected at more than one or two depths between ground surface and groundwater. In such cases, results for various depths from multiple sampling locations within the same area were combined to establish a more complete soil concentration profile.

8.2.1.4 Model Selected

The VLEACH model version 2.2a (Varadhan et al. 1997) was selected to perform the fate and transport simulations for the site. The EPA has developed this model for screening-level evaluation of chemical mobility and has used it at many sites across the United States. Kennedy/Jenks Consultants has used this model numerous times to develop an understanding of vertical migration potential for many organic chemicals and metals in soils.

VLEACH is a one dimensional finite-difference model that estimates the impact from mobilization and migration of a sorbed chemical in the vadose zone on the underlying groundwater over time. The model is used to show the movement of the chemical from the solid phase to the vapor phase (by gaseous diffusion) and from the solid phase to the dissolved phase in water (by advection in the liquid phase). Other attenuation mechanisms such as biodegradation or dispersion are not accounted for by this model and therefore, the model results provide a conservative estimate of chemical transport. Chemical transport mechanisms are simulated from initial conditions defined by the user. For each time step in the simulation, the total mass in each cell is re-calculated and re-equilibrated for each phase.

8.2.1.5 Model Assumptions

The results of the simulations are considered screening-level values based on site-specific data, literature-derived input parameters, and assumptions. Parameter values are provided in

Section 8.2.1.6. Several assumptions were made in performing the model simulations resulting in "conservative" model results (i.e., favoring leaching to groundwater). These assumptions are as follows:

- No Degradation. The VLEACH model does not account for environmental degradation pathways such as biodegradation of PAHs or chemical precipitation of metals, and other attenuation mechanisms such as transverse dispersion of chemicals in soil water. These natural attenuation mechanisms will generally reduce chemical concentrations in soil and decrease the potential of the chemical to reach groundwater. The VLEACH model design is therefore, inherently biased toward protection of groundwater quality.

- Conservative Initial Chemical Concentration. The simulations were performed to an observed average depth of 10 feet to groundwater. Chemical concentration data for every foot of the soil column were constructed by combining the maximum concentrations detected at various depths from different locations as described in Section 8.2.1.3.

8.2.1.6 Model Input Parameters and Values

Input parameters to the model include soil- and chemical-specific parameters and model run parameters. The key input parameters, their values, and rationale for the selected values are presented below. Input files containing input parameter values for the simulations are included in Appendix N.

- Soil Input Values. Key soil characteristic input parameters including the recharge rate, dry bulk density, porosity, volumetric water content, and F_{oc} used in the simulations were directly measured or calculated based on site-specific data. These characteristics are as follows:

  - Recharge. A recharge rate of 0.03 feet per year, equal to one percent of the total incident rainfall of approximately 3 feet per year (online data available from Western Regional Climate Center), was assumed for the site. This recharge rate was selected based on (1) presence of buildings on site and (2) presence of a competent pavement cap.

  - F_{oc} (Fraction of Organic Carbon). An F_{oc} value of 0.03 was calculated as 3 percent of the weighted total organic carbon values in unsaturated zone soil samples (MW-8-6-6.5 and MW-9-10.5-11) collected at the site.

  - Soil Bulk Density, Porosity, and Water Content. A soil dry bulk density of 1.35 grams per milliliter (g/ml) was calculated based on site-specific porosity and specific gravity of soil samples collected at the site. A porosity value of 0.49 and water content of 0.26 were used based on the average of measured values in the soil samples.

  - Depth to Groundwater. A depth to groundwater of 10 feet was used in the simulations based on the average depth of groundwater at the site during high tide.

8.2.1.7 Chemical Input Parameters

Key chemical input parameters used in the simulations were obtained from literature sources and include K_{oc} (organic carbon-normalized soil partition coefficient), K_h (Henry's Law Constant),

and free air diffusion coefficient (D_i). The chemical input values used for the simulations are summarized in Table 8-2.

8.2.1.8 Model Sensitivity Analysis

The impact of varying several input parameters on soil water chemical concentrations over time was evaluated in a sensitivity analysis. The chemical-specific input values were not varied during this evaluation. Varying water recharge rate had a significant impact on migration rates of PAHs but not on metals. However, even when the recharge rate was increased to 80 percent of the average annual rainfall amount, the PAH concentrations in groundwater remained low. Changing the values of other parameters did not cause the predicted chemical concentrations at the water table to vary significantly.

8.2.1.9 Model Results and Discussion

The predicted distributions of aqueous chemical concentrations with depth were used to obtain the concentrations at the bottom of the soil column in contact with groundwater. The aqueous concentrations at the water table increased during the 500 years simulation time for all chemicals. The chemical concentrations predicted after 500 years are presented in Table 8-3. The results indicate that these chemicals are essentially immobile under the environmental conditions simulated. A combination of low water recharge rate and relatively high sorption partitioning caused only minimal downward migration of the selected COCs. The predicted immobility of these COCs at the site is consistent with results observed at many other sites and under a variety of environmental conditions.

Based on the modeling results, it appears that the concentrations of metals, PCBs, and PAHs (including cPAHs) detected in shallow soil at the site, are unlikely to leach to the groundwater, if left in place, provided surface water recharge is minimized.

A number of samples representing the range of metal concentrations found at the site were analyzed using the SPLP (refer to Tables 4-8A and 4-8B). The SPLP is similar to the TCLP used to characterize hazardous waste; however, the amount of acidity used in the test is significantly less, using a dilute nitric/sulfuric acid mixture. The SPLP was developed to simulate leaching under acid rain conditions and therefore better simulates the type of leaching likely to occur from infiltration of precipitation through the unsaturated soil column at the site. A range of total lead concentrations were analyzed using the SPLP. In the case of arsenic, barium, cadmium, chromium, copper, mercury, selenium, and silver, the sample containing the highest total metal concentration was analyzed using the SPLP.

The SPLP results indicate that low concentrations of barium (0.672 mg/l), copper (0.005 mg/l), lead (up to 0.07 mg/l), and mercury (0.0021 mg/l) leached from the soil samples (refer to Table 4-8A). This suggests the potential for movement of these metals beyond their initial zone of presence, if precipitation is allowed to infiltrate through the soil column, as indicated by the models sensitivity to surface water recharge. However, these metals have not been detected in site groundwater at or above surface water cleanup levels and/or ARARs suggesting that site conditions have limited the ability for metals to leach from site soil.

Select samples containing the highest concentrations of cPAHs were also analyzed using the SPLP (refer to Table 4-8B). None of the cPAHs leached from the samples. Some of the more

mobile noncarcinogenic PAHs leached, again indicating the potential for movement of these chemicals beyond their initial zone of presence, if precipitation is allowed to infiltrate through the soil column. It should be noted that in the samples selected for analysis, naphthalene was not detected at an elevated concentration and was therefore not observed to leach from the sample tested. Naphthalene was chosen in the model to represent the more mobile PAHs due to its overall higher concentration in site soil. The presence of naphthalene in groundwater in the western potion of the site is indicative of its mobility in the environment when present in soil at higher concentrations.

8.3 Evaluation of Fate and Transport of Chemicals in Shallow Groundwater

As previously discussed, groundwater in the western portion of the site has been impacted by gasoline-range petroleum hydrocarbons and naphthalene (a constituent hydrocarbon) at concentrations exceeding surface water cleanup levels. Carcinogenic PAH compounds were detected in unfiltered groundwater samples collected from this portion of the site. While it is believed the results are an artifact of the sampling method (i.e., suspended entrained soil particles in the sample), these compounds have been included in the groundwater migration modeling in order to be conservative. Although benzene was not detected in site groundwater above cleanup levels and/or ARARs, it was included in the modeling since it is a mobile carcinogenic constituent of petroleum hydrocarbons. These compounds are expected to move in the direction of groundwater flow. Potential transport of benzene, cPAHs, and naphthalene within the shallow zone toward the Puyallup River at concentrations close to cleanup levels and/or ARARs is evaluated in this section.

8.3.1 Transport Scenario and Assumptions

Transport of benzene, cPAHs, and naphthalene in shallow groundwater toward the Puyallup River was evaluated under very conservative (i.e., favoring migration to the river) scenarios and assumptions as described below.

- Groundwater flow at the site is influenced by the tidal fluctuations of the Puyallup River, as discussed in Section 3.3.1. At low tide, groundwater flow is toward the Puyallup River. During high tide, groundwater recharge occurs along the river bank which causes a reversal in the groundwater gradient across the majority of the site (i.e., groundwater flow is away from the river). For the purpose of this evaluation, it has been assumed that groundwater flow is predominantly toward the river. This will provide a conservative estimate of transport within the shallow groundwater zone.

- The concentrations of all cPAH compounds were added to obtain a total cPAH value (refer to Table 5-8). This total concentration was then used along with the K_{oc} value for the most mobile cPAH compound, dibenz(a,h)anthracene, to evaluate cPAH compound migration in groundwater. As such, this is a conservative approach to modeling of cPAH migration.

- Migration of the selected compounds was evaluated over a distance of approximately 300 feet between the location of well MW-8(R) and the Puyallup River along the general

direction of groundwater flow. Well MW-8(R) has consistently contained the highest concentrations of the selected COCs.

- Two groundwater flow rates were used in chemical migration evaluation. A conservatively fast rate was estimated based on the highest hydraulic conductivity of 0.05 centimeters per hour (cm/hr) (140 feet per day) measured at the site during a short-term pumping test (PGG 1992), and a second slower rate based on a hydraulic conductivity value of 0.011 cm/hr measured in well MW-8(R) using slug tests. A hydraulic gradient of 0.008 was used based on the 13 February 2001 data (refer to Figure 3-5B). A value of 0.004 has been used elsewhere in this report based on the more typical observations of water levels in wells.

- No degradation, whether biological, chemical, etc., were assumed for the selected compounds.

- An infinite source of the selected compounds was assumed to provide maximum mass in groundwater.

8.3.2 Evaluation Methodology

The model BIOSCREEN Version 1.3 (EPA 1996b) was used to simulate movement of the selected COCs from the location of well MW-8(R) toward the Puyallup River. BIOSCREEN is a two-dimensional analytical screening model developed by the EPA to simulate lateral migration of organic compounds dissolved in groundwater due to the processes of advection, dispersion, sorption, and biodegradation. In this evaluation, the results of model simulation in the absence of biodegradation are used to provide a conservative migration assessment. Additionally, the assumptions presented in Section 8.3.1 were used to determine the input values to the model. The key input values used in the model for each compound are summarized in Table 8-4.

The BIOSCREEN model results are typically most sensitive to groundwater flow rate and retardation factor. The highest value of conductivity measured at the site and typical values of K_{oc} available in the literature for the selected compounds were used in the simulations. Therefore, it is expected that a reasonable range of variability in these parameters has been accounted for in the simulations. The BIOSCREEN modeling input parameters and the numerical simulation results are presented in Appendix O.

8.3.3 Findings

The model results, presented on the figures in Appendix O, depict the compound concentrations along the centerline of the groundwater plume. The results indicate that even under the conservative assumptions and two values of hydraulic conductivity used, naphthalene and cPAHs are not expected to migrate beyond the northern property boundary toward the Puyallup River. Benzene (the most mobile of the compounds modeled) may be present beyond the property boundary at concentrations below the cleanup levels and/or ARARs presented in this report. It should be noted again that the simulations *included an assumption that groundwater continuously flows toward the river*. However, during high tides the reversal in hydraulic gradient causes groundwater movement onto the site and reversing the direction of chemical migration. Additionally, the alternating groundwater flow direction causes mixing of oxygenated river water with ambient groundwater that is expected to enhance aerobic biodegradation of all

hydrocarbons, and specifically the relatively highly biodegradable benzene. Therefore, the model results may over-estimate the migration distance and concentrations of benzene between the site and the Puyallup River.

Section 9: Feasibility Study

The FS is presented in two sections: the first addresses the selection of cleanup standards, and the second presents the rationale for selecting remedial actions for the site.

9.1 Selection of Cleanup Standards

This section, which addresses the selection of cleanup standards for the site, is presented in seven subsections.

- Section 9.1.1 presents the chemicals and media of concern for the site
- Section 9.1.2 discusses potential receptors and exposure routes
- Section 9.1.3 describes MTCA Method A, B, and C cleanup levels
- Section 9.1.4 describes ARARs for the site
- Section 9.1.5 identifies and provides justification for cleanup levels and/or ARARs used for the site (collectively referred to as "site cleanup levels")
- Section 9.1.6 presents the points of compliance for attainment of soil, groundwater, and surface water site cleanup levels
- Section 9.1.7 presents an estimate of the areas and volume of site media that exceed site cleanup levels.

9.1.1 Chemicals and Media of Concern

During performance of the RI, the distribution and concentration of COCs in site media (soil, groundwater, surface water) that exceed MTCA cleanup levels and/or ARARs were delineated. Summaries of these COCs, the media in which they were detected, and their concentration ranges are presented in Table 9-1. In general, the site can be characterized by having widespread low-level chemically impacted soils with a few localized "hot spots."

9.1.2 Potential Receptors and Exposure Routes

9.1.2.1 Potential Human Receptors

Human receptors include current and future populations at and adjacent to the site. The site is currently unused but was previously developed for industrial use. The proposed future use of the site is unknown at this time; however, given the site's location in an area zoned for industrial land use, it is anticipated that any future land use will be of an industrial nature. Future potential site receptors include workers (e.g., employees who work at the site) and authorized visitors. These individuals could ingest small quantities of soil or surface water, absorb chemicals through their skin, or inhale chemicals adsorbed to fugitive dust particles. Dermal adsorption, ingestion, and inhalation of surface and subsurface soils are considered to be the most

important exposure routes. However, the risks posed by widespread, low-level contamination may be mitigated by an asphalt pavement surface that would be required over the majority of the site as part of any future site development.

The site has been investigated to a maximum depth of approximately 24 feet bgs; however, the majority of the site investigations terminated at a depth of 10 to 12 feet bgs or less, which correlates with the top of the water table (refer to Section 3.2.1). Shallow subsurface stratigraphy beneath the site includes both fill and native deltaic units (refer to Figures 3-1, 3-2, and 3-3). A significant amount of wood type debris is encountered across the site beginning at depths of approximately 3 to 9 feet bgs. The thickness of the wood debris layer varies from a few feet at the eastern end of the site to possibly 18 feet (or more) at the western end of the site. Abundant metal, glass, and other miscellaneous debris are encountered at the eastern end of the site typically within the uppermost 4 feet of the fill material. Shallow groundwater has been identified at depths of approximately 7 to 12 feet bgs depending on tidal influences and location on the site. The net groundwater flow direction is toward the Puyallup River; however, actual flow direction is controlled by tidal fluctuations (refer to Figures 3-4A and 3-4B through 3-6A and 3-6B).

No production wells use the shallow zone locally; therefore, groundwater ingestion via the shallow saturated unit is not a viable exposure pathway.

Due to the industrial zoning of the area, it is very unlikely that the site and surrounding area will become residential in the future. Therefore, the exposure routes and development of remedial action objectives are based on an industrial land use scenario.

9.1.2.2 Potential Ecological Receptors.

Onsite ecological receptors could include birds, reptiles, and mammals. Exposure to site chemicals can occur through ionic uptake in plants, ingestion of contaminated soil or surface water by ground-feeding organisms, direct contact, or indirect ingestion through bioconcentration in the food chain. These risks may also be mitigated by an asphalt pavement surface that would be required over the majority of the site as part of any future site development. Some aquatic organisms could potentially ingest or dermally absorb surface water or shallow zone groundwater originating from the site that discharges to the Puyallup River. However, available modeling results indicate that it is unlikely that site contaminants could migrate to the Puyallup River, at concentrations exceeding cleanup levels and/or ARARs (refer to Section 8.3).

The site was excluded from a terrestrial ecological evaluation since all proposed remedial alternatives identified in the FS included a low permeability cap and institutional controls (refer to Section 9.2.2.5).

9.1.3 MTCA Cleanup Levels

MTCA cleanup levels are risk-based numbers used to evaluate risks to human health and the environment at the site. MTCA outlines three basic approaches (Methods A, B, and C) for establishing cleanup levels. Method A cleanup levels are established at concentrations at least as stringent as those specified in WAC 173-340 Tables 1, 2, and 3 and applicable state and

federal laws. Methods B and C cleanup levels are based on risk assessment procedures [WAC 173-340-700(4)(c)] for residential and industrial land use scenarios, respectively.

WAC 173-340-700(3)(a) and -704 authorize Method A cleanup levels for some cleanup actions. Method A is appropriate for routine cleanups involving relatively few hazardous substances and for sites where numerical standards are available for indicator hazardous substances. Given the complexity of the site and the variety of chemical compounds detected [petroleum hydrocarbons, metals, VOCs, PAHs (including cPAHs), and PCBs], relying only on MTCA Method A cleanup levels is not appropriate for the site. However, in accordance with CLARC II tables (Ecology 1996b, page 5) use (mixing) of Method A cleanup levels is acceptable when using Method B or C cleanup levels.

Method B is the standard method for determining cleanup levels under a residential land use scenario for soil, groundwater, surface water, and air. Cleanup levels for individual hazardous substances are established using applicable state and federal laws or the risk assessment equations specified in WAC 173-340-720 through -750.

Method C is a conditional method for establishing cleanup levels. Method C provides cleanup levels that protect human health and the environment under an industrial land use scenario. Method C can be used where the cleanup action can be shown to comply with applicable state and federal laws, to use all practical methods of treatment, and to implement institutional controls. Method C can be used when the site is classified as an industrial site that meets the criteria for establishing the soil cleanup levels described in WAC 173-340-745. Method C cleanup levels, based on the risk assessment equations in WAC 173-340-720 through -750, must be as stringent as cleanup levels established under applicable state or federal laws and must be estimated to result in no significant adverse effects on the protection and propagation of aquatic and terrestrial life.

9.1.4 Potential ARARs

MTCA requires that all cleanup actions comply with ARARs [WAC 173-340-710(1)(a)]. MTCA presents the definitions for ARARs [WAC 173-340-710(2) and (3)] as follows:

- Applicable requirements include "... those cleanup standards, standards of control, and other environmental protection requirements, criteria, or limitations promulgated under state or federal law that specifically address a hazardous substance, cleanup action, location, or other circumstance at the site."

- Relevant and appropriate requirements include "... those cleanup standards, standards of control, and other environmental requirements, criteria, or limitations established under state or federal law that, while not legally applicable to the hazardous substance, cleanup action, location, or other circumstance at a site, address problems or situations sufficiently similar to those encountered at the site that their use is well suited to the particular site."

ARARs can be location-, action-, or chemical-specific. Location-specific ARARs address restrictions on activities or permissible chemical concentrations in a particular location. Potential location-specific ARARs include:

- The Shoreline Management Act of 1971 (Chapter 13.10 of City Code) requires construction activities within 200 feet of the shoreline to be performed in accordance with applicable City codes. This ARAR applies to site improvements, such as construction of a cap and storm drain up grades.

Action-specific ARARs regulate technologies or activities that involve handling or treating hazardous wastes. Action-specific ARARs are typically technology- or activity-based requirements or limitations. Table 9-2 describes the potential action-specific ARARs for the site.

Chemical-specific ARARs are typically health- or risk-based numerical values that result in acceptable concentrations of chemical concentrations that may be detected in or discharged to the environment. Chemical-specific ARARs for surface water include Ecology's Acute Freshwater SWQS established under WAC 173-201A, the NTR for the Consumption of Organisms Only established under 40 CFR 131.36, and Ecology's Model NPDES Permit Standards established under WAC 173-226. The ARARs for chemicals detected at the site are identified on applicable analytical tables presented in Sections 4, 5, and 6 of this report. Chemicals exceeding chemical-specific ARARs are summarized in Table 9-1.

9.1.5 Identification and Justification of Site Cleanup Levels

9.1.5.1 Soil Cleanup Levels

This section identifies appropriate site cleanup levels for soil. Site cleanup levels may be cleanup levels identified in MTCA or other ARARs. Both MTCA cleanup levels and chemical-specific ARARs are generally derived based on established equations or empirical studies for protection of human health and/or the environment. MTCA allows modification of the cleanup level values to address (1) background concentrations (such as metals) in the vicinity of the site [WAC 173-340-700(4)(d)] and (2) the practical quantification limits (PQLs) of an analyte (WAC 173-340-707), where the MTCA cleanup level is below a respective PQL. PQLs, based on current limitations of analytical procedures, are identified in Ecology's *Implementation Memo No. 3* (Ecology 1993).

The site meets the criteria for use of MTCA Method C industrial soil cleanup levels as identified in WAC 173-340-706 and WAC 173-340-745. Consequently, MTCA Method C industrial cleanup levels will be used to evaluate the need for soil remedial action at the site. Where there are no available Method C industrial soil cleanup levels (e.g., lead, chromium), MTCA Method A industrial soil cleanup levels will be used (WAC 173-340-704). For petroleum hydrocarbons, the proposed amended MTCA Method A industrial soil cleanup levels will be used (Ecology 2001).

Soil cleanup standards based on the protection of potable groundwater (i.e., drinking water) [WAC 173-340-745(4)(a)(ii)(A)], using 100 times the groundwater cleanup level provided in WAC 173-340-720, are not considered applicable to the site. Ecology derived this "safety factor" using empirical methods, and it is applied consistently to all compounds, regardless of their potential leachability and aqueous mobility. This "safety factor" appears to be overly conservative for a number of compounds encountered at the site (e.g., diesel- and oil-range petroleum hydrocarbons, metals, cPAHs, and PCBs).

Soil cleanup standards based on the protection of potable water are also not applicable because shallow groundwater at the site is not considered a potential future source of potable water due to its proximity to the Puyallup River (refer to Section 3.3). Since groundwater at the site discharges to surface water (Puyallup River), soil cleanup standards based on the protection of surface water [WAC 173-340-740(3)(b)(v)] are more appropriate for the site; however, Ecology has not established methods to calculate soil cleanup levels that are protective of surface water.

Ecology does allow soil concentrations above MTCA soil cleanup levels to remain at a site if it can be demonstrated that higher soil concentrations are protective of groundwater [WAC 173-340-745(4)(a)(ii)(A)]. Ecology has accepted a more appropriate method to assess the potential leachability of both organic and inorganic contaminants from soil as an alternative to using 100 times the groundwater cleanup level discussed above. This method includes performance of leaching tests (SPLP) to assess "worst-case" leachability of contaminants present in soil in accordance with WAC 173-340-740(4)(a)(ii)(A).

As indicated in the Section 8 of this report (chemical fate and transport), the leachability of COCs detected at the site is most sensitive to surface water infiltration. In lieu of appropriate soil cleanup standards to address protection of surface water, this FS will use the SPLP in conjunction with the need for surface water infiltration engineering controls to address soil concentrations that are protective of surface water (and groundwater) at the site.

9.1.5.2 Groundwater Cleanup Levels

This section identifies appropriate site cleanup levels for groundwater. Groundwater standards for the protection of human consumption are not appropriate for shallow zone groundwater at the site since the shallow zone groundwater is not considered a potential future source of potable water. Since shallow zone groundwater at the site discharges to the Puyallup River, site groundwater cleanup levels that are protective of surface water are appropriate. These include:

- MTCA Method B and C surface water cleanup levels established in WAC 173-340-730, which are risk-based cleanup levels developed for protection of human health and are based on consumption of food fish and shellfish. MTCA Method B and C surface water cleanup levels are tabulated in Ecology's CLARC II database (Ecology 1996b).

- Ecology's Acute Freshwater SWQS established in WAC 173-201A. These ARARs were derived for protection of aquatic organisms that may inhabit waters of the state, including the Puyallup River, which is adjacent to the site. (Note: Ecology's Acute Freshwater SWQS for certain metals are hardness dependent and have been calculated using equations provided in WAC 173-201A based on an average groundwater hardness of 180 mg/l measured during the RI.)

- NTR established in 40 CFR 131.36. These ARARs were derived for those states not complying with the Clean Water Act [40 CFR, Part 303(c)(2)(B)]. All waters assigned to the following use classifications as defined in WAC 173-201-045 [fish and shellfish, fish, water supply (domestic), recreation] are subject to this regulation. The NTR criteria for the consumption of organisms only, based on a 1×10^{-5} risk, are considered most applicable to the site.

Since no surface water cleanup levels have been established for petroleum hydrocarbons under MTCA, Ecology's Model NPDES Permit Standards for surface water discharge (WAC 173-226) will be used for petroleum hydrocarbons. These ARARs were developed to regulate the amount of pollution allowed in lakes, streams, bays, and groundwater as required by the federal Clean Water Act (40 CFR 131.36) and the state Water Pollution Control Act (90.48 RCW). Specifically, these ARARs are based on the protection of surface water from leaking UST sites containing diesel contamination. These ARARs are considered applicable given the types of compounds encountered in soil and groundwater at the site. Ecology's Model NPDES Permit Standard for gasoline-range petroleum hydrocarbons is the same as the MTCA Method A groundwater cleanup level for gasoline-range petroleum hydrocarbons. Other VOCs typically associated with petroleum hydrocarbons (BTEX) have not been detected above MTCA surface water cleanup levels and/or other chemical-specific ARARs.

Use of these standards as cleanup levels meets the requirements of MTCA established in WAC 173-340-720(6)(d) for protection of shallow groundwater discharging to an adjacent surface water body.

9.1.5.3 Surface Water Cleanup Levels

This section identifies appropriate site cleanup levels for surface water. Site surface water cleanup levels will be the same as those identified for groundwater, since the groundwater cleanup levels are based on the protection of surface water. (Note: Ecology's Acute Freshwater SWQS for certain metals are hardness dependent and have been calculated using equations provided in WAC 173-201A based on an average surface water hardness of 31 mg/l measured during the RI. This could result in different cleanup levels for these metals in surface water and groundwater at the site.)

9.1.5.4 Summary of Proposed Site Cleanup Levels

Proposed site cleanup levels for COCs in soil, groundwater, and surface water are summarized in Table 9-3. This table also includes proposed site cleanup levels for other petroleum hydrocarbon-related compounds (diesel-range hydrocarbons, BTEX) that have been detected in site groundwater and/or surface water at concentrations below the proposed site cleanup levels. The table also includes proposed groundwater cleanup levels for cPAHs. Carcinogenic PAH compounds were detected in unfiltered samples at concentrations exceeding the proposed site groundwater cleanup levels. These compounds were not detected in filtered samples above the method reporting limit [with the exception of a low concentration of benzo(a)anthracene slightly above the laboratory reporting limit]. The proposed site cleanup levels have been used to evaluate the need for remedial action at the site; *however, exceedance of the site cleanup levels does not necessarily indicate that remedial action is required.* Final cleanup levels for the site will be identified by Ecology in the Corrective Action Plan (CAP).

9.1.6 Points of Compliance

The point of compliance, which is based on the expected exposure pathway, is the point (or points) where cleanup levels established for the site are to be achieved. The following complete exposure pathways have been identified for the site (refer to Section 9.1.2). The first complete exposure pathway is human and ecological exposure to COCs at this site via direct contact or

ingestion of site soils. The second complete exposure pathway is aquatic organisms that may be exposed to COCs through ingestion or direct contact with surface water or shallow zone groundwater discharging to the Puyallup River.

To address these potential exposure pathways, the following points of compliance are proposed for site media:

- Soil – The point of compliance for soil will be throughout the site to a depth of 15 feet below grade (the reasonable maximum depth of soil excavation for development purposes) based on WAC 173-340-740(6). MTCA recognizes that for cleanup actions that involve containment of hazardous substances, soil cleanup levels will not be met at the points of compliance. In these cases, the cleanup action may be determined to comply with cleanup standards, provided the compliance monitoring is designed to ensure the long-term integrity of the containment system, and other requirements for containment technologies in WAC 173-340-360(8) are met. Addressing COCs in site soils also reduces concerns regarding exposure of potential ecological receptors to these chemicals in surface water that could potentially discharge from the site, as well as impacts to shallow groundwater.

- Shallow Zone Groundwater – MTCA defines the point of compliance for groundwater as being throughout the site from the uppermost level of the saturated zone extending vertically to the lowest most depth that could potentially be affected by the site [WAC 173-340-720(6)(b)]. However, MTCA also recognizes that a site where affected groundwater flows to nearby surface water, cleanup levels may be based on the protection of surface water (refer to Section 9.1.5). At these sites, a conditional point of compliance [WAC 173-340-720(6)(d)] may be established in surface water as close as technically possible to the point of groundwater discharge to the surface water. Establishment of a conditional point of compliance is appropriate for this site. No seep discharges from the site have been identified along the bank of the Puyallup River adjacent to the site. Therefore, the conditional point of compliance for the site will be established in onsite shallow zone monitoring wells located along the northern property boundary closest to the river [i.e., wells MW-8(R), MW-4(R), MW-5, MW-6, MW-9, and MW-2].

- Surface Water Runoff – The point of compliance for surface water is the point or points of discharge from the site to surface waters of the state based on WAC 173-340-730(6). Although the site is adjacent to the Puyallup River, it is separated by a man-made levee, therefore, there is no interaction of surface water runoff flow between the site and the river. For practical purposes, the surface water points of compliance will be established at those points where the surface water discharges from the site.

9.1.7 Estimated Areas and Volume of Site Material That Exceed MTCA Cleanup Levels and/or ARARs

9.1.7.1 Soil

Figures 4-1 through 4-4 show the lateral and vertical extent of soil with COCs (metals, PCBs, cPAHs, and petroleum hydrocarbons) exceeding site cleanup levels. Elevated concentrations of metals in soil have been detected close to the northern property boundary. Given the flat topography of the site, the site drainage patterns (refer to Figure 3-8), and the fact that this

portion of the site has historically not been paved, surface water flow beyond the northern property boundary is likely to have been limited in favor of surface water infiltration. Therefore, metals-impacted soil is not expected to extend a significant distance beyond the northern property boundary. The estimated volumes of soil exceeding site cleanup levels are summarized in Table 4-9.

9.1.7.2 Groundwater

As previously discussed, site groundwater cleanup levels are based on protection of surface water in the Puyallup River. Compliance with surface water standards is measured in surface water at the point where the groundwater discharges to surface water. Because the Army Corps of Engineers levee separates the site from the Puyallup River, compliance with site cleanup levels has been assessed at a conditional point of compliance located along the northern property boundary, closest to the Puyallup River [wells MW-8(R), MW-4(R), MW-5, MW-6, MW-9, and MW-2].

Groundwater samples collected from monitoring well MW-8(R) contained COCs at concentrations exceeding site groundwater cleanup levels for naphthalene and gasoline-range petroleum hydrocarbons. The maximum concentration of naphthalene was 8,500 μg/l, which exceeds Ecology's Acute Freshwater SWQS of 2,300 μg/l. The maximum concentration of gasoline-range petroleum hydrocarbons (39,000 μg/l) exceeds Ecology's Model NPDES Permit Standard of 1,000 μg/l. Gasoline-range petroleum hydrocarbons were also detected in groundwater samples collected from upgradient well MW-11 at concentrations exceeding site groundwater cleanup levels. (Note: Carcinogenic PAHs were also detected in unfiltered groundwater reconnaissance and monitoring well samples above site groundwater cleanup levels. As previously noted in Sections 5.1 and 5.2, the presence of cPAHs in monitoring well and reconnaissance groundwater samples may be an artifact of the sampling methods and are not considered representative of site groundwater quality.)

The lateral extent of the naphthalene and petroleum hydrocarbons in site groundwater are shown on Figures 5-2 and 5-3, respectively. Given the groundwater flow direction in this portion of the site and the areas of deep soil impact, the source of the groundwater contamination appears to be in the vicinity of a former creosoting plant located in the southwestern corner of the site. The distribution of contaminants within the plume appears to reflect the relative mobility of the COCs. Groundwater impact related to the other area of deep soil impact, in the vicinity of test pits TP-10, TP-11, TP-55, and well MW-12 (west of the former red brick building), appears to be limited to the presence of free product (LNAPL) on the water table.

Based on the groundwater migration modeling presented in Section 8.3, naphthalene is not expected to migrate passed the northern property boundary. Gasoline-range petroleum hydrocarbons were not modeled. Benzene, a carcinogenic and mobile constituent of gasoline, was modeled as a surrogate. The highest concentrations of benzene (25 μg/l) were detected in the groundwater samples collected from well MW-8(R), where the highest concentrations of gasoline-range petroleum hydrocarbons (39,000 μg/l) were detected. The highest benzene concentrations did not exceed the site groundwater cleanup levels. The modeling indicated that benzene may be present beyond the northern property boundary (at concentrations below site groundwater cleanup levels), based on the very conservative assumptions used in the modeling (refer to Section 8.3).

9.1.7.3 Surface Water

Surface water from the site does not discharge into the Puyallup River. The points of compliance for site surface water cleanup levels are the points where surface water discharges from the site. Currently, surface water discharges from the site along the eastern and western property boundaries as well as via catch basins located within the eastern portion of the site (refer to Figure 3-8). Surface water runoff occurs during and after rain events that produce sufficient water to create runoff. The quality of surface water discharging from the eastern and western property boundaries was evaluated during the RI. Surface water discharging from the site along the along the eastern and/or western property boundaries exceeded site surface water cleanup levels for metals, cPAHs, and PCBs. The volume of impacted surface water discharging from the site is unknown.

9.2 Rationale for Selecting the Remedial Action

This section presents the rationale for selecting remedial actions to address the soil, groundwater, and surface water containing COCs at concentrations exceeding the proposed site cleanup levels (refer to Table 9-3). Section 9.2.1 identifies and evaluates potential remedial methods. Section 9.2.2 identifies remedial alternatives that are applicable to the site conditions and defines the remediation areas within the site. A preliminary analysis of the remedial alternatives is presented in Section 9.2.3, followed by a detailed analysis in Section 9.2.4. Section 9.2.5 offers a comparative analysis using the criteria presented in the detailed analysis, and Section 9.2.6 concludes with the recommended remedial alternative.

9.2.1 Identification and Evaluation of Potential Remedial Methods

This section identifies and evaluates potentially applicable remedial methods based on effectiveness, ability to be implemented, and cost. Remedial methods passing this evaluation were then ranked according to the MTCA hierarchy of preferred remedial methods.

9.2.1.1 Identify and Evaluate Remedial Methods

General response actions, remedial technologies, and process options that may be appropriate for addressing site conditions were identified (EPA 1985; 1987a). General response actions are broad categories of remedial methods that can address the cleanup of a specific matrix. Remedial technologies are different techniques within the general response actions. Process options are specific processes within each remedial technology category. For example, aboveground treatment is a general response action. Physical/chemical treatment is a remedial technology within the aboveground treatment category, and soil washing is a process option within the physical/chemical remedial technology class.

Process options were screened for their effectiveness, ability to be implemented, and relative cost.

Effectiveness involves consideration of a process option's ability to:

- Process the anticipated volume of soil and groundwater

- Meet cleanup standards
- Protect human health and the environment during construction and implementation.

The second criterion for evaluating process options (i.e., ability to be implemented) includes technical and administrative considerations. This criterion focuses on the ability to technically address COCs in soil and groundwater at concentrations detected during the RI. It also evaluates the permits necessary for onsite and offsite activities and discharges, and the availability of offsite facilities, services, and materials.

Cost is the final criterion for evaluating process options. Cost is based on engineering judgments rather than detailed estimates. Process options that are judged to be similar in effectiveness and ability to be implemented, yet costing several times more than other process options in the same technology category, were eliminated from further consideration.

Process options that are not appropriate for site conditions, planned future site uses, or for COCs contained in soil and groundwater at concentrations detected during the RI were eliminated from further consideration. In addition, process options that are innovative but not yet proven were also eliminated. If more than one process option in a remedial technology group was identified as potentially appropriate for the site, one process option was selected to represent that technology group. Tables 9-4 and 9-5 presents the identification and evaluation of general response actions, remedial technologies, and process options for soil and groundwater, respectively. (Note: Process options were not evaluated for surface water since actions taken for soil will address surface water.)

9.2.1.2 MTCA Hierarchy of Preferred Remedial Methods

MTCA requires that the process options used minimize the amount of untreated hazardous substances remaining at a site and that attention be given to permanent solutions and a hierarchy of preferred remedial methods [WAC 173-340-360(3)-(5)]. The MTCA preference for process options, in descending order, is:

1. Reuse or recycling
2. Destruction or detoxification
3. Separation or volume reduction followed by reuse, recycling, destruction, or detoxification of the residual hazardous substance
4. Immobilization of hazardous substances
5. Onsite or offsite disposal at an engineered facility designed to minimize the future release of hazardous substances, and in accordance with applicable state and federal laws
6. Isolation or containment with attendant engineering controls
7. Institutional controls and monitoring.

In general, technologies that reuse, recycle, destroy, or detoxify hazardous substances will result in permanent solutions.

Soil - Table 9-6 summarizes the results of the process option evaluation, as detailed in Table 9-4. Table 9-6 also lists the MTCA preference for each process option considered potentially applicable to site soil conditions. At least one soil process option identified for further consideration fulfills each MTCA preference category.

Reuse/recycling of site materials ranks the highest of Ecology's technology preference criteria. Onsite reuse of untreated soil may be feasible to bring the site to grade prior to installation of a cap by consolidating impacted soil from excavation areas providing it can be shown that the soil will not leach compounds, even under worst-case conditions. Onsite reuse of treated soil may be feasible to backfill excavation areas or to bring the site to grade prior to installation of a cap. Offsite reuse of treated or untreated soil as daily cover at a permitted disposal may be feasible provided the soil meets the disposal facilities acceptance criteria. The amount of debris material present in site soil may significantly limit the reuse of excavated materials both onsite and offsite. Debris materials (i.e., metal, wood) encountered during site remediation activities may be recyclable, depending on volume recovered.

Aboveground biological remediation (bioremediation by landfarming) uses microorganisms to destroy organic contaminants (such as petroleum hydrocarbons) found in soil. Thermal desorption would separate the organic COCs from the soil for destruction or further treatment. These process options meet the MTCA expectation to use treatment technologies when practicable, and to destroy or remove hazardous substances to concentrations below site cleanup levels [WAC 173-340-360(9)(a) and (b)].

Excavation would separate soil exceeding soil cleanup criteria from soil that is below the criteria prior to reuse/recycling, destruction/detoxification, or chemical stabilization. Given the amount of debris material likely to be encountered in site soil, physical separation through sieving (or other form of mechanical separation) will be necessary prior to any treatment option.

Chemical stabilization would immobilize metals detected above site cleanup levels by forming insoluble molecular bonds, which significantly reduces a metals leaching potential. This process option also meets the MTCA expectation to use treatment technologies when practicable [WAC 173-340-360(9)(a) and (b)].

Process options shown in Table 9-6 also include the lower preference methods of offsite disposal, containment, and institutional controls. MTCA recognizes the need for institutional controls, such as deed restrictions, as well as engineering controls, such as containment, for sites that contain large volumes of material with relatively low levels of hazardous substances where treatment is impracticable [WAC 173-340-360(9)(c)].

Groundwater - MTCA requires that groundwater treatment be used to achieve cleanup levels at and beyond the point of compliance [WAC 173-340-360(7)(a)]. If groundwater treatment to achieve site cleanup levels at and beyond the point of compliance within an existing plume is not practicable then the following measures shall be taken [WAC 173-340-360(7)(b)]:

- Treatment shall be used to reduce the levels to the maximum extent practicable.

- Groundwater containment, including barriers or hydraulic control through pumping or both, shall be implemented to the maximum extent practicable to avoid lateral and vertical expansion of the groundwater water volume affected by the hazardous substance.

- Source control measures shall be implemented to prevent or minimize additional releases to the groundwater.

- Adequate groundwater monitoring to demonstrate control and containment of the hazardous substances shall be conducted.

- The potentially liable persons shall provide an alternative water supply or treatment for persons with water supplies rendered unusable by the release.

- The practicability of achieving groundwater cleanup levels by treating groundwater affected by the release shall be reevaluated during the periodic review under WAC 173-340-420.

Groundwater extraction (i.e., pumping) was not considered an appropriate remedial technology for this site, given the site-specific hydrogeologic conditions and tidal influences impacting the site in the vicinity of the groundwater plume. Any groundwater extraction system would not only extract impacted water from the site but non-impacted water entering the saturated zone from the Puyallup River during high tides. Fluctuating water levels would significantly reduce the effective radii of influence of the extraction system wells and their ability to contain the groundwater plume. Consequently high extraction rates may be required to effectively contain the plume thus increasing the volume of water, which would need to be removed from the saturated zone and the volume of water requiring treatment and management aboveground. Therefore, technologies and process options associated with groundwater extraction were not evaluated in this FS.

Air sparging is a process by which oxygen is introduced to the subsurface enabling a phase transfer of certain compounds (typically volatile constituents of petroleum hydrocarbons) from a dissolved state to a vapor phase. The vapors are then vented through the unsaturated zone. Air sparging is most often used in conjunction with soil vapor extraction (SVE) that removes and treats vapors from the unsaturated zone. In situ enhanced biological biodegradation is a passive remediation process option that uses oxygen to detoxify organic COCs by promoting naturally occurring microorganisms that can aerobically degrade organic compounds into harmless by-products such as carbon dioxide and water. These process options meet the MTCA expectation to use treatment technologies when practicable, and to destroy or remove hazardous substances to concentrations below site cleanup levels [WAC 173-340-360(9)(a) and (b)].

Source control measures include the removal of free product from the water table, via physical separation, to the maximum extent practicable and properly treat, discharge, or dispose of the recovery by-products. This process option meets the MTCA requirements of WAC 173-340-450 for releases from USTs. Free product has been detected in limited areas of the site in the vicinity of TP-10, TP-11, TP-55, and monitoring well MW-12 (west of the former red brick building) and to a lesser extent in the vicinity of the former creosoting plant located in the southwestern corner of the site (refer to Figure 5-3). While historical Sanborn Maps indicate the presence of an oil tank at the former creosoting plant location, no evidence of USTs were

observed during the RI this location or west of the former red brick building. In addition to free product removal, soil excavation as discussed in the previous subsection also provides for additional source control measures.

Since the shallow groundwater at the site is not a water supply, the need to provide an alternative water supply or treatment for persons with water supplies rendered unusable by the release is not applicable. Institutional controls, such as deed restrictions, will provide for the protection of unauthorized use of shallow groundwater, and compliance monitoring and period review will evaluate the effectiveness of treatment in meeting the site groundwater cleanup levels.

9.2.2 Identification and Description of Remedial Alternatives

This section identifies alternatives that may be appropriate for remediating the site.

9.2.2.1 Description of Process Options Selected for Further Consideration in Developing Remedial Alternatives for Soil

This section presents specific descriptions of the process options considered potentially implementable at the site.

Reuse/Recycling – Soil from excavation areas can be reused onsite in order to consolidate untreated soil and to bring low areas within the consolidation area to grade prior to capping providing it can be shown that the material will be not be subject to leaching. Soil from excavation areas can also be reused onsite after treatment as backfill material for excavated areas or to bring the existing surface to grade prior to capping. Treated or untreated soil may be sent to a permitted offsite facility for disposal providing the material meets the disposal facilities waste acceptance criteria and land disposal restrictions. Soil that is sent to a permitted offsite disposal facility may be used by the facility as daily landfill cover material; however, the amount of debris material in the soil may limit its reuse.

Although the majority of the surficial debris-type materials have been removed from the site, metal, asphalt, and wood type debris still exist on the surface and in soil that may require excavation. The uppermost soil at the site is fill material that contains various types of debris type material. The amount of debris materials in the excavated soil may significantly limit the reuse of the soil onsite. Excavated soil will need to sieved or mechanically separated prior to any treatment process. Depending on the amount of recoverable materials obtained from the separation process, metal debris may be sent to a recycling facility, wood waste type debris may be used for industrial landscaping, and asphalt may be crushed and reused as base material. Aggressive extraction tests will need to be performed on any recoverable materials identified for reuse to determine whether there is leaching potential.

Landfarming – Aboveground bioremediation, also known as landfarming, refers to the bio-oxidation of organic contaminants by microorganisms. Landfarming involves the excavation of impacted soil and placement of the soil on a treatment pad with an impermeable surface and a passive leachate collection system. The soil is placed in 6- to 12-inch lifts, fortified with nutrients (fertilizer), and tilled periodically to increase aeration. When the desired level of treatment is achieved, the lift is removed and a new lift is constructed. It may be desirable to

only remove the top of the remediated lift, then construct the new lift by adding more contaminated soil to the remaining material and mixing. This serves to inoculate the freshly added material with an actively degrading microbial culture, and can reduce treatment times.

Soil conditions need to be controlled to optimize the rate of contaminant degradation. Conditions normally controlled include: moisture content (usually by irrigation or spraying); aeration (by tilling the soil with a predetermined frequency, the soil is mixed and aerated); pH (buffered near neutral pH by adding crushed limestone or agricultural amendment); and other amendments (e.g., soil bulking agents, nutrients, etc.). The use of this process option will require a treatability study to identify the optimal approach for treatment at the site.

Ex situ landfarming has been proved most successful in treating petroleum hydrocarbons; however, it tends to be less effective for diesel- and heavy oil-range hydrocarbons than other treatment methods (i.e., thermal treatment). This process will not remediate the metals found at the site. Other factors that can limit the applicability and effectiveness of landfarming include: the amount of space required to implement the process; conditions affecting biological degradation that cannot be controlled, but can increase the length of time required to complete remediation (e.g., temperature, rainfall); the need for fugitive dust control during tilling; and the need for runoff collection facilities that have to be constructed and monitored. Given these factors and the length of time typically required to meet cleanup levels, this process option is eliminated from further consideration.

Thermal Desorption - Thermal treatment strips organics from the soil with applications of relatively low temperatures (400° to 1,100°F) compared to those used for incineration. Excavated soil is heated to volatilize water and organic contaminants. A carrier gas or vacuum system transports volatilized water and organics to a gas treatment system. The bed temperatures and residence times designed into these systems volatilize selected contaminants but will typically not oxidize them. Two common thermal desorption designs are rotary dryer and thermal screw. Rotary dryers are horizontal cylinders that can be indirect or direct-fired. The dryer is normally inclined or rotated. For the thermal screw units, screw conveyors or hollow augers are used to transport the soil through an enclosed trough. Hot oil or steam circulates through the auger to indirectly heat the medium. Since the thermal desorption process is actually a physical separation process, all thermal desorption systems require treatment of the off-gas to remove and destroy the particulates and contaminants. Contaminants are removed through condensation followed by carbon adsorption, or they are destroyed in a secondary combustion chamber or catalytic oxidizer.

Based on the operating temperature of the desorber, thermal desorption processes can be categorized into two groups: high temperature thermal desorption (HTTD) and low temperature thermal desorption (LTTD). The target contaminant groups for HTTD are semivolatile organic compounds (SVOCs), PAHs, and PCBs. The target contaminant groups for LTTD are nonhalogenated VOCs and fuels. Thermal desorption will not remediate the metals found at the site. Debris mixed throughout site soils may cause physical difficulties with treatments using thermal desorption. Physical separation of these materials from the soil will be required and will result in additional material handling; however, the volume of material requiring treatment will be reduced. This process requires only a limited amount of space to implement since most of the thermal desorption units are truck-mounted and mobile, and soil can be remediated to cleanup levels in a shorter timeframe than via landfarming.

Excavation – Excavation is the process of removing impacted soil from the ground and is a well proven and readily implementable process option. Excavation is the most effective means of separating soil that requires treatment and/or disposal from soil that does not require treatment and/or disposal. Excavation is an initial component to all ex situ treatments. Aboveground, the excavated soil can be further segregated into stockpiles, if necessary, depending on eventual disposition of the materials. Excavated soil can either be reused (see reuse/recycling) or transported to a permitted offsite disposal facility. Excavated soil may require treatment in order to meet the disposal facilities waste acceptance criteria and land disposal restrictions. Soil treatment can be conducted onsite prior to transportation or at the disposal facility. Excavation is applicable to all COCs encountered at the site. Others factors to be considered during excavation include the generation of fugitive dust and the depth and composition of the materials requiring excavation. If excavated materials are transported offsite, clean fill material will need to be imported to backfill the excavation areas and bring the site to grade.

Sieving/Separation - Sieving is a physical separation process that uses different size sieves and screens to sort grain sizes and remove undesirable materials (e.g., debris), which may impact a treatment process. Physical separation is based on the fact that most organic and inorganic contaminants tend to bind, either chemically or physically, to the fraction of a soil fine (i.e., clay and silt). The clay and silt particles are, in turn, physically bound to the coarser sand and gravel particles by compaction and adhesion. Thus, separating the fine clay and silt particles from the coarser sand, gravel, and debris would effectively concentrate the contaminants into a smaller volume of soil for treatment or disposal. Another form of mechanical separation may be required (using a backhoe) to separate and remove larger pieces of debris.

Recovered debris materials may be appropriate for recycling as previously discussed. Materials not appropriate for recycling will be disposed of at a permitted offsite disposal facility. Given the amount of debris likely in potential excavation areas at the site, sieving/physical separation will be required prior to any treatment process.

Chemical Stabilization - Chemical stabilization reduces the mobility of contaminants in the environment. Unlike other remedial technologies, stabilization seeks to immobilize contaminants within their "host" medium (i.e., soil) instead of removing them through chemical and/or physical treatment. Leachability testing is used to measure the degree of immobilization. Chemical stabilization can be performed both in situ and ex situ. This technology will require a limited bench-scale test to identify the optimum chemical mixture to be used for the stabilization and to determine whether the process is best performed in situ or ex situ. Target contaminants for this remedial technology are metals. Debris mixed throughout site soils may cause physical difficulties with treatments using chemical stabilization in situ. If the process is implemented ex situ physical separation of these materials from impacted soils can be performed, this will result in additional material handling but the volume of material requiring treatment will be reduced.

For the purposes of this FS, it has been assumed that a chemical stabilization process patented by Forrester Environmental Services, Incorporated (FESI) of Hampton, New Hampshire can be used. Kennedy/Jenks Consultants has used this patented process successfully on a number of sites impacted with heavy metals. The process entails application of phosphate-based liquid that causes substitution and co-precipitation of target metals (lead) into stable complexes. The result is lower solubility and mobility in the environment.

Offsite Disposal - Soil and debris transported to a permitted offsite disposal facility may be treated or untreated depending on the disposal facilities waste acceptance criteria and land disposal restrictions. Disposal facilities can accept soil impacted with COCs identified at the site; however, the type of chemical and its concentration will determine actual offsite disposal requirements. Soil characterization as dictated by land disposal restrictions (LDRs) will be required. Most hazardous and dangerous wastes require treatment either onsite or at the receiving disposal facility to meet either RCRA or nonRCRA treatment standards prior to land disposal. Physical separation of the debris materials mixed throughout site soil may be required to facilitate disposal. The distance of the disposal facility with the required permits from the site, and the difference between the transportation and disposal of hazardous/dangerous waste versus nonhazardous waste can significantly impact the cost of a site cleanup.

For the purposes of this FS, it has been assumed that the Roosevelt Regional Landfill located in Roosevelt, Washington, which is permitted to accept nonhazardous wastes will be used. Offsite disposal of hazardous/dangerous waste it not anticipated due to the significant costs involved (refer to Section 9.2.2.3); with the possible exception of a small quantity of soil containing lead-acid batteries from a limited area immediately south of the former red brick building.

Asphalt Cap - An asphalt cap typically consists of 3 inches of appropriate base material (crushed rock), covered with 3 inches of low permeability asphalt. Prior to capping, soils affected with higher levels of COCs may require excavation, treatment, and/or disposal. Treated soil can be used onsite as excavation backfill material or to bring the site to grade prior to installation of the cap. Untreated soil may also be used to bring the site to grade under specific circumstances (i.e., within a defined consolidation area). Imported clean fill material may be needed to complete backfilling of excavation areas and to bring the site to grade. Capping will include the installation of a stormwater collection system (designed to control surface water runoff) and inspections and repairs (as needed) to maintain the integrity of the cap. The cap would be installed over the entire site, excluding the area currently occupied by the storage building on the eastern portion of the site.

Asphalt is currently present over a large portion of the site; however, the integrity of the existing asphalt has been compromised through demolition of buildings and site investigation activities and will be further compromised during the proposed excavation activities. The existing asphalt can either be removed and crushed to be reused as base material for the new asphalt cover or removed from the site and disposed of at an appropriate facility. Alternatively, the existing asphalt can be left in place and the new cap constructed over it.

Although this FS evaluates asphalt, other caps (e.g., concrete) would provide equivalent protection to human health and the environment. However, asphalt provides adequate protection of human health, is cost-effective, and is a common paving material for parking and/or industrial areas.

Institutional Controls - Institutional controls (WAC 173-340-440) includes deed restrictions that are required whenever contaminants remain onsite at concentrations exceeding site cleanup levels (refer to Table 9-3). Deed restrictions are controls on land use that are described in a covenant on the property, as executed by the property owner and recorded with the Registrar of Deeds. Deed restrictions meet the requirement for institutional controls as defined in WAC 173-340-440(3). Institutional controls would include a 5-year periodic review in accordance with WAC 173-340-420 if soil containing COCs above site cleanup levels remains onsite or if

conditional points of compliance have been established. The 5-year periodic review would entail evaluating the remedial actions to assess whether human health and the environment remain protected. In addition, long-term monitoring would be required under WAC 173-340-360(8) and WAC 173-340-410(c). At a minimum, annual inspections and repairs (as needed) of the asphalt cap would be needed to maintain the integrity of the cap, and compliance monitoring of the stormwater collection system discharge to monitor attainment of site surface water cleanup levels.

9.2.2.2 Description of Process Options Selected for Further Consideration for Developing Remedial Alternatives for Groundwater

This section presents specific descriptions of the process options to address groundwater considered potentially implementable at the site.

Free Product Removal – When a chemical is released on or into the ground, it divides into one or more phases: vapor or gaseous phase; adsorbed or residual phase (on soil); dissolved phase (in groundwater); and free or liquid phase. Liquid or pure phase, also known as free product, is characterized by having sufficient volume to saturate the soil that it accumulates on the water table and can readily flow into wells and excavations. When the free product is immiscible (i.e., does not readily dissolve in water) it is referred to as a LNAPL. Free product consists of both a residual (nondrainable) portion and a portion that is recoverable (drainable). Free product has been identified in limited areas of the site where soil contamination extends to the water table. Free product serves as a continual source of contamination by dissolving, volatilizing, smearing onto soil and groundwater.

LNAPLs can be removed using various methods depending on the lateral extent and other remediation activities being conducted at a site. The two most common systems use either recovery wells or a series of trenches/drains. Recovery wells use skimmers, canisters, or absorbent filters with the goal of collecting little or no groundwater. Trenches/drains can be installed perpendicular to the direction of groundwater flow or longitudinally along the plume of contamination. A perforated collection pipe is placed in the trench in order to drain the free product to a sump. The LNAPL is then periodically pumped from the sump. A modification of the trench/drain approach can be implemented if soil excavation is proposed down to or just below the water table in the area of LNAPL. Excavation in conjunction with free product removal reduces the amount of residual (nondrainable) soil contamination that also serves as a continual source of contamination. LNAPL removal from the open excavation may involve the removal of more groundwater than using other techniques. Depending on the amount of product and rate of groundwater entering the excavation area, the product can be skimmed directly from the excavation or alternatively groundwater/ LNAPL can be pumped from the excavation into a holding tank, where water/ LNAPL separation is allowed to occur. Product is then skimmed from the holding tank. Any groundwater removed as part of the LNAPL recovery may need to be treated prior to disposal.

Air Sparging - Air sparging is an in situ technology that reduces concentrations of volatile constituents of petroleum hydrocarbons that are adsorbed to soil and dissolved in groundwater. This process option involves the injection of atmospheric air into the saturated zone, enabling a phase transfer of hydrocarbons from a dissolved phase to a vapor phase. The air is then vented through the unsaturated zone. Air sparging is most often used together with a SVE system, which removes and treats the resultant vapors from the unsaturated soil zone. Air

sparging is generally more applicable to the lighter gasoline constituents (BTEX) because they readily transfer from the dissolved to the vapor phase. Air sparging is less applicable to diesel-range petroleum hydrocarbons and PAHs. Addition of oxygen to the saturated zone via air sparging may also serve to increase the amount of available oxygen in the groundwater that can enhance biodegradation of organic contaminants. However, since oxygen has a relatively low water solubility, air sparging alone (which uses atmospheric air) may not be able to provide the amount of oxygen required to produce the optimum aerobic conditions for bioremediation to occur (see enhanced biodegradation).

Air sparging cannot be used if free product is present. The effectiveness of air sparging depends primarily on two factors. The vapor/dissolved phase partitioning of chemicals determines the equilibrium distribution of a chemical between the dissolved phase and the vapor phase. Vapor/dissolved partitioning is, therefore, a significant factor in determining the rate at which dissolved constituents can be transferred to the vapor phase. The other significant factor in determining the mass transfer rate of chemicals from the dissolved phase to the vapor phase is the permeability of the soil, which determines the rate at which air can be injected into the saturated zone. In general, air sparging is more effective for chemicals with greater volatility and lower solubility and for soils with higher permeability. Stratified or highly heterogeneous soil typically creates the greatest barriers to air sparging. Both injected air and stripped vapors will travel along the paths of least resistance and could travel great lateral distances from the injection point. Air sparging also has the potential for inducing chemical migration, and as previously stated may need to be implemented in conjunction with a SVE system especially if the site is developed and buildings constructed. This process option can take a moderate amount of time to reduce COCs to cleanup levels. This process option requires detailed pilot testing and monitoring to determine the number, spacing, and radii of influence of air sparging wells. Given these factors and the length of time typically required to meet cleanup levels (3 to 5 years), this process option is eliminated from further consideration.

In Situ Enhanced Biodegradation – Enhanced biodegradation introduces oxygen to the saturated zone in order to increase the rate of biodegradation. Increasing the concentration of electron acceptors and nutrients in the groundwater enhances the rate of biodegradation of organic contaminants by microbes. Oxygen is the main electron receptor for aerobic biodegradation. Nitrate serves as an alternative electron receptor under anaerobic (oxygen deficient) conditions. Enhanced biodegradation is a process that attempts to accelerate natural biodegradation processes by providing nutrients, electron receptors, and competent degrading microorganisms that may otherwise be limiting the rapid conversion of organic contaminants into innocuous end products. Oxygen enhancement can be achieved by either air sparging (as discussed above) or introducing oxygen releasing compounds to the saturated zone. Under anaerobic conditions, nitrate is introduced to enhance bioremediation. The advantage of using oxygen releasing compounds over air sparging is that it provides pure oxygen to the saturated zone. The concentration of oxygen from oxygen releasing compounds can build up in groundwater to very high concentrations (up to 45 mg/l) before leaving solution in the form of bubbles. This gives a tremendous advantage over air sparging in that the high concentrations of oxygen dramatically increase the rate of oxygen diffusion through the subsurface. Thus oxygen releasing compounds have the potential to impact a much greater area around an application point by simple diffusion than can be expected by applying atmospheric air.

Petroleum hydrocarbons degrade rapidly under aerobic conditions, but success is often limited by the inability to provide sufficient oxygen to contaminated zones as a result of low water solubility of oxygen and because available oxygen is rapidly consumed by aerobic microbes. Nitrate can also serve as an electron receptor and is more soluble in water than oxygen. The addition of nitrate results in the anaerobic biodegradation of toluene, ethylbenzene, and xylenes. The benzene component of fuel has been found to biodegrade slower under strict anaerobic conditions.

The groundwater contamination plume is located in an area of the site that contains a significant quantity of organic material (wood). It is likely that the presence of a large amount of organic material has created more anaerobic than aerobic conditions in this portion of the site. A limited-treatability study will be required to determine the optimum requirements for enhanced biodegradation at the site. For the purposes of this FS, it has been assumed that an oxygen releasing compound known as ORC®, patented by Regenesis Bioremediation Products, Inc., of San Clemente, California, can be used. Kennedy/Jenks Consultants has used this patented process successfully on a number of sites impacted with petroleum hydrocarbon-related compounds. ORC® can be applied in a number of ways depending on site conditions. ORC® can be introduced into existing site monitoring wells using filter socks filled with ORC® powder. ORC® can be mixed into a slurry and applied via a series of injection points throughout the plume or injected in a line to create an "oxygen barrier" at or near the point of compliance. ORC® can also be placed in the base of an excavation as a slurry (if water is present) or as powder (if water is not present). Enhanced biodegradation typically can achieve cleanup levels in a shorter period of time (1 to 2 years) than air sparging.

Compliance Monitoring – The effectiveness of the groundwater treatment process option will be monitored through both performance and confirmational monitoring [WAC 173-340-410(b)(c)]. Groundwater performance monitoring will be used to confirm that the cleanup action has attained the site groundwater cleanup levels (refer to Table 9-3). Groundwater confirmational monitoring will be used to confirm the long-term effectiveness of the cleanup action once the site groundwater cleanup levels have been achieved.

9.2.2.3 Development of Alternatives

This section identifies alternatives that could be appropriate for remediation of COC-impacted soil, groundwater, and surface water at the site. These alternatives are identified using the requirements and expectations described in MTCA (WAC 173-340-360), which include:

- Meeting threshold requirements for remedial alternatives (refer to Section 9.2.3)
- Using permanent solutions to the maximum extent practicable
- Providing for a reasonable restoration time frame
- Addressing public concerns raised during the public comment on the Draft CAP.

In addition to these requirements, Ecology has the following expectations for cleanup actions [WAC 173-340-360(9)]:

- Using treatment technologies whenever practicable

- Minimizing the need for long-term management of contaminated materials by destroying, detoxifying, or removing hazardous substances that are above cleanup levels

- Recognizing the need to use engineering controls, such as containment, for sites with large volumes of relatively low levels of hazardous substances

- Using institutional controls to supplement engineering controls

- Minimizing contact of precipitation and runon with contaminated material

- Consolidating hazardous substances to the maximum extent practicable, if the hazardous substances remain onsite

- Preventing or minimizing releases to surface water and not depending solely on dilution to demonstrate compliance with the cleanup standards

- Not undertaking cleanup actions that will result in a greater overall threat to human health and the environment when compared to other alternatives.

MTCA recognizes that treatment may not be practicable for all sites. Treatment is required, wherever practicable, for sites containing liquid wastes, areas contaminated with high concentrations of hazardous substances, highly mobile materials, or discrete areas of hazardous substances that lend themselves to treatment [WAC 173-340-360(9)(a)]. MTCA also recognizes that engineering controls, such as containment, are appropriate for sites that contain large volumes of materials with relatively low levels of hazardous substances where treatment is impracticable [WAC 173-340-360(9)(c)].

For discussion purposes throughout the remainder of this FS and to assist in the development of remedial alternatives, soil impacted with COCs at the site has been divided into the following two main categories:

- Metals-Impacted Soil – Categorized as near-surface soil less than 3 feet bgs. There are two isolated areas extending 4 to 6 feet bgs (TP-34 and TP-46) (refer to Figure 4-1). At TP-34, the concentration detected in the 4 to 6 feet depth interval (1,110 mg/kg) slightly exceeds the site cleanup level. Higher concentrations (4,320 mg/kg) were detected in the 4 to 6 feet depth interval at TP-46, located along the eastern property boundary. The most widespread COC in this category of soil is lead exceeding the MTCA Method A industrial cleanup level of 1,000 mg/kg. This soil may also contain chromium, PCBs, PAHs (including cPAHs), and diesel- and oil-range petroleum hydrocarbons at concentrations above site cleanup levels (refer to Table 9-3). Except for the isolated areas identified above, metals-impacted soil is located at least 4 feet or more above the high tide water table.

- Petroleum Hydrocarbon-Impacted Soil – Categorized as soil that has been impacted down to the water table and has resulted in groundwater impact. Petroleum hydrocarbon-impacted soil up to 10 feet bgs has been identified in two areas of the site (refer to Figure 4-4). One area is in the vicinity of the former creosoting plant located in the southwestern corner of the site. The second area is in the vicinity of test pits TP-10, TP-11, and TP-55, west of the former red brick building. The most widespread COCs in this category of soil are diesel- and oil-range petroleum hydrocarbons and cPAHs. The

petroleum hydrocarbon and cPAH concentrations detected in the deeper petroleum hydrocarbon-impacted soil are typically an order of magnitude greater than the concentrations of these same COCs detected in the shallow metals-impacted soil category described above.

The following remediation alternatives have been developed from the selected soil and groundwater process options.

Alternative 1: Source Control (Free Product Removal and Petroleum Hydrocarbon-Impacted Soil Excavation with Offsite Disposal), Asphalt Cap with Stormwater Control, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater/Surface Water Compliance Monitoring, and Periodic Review. Source control in those areas of the site where groundwater has been impacted by potentially mobile contaminants. Source control will include free product removal and excavation of petroleum hydrocarbon-impacted soil where impacted soil has been identified down to the water table. Petroleum hydrocarbon-impacted soil will be disposed of offsite. Source control will also include the removal of lead-acid battery casings located in the shallow soil immediately south of the former red brick building. These battery casings, if left in place, could act as a continual source of lead to soil in this area. The lead-acid battery casings and impacted soil will be disposed offsite. Since COCs above the site soil cleanup levels will remain onsite, this alternative includes the installation of a low permeability asphalt cap with a stormwater collection system, institutional controls, compliance monitoring, and periodic reviews. This alternative includes enhanced biodegradation to accelerate bioremediation of groundwater contaminants in the western portion of the site.

Alternative 2: Source Control (Free Product Removal and Petroleum Hydrocarbon-Impacted Soil Excavation with Offsite Disposal), Limited Metals-Impacted Soil Excavation with Onsite Consolidation, Asphalt Cap with Stormwater Control, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater/Surface Monitoring, and Periodic Review. Source control measures as described in Alternative 1. Petroleum hydrocarbon-impacted soil and soil containing lead-acid battery casings will be disposed of offsite. This alternative includes the limited excavation of shallow metals-impacted soil along portions of the property boundary to site cleanup levels in order to create a "buffer zone" between shallow metals-impacted soil being left in place onsite and the adjacent properties. The excavated metals-impacted soil will be consolidated onsite within the limits of the shallow metals-impacted soil footprint. Since COCs above the site cleanup levels will remain onsite, this alternative also includes the installation of a low permeability asphalt cap with a stormwater collection system and implementation of institutional controls and monitoring, as described in Alternative 1. This alternative also includes enhanced biodegradation to accelerate bioremediation of groundwater contaminants, as described in Alternative 1.

Alternative 3: Source Control (Free Product Removal and Petroleum Hydrocarbon-Impacted Soil Excavation), Limited Metals-Impacted Soil Excavation, Onsite Treatment & Reuse of Excavated Soil, Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater/Surface Monitoring, and Periodic Review. Source control measures, as described in Alternative 1. This alternative also includes the limited excavation of shallow metals-impacted soil along portions of the property boundary to site cleanup levels in order to create a "buffer zone" between shallow metals-impacted soil being left in place onsite and the adjacent properties, as described in Alternative 2. However, in this alternative, excavated soil will be treated onsite using thermal desorption for petroleum hydrocarbon-impacted soil and chemical

stabilization for metals-impacted soil, respectively. (Note: Impacted soil containing lead-acid battery casing will be disposed of offsite.) Sieving or mechanical separation of debris will be performed prior to implementation of treatment processes. The debris material will be stockpiled pending characterization for recycling or offsite disposal. Treated soil will be used onsite to backfill excavation areas or bring the site to grade for capping. Since COCs above the site cleanup levels will remain onsite, this alternative also includes the installation of a low permeability asphalt cap with a stormwater collection system and implementation of institutional controls and monitoring, as described in Alternative 1. This alternative also includes enhanced biodegradation to accelerate bioremediation of groundwater contaminants, as described in Alternative 1.

9.2.2.4 Discussion of Alternatives Relative to MTCA Criteria

All the alternatives include source control measures in the portion of the site where groundwater has been impacted by petroleum hydrocarbon compounds. All alternatives also include the removal of lead-acid battery casings and associated impacted soil in a limited area of the site immediately south of the former red brick building. Source control meets Ecology's expectation to minimize the need for long-term management by removing hazardous substances that are above cleanup levels.

The rationale for determining whether COCs above site soil cleanup levels could be left in place in those areas of the site where soil has not been impacted down to the water table was based on an assessment of the following: (1) the ability of an alternative to minimize the potential for direct contact with COCs (e.g., via dermal contact, ingestion, inhalation), and (2) the ability of an alternative to reduce a COCs potential to be leached from the soil into the groundwater and migrate toward the Puyallup River.

The most widespread COC in the shallow metals-impacted soil is lead (refer to Figure 4-1). The proposed cleanup level for lead is the MTCA Method A industrial cleanup level of 1,000 mg/kg. The estimated volume of soil with concentrations of lead exceeding 1,000 mg/kg is approximately 11,400 cubic yards (refer to Table 4-9). Soil samples with a range of concentrations exceeding 1,000 mg/kg were analyzed using the TCLP (refer to Table 4-8A). The TCLP is used to characterize waste with respect to toxicity. Based on the TCLP results, generally speaking, soil exceeding 1,000 mg/kg of total lead also exceeds the TCLP criterion for lead of 5 mg/l. Therefore, excavated soil with lead concentrations exceeding 1,000 mg/kg would need to be managed as a dangerous waste (WAC 173-303-090). The costs associated with handling and treatment and/or disposal of dangerous waste are prohibitive. Futhermore, the potential risks posed by leaching to groundwater appear minimal if engineering controls (asphalt cap with a stormwater collection system) are used.

As previously discussed in Section 9.1.5.1, Ecology does allow soil concentrations above MTCA soil cleanup levels to remain at a site if it can be demonstrated that higher concentrations are protective of groundwater [WAC 173-340-745(4)(a)(ii)(A)]. Soil samples with concentrations of metals and cPAHs exceeding site cleanup levels were evaluated using the SPLP, a procedure designed to simulate leaching under acid rain conditions. The SPLP results (refer to Tables 4-8A and 4-8B) indicate that low concentrations of metals (below the proposed site groundwater cleanup levels) leached from the samples suggesting the low potential for migration of metals beyond their initial zone of presence, if precipitation is allowed to infiltrate through the soil column. This is supported by the fate and transport modeling presented in

Section 8.2, which found COCs encountered in the shallow soil to be virtually immobile (under the conditions modeled) at concentrations exceeding soil cleanup levels at the site. The most sensitive parameter in the model was recharge rate, indicating that in order to minimize the potential for leaching, surface water infiltration should be kept to a minimum or eliminated. Installation of an asphalt cap and a stormwater collection system will significantly reduce (and possibly eliminate) the potential for surface water infiltration at the site. Other COCs (chromium, cPAHs, and PCBs) are detected in the shallow soil above their respective site cleanup levels within the area of soil impacted by lead. These chemicals are also considered to be virtually immobile (refer to Tables 4-8A and 4-8B and Section 8.2.1.9). [Note: Metals (with the exception of dissolved selenium) and PCBs have not been detected in site groundwater above cleanup levels, cPAHs were detected in the unfiltered groundwater reconnaissance and well samples; however, as previously discussed these results are believed to be an artifact of the sampling method and not representative a groundwater quality.]

Petroleum hydrocarbons in the diesel- and oil-range are also present in the shallow soil at the site. Soil samples exceeding the proposed site cleanup level of 2,000 mg/kg (amended MTCA Method A industrial soil cleanup level) for petroleum hydrocarbons in the diesel- and oil-ranges were evaluated using Ecology's TPH Interim Policy (refer to Section 4.5). The TPH Interim Policy addresses two pathways: direct human health contact, and soil-to-groundwater, the two exposure pathways of concern at the site (refer to 9.1.2). Based on the evaluation, the sum of the hazard quotients (the hazard index) did not exceed 1.0; however, at those locations where cPAHs were also detected, the $1x10^{-5}$ cancer risk was exceeded. This is only of concern if a direct contact exposure pathway exists. The direct contact exposure pathway can be effectively eliminated by the installation of an asphalt cap and institutional controls (i.e., deed restrictions).

Each alternative includes installation of an asphalt cap with a stormwater collection system and deed restrictions. This meets Ecology's expectation of using engineering controls for sites with large volumes of relatively low levels of hazardous substances, using institutional controls to supplement engineering controls, and minimizing contact with precipitation and runon with contaminated material.

Ecology's TPH Interim Policy does not take into account long-term exposures to petroleum hydrocarbon vapors or address ecological protection. The most volatile COC at the site is benzene. Benzene was not detected in groundwater at concentrations exceeding site groundwater cleanup levels; however, as a carcinogenic, mobile and volatile constituent of gasoline, its fate and transport in the environment is of potential concern. Volatilization to the outdoor (ambient) air may occur, but given the extensive dilution that occurs outdoors compared to an indoor air scenario, this pathway is not of concern. Installation of an asphalt cap will reduce the potential migration of vapors at the site. A groundwater to indoor air risk assessment may be necessary if future buildings are constructed in the northwestern corner of the site based on groundwater quality at that time. (Note: It is anticipated that if buildings are constructed sometime in the future, the source control measures and groundwater remediation activities proposed in each of the alternatives will have reduced benzene in site groundwater to levels where a risk assessment may not be warranted.)

According to the groundwater migration modeling performed in Section 8.3, under the conservative assumptions used in the model (i.e., groundwater flows continuously toward the Puyallup River) it is possible that benzene may have migrated beyond the northern property boundary toward the river at concentrations below site cleanup levels. However, as benzene is

transported from groundwater to surface water and potential ecological receptors, natural attenuation (dilution, biodegradation, volatilization) will occur. If benzene reaches surface water it will be subject to rapid volatilization. The estimated half-life for volatilization of benzene from a model river one meter deep flowing at 1 meter per second with a wind speed of velocity of 3 meters per second is estimated to be 2.7 hours at 20 degree Celsius (National Park Service 1997). Benzene is not expected to significantly adsorb to sediment, bioconcentrate in aquatic organisms or hyrolyze, and may be subject to biodegradation based on a reported biodegradation half-life of 16 days in an aerobic river die-away test (National Park Service 1997).

Each alternative includes groundwater treatment through enhanced biodegradation to accelerate the bioremediation of contaminants in site groundwater. Enhanced biodegradation will be achieved by introducing an oxygen releasing compound into the saturated zone. All of the organic COCs detected in site groundwater can be bioremediated using enhanced biodegradation. Benzene is particularly amenable to aerobic biodegradation using oxygen release compounds. Alternative 3 also includes the use of treatment technologies for soil. This meets Ecology's expectation of using treatment technologies whenever practical and minimizing the need for long-term management of contaminated materials by detoxifying or destroying hazardous substances that are above cleanup levels and to treat hazardous substances whenever practicable.

Each alternative includes compliance monitoring and periodic reviews. This will include protection monitoring during remedial activities, and performance and confirmational monitoring for a period of 3 to 5 years. This will include one year of quarterly monitoring, followed by semiannual monitoring for the remainder of the performance/confirmational period. Long-term groundwater monitoring is not anticipated at the site, since the source(s) of the groundwater contamination will be removed from the site. The length of the performance/confirmational monitoring period will be dependent on how quickly the site groundwater cleanup levels are achieved. At a minimum, the asphalt cap will be inspected on an annual basis to verify the caps integrity. Periodic monitoring of the stormwater collection system discharge will also be conducted to ensure compliance with site surface water cleanup levels. Ecology may stipulate requirements for different monitoring frequencies and duration in the CAP.

All the alternatives use permanent solutions to the maximum extent practicable through either offsite disposal or onsite treatment. It is not considered practicable to remove all metals-impacted soil above site cleanup levels since implementation of engineering and institutional controls can be shown to be protective of human health and the environment, as described above. In accordance with MTCA [WAC 173-340-360(5)(d)(vi)], a cleanup action is not considered practical if the incremental cost of the cleanup action is substantial and disproportional to the incremental degree of protection it would achieve over a lower preference cleanup action. Approximately 11,400 cubic yards of shallow metals-impacted soil exceeding the site soil cleanup level have been characterized as a hazardous waste based on the TCLP results (refer to Section 4.8). Therefore, it is recognized that the costs associated with the handling and management (treatment and/or disposal) of such a large volume of soil would be significant and impractical.

All the alternatives provide for a reasonable restoration time frame. Excavation and offsite disposal can be achieved within a relatively short time frame. The soil treatment process options (thermal desorption and chemical stabilization) were chosen because they can also

achieve site soil cleanup levels in relatively short periods of time. Removal of the source(s) of groundwater contamination will greatly assist in the rate at which site groundwater cleanup levels can be achieved.

All the alternatives meet the MTCA expectation to avoid cleanup actions that result in a greater overall threat to human health and the environment. MTCA requirements for meeting threshold requirements, using permanent solutions to the maximum extent practicable, providing for reasonable restoration time frame, addressing public comments are further addressed in Section 9.2.4.

9.2.2.5 Detailed Description of Alternatives

This section further describes the three remedial alternatives identified in Section 9.2.2.3.

Alternative 1: Source Control (Free Product Removal and Petroleum Hydrocarbon-Impacted Soil Excavation with Offsite Disposal), Asphalt Cap with Stormwater Control, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater/Surface Water Compliance Monitoring, and Periodic Review.

This alternative involves implementing source control measures through the excavation of potentially mobile petroleum-impacted soil in two areas of the site down to the water table (refer to Figure 9-1) and free product removal. Metals-impacted soil may be encountered in the uppermost 1 foot of soil within portions of the two areas identified for deep excavation. Additional separation of the excavated soil into various stockpiles for disposal characterization may be required. Petroleum hydrocarbon-impacted soil will be excavated vertically down to groundwater and laterally until sidewall confirmation samples indicate petroleum hydrocarbon and cPAH concentrations below the site cleanup levels of 2,000 mg/kg (petroleum hydrocarbons) and 18 mg/kg (total cPAHs). Free product is expected to be present in the excavation areas in the vicinity of the TP-10, TP-11, and TP-55 and may be present to a lesser extent in the excavation in the vicinity of the former creosoting plant. The amount of free product encountered will determine the removal method. This alternative also involves the removal of lead-acid battery casings and associated impacted soil from a limited area south of the former red brick building. Excavated materials from this area of the site will be stockpiled separately from the petroleum hydrocarbon-impacted soil pending characterization and offsite disposal.

It is estimated that approximately 3,300 cubic yards of soil will require excavation in the vicinity of the former creosoting plant in the southwestern portion of the site and approximately 4,500 cubic yards of soil will require excavation west of the former red brick (refer to Figure 9-1). In this alternative, excavated soil will be transported offsite for disposal at a permitted facility and possible reuse as daily landfill cover material; however, its reuse may be limited by the amount of debris material in the soil. The excavated soil will be temporarily stockpiled onsite in order to characterize the material for offsite disposal. Control measures, such as covering or wetting the stockpiles and creating earth berms, will be used as necessary to control fugitive dust emissions and control precipitation runon and runoff. For the purposes of this FS, it has been assumed that the petroleum hydrocarbon-impacted soil will be disposed of as a nonhazardous waste. It is estimated that approximately 10 cubic yards of lead-acid battery casings and associated impacted soil will require excavation immediately south of the former

red brick building. This material may need to be disposed of as a hazardous waste. Imported clean fill material will be used to backfill the excavated areas.

Any existing asphalt will be left in place. Additional fill and base course materials will be imported as necessary to bring the site to grade and compacted according to the design specifications. The base course material will be covered by a 3-inch layer of low permeability asphalt. The asphalt pavement will cover the entire site to the property boundaries with the exception of the existing storage building located on the eastern portion of the site. Stormwater controls will be installed in the asphalt cap. The cap will be graded to collect surface water and convey it to a stormwater collection system. The stormwater collection system will be able to treat stormwater to meet site surface water cleanup levels.

This alternative will also include institutional controls (i.e., deed restrictions) because soil exceeding the MTCA industrial soil cleanup levels will be left in place. A registered engineer will inspect the pavement at a frequency identified by Ecology and identify necessary repairs. The results of the inspection will be provided to Ecology.

This alternative includes enhanced biodegradation of the groundwater plume through the application of an oxygen releasing compound, known as ORC® (provided by Regenesis, Bioremediation Products, Inc.). A limited treatability study will need to be conducted to assess the optimum approach to accelerate the biodegradation of COCs in site groundwater using ORC®. Groundwater treatment may need to be implemented in several phases. For example, ORC® may initially be introduced into the excavation areas to provide an oxygen source across a large treatment area. This approach will create an oxygenated zone to enhance aerobic biodegradation of the residual soil and groundwater contamination in the excavation areas and biodegradation of the groundwater contaminant plume downgradient of the excavation areas. Depending on its effectiveness, additional future applications of ORC® throughout the plume by injection or via groundwater monitoring wells may be warranted.

In this alternative, scheduled groundwater monitoring will be performed for 3 to 5 years to evaluate enhanced biodegradation in meeting site groundwater cleanup levels at the conditional point of compliance and assess the need for future groundwater controls. The need for future groundwater control and longer-duration groundwater monitoring will depend on the monitoring results obtained over the initial period. Potential impacts to surface water from site runoff will be controlled with the installation of a stormwater collection system. Captured stormwater runoff will be routed to the City of Tacoma stormwater system. This alternative includes 5-year periodic reviews since hazardous substances exceeding site cleanup levels will remain onsite, and conditional points of compliance are being used to evaluate effectiveness of the cleanup action.

Alternative 2: Source Control (Free Product Removal and Petroleum Hydrocarbon-Impacted Soil Excavation with Offsite Disposal), Limited Metals-Impacted Soil Excavation with Onsite Consolidation, Asphalt Cap with Stormwater Control, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater/Surface Monitoring, and Periodic Review.

This alternative includes source control via free product removal, excavation and offsite disposal of petroleum hydrocarbon-impacted soil from the western portion of the site and excavation and offsite disposal of lead-acid battery casings and associated impacted soil south of the former red brick building, as described in Alternative 1. This alternative also includes additional limited

excavation of metals-impacted soil (approximately 700 cubic yards) along portions of the property boundary as indicated on Figure 9-1. Soil from along the property boundary areas will be excavated vertically until confirmational samples show that the site soil cleanup levels (MTCA Method A Industrial) have been achieved. Although relatively high concentrations of lead were detected at the property boundary, the metals-impacted soil is not anticipated to have extended a significant distance offsite (if at all). This area has been historically unpaved; therefore, surface water infiltration is more likely to have occurred rather than surface water runoff onto adjacent properties. For the purposes of this FS, a 5-foot wide buffer zone excavated to an average depth of 3 feet bgs has been assumed along portions of the property boundary (refer to Figure 9-1). In actuality, it is likely that only 1 foot may need to be excavated along the property boundary encompassing the western portion of the site, while excavation may be required down to 4 to 6 feet along a limited portion of the eastern property boundary in the vicinity of TP-46. Excavated metals-impacted soil will be consolidated and placed in the central portions of the site in a manner that will assist in bringing the ground surface to grade prior to cap installation. Imported clean fill material will be used to backfill all the excavated areas.

This alternative also includes installation of the asphalt cap and stormwater collection system, enhanced biodegradation of the groundwater plume, institutional controls, groundwater and surface water compliance monitoring, and periodic reviews, as described in Alternative 1.

Alternative 3: Source Control (Free Product Removal and Petroleum Hydrocarbon-Impacted Soil Excavation), Limited Metals-Impacted Soil Excavation, Onsite Treatment & Reuse of Excavated Soil, Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater/Surface Monitoring, and Periodic Review.

This alternative is the same as Alternative 2, with the exception that excavated petroleum hydrocarbon- and metals-impacted soil removed from the various excavation areas will be treated onsite and reused as backfill material. Prior to treatment, the excavated soil will be sieved or mechanically separated to remove debris materials. The debris materials will be characterized and either recycled or disposed of at a permitted offsite disposal facility. Petroleum hydrocarbon-impacted soil will be treated by thermal desorption using a mobile thermal desorption unit. The metals-impacted soil will be treated via chemical stabilization. Imported clean fill material will be used as necessary to make up the balance of fill material required to backfill the excavation areas and bring to site to grade prior to cap installation.

9.2.3 Preliminary Analysis of Alternatives

A remedial action must meet the following threshold criteria to be considered a "cleanup" under MTCA [WAC 173-340-360(2)]:

- Protect human health and the environment
- Comply with cleanup standards
- Comply with applicable state and federal laws
- Provide for compliance monitoring.

An alternative is not available for selection if it cannot meet these threshold requirements. This section presents a preliminary analysis of each of the alternatives using these criteria to assess whether the alternatives are available for selection for the site.

A cleanup is presumed to be protective of human health and the environment at the site if it achieves the cleanup levels. Compliance with cleanup standards involves achieving cleanup levels, establishing points of compliance, and complying with applicable federal and state laws (ARARs). Compliance monitoring assesses the protection of human health and the environment during construction and the operation and maintenance period of a cleanup action (protection monitoring). Compliance monitoring also confirms that the remedial action has met cleanup standards (performance monitoring) and verifies its long-term effectiveness (confirmational monitoring).

Compliance with the threshold requirements does not mean that hazardous substances cannot remain onsite untreated. MTCA recognizes that containment can comply with cleanup standards, provided that compliance monitoring is included to ensure the long-term integrity of the containment system.

Table 9-2 identifies potential action-specific ARARs. Table 9-3 identifies the proposed site cleanup levels that include both MTCA cleanup levels as defined in WAC 173-340 and other chemical-specific ARARs that are considered applicable to the site. Tables 9-7 and 9-8 present an evaluation of each alternative's ability to meet these potential ARARs.

Three alternatives were developed to address site conditions (refer to Section 9.2.2.3). All three alternatives include containment (asphalt cap), deed restrictions, and compliance monitoring as well as treatment of impacted groundwater in the western portion of the site. Alternatives 1 and 2 achieve site soil cleanup levels through excavation and offsite disposal of petroleum hydrocarbon-impacted soil in limited areas of the site where attainment of cleanup levels is practicable and necessary for the protection groundwater. Alternative 2 also achieves site soil cleanup levels for COCs at the property boundary through excavation and onsite consolidation of metals-impacted soil, thus providing additional containment of COCs remaining onsite above site cleanup levels. Alternative 3 achieves soil cleanup levels for COCs using onsite treatment processes that allows onsite reuse of soil removed from the limited excavation areas. Table 9-9 summarizes the evaluation of these alternatives with MTCA's threshold criteria. In the evaluations, compliance with cleanup standards includes only a discussion of the point of compliance because the other threshold criteria include descriptions of the remaining components of the cleanup standards (i.e., cleanup levels and compliance with ARARs).

MTCA requires that alternatives meet the threshold criteria, at a minimum, to be eligible for selection as a cleanup action. Based on the evaluation presented in Tables 9-7, 9-8, and 9-9, all alternatives meet the threshold criteria. All alternatives can achieve overall protection of human health and the environment. All the alternatives can comply with the cleanup standards (points of compliance, cleanup levels, and compliance with ARARs) through selective excavation, offsite disposal or onsite treatment, containment, institutional controls, compliance monitoring, and periodic reviews.

9.2.4 Detailed Analysis of Alternatives

In addition to meeting the threshold criteria, MTCA requires (WAC 173-340-360) that cleanup actions:

- Use permanent solutions to the maximum extent practicable
- Provide for a reasonable restoration time frame
- Consider public concerns raised during the public comment period.

Permanent solutions are actions that meet cleanup standards without requiring further remedial activities at or off the site [WAC 173-340-360(5)(b)]. Permanent solutions must prevent or minimize future releases of hazardous substances; provide for a net reduction in the amount of hazardous substances being released from the source area; and not rely on institutional controls and monitoring, offsite disposal, or dispersion and dilution if active remedial measures are technically possible [WAC 173-340-360(5)(e)].

Ecology recognizes that permanent solutions may not be practicable for all sites. The following criteria are used to determine whether a cleanup action is permanent to the maximum extent practicable.

9.2.4.1 Overall Protection of Human Health and the Environment

This criterion evaluates the degree to which existing risks are reduced, the time required to reduce the risks and achieve cleanup standards, onsite and offsite risks resulting from implementation of the alternative, the degree the cleanup action may surpass the specific standards in WAC 173-340-700 through -760, and improvement of the overall environmental quality. Because overall protection of human health and the environment was evaluated for each alternative in Section 9.2.3.1, it is not evaluated further in this section.

9.2.4.2 Compliance with ARARs

This criterion evaluates how each alternative complies with federal and state ARARs. Tables 9-7 and 9-8 present evaluations of ARARs for each alternative.

9.2.4.3 Long-term Effectiveness

Long-term effectiveness evaluates the degree of certainty that the alternative will be successful, long-term reliability, the magnitude of residual risk, and the effectiveness of controls required to manage treatment residues or remaining wastes.

9.2.4.4 Short-term Effectiveness

Short-term effectiveness describes the protection of human health and the environment during remediation and the degree of risk prior to achieving cleanup standards.

9.2.4.5 Permanent Reduction of Toxicity, Mobility, and Volume of the Hazardous Substance

This criterion evaluates an alternative's ability to permanently and significantly reduce toxicity, mobility, or volume of the contaminated material. This criterion includes an evaluation of the alternative's adequacy in destroying the hazardous substance, reduction or elimination of the hazardous substance releases and source of releases, degree of irreversibility of the waste treatment process, and the characteristics and quantity of treatment residuals generated.

9.2.4.6 Ability to Be Implemented

Ability to be implemented considers whether the alternative is technically possible; the availability of necessary offsite facilities, services and materials; administrative and regulatory requirements; scheduling, size, and complexity; monitoring requirements; access for construction, operations, and monitoring; and integration with existing facility operations and other current or potential remedial actions.

9.2.4.7 Cost

The cost criterion is used to select from among two or more cleanup action alternatives that are equivalent with respect to cleanup technologies and process options. Costs are also used to determine practicability. A cleanup action is not considered practicable if the incremental cost of the cleanup action is substantial and disproportionate to the incremental degree of protection achieved compared to a lower preference cleanup action.

The detailed analysis of alternatives using these MTCA criteria is presented in Tables 9-10 through 9-14.

Selection of a cleanup alternative must also involve the restoration time frame. Establishment of a restoration time frame should consider:

- Potential risks posed by the site
- Practicability of achieving a shorter restoration time frame
- Current and future uses of the site, surrounding areas, and associated resources that are, or could be, affected by releases of hazardous substances
- Availability of alternative water supplies
- Likely effectiveness and reliability of institutional controls
- Ability to control and monitor hazardous substance migration from the site
- Toxicity of the hazardous substances
- Natural processes that reduce concentrations of hazardous substances and have been documented to occur at the site, or under similar site conditions.

Community concerns would be addressed by following the requirements described in WAC 173-340-550(5)(c)(iii). These requirements include:

- Sending written notification of the proposed remedial action to various parties
- Posting a sign at the site indicating what remedial actions are being conducted
- Identifying a party to contact for more information.

9.2.5 Comparative Analysis of Alternatives

9.2.5.1 Long-term Effectiveness

All the alternatives offer long-term effectiveness in reducing exposure pathways and protecting potential receptors even though impacted soil above site cleanup levels will remain in place. All three alternatives reduce the magnitude of residual risk to acceptable levels through containment of impacted soil left in place via installation of an asphalt cap and stormwater collection system. The asphalt cap will prevent direct contact with impacted soil and decrease (or eliminate) the infiltration of surface water and the potential migration of COCs left in place in the shallow soil from leaching to the uppermost saturated zone. Provided the asphalt cap is maintained through regular inspections, caps have been proven reliable in effectively reducing long-term surface water infiltration. Alternatives 2 and 3 provide for additional containment along the property boundaries providing a buffer between impacted soil remaining onsite and adjacent properties. Alternative 3 requires the implementation of two treatment processes. While both treatment processes have been implemented successfully, there remains some uncertainties regarding the effectiveness of thermal treatment in destroying contaminants and the ability of chemical stabilization in reducing the long-term potential for leaching of metals from soil. All the alternatives also include the removal of lead-acid battery casings and associated impacted soil, which could act as a potential continual source of lead in soil, if left in place.

All three alternatives include groundwater treatment via enhanced biodegradation, a process that has been proven to be effective at sites where groundwater has been impacted by petroleum hydrocarbons and related compounds. All the alternatives include removal of free product and removal of petroleum hydrocarbon-impacted soil (source removal) that currently intercepts the shallow groundwater that will provide for long-term effectiveness of groundwater remediation.

9.2.5.2 Short-term Effectiveness

Each alternative offers similar degrees of short-term risks. Each involves the disruption of soil containing COCs and the potential for producing fugitive dust and/or organic vapors. However, these risks are easily managed by standard dust control measures. During performance of all three alternatives, remedial workers would be adequately protected with clothing and respirators, if required, during construction and operation of the remedial action. Installation of an asphalt cap (all alternatives) is routine construction that would not significantly impact remedial workers, the community, or the environment. Treatment residuals resulting from Alternative 3 (thermal treatment) would be managed in accordance with applicable state and federal regulations.

Each alternative poses minimal potential risks to remedial workers from exposure to free product, lead-acid battery casings, COC-impacted soil, falling hazards, and work around heavy equipment for protracted periods. Open excavations and stockpiles could also pose a threat to the environment due to the potential contamination of stormwater runon and runoff. Fencing, onsite controls (i.e., barricades), and management of stockpiled materials through covering and/or construction of stormwater runon/runoff berms, can effectively be used to control these potential threats. Although Alternative 3 (thermal treatment) has short-term risks associated with air emissions, air pollution controls can be implemented to comply with air quality standards.

9.2.5.3 Permanent Reduction of Toxicity, Mobility, and Volume

Alternative 3 (thermal treatment/chemical stabilization) would destroy and immobilize COCs in the soil from specific excavation areas to site soil cleanup levels thus reducing overall toxicity, mobility, and volume of soil exceeding site cleanup levels remaining onsite. Alternatives 1 and 2 manage COCs at a permitted offsite landfill where long-term mobility of COCs should not pose a significant concern. All the alternatives include an asphalt cap that reduces the mobility of residual COCs left in place above site cleanup levels through placement of an impermeable barrier above the residual impacted soil. The volume of petroleum hydrocarbon-impacted soil above site cleanup levels will be reduced by all the alternatives. The volume of metals-impacted soil remaining onsite is the same for all the alternatives; however, chemical stabilization (Alternative 3) will significantly reduce the potential mobility of metals in soil after treatment.

All three alternatives include potential reuse of soil. Recycling and/or reuse ranks the highest on Ecology's preferred remedial methods. Alternative 3 offers the greatest potential for onsite reuse. Treated soil (thermal/chemical stabilization) will be used as backfill material for the excavation areas and to bring the site to grade for asphalt cap installation. Alternatives 1 and 2 offer the potential for offsite reuse of soil transported to a permitted offsite disposal as daily landfill cover, if deemed suitable by the facility; however, the amount of debris material likely to be present in the soil may limit its use by the facility. Alternative 2 reuses untreated shallow metals-impacted soil excavated from the property boundary buffer zone, for onsite consolidation and grading within the shallow metals-impacted soil footprint.

All three alternatives include groundwater treatment via enhanced biodegradation which will reduce the toxcity of the COCs in groundwater. All the alternatives include removal of free product and removal of petroleum hydrocarbon-impacted soil (source removal) that currently intercepts the shallow groundwater that will provide for permanent reduction of COCs in groundwater.

9.2.5.4 Ability to be Implemented

Alternative 1 would be the simplest to implement because it involves routine construction activities and the excavation and handling of the least amount of soil. Alternative 2 would be slightly more complex due to the additional areas being excavated along the property boundary and the consolidation/grading within the shallow metals-impacted soil footprint. Alternative 3 would be the most complex alternative to implement. This alternative includes additional handling of the soil to separate and remove debris materials as well as implementing the two separate treatment processes. All the alternatives include treatment of groundwater via

enhanced biodegradation. Introduction of ORC® to the saturated zone can be easily implemented by placing ORC® at the base of the excavation area prior to backfilling and/or by borehole injection or through existing monitoring wells throughout the plume. This technology has been successfully implemented at many sites. A limited treatability study would need to be performed to obtain the optimum design for implementation.

All the alternatives require excavation (up to 10 feet bgs) to the water table that may require shoring. If shoring is not used, the excavation areas will need to be expanded to accommodate sidewall sloping and/or benching, which will result in the excavation and management of a larger volume of soil. Alternatives 2 and 3 also include shallow excavation (3 feet or less) along the property boundary. This excavation will not require shoring; however, access to adjacent properties may limit the ability to excavate to site cleanup levels beyond the property boundary. Alternative 3 involves uncertainties regarding the thermal treatment process and the ability to chemically stabilize soils containing high organic carbon and petroleum hydrocarbons. These uncertainties could be overcome by passing metals-impacted soil through the thermal treatment unit prior to chemical stabilization. However, this would require additional handling of the soil and pretreatment of a portion of the soil. Additional handling will be required prior to the treatment in order to remove debris materials that may impact the effectiveness of the treatment processes. A limited bench-scale test would be required for the chemical stabilization process to identify the optimum chemical mixture. Soil moisture conditions, materials handling problems, presence of wood and debris, and air pollution control system performance deficiencies could also adversely affect the thermal treatment process.

Permits for the alternatives are expected to be relatively easily obtainable, although the permitting process could take up to 6 months. Delays resulting from acquiring permits can be mitigated by developing an Agreed Order or Consent Decree for the remedial action in accordance with WAC 173-340-530, which requires substantial compliance with administrative requirements. The availability of offsite facilities, services, and materials is adequate for Alternatives 1 and 2. However, the availability of a mobile thermal treatment unit or a mobile chemical stabilization unit is unknown. All the alternatives can be monitored effectively during remedial action implementation to assess the attainment of site cleanup levels.

9.2.5.5 Cost

A summary of costs for the alternatives is presented in Table 9-14, and detailed cost information is provided in Appendix P. Alternative 1 is the least expensive remedial alternative. This alternative would have the greatest amount of soil above site cleanup levels remaining onsite; however, the residual COCs would be adequately contained by the asphalt cap. Alternative 2 has the same amount of residual soil above site cleanup levels remaining onsite as Alternative 1 but provides for additional containment and consolidation through the creation of the buffer zone along the property boundary. Alternative 3 is the most expensive remedial alternative due to the implementation of two different treatment processes required to treat the different types of COCs encountered in site soil (i.e., petroleum hydrocarbon- and metals-impacted soil). Alternative 3 reduces the overall amount of soil above site cleanup levels with the potential capacity to leach to groundwater remaining onsite.

9.2.5.6 Restoration Time Frame

The permitting, design, and construction activities (excavation, offsite disposal and/or onsite consolidation, capping) associated with Alternatives 1 and 2 could be accomplished in approximately 3 to 6 months. Alternative 3 could require 8 to 12 months to complete, with additional time needed for treatability testing and identification of appropriate contractors with suitable equipment. The restoration time for groundwater remediation is anticipated to be accomplished in 1 to 3 years. Due to the amount of organic material present in the saturated zone, it is possible that several phased applications of ORC® may be required to attain site groundwater cleanup levels. The treatability study will determine the optimum remediation approach. Performance monitoring will be used to determine whether additional applications of ORC® are required.

9.2.5.7 Community Concerns

Community concerns will be addressed as described in Section 9.2.4.7.

9.2.6 Recommended Alternative

The recommended alternative for the site is Alternative 2. Alternative 2 provides for the containment of residual soil containing COCs above site cleanup levels through installation of the asphalt cap (including a stormwater collection system) and a perimeter buffer zone between residual impacted soil onsite and adjacent properties. This alternative also includes institutional controls, compliance monitoring, and periodic reviews in accordance with the MTCA requirement for alternatives using engineering controls to comply with cleanup standards. This alternative also includes remediation of impacted groundwater beneath the western portion of the site. Future concerns regarding human and ecological exposure to residual impacted soil, shallow groundwater, and surface water will be substantially reduced or eliminated by the containment system and groundwater remediation.

Offsite disposal provides for the shortest time requirement for achieving site soil cleanup levels and offers the greatest degree of certainty that soil cleanup levels in designated areas of the site will be achieved over the long-term. Uncertainties exist regarding the effectiveness of thermal treatment due to high organic and moisture content of the soil. The effectiveness of chemical stabilization is also questionable due to the presence of petroleum hydrocarbons. Addressing these issues would require pre-treatment of soil containing metals and additional material handling. There are also some uncertainties regarding the long-term potential for leaching from chemically stabilized soil.

Alternative 2 involves routine construction activities including excavation, stockpiling, backfilling and compaction, grading, and installation of an asphalt cap. This alternative requires more material handling than Alternative 1 due to the additional excavation along the property boundaries and onsite consolidation; however, significantly less material handling is required for Alternative 2 than Alternative 3.

Alternative 2 is moderately expensive. Alternative 2 is more expensive than Alternative 1 due to the additional excavation areas and material handling. Alternative 2 is less expensive than Alternative 3, which includes two separate treatment processes. The incremental cost associated with the treatment processes in Alternative 3 is considered to be disproportionate to

the incremental degree of protection it would achieve [WAC 173-340-360(5)(vi)] given the uncertainties outlined above.

9.2.7 Additional Field Investigations in Support of the Remedial Design

Additional field investigations may be required in support of the recommended remedial alternative. As indicated, a limited treatability study will be required prior to implementation of the recommended remedial alternative to determine the optimum approach for enhanced biodegradation of impacted groundwater beneath the western portion of the site. The limited treatability study may include the collection of additional groundwater samples from existing site wells for analysis of redox potential, pH, dissolved oxygen, ferrous iron, biochemical oxygen demand, and chemical oxygen demand. The study may also include the installation of additional groundwater monitoring wells to further define the lateral extent of the plume offsite toward the Puyallup River. While additional information appears warranted in some locations of the site, the information developed will not substantially change the proposed remedial alternative. These additional investigations will be presented in a pre-engineering design document that will be prepared upon approval by Ecology of the proposed site cleanup levels and recommended remedial alternative.

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Tables

TABLE 2-1

MONITORING WELL CONSTRUCTION DETAILS
Former Tacoma Metals Facility

Well Designation	Previous Designation[a]	Date of Installation	Casing Diameter/ Construction	Borehole Diameter	ToC Elevation (ft)[b,c]	Total Well Depth (ft)	Length of Screen (ft)	Slot Size (in)
MW-1	MW-1	25-Aug-92	2 inch / PVC	9 inch	12.23	16.5	6	0.010
MW-2	MW-2	25-Aug-92	2 inch / PVC	9 inch	12.04	16.5	6	0.010
MW-3(D)[d]	MW-3	26-Aug-92	2 inch / PVC	9 inch	NA	16.5	6	0.010
MW-4(R)[e]	NMW-2	9-May-00	2 inch / PVC	9 inch	12.55	22.8	17.8	0.010
MW-5	MW-5	27-Aug-92	2 inch / PVC	9 inch	10.9	16.5	6	0.010
MW-6	MW-6	26-Aug-92	2 inch / PVC	9 inch	10.07	16.5	6	0.010
MW-7	MW-7	11-Sep-92	2 inch / PVC	9 inch	9.45	16.5	6	0.010
MW-8(R)[f]	NMW-3	9-May-00	2 inch / PVC	9 inch	11.16	23.6	18.6	0.010
MW-9	NMW-1	9-May-00	2 inch / PVC	9 inch	13.61	23.5	18.5	0.010
MW-10	NMW-4	10-Nov-00	2 inch / PVC	9 inch	9.41	20	12	0.010
MW-11	NMW-5	10-Nov-00	4 inch / PVC	12 inch	9.47	20	14	0.020
MW-12	NMW-6	10-Nov-00	4 inch / PVC	12 inch	10.8	20	12	0.020

Notes:

(a) Wells installed in 2000 by Kennedy/Jenks Consultants were initially designated NMW-# but were subsequently numbered in sequential order with the existing site monitoring wells. The critical NMW-# designations are used in some of the analytical reports for groundwater samples (Appendix L) and for geotechnical soil samples (Appendix F).
(b) ToC elevations are based on a survey performed by Earth Tech on 21 November 2000.
(c) Elevations measured at north side of PVC casing.
(d) MW-3(D) was originally installed on 26 August 1992 by Pacific Groundwater Group. MW-3(D) was demolished (D) by a former Tacoma Metals site tenant.
(e) MW-4(R) was originally installed on 26 August 1992 by Pacific Groundwater Group. MW-4(R) was replaced (R) 9 May 2000 by Kennedy/Jenks Consultants.
(f) MW-8(R) was originally installed on 25 August 1992 by Pacific Groundwater Group. MW-8(R) was replaced (R) 9 May 2000 by Kennedy/Jenks Consultants.

PVC - Polyvinyl chloride (Schedule 40)
ToC - Top of well casing
in - inches
ft - feet

TABLE 3-1

GEOTECHNICAL TESTING RESULTS
Former Tacoma Metals Facility

Boring Identification	Lithology	Sample Depth (ft)	Total Porosity %[a]	Vertical Hydraulic Conductivity (Kv)(cm/s)[a]	TOC %[b]	CEC (meq/100 g)[c]	Total Solids %[d]
MW-4(R)	Medium to fine sand	0.5-1.0	0.53	2.0×10^{-2}	16	4.9	93.1
MW-8(R)	Sandy silt with clay	6-6.5	0.552	8.3×10^{-7}	7.3	26	54.8
MW-9	Fine sand with silt and gravel	10.5-11	0.48	3.2×10^{-5}	0.99	6.5	69.6
MW-9	Medium to fine sand	15-16	0.39	3.8×10^{-3}	0.47	2.4	82.8

Notes:

(a) Geotechnical testing was conducted according to ASTM D-5084.
(b) Soil samples were analyzed for total organic carbon (TOC) by Plumb1981.
(c) Soil samples were analyzed for cation exchange capacity (CEC) by EPA Method 9076.
(d) Soil samples were analyzed for total solids by EPA Method 160.3.

ft - feet
% - percent
cm/s - centimeters per second
meq/100 g - milliequivalent per 100 grams

TABLE 3-2

GROUNDWATER ELEVATION MONITORING SUMMARY
Former Tacoma Metals Facility

Well Number	Top of Well Casing Elevation (ft)[a]	Water Elevation (ft)[a] 1/31/01		Water Elevation (ft)[a] 2/13/01		Water Elevation (ft)[a] 2/28/01	
		High Tide	Low Tide	High Tide	Low Tide	High Tide	Low Tide
MW-1	12.23	1.61	0.95	1.42	0.96	1.45	0.94
MW-2	12.04	1.33	0.26	1.22	0.33	1.24	0.21
MW-4(R)	12.55	2.49	0.98	2.03	1.00	2.31	1.03
MW-5	10.90	2.54	0.71	2.39	0.73	2.38	0.54
MW-6	10.07	2.21	0.55	2.04	0.64	2.05	0.54
MW-7	9.45	2.30	2.27	2.41	2.37	2.09	2.09
MW-8(R)	11.16	2.40	1.31	2.27	1.44	2.20	1.44
MW-9	13.61	1.58	0.74	1.42	1.10	1.44	1.00
MW-10	9.41	2.34	2.25	2.39	2.32	2.12	2.06
MW-11	9.47	2.29	2.23	2.41	2.36	2.09	2.08
MW-12	10.80	2.22	1.78	2.40[b]	1.86[b]	2.16[c]	1.38[c]

Notes:

(a) Vertical elevation in feet relative to mean sea level (MSL) based on a well survey performed by Earth Tech, Inc. on 21 November 2000. Elevations are based on the City of Tacoma datum.

(b) Product present in well on 13 February 2001; measured product elevation 1.91 feet MSL at low tide.

(c) Product present in well on 28 February 2001; measured product elevations 2.69 feet MSL at high tide and 1.79 feet MSL at low tide.

ft - feet

TABLE 3-3

ESTIMATED HORIZONTAL HYDRAULIC CONDUCTIVITY AND GROUNDWATER SEEPAGE VELOCITY FROM SLUG TESTING

Former Tacoma Metals Facility

	Horizontal Hydraulic Conductivity (Kh[a])			Average Horizontal Hydraulic Conductivity ($Kh_{(avg)}$)[b]		Estimated Groundwater Seepage Velocity (V)[c,d,e]
Well #	Test #	(ft/min)	(cm/sec)	(ft/min)	(cm/sec)	(ft/year)
MW-1	1	2.35E-02	1.19E-02			
	2	3.15E-02	1.60E-02			
	3	3.87E-02	1.96E-02			
	4	4.05E-02	2.06E-02			
	5	4.01E-02	2.04E-02	3.4E-02	1.7E-02	147
MW-2	1	2.91E-02	1.48E-02			
	2	3.61E-02	1.83E-02			
	3	3.27E-02	1.66E-02			
	4	3.41E-02	1.73E-02			
	5	3.77E-02	1.91E-02	3.4E-02	1.7E-02	145
MW-5	1	2.78E-03	1.41E-03			
	2	2.22E-03	1.13E-03			
	3	2.13E-03	1.08E-03			
	4	2.34E-03	1.19E-03			
	5	2.48E-03	1.26E-03	2.4E-03	1.2E-03	10
MW-7	1	4.83E-03	2.45E-03			
	2	6.33E-03	3.22E-03			
	3	6.69E-03	3.40E-03			
	4	5.09E-03	2.58E-03			
	5	5.75E-03	2.92E-03	5.7E-03	2.9E-03	24
MW-8(R)	1	1.62E-02	8.21E-03			
	2	1.75E-02	8.90E-03			
	3	2.76E-02	1.40E-02			
	4	2.44E-02	1.24E-02			
	5	3.00E-02	1.52E-02	2.2E-02	1.1E-02	96
MW-9	1	1.89E-02	9.59E-03			
	2	1.44E-02	7.31E-03			
	3	1.90E-02	9.67E-03			
	4	1.44E-02	7.33E-03			
	5	1.74E-02	8.83E-03	1.7E-02	8.5E-03	72
Average Values for All Wells:				**1.3.E-02**	**6.8.E-03**	**82**

Notes:

(a) Graphs of all slug tests are included in Appendix G

(b) Average hydraulic conductivity calculated as geometric mean.

(c) Groundwater seepage velocity (V) = ($Kh_{(avg)}$ * (hydraulic gradient[d] / porosity[d]))

(d) Hydraulic gradient = 0.004; Porosity = 0.49

(e) Estimated seepage velocity does not consider hydraulic gradient reversals caused by tital influences.

TABLE 4-1
SOIL ANALYTICAL RESULTS - METALS
Former Tacoma Metals Facility

Sample Designation	Sample Depth	Sample Date	Total Metals (mg/kg)[a]								
			Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver
TP-1	0-1'	9/27/00	40	290	8.5	76	873	***2,230***	1.53	<10	1.4
	2-3'	9/27/00	---[b]	---	---	---	---	120	0.11	---	---
	4-6'	9/27/00	---	---	---	---	---	90	---	---	---
	6-10'	9/27/00	---	---	---	---	---	30	---	---	---
TP-2	0-1'	9/27/00	<10[c]	404	18.2	67	1,090	831	0.88	<10	0.9
	2-3'	9/27/00	<5	47.2	<0.2	18.6	20	10	0.04	<5	<0.3
	4-6'	9/27/00	<6	58.1	<0.2	15.4	35.2	85	<0.06	<6	0.4
	6-10'	9/27/00	<6	53.8	1.1	18.6	79.6	72	0.13	<6	<0.4
TP-3	0-1'	9/27/00	<5	63.5	2.7	26.9	44.1	46	0.13	<5	<0.3
	2-3'	9/27/00	---	---	---	---	---	---	---	---	---
	4-6'	9/27/00	7	63.8	0.4	15.4	33.2	106	0.21	<7	<0.4
	6-10'	9/27/00	<10	110	<0.5	18	42.4	93	0.13	<10	<0.7
TP-4	0-1'	9/27/00	30	609	21.6	82	4,650	***1,760***	0.55	<10	1.2
	2-3'	9/27/00	---	---	8	---	---	443	---	---	---
	4-6'	9/27/00	---	---	---	---	---	160	---	---	---
	6-10'	9/27/00	<7	60.1	<0.3	16.9	24.6	9	<0.06	<7	<0.4
TP-5	0-1'	10/4/00	<5	59.4	<0.2	59.9	28	8	<0.05	5	0.4
	2-3'	10/4/00	---	---	---	---	---	---	---	---	---
	4-6'	10/4/00	<6	67.7	<0.3	38.2	37.3	56	0.20	<6	<0.4
	6-10'	10/4/00	<10	52.3	<0.5	24	56.1	248	0.3	<10	<0.8
TP-6/600[d]	0-1'	10/4/00	30/30	196/208	5.6/4.9	92/59	711/237	***1,550***/867	0.5/0.45	20/20	1.9/2.1
	2-3'	10/4/00	---	---	---	---	---	54	---	---	---
	4-6'	10/4/00	---	---	---	---	---	40	---	---	---
	6-10'	10/4/00	---	---	---	---	---	60	---	---	---
TP-7	0-1'	10/4/00	10	697	12.3	103	361	796	0.88	8	1.5
	2-3'	10/4/00	---	---	9	---	---	---	---	---	---
	4-6'	10/4/00	---	---	---	---	---	---	---	---	---
	6-10'	10/4/00	---	---	---	---	---	---	---	---	---
TP-8	0-1'	10/4/00	<5	235	0.9	33.9	41	31	<0.05	<5	0.3
	2-3'	10/4/00	---	---	---	---	---	---	---	---	---
TP-8/800	4-6'	10/4/00	<6/<5	38.4/42.1	0.3/<0.2	17.5/15.7	29.6/47.8	25/26	<0.06/<0.05	<6/<5	<0.4/0.7
	6-10'	10/4/00	---	---	---	---	---	---	---	---	---
TP-9	0-1'	10/5/00	40	1,990	59	132	1,260	***1,960***	0.90	<30	<2
	2-3'	10/5/00	---	---	---	---	---	20	---	---	---
	4-6'	10/5/00	<6	224	2.1	24.2	59.9	93	<0.05	<6	<0.4
	6-10'	10/5/00	---	---	---	---	---	---	---	---	---
TP-10	0-1'	10/5/00	<5	218	4.2	49.2	217	460	0.54	7	0.5
	2-3'	10/5/00	---	---	---	---	---	---	---	---	---
	4-6'	10/5/00	<5	61	0.7	32.2	60.3	72	0.07	<5	0.3
	6-10'	10/5/00	<6	49.5	0.4	28.8	29.3	15	<0.06	<6	<0.4
MTCA Method C Industrial Soil Cleanup Levels [e]			219	245,000	3,500	500[f]	130,000	1,000[f]	1,050	17,500	17,500

Analytes detected in samples at concentrations exceeding respective cleanup levels are shown in bold and italics.

TABLE 4-1
SOIL ANALYTICAL RESULTS - METALS
Former Tacoma Metals Facility

Sample Designation	Sample Depth	Sample Date	Total Metals (mg/kg)[a]								
			Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver
TP-11	0-1'	10/5/00	<5	254	5.7	54.4	157	202	0.27	5	0.3
	2-3'	10/5/00	---	---	---	---	---	---	---	---	---
	4-6'	10/5/00	---	---	---	---	---	---	---	---	---
	6-10'	10/5/00	<9	164	<0.3	18.4	31.5	57	0.1	<9	<0.5
TP-12	0-1'	10/5/00	<5	37.5	3.3	19.4	21.3	17	<0.04	<5	<0.3
	2-3'	10/5/00	---	---	---	---	---	---	---	---	---
	4-6'	10/5/00	---	---	---	---	---	---	---	---	---
	6-10'	10/5/00	---	---	---	---	---	---	---	---	---
TP-13	0-1'	10/5/00	<5	96	3	49.3	266	167	0.71	<5	1
	2-3'	10/5/00	---	---	---	---	---	---	---	---	---
	4-6'	10/5/00	---	---	---	---	---	---	---	---	---
	6-10'	10/5/00	---	---	---	---	---	---	---	---	---
TP-14	0-1'	10/6/00	<5	41.8	<0.2	22.2	13	8	<0.05	<5	<0.3
	2-3'	10/6/00	---	---	---	---	---	560	---	---	---
	4-6'	10/6/00	---	---	---	---	---	20	---	---	---
	6-10'	10/6/00	<6	84.9	2.3	35.3	78.6	152	0.07	<6	<0.4
TP-15	0-1'	10/6/00	<5	42.6	<0.2	32.8	29.4	79	<0.04	<5	0.3
	2-3'	10/6/00	---	---	---	---	---	---	---	---	---
	4-6'	10/6/00	---	---	---	---	---	---	---	---	---
	6-10'	10/6/00	---	---	---	---	---	---	---	---	---
TP-16/160	0-1'	10/6/00	40/30	999/592	45/22	105/85	804/1,210	***2,590/2,040***	1.82/2.19	<30/<30	2/2
	2-3'	10/6/00	---	---	68	---	---	***8,240***	---	---	---
TP-17	0-1'	10/6/00	60	272	15	120	2,930	***1,470***	0.4	<50	<3
	2-3'	10/6/00	---	---	---	---	---	30	---	---	---
	4-6'	10/6/00	---	---	---	---	---	30	---	---	---
	6-10'	10/6/00	---	---	---	---	---	20	---	---	---
TP-18	0-1'	10/10/00	8	107	3.3	26.3	451	311	0.88	<5	0.9
	2-3'	10/10/00	---	---	---	---	---	---	---	---	---
	4-6'	10/10/00	---	---	---	---	---	---	---	---	---
	6-10'	10/10/00	---	---	---	---	---	---	---	---	---
TP-19	0-1'	10/10/00	20	111	4	46	1,060	204	1.35	<10	3.4
	2-3'	10/10/00	---	---	---	---	---	---	---	---	---
	4-6'	10/10/00	---	---	---	---	---	---	---	---	---
	6-10'	10/10/00	---	---	---	---	---	---	---	---	---
TP-20	0-1'	10/10/00	<6	35.9	<0.2	22	17.2	6	<0.06	6	<0.3
TP-20/2000[g]	2-3'	10/10/00	20/<10	304/292	17/26.2	84/83	6,970/4,350	***6,790/10,200***	0.94/0.95	<30/<10	<2/2.8
	4-6'	10/10/00	---	---	1	---	---	540	---	---	---
	6-10'	10/10/00	---	---	---	---	---	230	---	---	---
MTCA Method C Industrial Soil Cleanup Levels [e]			219	245,000	3,500	500[f]	130,000	1,000[f]	1,050	17,500	17,500

Analytes detected in samples at concentrations exceeding respective cleanup levels are shown in bold and italics.

TABLE 4-1
SOIL ANALYTICAL RESULTS - METALS
Former Tacoma Metals Facility

Sample Designation	Sample Depth	Sample Date	Total Metals (mg/kg)[a]								
			Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver
TP-21	0-1'	10/10/00	70	1,580	66	***574***	12,800	***6,020***	22.4	<30	31
	2-3'	10/10/00	<300	4,190	130	***1,080***	13,200	***7,570***	10.2	<300	90
	4-6'	10/10/00	---	---	<1	42	---	20	---	---	---
	6-10'	10/10/00	---	---	---	---	---	50	---	---	---
TP-22	0-1'	10/10/00	30	372	51	***2,520***	13,000	***3,180***	5.3	<30	36
	2-3'	10/10/00	<60	464	52	***913***	20,200	***3,690***	5.1	<60	198
	4-6'	10/10/00	---	---	---	47	---	360	---	---	---
	6-10'	10/10/00	---	---	---	---	---	80	---	---	---
TP-23	0-1'	10/11/00	<5	40.4	<0.2	25.1	21.9	11	<0.04	<5	<0.3
	2-3'	10/11/00	30	376	15.3	127	1,560	***1,190***	1.21	<10	1.4
	4-6'	10/11/00	---	---	---	---	---	140	0.19	---	---
	6-10'	10/11/00	---	---	---	---	---	130	---	---	---
TP-24	0-1'	10/11/00	6	105	2.3	34.3	539	438	0.7	6	0.5
	2-3'	10/11/00	---	---	---	---	---	---	---	---	---
	4-6'	10/11/00	---	---	---	---	---	---	---	---	---
	6-10'	10/11/00	---	---	---	---	---	---	---	---	---
TP-25	0-1'	10/11/00	<5	52.5	0.3	28.4	151	48	0.14	<5	<0.3
	2-3'	10/11/00	---	---	---	---	---	---	---	---	---
	4-6'	10/11/00	---	---	---	---	---	---	---	---	---
	6-10'	10/11/00	---	---	---	---	---	---	---	---	---
TP-26	0-1'	10/11/00	<5	47.4	0.3	30.3	21.6	9	<0.05	<5	<0.3
	2-3'	10/11/00	---	---	---	---	---	---	---	---	---
	4-6'	10/11/00	<6	272	0.2	20.8	40.9	17	<0.05	<6	<0.3
	6-10'	10/11/00	<7	80.1	<0.3	17.3	31.1	13	<0.06	<7	<0.4
TP-27/270	0-1'	10/11/00	30/40	261/259	6.8/8.4	99/119	577/806	***5,000/14,700***	1.83/1.62	<10/<10	1.2/1.7
	2-3'	10/11/00	<10	217	6.2	49	3,130	575	1.82	<10	1.3
	4-6'	10/11/00	---	---	---	---	---	---	<0.06	---	---
	6-10'	10/11/00	---	---	---	---	---	---	---	---	---
TP-28	0-1'	10/11/00	20	382	16.5	91	789	***1,430***	1.56	10	1.5
	2-3'	10/11/00	20	444	16.5	88	3,000	***2,340***	1.12	<10	1.8
	4-6'	10/11/00	---	---	<1	---	---	<10	<0.05	---	---
	6-10'	10/11/00	---	---	---	---	---	7	---	---	---
TP-29	0-1'	10/12/00	5	67.9	0.2	29.7	24.6	16	<0.04	<5	<0.3
	2-3'	10/12/00	---	---	---	---	---	---	---	---	---
	4-6'	10/12/00	---	---	---	---	---	---	---	---	---
	6-10'	10/12/00	---	---	---	---	---	---	---	---	---
TP-30	0-1'	10/12/00	30	733	59.5	108	1,960	***2,410***	2.06	<10	2.6
	2-3'	10/12/00	20	805	21.2	90	540	***1,110***	0.57	<10	1.4
	4-6'	10/12/00	---	---	<1	---	---	<10	---	---	---
	6-10'	10/12/00	---	---	---	---	---	50	---	---	---
MTCA Method C Industrial Soil Cleanup Levels[e]			219	245,000	3,500	500[f]	130,000	1,000[f]	1,050	17,500	17,500

Analytes detected in samples at concentrations exceeding respective cleanup levels are shown in bold and italics.

TABLE 4-1
SOIL ANALYTICAL RESULTS - METALS
Former Tacoma Metals Facility

Sample Designation	Sample Depth	Sample Date	Total Metals (mg/kg)[a]								
			Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver
TP-31	0-1'	10/12/00	<10	558	19.3	58	417	***1,040***	0.63	<10	1
	2-3'	10/12/00	<10	189	6.4	40	182	387	0.42	<10	0.7
	4-6'	10/12/00	---	---	---	---	---	---	---	---	---
	6-10'	10/12/00	---	---	---	---	---	---	---	---	---
TP-32	0-1'	10/12/00	30	2,010	84	271	3,720	***4,470***	2.36	<30	3
TP-33	0-1'	10/12/00	40	3,070	89	353	2,970	***6,470***	2.91	<30	5
	2-3'	10/12/00	---	---	---	---	---	***4,560***	1.69	---	---
	4-6'	10/12/00	---	---	---	---	---	10	---	---	---
	6-10'	10/12/00	---	---	---	---	---	70	---	---	---
TP-34/340	0-1'	10/12/00	<10/<30	196/1,740	4/42	65.6/92	4,030/1,640	***1,530/5,100***	0.93/1.23	<10/<30	1.6/<2
	2-3'	10/12/00	30	1,400	52	91	1,570	***3,990***	1.08	<30	<2
	4-6'	10/12/00	---	---	---	---	---	***1,110***	<0.05	---	---
	6-10'	10/12/00	---	---	---	---	---	40	---	---	---
TP-35	0-1'	10/13/00	<10	290	8.4	153	1,260	***4,230***	0.52	<10	2.2
	2-3'	10/13/00	---	---	---	---	---	240	---	---	---
	4-6'	10/13/00	---	---	---	---	---	30	---	---	---
	6-10'	10/13/00	---	---	---	---	---	20	---	---	---
TP-36	0-1'	10/13/00	<10	54.5	0.9	31	39.3	36	0.12	<10	<0.6
	2-3'	10/13/00	---	---	---	---	---	---	---	---	---
	4-6'	10/13/00	---	---	---	---	---	---	---	---	---
	6-10'	10/13/00	<10	31.7	0.5	19	25.3	15	0.06	<10	<0.8
TP-37	0-1'	10/13/00	30	979	26.6	124	625	***1,900***	4.18	10	1.1
	2-3'	10/13/00	20	1,630	24.7	112	483	***1,630***	2.66	<10	<0.6
	4-6'	10/13/00	---	---	<1	---	---	20	<0.05	---	---
	6-10'	10/13/00	---	---	---	---	---	30	---	---	---
TP-38	0-1'	10/13/00	60	2,710	125	263	3,320	***9,380***	14.3	30	6
	2-3'	10/13/00	---	---	---	---	---	70	0.12	---	---
	4-6'	10/13/00	---	---	---	---	---	50	---	---	---
	6-10'	10/13/00	---	---	---	---	---	11	---	---	---
TP-39/390	0-1'	10/13/00	10/<10	110/134	13.2/16.8	30/27	1,100/107	***1,040***/374	0.21/0.24	<10/<10	<0.8/<0.7
	2-3'	10/13/00	---	---	10.4	---	---	---	---	---	---
	4-6'	10/13/00	---	---	---	---	---	---	---	---	---
	6-10'	10/13/00	---	---	---	---	---	---	---	---	---
TP-40	0-1'	10/13/00	60	738	36	***670***	2,530	***3,700***	15	<50	4
	2-3'	10/13/00	<30	851	40	212	1,240	***2,050***	3.19	<30	3
	4-6'	10/13/00	<10	126	3.7	31	94	192	0.22	<10	<0.7
	6-10'	10/13/00	---	---	---	---	---	---	---	---	---
MTCA Method C Industrial Soil Cleanup Levels [e]			219	245,000	3,500	500[f]	130,000	1,000[f]	1,050	17,500	17,500

Analytes detected in samples at concentrations exceeding respective cleanup levels are shown in bold and italics.

TABLE 4-1
SOIL ANALYTICAL RESULTS - METALS
Former Tacoma Metals Facility

Sample Designation	Sample Depth	Sample Date	Total Metals (mg/kg)[a]								
			Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver
TP-41	0-1'	10/16/00	<30	38	<1	39	20	20	5.5	<30	<2
	2-3'	10/16/00	---	---	---	---	---	---	---	---	---
	4-6'	10/16/00	---	---	---	---	---	---	---	---	---
	6-10'	10/16/00	---	---	---	---	---	---	---	---	---
TP-42	0-1'	10/16/00	<30	78	2	31	98	130	4.33	<30	<2
	2-3'	10/16/00	---	---	---	---	---	---	---	---	---
	4-6'	10/16/00	---	---	---	---	---	---	---	---	---
	6-10'	10/16/00	---	---	---	---	---	---	---	---	---
TP-43/430	0-1'	10/16/00	90/80	1,620/1,400	53/54	***564/566***	5,620/5,000	***5,840/9,370***	47/41	<30/<30	5/6
	2-3'	10/16/00	80	1,280	46	259	2,520	***12,300***	21	<30	5
	4-6'	10/16/00	---	---	<1	---	---	10	<0.04	---	---
	6-10'	10/16/00	---	---	---	---	---	70	---	---	---
TP-44	0-1'	10/13/00	<10	27.2	0.4	17.2	21.5	13	<0.05	<10	<0.6
	2-3'	10/13/00	---	---	---	---	---	---	---	---	---
	4-6'	10/13/00	---	---	---	---	---	---	---	---	---
	6-10'	10/13/00	---	---	---	---	---	---	---	---	---
TP-45	0-1'	10/16/00	100	774	30	368	3,560	***4,060***	47	30	7
	2-3'	10/16/00	---	---	15	---	---	950	16	---	---
	4-6'	10/16/00	---	---	---	---	---	180	---	---	---
	6'-10'	10/16/00	---	---	---	---	---	80	---	---	---
TP-46	0-1'	10/16/00	40	302	15	***721***	1,820	***2,100***	10.6	<30	69
	2-3'	10/16/00	---	---	9	104	---	970	2.88	---	---
	4-6'	10/16/00	50	1,910	93	93	1,180	***4,320***	0.83	<30	2
	6'-10'	10/16/00	---	---	---	0.9	---	82	---	---	---
TP-47	0-1'	10/16/00	<30	33	<1	25	13	<10	<0.05	<30	<2
	2-3'	10/16/00	---	---	---	---	---	---	---	---	---
	4-6'	10/16/00	---	---	---	---	---	---	---	---	---
	6'-10'	10/16/00	---	---	---	---	---	---	---	---	---
TP-48	0-1'	10/17/00	40	232	8	52	588	630	0.45	<30	<2
	2-3'	10/17/00	---	---	---	---	---	---	---	---	---
	4-6'	10/17/00	---	---	---	---	---	---	---	---	---
	6'-8.5'	10/17/00	<70	67	<3	18	45	40	<0.1	<70	<4
TP-49	0-1'	10/17/00	<30	71	1	33	78	150	0.13	<30	<2
	2-3'	10/17/00	<30	64	<1	20	20	10	<0.05	<30	<2
	4-6'	10/17/00	<30	78	<1	15	20	150	0.44	<30	<2
	6'-10'	10/17/00	<50	51	<2	23	942	430	0.12	<50	<3
MTCA Method C Industrial Soil Cleanup Levels [e]			219	245,000	3,500	500[f]	130,000	1,000[f]	1,050	17,500	17,500

Analytes detected in samples at concentrations exceeding respective cleanup levels are shown in bold and italics.

TABLE 4-1
SOIL ANALYTICAL RESULTS - METALS
Former Tacoma Metals Facility

Sample Designation	Sample Depth	Sample Date	Total Metals (mg/kg)[a]								
			Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver
TP-50/500	0-1'	10/17/00	<30/<30	208/293	8/18	37/55	1,100/530	380/570	0.49/0.61	<30/<30	<2/<2
	2-3'	10/17/00	<30	69	<1	44	29	150	<0.05	<30	<2
	4-6'	10/17/00	---	---	---	---	---	---	---	---	---
	6'-10'	10/17/00	---	---	---	---	---	---	---	---	---
TP-51	0-1'	11/14/00	<30	73	<1	34	61	100	0.05	<30	<2
	2-3'	11/14/00	---	---	---	---	---	---	---	---	---
	4-6'	11/14/00	---	---	---	---	---	---	---	---	---
	6'-10'	11/14/00	---	---	---	---	---	---	---	---	---
TP-52	0-1'	11/14/00	<20	50	<1.0	27	38.2	38	0.06	<20	<1
	2-3'	11/14/00	---	---	---	---	---	---	---	---	---
	4-6'	11/14/00	---	---	---	---	---	---	---	---	---
	6'-10'	11/14/00	---	---	---	---	---	---	---	---	---
TP-53	0-1'	11/14/00	<30	63	<1	31	40	20	0.05	<30	<2
	2-3'	11/14/00	---	---	---	---	---	---	---	---	---
	4-6'	11/14/00	---	---	---	---	---	---	---	---	---
	6'-10'	11/14/00	---	---	---	---	---	---	---	---	---
TP-54	0-1'	11/14/00	<30	242	8	48	273	410	0.98	<30	<2
	2-3'	11/14/00	---	---	---	---	---	---	---	---	---
	4-6'	11/14/00	---	---	---	---	---	---	---	---	---
	6'-10'	11/14/00	---	---	---	---	---	---	---	---	---
TP-55	0-1'	11/14/00	<30	1,080	29	117	465	***1,750***	0.83	<30	<2
	2-3'	11/14/00	---	---	21.1	---	---	772	---	---	---
	4-6'	11/14/00	---	---	---	---	---	106	---	---	---
	6'-10'	11/14/00	---	---	---	---	---	70	---	---	---
TP-56	0-1'	11/14/00	<30	63	2	31	88	70	0.12	<30	<2
	2-3'	11/14/00	---	---	---	---	---	---	---	---	---
	4-6'	11/14/00	---	---	---	---	---	---	---	---	---
	6'-10'	11/14/00	---	---	---	---	---	---	---	---	---
TP-57	0-1'	11/14/00	60	2,740	70	145	7,410	***2,710***	0.6	40	<2
	2-3'	11/14/00	---	---	1.7	---	---	28	---	---	---
	4-6'	11/14/00	---	---	---	---	---	80	---	---	---
	6'-10'	11/14/00	---	---	---	---	---	23	---	---	---
TP-58	0-1'	11/15/00	<30	45	<1	29	21	<10	0.06	<30	<2
	2-3'	11/15/00	<30	602	17	105	2,070	***2,340***	62	<30	<2
	4-6'	11/15/00	---	---	<0.5	---	---	9	---	---	---
	6'-10'	11/15/00	---	---	---	---	---	70	---	---	---
TP-59	0-1'	11/15/00	40	871	34	173	3,010	***2,250***	1.55	<30	2
	2-3'	11/15/00	<30	194	9	35	388	350	0.22	<30	<2
	4-6'	11/15/00	---	---	---	---	---	---	---	---	---
	6-10'	11/15/00	---	---	---	---	---	---	---	---	---
MTCA Method C Industrial Soil Cleanup Levels [e]			219	245,000	3,500	500[f]	130,000	1,000[f]	1,050	17,500	17,500

Analytes detected in samples at concentrations exceeding respective cleanup levels are shown in bold and italics.

TABLE 4-1
SOIL ANALYTICAL RESULTS - METALS
Former Tacoma Metals Facility

Sample Designation	Sample Depth	Sample Date	Total Metals (mg/kg)[a]								
			Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver
TP-60	0-1'	11/15/00	50	1,050	30	225	2,330	***10,800***	77	40	2
	2-3'	11/15/00	<30	1,410	20	99	773	***3,260***	1.41	<30	<2
	4-6'	11/15/00	---	---	0.9	---	---	116	0.08	---	---
	6-10'	11/15/00	---	---	---	---	---	49	---	---	---
TP-61	0-1'	11/15/00	<30	377	10	53	356	***4,180***	0.76	<30	<2
	2-3'	11/15/00	<30	352	1	25	40	80	0.23	<30	<2
	4-6'	11/15/00	---	---	---	---	---	---	---	---	---
	6-10'	11/15/00	---	---	---	---	---	---	---	---	---
TP-62	0-1'	11/15/00	<30	201	5	72	208	420	0.92	<30	2
	2-3'	11/15/00	<30	265	11	283	407	800	2.05	<30	<2
	4-6'	11/15/00	---	---	<0.5	---	---	---	<0.04	---	---
	6-10'	11/15/00	---	---	---	---	---	---	---	---	---
TP-63	0-1'	11/15/00	<30	584	38	61	304	700	0.37	<30	<2
	2-3'	11/15/00	<30	637	50	64	299	***1,800***	0.24	30	<2
	4-6'	11/15/00	---	---	0.7	---	---	123	---	---	---
	6-10'	11/15/00	---	---	---	---	---	102	---	---	---
TP-64	0-1'	11/15/00	<30	163	5	31	459	450	0.98	<30	<2
	2-3'	11/15/00	---	---	---	---	---	---	---	---	---
	4-6'	11/15/00	---	---	---	---	---	---	---	---	---
	6-10'	11/15/00	---	---	---	---	---	---	---	---	---
TP-65	0-1'	11/15/00	<30	58	<1	28	19	<10	0.05	<30	<2
	2-3'	11/15/00	---	---	---	---	---	---	---	---	---
	4-6'	11/15/00	---	---	---	---	---	---	---	---	---
	6-10'	11/15/00	---	---	---	---	---	---	---	---	---
MTCA Method C Industrial Soil Cleanup Levels[e]			219	245,000	3,500	500[f]	130,000	1,000[f]	1,050	17,500	17,500

Analytes detected in samples at concentrations exceeding respective cleanup levels are shown in bold and italics.

Notes
(a) Soil samples were analyzed for total metals by EPA Methods 6010/7000 series.
(b) "---" Sample not tested for selected analyte.
(c) "<" denotes analyte was not detected at the indicated reporting limit.
(d) Second number signifies analysis of duplicate sample.
(e) MTCA Method C industrial soil cleanup levels are based on CLARC II, dated February 1996.
(f) Method A industrial soil cleanup levels (WAC 173-340-745) used where Method C soil industrial cleanup levels are not available.
(g) TP-20/2000-2-3 was re-analyzed for lead and arsenic due to suspected sample homogeneity issues. (The re-analysis result is presented in this table).

mg/kg - milligrams per kilogram

TABLE 4-2
SOIL ANALYTICAL RESULTS - PCBs
Former Tacoma Metals Facility

Sample Designation	Sample Depth	PCBs (mg/kg)[a]							Total PCBs[b]
		Aroclor 1016	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1221	Aroclor 1232	
TP-1	0-1'	<0.036[c]	<0.036	<0.036	0.64	0.50	<0.073	<0.036	1.25
TP-3	0-1'	<0.035	<0.035	<0.035	0.17	0.061	<0.070	<0.035	0.336
TP-4	0-1'	<0.037	<0.037	1.1	4.7	2.4	<0.073	<0.037	8.3
	2-3'	<0.035	<0.035	0.390	1.4	0.970	<0.071	<0.035	2.85
TP-5	0-1'	<0.036	<0.036	<0.036	<0.036	<0.036	<0.073	<0.036	0.145
TP-6	0-1'	<0.036	<0.036	0.110	0.360	0.300	<0.073	<0.036	0.86
	2-3'	<0.035	<0.035	0.018J	0.050	0.028J	<0.069	<0.035	0.183
TP-7	0-1'	<0.370	<0.370	4.3	7.7	2.7	<0.740	<0.370	0.186
	2-3'	<0.036	<0.036	2.1	5.2	1.9	<0.071	<0.036	9.28
TP-9	0-1'	<0.040	0.53	<0.040	0.87	1.1	<0.081	<0.040	2.6
TP-10	0-1'	<0.037	<0.037	0.56	0.65	0.29	<0.073	<0.037	1.6
	2-3'	<0.037	<0.037	<0.037	0.045	<0.037	<0.074	<0.037	0.17
TP-11	0-1'	<0.036	<0.036	0.52	1.5Y	1.1	<0.073	<0.036	3.21
TP-12	0-1'	<0.035	<0.035	0.031J	0.063	0.030J	<0.069	<0.035	0.211
	2-3'	<0.034	<0.034	0.150	0.430	0.170	<0.068	<0.034	0.835
TP-13	0-1'	<0.034	<0.034	<0.034	1	2	<0.069	<0.034	3.1
TP-14	0-1'	<0.034	<0.034	<0.034	<0.034	<0.034	<0.069	<0.034	0.14
	2-3'	<0.037	<0.037	0.098Y	0.60	0.26	<0.073	<0.037	1.05
TP-15	0-1'	<0.035	<0.035	<0.035	0.043	0.058	<0.070	<0.035	0.206
TP-16/160[d]	0-1'	<1.1/<0.040	<1.1/<0.040	1.0J/0.39	3.1/1.9	4.6/2.7	<2.3/<0.080	<1.1/<0.040	11.5/5.09
TP-17	0-1'	<0.035	<0.035	0.43	0.67	1.6	<0.071	<0.035	2.79
TP-19	0-1'	<0.038	<0.038	<0.038	0.057	0.060	<0.076	<0.038	0.231
TP-20	0-1'	<0.035	<0.035	<0.035	0.020J	0.023J	<0.070	<0.035	0.148
	2-3'	<0.036	<0.036	0.180Y	0.970	0.320	<0.072	<0.036	1.56
TP-21	0-1'	<0.041	<0.041	1.4	6.9	5.2	<0.082	<0.041	13.6
	2-3'	<0.040	0.088	<0.040	2.3	1.1	<0.080	<0.040	3.6
TP-22	0-1'	<0.042	<0.042	0.43Y	1.4	0.66	<0.083	<0.042	2.59
	2-3'	<0.041	<0.041	0.520Y	1.3	0.990	<0.083	<0.041	2.91
TP-23	0-1'	<0.035	<0.035	<0.035	0.019J	0.020J	<0.070	<0.035	0.144
TP-25	0-1'	<0.036	<0.036	0.042	0.043	0.048	<0.072	<0.036	0.223
TP-27/270[d]	0-1'	<0.038/<0.039	<0.038/<0.039	0.14/0.14	0.53/0.49	0.94/0.93	<0.077/<0.077	<0.038/<0.039	1.7/1.66
TP-29	0-1'	<0.036	<0036	<0.036	<0.036	0.024J	<0.071	<0.036	0.15
TP-31	0-1'	<0.037	<0.037	0.15	0.71	0.76	<0.074	<0.037	1.71
TP-33	0-1'	<0.037	<0.037	0.52	1.7	1.2	<0.075	<0.037	3.51
TP-34[e]	0-1'	<0.040	<0.040	0.12	0.57	0.5	<0.080	<0.040	1.3
	2-3'	<0.041	<0.041	0.11	0.51	0.40	<0.081	<0.041	1.12
TP-35	0-1'	<0.036	<0.036	<0.036	0.21	0.30	<0.073	<0.036	0.619
TP-36	0-1'	<0.037	<0.037	0.031J	0.056	0.060	<0.074	<0.037	0.24
TP-37	0-1'	<0.037	<0.037	0.46	1.5	1.3	<0.074	<0.037	3.35
TP-39/390[d]	0-1'	<0.035/<0.042	<0.035<0.042	<0.035<0.042	2.7/1.5	<0.035/<0.042	<0.069/<0.084	<0.035/<0.042	2.82/1.65
TP-40	0-1'	<0.038	<0.038	3.7Y	18	6	<0.077	<0.038	***27.8***
	2-3'	<0.038	<0.038	0.600Y	3.2	1.7	<0.076	<0.038	5.6
MTCA Method C Industrial Soil Cleanup Levels[f]		NA[g]	NA	NA	NA	NA	NA	NA	**17**

Analytes detected in samples at concentrations exceeding cleanup levels or comparison values are shown in bold and italics.

TABLE 4-2
SOIL ANALYTICAL RESULTS - PCBs
Former Tacoma Metals Facility

Sample Designation	Sample Depth	PCBs (mg/kg)[a]							Total PCBs[b]
		Aroclor 1016	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1221	Aroclor 1232	
TP-41	0-1'	<0.035	<0.035	<0.035	0.049	0.021J	<0.070	<0.035	0.175
TP-43/430[d]	0-1'	<0.48/<0.46	<0.48/<0.46	2.6Y/2.2Y	14/11	6.8/5.8	<0.95/<0.92	<0.48/<0.46	***23.9/20.2***
	2-3'	<0.47	<0.47	1.9Y	8.1	8.6	<0.93	<0.47	***19.8***
	4-6'	<0.036	<0.036	<0.036	0.036J	<0.036	<0.072	<0.036	0.162
TP-44	0-1'	<0.035	<0.035	<0.035	<0.035	<0.035	<0.070	<0.035	0.14
TP-45	0-1'	<0.46	<0.46	1.9Y	12	9.5	<0.92	<0.46	***24.6***
	2-3'	<0.88	<0.88	<0.88	7	4.6	<1.8	<0.88	14.26
TP-46	0-1'	<0.036	<0.036	0.90Y	8.3	4.3	<0.073	<0.036	13.6
	2-3'	<0.038	<0.038	<0.038	0.051	<0.038	<0.076	<0.038	0.184
TP-47	0-1'	<0.037	<0.037	<0.037	<0.037	<0.037	<0.075	<0.037	0.149
TP-49	0-1'	<0.035	<0.035	<0.035	0.190	0.130	<0.070	<0.035	0.425
TP-50	0-1'	<0.036	<0.036	0.87	5.3	1.3	<0.071	<0.036	7.6
	2-3'	<0.037	<0.037	<0.037	0.036J	<0.037	<0.073	<0.037	0.165
TP-51	0-1'	<0.036	<0.036	0.043	0.14	0.14	<0.072	<0.036	0.413
TP-53	0-1'	<0.035	<0.035	<0.035	0.054	0.046	<0.070	<0.035	0.205
TP-55	0-1'	<0.036	<0.036	0.83	3	1.5	<0.073	<0.036	5.42
TP-57	0-1'	0.71Y	<0.041	1.4	1.2	0.29	<0.082	<0.041	3.68
TP-59	0-1'	<0.038	<0.038	13	9.8	2.1	<0.076	<0.038	***25***
	2-3'	<0.036	<0.036	0.38	0.55	0.20	<0.072	<0.036	1.22
TP-60	0-1'	<0.93	<0.93	<0.93	29	8.3	<1.9	<0.93	***40.11***
	2-3'	<0.045	<0.045	0.12Y	1.1	0.58	<0.090	<0.045	1.913
TP-61	0-1'	<0.036	<0.036	0.71	1.9	0.83	<0.072	<0.036	3.53
TP-63	0-1'	<0.036	<0.036	0.33Y	2.6	0.35	<0.072	<0.036	3.37
TP-65	0-1'	<0.036	<0.036	<0.036	0.020J	<0.036	<0.071	<0.036	0.146
MTCA Method C Industrial Soil Cleanup Level[f]		NA[g]	NA	NA	NA	NA	NA	NA	**17**

Analytes detected in samples at concentrations exceeding cleanup levels or comparison values are shown in bold and italics.

Notes:
(a) Samples were analyzed for polychlorinated biphenyls (PCBs) by EPA Method 8082.
(b) The total PCBs were calculated by summing the concentrations of all the probable PCBs. If a probable PCB was not detected, a value equal to one-half the reporting limit was used.
(c) "<" denotes analyte was not detected at the indicated reporting limit.
(d) Duplicate sample.
(e) Analytical report reads TP-34 as TP-340.
(f) MTCA Method C industrial soil cleanup levels based on CLARC II, dated February 1996.
(g) "NA" = No cleanup level available.

Qualifiers:
J - Indicates as estimated value of analyte found and confirmed by analyst but with low spectral match.
Y - Indicates raised reporting limit due to background interference.

mg/kg - milligrams per kilogram

TABLE 4-4

SOIL ANALYTICAL RESULTS - TPHs AND VOCs
Former Tacoma Metals Facility

			TPHs (mg/kg)[a]		Volatile Organic Compounds (µg/kg)[b]																				
Sample Designation	Sample Depth (ft)	Collection Date	TPH-Diesel	TPH-motor oil	Benzene	Toluene	Ethyl-benzene	Total[c] Xylenes	Acetone	1,1-Di-chloro-ethene	1,1-Di-chloro-ethane	Cis-1,2-di-chloro-ethene	Chloro-form	2-Butanone	1,1,1-Tri-chloro-ethane	Trichloro-ethene	Tetrachloro-ethene	1,1,2-Tri-chloro-fluoroethane	1,3,5-Tri-methyl-benzene	1,2,4-Tri-methyl-benzene	Hexa-chlorobut-adiene	4-Isopropyl-toluene	Styrene	Naphthalene	Isopropy-benzene
TP-59	0-1'	11/15/00	520B	1,200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	11/15/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	11/15/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	11/15/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-60	0-1'	11/15/00	980B	1,700	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	11/15/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	11/15/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	11/15/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-61	0-1'	11/15/00	***3,700B***	1,900	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	11/15/00	***8,500B***	***2,300***	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	11/15/00	120	87	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	11/15/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-62	0-1'	11/15/00	320B	910	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	11/15/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	11/15/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	11/15/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-63	0-1'	11/15/00	340B	1,100	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	11/15/00	860B	***2,100***	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	11/15/00	240	640	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	11/15/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-64	0-1'	11/15/00	150B	330	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	11/15/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	11/15/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	11/15/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-65	0-1'	11/15/00	<5.3	<11	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	11/15/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	11/15/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	11/15/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MTCA Method C Industrial[g] Soil Cleanup Levels			2,000[h]	2,000[h]	4.53E+06	7.00E+08	3.50E+08	7.00E+09	3.50E+08	2.19E+05	3.50E+08	3.50E+07	2.15E+07	NA[i]	3.15E+09	1.19E+04	2.57E+06	NA	NA	NA	7.00E+05	NA	4.38E+06	1.40E+05	NA

Analytes detected in samples at concentrations exceeding cleanup levels or comparison values are shown in bold and italics.

Notes:

(a) Total diesel- and motor oil-range hydrocarbons were analyzed by Ecology Method NWTPH-Diesel (Extended).
(b) Samples were analyzed for volatile organic compounds (VOCs) by EPA Method 8260.
(c) Total xylenes were calculated by summing the concentrations of m,p- and o-xylene isomers.
(d) "---" = Sample not tested for selected analyte.
(e) "<" denotes analyte was not detected at the indicated reporting limit.
(f) Duplicate sample.
(g) MTCA Method C industrial soil cleanup levels are based on CLARC II, dated February 1996.
(h) MTCA Method A industrial soil cleanup levels used where Method C industrial soil cleanup levels are not available. MTCA Method A cleanup level based on amended MTCA cleanup regulation (WAC-173-340-745) anticipated by Ecology to become effective August 2001.
(i) "NA" = No cleanup level is available.

Qualifiers:

J - Indicates an estimated value below the calculated detection limit.
B - Indicates compound also detected in method blank.

mg/kg - milligrams per kilogram
µg/kg - micrograms per kilogram

TABLE 4-4

SOIL ANALYTICAL RESULTS - TPHs AND VOCs
Former Tacoma Metals Facility

			TPHs (mg/kg)[a]		Volatile Organic Compounds (µg/kg)[b]																				
Sample Designation	Sample Depth (ft)	Collection Date	TPH-Diesel	TPH-motor oil	Benzene	Toluene	Ethyl-benzene	Total[c] Xylenes	Acetone	1,1-Di-chloro-ethene	1,1-Di-chloro-ethane	Cis-1,2-di-chloro-ethene	Chloro-form	2-Butanone	1,1,1-Tri-chloro-ethane	Trichloro-ethene	Tetrachloro-ethene	1,1,2-Tri-chloro-fluoroethane	1,3,5-Tri-methyl-benzene	1,2,4-Tri-methyl-benzene	Hexa-chlorobut-adiene	4-Isopropyl-toluene	Styrene	Naphthalene	Isopropy-benzene
TP-48	0-1'	10/17/00	130	290	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2-3'	10/17/00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	4-6'	10/17/00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	6-8.5'	10/17/00	630	870	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TP-49	0-1'	10/17/00	220	1,500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2-3'	10/17/00	29	50	<1.1	3.7	<1.1	<2.2	<5.7	<1.1	<1.1	<1.1	<1.1	<5.7	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<5.7	<1.1	<1.1	<5.7	<1.1
	4-6'	10/17/00	***11,000***	***4,000***	<9.0	1,600	27	78	510	<9.0	<9.0	<9.0	<9.0	120	<9.0	<9.0	<9.0	<9.0	580	950	<45	200	<7.8	16,000	17
	6-10'	10/17/00	***14,000***	***2,900***	<22	270	24	142	530	<22	<22	<22	<22	120	<22	<22	<22	<22	490	820	<110	250	<22	8,800	39
TP-50/500[f]	0-1'	10/17/00	90/110	190/230	1.2/1 3	430/610	<1.1/<1.1	<2.2/<2.2	90/94	<1.1/<1.1	<1.1/<1.1	<1.1/<1.1	<1.1/<1.1	12/12	<1.1/<1.1	<1.1/<1.1	<1.1/<1.1	<1.1/<1.1	<1.1/<1.1	<1.1/<1.1	<5.4/<5.7	<1.1/<1.1	<1.1/<1.1	<5.4/<5.7	<1.1/<1.1
	2-3'	10/17/00	39	54	<10	270	<1.1	<2.2	49	<1.1	<1.1	<1.1	<1.1	<5.6	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<5.6	<1.1	<1.1	<5.6	<1.1
	4-6'	10/17/00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	6-10'	10/17/00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TP-51	0-1'	11/14/00	35B	100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2-3'	11/14/00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	4-6'	11/14/00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	6-8'	11/14/00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TP-52	0-1'	11/14/00	86B	440	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2-3'	11/14/00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	4-6'	11/14/00	240	140	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	6-10'	11/14/00	730	870	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TP-53	0-1'	11/14/00	690B	700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2-3'	11/14/00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	4-6'	11/14/00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	6-10'	11/14/00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TP-54	0-1'	11/14/00	160B	310	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2-3'	11/14/00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	4-6'	11/14/00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	6-10'	11/14/00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TP-55	0-1'	11/14/00	1,700B	***6,300***	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2-3'	11/14/00	***2,000***	***8,000***	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	4-6'	11/14/00	1,700	***6,500***	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	6-10'	11/14/00	***2,400***	***12,000***	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TP-56	0-1'	11/14/00	16B	54	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2-3'	11/14/00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	4-6'	11/14/00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	6-10'	11/14/00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TP-57	0-1'	11/14/00	***2,200B***	***4,700***	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2-3'	11/14/00	66	98	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	4-6'	11/14/00	170	200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	6-10'	11/14/00	88	350	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TP-58	0-1'	11/15/00	11B	<10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2-3'	11/15/00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	4-6'	11/15/00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	6-10'	11/15/00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MTCA Method C Industrial[g] Soil Cleanup Levels			2,000[h]	2,000[h]	4.53E+06	7.00E+08	3.50E+08	7.00E+09	3.50E+08	2.19E+05	3.50E+08	3.50E+07	2.15E+07	NA[i]	3.15E+09	1.19E+04	2.57E+06	NA	NA	NA	7.00E+05	NA	4.38E+06	1.40E+05	NA

Analytes detected in samples at concentrations exceeding cleanup levels or comparison values are shown in bold and italics.

TABLE 4-4

SOIL ANALYTICAL RESULTS - TPHs AND VOCs
Former Tacoma Metals Facility

			TPHs (mg/kg)[a]		Volatile Organic Compounds (µg/kg)[b]																				
Sample Designation	Sample Depth (ft)	Collection Date	TPH-Diesel	TPH-motor oil	Benzene	Toluene	Ethyl-benzene	Total[c] Xylenes	Acetone	1,1-Di-chloro-ethene	1,1-Di-chloro-ethane	Cis-1,2-di-chloro-ethene	Chloro-form	2-Butanone	1,1,1-Tri-chloro-ethane	Trichloro-ethene	Tetrachloro-ethene	1,1,2-Tri-chloro-fluoroethane	1,3,5-Tri-methyl-benzene	1,2,4-Tri-methyl-benzene	Hexa-chlorobut-adiene	4-Isopropyl-toluene	Styrene	Naphthalene	Isopropy-benzene
TP-37	0-1'	10/13/00	810	***2,100***	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/13/00	970	***2,800***	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/13/00	60	84	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/13/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-38	0-1'	10/13/00	1,400	***2,700***	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/13/00	68	88	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/13/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/13/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-39/390[f]	0-1'	10/13/00	81/83	340/350	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/13/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/13/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/13/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-40	0-1'	10/13/00	1,100	***2,300***	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/13/00	670	1,600	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/13/00	100	230	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/13/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-41	0-1'	10/13/00	<5.2	16	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/13/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/13/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/13/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-42	0-1'	10/13/00	42	130	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/13/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/13/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/13/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-43/430[f]	0-1'	10/13/00	1,000/1,000	***2,500/2,800***	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/13/00	1,500	***3,400***	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/13/00	<5.3	<11	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/13/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-44	0-1'	10/13/00	19	28	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/13/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/13/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/13/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-45	0-1'	10/16/00	450	1,100	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/16/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/16/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/16/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-46	0-1'	10/16/00	140	450	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/16/00	170	510	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/16/00	1,000	***2,700***	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/16/00	45	150	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-47	0-1'	10/16/00	6.2	<11	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/16/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/16/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/16/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MTCA Method C Industrial[g] Soil Cleanup Levels			2,000[h]	2,000[h]	4.53E+06	7.00E+08	3.50E+08	7.00E+09	3.50E+08	2.19E+05	3.50E+08	3.50E+07	2.15E+07	NA[i]	3.15E+09	1.19E+04	2.57E+06	NA	NA	NA	7.00E+05	NA	4.38E+06	1.40E+05	NA

Analytes detected in samples at concentrations exceeding cleanup levels or comparison values are shown in bold and italics.

TABLE 4-4

SOIL ANALYTICAL RESULTS - TPHs AND VOCs
Former Tacoma Metals Facility

			TPHs (mg/kg)[a]		Volatile Organic Compounds (µg/kg)[b]																				
Sample Designation	Sample Depth (ft)	Collection Date	TPH-Diesel	TPH-motor oil	Benzene	Toluene	Ethyl-benzene	Total[c] Xylenes	Acetone	1,1-Di-chloro-ethene	1,1-Di-chloro-ethane	Cis-1,2-di-chloro-ethene	Chloro-form	2-Butanone	1,1,1-Tri-chloro-ethane	Trichloro-ethene	Tetrachloro-ethene	1,1,2-Tri-chloro-fluoroethane	1,3,5-Tri-methyl-benzene	1,2,4-Tri-methyl-benzene	Hexa-chlorobut-adiene	4-Isopropyl-toluene	Styrene	Naphthalene	Isopropy-benzene
TP-25	0-1'	10/11/00	58	380	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/11/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/11/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/11/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-26	0-1'	10/11/00	6.4	15	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/11/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/11/00	120	470	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/11/00	26	78	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-27/270[f]	0-1'	10/11/00	610/670	***2,000/2,200***	<5.7/<5.0	320/270	<5.7/<5.0	<11.4/<10	<28/<25	<5.7/<5.0	<5.7/<5.0	<5.7/<5.0	<5.7/<5.0	<28/<25	<5.7/<5.0	<5.7/<5.0	<5.7/<5.0	<5.7/<5.0	<5.7/<5.0	<5.7/<5.0	<28/<25	<5.7/<5.0	<5.7/<5.0	<28/<25	<5.7/<5.0
	2-3'	10/11/00	120	430	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/11/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/11/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-28	0-1'	10/11/00	190	940	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/11/00	930	1,000	<5.5	150	<5.5	<11	<28	<5.5	<5.5	<5.5	<5.5	<28	<5.5	<5.5	<5.5	<5.5	<5.5	<5.5	<28	<5.5	<5.5	<28	<5.5
	4-6'	10/11/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/11/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-29	0-1'	10/12/00	39	320	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/12/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/12/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/12/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-30	0-1'	10/12/00	330	1,800	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/12/00	700	***2,500***	<4.8	640	<4.8	16.4	130	<4.8	<4.8	<4.8	<4.8	<24	<4.8	<4.8	<4.8	<4.8	150	180	<24	<4.8	<4.8	<24	35
	4-6'	10/12/00	8.5	15	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/12/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-31	0-1'	10/12/00	490	1,300	<4.7	640	<4.7	<9.4	92	<4.7	<4.7	<4.7	<4.7	<23	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<23	7.6	<4.7	<23	<4.7
	2-3'	10/12/00	290	610	<5.5	170	<5.5	6.6	76	<5.5	<5.5	<5.5	<5.5	<27	<5.5	<5.5	<5.5	<5.5	14	22	<27	<5.5	<5.5	<27	<5.5
	4-6'	10/12/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/12/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-32	0-1'	10/12/00	450	1,700	<5.1	780	<5.1	13.7	300	<5.1	<5.1	<5.1	<5.1	45	<5.1	<5.1	<5.1	<5.1	9	12	<25	<5.1	<5.1	<25	<5.1
TP-33	0-1'	10/12/00	970	***2,000***	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/12/00	420	1,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/12/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/12/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-34/340[f]	0-1'	10/12/00	350/460	1,100/1,400	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/12/00	710	***2,600***	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/12/00	59	160	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/12/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-35	0-1'	10/13/00	190	350	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/13/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/13/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/13/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-36	0-1'	10/13/00	15	56	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/13/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/13/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/13/00	280	220	<4.3	84	3.0J	<8.6	30B	<4.3	<4.3	<4.3	<4.3	<22	<4.3	<4.3	<4.3	<4.3	10	6.2	<22	7.4	<4.3	150	2.2J
MTCA Method C Industrial[g] Soil Cleanup Levels			2,000[h]	2,000[h]	4.53E+06	7.00E+08	3.50E+08	7.00E+09	3.50E+08	2.19E+05	3.50E+08	3.50E+07	2.15E+07	NA[i]	3.15E+09	1.19E+04	2.57E+06	NA	NA	NA	7.00E+05	NA	4.38E+06	1.40E+05	NA

Analytes detected in samples at concentrations exceeding cleanup levels or comparison values are shown in bold and italics.

TABLE 4-4

SOIL ANALYTICAL RESULTS - TPHs AND VOCs
Former Tacoma Metals Facility

			TPHs (mg/kg)[a]		Volatile Organic Compounds (µg/kg)[b]																				
Sample Designation	Sample Depth (ft)	Collection Date	TPH-Diesel	TPH-motor oil	Benzene	Toluene	Ethyl-benzene	Total[c] Xylenes	Acetone	1,1-Di-chloro-ethene	1,1-Di-chloro-ethane	Cis-1,2-di-chloro-ethene	Chloro-form	2-Butanone	1,1,1-Tri-chloro-ethane	Trichloro-ethene	Tetrachloro-ethene	1,1,2-Tri-chloro-fluoroethane	1,3,5-Tri-methyl-benzene	1,2,4-Tri-methyl-benzene	Hexa-chlorobut-adiene	4-Isopropyl-toluene	Styrene	Naphthalene	Isopropy-benzene
TP-13	0-1'	10/5/00	27	59	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/5/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/5/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/5/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-14	0-1'	10/6/00	<5.2	15	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/6/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/6/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/6/00	48	110	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-15	0-1'	10/6/00	13	30	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/6/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/6/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/6/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-16/160[f]	0-1'	10/6/00	***2,600***/300	***2,500***/890	<9.9/<9.1	720/380	15/<9.1	20/<9.1	140B/<45	<9.9/<9.1	<9.9/<9.1	<9.9/<9.1	<9.9/<9.1	<49/<45	<9.9/<9.1	<9.9/<9.1	<9.9/<9.1	<9.9/<9.1	83/<9.1	90/<9.1	<49/<45	44/<9.1	<9.9/<9.1	400Y/<45	<9.9/<9.1
	2-3'	10/6/00	940	1,400	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-17	0-1'	10/6/00	300	1,200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/6/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/6/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/6/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-18	0-1'	10/10/00	55	160	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/10/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/10/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/10/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-19	0-1'	10/10/00	75	220	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/10/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/10/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/10/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-20	0-1'	10/10/00	<5.2	<10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-20/2000[f]	2-3'	10/10/00	130/140	380/410	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/10/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/10/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-21	0-1'	10/10/00	200	660	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/10/00	100	240	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/10/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/10/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-22	0-1'	10/10/00	60	250	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/10/00	48	170	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/10/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/10/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-23	0-1'	10/11/00	<5.2	17	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/11/00	260	970	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/11/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/11/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-24	0-1'	10/11/00	28	130	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/11/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/11/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/11/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MTCA Method C Industrial[g] Soil Cleanup Levels			2,000[h]	2,000[h]	4.53E+06	7.00E+08	3.50E+08	7.00E+09	3.50E+08	2.19E+05	3.50E+08	3.50E+07	2.15E+07	NA[i]	3.15E+09	1.19E+04	2.57E+06	NA	NA	NA	7.00E+05	NA	4.38E+06	1.40E+05	NA

Analytes detected in samples at concentrations exceeding cleanup levels or comparison values are shown in bold and italics.

TABLE 4-4

SOIL ANALYTICAL RESULTS - TPHs AND VOCs
Former Tacoma Metals Facility

			TPHs (mg/kg)[a]		Volatile Organic Compounds (µg/kg)[b]																				
Sample Designation	Sample Depth (ft)	Collection Date	TPH-Diesel	TPH-motor oil	Benzene	Toluene	Ethyl-benzene	Total[c] Xylenes	Acetone	1,1-Di-chloro-ethene	1,1-Di-chloro-ethane	Cis-1,2-di-chloro-ethene	Chloro-form	2-Butanone	1,1,1-Tri-chloro-ethane	Trichloro-ethene	Tetrachloro-ethene	1,1,2-Tri-chloro-fluoroethane	1,3,5-Tri-methyl-benzene	1,2,4-Tri-methyl-benzene	Hexa-chlorobut-adiene	4-Isopropyl-toluene	Styrene	Naphthalene	Isopropy-benzene
TP-1	0-1'	9/27/00	560	1,200	---[d]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	9/27/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	9/27/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	9/27/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-2	0-1'	9/27/00	130	400	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	9/27/00	1,700	1,200	3.6	120	6	14.4	200B	<1.2[e]	<1.2	<1.2	<1.2	47	<1.2	<1.2	<1.2	<1.2	3	7.1	<6	<1.2	2.4	120	<1.2
	4-6'	9/27/00	***2,900***	1,700	58	850	140	410	460B	<1.5	<1.5	<1.5	<1.5	120	<1.5	<1.5	<1.5	<1.5	520	1,400	<7.3	91	12M	120,000	55
	6-10'	9/27/00	***10,000***	***2,100***	73	430	870	3,600	940J	<1.6	<1.6	<1.6	<1.6	110	<1.6	<1.6	<1.6	<1.6	2,800	6,200	<7.9	1,600	<1.6	390,000	480
TP-3	0-1'	9/27/00	14	26	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	9/27/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	9/27/00	1,300	1,200	<1.8	830	<1.8	<38	530	<1.8	<1.8	<1.8	<1.8	73	<1.8	<1.8	<1.8	<1.8	<19	<19	<9.2	<1.8	<19	130	<1.8
	6-10'	9/27/00	280	240	<3.3	8	4.60	27	200	<3.3	<3.3	<3.3	<3.3	27	<3.3	<3.3	<3.3	<3.3	18	42	<17	27	<3.3	210	12
TP-4	0-1'	9/27/00	270	530	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	9/27/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	9/27/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	9/27/00	67	31	<1.7	7.30	<1.7	<3.4	<8.6	<1.7	<1.7	<1.7	<1.7	<8.6	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<8.6	<1.7	<1.7	8.60	<1.7
TP-5	0-1'	10/4/00	18	21	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/4/00	81	75	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/4/00	***2,000***	***2,300***	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/4/00	***23,000***	***8,600***	<230	1,200	<230	<230	<1,200	<230	<230	<230	<230	<1,200	<230	<230	<230	<230	360	660	<1,200	750	<230	26,000	<230
TP-6/600[f]	0-1'	10/4/00	160/190	210/220	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/4/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/4/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/4/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-7	0-1'	10/4/00	330	760	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/4/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/4/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/4/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-8	0-1'	10/4/00	440	1,200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/4/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-8/800[f]	4-6'	10/4/00	32/34	49/70	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/4/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-9	0-1'	10/4/00	1,900	***3,000***	<140	98J	<140	<140	<700	<140	<140	<140	<140	<700	<140	<140	<140	<140	490	220	<700	74J	<140	710	<140
	2-3'	10/4/00	54	72	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/4/00	160	250	<7.0	130	<7.0	<7.0	<35	<7.0	<7.0	<7.0	<7.0	<35	<7.0	<7.0	<7.0	<7.0	6.9J	6.8J	<35	<7.0	<7.0	<35	<7.0
	6-10'	10/4/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-10	0-1'	10/4/00	64	260	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/5/00	43	280	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/5/00	440	***2,000***	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/5/00	1,400	***8,700***	<150	1,800	<150	<150	<770	<150	<150	<150	<150	<770	<150	<150	<150	<150	<150	<150	<770	<150	<150	<770	<150
TP-11	0-1'	10/5/00	800	***2,400***	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/5/00	440	540	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/5/00	870	610	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/5/00	***3,900***	***8,500***	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-12	0-1'	10/5/00	17	17	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/5/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/5/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/5/00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MTCA Method C Industrial[g] Soil Cleanup Levels			2,000[h]	2,000[h]	4.53E+06	7.00E+08	3.50E+08	7.00E+09	3.50E+08	2.19E+05	3.50E+08	3.50E+07	2.15E+07	NA[i]	3.15E+09	1.19E+04	2.57E+06	NA	NA	NA	7.00E+05	NA	4.38E+06	1.40E+05	NA

Analytes detected in samples at concentrations exceeding cleanup levels or comparison values are shown in bold and italics.

TABLE 4-3

SOIL ANALYTICAL RESULTS - PAHs
Former Tacoma Metals Facility

Sample Designation	Sample Date	PAHs (mg/kg)[a]									cPAHs(mg/kg)[a][b]							
		Naphth-alene	Acenaph-thlyene	Acenaph-thene	Fluorene	Phenan-threne	Anth-racene	Fluoran-thene	Pyrene	Benzo (g,h,i) perylene	Chrysene	Benzo (b)-fluoranthene	Benzo (k)-fluoranthene	Benzo (a)-pyrene	Indeno (1,2,3-cd) pyrene	Dibenz (a,h)-anthracene	Benzo (a)-anthracene	Total cPAHs[b]
TP-2-6-10	9/27/00	440	7.1	240	200	460	380	370	430	34	***230***	***90***	***110***	***110***	***33***	17	***140***	***730***
TP-5-6-10	10/4/00	41	19	260	360	750	750	470	400	39	***190***	***93***	***80***	***95***	***35***	16	***130***	***639***
TP-9-0-1	10/4/00	0.35	0.014J	0.028	0.028	0.16	0.067	0.27	0.24	0.17	0.28	0.17	0.12	0.14	0.094	0.035	0.15	0.989
TP-10-6-10	10/5/00	0.011J	0.0068J	0.023	0.014J	0.023	0.014J	0.032M	0.018J	0.041M	0.038	0.036M	0.023MJ	0.025	0.018JM	0.0091MJ	0.020MJ	0.169
TP-11-6-10	10/5/00	0.7J	0.16J	1.6	1.4	2.7	0.86M	4.6	2.8	0.55J	1.8	1	0.78J	0.94	0.55J	0.16MJ	1.2	6.43
TP-16-0-1	10/6/00	0.99	18	1.8	1	2.2	1.8	6.9	6.2	3.5	4.3	4.5	5.6	7	3.8	1.4	3.8	***30.4***
TP-27-0-1	10/11/00	0.08	0.025	0.011MJ	0.011J	0.13	0.034	0.15	0.19	0.22	0.27	0.19	0.12	0.14	0.16	0.048	0.11	1.038
TP-30-2-3	10/12/00	0.14	0.11	0.053J	0.091	0.5	0.2	0.84	0.95	0.49	1.9	0.82	0.44	0.52	0.38	0.12	0.5	4.68
TP-33-0-1	10/12/00	0.31	0.067J	0.075	0.097	0.51	0.17	0.6	0.94	0.49	0.65	0.46	0.39	0.49	0.34	0.12	0.36	2.81
TP-34-2-3	10/12/00	0.95	0.1	1.9	0.91	4.3	1.3	4.7	4	0.93	4.2	2	1.1	1.3	0.79	0.24	1.9	11.53
TP-37-2-3	10/13/00	0.3	0.094	0.078	0.2	1.1	0.34	1.9	2	1.2	1.2	1.1	0.75	1	0.87	0.27	0.81	6
TP-38-0-1	10/13/00	0.3	0.24	0.59	0.51	4.2	1	5.1	4.9	2	3.2	2	2.1	2.4	2	0.59	2.5	14.79
TP-40-0-1	10/13/00	0.98	3.8	0.74	1.4	17	4.7	43	51	13	***41***	***24***	***23***	***28***	14	4.8	***33***	***167.8***
TP-43-2-3	10/16/00	0.29	0.34	0.31	0.25	2.3	0.83	3.6	2.6	1.3	2.2	1.5M	1.4	1.7	1.1	0.44	1.6	9.94
TP-46-4-6	10/16/00	0.21	0.055J	0.055J	0.063J	0.35	0.11	0.62	0.43	0.35	0.45	0.3M	0.3M	0.31M	0.2	0.094	0.25	1.904
TP-49-6-10	10/17/00	8.4	16	440	390	1,300	250	810	620	38	***230***	***73***	***54***	***82***	***31***	14M	***150***	***634***
TP-55-6-10	11/14/00	<1.3[c]	<1.3	3.9	3.6	7.0	1.4	4.6	3.1	<1.3	1.7M	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	5.6
TP-57-0-1	11/14/00	0.68	<0.081	<0.081	<0.081	0.26	<0.081	0.53	0.63	0.31M	0.32M	0.31M	0.22	0.25	0.19	<0.081	0.22	1.55
TP-61-2-3	11/15/00	2.8	0.67	0.68M	1.7	7.2	2.5M	9.3	7.8	1.1	4.9	2.9	2.7	2.9	1.6	0.61M	4.1	***19.71***
MTCA Method C Industrial Soil Cleanup Level[d]		1.40E+05	NA[e]	2.10E+05	1.40E+05	NA	1.05E+06	1.40E+05	1.05E+05	NA	18	18	18	18	18	18	18	18

Analytes detected in samples at concentrations exceeding cleanup levels or comparison values are shown in bold and italics.

Notes:

(a) Samples were analyzed for polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270B GC/MS SIM.
(b) The total probable carcinogenic polycyclic aromatic hydrocarbons (cPAHs) were calculated by summing the concentrations of all the probable cPAHs. If a probable cPAH was not detected in the sample, a value equal to one-half the reporting limit was used.
(c) "<" denotes analyte was not detected at the indicated reporting limit.
(d) MTCA Method C industrial soil cleanup levels based on CLARC II, dated February 1996.
(e) "NA" = No cleanup level is available.

Qualifiers:

M - Indicates an estimated value of analyte found and confirmed by analyst but with low spectral match.
J - Indicates an estimated concentration when the value is less than the calculated reporting limit.

mg/kg - milligrams per kilogram

TABLE 4-5

SUMMARY OF EXTRACTABLE PETROLEUM HYDROCARBONS ANALYTICAL RESULTS

Former Tacoma Metals Facility

Analytes	Sample Designation									
	TP-2-6-10	TP-5-6-10	TP-9-0-1	TP-10-6-10	TP-11-6-10	TP-16-0-1	TP-27-0-1	TP-30-2-3	TP-33-0-1	TP-34-2-3
EXTRACTABLE PETROLEUM HYDROCARBONS (mg/kg)[a]										
Aliphatics										
C8-C10	<50[b]	<65.9	<50	<50	<50	<20	<50	<50	<50	<50
C10-C12	<50	<65.9	137	<50	<50	96	<50	<50	<50	<50
C12-C16	150	419	145	<50	241	280	137	<50	85.5	<50
C16-C21	122	442	463	231	1,830	145	133	202	366	94.1
C21-C34	150	278	2,290	4,580	6,720	475	1,250	1,980	1,200	740
Aromatics										
C10-C12	376	73.2	<50	<50	<5	36	<50	<50	<50	<50
C12-C16	1,260	2,300	<50	<50	<50	106	<50	<50	<50	<50
C16-C21	3,030	5,590	88.8	<50	178	208	<50	53	75.6	<50
C21-C34	3,280	4,950	396	468	761	438	389	295	309	199

Analytes	Sample Designation								
	TP-37-2-3	TP-38-0-1	TP-40-0-1	TP-43-2-3	TP-46-4-6	TP-49-6-10	TP-55-6-10	TP-57-0-1	TP-61-2-3
EXTRACTABLE PETROLEUM HYDROCARBONS (mg/kg)[a]									
Aliphatics									
C8-C10	<10	<50	<20	<50	<50	<119	<28	<50	<10
C10-C12	<10	<50	<20	<50	<50	<119	<28	<50	12
C12-C16	20	<50	<20	<50	<50	319	151	<50	695
C16-C21	163	106	151	339	304	243	1,540	386	3,160
C21-C34	925	948	861	1,520	2,120	172	10,100	2,430	1,190
Aromatics									
C10-C12	<10	<50	<20	<50	<50	<119	<28	<50	<10
C12-C16	19	<50	41.8	55.7	<50	1,960	93	<50	65
C16-C21	95	71.2	265	267	74.6	4,270	308	94	521
C21-C34	559	360	632	670	521	3,260	3,360	676	495

Notes:

(a) Results for analysis of extractable petroleum hydrocarbons (EPHs) by methods identified in Ecology's TPH Interim Policy, dated January 1997.

(b) "<" denotes analyte was not detected at the indicated reporting limit.

mg/kg - milligrams per kilogram

TABLE 4-6

SUMMARY OF TPH INTERIM POLICY CALCULATIONS
Former Tacoma Metals Facility

Sample	Hazard Index	Total Carcinogenic Risk Factor	Concentration at Well	
			DF=20[a]	DF=1[b]
TP-2-6-10	0.08	***4.06E-04***	---	***3.2***
TP-5-6-10	0.13	***3.55E-04***	---	***1.8***
TP-9-0-1	0.01	5.50E-07	0.0	---
TP-10-6-10	0.01	7.47E-08	---	***4.2***
TP-11-6-10	0.02	3.38E-06	---	0.0
TP-16-0-1	0.01	***1.69E-05***	0.1	---
TP-27-0-1	0.00	5.77E-07	0.0	---
TP-30-2-3	0.00	2.60E-06	0.1	---
TP-33-0-1	0.01	1.56E-06	0.0	---
TP-34-2-3	0.00	6.41E-06	0.0	---
TP-37-2-3	0.01	3.34E-06	0.0	---
TP-38-0-1	0.00	8.23E-06	0.0	---
TP-40-0-1	0.01	***9.33E-05***	0.0	---
TP-43-2-3	0.01	5.53E-06	0.0	---
TP-46-4-6	0.01	1.06E-06	0.0	---
TP-49-6-10	0.09	***3.53E-04***	---	***1.7***
TP-55-6-10	0.04	3.12E-06	---	0.2
TP-57-0-1	0.01	8.62E-07	0.0	---
TP-61-2-3	0.03	***1.10E-05***	0.0	---
Exceedence Levels	1	1x10E-05	1 mg/l	1 mg/l

Notes:

(a) Dilution factor (DF) of 20 was used to evaluate samples collected from above the saturated or groundwater smear zone.

(b) Dilution factor (DF) of 1 was used to evaluate samples collected from the groundwater smear zone.

mg/l - milligrams per liter

TABLE 4-7

SOIL ANALYTICAL RESULTS - TNT/DNT
Former Tacoma Metals Facility

Sample Designation	Sample Depth	Sample Date	TNT/DNT (mg/kg)[a]				
			2,4-Dinitri-toluene	2,6-Dinitro-toluene	2,4,6-Trinitro-toluene	4-Amino-2,6-Dinitrotoluene	2-Amino-4,6-Dinitrotoluene
TP-39	0-1'	10/13/00	<50[b]	<50	<50	<50	<50
TP-390[c]	0-1'	10/13/00	<50	<50	<50	<50	<50
TP-39	2-3'	10/13/00	<50	<50	<50	<50	<50
TP-39	4-6'	10/13/00	<50	<50	<50	<50	<50
TP-39	6-10'	10/13/00	<50	<50	<50	<50	<50
TP-44	0-1'	10/13/00	<50	<50	<50	<50	<50
MTCA Method C Industrial Soil Cleanup Levels [d]			7,000	3,500	N/A[e]	N/A	N/A

Notes

(a) Samples were analyzed for trinitrotoluene/dinitrotoluene (TNT/DNT) by EPA Method 8330.
(b) "<" denotes analyte was not detected at the indicated reporting limit.
(c) Duplicate sample.
(d) MTCA Method C industrial soil cleanup levels are based on CLARC II, dated February 1996.
(e) "NA" = No cleanup level available.

mg/kg - milligrams per kilogram

TABLE 4-8A

SPLP AND TCLP ANALYTICAL RESULTS - METALS[a]
Former Tacoma Metals Facility

Analyte	Analysis	Sample Designation/Depth														Criteria
		TP-1-0-1	TP-14-6-10	TP-16-2-3	TP-21-2-3	TP-22-2-3	TP-33-2-3	TP-38-0-1	TP-39-0-1	TP-40-2-3	TP-43-2-3	TP-45-0-1	TP-55-0-1	TP-60-0-1	TP-61-0-1	
Arsenic	Total (mg/kg)	40	<6[b]	---[c]	<300	<60	---	60	10	<30	80	100	<30	50	<30	219[d]
	TCLP (mg/l)	---	---	---	---	---	---	---	---	---	---	<0.05	---	---	---	5.0[e]
	SPLP (mg/l)	---	---	---	---	---	---	---	---	---	---	<0.05	---	---	---	NA[f]
Barium	Total (mg/kg)	290	84.9	---	4,190	464	---	2,710	110	851	1,280	774	1,080	1,050	377	245,000[d]
	TCLP (mg/l)	---	---	---	6.99	---	---	---	---	---	---	---	---	---	---	100.0[e]
	SPLP (mg/l)	---	---	---	0.672	---	---	---	---	---	---	---	---	---	---	NA
Cadmium	Total (mg/kg)	8.5	2.3	68	130	52	---	125	13.2	40	46	30	29	30	10	3,500[d]
	TCLP (mg/l)	---	---	---	0.94	---	---	---	---	---	---	---	---	---	---	1.0[e]
	SPLP (mg/l)	---	---	---	<0.002	---	---	---	---	---	---	---	---	---	---	NA
Chromium	Total (mg/kg)	76	35.3	---	***1,080***	913	---	263	30	212	259	368	117	225	53	500[g]
	TCLP (mg/l)	---	---	---	<0.05	---	---	---	---	---	---	---	---	---	---	1.0[a]
	SPLP (mg/l)	---	---	---	<0.005	---	---	---	---	---	---	---	---	---	---	NA
Copper	Total (mg/kg)	873	78.6	---	13,200	20,200	---	3,320	1,100	1,240	2,520	3,560	465	2,330	356	130,000[d]
	TCLP (mg/l)	---	---	---	---	66.2	---	---	---	---	---	---	---	---	---	NA
	SPLP (mg/l)	---	---	---	---	0.005	---	---	---	---	---	---	---	---	---	NA
Lead	Total (mg/kg)	***2,230***	152	***8,240***	***7,570***	***3,690***	***4,560***	***9,380***	***1,040***	***2,050***	***12,300***	***4,060***	***1,750***	***10,800***	***4,180***	1,000[g]
	TCLP (mg/l)	***11.7***	<0.1	3.3	***74.7***	---	***22.4***	***20.6***	0.13	***6.9***	***63.6***	---	***26.5***	---	***12.2***	5.0[a]
	SPLP (mg/l)			<0.02	---	---	---	---	0.03	<0.02	0.03	---	---	---	0.07	NA
Mercury	Total (mg/kg)	1.53	0.07	---	10.2	5.1	1.69	14.3	0.21	3.19	21	47	0.83	77	0.76	1,050[d]
	TCLP (mg/l)	---	---	---	---	---	---	---	---	---	---	---	---	0.0005	---	0.2[e]
	SPLP (mg/l)	---	---	---	---	---	---	---	---	---	---	---	---	0.0021	---	NA
Selenium	Total (mg/kg)	<10	<6	---	<300	<60	---	30	<10	<30	<30	30	<30	40	<30	17,500[d]
	TCLP (mg/l)	---	---	---	---	---	---	---	---	---	---	---	---	<0.2	---	1.0[e]
	SPLP (mg/l)	---	---	---	---	---	---	---	---	---	---	---	---	<0.05	---	NA
Silver	Total (mg/kg)	1.4	<0.4	---	90	198	---	6	<0.8	3	5	7	<2	2	<2	17,500[d]
	TCLP (mg/l)	---	---	---	---	<0.02	---	---	---	---	---	---	---	---	---	5.0[e]
	SPLP (mg/l)	---	---	---	---	<0.003	---	---	---	---	---	---	---	---	---	NA

Analytes detected in samples at concentrations exceeding criteria are shown in bold and italics.

Notes:
(a) Samples were analyzed for TCLP and SPLP Metals by EPA Methods 1311/1312/6010.
(b) "<" denotes analyte was not detected at the indicated reporting limit.
(c) "---" Sample not tested for selected analyte.
(d) MTCA Method C industrial soil cleanup levels are based on CLARC II, dated February 1996.
(e) Toxicity characteristics based on Dangerous Waste Criteria (WAC 173-303-100).
(f) "NA" = No criteria available.
(g) Method A industrial soil cleanup levels (WAC 173-340-745) used where Method C industrial soil cleanup levels are not available.

mg/kg - milligrams per kilogram
mg/l - milligrams per liter

TABLE 4-8B

SPLP AND TCLP ANALYTICAL RESULTS - PAHs
Former Tacoma Metals Facility

Sample Designation	Sample Depth	Totals	PAHs[a]									cPAHs[a][b]							
			Naphth-alene	Acenaph-thlyene	Acenaph-thene	Fluorene	Phenan-threne	Anth-racene	Fluoran-thene	Pyrene	Benzo (g,h,i) perylene	Chrysene	Benzo (b)-fluoranthene	Benzo (k)-fluoranthene	Benzo (a)-pyrene	Indeno (1,2,3-cd) pyrene	Dibenz (a,h)-anthracene	Benzo (a)-anthracene	Total cPAHs[b]
TP-40	0-1	Total (mg/kg)	0.98	3.8	0.74	1.4	17	4.7	43	51	13	41	24	23	28	14	4.8	33	167.8
		TCLP (µg/l)	<10[c]	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	35
		SPLP (µg/l)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	35
TP-49	6-10	Total (mg/kg)	8.4	16	440	390	1,300	250	810	620	38	230	73	54	82	31	14M	150	634
		TCLP (µg/l)	<10	<10	300	180	190	20	28	18	<10	<10	<10	<10	<10	<10	<10	<10	35
		SPLP (µg/l)	<10	<10	230	140	150	15	23	18	<10	<10	<10	<10	<10	<10	<10	<10	35
TP-61	2-3	Total (mg/kg)	2.8	0.67	0.68M	1.7	7.2	2.5M	9.3	7.8	1.1	4.9	2.9	2.7	2.9	1.6	0.61M	4.1	19.71
		TCLP (µg/l)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	35
		SPLP (µg/l)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	35

Notes:
(a) Samples were analyzed for TCLP and SPLP polycyclic aromatic hydrocarbons (PAHs) by EPA Methods 1311/1312/8270.
(b) The total probable carcinogenic polycyclic aromatic hydrocarbons (cPAHs) were calculated by summing the concentrations of all the probable cPAHs. If a probable cPAH was not detected in the sample, a value equal to one-half the reporting limit was used.
(c) "<" denotes analyte was not detected at the indicated reporting limit.

Qualifiers:
M - Indicates an estimated value of analyte found and confirmed by analyst but with low spectral match.

mg/kg - milligrams per kilogram
µg/l - micrograms per liter

TABLE 4-9

ESTIMATED SOIL CLEANUP LEVEL EXCEEDANCE VOLUMES
Former Tacoma Metals Facility

ESTIMATED EXCEEDANCE AREA VOLUMES FOR SPECIFIC ANALYTES					
Analyte	Depth Interval (ft)	Interval Thickness (ft)	Surface Area (ft^2)	Volume (yd^3)	
Lead	0-1	1	142,534	5,279[a]	
	2-3	2	70,538	5,225	
	4-6	3	8,318	924	
	Total Lead Soil Cleanup Level Exceedance Volume:			**11,428[a]**	**(11,400)[b]**
Petroleum Hydrocarbons	0-1	1	36,223	1,342	
	2-3	2	22,268	1,649	
	4-6	3	13,875	1,542	
	6-10	4	14,430	2,138	
	Total Petoleum Hydrocarbon Soil Cleanup Level Exceedance Volume:			**6,671**	**(6,700)**
cPAHs	0-1	1	6,209	230	
	2-3	2	2,750	204	
	6-10	4	7,540	1,117	
	Total cPAH Soil Cleanup Level Exceedance Volume:			**1,551**	**(1,600)**
PCBs	0-1	1	20,945	776	
	2-3	2	3,503	259	
	Total PCB Soil Cleanup Level Exceedance Volume:			**1,035**	**(1,000)**

Notes:

ft - feet

ft^2 - square feet

yd^3 - cubic yards

cPAHs - Carcinogenic polycyclic aromatic hydrocarbons.

PCBs - Polychlorinated biphenyls.

(a) Includes area identified in previous investigations.

(b) Volume rounded to nearest hundred cubic yards.

TABLE 5-1

RECONNAISSANCE GROUNDWATER ANALYTICAL RESULTS - DISSOLVED METALS
Former Tacoma Metals Facility

Sample Designation	Sample Date	Dissolved Metals (µg/l)[a][b]							
		Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
RGW -1	5/25/00	<5[c]	61	***9***	<10	<4	<0.2	<50	<7
RGW -2	5/25/00	<5	49	6	<10	<4	<0.2	<50	<7
RGW -3	5/25/00	<5	62	<5	<10	<4	<0.2	<50	<7
RGW -4	5/25/00	<5	33	<5	<10	<4	<0.2	<50	<7
RGW -5	5/25/00	<5	44	5	<10	<4	<0.2	<50	<7
RGW -6	5/25/00	<5	14	<5	<10	<4	<0.2	<50	<7
RGW -7	5/25/00	<5	23	<5	<10	<4	<0.2	<50	<7
RGW -8	5/25/00	<5	120	<5	<10	<4	<0.2	<50	<7
RGW -9	5/25/00	<5	30	<5	<10	<4	<0.2	<50	<7
RGW -10	5/25/00	<5	17	<5	<10	<4	<0.2	<50	<7
RGW -11	5/25/00	<5	9	<5	<10	<4	<0.2	<50	<7
RGW -12	5/25/00	<5	10	<5	<10	<4	<0.2	<50	<7
RGW -13	5/26/00	<5	11	<5	<10	<4	<0.2	<50	<7
RGW -14	5/26/00	<5	4	<5	<10	<4	<0.2	<50	<7
RGW -15	5/26/00	<5	4	<5	<10	<4	<0.2	<50	<7
RGW -16	5/26/00	<5	12	<5	<10	<4	<0.2	<50	<7
RGW -17	5/26/00	<5	14	<5	<10	<4	<0.2	<50	<7
RGW -18	5/26/00	<5	7	<5	<10	<4	0.2	<50	<7
MTCA Method B Surface Water Cleanup Level[d]		0.0982	NA[e]	20.3	NA	NA	NA	NA	25,900
MTCA Method C Surface Water Cleanup Level[d]		2.46	NA	50.6	NA	NA	NA	NA	64,800
Ecology Acute Freshwater Surface Water Cleanup Level[f]		360	NA	7.0[g]	888.04[g,h]	121.70[g]	2.10	20	9.48[g]
National Toxics Rule for Consumption of Organisms[i]		1.4	NA	NA	NA	NA	1.5	NA	NA

Analytes detected in samples at concentrations exceeding one or more of the comparison values are shown in bold and italics.

TABLE 5-1

RECONNAISSANCE GROUNDWATER ANALYTICAL RESULTS - DISSOLVED METALS
Former Tacoma Metals Facility

Notes:
(a) Reconnaissance groundwater samples were analyzed for dissolved metals by EPA Methods 6010/7000 series.
(b) All groundwater samples were field filtered. All concentrations are dissolved.
(c) "<" denotes analyte was not detected at the indicated reporting limit.
(d) MTCA Method B and C surface water cleanup levels based on CLARC II, dated February 1996.
(e) "NA" = No cleanup level available.
(f) Ecology Acute Freshwater Surface Water Standard (WAC 173-201A).
(g) Surface Water Quality Standard is based on an average groundwater hardness of 180 mg/l.
(h) Chromium as chromium III (CAS# 7440-47-3).
(i) National Toxics Rule for consumption of organisms only based on 40 CFR 131.36 for a risk level of $1x10^{-5}$.

mg/l - milligrams per liter
µg/l - micrograms per liter

TABLE 5-2

RECONNAISSANCE GROUNDWATER ANALYTICAL RESULTS - PCBs
Former Tacoma Metals Facility

Sample Designation	Sample Date	PCBs (µg/l)[a]							Total PCBs[c]
		Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	
RGW-1	5/25/00	<0.2[b]	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.7
RGW-2	5/25/00	<1	<1	<1	<1	<1	<1	<1	3.5
RGW-3	5/25/00	<1	<1	<1	<1	<1	<1	<1	3.5
RGW-4	5/25/00	<1	<1	<1	<1	<1	<1	<1	3.5
RGW-5	5/25/00	<2	<2	<2	<2	<2	<2	<2	7.0
RGW-6	5/25/00	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.35
RGW-7	5/25/00	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.35
RGW-8	5/25/00	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.35
RGW-9	5/25/00	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.7
RGW-10	5/25/00	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.7
RGW-11	5/25/00	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.7
RGW-12	5/25/00	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.7
RGW-13	5/26/00	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.35
RGW-14	5/26/00	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.35
RGW-15	5/26/00	<1	<1	<1	<1	<1	<1	<1	3.5
RGW-16	5/26/00	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.7
RGW-17	5/26/00	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.7
RGW-18	5/26/00	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.7
MTCA Method B Surface Water Cleanup Level[d]		NA[e]	NA	NA	NA	NA	NA	NA	2.70E-05 (1)
MTCA Method C Surface Water Cleanup Level[d]		NA	NA	NA	NA	NA	NA	NA	6.74E-04 (1)
Ecology Acute Freshwater Surface Water Quality Standard[f]		NA	NA	NA	NA	NA	NA	NA	2.0
National Toxics Rule for Consumption of Organisms[g]		NA	NA	NA	NA	NA	NA	NA	0.0017 (1)

TABLE 5-2

RECONNAISSANCE GROUNDWATER ANALYTICAL RESULTS - PCBs
Former Tacoma Metals Facility

Notes:
(a) Samples were analyzed for polychlorinated biphenyls (PCBs) by EPA Method 8082.
(b) "<" denotes analyte was not detected at the indicated reporting limit.
(c) The total PCBs were calculated by summing the concentrations of all the probable PCBs. If a probable PCB was not detected, a value equal to one-half the reporting limit was used.
(d) MTCA Method B and C surface water cleanup levels based on CLARC II, dated February 1996. "(1)" denotes practical quantification limit (PQL) is greater than cleanup level, or standard (Ecology 1993).
(e) "NA" = No cleanup level available.
(f) Ecology Acute Freshwater Surface Water Quality Standards (WAC 173-201A).
(g) National Toxics Rule for consumption of organisms only based on 40 CFR 131.36 for a risk level of $1x10^{-5}$.

µg/l - micrograms per liter

TABLE 5-3

RECONNAISSANCE GROUNDWATER ANALYTICAL RESULTS - PAHs
Former Tacoma Metals Facility

Sample Designation	Sample Date	PAHs (µg/l)[a]									cPAHs (µg/l)[a][b]							
		Naphth-alene	Acenaph-thlyene	Acenaph-thene	Fluorene	Phenan-threne	Anth-racene	Fluoran-thene	Pyrene	Benzo (g,h,i) perylene	Chrysene	Benzo (b)-fluoranthene	Benzo (k)-fluoranthene	Benzo (a)-pyrene	Indeno (1,2,3-cd) pyrene	Dibenz (a,h)-anthracene	Benzo (a)-anthracene	Total cPAHs
RGW -1	5/25/00	<0.02[c]	<0.02	0.24	0.23	0.09	0.07	0.22	0.14	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	***0.03***	***0.1***
RGW -2	5/25/00	<0.02	<0.02	***1100***	0.05	0.03	0.03	0.08	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.07
RGW -3	5/25/00	<0.02	<0.02	0.17	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.07
RGW -4	5/25/00	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.07
RGW -5	5/25/00	0.02	<0.02	<0.02	0.04	0.06	<0.02	0.07	0.06	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.08
RGW -6	5/25/00	<0.02	<0.02	0.16	<0.02	0.04	<0.02	0.09	0.16	0.07	***0.55***	***0.21***	***0.09***	***0.04***	***0.04***	<0.02	***0.09***	***1.03***
RGW -7	5/25/00	0.02	<0.02	0.55	0.4	1.2	0.18	0.38	0.25	<0.02	***0.04***	<0.02	<0.02	<0.02	<0.02	<0.02	***0.05***	***0.14***
RGW -8	5/25/00	<0.02	<0.02	0.02	<0.02	0.09	<0.02	0.05	0.06	<0.02	***0.03***	<0.02	<0.02	0.02	<0.02	<0.02	0.02	***0.11***
RGW -9	5/25/00	0.02	<0.02	0.04	<0.02	0.06	<0.02	0.03	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.07
RGW -10	5/25/00	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.07
RGW -11	5/25/00	0.13	<0.02	1.4	0.03	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.07
RGW -12	5/25/00	0.02	<0.02	0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.07
RGW -13	5/26/00	34	0.61	140	57	31	2.4	4.4	3.1	0.24	***0.47***	***0.27***	***0.23***	***0.38***	***0.21***	***0.07***	***0.43***	***2.06***
RGW -14	5/26/00	8.6	0.05	3.6	2.2	2.2	0.64	2.7	1.6	0.03	***0.22***	***0.07***	***0.07***	***0.06***	***0.03***	<0.02	***0.28***	***0.74***
RGW -15	5/26/00	110	0.37	64	38	27	5.3	9.2	7.1	0.18	***0.54***	***0.26***	***0.23***	***0.38***	***0.15***	<0.02	***0.59***	***2.16***
RGW -16	5/26/00	0.21	0.01	0.13	0.1	0.2	0.04	0.05	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.07
RGW -17	5/26/00	0.22	<0.02	0.19	0.03	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.07
RGW -18	5/26/00	45	0.82	66	47	130	26	88	79	7.4	***19***	***13***	***13***	***16***	***6.6***	***2.4***	***26***	***96***
MTCA Method B Surface Water Cleanup Level[d]		9,880	NA[e]	643	3,460	NA	25,900	90.2	2,590	NA	0.0296 (1)	0.0296 (1)	0.0296 (1)	0.0296 (1)	0.0296 (1)	0.0296 (1)	0.0296 (1)	0.0296 (1)
MTCA Method C Surface Water Cleanup Level[d]		24,700	NA	1,610	8,640	NA	64,800	225	6,480	NA	0.740 (1)	0.740 (1)	0.740 (1)	0.740 (1)	0.740 (1)	0.740 (1)	0.740 (1)	0.740 (1)
Ecology Acute Freshwater Surface Water Quality Standard[f]		2,300	NA	1,700	NA	NA	NA	3,980	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
National Toxics Rule for Consumption of Organisms[g]		NA	NA	NA	1.4×10^5	NA	1.1×10^6	3,700	1.1×10^5	NA	0.31 (1)	0.31 (1)	0.31 (1)	0.31 (1)	0.31 (1)	0.31 (1)	0.31 (1)	0.31 (1)

Analytes detected in samples at concentrations exceeding one or more of the cleanup levels or comparison values are shown in bold and italics.

Notes:

(a) Samples were analyzed for polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270B GC/MS SIM.
(b) The total probable carcinogenic polycyclic aromatic hydrocarbons (cPAHs) were calculated by summing the concentrations of all the probable cPAHs. If a probable cPAH was not detected in the sample, a value equal to one-half the reporting limit was used.
(c) "<" denotes analyte was not detected at the indicated reporting limit.
(d) MTCA Method B and C surface water cleanup levels based on CLARC II, dated February 1996. "(1)" denotes practical quantification limit (PQL) is greater than cleanup level or standard (Ecology 1993).
(e) "NA" = No cleanup level is available.
(f) Ecology Acute Freshwater Surface Water Quality Standards (WAC 173-201A).
(g) National Toxics Rule for consumption of organisms only based on 40 CFR 131.36 for a risk level of 1×10^{-5}. "(1)" denotes practical quantification limit (PQL) is greater than cleanup level or standard (Ecology 1993).

µg/l - micrograms per liter

TABLE 5-4

RECONNAISSANCE GROUNDWATER ANALYTICAL RESULTS - TPHs AND VOCs
Former Tacoma Metals Facility

Sample Designation	Sample Date	TPHs (mg/l)[a]			Volatile Organic Compounds (µg/l)[b]				
		TPH-Gas	TPH-Diesel	TPH-Motor Oil	Benzene	Toluene	Ethylbenzene	Total xylenes	Naphthalene
RGW -1	5/25/00	<0.05[c]	<0.25	<0.5	<2	3	<2	<6	<2
RGW -2	5/25/00	<0.05	<0.25	<0.5	<2	<2	<2	<6	<2
RGW -3	5/25/00	<0.05	<0.25	<0.5	<2	<2	<2	<6	<2
RGW -4	5/25/00	<0.05	<0.25	<0.5	<2	<2	<2	<6	<2
RGW -5	5/25/00	<0.05	<0.25	<0.5	<2	<2	<2	<6	<2
RGW -6	5/25/00	<0.05	<0.25	<0.5	<2	<2	<2	<6	<2
RGW -7	5/25/00	<0.05	<0.25	<0.5	<2	<2	<2	<6	<2
RGW -8	5/25/00	<0.05	<0.25	<0.5	<2	2	<2	<6	<2
RGW -9	5/25/00	<0.05	<0.25	<0.5	<2	<2	<2	<6	<2
RGW -10	5/25/00	<0.05	<0.25	<0.5	<2	<2	<2	<6	<2
RGW -11	5/25/00	<0.05	<0.25	<0.5	<2	<2	<2	<6	<2
RGW -12	5/25/00	<0.05	<0.25	<0.5	<2	<2	<2	<6	<2
RGW -13	5/26/00	0.33	0.88	<0.5	<2	<2	2	<6	33
RGW -14	5/26/00	<0.05	<0.25	<0.5	<2	<2	<2	<6	23
RGW -15	5/26/00	0.2	0.96	0.96	<2	<2	<2	<6	210
RGW -16	5/26/00	<0.05	1.7	<0.5	<2	<2	<2	<6	<2
RGW -17	5/26/00	<0.05	<0.25	<0.5	<2	<2	<2	<6	<2
RGW -18	5/26/00	0.09	0.86	<0.5	<2	<2	<2	<6	77
MTCA Method B Surface Water Cleanup Level[d]		NA[e]	NA	NA	43	48,500	6,910	NA	9,880
MTCA Method C Surface Water Cleanup Level[d]		NA	NA	NA	1,070	121,000	17,300	NA	24,700
Ecology Acute Freshwater Surface Water Quality Standard[f]		NA	NA	NA	5,300	17,500	32,000	NA	2,300
National Toxics Rule for Consumption of Organisms[g]		NA	NA	NA	710	2,000,000	290,000	NA	NA
Ecology Model NPDES Permit Standard[h]		1	10	10	NA	NA	NA	NA	NA

Analytes detected in samples at concentrations exceeding one or more of the cleanup levels or comparison values are shown in bold and italics.

TABLE 5-4

RECONNAISSANCE GROUNDWATER ANALYTICAL RESULTS - TPHs AND VOCs
Former Tacoma Metals Facility

Notes:

(a) Samples were analyzed for total petroleum hydrocarbons (TPHs) by the appropriate Ecology Methods NWTPH-Gas and NWTPH-Diesel (extended).
(b) Soil and groundwater samples were analyzed for volatile organic compounds (VOCs) by EPA Method 8260.
(c) "<" denotes analyte was not detected at the indicated reporting limit.
(d) MTCA Method B and C surfaco water cleanup levels based on CLARC II, dated February 1996.
(e) "NA" = No cleanup level available.
(f) Ecology Acute Freshwater Surface Water Quality Standards (WAC 173-201A).
(g) National Toxics Rule for consumption of organisms only based on 40 CFR 131.36 for a risk level of $1x10^{-6}$.
(h) Ecology's Model National Pollutant Discharge Elimination System (NPDES) Permit Standard for discharges to surface wator from leaking underground storage tank (LUST) cleanups where gasoline or diesel fuel are the pollutants of concern.

mg/l - milligrams per liter
µg/l - micrograms per liter

TABLE 5-5

GROUNDWATER ANALYTICAL RESULTS - TOTAL METALS

Former Tacoma Metals Facility

Sample Designation	Sample Date	Total Metals (µg/l)[a]								
		Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver
MW-1	3/14/00	<5[b]	12	<5	30	---[c]	<4	<0.2	<50	<7
	11/21/00	<50	9	<2	<5	11	<20	<0.1	<50	<3
	3/5/01	<50	13	<2	<5	<2	<20	<0.1	<50	<3
MW-2	3/14/00	<5	5	<5	190	---	<4	<0.2	<50	<7
	11/21/00	<50	28	<2	<5	20	<20	<0.1	<50	<3
	3/5/01	<50	13	<2	<5	<2	<20	<0.1	<50	<3
MW-4(R)[d]	5/11/00	<5	8	<5	<10	---	20	<0.2	<50	<7
	11/20/00	<50	12	<2	<5	<2	<20	<0.1	<50	<3
	3/5/01	<50	14	<2	<5	8	<20	<0.1	<50	<3
MW-5	3/14/00	<5	18	<5	30	---	<4	<0.2	<50	<7
	11/21/00	<50	2	<2	<5	4	<20	<0.1	<50	<3
	3/5/01	<50	21	<2	<5	3	<20	<0.1	<50	<3
MW-6	3/14/00	<5	24	<5	70	---	<4	<0.2	<50	<7
	11/21/00	<50	3	<2	<5	5	<20	<0.1	<50	<3
	3/5/01	<50	22	3	<5	<2	<20	<0.1	<50	<3
MW-7	3/14/00	<5	23	<5	20	---	<4	<0.2	<50	<7
	11/21/00	<50	31	<2	<5	8	<20	<0.1	<50	<3
	3/6/01	<50	34	<2	<5	<2	<20	<0.1	<50	<3
MW-8(R)/MW-800[e]	5/12/00	<5	15	<5	<10	---	6	<0.2	<50	<7
	11/20/00	<50/<50	13/11	<2/<2	<5/<5	2/<2	<20/<20	<0.1/<0.1	<50/<50	<3/<3
	3/6/01	<50/<50	14/15	<2/<2	<5/<5	<2/<2	<20/<20	<0.1/<0.1	<50/<50	<3/<3
MW-9	5/11/00	<5	17	<5	<10	---	6	<0.2	<50	<7
	11/21/00	<50	16	<2	<5	<2	<20	<0.1	<50	<3
	3/5/01	<50	90	<2	<5	<2	<20	<0.1	<50	<3
MW-10	11/20/00	<50	10	<2	<5	3	<20	<0.1	<50	<3
	3/6/01	<50	9	<2	<5	4	<20	<0.1	<50	<3
MW-11	11/20/00	<50	9	<2	<5	3	<20	<0.1	<50	<3
	3/6/01	<50	8	<2	<5	<2	<20	<0.1	<50	<3
MW-12	11/20/00	<50	3	<2	<5	<2	<20	<0.1	<50	<3
	3/6/01	<50	31	<2	<5	<2	<20	<0.1	<50	<3
MTCA Method B Surface Water Cleanup Level[f]		0.00982	NA[g]	20.3	NA	2,660	NA	NA	NA	25,900
MTCA Method C Surface Water Cleanup Level[f]		2.46	NA	50.6	NA	6,660	NA	NA	NA	64,800
Ecology Acute Freshwater Surface Water Cleanup Level[h]		360	NA	7.0[i]	888.04[i,j]	29.61[i]	121.70[i]	2.10	20	9.48[i]
National Toxics Rule for Consumption of Organisms[k]		1.4	NA	NA	NA	NA	NA	1.5	NA	NA

TABLE 5-5

GROUNDWATER ANALYTICAL RESULTS - TOTAL METALS
Former Tacoma Metals Facility

Notes:

(a) Groundwater samples were analyzed for metals by EPA Methods 6010/7000 series.
(b) "<" denotes analyte was not detected at the indicated reporting limit.
(c) "---" Sample not analyzed for indicated analyte.
(d) "R" = Replacement well.
(e) Sample MW-800 is a duplicate sample collected from well MW-8(R).
(f) MTCA Method B and C surface water cleanup levels based on CLARC II, dated February 1996.
(g) "NA" = No cleanup level available.
(h) Ecology Acute Freshwater Surface Water Standard (WAC 173-201A).
(i) Surface Water Quality Standard is based on an average groundwater hardness of 180 mg/l.
(j) Chromium as chromium III, (CAS# 7440-47-3).
(k) National Toxics Rule for consumption of organisms only based on 40 CFR 131.36 for a risk level of $1x10^{-5}$.

µg/l - micrograms per liter
mg/l - milligrams per liter

TABLE 5-6

GROUNDWATER ANALYTICAL RESULTS - DISSOLVED METALS
Former Tacoma Metals Facility

Sample Designation	Sample Date	Dissolved Metals (µg/l)[a][b]								
		Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver
MW-1	11/21/00	<50[c]	19	<2	<5	<2	<20	<0.1	<50	<3
	3/5/01	<50	14	<2	<5	<2	<20	<0.1	<50	<3
MW-2	11/21/00	<50	11	<2	<5	<2	<20	<0.1	<50	<3
	3/5/01	<50	10	<2	<5	<2	<20	<0.1	<50	<3
MW-4(R)[d]	11/20/00	<50	13	<2	<5	<2	<20	<0.1	<50	<3
	3/5/01	<50	10	<2	<5	<2	<20	<0.1	<50	<3
MW-5	11/21/00	<50	35	<2	<5	<2	<20	<0.1	<50	<3
	3/5/01	<50	21	<2	<5	<2	<20	<0.1	<50	<3
MW-6	11/21/00	<50	34	<2	<5	<2	<20	<0.1	<50	<3
	3/5/01	<50	22	<2	<5	<2	<20	<0.1	<50	<3
MW-7	11/21/00	<50	39	<2	<5	3	<20	<0.1	<50	<3
	3/6/01	<50	34	<2	<5	<2	<20	<0.1	<50	<3
MW-8(R)/MW-800[e]	11/20/00	<50/<50	15/15	<2/<2	<5/<5	<2/<2	<20/<20	<0.1/<0.1	<50/<50	<3/<3
	3/6/01	<50/<50	19/19	<2/<2	<5/<5	<2/<2	<2/<2	<0.1/<0.1	<50/<50	<3/<3
MW-9	11/21/00	<50	102	<2	<5	<2	<20	<0.1	***70***	<3
	3/5/01	<50	97	<2	<5	<2	<20	<0.1	<50	<3
MW-10	11/20/00	<50	12	<2	<5	<2	<20	<0.1	<50	<3
	3/6/01	<50	11	<2	<5	<2	<20	<0.1	<50	<3
MW-11	11/20/00	<50	10	<2	<5	<2	<20	<0.1	<50	<3
	3/6/01	<50	9	<2	<5	<2	<20	<0.1	<50	<3
MW-12	11/20/00	<50	35	<2	<5	<2	<20	<0.1	<50	<3
	3/6/01	<50	33	<2	<5	<2	<20	<0.1	<50	<3
MTCA Method B Surface Water Cleanup Level[f]		0.00982	NA[g]	20.3	NA	2,660	NA	NA	NA	25,900
MTCA Method C Surface Water Cleanup Level[f]		2.46	NA	50.6	NA	6,660	NA	NA	NA	64,800
Ecology Acute Freshwater Surface Water Cleanup Level[h]		360	NA	7[i]	888.04[i,j]	29.61[i]	121.70[i]	2.10	20	9.48[i]
National Toxics Rule for Consumption of Organisms[k]		1.4	NA	NA	NA	NA	NA	1.5	NA	NA

Analytes detected in samples at concentrations exceeding one or more of the cleanup levels or comparison values are shown in bold and italics.

TABLE 5-6

GROUNDWATER ANALYTICAL RESULTS - DISSOLVED METALS
Former Tacoma Metals Facility

Notes:

(a) Groundwater samples were analyzed for metals by EPA Methods 6010/7000 series.
(b) All groundwater samples were field filtered. All concentrations are dissolved.
(c) "<" denotes analyte was not detected at the indicated reporting limit.
(d) "R" = Replacement well.
(e) Sample MW-800 is a duplicate sample collected from well MW-8(R).
(f) MTCA Method B and C surface water cleanup levels based on CLARC II, dated February 1996.
(g) "NA" = No cleanup level available.
(h) Ecology Acute Freshwater Surface Water Standard (WAC 173-201A).
(i) Surface Water Quality Standard is based on an average groundwater hardness of 180 mg/l.
(j) Chromium as chromium III, (CAS # 7440-47-3).
(k) National Toxics Rule for consumption of organisms only based on 40 CFR 131.36 for a risk level of $1x10^{-5}$.

mg/l - milligrams per liter
µg/l - micrograms per liter

TABLE 5-7

GROUNDWATER ANALYTICAL RESULTS - PCBs
Former Tacoma Metals Facility

Sample Designation	Sample Date	PCBs (µg/l)[a]							Total PCBs[b]
		Aroclor 1016	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1221	Aroclor 1232	
MW-1	3/14/00	<0.1[c]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.35
	11/21/00	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
	3/5/01	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
MW-2	3/14/00	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.35
	11/21/00	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
	3/5/01	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
MW-4(R)[d]	5/11/00	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.35
	11/20/00	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
	3/5/01	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
MW-5	3/14/00	<0.1	<0.1	<0.1	<1.0	<1.0	<0.1	<0.1	1.25
	11/21/00	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
	3/5/01	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
MW-6	3/14/00	<0.1	<0.1	<0.1	<1.0	<1.0	<0.1	<0.1	1.25
	11/21/00	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
	3/5/01	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
MW-7	3/14/00	<0.5	<0.5	<0.5	<2.0	<2.0	<0.5	<0.5	3.25
	11/21/00	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
	3/6/01	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
MW-8(R)/MW-800[e]	5/12/00	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<5	15
	11/20/00	<1.0/<1.0	<1.0/5.6Y[f]	<1.0/1.9Y	<1.0/1.3Y	<1.0/<1.0	<2.0/<2.0	<1.0/<1.0	4.0/***11.3***
	3/6/01	<1.0/<1.0	<1.0/<1.0	<1.0/<1.0	<1.0/<1.0	<1.0/<1.0	<2.0/<2.0	<1.0/<1.0	4.0/4.0
MW-9	5/11/00	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.35
	11/21/00	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
	3/5/01	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
MW-10	11/20/00	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
	3/6/01	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
MW-11	11/20/00	<1.0	2.0Y	<1.0	<1.0	<1.0	<2.0	<1.0	***5.5***
	3/6/01	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
MW-12	11/20/00	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
	3/6/01	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
MTCA Method B Surface Water Cleanup Level[g]		NA[h]	NA	NA	NA	NA	NA	NA	2.70E-05 (1)
MTCA Method C Surface Water Cleanup Level[g]		NA	NA	NA	NA	NA	NA	NA	6.74E-04 (1)
Ecology Acute Freshwater Surface Water Quality Standard[i]		NA	NA	NA	NA	NA	NA	NA	2.0
National Toxics Rule for Consumption of Organisms[j]		NA	NA	NA	NA	NA	NA	NA	0.0017 (1)

Analytes detected in samples at concentrations exceeding one or more of the cleanup levels or comparison values are shown in bold and italics.

TABLE 5-7

GROUNDWATER ANALYTICAL RESULTS - PCBs
Former Tacoma Metals Facility

Notes:
(a) Samples were analyzed for polychlorinated biphenyls (PCBs) by EPA Method 8082.
(b) The total PCBs were calculated by summing the concentrations of all the probable PCBs. If a probable PCB was not detected, a value equal to one-half the reporting limit was used.
(c) "<" denotes analyte was not detected at the indicated reporting limit.
(d) "R" Replacement well.
(e) Sample MW-800 is a duplicate sample collected from well MW-8(R).
(f) "Y" indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration.
(g) MTCA Method B and C surface water cleanup levels based on CLARC II, dated February 1996. "(1)" denotes practical quantification limit (PQL) is greater than cleanup level or standard (Ecology 1993).
(h) "NA" = No cleanup level available.
(i) Ecology Acute Freshwater Surface Water Quality Standards (WAC 173-201A).
(j) National Toxics Rule for consumption of organisms only based on 40 CFR 131.36 for a risk level of $1x10^{-5}$.

µg/l - micrograms per liter

TABLE 5-9

GROUNDWATER ANALYTICAL RESULTS - TPHs AND VOCs
Former Tacoma Metals Facility

Sample Designation	Sample Date	TPHs (mg/l)[a]			Volatile Organic Compounds (µg/l)[b]																			
		TPH-Gas	TPH-Diesel	TPH-Motor Oil	Benzene	Toluene	Ethyl-benzene	Total xylenes	Naphth-alene	Chloro-benzene	Carbon Disulfide	Acetone	Methylene Chloride	P-Isopropy-toluene	1,1,1,2-Tetra chloroethane	1,3,5 Trimethyl benzene	1,2,4 Trimethyl benzene	Isopropyl-benzene	n-Propyl benzene	4-Isopropy toluene	n-Butyl benzene	Styrene	1,4, Dichloro-benzene	1,1 Dichloro-ethane
MW-1	3/14/00	<0.05[c]	<0.25	<0.50	<5	<5	<5	<15	<5	<5	---	<150	<5	<5	<5	<5	<5	<5	<5	---	<5	<5	<5	<5
	11/21/00	<0.25	<0.25	<0.50	<0.2	<0.2	<0.2	<0.6	<0.5	<0.2	<0.2	1.8	<0.3	---	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	3/5/01	<0.25	<0.25	<0.50	<1.0	<1.0	<1.0	<2.0	<5.0	<1.0	<1.0	<5.0	<2.0	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-2	3/14/00	<0.05	<0.25	<0.50	<5	<5	<5	<15	<5	<5	---	<150	<5	<5	<5	<5	<5	<5	<5	—	<5	<5	<5	<5
	11/21/00	<0.25	<0.25	<0.50	<0.2	<0.2	<0.2	<0.6	<0.5	<0.2	<0.2	<1.0	<0.3	---	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2
	3/5/01	<0.25	<0.25	<0.50	<1.0	<1.0	<1.0	<2.0	<5.0	<1.0	<1.0	<5.0	<2.0	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-4(R)[d]	5/11/00	---[e]	0.42	<0.50	<2	<2	<2	<6	<2	<2	---	<20	<2	5	<2	<2	<2	<2	<2	---	<2	<2	<2	<2
	11/20/00	<0.25	0.56	<0.50	<1.0	<1.0	<1.0	<2.0	<5.0	<1.0	<1.0	<5.0	<2.0	—	<1.0	<1.0	<1.0	<1.0	<1.0	10	<1.0	<1.0	<1.0	<1.0
	3/5/01	<0.25	0.67	<0.50	<1.0	<1.0	<1.0	<2.0	<5.0	<1.0	<1.0	<5.0	<2.0	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-5	3/14/00	<0.05	<0.25	<0.50	<5	<5	<5	<15	<5	<5	---	<150	<5	<5	<5	<5	<5	<5	<5	---	<5	<5	<5	<5
	11/21/00	<0.25	0.62	<0.50	<0.2	<0.2	<0.2	<0.6	<0.5	<0.2	<0.2	1.7	<0.3	---	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	3/5/01	<0.25	0.76	<0.50	<1.0	<1.0	<1.0	<2.0	<5.0	<1.0	<1.0	<5.0	<2.0	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-6	3/14/00	<0.05	<0.25	<0.50	<5	<5	<5	<15	<5	36	—	<150	<5	<5	<5	<5	<5	<5	<5	—	<5	<5	<5	<5
	11/21/00	<0.25	1.2	<0.50	<0.2	<0.2	<0.2	<0.6	<5.0	72	0.3	1.3	<0.3	---	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.4	<0.2
	3/5/01	<0.25	1.0	<0.50	<1.0	<1.0	<1.0	<2.0	<5.0	88	<1.0	<5.0	<2.0	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-7	3/14/00	<0.05	<0.25	<0.50	<5	<5	<5	<15	<5	<5	—	<150	<5	<5	<5	<5	<5	<5	<5	---	<5	<5	<5	<5
	11/21/00	<0.25	0.44	<0.50	<0.2	<0.2	<0.2	<0.6	<0.5	<0.2	<0.2	1.1	<0.3	—	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	3/6/01	<0.25	0.33	<0.50	<1.0	<1.0	<1.0	<2.0	<5.0	<1.0	<1.0	<5.0	<2.0	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-8(R)/MW-800[f]	5/12/00	---	4.1	<0.50	23	47	220	880	2000	<2	---	<20	<2	38	<2	120	<2	58	<2	—	10	<20	<2	<2
	11/20/00	***29/30***	4/3.8	<0.50/<0.50	23/25	98/100	280/280	1,560/1,680	***8,500/7,200***	<0.2/<0.2	<0.2/<0.2	4.2/4.5	<0.3/<0.3	---	<0.2/<0.2	170/180	520/540	59/59	12/12	45/44	12M/<0.2	<0.2/<0.2	<0.2/<0.2	<0.2/<0.2
	3/6/01	***38/39***	3.8/3.7	<0.50/<0.50	24/25	70/61	190/190	1,070/1,000	***5,600/6,000***	<10/<10	<10/<10	<50/<50	<20/<20	---	<10/<10	150/150	430/420	44/44	<10/<10	34/34	<10/<10	<10/<10	<10/<10	<10/<10
MW-9	5/11/00	---	<0.25	<0.50	<2	<2	<2	<6	<2	16	—	<20	<2	<2	<2	<2	<2	<2	<2	—	<2	<2	<2	<2
	11/21/00	<0.25	0.52	<0.50	<0.2	<0.2	1.8	2.4	43	11	<0.2	<1.0	<0.3	---	<0.2	0.2	1.5	0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	3/5/01	<0.25	0.63	<0.50	<1.0	<1.0	<1.0	<2.0	6.0	19	<1.0	<5.0	<2.0	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-10	11/20/00	0.42	1.3	<0.50	0.6	0.4	0.6	2.1	96	<0.2	<0.2	1.5	<0.3	---	<0.2	0.6	1.8	0.9	0.3	5.8	<0.2	<0.2	<0.2	<0.2
	3/6/01	0.39	1.1	<0.50	1.2	<1.0	<1.0	1.6	29	<1.0	<1.0	<5.0	<2.0	---	<1.0	<1.0	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-11	11/20/00	***1.9***	3.6	<0.50	1.5	1.4	6.6	12.5	1,100	<0.2	<0.2	3.7	<0.3	---	<0.2	6.0	17	3.8	2.2	14	<0.2	<0.2	<0.2	<0.2
	3/6/01	***2.5***	3.1	<0.50	<5.0	<5.0	7.6	12.1	550	<5.0	<5.0	<25	<10	---	<5.0	<5.0	14	<5.0	<5.0	28	<5.0	<5.0	<5.0	<5.0
MW-12	11/20/00	<0.25	0.64	<0.50	<1.0	<1.0	<1.0	<2.0	11	<1.0	<1.0	<5.0	<2.0	---	<1.0	<1.0	<1.0	<1.0	<1.0	4.5	<1.0	<1.0	<1.0	<1.0
	3/6/01	<0.25	1	1.4	<1.0	<1.0	<1.0	<2.0	<5.0	<1.0	<1.0	<5.0	<2.0	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MTCA Method B Surface Water Cleanup Level[g]		NA[h]	NA	NA	43	48,500	6,910	NA	9,880	5,030	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.86	NA
MTCA Method C Surface Water Cleanup Level[g]		NA	NA	NA	1,070	121,000	17,300	NA	24,700	12,600	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	121	NA
Ecology Acute Freshwater Surface Water Quality Standard[i]		NA	NA	NA	5,300	17,500	32,000	NA	2,300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
National Toxics Rule for Consumption of Organisms[j]		NA	NA	NA	710	2,000,000	290,000	NA	NA	210,000	NA	NA	16,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	26,000	NA
Ecology Model NPDES Permit Standard[k]		1	10	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Analytes detected in samples at concentrations exceeding one or more of the cleanup levels or comparison values are shown in bold and italics.

Notes:
(a) Samples were analyzed for total petroleum hydrocarbons (TPHs) by Ecology Methods NWTPH-Gas and NWTPH-Diesel (extended).
(b) Groundwater samples were analyzed for volatile organic compounds (VOCs) by EPA Method 8260.
(c) "<" denotes analyte was not detected at the indicated reporting limit.
(d) "R" Replacement well.
(e) "—" Sample not tested for indicated analyte.
(f) Sample MW-800 is a duplicate sample collected from well MW-8(R).
(g) MTCA Method B and C surface water cleanup levels based on CLARC II, dated February 1996.
(h) "NA" = No cleanup level available.
(i) Ecology Acute Freshwater Surface Water Quality Standards (WAC 173-201A).
(j) National Toxics Rule for consumption of organisms only based on 40 CFR 131.36 for a risk level of $1x10^{-6}$.
(k) Ecology's Model National Pollutant Discharge Elimination System (NPDES) Permit Standard for discharges to surface water from leaking underground storage tank (LUST) cleanups where gasoline or diesel fuel are the pollutants of concern.

mg/l - milligrams per liter
µg/l - micrograms per liter

TABLE 5-8

GROUNDWATER ANALYTICAL RESULTS - PAHs
Former Tacoma Metals Facility

Sample Designation	Sample Date	PAHs (µg/l)[a]									cPAHs (ug/l)[a][b]							
		Naphth-alene	Acenaph-thlyene	Acenaph-thene	Fluorene	Phenan-threne	Anth-racene	Fluoran-thene	Pyrene	Benzo (g,h,i) perylene	Chrysene	Benzo (b)-fluoranthene	Benzo (k)-fluoranthene	Benzo (a)-pyrene	Indeno (1,2,3-cd) pyrene	Dibenz (a,h)-anthracene	Benzo (a)-anthracene	Total cPAHs[b]
MW-1	3/14/00	<0.02[c]	<0.02	0.09	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.07
	11/21/00	0.09J	<0.10	0.26	<0.10	0.09J	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.35
	3/5/01	<0.10	<0.10	0.22	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.35
MW-2	3/14/00	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.07
	11/21/00	0.08J	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.35
	3/5/01	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.35
MW-4(R)[d]	5/11/00	<0.02	<0.02	0.30	0.05	<0.02	<0.02	0.04	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.07
	11/20/00	2.4	<0.10	0.54	0.17	0.21	0.05J	0.10	0.06J	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.35
	3/5/01	0.13	<0.10	0.34	0.08J	0.10	<0.10	0.10	0.06J	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.35
MW-5	3/14/00	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.07
	11/21/00	0.40	<0.10	0.06J	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.35
	3/5/01	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.35
MW-6	3/14/00	0.17	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.07
	11/21/00	0.12	<0.10	0.09J	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.35
	3/5/01	0.10	<0.10	0.15	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.35
MW-7	3/14/00	<0.02	<0.02	0.25	0.11	<0.02	0.03	0.08	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.07
	11/21/00	0.19	<0.10	0.79	0.28	0.06J	0.13	0.26	0.16	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.35
	3/6/01	0.12	<0.10	0.72	0.28	0.06J	0.13	0.20	0.13	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.35
MW-8(R)/MW-800[e]	5/12/00	***6200***	2.1	130	68	50	38	3.9	2.5	<0.02	***0.32***	***0.05***	***0.06***	***0.06***	<0.02	<0.02	***0.30***	***0.81***
	11/20/00	***6,200/5,600***	3/2.9	220/200	100/95	70/65	5.2/4.9	5.9/6.2	2.9/2.8	<0.10/<0.10	***0.17/0.18***	<0.10/<0.10	<0.10/<0.10	<0.10/<0.10	<0.10/<0.10	<0.10/<0.10	***0.18/0.19***	***0.6/0.62***
	3/6/01	***4,500/4,000***	3.6M/3.6M	210/190	88/79	60/54	5.0/4.9	5.4/4.7	3.0/2.5	<0.10/<0.10	***0.21M/0.13***	***0.06J***/<0.10	***0.05J***/<0.10	***0.06MJ***/<0.10	<0.10/<0.10	<0.10/<0.10	***0.29/0.19***	***0.77/0.57***
	5/14/01[f]	***4,900***	2.8	140	<50	<50	2.7	1.1	0.57	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.35
MW-9	5/11/00	0.07	<0.02	0.46	0.06	0.15	0.07	0.12	0.10	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.07
	11/21/00	28	<0.10	3.9	1.1	0.77	0.15	0.32	0.22	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.35
	3/5/01	4.9	<0.10	1.4	0.37	0.60	0.20	0.40	0.30	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.35
MW-10	11/20/00	63	0.44	96	50	66	8	10	7.9	0.11	***0.59***	***0.27***	***0.21***	***0.28***	***0.11***	<0.10	***0.70***	***2.21***
	3/6/01	7	0.86M	68	36	46	6.9	8.5	8.9	0.31	***1.2***	***0.56***	***0.63***	***0.71***	***0.26***	***0.09MJ***	***1.4***	***4.85***
	5/14/01[f]	3.7	<0.10	18	9.9	9.9	1.4	1.2	0.76	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	***0.11***	***0.41***
MW-11	11/20/00	0.46M	2.4Y	340	190	230	26	38	30	0.75	***4.0M***	***1.8***	***1.5***	***1.8***	***0.72***	***0.23***	***4.8***	***14.85***
	3/6/01	280	2.2M	210	140	170	16	18	18	0.26	***1.1***	***0.52***	***0.51***	***0.65***	***0.23***	***0.07MJ***	***1.8***	***4.88***
	5/14/01[f]	0.28	<0.10	0.23	<0.10	<0.10	0.11	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.35
MW-12	11/20/00	1.3	<0.10	2.3	0.83	0.25	0.14	0.24	0.14	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.35
	3/6/01	2.1	<0.10	2	0.82	0.11	0.13	0.18	0.11	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.35
MTCA Method B Surface Water Cleanup Level[g]		9,880	NA[h]	643	3,460	NA	25,900	90.2	2,590	NA	0.0296 (1)	0.0296 (1)	0.0296 (1)	0.0296 (1)	0.0296 (1)	0.0296 (1)	0.0296 (1)	0.0296 (1)
MTCA Method C Surface Water Cleanup Level[g]		24,700	NA	1,610	8,640	NA	64,800	225	6,480	NA	0.740 (1)	0.740 (1)	0.740 (1)	0.740 (1)	0.740 (1)	0.740 (1)	0.740 (1)	0.740 (1)
Ecology Acute Freshwater Surface Water Quality Standard[i]		2,300	NA	1,700	NA	NA	NA	3,980	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
National Toxics Rule for Consumption of Organisms[j]		NA	NA	NA	$1.4x10^5$	NA	$1.1x10^6$	3,700	$1.1x10^5$	NA	0.31 (1)	0.31 (1)	0.31 (1)	0.31 (1)	0.31 (1)	0.31 (1)	0.31 (1)	0.31 (1)

Analytes detected in samples at concentrations exceeding one or more of the cleanup levels or comparison values are shown in bold and italics.

Notes:
(a) Samples were analyzed for polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270B GC/MS SIM.
(b) The total probable carcinogenic polycyclic aromatic hydrocarbons (cPAHs) were calculated by summing the concentrations of all the probable cPAHs. If a probable cPAH was not detected in the sample, a value equal to one-half the reporting limit was used.
(c) "<" denotes analyte was not detected at the indicated reporting limit.
(d) "R" replacement well.
(e) Sample MW-800 is a duplicate sample collected from well MW-6(R).
(f) Samples were field filtered.
(g) MTCA Method B and C surface water cleanup levels based on CLARC II, dated February 1996. "(1)" denotes practical quantification limit (PQL) is greater than cleanup level or standard (Ecology 1993).
(h) "NA" = No cleanup level is available.
(i) Ecology Acute Freshwater Surface Water Quality Standards (WAC 173-201A).
(j) National Toxics Rule for consumption of organisms only based on 40 CFR 131.36 for a risk level of $1x10^{-5}$. "(1)" denotes practical puantification limit (PQL) is greater than cleanup level or standard (Ecology 1993).

Qualifiers:
J: Indicates an estimated concentration when the value is less than the calculated reporting limit.
M: Indicates an estimated value of analyte found and confirmed by analyst but with low spectral match.

µg/l - micrograms per liter

Figures

TABLE 5-10

GROUNDWATER ANALYTICAL RESULTS - GENERAL WATER QUALITY PARAMETERS

Former Tacoma Metals Facility

Sample Designation	Sample Date	Total Metals (mg/l)[a]						Water Quality Parameters			
		Calcium	Iron	Manganese	Potassium	Sodium	Hardness	Total Dissolved Solids (mg/l)[b]	Sulfate (mg/l)[c]	pH (Std. Units)	Conductivity (umhos/cm)
MW-1	11/29/00	30.8	36.8	0.746	9	23.6	140	300	13	---[d]	---
	3/5/01	25.9	31.7	14.4	7.3	18	120	250	30	6.26	350
MW-2	11/29/00	35.7	14.1	0.309	17.8	277	290	910	72		
	3/5/01	32.5	10.2	45.7	16.2	289	270	1,100	65	6.43	2,100
MW-5	11/29/00	31.7	6.22	0.627	6.3	20.2	210	320	14	---	---
MW-8(R)[e]	11/29/00	10	26.2	0.365	8.3	14.3	78	290	45	---	---
	3/6/01	10.5	28.4	0.393	9.4	14.5	88	280	52	6.31	340
MW-11	3/6/01	22.4	6.16	0.557	2.9	13.1	92	180	18	6.19	260

Notes:

(a) Groundwater samples were analyzed for total metals by EPA Methods 6010/7000 series.
(b) Total dissolved solids (TDS) were analyzed by referencing EPA Method 160.1.
(c) Sulfates were analyzed by referencing EPA Method 375.2.
(d) "---" Sample not analyzed for indicated parameter.
(e) "R" - Replacement well.

mg/l - milligrams per liter
Std Units - Standard units
umhos/cm - micromhos per centimeter

TABLE 6-1
SURFACE WATER ANALYTICAL RESULTS
Former Tacoma Metals Facility

Analyte	Sample Designation				MTCA Method B[a]	MTCA Method C[a]	Ecology Standard[b]	National Toxics Rule[c]	Ecology Model NPDES[d]
	SW-1		SW-2						
Total Metals (µg/l)[e]	3/13/01	4/29/01	3/13/01	4/29/01					
Arsenic	<50[f]	<50	<50	<50	0.00982	2.46	360	1.4	NA
Barium	175	49	57	27	NA[g]	NA	NA	NA	NA
Cadmium	***8***	***2***	***8***	***5***	20.3	50.6	1.04[h]	NA	NA
Chromium	127	8	7	<5	NA	NA	210.28[h]	NA	NA
Copper	***2,070***	***437***	***410***	***231***	2,660	6,660	5.64[h]	NA	NA
Lead	***8,090***	***360***	***250***	<20	NA	NA	17.68[h]	NA	NA
Mercury	***9.4***	0.9	0.7	0.3	NA	NA	2.10	1.5	NA
Selenium	<50	<50	<50	<50	NA	NA	20	NA	NA
Silver	***6***	<3	<3	<3	25,900	64,800	0.46[h]	NA	NA
Dissolved Metals (µg/l)[i]									
Arsenic	<50	<50	<50	<50	0.00982	2.46	360	1.4	NA
Barium	12	21	35	27	NA	NA	NA	NA	NA
Cadmium	<2	<2	***8***	***5***	20.3	50.6	1.04[h]	NA	NA
Chromium	<5	<5	***<5***	<5	NA	NA	210.28[h]	NA	NA
Copper	***90***	***181***	***172***	***240***	2,660	6,660	5.64[h]	NA	NA
Lead	<20	<20	<20	<20	NA	NA	17.68[h]	NA	NA
Mercury	<0.1	0.2	0.1	0.2	NA	NA	2.10	1.5	NA
Selenium	<50	<50	<50	<50	NA	NA	20	NA	NA
Silver	<3	<3	<3	<3	25,900	64,800	0.46[h]	NA	NA
PCBs (µg/l)[j]									
Aroclor 1016	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA
Aroclor 1242	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA
Aroclor 1248	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA
Aroclor 1254	2.7	1.8	1.0	<1.0	NA	NA	NA	NA	NA
Aroclor 1260	2.1	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA
Aroclor 1221	<2.0	<2.0	<2.0	<2.0	NA	NA	NA	NA	NA
Aroclor 1232	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA
Total PCBs[k]	***7.8***	***5.3***	***4.5***	***4***	2.70E-05	6.74E-04	2	0.0017	NA
TPH (mg/l)[l]									
Diesel	1.8	3.2	2	2.8	NA	NA	NA	NA	10
Motor Oil	2.9	3.2	2.6	1.4	NA	NA	NA	NA	10
PAHs (µg/l)[m]									
Naphthalene	0.63	0.5	0.12	<0.10	9,880	24,700	2,300	NA	NA
2-Methylnaphthalene	0.33	0.24	<0.10	<0.10	NA	NA	NA	NA	NA
Acenaphthylene	0.33	0.24	<0.10	<0.10	NA	NA	NA	NA	NA
Acenaphthene	0.37	0.33	0.15	<0.10	643	1,610	1,700	NA	NA
Fluorene	0.36	0.27	0.1	<0.10	3,460	8,640	NA	140,000	NA
Phenanthrene	0.99	0.74	0.24	<0.10	NA	NA	NA	NA	NA
Anthracene	0.81	0.69	<0.10	<0.10	25,900	64,800	NA	1,100,000	NA
Fluoranthene	2.0	1.1	0.28	<0.10	90.2	225	3,980	3,700	NA
Benzo(g,h,i)perylene	0.59	0.36	<0.10	<0.10	NA	NA	NA	NA	NA
Dibenzofuran	0.39	0.29	0.08J[n]	<0.10	NA	NA	NA	NA	NA
Pyrene	2.1	1.2	0.17	<0.10	2,590	6,480	NA	110,000	NA
Benzo(a)anthracene[o]	***0.71***	***0.34***	***0.08J***	<0.10	0.0296 (1)	0.740 (1)	NA	0.31 (1)	NA
Chrysene[o]	***1.8***	***1.4***	***0.11***	<0.10	0.0296 (1)	0.740 (1)	NA	0.31 (1)	NA
Benzo(b)fluoranthene[o]	***1.0***	***0.73***	<0.10	<0.10	0.0296 (1)	0.740 (1)	NA	0.31 (1)	NA
Benzo(k)fluoranthene[o]	***1.2***	***0.70***	<0.10	<0.10	0.0296 (1)	0.740 (1)	NA	0.31 (1)	NA
Benzo(a)pyrene[o]	***1.0***	***0.44***	<0.10	<0.10	0.0296 (1)	0.740 (1)	NA	0.31 (1)	NA
Indeno(1,2,3-cd)pyrene[o]	***0.71***	***0.36***	<0.10	<0.10	0.0296 (1)	0.740 (1)	NA	0.31 (1)	NA
Dibenz(a,h)anthracene[o]	***0.2***	***0.12***	<0.10	<0.10	0.0296 (1)	0.740 (1)	NA	0.31 (1)	NA
Total cPAHs[o,p]	***6.62***	***4.09***	***0.44***	0.35	0.0296 (1)	0.740 (1)	NA	0.31 (1)	NA

Analytes detected in samples at concentrations exceeding one or more of the cleanup levels or comparison values are shown in bold and italics.

Notes:

(a) MTCA Method B and C surface water cleanup levels based on CLARC II, dated February 1996. "(1)" denotes pratical quantification limit (PQL) is greater than cleanup level or standard (Ecology 1993).

(b) Ecology Acute Freshwater Surface Water Quality Standards (WAC 173-201A).

(c) National Toxics Rule based on 40 CFR 131.36 for a risk level of $1x10^{-5}$. "(1)" denotes pratical quantification limit (PQL) is greater than cleanup level or standard (Ecology 1993).

(d) Ecology's Model National Pollutant Discharge Elimination System (NPDES) Permit Standard for discharges to surface water from leaking underground storage tank (LUST) cleanups where gasoline or diesel fuel are the pollutants of concern.

TABLE 6-1

SURFACE WATER ANALYTICAL RESULTS
Former Tacoma Metals Facility

(e) Surface water samples were analyzed for total metals by EPA Methods 6010/7000 series.
(f) "<" denotes analyte was not detected at the indicated reporting limit.
(g) "NA" = No cleanup level is available.
(h) Surface Water Quality Standard is based on an average groundwater hardness of 31 mg/L.
(i) Surface water samples for dissolved metals were field filtered and analyzed by EPA Methods 6010/7000 series.
(j) Surface water samples were analyzed for polychlorinated biphenyls (PCBs) by EPA Method 8082.
(k) The total polychlorinated biphenyls (PCBs) were calculated by summing the concentrations of all the probable PCBs. If a probable PCB was not detected, a value equal to one-half the reporting limit was used.
(l) Suface water samples were analyzed for total petroleum hydrocarbons (TPHs) by the Ecology Method NWTPH-Diesel (extended).
(m) Method A groundwater cleanup levels used when Method B surface water cleanup levels are not available.
(n) Surface water samples were analyzed for polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270B GC/MS SIM.
(o) "J" indicates an estimated concentration when the value is less than the calculated reporting limit.
(p) Carcinogenic polycyclic aromatic hydrocarbons (cPAHs).
(q) The total cPAHs were calculated by summing the concentrations of all the probable cPAHs. If a probable cPAH was not detected in the sample, a value equal to one-half the reporting limit was used.

mg/l - milligrams per liter
µg/l - micrograms per liter

TABLE 8-1

RATIONALE FOR SELECTION OF CHEMICALS OF CONCERN FOR UNSATURATED ZONE MODELING
Former Tacoma Metals Facility

Group	Chemical	Selection Rationale
PAHs[a]	Naphthalene	• Most mobile noncarcinogenic PAH detected in the subsurface based on relatively low sorption (surrogate for high mobility PAHs in modeled area).
	Chrysene	• Carcinogenic PAH (cPAH). • Higher mobility relative to other cPAHs. • Present in soil in modeled area above MTCA Method C industrial soil cleanup level of 18 mg/kg[b].
	Benzo(a)pyrene	• Carcinogenic PAH (cPAH). • Relatively lower mobility than other detected cPAHs. • Present in soil in modeled area above MTCA Method C industrial soil cleanup level of 18 mg/kg.
	Benzo(b)fluoranthene Benzo(k)fluoranthene Dibenz(a,h)anthracene Benzo(a)anthrecene	• Carcinogenic PAHs (cPAHs) detected in site soil. • Present in modeled area above MTCA Method C industrial soil cleanup level of 18 mg/kg.
Metals	Lead	• Human carcinogen. • Present in soil in modeled area above MTCA Method A industrial soil cleanup level of 1,000 mg/kg.
	Chromium	• Present in soil in modeled area above MTCA Method A industrial soil cleanup level of 500 mg/kg.
	Arsenic Copper Mercury	• Metals not detected at site at concentrations above soil cleanup levels; however, these metals are generally considered to be of high environmental concern and were selected to evaluate whether they may leach to groundwater at elevated levels. • Copper was selected since it was detected in soil sample TP-22 at a relatively high concentration of 13,000 mg/kg in 0-1 foot sample and 20,200 mg/kg in 2-3 feet sample.
PCBs[c]	Aroclor 1248 Aroclor 1254 Aroclor 1260	• Human carcinogens. • Selected Aroclors are those PCBs detected in soil at highest concentrations.

Notes:
(a) PAHs – Polycyclic aromatic hydrocarbons.
(b) mg/kg – milligrams per kilogram.
(c) PCBs – Polychlorinated biphenyls.

TABLE 8-2

SUMMARY OF CHEMICAL INPUT VALUES USED FOR MODEL SIMULATIONS

Former Tacoma Metals Facility

Analyte	Chemical Input Parameters		
	K_{oc} (ml/g)[a]	K_h (dimensions)	D_i (m^2/d)[b]
PAHs			
Naphthalene	5.5×10^4	0.019	0.51
Chrysene	1.3×10^7	0.0001	0.21
Benzo(b)flouranthene	5.3×10^7	0.001	0.195
Benzo(k)flouranthene	5.6×10^7	2.2×10^{-6}	0.195
Benzo(a)pyrene	8.5×10^7	0.0001	0.37
Dibenz(a,h)anthracene	3.3×10^6	3.0×10^{-6}	0.17
Benzo(a)anthracene	1.85×10^7	0.0001	0.44
PCBs			
Aroclor 1248	1.16×10^7	0.089	0
Aroclor 1254	3.8×10^7	0.015	0
Aroclor 1260	8.2×10^7	0.032	0
Metals			
Arsenic	29	0	0
Chromium	2.5×10^6	0	0
Copper	22	0	0
Lead	10,000	0	0
Mercury	82	0	0

Notes:

K_{oc} - Organic carbon-normalized soil partition coefficient.

K_h - Henry's Law Constant.

D_i - Free air diffusion coefficient.

(a) ml/g - milliliters per gram.

(b) m^2/d - square meters per day.

TABLE 8-3

SUMMARY RESULTS FOR DOWNWARD MIGRATION
Former Tacoma Metals Facility

Analyte	Predicted Concentrations After 500 Years of Simulation (µg/l)[a]
PAHs	
Naphthalene	$1x10^{-4}$
Chrysene	$6x10^{-11}$
Benzo(b)flouranthene	$2x10^{-11}$
Benzo(k)flouranthene	$4x10^{-14}$
Benzo(a)pyrene	$1x10^{-12}$
Dibenz(a,h)anthracene	$4x10^{-12}$
Benzo(a)anthracene	$2x10^{-11}$
PCBs	
Aroclor 1248	$8x10^{-23}$
Aroclor 1254	$1x10^{-23}$
Aroclor 1260	$1x10^{-24}$
Metals	
Arsenic	$3x10^{-9}$
Chromium	$4x10^{-18}$
Copper	$2x10^{-5}$
Lead	5
Mercury	$7x10^{-10}$

Note:

(a) µg/l = micrograms per liter

TABLE 8-4

SUMMARY OF KEY INPUT VALUES USED IN GROUNDWATER MIGRATION MODEL
Former Tacoma Metals Facility

Input Parameter	Benzene	Naphthalene	Total cPAHs	Reference
Hydraulic conductivity (cm/s)[a]	0.05 or 0.011	0.05 or 0.011	0.05 or 0.011	The 0.05 value is based on a site maximum value of 140 feet per day reported by Pacific Groundwater Group (1992) for the deltaic sand unit encountered at the site. The 0.011 value is based on slug tests performed at well MW-8(R).
Hydraulic gradient	0.008	0.008	0.008	Based on low tide water levels observed at the site on 13 February 2001.
Porosity	0.49	0.49	0.49	See Table 3-1.
Plume length (ft)	300	300	300	Approximate distance along the groundwater flow path between well MW-8(R) and the river.
Organic carbon-normalized soil partition coefficient (K_{oc}) (ml/g)[b]	70	5.5×10^4	3.3×10^6	Mackay et. al (1999).
Soil bulk density (g/ml)[c]	1.35	1.35	1.35	See Section 8.2.1.6.
Fraction organic carbon (F_{oc})	0.03	0.03	0.03	See Section 8.2.1.6.
Simulation time (years)	30	30	30	Assumed to represent a reasonable remediation time frame.
Source thickness (feet)	10	10	10	Assumed as a reasonable overall depth of groundwater containing the selected compounds.
Beginning concentration (mg/l)[d]	2.4×10^{-2}	6.825	6.2×10^{-4}	Average of values measured in well MW-8(R) samples collected in May and November 2000 and March 2001.
Source life	Infinite	Infinite	Infinite	A conservative assumption.

Notes:
(a) cm/s – centimeter per second.
(b) ml/g – milliters per gram.
(c) g/ml – grams per millilter.
(d) mg/l – milligrams per liter.

TABLE 9-1

SUMMARY OF ANALYTES EXCEEDING MTCA CLEANUP LEVELS AND/OR CHEMICAL-SPECIFIC ARARs IN SOIL, SHALLOW GROUNDWATER, AND SURFACE WATER
Former Tacoma Metals Facility

Media/Chemicals	Analytical Units	Concentration Range (Remedial Investigation)	Concentration Range (Previous Investigations)	Cleanup Level/ Chemical-Specific ARAR	Basis
Soil					
Lead	mg/kg	<10 – 14,700	<10 – 32,000	1,000	Method A Industrial Soil Cleanup Level[a]
Chromium	mg/kg	0.9 – 2,520	11 – 340	500	Method A Industrial Soil Cleanup Level[a]
Total PCBs	mg/kg	0.14 – 40.11	<0.11 – 43.73	17	MTCA Method C Industrial Soil Cleanup Level[b]
TPH (diesel range)	mg/kg	<5.2 – 23,000	<5 – 2,400	2,000	MTCA Method A Industrial Soil Cleanup Level (Amended)[c]
TPH (motor oil range)	mg/kg	<10 – 12,000	<25 – 1,500	2,000	MTCA Method A Industrial Soil Cleanup Level (Amended)[c]
Total cPAHs	mg/kg	0.169 – 730	1.48 – 28.2	18	MTCA Method C Industrial Soil Cleanup Level[b]
Shallow Groundwater					
TPH (gasoline range)	µg/l	<50 – 39,000	<3,000 – 18,000	1,000	Ecology Model NPDES Permit for Surface Water Discharge[d]
Total cPAHs (unfiltered)	*µg/l*	*0.07 – 14.85*	*0.12 – 0.78*	*0.31*	*National Toxics Rule for Consumption of Organisms[e]*
Total cPAHs (filtered)	µg/l	<0.10 – 0.11	- - - [f]	0.31	National Toxics Rule for Consumption of Organisms[e]
Naphthalene	µg/l	<0.5 – 8,500	<0.50 – 99	2,300	Ecology Freshwater Acute SWQS[g]
Total PCBs	*µg/l*	*0.35 – 11.3*	- - -	*2.70E – 05*	*MTCA Method B Surface Water Cleanup Levels[h]*
Selenium (Dissolved)	*µg/l*	*<50 – 70*	- - -	*20*	*Ecology Acute Freshwater SWQS[g]*
Surface Water					
Cadmium (Total)	µg/l	2 – 8	<2	1.04	Ecology Acute Freshwater SWQS[g][i]
Cadmium (Dissolved)	µg/l	<2 – 8	- - -	1.04	Ecology Acute Freshwater SWQS[g][i]
Copper (Total)	µg/l	231 – 2,070	- - -	5.64	Ecology Acute Freshwater SWQS[g][i]
Copper (Dissolved)	µg/l	90 – 240	- - -	5.64	Ecology Acute Freshwater SWQS[g][i]
Lead (Total)	µg/l	<20 – 8,090	1	17.68	Ecology Acute Freshwater SWQS[g][i]
Mercury (Total)	µg/l	0.3 – 9.4	- - -	2.10	Ecology Freshwater Acute SWQS[g]
Silver (Total)	µg/l	<3 - 6	- - -	0.46	Ecology Acute Freshwater SWQS[g][i])
Total PCBs	µg/l	4 – 7.8	- - -	2	Ecology Freshwater Acute SWQS[g]
Total cPAHs	µg/l	0.35 – 6.62	0.12	0.31	National Toxics Rule for Consumption of Organisms[e]

TABLE 9-1

SUMMARY OF ANALYTES EXCEEDING MTCA CLEANUP LEVELS AND/OR CHEMICAL-SPECIFIC ARARs IN SOIL, SHALLOW GROUNDWATER, AND SURFACE WATER
Former Tacoma Metals Facility

Notes:

(a) Method A Industrial Soil Cleanup Level is based on WAC 173-340-745(2), Table 3.
(b) Method C Industrial Soil Cleanup Level is based on WAC 173-340-745(4) and MTCA Cleanup Levels and Risk Calculations (CLARC II, February 1996).
(c) Method A Industrial Soil Cleanup Level is based on Amended WAC 173-340-745(3), Table 745-1.
(d) Ecology's Model National Pollutant Discharge Elimination System (NPDES) Permit for discharges from cleanups at leaking underground storage tank sites containing diesel contamination based on WAC 173-226.
(e) National Toxics Rule is based on 40 CFR 131.36 for a risk level of 1×10^{-5}.
(f) "- - -" = Sample not tested for selected analyte.
(g) Ecology Acute Freshwater Ambient Surface Water Quality Standards (SWQS) are based on WAC 173-201A.
(h) Method B Surface Water Cleanup Levels is based on WAC 173-340-730(3) and MTCA Cleanup Levels and Risk Calculations (CLARC II, February 1996).
(i) Based on an average surface water hardness of 31 mg/l.

mg/l - milligrams per liter
µg/l - micrograms per liter

Italicized chemicals are considered to be anomalous and not representative of site groundwater quality. Analytical results presented were either not reproducible in multiple monitoring events, or the samples were impacted by suspended entrained soil particles.

TABLE 9-2

POTENTIAL ACTION-SPECIFIC ARARs
Former Tacoma Metals Facility

Federal Citation	State Citation	Description	Potential Requirement	Justification
29 CFR 1910.120	WAC 296-62	General safety and health standards for workers, including requirements for responses involving hazardous substances.	Applicable	Required for protection of remedial action workers.
40 CFR 50.6 and .12 40 CFR 60.5	WAC 173-400 WAC 173-460 WAC 173-470 PSAPCA Regulations I, II, and III	General regulations for air pollution sources; particulate matter emissions standards; control standards for toxic air pollutants.	Applicable	Applicable for remedial processes emitting air pollutants.
40 CFR 262.12, 262.20 through .33, and 262.40 through .43	WAC 173-303-160, 170, 180, 190, 210, and 220	Requirements for generators of hazardous and dangerous waste.	Applicable	Required if hazardous or dangerous wastes are transported offsite.
40 CFR 268	WAC 173-303-140	Land disposal restrictions.	Applicable	Applicable if dangerous wastes are disposed in an offsite landfill.
None	WAC 173-304	Standards for disposal of solid waste.	Applicable	Applicable for disposal of solid waste.
49 CFR 107, 171 through 179	WAC 446-50	Transportation regulations for hazardous materials.	Applicable	Applicable for offsite transportation of dangerous or hazardous waste.
None	WAC 173-160 WAC 173-162	Regulations for construction and maintenance of new water wells; licensing of drillers.	Applicable	Applicable for new and existing wells.
None	WAC 173-340-360	Model Toxics Cleanup Act (MTCA) requirements for selection of cleanup actions.	Applicable	Regulations outline requirements for hazardous substance cleanups.
None	WAC 173-340-410	MTCA requirements regarding compliance monitoring during remedial activities.	Applicable	Required for protecting human health and confirming attainment of cleanup standards.
None	WAC 173-340-440 and -702(4)	MTCA requirements regarding institutional controls to limit activities at a site that may result in exposure to hazardous substances.	Applicable	Applicable if residual concentrations exceed cleanup levels or if conditional points of compliance have been established.
None	WAC 173-340-450(2), (3), (7), and (8)	MTCA regulations regarding releases from underground storage tanks (USTs).	Applicable	Free product and chemicals associated with releases from USTs detected in the groundwater.
None	WAC 173-340-704,-705, and -706	Use of Methods A, B, and C for determining cleanup levels.	Applicable	Applicable methods for determining cleanup levels.
None	WAC 173-340-707	MTCA analytical methods for evaluating the effectiveness of a cleanup action.	Applicable	Applicable if remedial action requires chemical analyses.

TABLE 9-2

POTENTIAL ACTION-SPECIFIC ARARs
Former Tacoma Metals Facility

Federal Citation	State Citation	Description	Potential Requirement	Justification
None	WAC 173-340-708	MTCA regulation on human health risk assessment procedures.	Applicable	Required for determining site cleanup levels.
None	WAC 173-201A	Surface Water Quality Standards (SWQS) for the State of Washington	Applicable	Required for determining site cleanup levels.
None	WAC 173-340-720, -730, -740, and -745	MTCA cleanup standards for groundwater, surface water, and soil.	Applicable	Required for determining site cleanup levels.
None	WAC 197-11	Washington State Environmental Policy Act (SEPA).	Applicable	Required to ensure environmental concerns are adequately addressed.
40 CFR 131.36 (National Toxics Rule)	WAC 173-226	Regulations developed to implement the federal Clean Water Act [33 USC 466 *et seq*] and State Water Pollution Control Act for protection of aquatic life in nations waters (lakes, rivers, aquifers, and coastal areas).	Applicable	Applicable if groundwater seeps or surface water runoff discharge to the Puyallup River.

TABLE 9-3

SUMMARY OF PROPOSED SITE CLEANUP LEVELS FOR SOIL, SHALLOW GROUNDWATER, AND SURFACE WATER
Former Tacoma Metals Facility

Media/Chemicals	Analytical Units	Proposed Cleanup Level	Basis
Soil			
Lead	mg/kg	1,000	Method A Industrial Soil Cleanup Level[a]
Chromium	mg/kg	500	Method A Industrial Soil Cleanup Level[a]
Total PCBs	mg/kg	17	MTCA Method C Industrial Soil Cleanup Level[b]
TPH (diesel range)	mg/kg	2,000	MTCA Method A Industrial Soil Cleanup Level (Amended)[c]
TPH (motor oil range)	mg/kg	2,000	MTCA Method A Industrial Soil Cleanup Level (Amended)[c]
Total cPAHs	mg/kg	18	MTCA Method C Industrial Soil Cleanup Level[b]
Shallow Groundwater			
TPH (diesel range)	µg/l	10,000	Ecology Model NPDES Permit for Surface Water Discharge[d]
TPH (motor oil range)	µg/l	10,000	Ecology Model NPDES Permit for Surface Water Discharge[d]
TPH (gasoline range)	µg/l	1,000	Ecology Model NPDES Permit for Surface Water Discharge[d]
Benzene	µg/l	43	MTCA Method B Surface Water Cleanup Level[e]
Toluene	µg/l	17,500	Ecology Acute Freshwater SWQS[f]
Ethylbenzene	µg/l	6,910	MTCA Method B Surface Water Cleanup Level[e]
Total cPAHs	µg/l	0.31	National Toxics Rule for Consumption of Organisms[g]
Naphthalene	µg/l	2,300	Ecology Acute Freshwater SWQS[f]
Surface Water			
Cadmium (Total & Dissolved)	µg/l	1.04	Ecology Acute Freshwater SWQS[f][h]
Copper (Total & Dissolved)	µg/l	5.64	Ecology Acute Freshwater SWQS[f][h]
Lead (Total)	µg/l	17.68	Ecology Acute Freshwater SWQS[f][h]
Mercury (Total)	µg/l	2.10	Ecology Acute Freshwater SWQS[f]
Silver	µg/l	0.46	Ecology Acute Freshwater SWQS[f][h]
Total PCBs	µg/l	2	Ecology Acute Freshwater SWQS[f]
TPH (diesel range)	µg/l	10,000	Ecology Model NPDES Permit for Surface Water Discharge[d]
TPH (motor oil range)	µg/l	10,000	Ecology Model NPDES Permit for Surface Water Discharge[d]
TPH (gasoline range)	µg/l	1,000	Ecology Model NPDES Permit for Surface Water Discharge[d]
Benzene	µg/l	43	MTCA Method B Surface Water Cleanup Level[e]
Toluene	µg/l	17,500	Ecology Acute Freshwater SWQS[f]
Ethylbenzene	µg/l	6,910	MTCA Method B Surface Water Cleanup Level[e]
Total cPAHs	µg/l	0.31	National Toxics Rule for Consumption of Organisms[g]

Notes:

(a) Method A Industrial Soil Cleanup Level is based on WAC 173-340-745(2), Table 3.
(b) Method C Industrial Soil Cleanup Level is based on WAC 173-340-745(4) and MTCA Cleanup Levels and Risk Calculations (CLARC II, February 1996).
(c) Method A Industrial Soil Cleanup Level is based on proposed amended WAC 173-340-745(3), Table 745-1.
(d) Ecology's Model National Pollutant Discharge Elimination System (NPDES) Permit for discharges from cleanups at leaking underground storage tank sites containing diesel contamination based on WAC 173-226.
(e) Method B Surface Water Cleanup Level is based on WAC 173-340-730(3) and MTCA Cleanup Levels and Risk Calculations (CLARC II, February 1996).
(f) Ecology Acute Freshwater Ambient Surface Water Quality Standards (SWQS) are based on WAC 173-201A.
(g) National Toxics Rule is based on 40 CFR 131.36 based on a risk level of 1×10^{-5}.
(h) Based on an average surface water hardness of 31 mg/l.

TABLE 9-4

EVALUATION OF GENERAL RESPONSE ACTIONS, REMEDIAL TECHNOLOGIES, AND PROCESS OPTIONS FOR SOIL

Former Tacoma Metals Facility

General Response Action	Remedial Technologies	Process Options	Description	Evaluation Comments
Institutional Controls	Access Restrictions	Physical Restrictions	Physical restrictions (e.g., fencing and signs) limit contact with media.	**Potentially implementable.**
		Deed Restrictions	Restrictive covenants recorded in the property deed prohibit site activities (e.g., excavation) that could result in exposure to chemicals of concern.	**Potentially implementable.**
Containment	Covers	Soil	Clean soil is placed over ground surface to provide a physical barrier to chemicals of concern.	Asphalt cover selected for further evaluation.
		Clay	Low permeability clay layer overlain with soil over chemically impacted materials provides physical barrier that minimizes potential for contact and infiltration.	Not appropriate for site awaiting development.
		Concrete	Similar to clay cover description with concrete used as low permeability barrier.	Asphalt cover selected for further evaluation.
		Asphalt	Similar to clay cover description with asphalt used as low permeability barrier.	**Potentially implementable.**
		RCRA	Multi-media barrier consisting of low-permeability layer, synthetic liner, drainage layer, and vegetative cover. Performs functions similar to those described for clay cover.	Asphalt cover selected for further evaluation.
	Vertical Barriers	Slurry Wall	Subsurface vertical barrier consisting of low-hydraulic conductivity material surrounds a subsurface source to prevent chemical migration.	Not appropriate for site conditions.
		Grout Curtain	Subsurface vertical barrier consisting of low-hydraulic conductivity material is pressure injected into soil or rock. Performs function similar to slurry wall.	Not appropriate for site conditions.
		Sheet Pile Cutoff Wall	Interlocking sheet piling driven vertically into subsurface to form a low permeability barrier. Performs function similar to slurry wall.	Not appropriate for site conditions.
	Horizontal Barriers	Grout Injection	Injection of grout to form a horizontal barrier in the ground underneath chemical source to reduce the vertical movement of chemicals.	Not appropriate for site conditions.
		Block Displacement	Vertical barrier (slurry trench or grout curtain) surrounds source. Continued injection of grout through injection holes causes displacement of source and forms a barrier beneath source.	Not appropriate for site conditions.

TABLE 9-4

EVALUATION OF GENERAL RESPONSE ACTIONS, REMEDIAL TECHNOLOGIES, AND PROCESS OPTIONS FOR SOIL

Former Tacoma Metals Facility

General Response Action	Remedial Technologies	Process Options	Description	Evaluation Comments
Containment (continued)	Surface Controls	Revegetation	Planting grasses, shrubs, or trees to minimize contact with soil, reduce dust generation, and control surface water runoff.	Asphalt cover selected for further evaluation.
	Dust Suppression	Wet Suppression	Watering ground surface to control dust generation.	Asphalt cover selected for further evaluation.
		Chemical Stabilization	A suppressant sprayed on the ground binds dust and surface particles into a protective crust that minimizes dust generation.	Asphalt cover selected for further evaluation.
		Physical Stabilization	Placing a cover (e.g. rock, soil, straw) on exposed surfaces to prevent particles from becoming airborne.	Asphalt cover selected for further evaluation.
		Vegetative Stabilization	Same as revegetation above.	Asphalt cover selected for further evaluation.
		Wind Fences/Screens	Fences or screens are installed around site perimeter to block wind and reduce dust generation.	Asphalt cover selected for further evaluation.
Removal	Excavation	Backhoe, Excavators, Loaders, Dozers	Excavate material for subsequent aboveground treatment and/or disposal.	**Potentially implementable.**
Ex Situ (Aboveground) Treatment	Solidification/ Stabilization	Pozzolanic Solidification	Siliceous materials are combined with a setting agent (e.g., lime, cement, or gypsum) and soil. Treatment results in a solidified product that resists leaching.	Chemical-based stabilization selected for further evaluation.
		Chemical-Based Stabilization	Dry or liquid chemical mix which forms insoluble molecular bonds through hydroxyapaptite crystal formations with heavy metals [and polychlorinated biphenyls (PCBs)] which significantly reduces the metals leaching potential.	**Potentially implementable.**
		Organic Polymer Solidification	Urea formaldehyde and several specialty organic polymers are mixed with soil to seal chemicals in a sponge-like polymer matrix.	Chemical-based stabilization selected for further evaluation.
		Thermoplastic Microencapsulation	Mixing of heated dried soil within asphalt bitumen, paraffin, or polyethylene matrix, resulting in a solid mass suitable for land disposal.	Chemical-based stabilization selected for further evaluation.
	Physical/Chemical	Soil Washing	Removal of inorganic or organic chemicals by washing excavated soil with a liquid medium (e.g., water). The wash water may be augmented with a basic leaching agent, surfactant, pH adjustment, or chelating agent to help remove organics and heavy metals.	Other more effective treatment methods are available. Creates secondary waste stream.

TABLE 9-4

EVALUATION OF GENERAL RESPONSE ACTIONS, REMEDIAL TECHNOLOGIES, AND PROCESS OPTIONS FOR SOIL
Former Tacoma Metals Facility

General Response Action	Remedial Technologies	Process Options	Description	Evaluation Comments
Ex Situ (Aboveground) Treatment (continued)	Physical/Chemical (continued)	Organic Solvent Extraction	Removal of organics, oil, and grease from soil, using an organic solvent as the mass transfer medium and then recovering the solvent by distillation.	Other more effective treatment methods are available. Creates secondary waste stream.
		Vapor Extraction	Removal of low molecular weight organics by creating a vacuum pressure gradient in soil that causes volatile organics to transfer from soil to air stream.	Not appropriate for chemicals of concern.
		Chemical Dehalogenation	Specially synthesized chemical reagents are used to dehalogenate certain classes of chlorinated organics (e.g., PCBs).	Other more effective treatment methods are available.
		Chemical Oxidation/Reduction	Reduction/oxidation chemically converts hazardous contaminants to non-hazardous or less toxic compounds that are more stable, less mobile, and/or inert. The oxidizing agents most commonly used are ozone, hydrogen peroxide, hypochlorites, chlorine, and chlorine dioxide.	Other more effective treatment methods are available.
		Solar Detoxification	Solar detoxification is a process that destroys contaminants by photochemical and thermal reactions using the ultraviolet energy in sunlight.	Other more effective treatment methods are available.
		Separation/Sieving	Sieving and physical separation processes use different size sieves and screens to effectively concentrate contaminants into smaller volumes. Physical separation can also be used to remove undesirable materials (i.e., debris) which may impact treatment processes.	**Potentially implementable**
	Biological/ Bioremediation	Landfarming	Contaminated soil is excavated, applied into lined beds, and periodically turned over or tilled to aerate the waste.	**Potentially implementable.**
		Land Treatment	Contaminated surface soil is treated in-place by tilling to achieve aeration, and if necessary, by addition of amendments. Periodically tilling, to aerate the waste, enhances the biological activity.	Landfarm/aerobic selected from the technology group for evaluation.
		Composting	Contaminated soil is excavated and mixed with bulking agents and organic amendments such as wood chips, hay, manure, and vegetative (e.g., potato) wastes. Proper amendment selection ensures adequate porosity and provides a balance of carbon and nitrogen to promote thermophilic, microbial activity.	Landfarm/aerobic selected from the technology group for evaluation.
		Biopiles	Excavated soils are mixed with soil amendments and placed in aboveground enclosures. It is an aerated static pile composting process in which compost is formed into piles and aerated with blowers or vacuum pumps.	Landfarm/aerobic selected from the technology group for evaluation.

TABLE 9-4

EVALUATION OF GENERAL RESPONSE ACTIONS, REMEDIAL TECHNOLOGIES, AND PROCESS OPTIONS FOR SOIL
Former Tacoma Metals Facility

General Response Action	Remedial Technologies	Process Options	Description	Evaluation Comments
Ex Situ (Aboveground) Treatment (continued)	Biological/ Bioremediation (continued)	Fungal Biodegradation	Fungal biodegradation refers to the degradation of a wide variety of organopollutants by using their lignin-degrading or wood-rotting enzyme system. White rot fungas has been tested under two different treatment configurations: in situ and bioreactor.	Other more effective treatment methods are available.
		Bio-Reactor System	Degradation with the use of a liquid/solids contact reactor. Reactor environment enhances mass transfer rates and contact between chemicals and microorganisms capable of degrading the chemicals.	Landform/aerobic selected from the technology group for evaluation.
	Thermal	Thermal Desorption	Soils are heated, driving off water and organics with boiling points less than 1,100°F. Organics are incinerated in an afterburner or collected for subsequent treatment.	**Potentially implementable.**
		Rotary Kiln Incineration	Incineration process (in the presence of oxygen) uses temperatures ranging from 1,500°F to 3,000°F and turbulence caused by rotation to vaporize and destroy organics.	Not appropriate. Other more cost-effective thermal treatment options are available.
		Infrared Thermal Incineration	Thermal destruction of organics in soil using electrically powered silicon carbide rods to heat organics to combustion temperatures. Remaining combustibles are incinerated in an afterburner.	Not appropriate. Other more cost-effective thermal treatment options are available.
		Pyrolysis	Thermal conversion (in an oxygen-deficient atmosphere) of organic material into solid, liquid, and gaseous components.	Not appropriate. Other more cost-effective thermal treatment options are available.
		Fluidized Bed/ Circulating Bed Combustor	A bed of granular sand-like material is fluidized by air injected into the incinerator to create a turbulent atmosphere and improve heat transfer.	Not appropriate. Other more cost-effective thermal treatment options are available.
		Multiple Hearth Incineration	Multiple levels of shifting plates move materials through the combustion chamber. Each hearth has fuel burners mounted on walls that incinerate organics as materials descend to lower hearths in increasingly hotter combustion zones.	Not appropriate. Other more cost-effective thermal treatment options are available.
		Vitrification	Application of heat destroys organics and immobilizes inorganics by incorporating them into a glass or glass-like structure.	Not appropriate. Other more cost-effective thermal treatment options are available.

TABLE 9-4

EVALUATION OF GENERAL RESPONSE ACTIONS, REMEDIAL TECHNOLOGIES, AND PROCESS OPTIONS FOR SOIL

Former Tacoma Metals Facility

General Response Action	Remedial Technologies	Process Options	Description	Evaluation Comments
In Situ Treatment	Solidification/ Stabilization	Pozzolanic Cement-Based	In situ treatment of soil by the injection and mixing of solidifying agents with soil. Treatment results in a solidified product that resists leaching.	Chemical stabilization selected for further evaluation.
		Chemical-Based Stabilization	Liquid chemical mix which forms insoluble molecular bonds through hydroxyapaptite crystal formations with heavy metals (and PCBs) which significantly reduces the metals leaching potential.	**Potentially implementable.**
	Physical/Chemical	Soil Freezing	Freezing surrounding soil to create a physical barrier to chemical migration.	Not appropriate. Only a temporary measure.
		Soil Flushing	In situ extraction of inorganics or organics from soils, accomplished by passing solvents through soil using an injection/recirculation process.	Not appropriate. Difficult to control; may result in groundwater contamination.
		Soil Vapor Extraction	Extraction of volatile organics from subsurface soil by creating a pressure gradient that causes volatile organics to transfer from soil to airstream.	Not appropriate for chemicals of concern.
		Electrokinetic Separation	The Electrokinetic Remediation (ER) process removes metals and organic contaminants from low permeability soil. ER uses electrochemical and electrokinetic processes to desorb, and then remove, metals and polar organics. This in situ soil processing technology is primarily a separation and removal technique for extracting contaminants from soils.	Not appropriate for site conditions.
		Fracturing	Cracks are developed by fracturing beneath the surface in low permeability and over-consolidated sediments to open new passageways that increase the effectiveness of many in situ processes and enhance extraction efficiencies.	Not appropriate for site conditions.
		Precipitation	Application of specific treatment reagents which aid in the formation of insoluble metal precipitates that reduce chemical mobility. Metals could later resolubilize as conditions change.	Not appropriate for organics; may result in groundwater contamination.
		Oxidation	Oxidation state of chemicals is raised to detoxify a few inorganics and oxidizable organics and to make some organics more amenable to biological degradation.	Not appropriate for chemicals of concern.
		Reduction	Reduction in the oxidation state of a few heavy metals (chromium, lead, mercury) to reduce toxicity or solubility or to transform them to a form that can be more easily handled.	Not appropriate for chemicals of concern.

TABLE 9-4

EVALUATION OF GENERAL RESPONSE ACTIONS, REMEDIAL TECHNOLOGIES, AND PROCESS OPTIONS FOR SOIL
Former Tacoma Metals Facility

General Response Action	Remedial Technologies	Process Options	Description	Evaluation Comments
In Situ Treatment (continued)	Biological/ Bioremediation	Enhanced Bioremediation (Aerobic)	Application of nutrients, oxygen, and microorganisms to accelerate the natural biodegradation of organic compounds.	**Potentially implementable.**
		Enhanced Bioremediation (Anaerobic)	Same as aerobic process with the omission of oxygen application. The anaerobic process degrades organics slower than the aerobic process, but is better suited to chlorinated hydrocarbons.	Not appropriate for chemicals of concern.
		Bioventing	Oxygen is delivered to contaminated unsaturated soils by forced air movement (either extraction or injection of air) to increase oxygen concentrations and stimulate biodegradation.	Enhanced bioremediation selected from the technology group for evaluation.
		Phytoremediation	Phytoremediation is a process that uses plants to remove, transfer, stabilize, and destroy contaminants in soil and sediment. Contaminants may be either organic or inorganic.	Experimental. Not appropriate for site conditions.
	Thermal	Vitrification	Using high temperatures to melt soil and bind chemicals in a stable non-crystalline solid that resists leaching. Organics are destroyed by pyrolysis.	Not appropriate for chemicals of concern. More cost-effective methods are available.
		Steam-Enhanced Vapor Extraction	Vapor extraction with the addition of steam to increase chemical mobility and removal rate.	Not appropriate for chemicals of concern. More cost-effective methods are available.
		Radio Frequency Heating	Application of radio frequency waves to heat soil and vaporize volatile organics. Volatiles are then collected for destruction or treatment.	Experimental. More tested and cost-effective methods are available.
Disposal	Offsite	Management Unit	Disposal of soil in a permitted offsite management unit.	**Potentially implementable.**
	Onsite	Containment	Containment of soil onsite.	Asphalt cover selected for further evaluation.
Reuse/Recycling	Onsite	Backfilling	Onsite reuse/recycling of site materials for suitable applications in accordance with applicable local, state, and federal regulations. One option may be reuse treated soil onsite to backfill excavation areas.	**Potentially implementable.**

TABLE 9-4

EVALUATION OF GENERAL RESPONSE ACTIONS, REMEDIAL TECHNOLOGIES, AND PROCESS OPTIONS FOR SOIL

Former Tacoma Metals Facility

General Response Action	Remedial Technologies	Process Options	Description	Evaluation Comments
Reuse/Recycling (continued)	Onsite (continued)	Grading	Onsite reuse/recycling of site materials for suitable applications in accordance with applicable local, state, and federal regulations. One option may be reuse untreated soil onsite to consolidated impacted soils or bring low areas within an impacted zone to grade prior to placement of a cover.	**Potentially implementable.**

TABLE 9-5

EVALUATION OF GENERAL RESPONSE ACTIONS, REMEDIAL TECHNOLOGIES, AND PROCESS OPTIONS FOR GROUNDWATER

Former Tacoma Metals Facility

General Response Action	Remedial Technologies	Process Options	Description	Evaluation Comments
Institutional Controls	Addressed under Evaluation of General Response Actions, Remedial Technologies, and Process Options for Soil (see Table 9-4).			
Containment	Covers	Addressed under Evaluation of General Response Actions, Remedial Technologies, and Process Options for Soil (see Table 9-4).		
	Vertical Barriers	Slurry Wall	Trench around area of contamination filled with a soil (or cement) bentonite slurry.	Not appropriate for site conditions.
		Grout Curtain	Pressure injection of grout in a regular pattern of drilled holes around are of contamination.	Not appropriate for site conditions.
Collection	Extraction	Extraction Wells	Series of wells to extract contaminated groundwater.	Not appropriate for site conditions given proximity to Puyallup River and tidal fluctuations.
		Extraction/Injection Wells	Inject treated of uncontaminated groundwater to increase flow to extraction wells.	Not appropriate for site conditions given proximity to Puyallup River and tidal fluctuations.
	Subsurface Drains	Interceptor Trenches	Perforated pipe in trenches backfilled with porous media to collect contaminated water.	Not appropriate for site conditions given proximity to Puyallup River and tidal fluctuations.
Aboveground Treatment (assuming extraction)	Physical/Chemical	Adsorption/ Absorption	In liquid adsorption, solutes concentrate at the surface of a sorbent, thereby reducing their concentration in the bulk liquid phase.	Not appropriate. Groundwater extraction not selected for further evaluation.
		Air Stripping	Volatile organics are partitioned from extracted ground water by increasing the surface area of the contaminated water exposed to air. Aeration methods include packed towers, diffused aeration, tray aeration, and spray aeration.	Not appropriate. Groundwater extraction not selected for further evaluation.
		Granulated Activated Carbon (GAC)/Liquid Phase Carbon Adsorption	Ground water is pumped through a series of canisters or columns containing activated carbon to which dissolved organic contaminants adsorb. Periodic replacement or regeneration of saturated carbon is required.	Not appropriate. Groundwater extraction not selected for further evaluation.
		Ion Exchange	Ion exchange removes ions from the aqueous phase by exchange with counter ions on the exchange medium.	Not appropriate. Groundwater extraction not selected for further evaluation.

TABLE 9-5

EVALUATION OF GENERAL RESPONSE ACTIONS, REMEDIAL TECHNOLOGIES, AND PROCESS OPTIONS FOR GROUNDWATER

Former Tacoma Metals Facility

General Response Action	Remedial Technologies	Process Options	Description	Evaluation Comments
Aboveground Treatment (assuming extraction) (continued	Physical/Chemical (continued)	Precipitation/ Coagulation/ Flocculation	This process transforms dissolved contaminants into an insoluble solid, facilitating the contaminant's subsequent removal from the liquid phase by sedimentation or filtration. The process usually uses pH adjustment, addition of a chemical precipitant, and flocculation.	Not appropriate. Groundwater extraction not selected for further evaluation.
		Separation	Separation techniques concentrate contaminated waste water through physical and chemical means. Includes distillation, filtration.ultrafiltartion/microfiltration, freeze crystallization, membrane pervaporation, and reverse osmosis.	Not appropriate. Groundwater extraction not selected for further evaluation.
		Sprinkler Irrigation	The process that involves the pressurized distribution of volatile organic compound (VOC)-laden water through a standard sprinkler irrigation system.	Not appropriate. Groundwater extraction not selected for further evaluation.
		UV Oxidation	Ultraviolet (UV) radiation, ozone, and/or hydrogen peroxide are used to destroy organic contaminants as water flows into a treatment tank. If ozone is used as the oxidizer, an ozone destruction unit is used to treat collected off-gases from the treatment tank and downstream units where ozone gas may collect, or escape.	Not appropriate. Groundwater extraction not selected for further evaluation.
	Biological/ Bioremediation	Bioreactors	Contaminants in extracted groundwater are put into contact with microorganisms in attached or suspended growth biological reactors. In suspended systems, such as activated sludge, contaminated groundwater is circulated in an aeration basin. In attached systems, such as rotating biological contractors and trickling filters, microorganisms are established on an inert support matrix.	Not appropriate. Other more cost-effective treatment options are available.
		Constructed Wetlands	The constructed wetlands-based treatment technology uses natural geochemical and biological processes inherent in an artificial wetland ecosystem to accumulate and remove metals, explosives, and other contaminants from influent waters. The process can use a filtration or degradation process.	Not appropriate. Other more cost-effective treatment options are available.
In Situ Treatment	Physical/Chemical	Aeration	Aeration is the process by which the area of contact between water and air is increased, either by natural methods or by mechanical devices.	Air sparging selected from technology group for evalaution.
		Air Sparging	Air is injected into saturated matrices to remove contaminants through volatilization.	**Potentially Implementable.**

TABLE 9-5

EVALUATION OF GENERAL RESPONSE ACTIONS, REMEDIAL TECHNOLOGIES, AND PROCESS OPTIONS FOR GROUNDWATER

Former Tacoma Metals Facility

General Response Action	Remedial Technologies	Process Options	Description	Evaluation Comments
In Situ Treatment (continued)	Physical/Chemical (continued)	Bioslurping	Bioslurping combines the two remedial approaches of bioventing and vacuum-enhanced free-product recovery. Bioventing stimulates the aerobic bioremediation of hydrocarbon-contaminated soils. Vacuum-enhanced free-product recovery extracts light nonaqueous phase liquids (LNAPLs) from the capillary fringe and the water table.	Not appropriate. Other more cost-effective treatment options are available.
		Directional Wells (enhancement)	Drilling techniques are used to position wells horizontally, or at an angle, to reach contaminants not accessible by direct vertical drilling.	Not appropriate for site conditions.
		Dual Phase Extraction	A high vacuum system is applied to simultaneously remove various combinations of contaminated groundwater, separate-phase petroleum product, and hydrocarbon vapor from the subsurface.	Not appropriate. Other more cost-effective treatment options are available.
		Fluid/Vapor Extraction	A high vacuum system is applied to simultaneously remove liquid and gas from low permeability or heterogeneous formations.	Not appropriate. Other more cost-effective treatment options are available.
		Hot Water or Steam Flushing/Stripping	Steam is forced into an aquifer through injection wells to vaporize volatile and semivolatile contaminants. Vaporized components rise to the unsaturated zone where they are removed by vacuum extraction and then treated.	Not appropriate. Other mora cost-effective treatment options are available.
		Hydrofracturing	Injection of pressurized water through wells into low permeability and over-consolidated sediments. Cracks are filled with porous media that serve as substrates for bioremediation or to improve pumping efficiency.	Not appropriate for site conditions.
		In-Well Air Stripping	Air is injected into a double screened well, lifting the water in the well and forcing it out the upper screen. Simultaneously, additional water is drawn in the lower screen. Once in the well, some of the VOCs in the contaminated groundwater are transferred from the dissolved phase to the vapor phase by air bubbles. The contaminated air rises in the well to the water surface where vapors are drawn off and treated by a soil vapor extraction system.	Not appropriate. Other more cost-effective treatment options are available.
		Passive/Reactive Treatment Walls	These barriers allow the passage of water while causing the degradation or removal of contaminants by employing such agents as zero-valent metals, chelators (ligands selected for their specificity for a given metal), sorbents, microbes, and others.	Not appropriate for site conditions.

TABLE 9-5

EVALUATION OF GENERAL RESPONSE ACTIONS, REMEDIAL TECHNOLOGIES, AND PROCESS OPTIONS FOR GROUNDWATER

Former Tacoma Metals Facility

General Response Action	Remedial Technologies	Process Options	Description	Evaluation Comments
In Situ Treatment (continued)	Biological/ Bioremediation	Co-metabolic Treatment	Injection of a dilute solution of primary substrate (e.g., toluene, methane) into the contaminated ground water zone to support the co-metabolic breakdown of targeted organic contaminants.	Emerging technology. Other process options considered for further evaluation.
		Enhanced Biodegradation	Rate of bioremediation of organic contaminants by microbes is enhanced by increasing the concentration of electron acceptors and nutrients in groundwater. Oxygen is the main electron acceptor for aerobic bioremediation. Nitrate serves as an alternative electron acceptor under anoxic conditions.	**Potentially implementable.**
		Natural Attenuation	Natural subsurface processes such as dilution, volatilization, biodegradation, adsorption, and chemical reactions with subsurface materials are allowed to reduce contaminant concentrations to acceptable levels.	Enhanced Biodegradation selected from technology group for evaluation.
		Phytoremediation	Phytoremediation is a set of processes that uses plants to remove, transfer, stabilize and destroy organic/inorganic contamination in groundwater, surface water, and leachate.	Not appropriate for site conditions.
Disposal/Discharge	Onsite	Stormdrain	Discharge of treated groundwater to storm drain.	Not appropriate. Groundwater extraction not selected for further evaluation.
	Offsite	Publicly Owned Treatment Works (POTW)	Discharge untreated groundwater for treatment at POTW.	Not appropriate. Groundwater extraction not selected for further evaluation.
Reuse/Recycling	Onsite/Offsite	Landscape Irrigation	Use of treated groundwater for landscape irrigation.	Not appropriate. Groundwater extraction not selected for further evaluation.

TABLE 9-6

SUMMARY OF POTENTIAL REMEDIAL PROCESS OPTIONS FOR SOIL
Former Tacoma Metals Facility

MTCA Preference[a]	General Technology Description	Soil Process Option
1	Reuse or Recycling	Soil Onsite: Soil for backfill/grading Offsite: Soil for daily landfill cover material Debris Offsite: Metal recycling
2	Destruction or Detoxification	Landfarming Thermal Desorption
3	Separation Followed by Reuse or Destruction	Excavation Sieving
4	Immobilization	In situ or Ex situ Chemical Stabilization
5	Onsite or Offsite disposal	Offsite Management Unit (Landfill)
6	Containment	Cover (Asphalt Cap with Stormwater Controls)
7	Institutional Controls or Monitoring	Deed Restrictions and Compliance Monitoring

Note:
(a) Source: WAC 173-340-360(4).

TABLE 9-7

COMPLIANCE OF ALTERNATIVES WITH POTENTIAL ACTION-SPECIFIC ARARs
Former Tacoma Metals Facility

ARAR		ALTERNATIVE 1 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation with Offsite Disposal), Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review	ALTERNATIVE 2 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation with Offsite Disposal), Lead Excavation & Consolidation, Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review	ALTERNATIVE 3 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation), Lead Excavation, Onsite Treatment & Reuse, Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review
Federal/State Citation	**Description**			
29 CFR 1910.120 WAC 296-62	General safety and health standards for workers, including requirements for responses involving hazardous substances.	Remedial action workers can be adequately protected.	Same as Alternative 1.	Same as Alternative 1.
40 CFR 50.6 and .12 40 CFR 60.5 WAC 173-400 WAC 173-460 WAC 173-470 PSAPCA Regulations I, II, and III	General regulations for air pollution sources; particulate matter emissions standards; control standards for toxic air pollutants.	Fugitive dust control during excavation and soil management activities can be adequately controlled with water.	Same as Alternative 1.	Same as Alternative 1. Thermal desorption unit baghouse and air pollution system expected to meet requirements.
40 CFR 262.12, 262.20 through .33, and 262.40 through .43 WAC 173-303-160, 170, 180, 190, 210, and 220	Requirements for generators of hazardous and dangerous waste.	Alternative can meet requirements.	Same as Alternative 1.	Same as Alternative 1.

TABLE 9-7

COMPLIANCE OF ALTERNATIVES WITH POTENTIAL ACTION-SPECIFIC ARARs
Former Tacoma Metals Facility

ARAR		ALTERNATIVE 1 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation with Offsite Disposal), Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review	ALTERNATIVE 2 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation with Offsite Disposal), Lead Excavation & Consolidation, Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review	ALTERNATIVE 3 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation), Lead Excavation, Onsite Treatment & Reuse, Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review
Federal/State Citation	**Description**			
40 CFR 268 WAC 173-303-140	Land disposal restrictions.	Alternative can meet requirements for disposal of impacted soil and debris. Disposal of hazardous/dangerous waste at a permitted offsite disposal facility not anticipated, with the exception of small amounts of lead-acid battery casings and associated impacted soils which may be characterized as hazardous/dangerous waste.	Same as Alternative 1.	Alternative can meet requirements for disposal of recovered debris materials. Disposal of hazardous/dangerous waste at a permitted offsite disposal facility not anticipated, with the exception of small amounts of lead-acid battery casings and associated impacted soils which may be characterized as hazardous/dangerous waste.
None WAC 173-304	Standards for disposal of solid waste.	Alternative can meet requirements for disposal of impacted soil.	Alternative can meet requirements for disposal of impacted soil.	Alternative can meet requirements for disposal of debris type materials.
49 CFR 107, 171 through 179 WAC 446-50	Transportation regulations for hazardous materials.	Alternative can meet requirements.	Same as Alternative 1.	Same as Alternative 1.
None WAC 173-160 WAC 173-162	Regulations for construction and maintenance of new water wells; licensing of drillers.	Alternative can meet requirements should additional monitoring wells are required as part of the compliance monitoring.	Same as Alternative 1.	Same as Alternative 1.

TABLE 9-7

COMPLIANCE OF ALTERNATIVES WITH POTENTIAL ACTION-SPECIFIC ARARs
Former Tacoma Metals Facility

ARAR		ALTERNATIVE 1 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation with Offsite Disposal), Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review	ALTERNATIVE 2 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation with Offsite Disposal), Lead Excavation & Consolidation, Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review	ALTERNATIVE 3 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation), Lead Excavation, Onsite Treatment & Reuse, Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review
Federal/State Citation	**Description**			
None WAC 173-340-360	Model Toxics Control Act (MTCA) requirements for selection of cleanup actions .	Offsite disposal (soil) is a low-preference remedial method. Treatment (groundwater) is a preferred remedial method. Meets other requirements.	Same as Alternative 1.	Treatment (soil and groundwater) is preferred remedial method. Meets other requirements.
None WAC 173-340-410	MTCA requirements regarding compliance monitoring during remedial activities.	Meets requirements.	Meets requirements.	Meets requirements.
None WAC 173-340-440 and -702(4)	MTCA requirements regarding institutional controls to limit activities at a site that may result in exposure to hazardous substances.	Meets requirements.	Meets requirements.	Meets requirements.
None WAC 173-340-450	MTCA regulations regarding releases from underground storage tanks (USTs).	Meets requirements for free product and impacted soil removal.	Meets requirements for free product and impacted soil removal.	Meets requirements for free product and impacted soil removal.
None WAC 173-340-704,-705, and -706	Use of Methods A, B, and C for determining cleanup levels.	MTCA Method A and C industrial cleanup levels used for site soil cleanup levels. ARARs used for site groundwater and surface water cleanup levels	Same as Alternative 1.	Same as Alternative 1.
None WAC 173-340-707	MTCA analytical methods for evaluating the effectiveness of a cleanup action.	Approved methods will be used.	Approved methods will be used.	Approved methods will be used.
None WAC 173-340-708	MTCA regulation on human health risk assessment procedures.	Addressed with selection of cleanup levels.	Addressed with selection of cleanup levels.	Addressed with selection of cleanup levels.

TABLE 9-7

COMPLIANCE OF ALTERNATIVES WITH POTENTIAL ACTION-SPECIFIC ARARs
Former Tacoma Metals Facility

ARAR		ALTERNATIVE 1 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation with Offsite Disposal), Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review	ALTERNATIVE 2 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation with Offsite Disposal), Lead Excavation & Consolidation, Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review	ALTERNATIVE 3 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation), Lead Excavation, Onsite Treatment & Reuse, Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review
Federal/State Citation	**Description**			
None WAC 173-201A	Surface Water Quality Standards (SWQS) for the State of Washington	Cleanup level achieved through groundwater treatment and asphalt cap and stormwater collection system. Cleanup levels will be monitored through compliance monitoring.	Same as Alternative 1.	Same as Alternative 1.
None WAC 173-340-720, -730, -740, and -745	MTCA cleanup standards for groundwater, surface water, and soil.	Cleanup standards achieved through offsite soil disposal, groundwater treatment, engineering controls (cap and stormwater collection system), institutional controls, compliance monitoring, and periodic reviews.	Same as Alternative 1.	Cleanup standards achieved through soil and groundwater treatment, engineering controls (cap and stormwater collection system), institutional controls, compliance monitoring, and periodic reviews.
None WAC 197-11	Washington State Environmental Policy Act (SEPA).	Alternative complies with the intent of SEPA (through SEPA integration with MTCA).	Same as Alternative 1.	Same as Alternative 1.
40 CFR 131.36 (National Toxics Rule) 90.48 RWC WAC 173-226	Regulations developed to implement the Federal Clean Water Act [33 USC 466 *et seq*] and State Water Pollution Control Act for protection of aquatic life in nations waters (lakes, rivers, aquifers, and coastal areas).	Cleanup level achieved through groundwater treatment and asphalt cap and stormwater collection system.	Same as Alternative 1.	Same as Alternative 1.

TABLE 9-7

COMPLIANCE OF ALTERNATIVES WITH POTENTIAL ACTION-SPECIFIC ARARs
Former Tacoma Metals Facility

Notes:

ARARs - Applicable, relevant, and appropriate requirements.
CFR - Code of Federal Regulations.
WAC - Washington Administrative Code.
RWC - Revised Washington Code.
USC - United States Code.

TABLE 9-8

COMPLIANCE OF ALTERNATIVES WITH POTENTIAL CHEMICAL-SPECIFIC ARARs
Former Tacoma Metals Facility

ARAR		ALTERNATIVE 1 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation with Offsite Disposal), Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review	ALTERNATIVE 2 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation with Offsite Disposal), Lead Excavation & Consolidation, Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review	ALTERNATIVE 3 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation), Lead Excavation, Onsite Treatment & Reuse, Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review
Citation	**Description**			
Model Toxics Control Act Cleanup Levels (WAC 173-340-740)	Specifies cleanup levels for soil, groundwater, and surface water that protect human health and the environment.	Petroleum hydrocarbon and cPAH soil cleanup levels achieved through excavation and offsite disposal of deeper soil in contact with groundwater. Shallow soil impacted with metals, petroleum hydrocarbons, cPAHs, and PCBs above cleanup levels left in-place; however, potential for direct contact and leaching to groundwater mitigated through installation of asphalt cap, institutional controls, and periodic reviews. Groundwater cleanup levels achieved through treatment of groundwater and compliance monitoring. Surface water - See Note 1.	Petroleum hydrocarbon and cPAH soil cleanup levels achieved through excavation and offsite disposal of deeper soil in contact with groundwater. Shallow soil cleanup levels achieved through excavation along portions of property boundary where elevated concentrations of COCs exist to create a "buffer zone" between impacted soils above cleanup levels left onsite and adjacent properties. Potential for direct contact and leaching to groundwater of shallow soil above cleanup levels mitigated through installation of asphalt cap, institutional controls, and periodic reviews. Groundwater cleanup levels achieved through treatment of groundwater and compliance monitoring. Surface water - See Note 1.	Petroleum hydrocarbon and cPAH soil cleanup levels achieved through excavation, onsite treatment, and reuse of deeper soil in contact with groundwater. Shallow soil cleanup levels achieved through excavation, onsite treatment, and reuse along portions of property boundary where elevated concentrations of COCs exist to create a "buffer zone" between impacted soils above cleanup levels left onsite and adjacent properties. Potential for direct contact and leaching to groundwater of shallow soil above cleanup levels mitigated through installation of asphalt cap, institutional controls, and periodic reviews. Groundwater cleanup levels achieved through treatment of groundwater and compliance monitoring. Surface water - See Note 1.

TABLE 9-8

COMPLIANCE OF ALTERNATIVES WITH POTENTIAL CHEMICAL-SPECIFIC ARARs
Former Tacoma Metals Facility

ARAR		ALTERNATIVE 1 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation with Offsite Disposal), Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review	ALTERNATIVE 2 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation with Offsite Disposal), Lead Excavation & Consolidation, Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review	ALTERNATIVE 3 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation), Lead Excavation, Onsite Treatment & Reuse, Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review
Citation	**Description**			
Ecology Freshwater Acute Surface Water Quality Standards (WAC 173-201A)	Specifies cleanup levels for surface waters.	See Note 1.	See Note 1.	See Note 1.
National Toxic Rule for Consumption of Water and Organisms (40 CFR 131.36)	Specifies cleanup levels for surface waters.	See Note 1.	See Note 1.	See Note 1.
Ecology Model NPDES Permit for Surface Water Discharge (WAC 173-226)	Specifies discharge levels to surface waters of the state from cleanups where gasoline and diesel are the pollutants of concern.	See Note 1.	See Note 1.	See Note 1.

Notes:

ARARs – Applicable, relevant, and appropriate requirements.
cPAHs – Carcinogenic polycyclic aromatic hydrocarbons.
PCBs – Polychlorinated biphenyls.
COCs – Chemicals of concern.
NPDES – National Pollutant Discharge Elimination System.

1. This alternative addresses surface water quality standards through the monitoring of the shallow zone groundwater, which discharges to the Puyallup River, and by monitoring surface water runoff to the asphalt cap stormwater collection system.

TABLE 9-9

ALTERNATIVE EVALUATION WITH MTCA'S THRESHOLD CRITERIA
Former Tacoma Metals Facility

Threshold Criteria	ALTERNATIVE 1 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation with Offsite Disposal), Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review	ALTERNATIVE 2 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation with Offsite Disposal), Lead Excavation & Consolidation, Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review	ALTERNATIVE 3 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation), Lead Excavation, Onsite Treatment & Reuse, Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review
Overall Protection of Human Health and Environment	Reduces risk to an acceptable level through removal of free product and petroleum hydrocarbon-impacted soil[a] above cleanup levels in those areas of the site where attainment of cleanup levels is practicable and necessary for the protection of groundwater. Also includes the removal of lead-acid battery casings and associated impacted soil. Potential risk to human and health and the environment associated with leaving chemicals of concern (COCs) above site cleanup levels is mitigated by installation of cap, institutional controls, compliance monitoring, and periodic reviews. Lowest potential risk to workers during earthwork activities due to the limited area and volume of materials to be handled. Potential risks to workers would be controlled through use of personal protective equipment. Potential air pollution threats would be controlled. Provides for groundwater treatment and surface water and groundwater monitoring which reduces the potential risk to surface water receptors.	Reduces risk to an acceptable level through removal of free product and petroleum hydrocarbon-impacted soil[a] above cleanup levels in those areas of the site where attainment of cleanup levels is practicable and necessary for the protection of groundwater. Also includes the removal of lead-acid battery casings and associated impacted soil. Provides for additional protection to human health and the environment by creating a "buffer zone" between shallow metals-impacted soil[b] remaining on site above site cleanup levels and adjacent properties. Potential risk to human and health and the environment associated with leaving COCs above site cleanup levels is mitigated by installation of cap and institutional controls. Slightly higher potential risk to workers during earthwork activities due to the greater volume of materials to be handled. Potential risks to workers would be controlled through use of personal protective equipment. Potential air pollution threats would be controlled. Provides for groundwater treatment and surface water and groundwater monitoring which reduces the potential risk to surface water receptors.	Same as Alternative 2, but reduces risks to acceptable level through onsite treatment of excavated petroleum hydrocarbon-impacted soil[a] and shallow metals-impacted soil[b]. Also includes the removal of lead-acid battery casings and associated impacted soil. Highest potential risk to workers due to the additional handling of soil during excavation, sieving/separation of debris, treatment, and backfilling activities. Potential risks to workers would be controlled through use of personal protective equipment. Potential air pollution threats would be controlled. Provides for groundwater treatment and surface water and groundwater monitoring which reduces the potential risk to surface water receptors.

TABLE 9-9

ALTERNATIVE EVALUATION WITH MTCA'S THRESHOLD CRITERIA
Former Tacoma Metals Facility

Threshold Criteria	ALTERNATIVE 1 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation with Offsite Disposal), Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review	ALTERNATIVE 2 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation with Offsite Disposal), Lead Excavation & Consolidation, Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review	ALTERNATIVE 3 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation), Lead Excavation, Onsite Treatment & Reuse, Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review
Point of Compliance	Soil throughout the site to a depth of 15 feet below grade for protection of surface water and human contact. The point of compliance for soil is not achieved throughout the site; however, Model Toxics Control Act (MTCA) recognizes that containment can comply with cleanup standards, provided compliance monitoring (see below) is included to ensure long-term integrity of containment system. The point of compliance for shallow zone groundwater is at the point of discharge to the Puyallup River; for practical purposes wells monitoring the shallow groundwater zone along the northern property boundary will serve as a conditional point of compliance. The point of compliance for surface water is at the point of discharge from the site to the Puyallup River. Since there is no interaction between the site surface water and the Puyallup River, the stormwater collection system will serve as the surface water compliance point	Same as Alternative 1.	Same as Alternative 1.
Applicable State and Federal Laws	See Tables 9-7 and 9-8.	See Tables 9-7 and 9-8.	See Tables 9-7 and 9-8.

TABLE 9-9

ALTERNATIVE EVALUATION WITH MTCA'S THRESHOLD CRITERIA
Former Tacoma Metals Facility

Threshold Criteria	ALTERNATIVE 1 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation with Offsite Disposal), Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review	ALTERNATIVE 2 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation with Offsite Disposal), Lead Excavation & Consolidation, Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review	ALTERNATIVE 3 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation), Lead Excavation, Onsite Treatment & Reuse, Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review
Compliance Monitoring	Threshold criteria met through protection monitoring during earthwork activities and performance monitoring to confirm that soil cleanup levels have been attained in designated excavation areas. Includes annual monitoring (at a minimum) and periodic reviews of the asphalt cap. Groundwater and surface water performance and confirmational monitoring (3 to 5 years minimum) to assess changing site conditions and attainment of groundwater and surface water cleanup levels.	Same as Alternative 1.	Same as Alternative 1.

Notes:

(a) Petroleum hydrocarbon-impacted soil is categorized as deep soil (up to 10 feet bgs) exceeding cleanup levels that intercepts the water table and has resulted in groundwater impact. Soil in this category may contain diesel- and oil-range petroleum hydrocarbons and carcinogenic polycyclic aromatic hydrocarbons (cPAHs).

(b) Metals-impacted soil is categorized as shallow soil (typically 3 feet or less bgs) exceeding cleanup levels. This category of soil predominantly contains lead but may contain other metals (e.g., chromium), diesel- and oil-range petroleum hydrocarbons, cPAHs, and polychlorinated biphenyls (PCBs).

TABLE 9-10

EVALUATION OF LONG-TERM EFFECTIVENESS FOR REMEDIAL ALTERNATIVES
Former Tacoma Metals Facility

Subcriteria	ALTERNATIVE 1 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation with Offsite Disposal), Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review	ALTERNATIVE 2 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation with Offsite Disposal), Lead Excavation & Consolidation, Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review	ALTERNATIVE 3 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation), Lead Excavation, Onsite Treatment & Reuse, Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review
Degree of certainty that alternative will be successful	Long-term effectiveness concerns would not be significant because free product and soil potentially impacting site groundwater will have been removed. Permitted disposal facility is expected to adequately manage landfilled soil for the long-term. Asphalt cap well proven as an effective engineering control measure for containing shallow soil left in-place above site cleanup levels and for reducing surface water infiltration that could potentially leach chemicals of concern (COCs) from subsurface soil to shallow groundwater. Institutional controls frequently selected for addressing sites containing hazardous substances. Groundwater treatment option well proven to be successful at site with similar COCs. Surface water runoff will be controlled through the stormwater collection system that will be an integral part of the asphalt cap design. Alternative expected to be successful and demonstrated as such through compliance monitoring and periodic reviews.	Same as Alternative 1.	See Alternative 1. Permitted disposal facility is expected to adequately manage any landfilled debris materials for the long-term. Success of the soil treatment options may be limited by how effectively debris materials can be removed prior to treatment. Uncertainties exist regarding the ability to chemically stabilize metals-impacted soil[a] containing high organic carbon and petroleum hydrocarbons. These could be overcome by pre-treating the metals-impacted soil via thermal desorption; however, this will require additional handling of soil.

TABLE 9-10

EVALUATION OF LONG-TERM EFFECTIVENESS FOR REMEDIAL ALTERNATIVES
Former Tacoma Metals Facility

Subcriteria	ALTERNATIVE 1 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation with Offsite Disposal), Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review	ALTERNATIVE 2 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation with Offsite Disposal), Lead Excavation & Consolidation, Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review	ALTERNATIVE 3 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation), Lead Excavation, Onsite Treatment & Reuse, Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review
Long-term reliability	Long-term reliability at the site is not a significant concern because compliance monitoring and periodic reviews will be conducted. Long-term reliability of the permitted disposal facility is expected to be adequate.	Same as Alternative 1.	See Alternative 1. Treatment process (thermal desorption/chemical stabilization) will result in the permanent destruction/detoxification/immobilization of COCs.
Magnitude of residual risk	Soil containing COCs above site soil cleanup levels will remain on site. Alternatives 1 and 2 have the most amount of metals-impacted soil[a] remaining onsite. Magnitude of residual groundwater impact reduced through treatment and source removal (free product and petroleum hydrocarbon-impacted soil[b] down to water table and lead-acid battery casings and associated impacted soil).	Soil containing COCs above site soil cleanup levels will remain onsite. Alternatives 1 and 2 have the most amount of metals-impacted soil[a] remaining onsite. Residual risk reduced along property boundary by creation of a "buffer zone" remediated to site cleanup levels. Magnitude of residual groundwater impact reduced through treatment and source removal (free product and petroleum hydrocarbon-impacted soil[b] down to water table and lead-acid battery casings and associated impacted soil).	Soil containing COC above site soil cleanup levels will remain on site. Alternative 3 has the least amount of metals-impacted soil[a] remaining onsite. Residual risk reduced along property boundary by creation of a "buffer zone" remediated to site cleanup levels. Magnitude of residual groundwater impact reduced through treatment and source removal (free product and petroleum hydrecarbon-impacted soil[b] down to water table and lead-acid battery casings and associated impacted soil).
Effectiveness of controls required to manage treatment residues or remaining wastes	Controls not required.	Controls not required.	Controls not required.

Notes:

(a) Metals-impacted soil is categorized as shallow soil (typically 3 feet or less bgs) exceeding cleanup levels. This category of soil predominantly contains lead but may contain other metals (e.g., chromium), diesel- and oil-range petroleum hydrocarbons, carcinogenic polycyclic aromatic hydrocarbons (cPAHs), and polychlorinated biphenyls (PCBs).

(b) Petroleum hydrocarbon-impacted soil is categorized at deep soil (up to 10 feet bgs) exceeding cleanup levels that intercepts the water table and has resulted in groundwater impact. Soil in this category may contain diesel- and oil-range petroleum hydrocarbons and cPAHs.

TABLE 9-11

EVALUATION OF SHORT-TERM EFFECTIVENESS FOR REMEDIAL ALTERNATIVES
Former Tacoma Metals Facility

Subcriteria	ALTERNATIVE 1 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation with Offsite Disposal), Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review	ALTERNATIVE 2 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation with Offsite Disposal), Lead Excavation & Consolidation, Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review	ALTERNATIVE 3 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation), Lead Excavation, Onsite Treatment & Reuse, Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review
Protection of human health during construction and implementation	Fugitive dust emissions could be generated during soil excavation, transportation, and handling. Chemicals of concern (COCs), adsorbed to dust particles or in vapor phase, could be ingested or inhaled; however, potential air pollution threats would be controlled. Potential for contamination of runon/runoff during earthwork activities. Risks to remedial workers because of moving heavy equipment, and direct contact with soil. Offsite tracking of contaminants on construction vehicles could occur. Increased vehicular traffic should not be a concern.	Same as Alternative 1.	See Alternative 1. Thermal treatment of petroleum hydrocarbon-impacted soil[a] could potentially increase air pollution risks as could mixing of metal-impacted soil[b] during chemical stabilization . Treatment also requires additional handling of soil to remove debris which may result in potential greater risk of exposure to remediation workers; however, potential air pollution threats would be controlled through dust control and the use of personal protective equipment.
Degree of risk prior to attainment of cleanup standards	Degree of risk can be controlled. Spraying the site with water would minimize generation and release of fugitive dust emissions. Remediation workers would wear protective clothing and respirators, if required. Surface water controls (e.g., covering stockpiled soil with plastic) and earth berms would be used to control potential contamination runon/runoff. Vehicles would be decontaminated before departing offsite.	Same as Alternative 1.	See Alternative 1. Thermal treatment pollution control features expected to meet local air quality standards.

Notes:

(a) Petroleum hydrocarbon-impacted soil is categorized at deep soil (up to 10 feet bgs) exceeding cleanup levels which intercepts the water table and has resulted in groundwater impact. Soil in this category may contain diesel- and oil-range petroleum hydrocarbons and carcinogenic polycyclic aromatic hydrocarbons (cPAHs).

(b) Metals-impacted soil is categorized as shallow soil (typically 3 feet or less bgs) exceeding cleanup levels. This category of soil predominantly contains lead but may contain other metals (e.g., chromium), diesel- and oil-range petroleum hydrocarbons, cPAHs, and polychlorinated biphenyls (PCBs).

TABLE 9-12

EVALUATION OF PERMANENT REDUCTION OF TOXICITY, MOBILITY, OR VOLUME FOR REMEDIAL ALTERNATIVES
Former Tacoma Metals Facility

Subcriteria	ALTERNATIVE 1 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation with Offsite Disposal), Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review	ALTERNATIVE 2 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation with Offsite Disposal), Lead Excavation & Consolidation, Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review	ALTERNATIVE 3 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation), Lead Excavation, Onsite Treatment & Reuse, Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review
Adequacy of alternative in destroying hazardous substances	Does not include treatment.	Does not include treatment.	Thermal desorption and subsequent destruction expected to virtually destroy (i.e., greater than 99 percent) organic chemicals of concern (COCs) in petroleum hydrocarbon-impacted soil[a]. Chemical stabilization of metals-impacted soil[b] does not involve destruction of metals; however, the mobility of the metals are significantly reduced or eliminated.
Reduction or elimination of hazardous substance releases and sources of releases	Does not destroy or treat hazardous materials. However, approximately 7,800 cubic yards of petroleum hydrocarbon-impacted[a] soil would be excavated and disposed of at a permitted offsite disposal facility (landfill), thereby eliminating source of groundwater contamination and reducing the amount of hazardous substances remaining on the site. Free product removal will also reduce the amount of hazardous substances onsite, as will the removal of lead-acid battery casings and associated impacted soil (approximately 10 cubic yards).	Does not destroy or treat hazardous materials. However, approximately 7,800 cubic yards of petroleum hydrocarbon-impacted soil [a] would be excavated and disposed of at a permitted offsite landfill, theroby eliminating site source of groundwater contamination and reducing the amount of hazardous substances remaining on the site. Free product removal will also reduce the amount of hazardous substances onsite, as will the removal of lead-acid battery casings and associated impacted soil (approximately 10 cubic yards). The volume of metals-impacted soil[b] would not be reduced; however, it would be consolidated onsite within the shallow-impacted soil footprint.	Thermal desorption would treat petroleum-hydrocarbon-impacted soil[a] containing organic COCs above the cleanup levels (approximately 7,800 cubic yards). Chemical stabilization of metals-impacted soil[b] does not involve destruction of metals; however, the mobility of the metals are significantly reduced or eliminated (approximately 700 cubic yards).
Irreversibility of waste treatment process	Not applicable.	Not applicable.	Thermal and chemical stabilization treatment processes are irreversible.

TABLE 9-12

EVALUATION OF PERMANENT REDUCTION OF TOXICITY, MOBILITY, OR VOLUME FOR REMEDIAL ALTERNATIVES
Former Tacoma Metals Facility

Subcriteria	ALTERNATIVE 1 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation with Offsite Disposal), Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review	ALTERNATIVE 2 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation with Offsite Disposal), Lead Excavation & Consolidation, Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review	ALTERNATIVE 3 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation), Lead Excavation, Onsite Treatment & Reuse, Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review
Characteristics and quantity of treatment residuals generated	Not applicable.	Not applicable.	Organic COCs removed bythermal desorption are destroyed in afterburner . No residuals produced as a result of chemical stabilization.

Notes:

(a) Petroleum hydrocarbon-impacted soil is categorized at deep soil (up to 10 feet bgs) exceeding cleanup levels that intercepts the water table and has resulted in groundwater impact. Soil in this category may contain diesel- and oil-range petroleum hydrocarbons and carcinogenic polycyclic aromatic hydrocarbons (cPAHs).

(b) Metals-impacted soil is categorized as shallow soil (typically 3 feet or less bgs) exceeding cleanup levels. This category of soil predominantly contains lead but may contain other metals (e.g., chromium), diesel- and oil-range petroleum hydrocarbons, cPAHs, and polychlorinated biphenyls (PCBs).

TABLE 9-13

EVALUATION OF ABILITY TO IMPLEMENT REMEDIAL ALTERNATIVES
Former Tacoma Metals Facility

Subcriteria	ALTERNATIVE 1 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation with Offsite Disposal), Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review	ALTERNATIVE 2 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation with Offsite Disposal), Lead Excavation & Consolidation, Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review	ALTERNATIVE 3 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation), Lead Excavation, Onsite Treatment & Reuse, Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review
Consideration of whether alternative is technically possible	Alternative is technically possible, uses reliable and well proven process options.	Alternative is technically possible, uses reliable and well proven process options.	Treatment processes involved in this alternative are common remedial methods that can be readily implemented. The amount of debris in the soil is of concern; however, sieving/mechanical separation prior to treatment is expected to reduce the amount of debris material. There are some concerns regarding chemical stabilization of metals-impacted soil[a] containing high organics concentrations.
Availability of necessary offsite facilities, services, and materials	Adequate offsite facilities, services, and materials are available.	Adequate offsite facilities, services, and materials are available.	The availability of a suitable offsite or mobile (onsite) thermal treatment unit and a mobile (onsite) chemical stabilization unit are unknown.
Administrative and regulatory requirements	Requirements include clearing and grading permit and Shoreline Permit. State Environmental Policy Act (SEPA) checklist may also be necessary.	Same as Alternative 1.	See Alternative 1. Thermal treatment units typically are pre-permitted to address local air quality requirements.
Scheduling, size, and complexity	Routine construction operation that can be scheduled at most times of year. Dry season is more suitable for construction activities to reduce potential stormwater runon/runoff contamination. Least complex of the alternatives.	Same as Alternative 1. Slightly more complex than Alternative 1 due to the additional excavation and consolidation of metals-impacted soil[a].	Thermal desorption and chemical stabilization are more suited to summer months because of potential stormwater runon/runoff contamination and because of increased energy required to treat wet soil (for thermal treatment). Most complex of the alternatives.

TABLE 9-13

EVALUATION OF ABILITY TO IMPLEMENT REMEDIAL ALTERNATIVES
Former Tacoma Metals Facility

Subcriteria	ALTERNATIVE 1 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation with Offsite Disposal), Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review	ALTERNATIVE 2 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation with Offsite Disposal), Lead Excavation & Consolidation, Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review	ALTERNATIVE 3 Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation), Lead Excavation, Onsite Treatment & Reuse, Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review
Monitoring requirements	Air monitoring would be performed during remedial activities (protection monitoring). Soil and groundwater samples would be collected and analyzed during remediation to evaluate compliance with cleanup levels (performance monitoring). Post remediation monitoring of groundwater and surface water would be conducted for a period specified by Ecology (confirmational monitoring). Asphalt cap inspections and periodic site reviews would also be conducted.	Same as Alternative 1.	See Alternative 1. Air samples also would be collected during thermal treatment to determine compliance with air quality standards.
Access for construction, operations, and monitoring	Available.	Available.	Available.
Integration with existing facility operations and other current or potential remedial actions	Future site land use unknown at this time. Site located in industrial-zoned area, anticipated land use will be industrial. Asphalt cap can be easily integrated into future site developments. Replacement wells may need to be installed for future confirmational monitoring depending onsite development. Risk assessment may be required to evaluate groundwater/soil to indoor air exposure pathway if buildings are proposed in the area of the groundwater plume.	Same as Alternative 1.	Same as Alternative 1.

Notes:

(a) Metals-impacted soil is categorized as shallow soil (typically 3 feet or less bgs) exceeding cleanup levels. This category of soil predominantly contains lead but may contain other metals (i.e., chromium), diesel- and oil-range petroleum hydrocarbons, carcinogenic polycyclic aromatic hydrocarbons (cPAHs), and polychlorinated biphenyls (PCBs).

TABLE 9-14

SUMMARY OF COST ESTIMATES FOR ALTERNATIVES
Former Tacoma Metals Facility

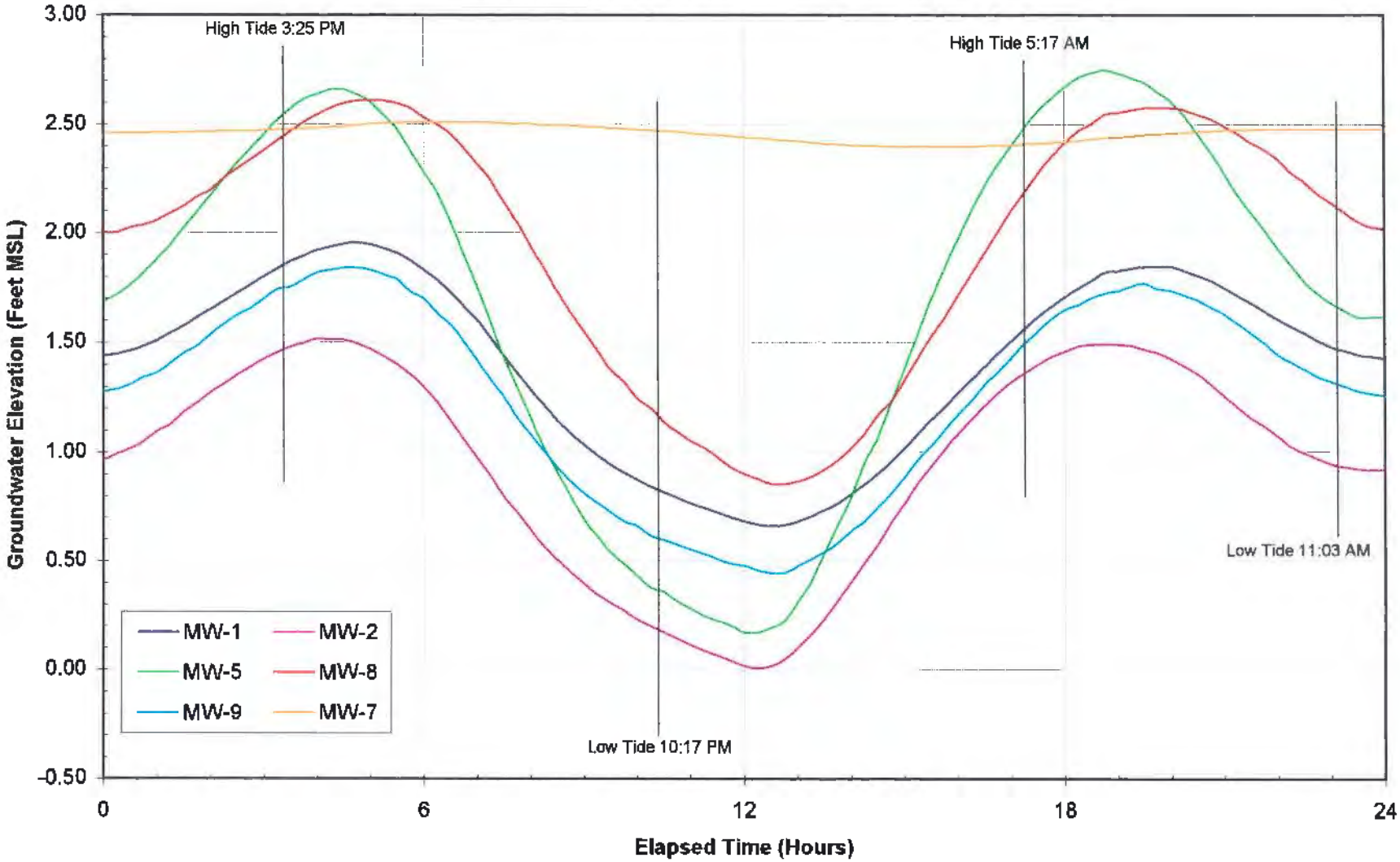
Alternative	Description	Estimated Total Present Worth[a] ($)
1	Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation with Offsite Disposal), Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review	$1,679,000
2	Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation with Offsite Disposal), Lead Excavation & Consolidation, Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review	$1,750,000
3	Source Control (Free Product Removal & Petroleum Hydrocarbon Excavation), Lead Excavation, Onsite Treatment & Reuse, Asphalt Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater & Surface Water Compliance Monitoring, Periodic Review	$2,860,000

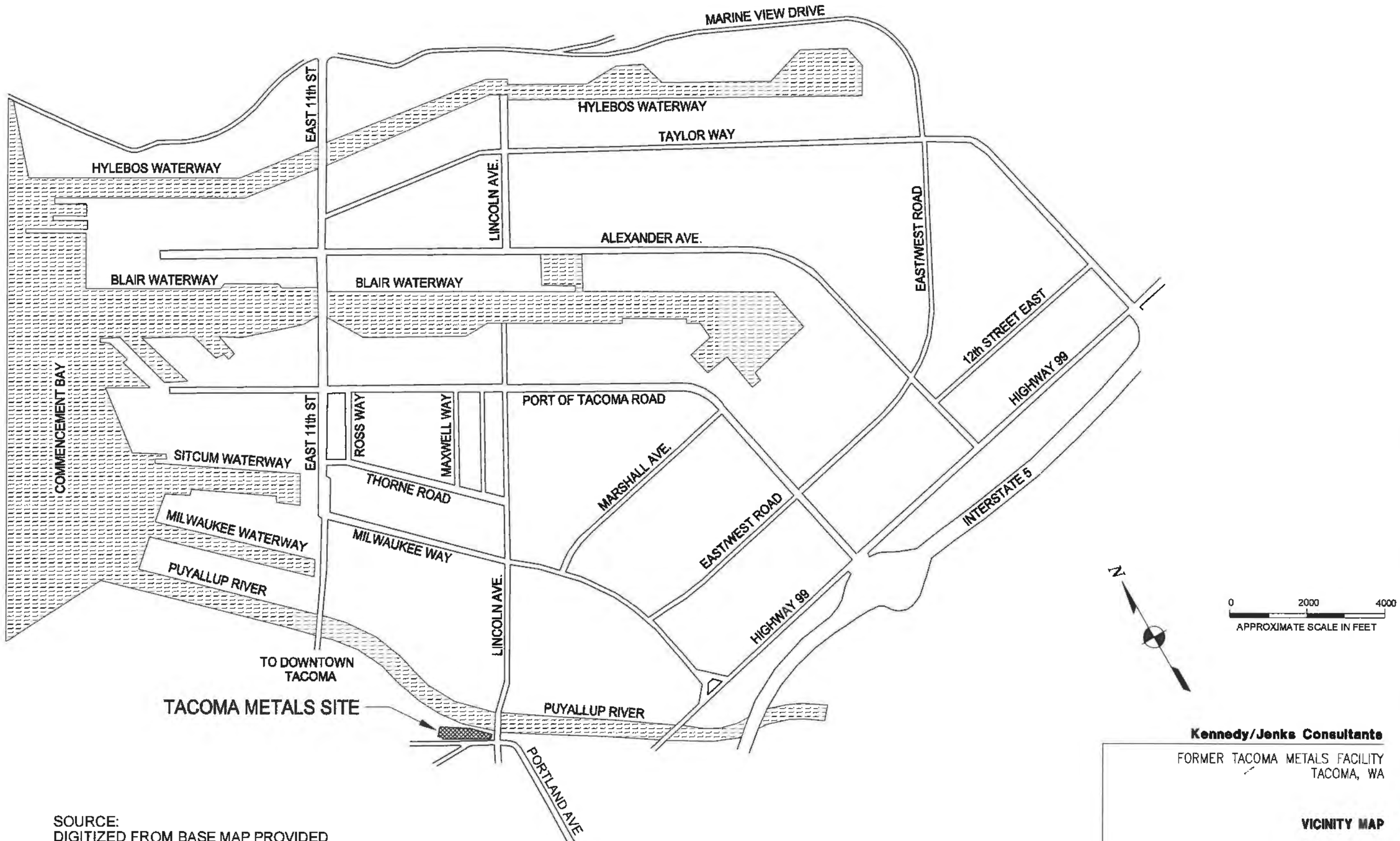
Note:

(a) Refer to Appendix P for detailed cost estimates.

FIGURE 3-7

Continuous Groundwater Level Monitoring Hydrograph
21-22 February 2001
Former Tacoma Metals Facility, Tacoma, WA





SOURCE:
DIGITIZED FROM BASE MAP PROVIDED
BY SWEET-EDWARDS AND ASSOCIATES, INC. (1987).

Kennedy/Jenks Consultants

FORMER TACOMA METALS FACILITY
TACOMA, WA

VICINITY MAP

996098.00/P01SK001-1

FIGURE 1-1

PUYALLUP RIVER

FORMER OIL HOUSE

WOODWASTE LANDFILL

FORMER MACHINE SHED

WOODWASTE PILE

PILE

FORMER FOUNDATION

APPROXIMATE FORMER UST LOCATION

FORMER BUNKHOUSE EXISTING CONCRETE PAD 2' BGS

FORMER BUILDING LOCATION

LEVEE ROAD

CONCRETE FOUNDATION (FURNACE BUILDING)

PREVIOUS BALER

APPROXIMATE PROPERTY BOUNDARY

UNKNOWN CONCRETE FOUNDATION

UNPAVED AREA

VAULT

FORMER MAIN WAREHOUSE BUILDING

OFFICE AREA

UNPAVED AREA

LINCOLN AVENUE

FORMER OIL TANK

FENCE & BRINK (CONCRETE PAD + CINDERBLOCK WALL)

CONCRETE VAULT

FORMER RED BRICK BUILDING

GATE

GATE

GATE

FORMER CREOSOTING PLANT

GATE

GATE

FORMER EQUIPMENT BUILDING

SEGMENTAL BLOCK WALL (CONCRETE)

FORMER POWER BUILDING

PORTLAND AVENUE

COUNTER WEIGHT (STEEL/CONCRETE BLOCK)

12" CMP CULVERT

FORMER RAILROAD TRACKS

PORTLAND AVENUE

FORMER SCALE

FORMER BUNKER

EXISTING STORAGE BUILDING (TO REMAIN)

FORMER BOARDING HOUSE

LEGEND:

- CATCHBASIN
- SD — STORMDRAIN LINES
- 8' CHAINLINK FENCE W/BARBED WIRE
- FORMER RAILROAD TRACK LOCATION
- EXISTING RAILROAD TRACK LOCATION
- UNPAVED AREA
- CONCRETE
- APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)

NOTES:

1. LOCATIONS SHOWN WITHIN PROPERTY BOUNDARIES ARE BASED ON SITE SURVEY BY EARTH TECH INC., ON 28 MARCH 2000.
2. INFORMATION SHOWN OUTSIDE OF PROPERTY BOUNDARIES IS BASED ON 1993 CITY OF TACOMA GEOGRAPHIC INFORMATION SYSTEM, TACOMA AREA MAPS.
3. PREVIOUS TRUNCATED RAILROAD SPUR LOCATION IS APPROXIMATE.
4. PROPERTY AREA = 249,223±sq.ft. (5.72±AC.)

N

0 50 100

SCALE: 1=100

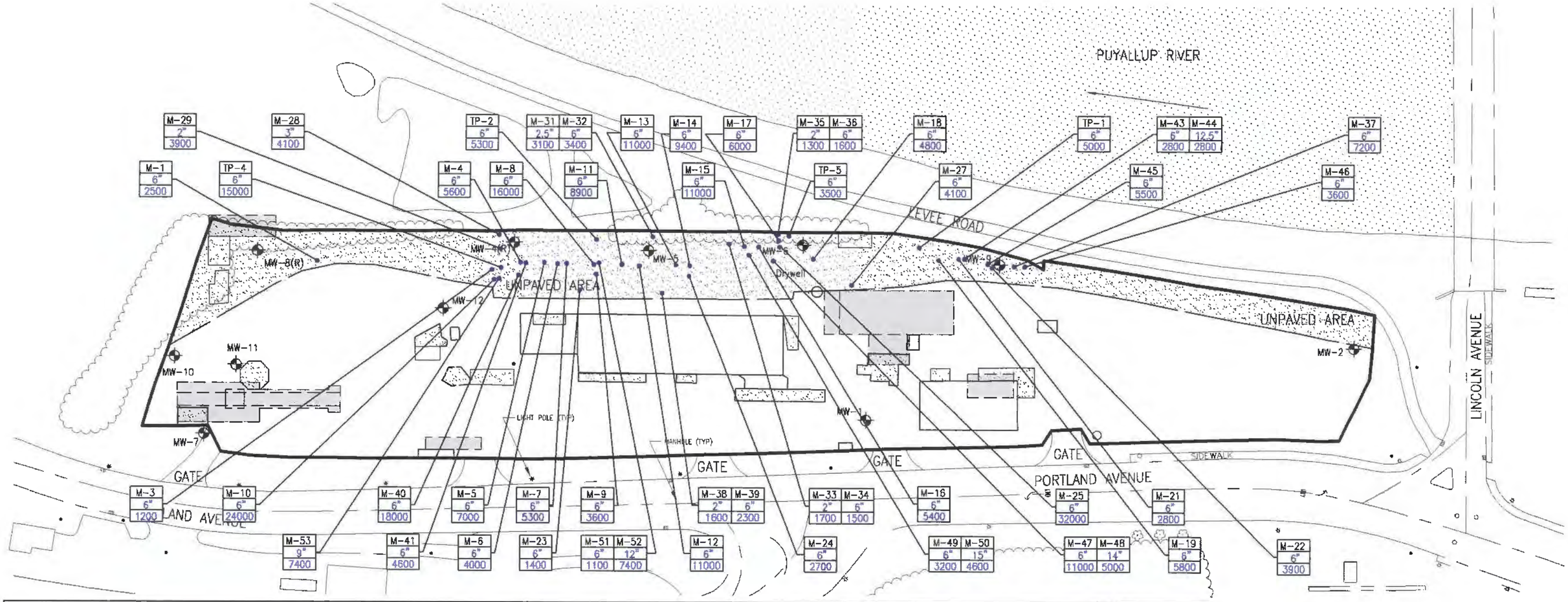
Kennedy/Jenks Consultants

FORMER TACOMA METALS FACILITY
TACOMA, WA

SITE OVERVIEW MAP

996098.00/P01SK001-2

FIGURE 1-2



LEGEND:

MW-1 MONITORING WELL LOCATION
(R) = REPLACEMENT

SOIL CONCENTRATIONS EXCEEDING MTCA METHOD A INDUSTRIAL SOIL CLEANUP LEVEL (LEAD 1000 mg/kg).

HART-CROWSER SURFACE SOIL SAMPLES (1990)

MORRIS ENVIRONMENTAL SERVICES SURFACE SOIL SAMPLES (1991)

TP-4	M-1
6"	6"
15000	2500

DEPTH(ft)

CONCENTRATION(mg/kg)

UNPAVED AREA

APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)

NOTES:

1. MAP IS BASED ON SITE SURVEY BY EARTH TECH INC., ON 28 MARCH 2000.
2. FIGURE SHOWS LEAD CONCENTRATIONS GREATER THAN OR EQUAL TO 1000 mg/kg.

N

0 50 100
SCALE: 1=100

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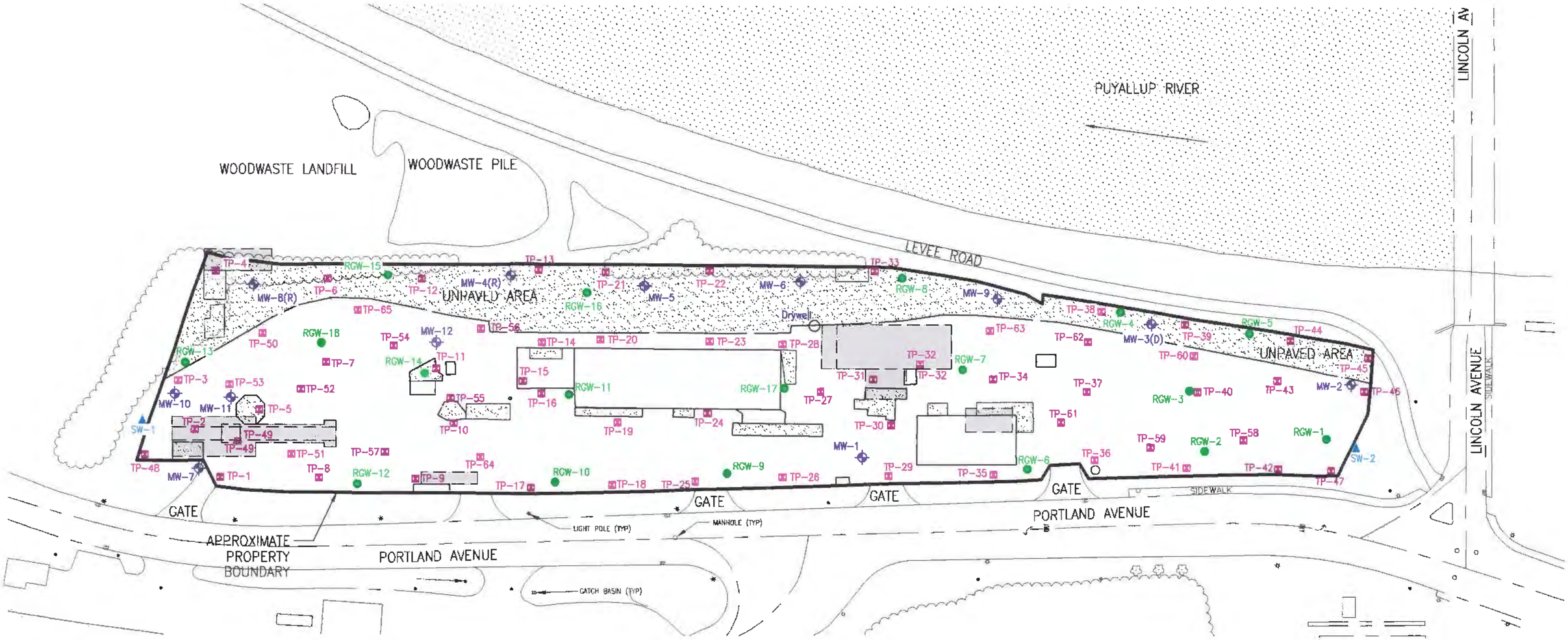
FORMER TACOMA METALS FACILITY
TACOMA, WA

PREVIOUS INVESTIGATIONS LEAD CONCENTRATIONS IN SOIL

996098.00/P01SK001-3

FIGURE 1-3



LEGEND:

MW-10	MONITORING WELL LOCATIONS (R) = REPLACEMENT (D) = DEMOLISHED
RGW-12	RECONNAISSANCE GROUNDWATER SAMPLING LOCATIONS
TP-64	TEST PIT SAMPLING LOCATIONS
SW-1	SURFACE WATER SAMPLING LOCATIONS
	UNPAVED AREA
	APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)

NOTES:

1. LOCATIONS SHOWN WITHIN PROPERTY BOUNDARIES ARE BASED ON SITE SURVEY BY EARTH TECH INC., ON 28 MARCH 2000.
2. INFORMATION SHOWN OUTSIDE OF PROPERTY BOUNDARIES IS BASED ON 1993 CITY OF TACOMA GEOGRAPHIC INFORMATION SYSTEM, TACOMA AREA MAPS.
3. PROPERTY AREA = 249,223±sq.ft. (5.72±AC.)

N

0 50 100

SCALE: 1=100

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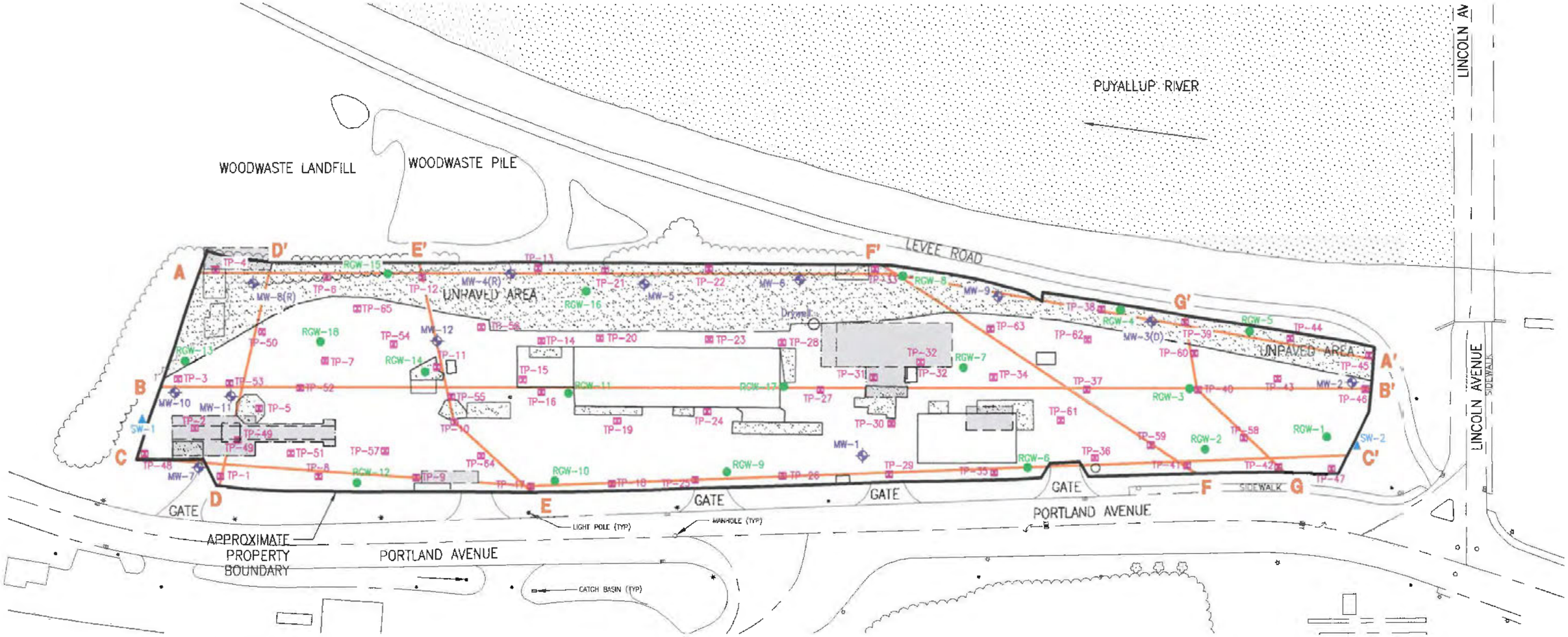
FORMER TACOMA METALS FACILITY
TACOMA, WA

SAMPLE LOCATION SUMMARY MAP

996098.00/P01SK002-1

FIGURE 2-1



LEGEND:

- MW-10 — MONITORING WELL LOCATIONS
  (R) = REPLACEMENT
  (D) = DEMOLISHED
- RGW-12 — RECONNAISSANCE GROUNDWATER SAMPLING LOCATIONS
- TP-64 — TEST PIT SAMPLING LOCATIONS
- SW-1 — SURFACE WATER SAMPLING LOCATIONS
- CROSS SECTION LINES
- UNPAVED AREA
- APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)

METAL DEBRIS FILL – ABUNDANT MIXED METAL AND OTHER DEBRIS WITH SOIL MATRIX. DEBRIS INCLUDES CABLE, WIRE, SHEET METAL, SPRINGS, MACHINE PARTS, SCRAP METAL, RUBBER, GLASS, BRICK, CONCRETE, AND OTHER MATERIAL. MATRIX MATERIAL IS TYPICALLY SAND AND GRAVEL MIXTURE.

MIXED FILL – VARIABLE FILL MATERIAL TYPICALLY INCLUDING WELL GRADED SAND AND GRAVEL, POORLY GRADED SAND, SILTY SAND AND GRAVEL, AND SOME SILT AND CLAY. COMMONLY CONTAINS SOME METAL, GLASS, BRICK, CONCRETE, AND OTHER DEBRIS.

WOOD FILL – MIXED WOOD DEBRIS INCLUDES LOGS, BOARDS, BARK, CHIPS, WOOD DUST, PLANKS, AND PILINGS. MATRIX MATERIAL INCLUDES MEDIUM TO FINE, SAND, SILT, AND CLAY MIXTURES. MATRIX CONTENT IS TYPICALLY 0–20%.

NATIVE MATERIAL – APPARENTLY NATIVE DELTAIC AND ALLUVIAL DEPOSITS INCLUDING CLAYEY SANDY SILT WITH ORGANIC PLANT MATERIAL, AND POORLY GRADED SAND WITH FINE GRAVEL MATERIAL.

N

0 50 100
SCALE: 1=100

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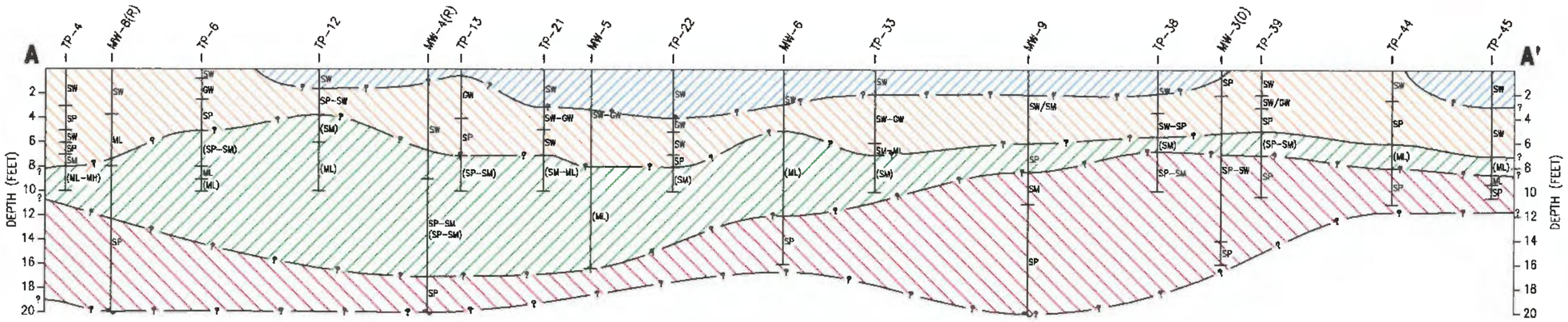
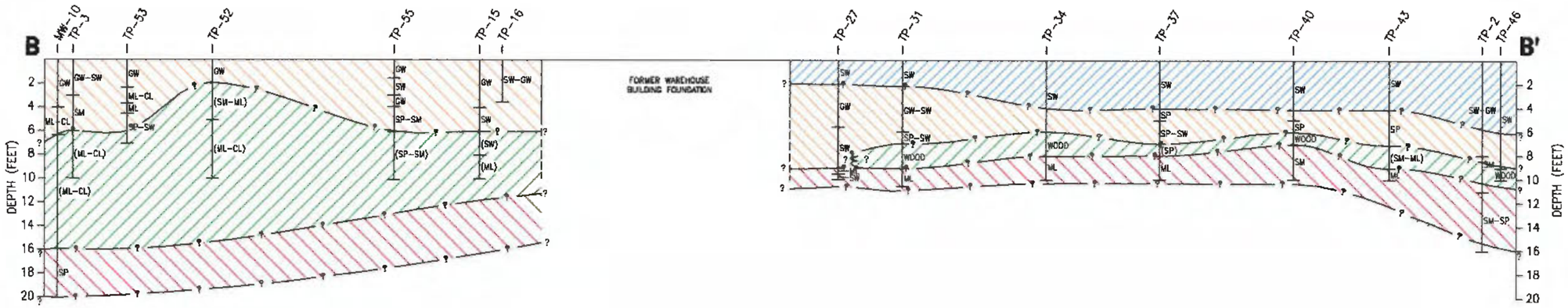
FORMER TACOMA METALS FACILITY
TACOMA, WA

GEOLOGIC CROSS SECTION LOCATIONS AND LEGEND

996098.00/P01SK003-1

FIGURE 3-1





NOTES:

1. REFER TO FIGURE 3-1 FOR LEGEND AND NOTES.
2. SOIL CLASSIFICATIONS IN PARENTHESES INDICATE THE MATRIX MATERIAL IN THE WOOD FILL UNIT.

USCS SOIL CLASSIFICATION

SP	POORLY-GRADED SAND
SW	WELL-GRADED SAND
GW	WELL-GRADED GRAVEL
ML	SILT
SM	SILTY SAND
CL	LEAN CLAY

N

0 50 100
HORIZONTAL SCALE: 1=100

0 5 10
VERTICAL SCALE: 1=10

VERTICAL EXAGGERATION 10x

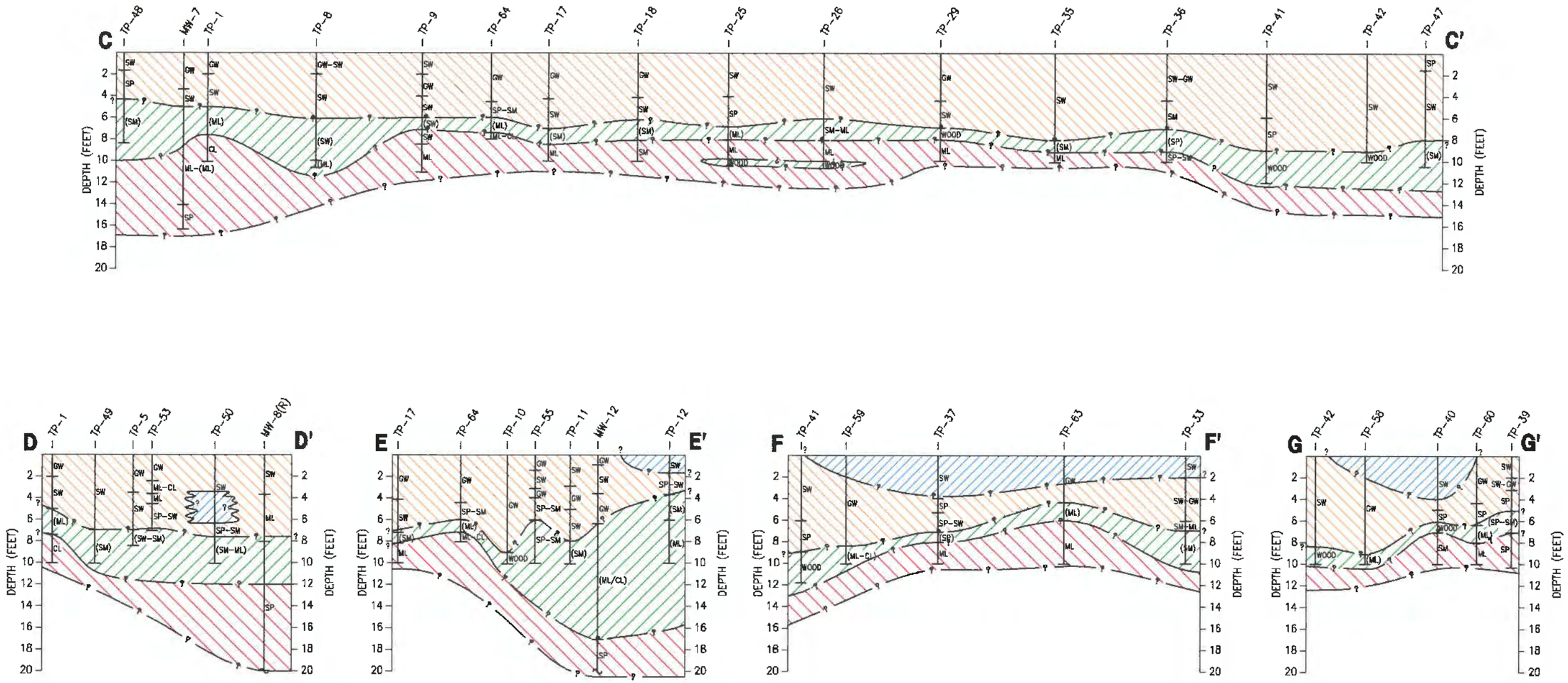
Kennedy/Jenks Consultants

FORMER TACOMA METALS FACILITY
TACOMA, WA

GEOLOGIC CROSS SECTIONS A-A' AND B-B'

99609B.00/P01SK003-2

FIGURE 3-2



NOTES:

1. REFER TO FIGURE 3-1 FOR LEGEND AND NOTES.
2. SOIL CLASSIFICATIONS IN PARENTHESES INDICATE THE MATRIX MATERIAL IN THE WOOD FILL UNIT.

USCS SOIL CLASSIFICATION

SP	POORLY-GRADED SAND
SW	WELL-GRADED SAND
GW	WELL-GRADED GRAVEL
ML	SILT
SM	SILTY SAND
CL	LEAN CLAY

N

0 50 100
HORIZONTAL SCALE: 1=100

0 5 10
VERTICAL SCALE: 1=10

VERTICAL EXAGGERATION 10x

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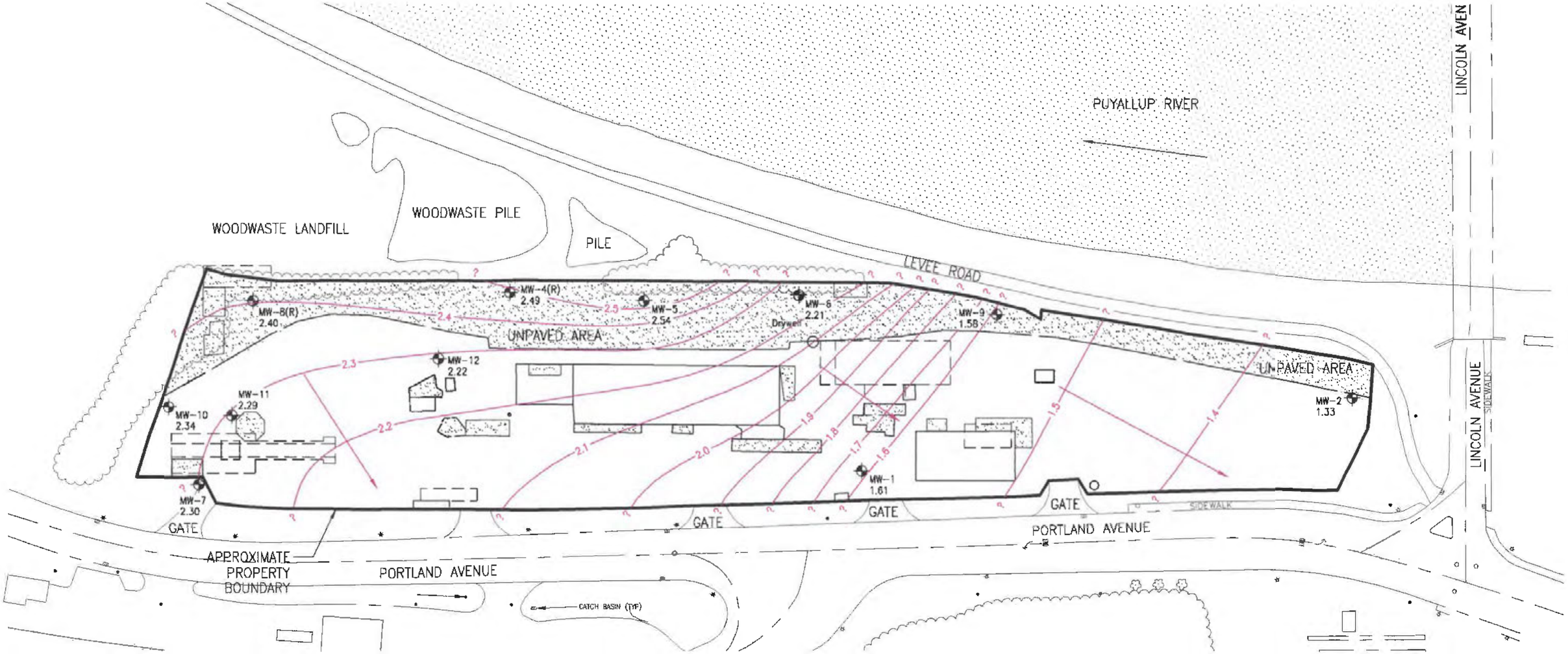
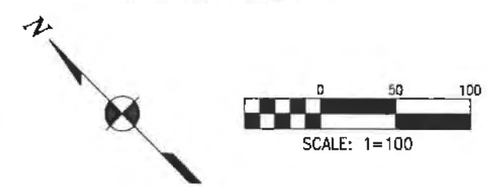
FORMER TACOMA METALS FACILITY
TACOMA, WA

GEOLOGIC CROSS SECTIONS
C-C', D-D', E-E', F-F' AND G-G'

996098.00/P01SK003-3

FIGURE 3-3





LEGEND:

MW-1 1.61	MONITORING WELL LOCATION AND GROUNDWATER ELEVATION (FEET MSL) (R) = REPLACEMENT
2.00	APPROXIMATE POTENTIOMETRIC SURFACE CONTOURS (FEET MSL)
	APPROXIMATE HYDRAULIC GRADIENT DIRECTION
	UNPAVED AREA
	APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)

NOTES:

1. LOCATIONS SHOWN WITHIN PROPERTY BOUNDARIES ARE BASED ON SITE SURVEY BY EARTH TECH INC., ON 28 MARCH 2000.
2. INFORMATION SHOWN OUTSIDE OF PROPERTY BOUNDARIES IS BASED ON 1993 CITY OF TACOMA GEOGRAPHIC INFORMATION SYSTEM, TACOMA AREA MAPS.
3. CONTOUR INTERVAL = 0.1 FEET.

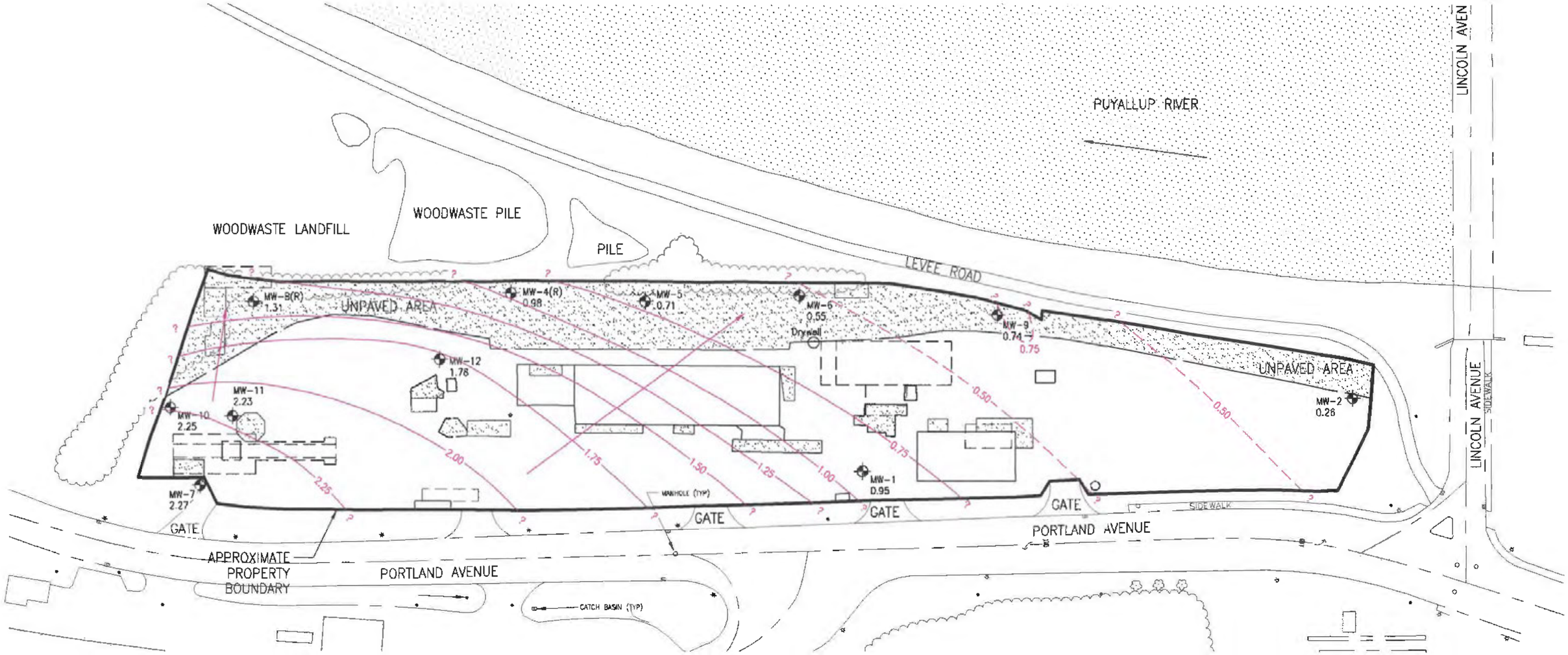
Kennedy/Jenks Consultants

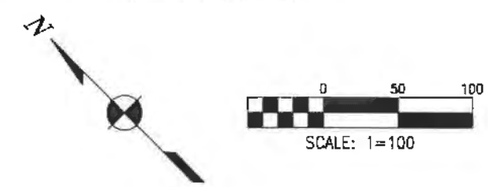
FORMER TACOMA METALS FACILITY
TACOMA, WA

POTENTIOMETRIC SURFACE CONTOUR
HIGH TIDE - 31 JANUARY 2001

996098.00/P01SK003-4A

FIGURE 3-4A





LEGEND:

MW-1 0.95	MONITORING WELL LOCATION AND GROUNDWATER ELEVATION (FEET MSL) (R) = REPLACEMENT
2.00	APPROXIMATE POTENTIOMETRIC SURFACE CONTOURS (FEET MSL) DASHED WHERE UNCERTAIN
	APPROXIMATE HYDRAULIC GRADIENT DIRECTION
	UNPAVED AREA
	APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)

NOTES:

1. LOCATIONS SHOWN WITHIN PROPERTY BOUNDARIES ARE BASED ON SITE SURVEY BY EARTH TECH INC., ON 28 MARCH 2000.
2. INFORMATION SHOWN OUTSIDE OF PROPERTY BOUNDARIES IS BASED ON 1993 CITY OF TACOMA GEOGRAPHIC INFORMATION SYSTEM, TACOMA AREA MAPS.
3. CONTOUR INTERVAL = 0.25 FEET.

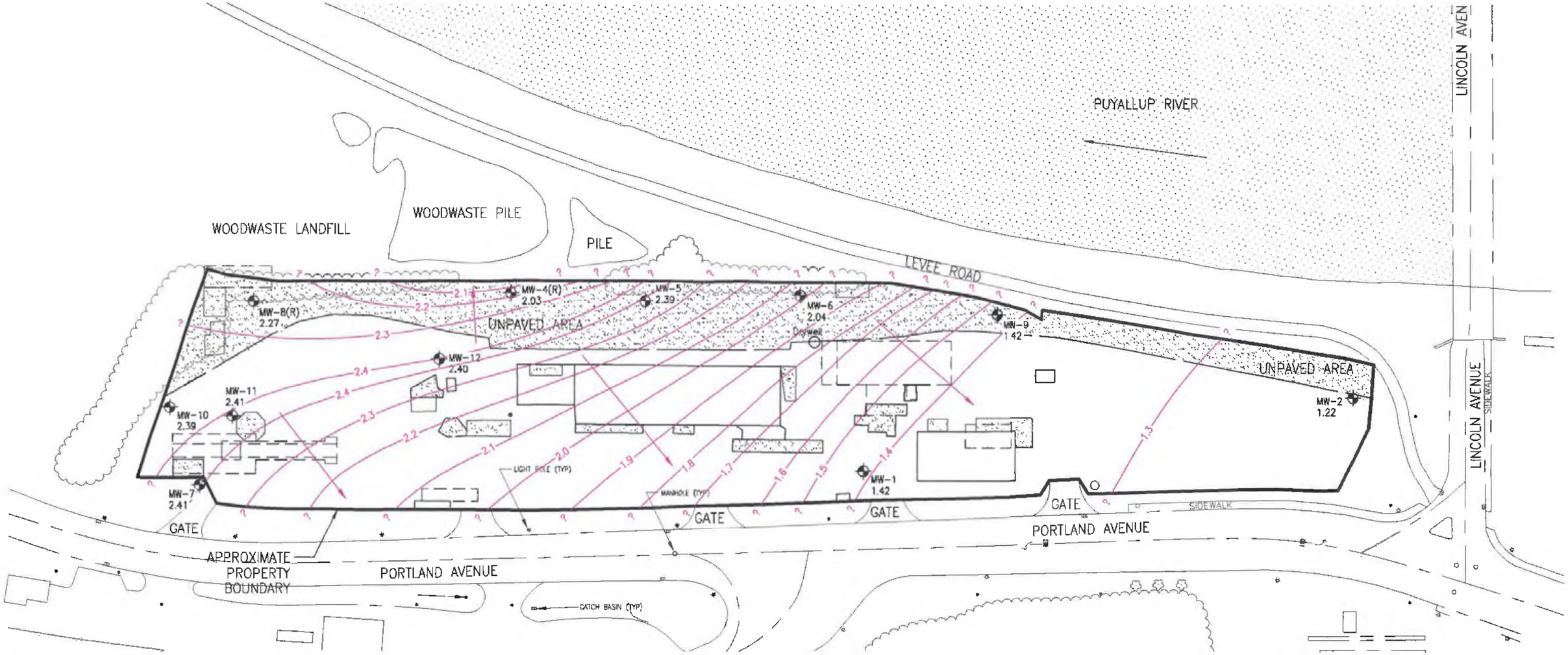
Kennedy/Jenks Consultants

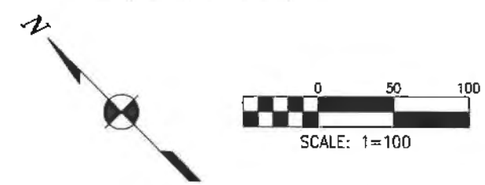
FORMER TACOMA METALS FACILITY
TACOMA, WA

POTENTIOMETRIC SURFACE CONTOUR
LOW TIDE - 31 JANUARY 2001

996098.00/P01SK003-4B

FIGURE 3-4B





LEGEND:

MW-1 1.42	MONITORING WELL LOCATION AND GROUNDWATER ELEVATION (FEET MSL) (R) = REPLACEMENT
2.00	APPROXIMATE POTENTIOMETRIC SURFACE CONTOURS (FEET MSL)
	APPROXIMATE HYDRAULIC GRADIENT DIRECTION
	UNPAVED AREA
	APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)

NOTES:

1. LOCATIONS SHOWN WITHIN PROPERTY BOUNDARIES ARE BASED ON SITE SURVEY BY EARTH TECH INC., ON 28 MARCH 2000.
2. INFORMATION SHOWN OUTSIDE OF PROPERTY BOUNDARIES IS BASED ON 1993 CITY OF TACOMA GEOGRAPHIC INFORMATION SYSTEM, TACOMA AREA MAPS.
3. CONTOUR INTERVAL = 0.1 FEET.

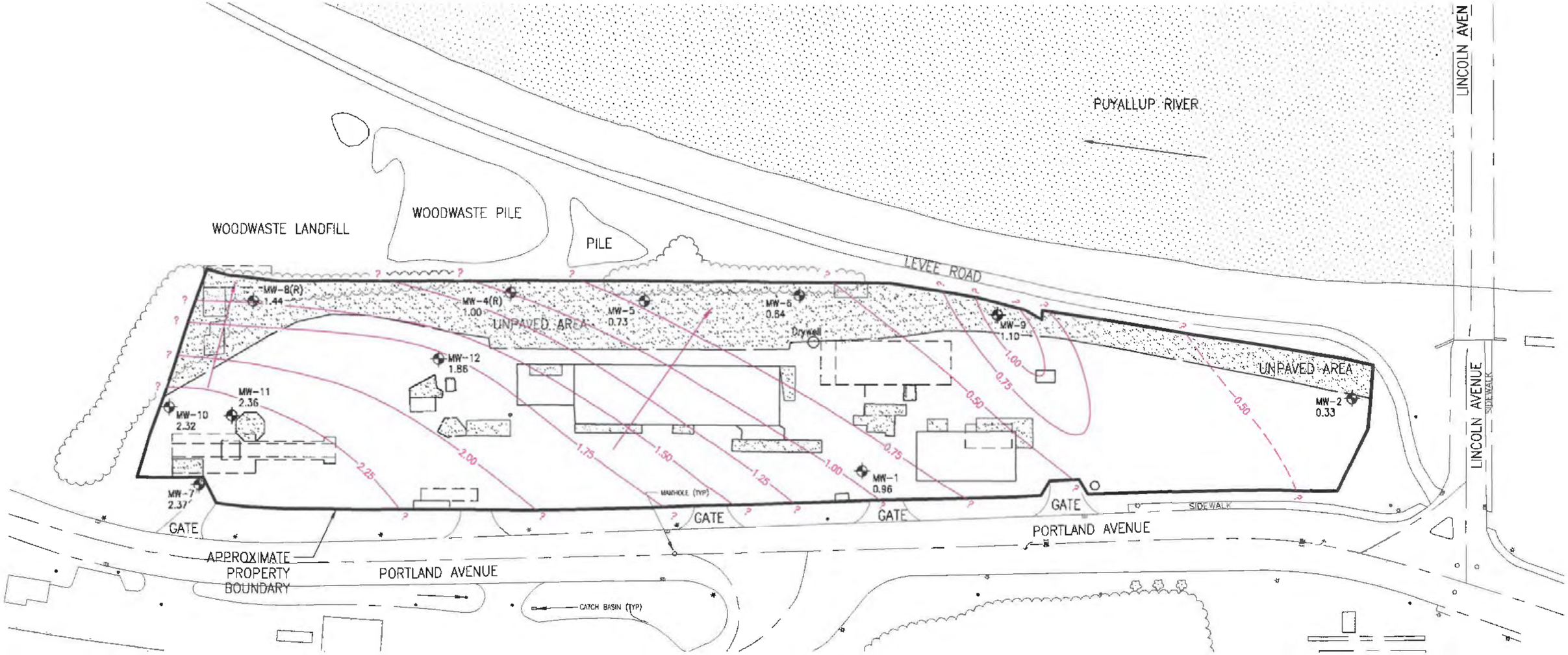
Kennedy/Jenks Consultants

FORMER TACOMA METALS FACILITY
TACOMA, WA

POTENTIOMETRIC SURFACE CONTOUR
HIGH TIDE - 13 FEBRUARY 2001

996098.00/P01SK003-5A

FIGURE 3-5A



LEGEND:

MW-1 0.96	MONITORING WELL LOCATION AND GROUNDWATER ELEVATION (FEET MSL) (R) = REPLACEMENT
2.00	APPROXIMATE POTENTIOMETRIC SURFACE CONTOURS (FEET MSL) DASHED WHERE UNCERTAIN
	APPROXIMATE HYDRAULIC GRADIENT DIRECTION
	UNPAVED AREA
	APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)

NOTES:

1. LOCATIONS SHOWN WITHIN PROPERTY BOUNDARIES ARE BASED ON SITE SURVEY BY EARTH TECH INC., ON 28 MARCH 2000.
2. INFORMATION SHOWN OUTSIDE OF PROPERTY BOUNDARIES IS BASED ON 1993 CITY OF TACOMA GEOGRAPHIC INFORMATION SYSTEM, TACOMA AREA MAPS.
3. CONTOUR INTERVAL = 0.25 FEET.

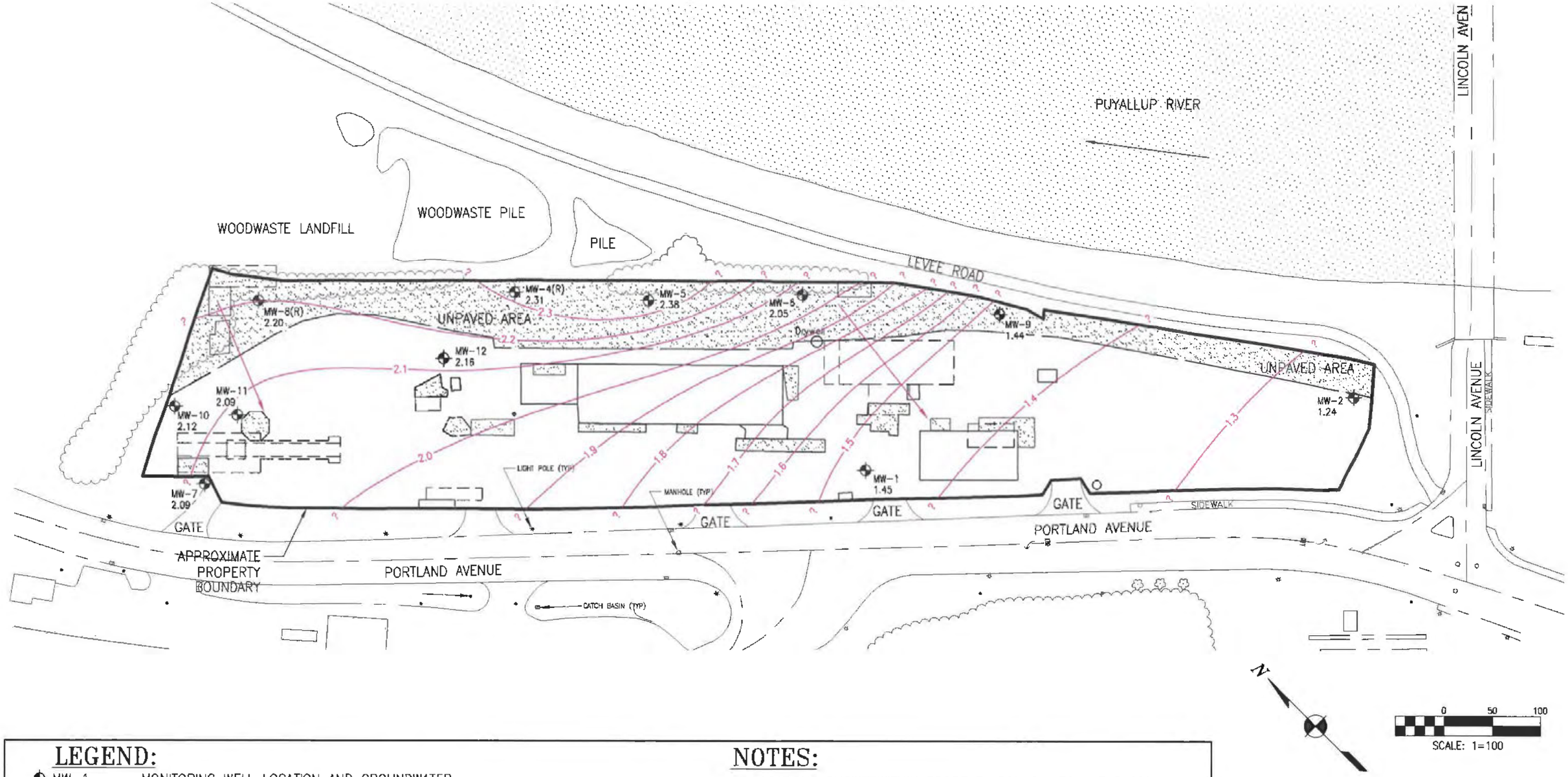
Kennedy/Jenks Consultants

FORMER TACOMA METALS FACILITY
TACOMA, WA

POTENTIOMETRIC SURFACE CONTOUR
LOW TIDE - 13 FEBRUARY 2001

996098.00/P01SK003-5B

FIGURE 3-5B



LEGEND:

MW-1 1.45	MONITORING WELL LOCATION AND GROUNDWATER ELEVATION (FEET MSL) (R) = REPLACEMENT
2.00	APPROXIMATE POTENTIOMETRIC SURFACE CONTOURS (FEET MSL)
	APPROXIMATE HYDRAULIC GRADIENT DIRECTION
	UNPAVED AREA
	APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)

NOTES:

1. LOCATIONS SHOWN WITHIN PROPERTY BOUNDARIES ARE BASED ON SITE SURVEY BY EARTH TECH INC., ON 28 MARCH 2000.
2. INFORMATION SHOWN OUTSIDE OF PROPERTY BOUNDARIES IS BASED ON 1993 CITY OF TACOMA GEOGRAPHIC INFORMATION SYSTEM, TACOMA AREA MAPS.
3. CONTOUR INTERVAL = 0.1 FEET.

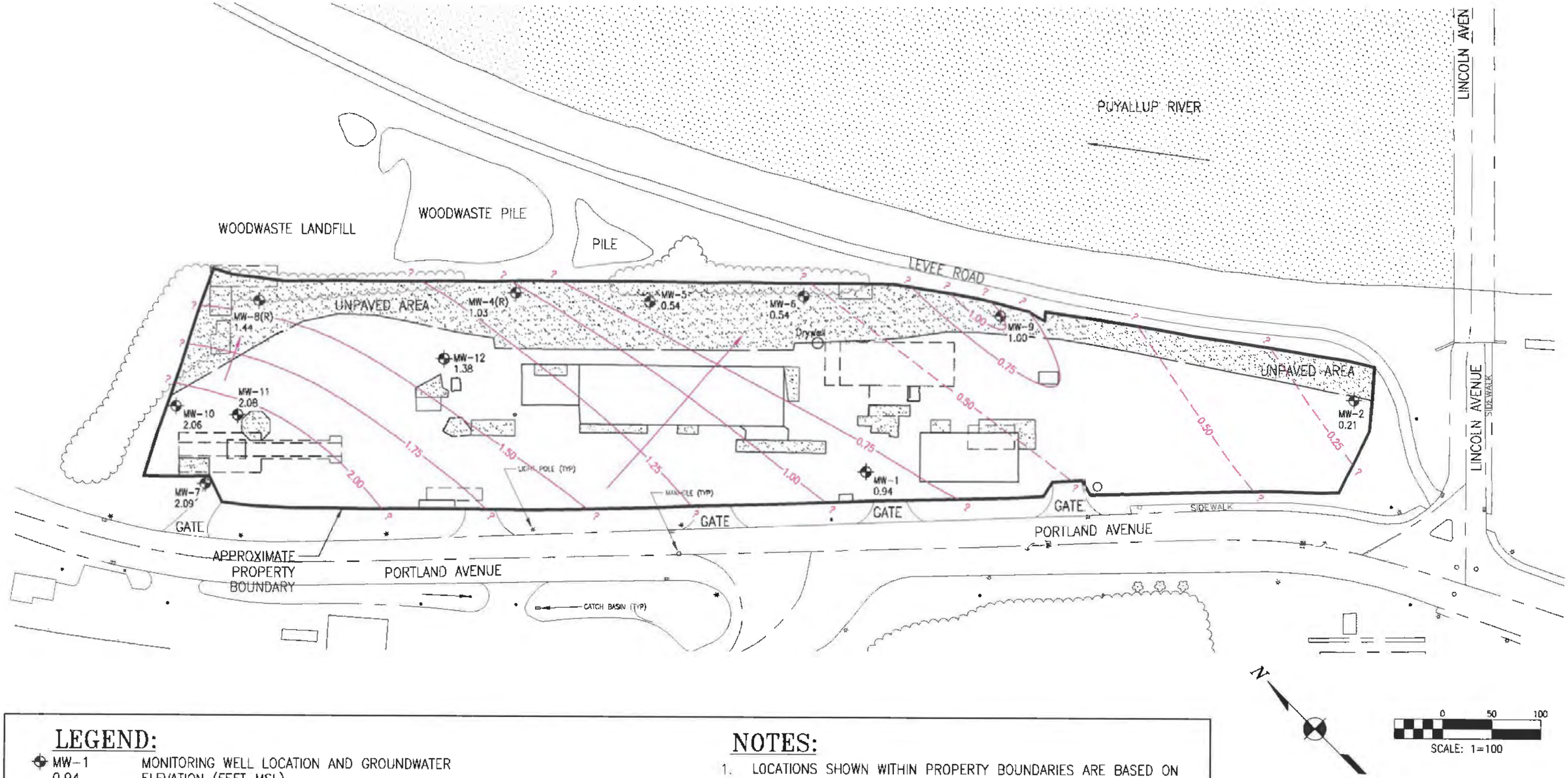
Kennedy/Jenks Consultants

FORMER TACOMA METALS FACILITY
TACOMA, WA

POTENTIOMETRIC SURFACE CONTOUR
HIGH TIDE - 28 FEBRUARY 2001

996098.00/P01SK003-6A

FIGURE 3-6A



LEGEND:

MW-1 0.94	MONITORING WELL LOCATION AND GROUNDWATER ELEVATION (FEET MSL) (R) = REPLACEMENT
2.00	APPROXIMATE POTENTIOMETRIC SURFACE CONTOURS (FEET MSL) DASHED WHERE UNCERTAIN
	APPROXIMATE HYDRAULIC GRADIENT DIRECTION
	UNPAVED AREA
	APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)

NOTES:

1. LOCATIONS SHOWN WITHIN PROPERTY BOUNDARIES ARE BASED ON SITE SURVEY BY EARTH TECH INC., ON 28 MARCH 2000.
2. INFORMATION SHOWN OUTSIDE OF PROPERTY BOUNDARIES IS BASED ON 1993 CITY OF TACOMA GEOGRAPHIC INFORMATION SYSTEM, TACOMA AREA MAPS.
3. CONTOUR INTERVAL = 0.25 FEET.

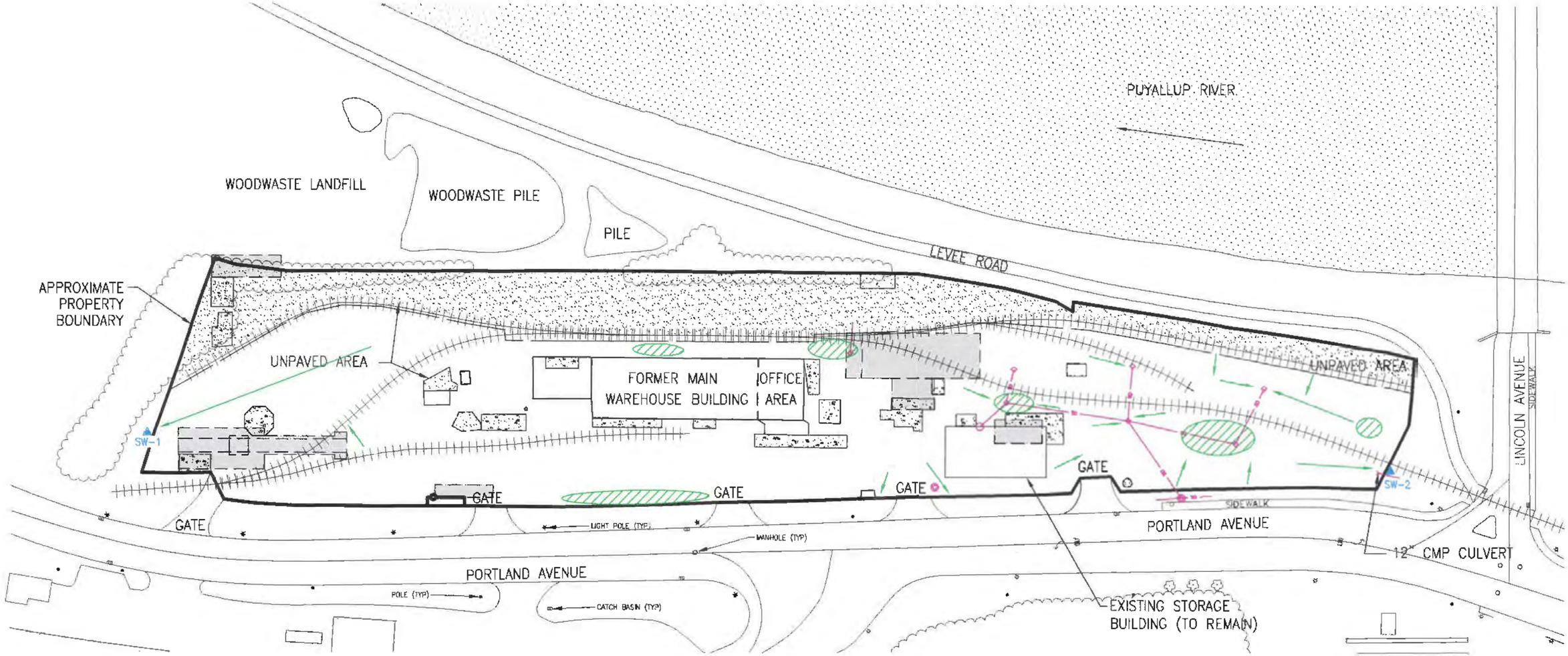
Kennedy/Jenks Consultants

FORMER TACOMA METALS FACILITY
TACOMA, WA

POTENTIOMETRIC SURFACE CONTOUR
LOW TIDE - 28 FEBRUARY 2001

996098.00/P01SK003-6B

FIGURE 3-6B



LEGEND:

- CATCHBASIN
- SD — STORM DRAIN LINES
- SW-1 — SURFACE WATER SAMPLING LOCATIONS
- APPROXIMATE SURFACE DRAINAGE FLOWLINES
- APPROXIMATE SURFACE WATER PONDING AREAS
- FORMER RAILROAD TRACK LOCATION
- UNPAVED AREA
- APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)

NOTES:

1. LOCATIONS SHOWN WITHIN PROPERTY BOUNDARIES ARE BASED ON SITE SURVEY BY EARTH TECH INC., ON 28 MARCH 2000.
2. INFORMATION SHOWN OUTSIDE OF PROPERTY BOUNDARIES IS BASED ON 1993 CITY OF TACOMA GEOGRAPHIC INFORMATION SYSTEM, TACOMA AREA MAPS.

N

0 50 100

SCALE: 1=100

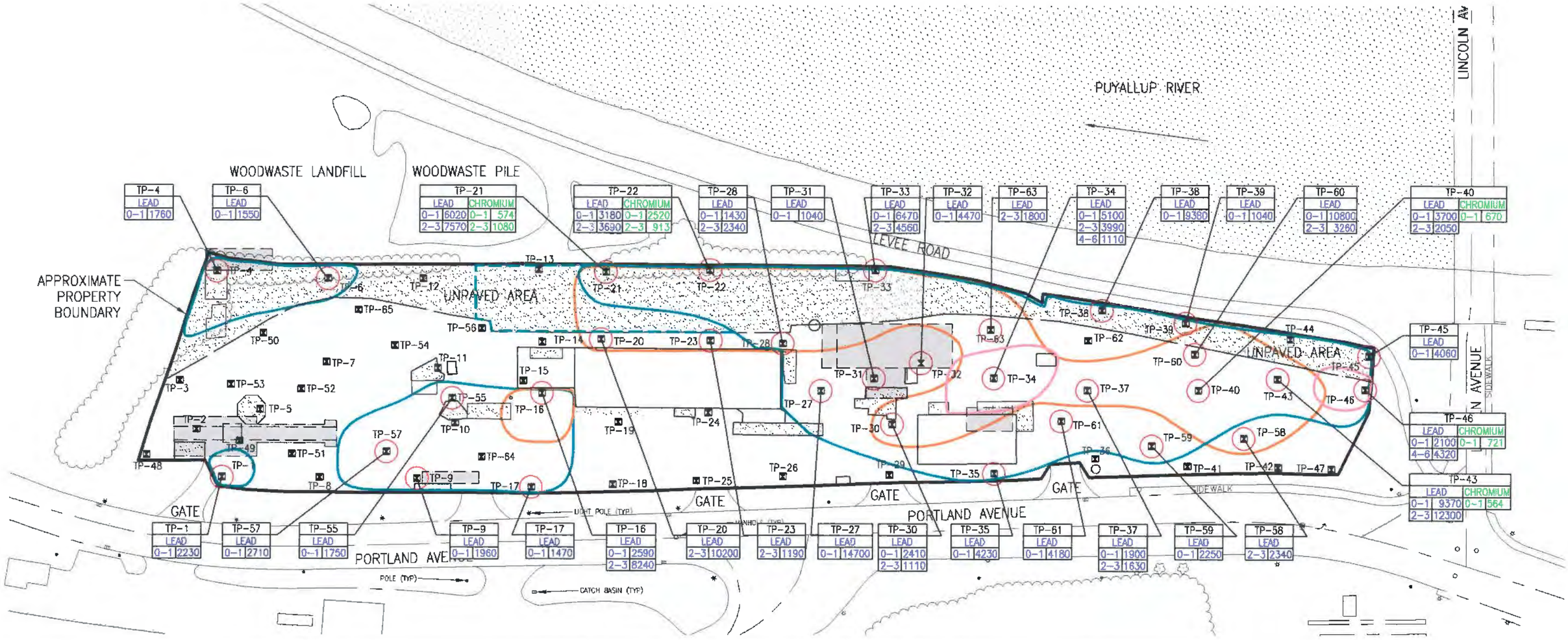
Kennedy/Jenks Consultants

FORMER TACOMA METALS FACILITY
TACOMA, WA

SURFACE WATER FLOW AND SAMPLING MAP

996098.00/P01SK003-8

FIGURE 3-8



LEGEND:

TP-1 — TEST PIT LOCATION

SOIL CONCENTRATIONS EXCEEDING MTCA METHOD A INDUSTRIAL SOIL CLEANUP LEVELS (LEAD 1000 mg/kg, CHROMIUM 500 mg/kg).

TP-43			
LEAD		CHROMIUM	
0-1	9370	6-10	564

TEST PIT DESIGNATION; ANALYTE; DEPTH(ft); CONCENTRATION(mg/kg)

UNPAVED AREA

APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)

0-1 ft bgs

0-1 ft bgs (previous investigations)

2-3 ft bgs

4-6 ft bgs

APPROXIMATE LEAD CLEANUP LEVEL EXCEEDANCE AREAS. (MTCA METHOD A, 1000 mg/kg)

NOTES:

1. MAP IS BASED ON SITE SURVEY BY EARTH TECH INC., ON 28 MARCH 2000.
2. FIGURE SHOWS LEAD CONCENTRATIONS GREATER THAN OR EQUAL TO 1000 mg/kg AND CHROMIUM CONCENTRATIONS GREATER THAN OR EQUAL TO 500 mg/kg.
3. SOIL SAMPLES WERE ANALYZED FOR RCRA METALS AND COPPER BY EPA METHODS 6010/7000 SERIES.
4. WHERE DUPLICATE SAMPLES WERE ANALYZED, THE HIGHER CONCENTRATION IS SHOWN.

N

0 50 100

SCALE: 1=100

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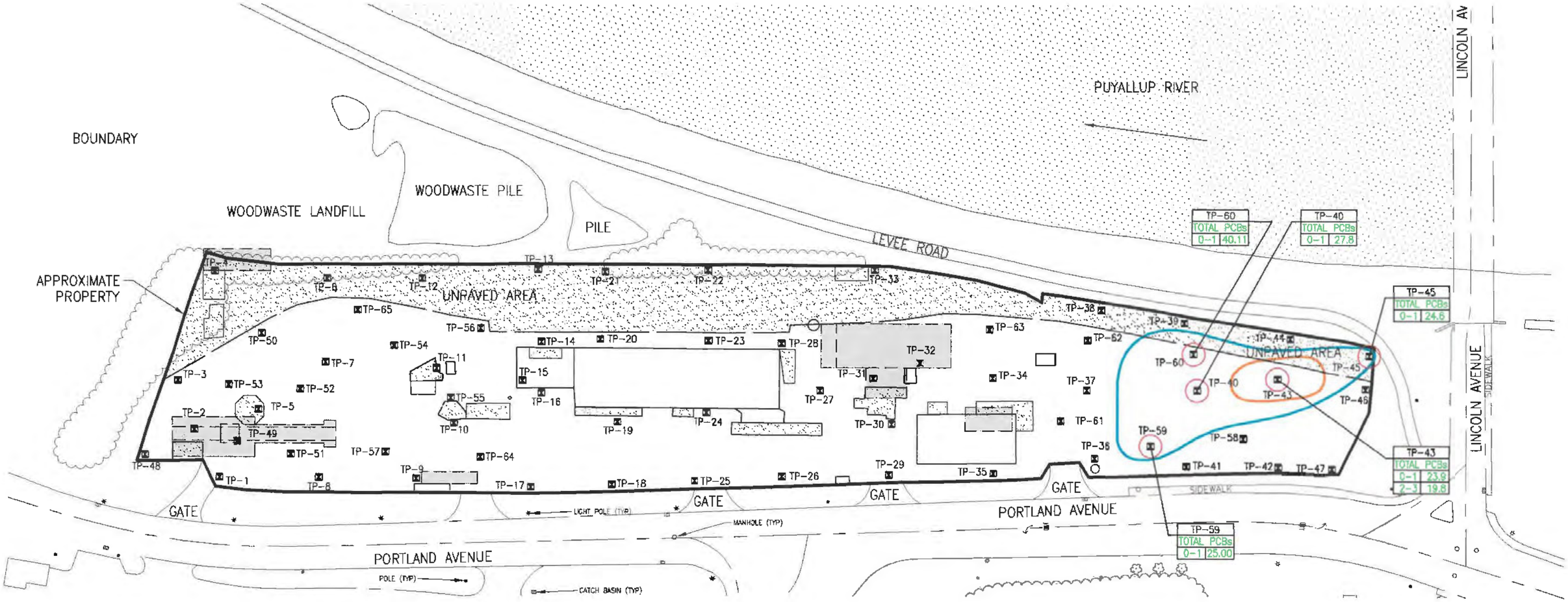
FORMER TACOMA METALS FACILITY
TACOMA, WA

METAL CONCENTRATIONS IN SOIL

996098.00/P01SK004-1

FIGURE 4-1



LEGEND:

- TP-1 — TEST PIT LOCATION
- TOTAL PCB CONCENTRATIONS EXCEEDING THE MTCA METHOD C INDUSTRIAL SOIL CLEANUP LEVEL OF 17 mg/kg
- TP-59 / TOTAL PCBs / 0-1 / 25.00 — TEST PIT DESIGNATION; ANALYTE; DEPTH(ft); CONCENTRATION(mg/kg)
- UNPAVED AREA
- APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)
- 0-1 ft bgs — APPROXIMATE TOTAL PCB CLEANUP LEVEL EXCEEDANCE AREAS. (MTCA METHOD C, 17 mg/kg)
- 2-3 ft bgs

NOTES:

1. MAP IS BASED ON SITE SURVEY BY EARTH TECH INC., ON 28 MARCH 2000.
2. FIGURE SHOWS PCB CONCENTRATIONS GREATER THAN OR EQUAL TO 17 mg/kg.
3. PCBs WERE ANALYZED BY EPA METHOD 8082.
4. WHERE DUPLICATE SAMPLES WERE ANALYZED, THE HIGHER CONCENTRATION IS SHOWN.

N

0 50 100
SCALE: 1=100

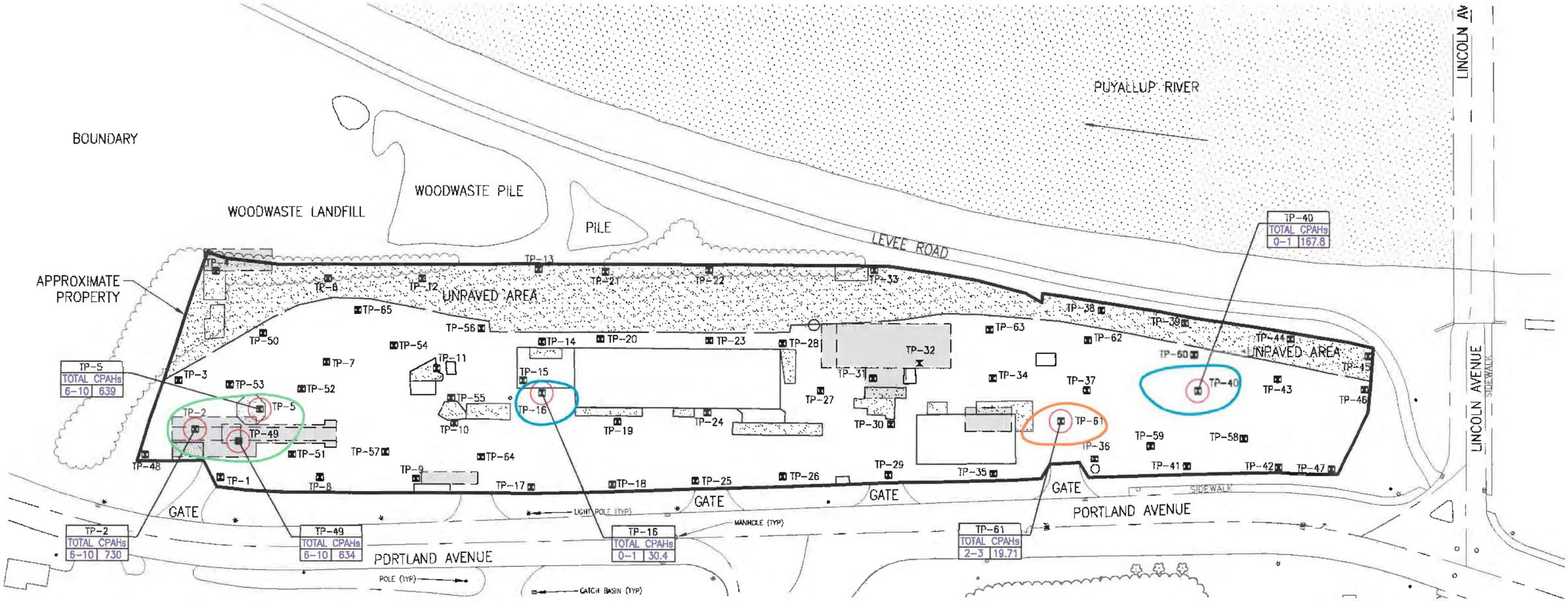
Kennedy/Jenks Consultants

FORMER TACOMA METALS FACILITY
TACOMA, WA

TOTAL PCB CONCENTRATIONS IN SOIL

996098.00/P01SK004-2

FIGURE 4-2



LEGEND:

TP-1 — TEST PIT LOCATION

TOTAL CPAHs CONCENTRATIONS EXCEEDING MTCA METHOD C INDUSTRIAL SOIL CLEANUP LEVEL OF 18 mg/kg

TP-49	
TOTAL CPAHs	
6-10	634

TEST PIT DESIGNATION
ANALYTE
DEPTH(ft)
CONCENTRATION(mg/kg)

UNPAVED AREA

APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)

0-1 ft bgs
2-3 ft bgs
6-10 ft bgs

APPROXIMATE TOTAL CPAH CLEANUP LEVEL EXCEEDANCE AREAS. (MTCA METHOD C, 18 mg/kg)

NOTES:

1. MAP IS BASED ON SITE SURVEY BY EARTH TECH INC., ON 28 MARCH 2000.
2. FIGURE SHOWS TOTAL CPAH CONCENTRATIONS GREATER THAN OR EQUAL TO 18 mg/kg.
3. SAMPLES WERE ANALYZED FOR POLYCYCLIC AROMATIC HYDROCARBONS (PAHS) BY EPA METHOD 8270B GC/MS-SIM. TOTAL CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS (CPAHs) WERE CALCULATED BY SUMMING THE CONCENTRATIONS OF ALL PROBABLE CPAHs. IF A PROBABLE CPAH WAS NOT DETECTED IN THE SAMPLE, A VALUE EQUAL TO 1/2 THE DETECTION LIMITS WAS USED.
4. WHERE DUPLICATE SAMPLES WERE ANALYZED, THE HIGHER CONCENTRATION IS SHOWN.

N

0 50 100
SCALE: 1=100

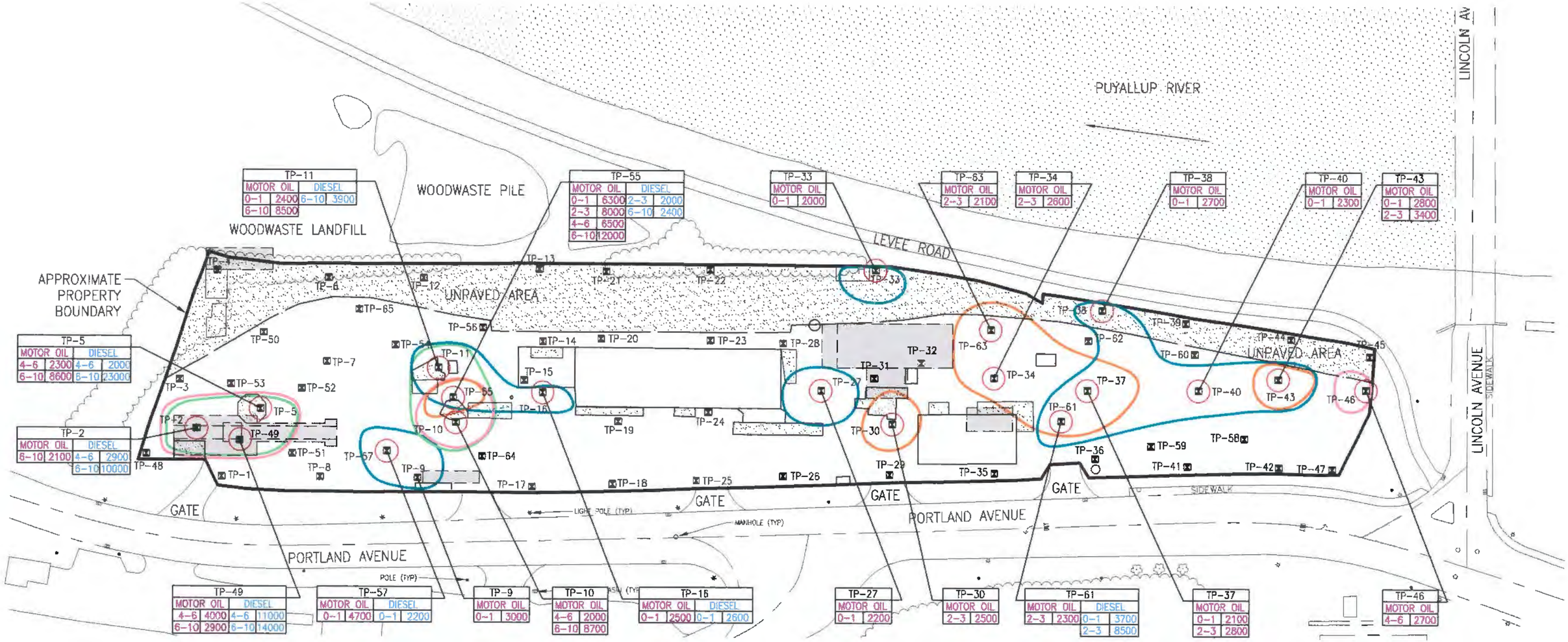
Kennedy/Jenks Consultants

FORMER TACOMA METALS FACILITY
TACOMA, WA

TOTAL CPAH CONCENTRATIONS IN SOIL

996098.00/P01SK004-3

FIGURE 4-3



LEGEND:

TP-1 — TEST PIT LOCATION

TPH CONCENTRATIONS EXCEEDING THE MTCA METHOD A INDUSTRIAL SOIL CLEANUP LEVEL OF 2000 mg/kg

TP-57			
MOTOR OIL		DIESEL	
0-1	4700	0-1	2200

TEST PIT DESIGNATION

ANALYTE — MOTOR OIL; ANALYTE — DIESEL

DEPTH(ft) — 0-1; DEPTH(ft) — 0-1

CONCENTRATION(mg/kg) — 4700; CONCENTRATION(mg/kg) — 2200

UNPAVED AREA

APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)

0-1 ft bgs
2-3 ft bgs
4-6 ft bgs
6-10 ft bgs

APPROXIMATE TPH CLEANUP LEVEL EXCEEDANCE AREAS. (MTCA METHOD A, 2000 mg/kg)

NOTES:

1. MAP IS BASED ON SITE SURVEY BY EARTH TECH INC., ON 28 MARCH 2000.
2. FIGURE SHOWS TPH CONCENTRATIONS GREATER THAN OR EQUAL 2D00 mg/kg.
3. WHERE DUPLICATE SAMPLES WERE ANALYZED, THE HIGHER CONCENTRATION IS SHOWN.
4. MTCA METHOD A INDUSTRIAL SOIL CLEANUP LEVEL BASED ON MTCA ADOPTED AMENDMENTS (ECOLOGY 2001).
5. SAMPLES WERE ANALYZED FOR DIESEL- AND OIL-RANGE PETROLEUM HYDROCARBONS BY ECOLOGY METHOD NWTPH-DIESEL (EXTENDED).

N

0 50 100
SCALE: 1=100

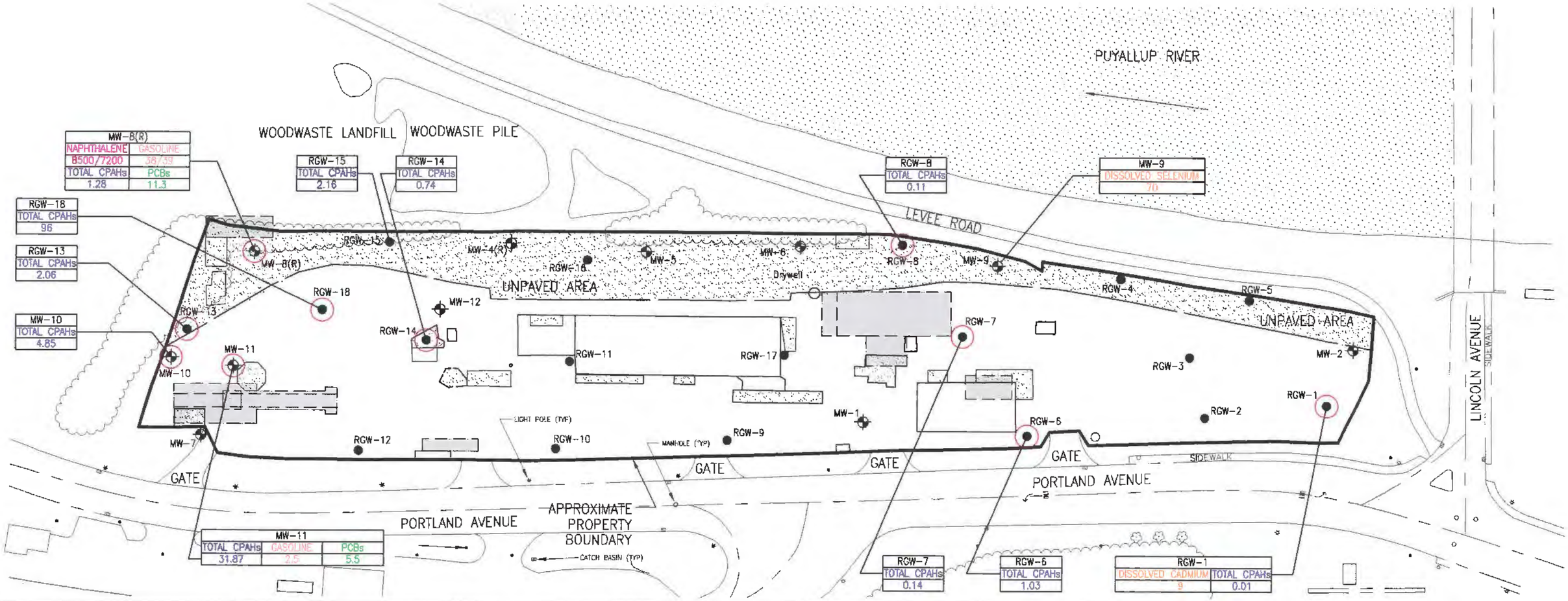
Kennedy/Jenks Consultants

FORMER TACOMA METALS FACILITY
TACOMA, WA

PETROLEUM HYDROCARBON CONCENTRATIONS IN SOIL

996098.00/P01SK004-4

FIGURE 4-4

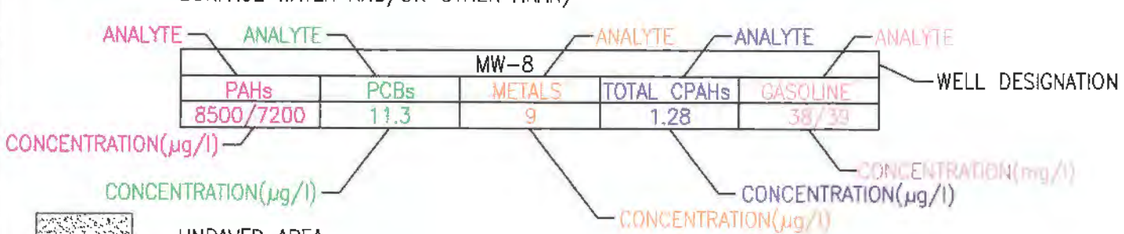


LEGEND:

MW-1 MONITORING WELL LOCATION
(R) = REPLACEMENT

RECONNAISSANCE GROUNDWATER SAMPLING LOCATION

GROUNDWATER CONCENTRATIONS EXCEEDING CLEANUP LEVELS (MTCA METHOD B SURFACE WATER AND/OR OTHER ARAR)



UNPAVED AREA

APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)

NOTES:

1. MAP IS BASED ON SITE SURVEY BY EARTH TECH INC., ON 28 MARCH 2000.
2. WHERE TWO RESULTS ARE PRESENTED, THE SECOND VALUE IS A DUPLICATE SAMPLE. (FIGURE SHOWS ONLY CONCENTRATIONS EXCEEDING CLEANUP LEVELS.)
3. ANALYTE CONCENTRATIONS REPRESENT THE MAXIMUM DETECTED VALUE REPORTED DURING THE MONITORING EVENTS.

N

0 50 100
SCALE: 1=100

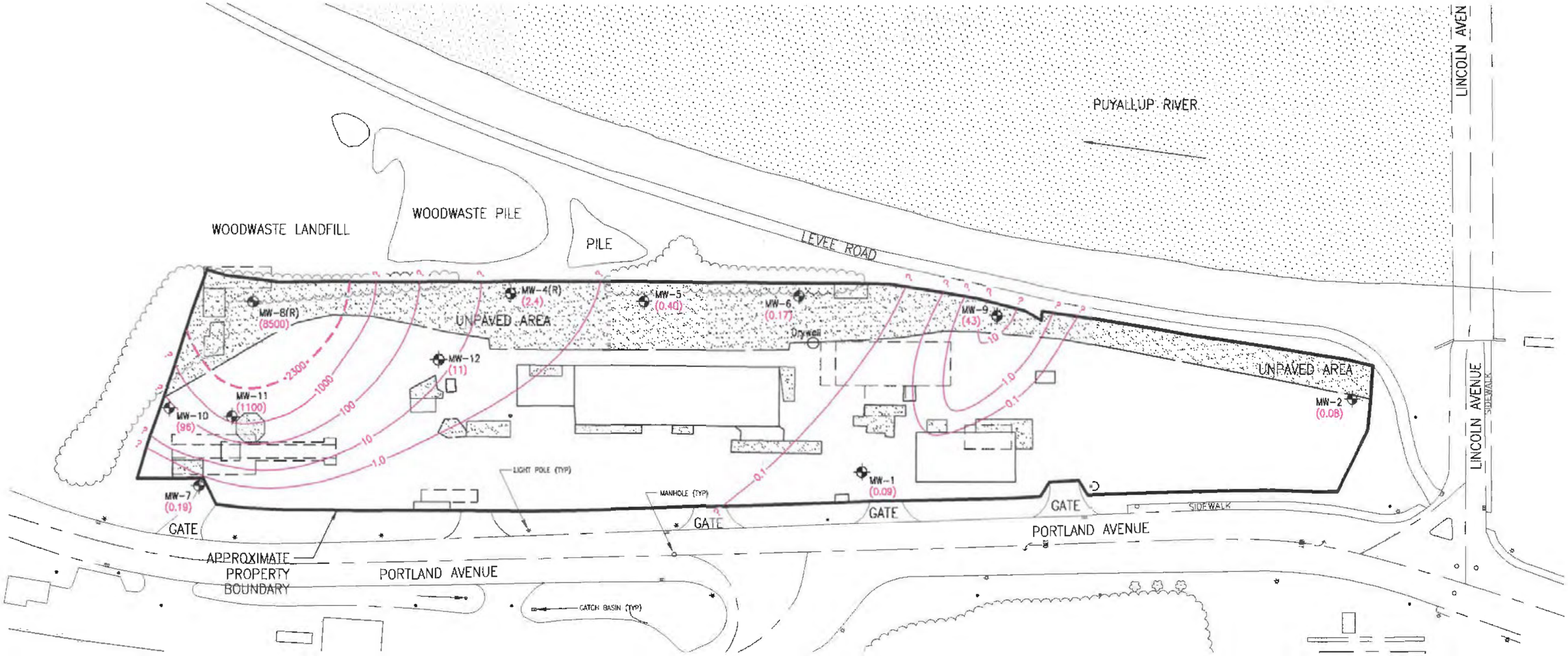
Kennedy/Jenks Consultants

FORMER TACOMA METALS FACILITY
TACOMA, WA

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS (WELLS AND RECONNAISSANCE SAMPLES)

996098.00/P01SK005-1

FIGURE 5-1



LEGEND:

MW-10 (96) — MONITORING WELL LOCATION NAPHTHALENE CONCENTRATION (µg/l)
(R) = REPLACEMENT

10 — APPROXIMATE NAPHTHALENE CONCENTRATION CONTOUR (µg/l). ADJACENT CONTOURS DIFFER BY ONE ORDER OF MAGNITUDE.

UNPAVED AREA

APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)

2300 — ECOLOGY'S ACUTE FRESHWATER SURFACE WATER QUALITY STANDARD

NOTES:

1. LOCATIONS SHOWN WITHIN PROPERTY BOUNDARIES ARE BASED ON SITE SURVEY BY EARTH TECH INC., ON 28 MARCH 2000.
2. ANALYTE CONCENTRATIONS REPRESENT THE MAXIMUM DETECTED VALUE REPORTED DURING THE MONITORING EVENTS.

N

0 50 100
SCALE: 1=100

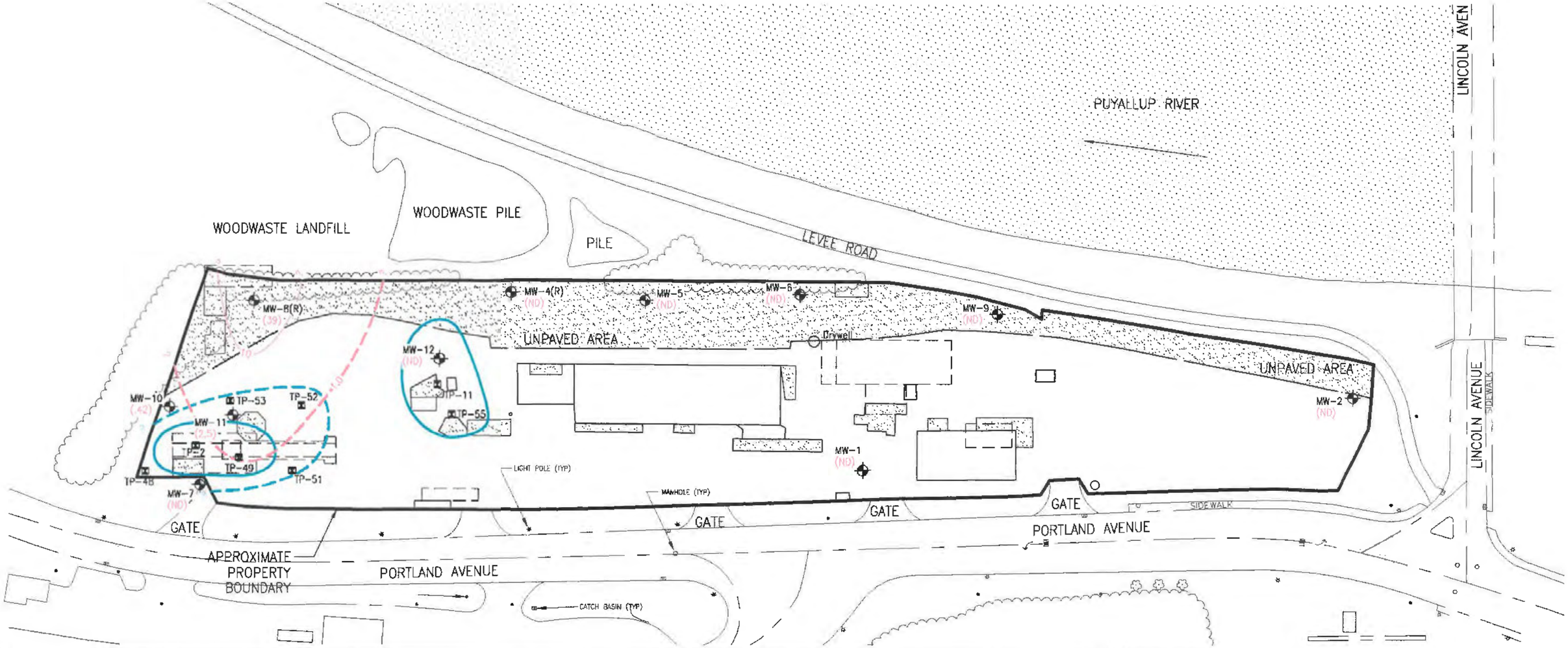
Kennedy/Jenks Consultants

FORMER TACOMA METALS FACILITY
TACOMA, WA

NAPHTHALENE GROUNDWATER CONCENTRATION CONTOUR MAP

996098.00/P01SK005-2

FIGURE 5-2



LEGEND:

- MW-10 (.42) — MONITORING WELL LOCATION GASOLINE CONCENTRATION (mg/l)
  (R) = REPLACEMENT
  ND = ANALYTED NOT DETECTED
- TP-1 — TEST PIT LOCATION
- 10 — APPROXIMATE GASOLINE CONCENTRATION CONTOUR (mg/l). ADJACENT CONTOURS DIFFER BY ONE ORDER OF MAGNITUDE.
- UNPAVED AREA
- APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)
- APPROXIMATE EXTENT OF LNAPL OBSERVED IN TEST PITS AND MONITORING WELLS.
- APPROXIMATE EXTENT OF SHEEN/FILM OBSERVED IN TEST PITS.
- 1.0 — ECOLOGY'S NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT STANDARD (1 mg/l)

NOTES:

1. LOCATIONS SHOWN WITHIN PROPERTY BOUNDARIES ARE BASED ON SITE SURVEY BY EARTH TECH, INC. ON 28 MARCH 2000.
2. ANALYTE CONCENTRATIONS REPRESENT THE MAXIMUM DETECTED VALUE REPORTED DURING THE MONITORING EVENTS.
3. LNAPL = LIGHT NON-AQUEOUS PHASE LIQUID.

N

0 50 100
SCALE: 1=100

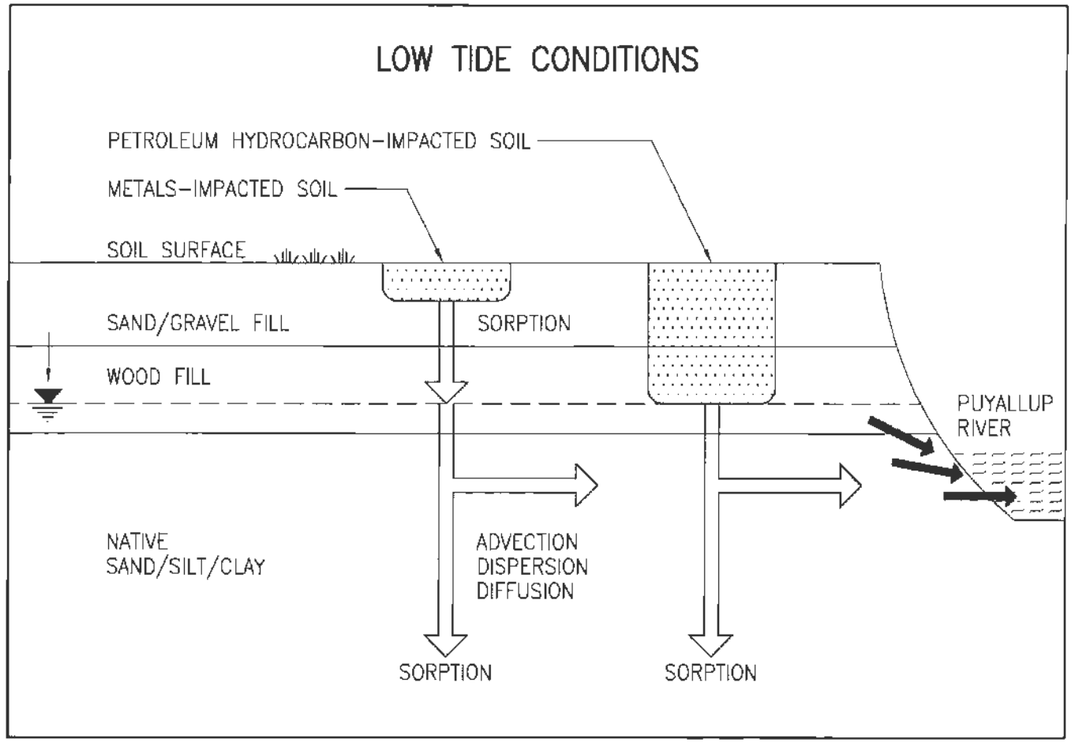
Kennedy/Jenks Consultants

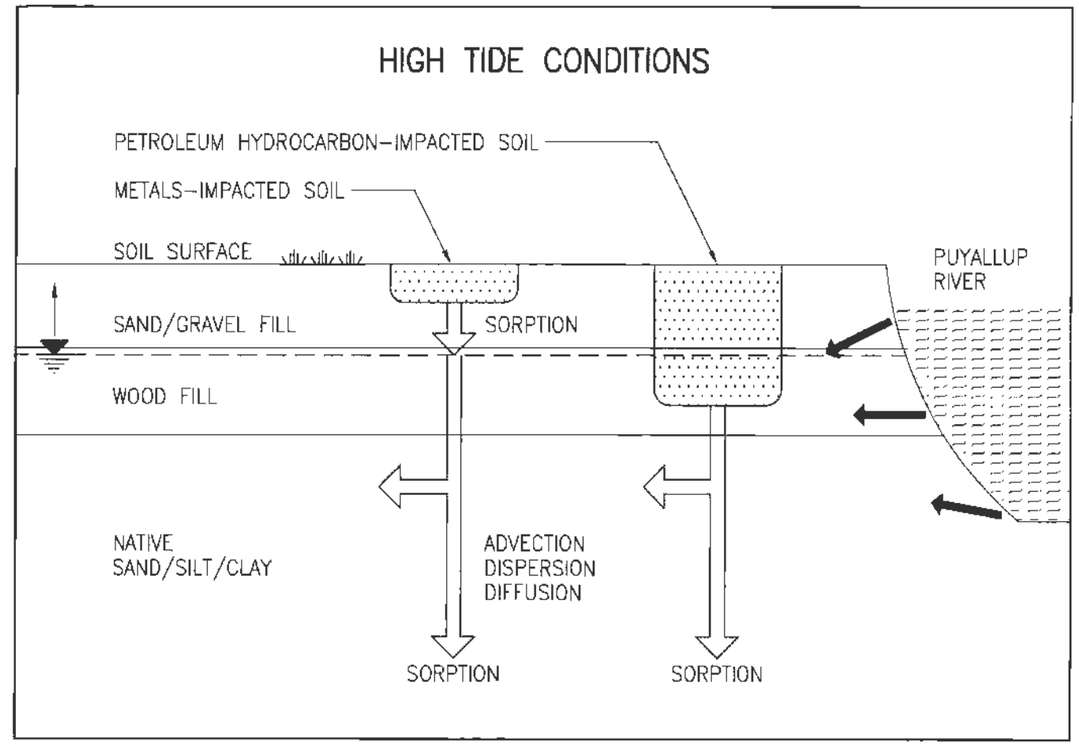
FORMER TACOMA METALS FACILITY
TACOMA, WA

GASOLINE-RANGE PETROLEUM HYDROCARBONS GROUNDWATER CONCENTRATION CONTOUR MAP

996098.00/P01SK005-3

FIGURE 5-3





LEGEND:

FALLING POTENTIOMETRIC SURFACE

RISING POTENTIOMETRIC SURFACE

GROUNDWATER FLOW PATH

NOTE:

1. THIS FIGURE REPRESENTS THE CONCEPTUAL CONDITIONS ASSUMED FOR CHEMICAL TRANSPORT MODELING. REFER TO FIGURES 3-1, 3-2, AND 3-3 FOR INTERPRETIVE CROSS SECTIONS OF SITE GEOLOGIC CONDITIONS.

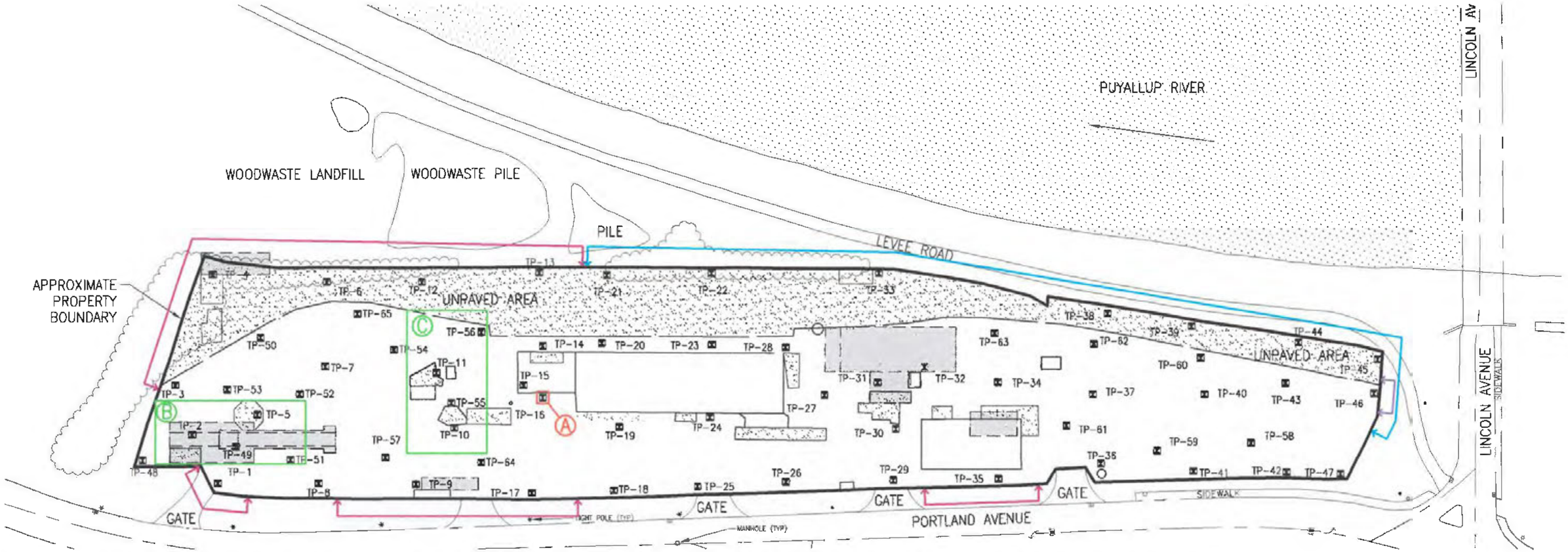
Kennedy/Jenks Consultants

FORMER TACOMA METALS FACILITY
TACOMA, WA

CONCEPTUAL MODEL OF CHEMICAL MIGRATION

996098.00/P01SK008-1

FIGURE 8-1



LEGEND:

- TP-1 — TEST PIT LOCATION
- UNPAVED AREA
- APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)

NOTES:

1. MAP IS BASED ON SITE SURVEY BY EARTH TECH INC., ON 28 MARCH 2000.
2. REFER TO FIGURE 4-4 FOR CONCENTRATIONS OF PETROLEUM HYDROCARBONS IN SOIL.
3. REFER TO FIGURE 4-1 FOR CONCENTRATIONS OF METALS IN SOIL.

ALTERNATIVES 1, 2, AND 3
LEAD-ACID BATTERY CASINGS AND ASSOCIATED IMPACT SOIL

A — 10ft LONG x 10ft WIDE x 3ft DEEP (AVERAGE) (10 CUBIC YARDS)

TOTAL 10 CUBIC YARDS (APPROXIMATE).

ALTERNATIVES 1, 2, AND 3
PETROLEUM HYDROCARBON-IMPACTED SOIL EXCAVATION AREAS (INCLUDES AREAS OF ANTICIPATED FREE PRODUCT).

B — FORMER CREOSOTING PLANT
150ft LONG x 60ft WIDE x 10ft DEEP (AVERAGE)
(3,333 CUBIC YARDS)

C — WEST OF RED BRICK BUILDING
150ft LONG x 80ft WIDE x 10ft DEEP (AVERAGE)
(4,444 CUBIC YARDS)

TOTAL 7,800 CUBIC YARDS (APPROXIMATE).

ALTERNATIVES 2 AND 3 ONLY
PROPERTY BOUNDARY METALS-IMPACTED SOIL EXCAVATION AREAS (BUFFER ZONE)

930ft — 5ft WIDE x 1ft DEEP (AVERAGE) (172 CUBIC YARDS)

920ft — 5ft WIDE x 3ft DEEP (AVERAGE) (511 CUBIC YARDS)

30ft — 5ft WIDE x AN ADDITIONAL 3ft DEEP (AVERAGE) (17 CUBIC YARDS)

TOTAL 700 CUBIC YARDS (APPROXIMATE).

N

0 50 100
SCALE: 1=100

Kennedy/Jenks Consultants

FORMER TACOMA METALS FACILITY
TACOMA, WA

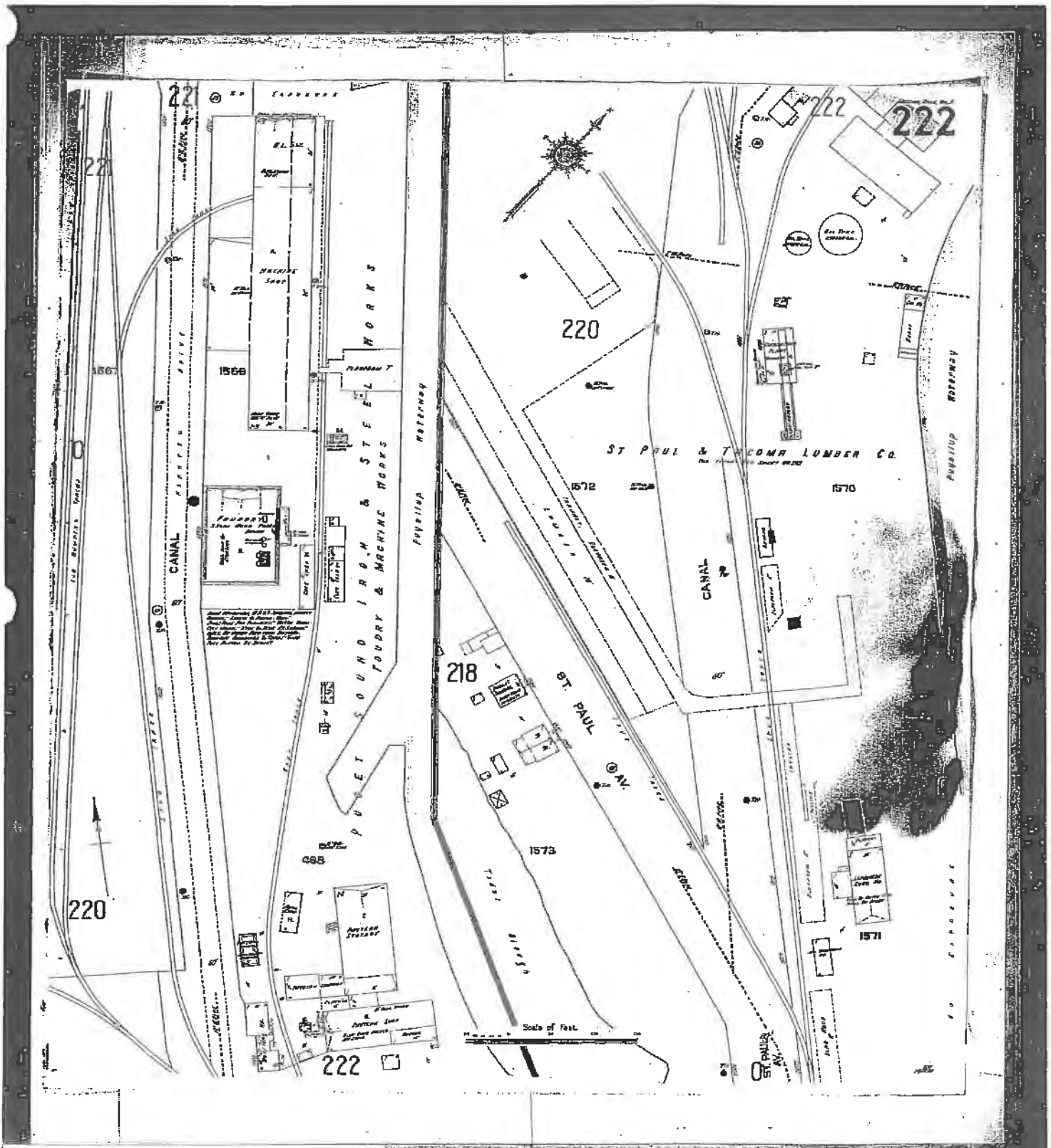
PROPOSED REMEDIAL ACTION EXCAVATION AREAS

995098.00/P01SK009-1

FIGURE 9-1

Appendix A

Sanborn Fire Insurance Maps (1912, 1950, and 1965)



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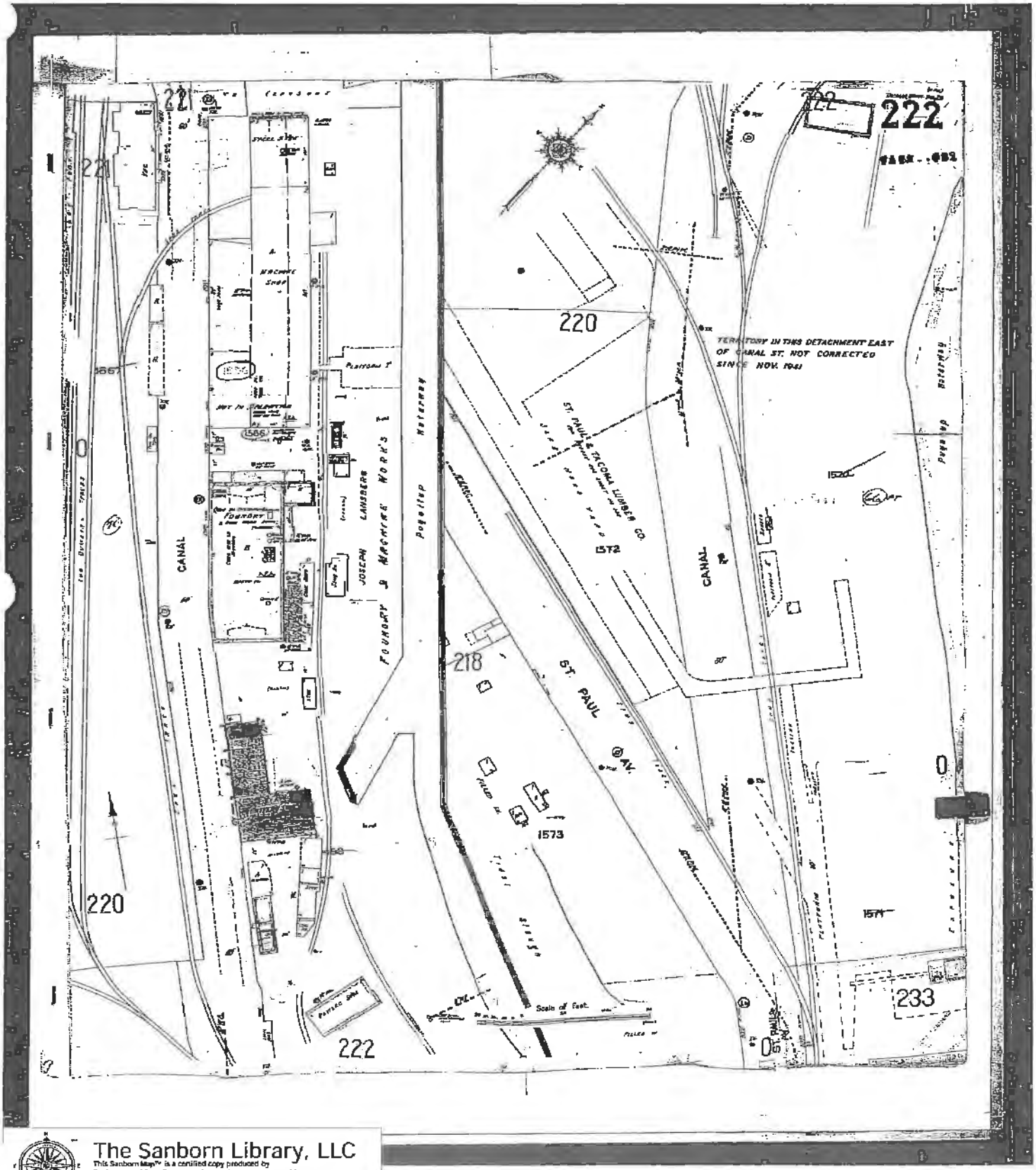

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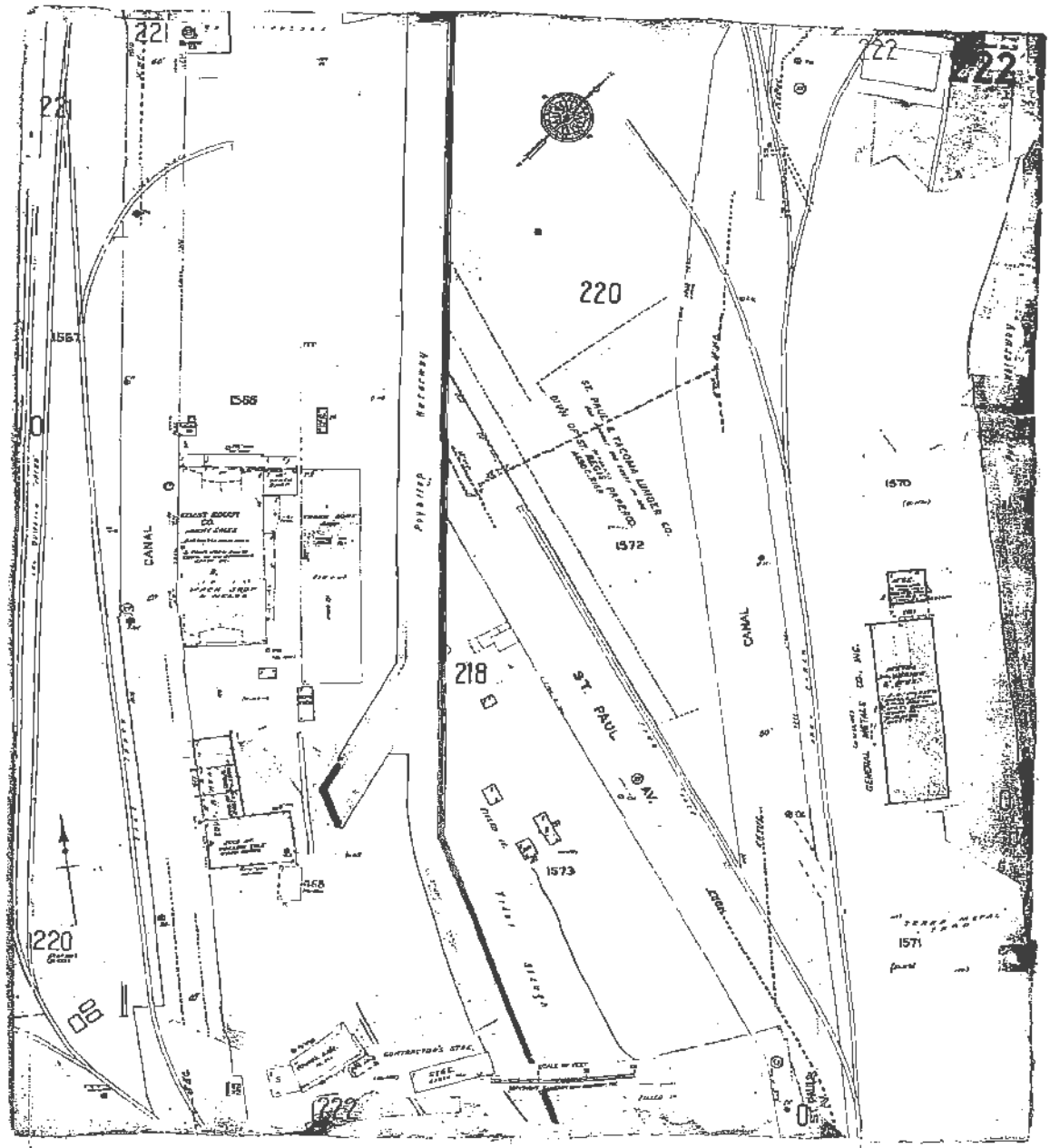

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Year EDR Research Associate

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Appendix B

2000 Hazardous Waste Report

Dangerous Waste Annual Report Verification Form 2000

WASHINGTON STATE DEPARTMENT OF ECOLOGY

Washington State Department of Ecology
Hazardous Waste Information
P. O. Box 47658
Olympia, WA 98504-7658
(800) 874-2022 (within state)
(360) 407-6170

For Ecology Use Only - Date Received :

Form	Review	HWIMSy Entry	Verification	
VF				
GM				
WR				
OI				

Site Location Information

RCRA Site ID: WAD 102 875 556
Company Name: TACOMA METALS SITE FORMER
Site Location: 1919 PORTLAND AVE
City/State/Zip: TACOMA, WA 98421-2804 County: PIERCE
Dept. of Revenue Tax Registration Number: 600-484-238 Primary SIC : 3449
Current company name if different from above _____

This Report is Due No Later Than March 1, 2001

All information listed below is required. If information is missing or incorrect, please enter the changes in the right hand column.

1a. The mailing address for this site is **1b.**

Name: Kennedy Jenks Consultants
Mail Address: 530 S 336th St
FEDERAL WAY, WA 98003

Name: _____
Mail Address: _____

2a. The legal company/agency owner of this site is **2b.**

Name: Portland Ave Associates
Mail Address: Wells Fargo Plaza Ste 1200
TACOMA, WA 98402
rk Phone: (253)572-4500 Ext:

Name: _____
Mail Address: _____
Phone: _____ Ext: _____

Did the company ownership of this site change in 2000?

☐ Yes Date: _____ (continue to the right):

☒ No (go to 3a):

I represent the
☐ Current Company Owner
☐ Previous Company Owner

This report covers waste activity for:
☐ Entire year
☐ My term of ownership only

3a. The land owner of this site is **3b.**

Name: Portland Ave Associates
Mail Address: Wells Fargo Plaza Ste 1200
TACOMA, WA 98402
Phone: (253)572-4500 Ext:

Name: _____
Mail Address: _____
Work Phone: _____ Ext: _____

4a. The contact for site visits and inspections is **4b.**

Name/Title: Ty Schreiner
Mail Address: 530 S 336th St
FEDERAL WAY, WA 98003
Work Phone: (253)874-0555 Ext: 232

Name/Title: _____
Mail Address: _____
Work Phone: _____ Ext: _____

5a. The contact for annual report forms is **5b.**

Name/Title: Ty Schreiner
Mail Address: 530 S 336th St
FEDERAL WAY, WA 98003
Work Phone: (253)874-0555 Ext: 232

Name/Title: _____
Mail Address: _____
Work Phone: _____ Ext: _____

1257

6. Generator Status and Waste Management Activities

Indicate the facility's generator status for 2000 by checking the appropriate boxes below. If your status has changed from last year, please use the Comments section (#8, below) to explain.

6a. Generator Status

- [x] Large Quantity Generator (LQG)
- [ ] Medium Quantity Generator (MQG)
- [ ] Small Quantity Generator (SQG)
- [ ] No regulated dangerous waste generated

6b. Transportation Activity (requires prior notification)

- [ ] Transporter for your own waste
- [ ] Transporter for commercial purposes
- [ ] Transfer facility

6c. Treatment, Storage, Disposal, Recycling (TSDR) Facility (Requires Permit)

- [ ] For waste generated at this facility
- [ ] For waste generated by other facilities

6d. Excluded On-Site Waste Management Activities (for waste streams that are not reported on a GM form)

- [ ] Permit-by-Rule - (PBR)
- [ ] Recycling without prior storage or accumulation

7. Report Summary

Please check off which forms are included in this report and provide the total number of pages. For electronic data submittal, please indicate method of your submission.

7a. Paper Form Submittal

- [x] Verification (VF) Form
- [x] Generation and Management (GM) Form
- [x] Off-site Identification Information (OI) Form
- [ ] Waste Received (WR) Form
- [ ] Recycling Credit documentation attached

17 Total Number of pages submitted

7b. Electronic Data Submittal

- [ ] Verification (VF) Form (paper only)
- [ ] Disk(s) included
- [ ] Data submitted on Internet
- [ ] Recycling Credit documentation attached (paper only)

8. Comments

_____

_____

_____

_____

9. Certification

The following must be signed by authorized representative of the company/agency. This certification language is required under EPA's Biennial Report. Ecology is required to implement reporting requirements at least as stringent as those in that report.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that thera are significant penalties for submitting false information, including the possiblity of fine and imprisonment for knowing violations.

Signature (in ink) _____

Name (print/type) _____

Date _____

Title _____

If you have special accommodation needs or require this document in an alternative format, please contact the Hazardous Waste and Toxics Reduction Program at (360) 407-6700 (voice) or (360) 407-6006 (TDD).

Do Not FAX this document unless requested by the Department of Ecology.

GENERATION AND MANAGEMENT FORM ANSWER SHEET

Please enter your RCRA Site ID number and your site name in the small box at the right, before making as many two-sided copies of this answer sheet as you will need to report each of your waste streams. Then complete one answer sheet for each waste stream.

PLEASE ENTER:
YOUR SITE ID #: WAD 102 875 556
Site name: Tacoma Metals Site Former

FOR ECOLOGY USE ONLY:
Date received: _____

Reference the instructions on pages 19 through 28 as you complete this form. Please type or print legibly in blue or black ink.

A. Description of Dangerous Waste Stream

A-1. _____ (optional)

A-2. waste water from storm drain cleaning

A-3. D008 D009 _____ _____ _____ _____

A-4. _____ _____

A-5. ☐ EHW ☒ DW

A-6. ☒ No ☐ Yes

A-7. A 69

A-8. B 119

A-9. ☐ i ☒ *ii* ☐ *iii* ☐ *iv* ☐ *v* (If *v*, answer A-9.a.)

A-9.a. M _____

B. Waste Management Activities

B-1. 3,600 ☐ ST ☐ MT ☐ P ☐ K ☒ G ☐ L ☐ C (If G, L, or C, answer B-1.a.)

B-1.a. 8.34 ☒ Lbs/gal ☐ Specific Gravity ☐ Lbs/yd³

B-2. ☐ On-site ☒ Off-site ☐ Both

B-3. _____ M _____

B-3a. ☐ Yes ☐ No

B-4.

i. Designated Facility (TSDR) ID Numbers	*ii.* System Code	*iii.* Quantity	*iv.* Recycling Percent
	M		
ORD089452353	M 111	3,600 G	
	M		
	M		

Page 3 of 17

PLEASE ENTER :
YOUR SITE ID #: WAD 102 875 556
Site name: Tacoma Metals Site Former

B-5. To be completed by LQG & TSDR only.

i. Date Shipped (mm/dd)	*ii.* Manifest Document Number	*iii.* Internal Tracking Code (optional)	*iv.* Designation Facility (TSDR) RCRA Site ID Number	*v.* Quantity Shipped
5/5	(TUK)00266		ORD089452353	3,600 G

If additional space is required, use continuation sheet on the following page.

C. Comments
Form Code B119 – Lead and Mercury contaminated waste water
From storm drain cleaning

Page 4 of 17

2000 GM

GENERATION AND MANAGEMENT FORM ANSWER SHEET

Please enter your RCRA Site ID number and your site name in the small box at the right, before making as many two-sided copies of this answer sheet as you will need to report each of your waste streams. Then complete one answer sheet for each waste stream.

PLEASE ENTER:
YOUR SITE ID #: WAD 102 875 556
Site name: Tacoma Metals Site Former

FOR ECOLOGY USE ONLY:
Date received: _____

Reference the instructions on pages 19 through 28 as you complete this form. Please type or print legibly in blue or black ink.

A. Description of Dangerous Waste Stream

A-1. _____ (optional)

A-2. Creosote-impacted solid waste (metal and wood) from vault

A-3. D018

A-4. _____

A-5. ☐ EHW ☒ DW

A-6. ☒ No ☐ Yes

A-7. A 69

A-8. B 319

A-9. ☐ i ☒ ii ☐ iii ☐ iv ☐ v (If v, answer A-9.a.)

A-9.a. M _____

B. Waste Management Activities

B-1. 20 ☐ ST ☐ MT ☐ P ☐ K ☐ G ☐ L ☒ C (If G, L, or C, answer B-1.a.)

B-1.a. 2,700 ☐ Lbs/gal ☐ Specific Gravity ☒ Lbs/yd³

B-2. ☐ On-site ☒ Off-site ☐ Both

B-3. _____ M _____

B-3a. ☐ Yes ☐ No

B-4.

i. Designated Facility (TSDR) ID Numbers	*ii.* System Code	*iii.* Quantity	*iv.* Recycling Percent
	M		
ORD089452353	M 137	20 C	
	M		
	M		

Page 5 of 17

PLEASE ENTER :
YOUR SITE ID #: WAD 102 875 556
Site name: Tacoma Metals Site Former

B-5. To be completed by LQG & TSDR only.

i. Date Shipped (mm/dd)	*ii.* Manifest Document Number	*iii.* Internal Tracking Code (optional)	*iv.* Designation Facility (TSDR) RCRA Site ID Number	*v.* Quantity Shipped
7/14	(TOK)00364		ORD089452353	20C

If additional space is required, use continuation sheet on the following page.

C. Comments
Form code B319- Creosote-impacted pipe, wood, and metal waste

Page 6 of 17

2000 GM

GENERATION AND MANAGEMENT FORM ANSWER SHEET

Please enter your RCRA Site ID number and your site name in the small box at the right, before making as many two-sided copies of this answer sheet as you will need to report each of your waste streams. Then complete one answer sheet for each waste stream.

PLEASE ENTER:

YOUR SITE ID #: WAD 102 875 556

Site name: Tacoma Metals Site Former

FOR ECOLOGY USE ONLY:

Date received: _____

Reference the instructions on pages 19 through 28 as you complete this form. Please type or print legibly in blue or black ink.

A. Description of Dangerous Waste Stream

A-1. _____ (optional)

A-2. Creosote-impacted waste solids

A-3. D018

A-4. _____

A-5. ☐ EHW ☒ DW

A-6. ☒ No ☐ Yes

A-7. A 69

A-8. B 319

A-9. ☐ i ☒ ii ☐ iii ☐ iv ☐ v (If v, answer A-9.a.)

A-9.a. M _____

B. Waste Management Activities

B-1. 1,500 ☐ ST ☐ MT ☒ P ☐ K ☐ G ☐ L ☐ C (If G, L, or C, answer B-1.a.)

B-1.a. _____ ☐ Lbs/gal ☐ Specific Gravity ☐ Lbs/yd³

B-2. ☐ On-site ☒ Off-site ☐ Both

B-3. _____ M _____

B-3a. ☐ Yes ☐ No

B-4. i. Designated Facility (TSDR) ID Numbers	ii. System Code	iii. Quantity	iv. Recycling Percent
	M		
ORD089452353	M 137	1,500 P	
	M		
	M		

Page 7 of 17

2000 GM

PLEASE ENTER :
YOUR SITE ID #: WAD 102 875 556
Site name: Tacoma Metals Site Former

B-5. To be completed by LQG & TSDR only.

i. Date Shipped (mm/dd)	ii. Manifest Document Number	iii. Internal Tracking Code (optional)	iv. Designation Facility (TSDR) RCRA Site ID Number	v. Quantity Shipped
7/31	(TUK)00366		ORD089452353	1,500 P

If additional space is required, use continuation sheet on the following page.

C. Comments
Form Code B319- creosote-impacted wood and metal waste

Page 8 of 17

2000 GM

GENERATION AND MANAGEMENT FORM ANSWER SHEET

Please enter your RCRA Site ID number and your site name in the small box at the right, before making as many two-sided copies of this answer sheet as you will need to report each of your waste streams. Then complete one answer sheet for each waste stream.

PLEASE ENTER:
YOUR SITE ID #: WAD 102 875 556
Site name: Tacoma Metals Site Former

FOR ECOLOGY USE ONLY:
Date received: _____

Reference the instructions on pages 19 through 28 as you complete this form. Please type or print legibly in blue or black ink.

A. Description of Dangerous Waste Stream

A-1. _____ (optional)

A-2. creosote-impacted vault water

A-3. D018

A-4. _____

A-5. ☐ EHW ☒ DW

A-6. ☒ No ☐ Yes

A-7. A 69

A-8. B 219

A-9. ☐ i ☒ ii ☐ iii ☐ iv ☐ v (If v, answer A-9.a.)

A-9.a. M _____

B. Waste Management Activities

B-1. 1,595 ☐ ST ☐ MT ☐ P ☐ K ☒ G ☐ L ☐ C (If G, L, or C, answer B-1.a.)

B-1.a. 8.34 ☒ Lbs/gal ☐ Specific Gravity ☐ Lbs/yd³

B-2. ☐ On-site ☒ Off-site ☐ Both

B-3. _____ M _____

B-3a. ☐ Yes ☐ No

B-4. i. Designated Facility (TSDR) ID Numbers	ii. System Code	iii. Quantity	iv. Recycling Percent
	M		
COD980591184	M 141	1,595 G	
	M		
	M		

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PLEASE ENTER :
YOUR SITE ID #: WAD 102 875 556
Site name: Tacoma Metals Site Former

B-5. To be completed by LQG & TSDR only.

i. Date Shipped (mm/dd)	ii. Manifest Document Number	iii. Internal Tracking Code (optional)	iv. Designation Facility (TSDR) RCRA Site ID Number	v. Quantity Shipped
7/24	TUK00363		COD980591184	1,595 G

If additional space is required, use continuation sheet on the following page.

C. Comments
Form Code B219 - creosote contaminated water From concrete vault

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2000 GM

GENERATION AND MANAGEMENT FORM ANSWER SHEET

Please enter your RCRA Site ID number and your site name in the small box at the right, before making as many two-sided copies of this answer sheet as you will need to report each of your waste streams. Then complete one answer sheet for each waste stream.

PLEASE ENTER:
YOUR SITE ID #: WAD 102 875 556
Site name: Tacoma Metals Site Former

FOR ECOLOGY USE ONLY:
Date received: _____

Reference the instructions on pages 19 through 28 as you complete this form. Please type or print legibly in blue or black ink.

A. Description of Dangerous Waste Stream

A-1. _____ (optional)

A-2. Lead-impacted waste solids

A-3. D008

A-4. _____

A-5. ☐ EHW ☒ DW

A-6. ☒ No ☐ Yes

A-7. A 69

A-8. B 319

A-9. ☐ i ☒ ii ☐ iii ☐ iv ☐ v (If v, answer A-9.a.)

A-9.a. M _____

B. Waste Management Activities

B-1. 6,540 ☐ ST ☐ MT ☒ P ☐ K ☐ G ☐ L ☐ C (If G, L, or C, answer B-1.a.)

B-1.a. _____ ☐ Lbs/gal ☐ Specific Gravity ☐ Lbs/yd³

B-2. ☐ On-site ☒ Off-site ☐ Both

B-3. _____ M _____

B-3a. ☐ Yes ☐ No

B-4. *i.* Designated Facility (TSDR) ID Numbers	*ii.* System Code	*iii.* Quantity	*iv.* Recycling Percent
	M		
ORD089452353	M 137	6,540 P	
	M		
	M		

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2000 GM

PLEASE ENTER:
YOUR SITE ID #: WAD 102 875 556
Site name: Tacoma Metals Site Former

B-5. To be completed by LQG & TSDR only.

i. Date Shipped (mm/dd)	*ii.* Manifest Document Number	*iii.* Internal Tracking Code (optional)	*iv.* Designation Facility (TSDR) RCRA Site ID Number	v. Quantity Shipped
5/10	00001		ORD089452353	6,540 P

If additional space is required, use continuation sheet on the following page.

C. Comments
State Manifest Document Number was not listed on the shipping manifest. Shipped by WAR000001263.

Form Code 319 – Lead-impacted waste solids

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2000 DWR

GENERATION AND MANAGEMENT FORM ANSWER SHEET

Please enter your RCRA Site ID number and your site name in the small box at the right, before making as many two-sided copies of this answer sheet as you will need to report each of your waste streams. Then complete one answer sheet for each waste stream.

PLEASE ENTER:
YOUR SITE ID #: WAD 102 875 556
Site name: Tacoma Metals Site Former

FOR ECOLOGY USE ONLY:
Date received: _____

Reference the instructions on pages 19 through 28 as you complete this form. Please type or print legibly in blue or black ink.

A. Description of Dangerous Waste Stream

A-1. _____ (optional)

A-2. Hydrocarbon sludge and DNAPL from concrete vault

A-3. D018

A-4. _____

A-5. ☐ EHW ☒ DW

A-6. ☒ No ☐ Yes

A-7. A 69

A-8. B 603

A-9. ☐ i ☒ ii ☐ iii ☐ iv ☐ v (If v, answer A-9.a.)

A-9.a. M _____

B. Waste Management Activities

B-1. 2,100 ☐ ST ☐ MT ☐ P ☐ K ☒ G ☐ L ☐ C (If G, L, or C, answer B-1.a.)

B-1.a. 8.34 ☒ Lbs/gal ☐ Specific Gravity ☐ Lbs/yd³

B-2. ☐ On-site ☒ Off-site ☐ Both

B-3. _____ M _____

B-3a. ☐ Yes ☐ No

B-4.

i. Designated Facility (TSDR) ID Numbers	*ii.* System Code	*iii.* Quantity	*iv.* Recycling Percent
	M		
ILD 098 642 424	M 042	2,100 G	
	M		
	M		

Page 13 of 17

2000 GM

PLEASE ENTER :
YOUR SITE ID #: WAD 102 875 556
Site name: Tacoma Metals Site Former

B-5. To be completed by LQG & TSDR only.

i. Date Shipped (mm/dd)	*ii.* Manifest Document Number	*iii.* Internal Tracking Code (optional)	*iv.* Designation Facility (TSDR) RCRA Site ID Number	v. Quantity Shipped
7/7	IL7781768(00010)		ILD098642424	2,100 G

If additional space is required, use continuation sheet on the following page.

C. Comments

Page 14 of 17

2000 GM

OFF-SITE IDENTIFICATION INFORMATION FORM ANSWER SHEET

Please enter your RCRA Site ID number and your site name in the small box at the right, before making as many copies of this two-sided answer sheet as you will need.

PLEASE ENTER:

Your Site ID #: WAD 102 875 556

Site name: Tacoma Metals Site Former

FOR ECOLOGY USE ONLY:

Date received: _____

Please complete this form if your facility received dangerous waste from off-site or shipped dangerous waste off-site during 2000.

Please type or print legibly in blue or black ink.

RCRA Site ID Number: WAR000001263

Name: Steve Forler Trucking, Inc

Address: PO Box 1479
Orting, WA 98360

Handler type: (Check all that apply.) ☐ Generator ☒ Transporter ☐ TSDR

RCRA Site ID Number: ORD089452353

Name: Chemical Waste Management of the Northwest

Address: 17629 Cedar Springs Lane
Arlington, OR 97812

Handler type: (Check all that apply.) ☐ Generator ☐ Transporter ☒ TSDR

RCRA Site ID Number: NJD080631369

Name: Onyx Environmental Services, LLC

Address: 1 Eden Lane
Flanders, NJ 07836

Handler type: (Check all that apply.) ☐ Generator ☒ Transporter ☐ TSDR

Comments:

2000 Q1

Page 15 of 17

PLEASE ENTER:

YOUR Site ID #: WAD 102 875 556

Site name: Tacoma Metals Site Former

RCRA Site ID Number: CAD000367755

Name: Diablo Transportation, Inc.

Address: 5401 Byron Hot Springs Rd.
Byron, CA 94514

Handler type: (Check all that apply.) ☐ Generator ☒ Transporter ☐ TSDR

RCRA Site ID Number: CAR000000505

Name: Onyx Industrial Services

Address: 451 West Channel Rd
Benicia, CA 94510

Handler type: (Check all that apply.) ☐ Generator ☒ Transporter ☐ TSDR

RCRA Site ID Number: COD980591184

Name: Onyx Environmental Services

Address: 9131 East 96TH Ave
Henderson, CO 80640

Handler type: (Check all that apply.) ☐ Generator ☐ Transporter ☒ TSDR

RCRA Site ID Number: OKD981588791

Name: Triad Transport, Inc.

Address: PO Box 818
McAlester, OK 74502

Handler type: (Check all that apply.) ☐ Generator ☒ Transporter ☐ TSDR

RCRA Site ID Number: ILD098642424

Name: Trade Waste Incineration

Address: 7 Mobile Avenue
Sauget, IL 62201

Handler type: (Check all that apply.) ☐ Generator ☐ Transporter ☒ TSDR

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2000 01

END OF REPORT
(Attach this page as the last page of your submission)

2000 WR

APPENDIX B

SUMMARY OF TEST PIT OBSERVATIONS
Former Tacoma Metals Facility

Test Pit Number	Test Pit Location	Depth (feet)	Unit Depths (feet)	Noticeable Odors[a]	Water Sheen[b]	OVM (ppm)	Soil Sample Number[c]	Description	USCS Symbol	Comments
TP-1	Grid Location	10	0.0-0.5	NONE	NS	—[e]	TP-1-0-1[f]	Crushed surface top coarse (CSTC) = gravel fill, dense (compacted)	GP	
			0.5-2.0	NONE	NS			Fill=Sandy Gravel, well-graded gravel (50-60%), mixed fine-medium sand, dense, brown, dry	GW	contains some organic fragments, mixed
			2.0-5.0	decaying wood	NS	---	TP-1-2-3	Fill=Gravelly Sand, Fine-medium sand, well-graded gravel (15-25%); dense, brown/dark gray, dry	SW	contains some brick fragments, mixed.
			5.0-7.5	decaying wood	NS	—	TP-1-4-6	Fill=wood debris, Sandy silt matrix; fine-medium gravel (10-15%), brown, moist to wet	(ML)	contains wood debris below 5.0', mixed
			7.5-10.0+	NONE	NS	---	TP-1-6-10	Silty Clay w/Very Fine Sand, very soft, moderately plastic, gray, wet to saturated, laminar, water @9.0'	CL	contains some decaying tree fragments (limbs), organics (estuary grass?)
TP-2	Grid Location	10	0.0-0.4	NONE	NS			CSTC	GP	0.2' asphalt cover
			0.4-0.8	NONE	NS	—	TP-2-0-1	Fill=Gravelly Sand, fine-medium sand, well-graded gravel (15-25%), dense, brown, dry	SW	
			0.8-2.2	VSL creosote/PH	MS	—	TP-2-2-3	Fill=Gravelly Sand, fine-medium sand, well-graded gravel (20-30%), dense, rusty brown/gray, dry	SW	wood planks @ 2.2' (former platform)- extends 18' S & 14' NW
			2.2-6.0	VSL creosote/PH	MS	---	TP-2-4-6	Fill=Gravelly Sand, fine-medium sand, well-graded gravel (20-30%), dense, dark brown, dry to moist	SW-GW	fissile wood layer (charcoalized?) from 5-6' (saturated w/creosote/PH product)
			6.0-8.0	SL creosote/PH	SS	—	TP-2-6-10	Fill=wood debris (logs, timber, chips), sandy matrix, fine-medium sand, medium dense	(SP)	predominantly wood debris
			8.0-10.0+	VSL creosote/PH	HS			Sandy Silt/Silty Clay, very fine sand, gray, stiff, wet, laminar, water@8.0'	ML-CL	product in sampling spoon; 1-2" product floating on water surface
TP-3	Grid Location	10	0.0-3.0	NONE	NS	—	TP-3-0-1	Fill=Sandy Gravel/Gravelly Sand, well-graded sand, well-graded gravel (35-60%), dense, brown, dry	GW-SW	0.2' asphalt cover; gravel content increases w/depth
				NONE	NS	—	TP-3-2-3			
			3.0-4.5	NONE	NS	—	TP-3-4-6	Fill=Silty Fine Sand, trace small gravel (<3%), medium dense, brown, dry, non-plastic silt (30%)	SM	contains some organics
			4.5-6.0	VSL PH	NS			Fill=Silty Sand, highly organic, fine sand, silt (30-35%), dark brown, medium dense	SM	
			6.0-10.0+	SL-MOD PH	SS-HS	---	TP-3-6-10	Fill=wood debris, sandy clayey silt matrix, water@8.0'	(ML-CL)	predominantly wood debris, logs, timber, chips
TP-4	Grid Location	10	0.0-3.0	NONE	NS	—	TP-4-0-1	Fill=Gravelly Sand, fine to medium sand (predominantly medium sand), well-graded gravel (20-25%), loose, brown, dry, <5% fines	SW	contains some small metal/glass/concrete debris
			3.0-5.0	NONE	NS	---	TP-4-2-3	Fill=medium Sand, poorly-graded sand, contains some fine sand, medium dense to loose, brown, dry, mixed	SP	contains some small metal/glass debris
			5.0-6.0	NONE	NS	---	TP-4-4-6	Fill=Gravelly Sand, fine to medium sand, well-graded gravel (30-35%), medium dense, brown, dry, mixed	SW	contains some small metal/glass/wood debris
			6.0-7.0	NONE	NS			Fill=Fine Sand, contains some silt (<10%), medium dense to dense, gray, dry to moist, mixed	SP	contains some small metal debris
			7.0-8.0	NONE	NS	—	TP-4-6-10	Fill=Silty Sand, fine sand (20-30%), non-plastic silt, dense, gray, moist, laminar	SM	
			8.0-10.0	MOD PH	NS			Fill=wood debris, clayey sandy silt matrix (65-75%), soft, mod to highly plastic fines, gray, wet, mixed	(ML-MH)	large decaying logs and boards
TP-5	Grid Location	8.5	0.0-3.5	NONE	NS	26	TP-5-0-1	Fill=Sandy Gravel, well-graded gravel (55-60%), loose, brown, dry,	GW	note: TP in center of former octagon findn; appx. 1.5' below surrounding grade
				NONE	NS	5.3	TP-5-2-3	Fill=Sandy Gravel, well-graded gravel (55-60%), loose, brown, dry,	GW	
			3.5-7.0	MOD-VS PH	VSS-HS	303	TP-5-4-6	Fill=Gravelly Sand, well-graded sand, well-graded gravel (30-40%), ~10% fines, medium dense, brown	SW	abundant wood debris below 6.0', wet at 7.0'
			7.0-8.5+	VS PH	HS	1176(?)	TP-5-6-10	Fill=wood debris, silty sand matrix, fine-medium sand, fine-course gravel (20%), medium dense, brown	(SW-SM)	refusal at 8.5' (large timbers at bottom of TP)
TP-6	Grid Location	10	0.0-1.0	NONE	NS	1653(?)	TP-6-0-1	Fill=Gravelly Sand, fine-medium sand, well-graded gravel (20-30%), no fines, loose, brown, dry, mixed	SW	
			1.0-2.5	NONE	NS	1.1	TP-6-2-3	Fill=Sandy Gravel, well-graded gravel (60-65%), fine to medium sand, <10% fines, loose, brown, dry, mixed	GW	
			2.5-5.0	NONE	NS	66.1	TP-6-4-6	Fill=Fine to medium Sand, trace gravel, medium dense, brown, dry, mixed	SP	
			5.0-8.0	NONE	NS			Fill=wood debris (wood chips, pressboard, etc), mixed gravelly sand/silty sand/sand matrix, medium dense, wet, mixed	(SP/SM)	6.0-7.0 feet entirely wood debris (no soil matrix)
			8.0-9.0	VSL PH	NS	2.3	TP-6-6-10	Fill=Sandy Silty Clay, silt (~35%), v. fine sand (~10%), very soft to medium stiff, gray, wet, moderately plastic, mixed	ML	
			9.0-10.0	VSL PH	NS			Fill=wood debris, clay/silt/fine sand matrix	(ML)	
TP-7	Grid Location	10	0.0-0.9	NONE	NS	1485	TP-7-0-1	CSTC	GP	0.4' asphalt cover
			0.9-4.0	NONE	NS	1573	TP-7-2-3	Fill=Gravelly Sand, well-graded sand, well-graded gravel (30-40%), dense, gray/brown, dry, mixed	SW	Soil stained from 0.9'-2.0'; contains metal debris
			4.0-6.5	SL-MOD PH	NS	35.8	TP-7-4-6	Fill=Gravelly Sand with Silt, fine to medium sand, well-graded gravel (15-30%), silt (10-15%), dense, moist, mixed	SW	soil stained, contains some wood debris
			6.5-8.5	VS PH	NS	53.2	TP-7-6-10	Fill=wood debris, no soil matrix	–	wood chips, pressboard
			8.5-10.0	NONE	NS			Fill=wood debris, clayey silt matrix with very fine sand (3%) and clay (20%), soft, wet, plastic	(ML)	contains abundant wood debris
TP-8	Grid Location	10	0.0-2.0	SL uknown	SS	838	TP-8-0-1	Fill=Sandy Gravel/Gravelly Sand, well-graded gravel (45-55%), well-graded sand, <5% fines, dense, dry, mixed	GW-SW	0.3' asphalt cover; soil stained from 0-0.6'
			2.0-6.0	MOD PH	VSS	139	TP-8-2-3	Fill=Gravelly Sand, fine to medium sand, fine-medium gravel (10-25%), medium dense, dark gray, dry	SW	no odor below 4.0'
			6.0-10.0	decaying organic	NS	42.2	TP-8-4-6	Fill=wood debris, gravelly fine to medium sand matrix, fine-medium gravel (10-25%), medium dense, dark gray, moist to wet	(SW)	soil content 25-30%
			10.0+	decaying organic	NS	40	TP-8-6-10	Fill=wood debris, sandy clayey silt matrix, soft, wet	(ML)	
TP-9	Grid Location	10.5	0.0-2.0	SL PH	VSS	89.1	TP-9-0-1	Fill=Gravelly Sand, well-graded sand, well-graded gravel (35-45%), dense, dark gray, dry, mixed	SW	0.3' asphalt cover; soil heavily stained, contains abundant glass fragments
			2.0-4.0	VS PH	SS	20.5	TP-9-2-3	Fill=Sandy Gravel, well-graded gravel (55-60%), well-graded sand, dense, gray, dry, mixed	GW	contains some small cobbles (max. = 0.3').
			4.0-7.0	VS PH	SS	9.8	TP-9-4-6	Fill=Gravelly Sand, fine-medium sand, well-graded gravel (15-20%), 10% fines, medium dense, gray, dry, mixed	SW	contains wood debris @ 5.5'-7.0'
			7.0-8.5	NONE	NS	4.2	TP-9-6-10	Fill=Fine to medium Sand, some silt (<10%) trace small gravel (<3%), medium dense gray, dry	SW	
			8.5-10.5+	NONE	NS			Sandy Clayey Silt; very fine sand (10-15%), clay (~20%), medium stiff, low plasticity, gray, moist to wet, stratified	ML	contains decaying estuary grasses; layers of sandy clayey silt and silty sand

APPENDIX B

SUMMARY OF TEST PIT OBSERVATIONS
Former Tacoma Metals Facility

Test Pit Number	Test Pit Location	Depth (feet)	Unit Depths (feet)	Noticeable Odors[a]	Water Sheen[b]	OVM (ppm)	Soil Sample Number[c]	Description	USCS Symbol	Comments
TP-10	Adjacent to former vault/ metal crusher	10	0.0-9.0	NONE	NS	4.1	TP-10-0-1	Fill=Sandy Gravel, well-graded gravel (55-60%), well-graded sand, dense, gray, dry to moist, mixed	GW	0.4' asphalt cover
				NONE	NS	0.8	TP-10-2-3			
				S PH below 6.0	SS	13.8	TP-10-4-6			
			9.0-10.0	MOD PH	NS	145	TP-10-6-10	Fill=wood debris (wood chips, timber, manufactured wood)	—	No soil matrix
			10.0+	MOD PH	NS			Silty Sand, fine sand, dense, gray/brown, wet, stratified(?)	SM	contains decaying estuary grasses
TP-11	Grid Location	10	0.0-2.8	NONE	VSS	212	TP-11-0-1	Fill=Gravelly Sand, fine to medium sand, well-graded gravel (25-35%), loose, brown, dry, mixed	SW	
			2.8-5.0	NONE	SS	>2000?	TP-11-2-3	Fill=Sandy Gravel, well-graded gravel (55-65%), well-graded sand, dense, brown, dry, mixed	GW	
				NONE	SS	26.1	TP-11-4-6			
			5.0-8.0	SL-S PH	SS	7.0	TP-11-6-10	Fill=Gravelly Sand, fine to medium sand, well-graded gravel (15-20%), silt (<10%), medium dense, brown, dry mixed	SW	contains some wood fragments and metal debris
			8.0-10.0	S PH	HS			Fill=wood debris, silty sand to fine sand matrix, medium dense, light gray/brown, moist, mixed	(SM)	free oil product layer at 9.6' bgs (clear amber liquid, 0.3' thick)
TP-12	Grid Location	10	0.0-1.5	NONE	NS	118	TP-12-0-1	Fill=Gravelly Sand, well-graded sand, well-graded gravel (35-40%), loose, brown, dry, mixed	SW	contains metal debris
			1.5-3.5	NONE	NS	>2000?	TP-12-2-3	Fill=medium Sand, some gravel (<10%), loose, gray, dry, mixed	SP-SW	contains some small debris
			3.5-6.0	NONE	NS	80	TP-12-4-6	Fill=Silty Sand, very fine sand, fine gravel (5-10%), medium dense, light gray/brown, dry to wet	(SM)	contains abundant wood debris; bedding planes noted
			6.0-10.0	NONE	NS	11.8	TP-12-6-10	Fill=wood debris, sandy clayey silt matix, very fine sand (~15%), clay (20%), medium stiff, very soft, gray, wet, mixed	(ML)	old boards, timber, wood chips
			@10.0	NONE	NS			Fill=wood debris, clayey silty sand matix, very fine sand, silt (30-40%), clay (10-15%), loose, gray, wet, mixed	(ML)	contains wood planks, timber, manuf. Wood
TP-13	Grid Location	10	0.0-4.0	NONE	NS	14817	TP-13-0-1	Fill=Sandy Gravel, well-graded gravel (55-65%), silt (<10%) well-graded sand, loose, brown, dry, mixed, contains ashes	GW	contains abundant metal debris 0-0.6'
				NONE	NS	>2000?	TP-13-2-3			
			4.0-6.0	NONE	NS	>2000?	TP-13-4-6	Fill=medium Sand, contains some fine sand, some fine-medium gravel (~5%), loose, dark gray, dry,mixed	SP	contains some small wood & glass debris
			6.0-7.0	NONE	NS	415?	TP-13-6-10	Fill=Fine Sand, poorly-graded sand, medium dense, light brown, dry, slight Fe-oxidation mottling	SP	
			7.0-10.0+	NONE	NS			Fill=wood debris, fine sand to silty sand matrix, medium dense, gray, dry, mixed	(SP-SM)	logs, boards, timbers; matrix % decreases with depth
TP-14	Northeast side of former red brick building	10	0.0-9.0	NONE	NS	5.6	TP-14-0-1	Fill=Sandy Gravel, well-graded gravel (50-70%), well-graded sand, dense, gray, dry to moist, mixed	GW	SW layer at 2.0-2.5'
				NONE	NS	105	TP-14-2-3			2 steel pipes in TP that are perpendicular to former red brick bldg. concrete vault;
				NONE	NS	38.3	TP-14-4-6			1 pipe (12" dia.) is 7.5' and other (6" dia.) is 13.5' from 'south' end of vault; 5.0' bgs
			9.0-10.0	SL PH	NS	34.8	TP-14-6-10	Fill=Sandy Gravel, well-graded gravel (55-60%), well-graded sand, silt (~10%) and clay (~5-10%), dense, moist-wet	GW	contains wood debris
			10.0-10.5	decaying organic	NS			Fill=wood debris, silty sandy gravel matrix, wet	(GM)	wood chips, timber, pressboard
TP-15	Grid Location	10	0.0-4.0	NONE	NS	—	TP-15-0-1	Fill=Sandy Gravel, well-graded gravel (55-60%), well-graded sand, medium dense to dense, gray, dry, mixed	GW	
						—	TP-15-2-3			
			4.0-8.0	NONE	NS	—	TP-15-4-6	Fill=Gravelly Sand, fine to medium sand, well-graded gravel (30-35%), medium dense, brown, dry, mixed	SW-(SW)	contains abundant wood fragments from 6.0-8.0' bgs
			8.0-10.0	NONE	NS	—	TP-15-6-10	Fill=wood debris, sandy silt matrix, v. fine sand (~30-45%), clay (~10%), soft, gray, wet, moderately plastic	(ML)	wood timbers, logs, chips
			@10.0	NONE	NS			Silty Sand, fine to medium sand, silt (30-35%), medium dense, gray, moist	SM	native material?
TP-16	SW side red brick building	3.5	0.0-3.5	VS PH	MS	---	TP-16-0-1	Fill=Gravelly Sand/Sandy Gravel, well-graded gravel (45-55%), well-graded sand, medium dense to dense, brown/gray/black, moist to wet, mixed	SW-GW	0.4' asphalt cover; contains abundant auto/machinery battery casings; heavily stained; water perched in TP@2.5' bgs (remained perched for 6 days); possible vault (40'x17') on western side of former red brick building
				VS PH	HS	—	TP-16-2-3			
TP-17	Grid Location	10	0.0-4.4	NONE	NS	—	TP-17-0-1	Fill=Sandy Gravel, well graded gravel (55-65%) medium-course sand, dense, mixed	GW	heavily stained black from 0-1.5'
			4.4-7.0	SL PH @5.0'	NS	---	TP-17-2-3	Fill=Gravelly Sand, fine-medium sand, subrounded-subangular gravel (20-35%), medium dense, moist	SW	wood fragments @ 6'
			7.0-8.5	NONE	NS	—	TP-17-4-6	Fill=wood debris (logs, pressboard, chips) in silty sand matrix, fine-medium sand, silt (10-20%) loose, medium-dense, wet	(SM)	
			8.5-10	NONE	NS	---	TP-17-6-10	Sandy Clayey Silt, very fine sand (25-30%) medium stiff, mod-plastic, grey, moist, laminar, w/organics (marsh grass?)	ML	Water at 7.5', native materials?
TP-18	Grid Location	10	0.0-4.3	NONE	NS	---	TP-18-0-1	Fill=Sandy Gravel, well graded gravel (55-60%), medium-course sand, moist, mixed, gray	GW	
			4.3-6.5	NONE	NS	—	TP-18-2-3	Gravelly Sand, fine-medium sand, well graded gravel (30-35%) medium dense, moist, mixed	SW	contains brick fragments; wood fragments above 6.0', abundant below 6.0'
			6.5-7.8	NONE	NS	---	TP-18-4-6	Fill=wood debris, silty sand matrix (15%), medium-dense, moist, mixed	(SM)	timbers, wood chips, boards
			7.8-10.0	NONE	NS	—	TP-18-6-10	Silty Sand, fine-medium sand, (10-20%) silt, laminated/stratified, medium dense-dense, moist, some organics (esturary grasses)	SM	native materials?

APPENDIX B

SUMMARY OF TEST PIT OBSERVATIONS
Former Tacoma Metals Facility

Test Pit Number	Test Pit Location	Depth (feet)	Unit Depths (feet)	Noticeable Odors[a]	Water Sheen[b]	OVM (ppm)	Soil Sample Number[c]	Description	USCS Symbol	Comments
TP-19	Grid Location	10.5	0.0-2.0	NONE	NS	—	TP-19-0-1	Fill= Gravelly Sand, fine-medium, well graded gravel (25-45%), loose, dry, mixed	SW	contains brick and demolished concrete
			2.0-8.0	NONE	NS	—	TP-19-2-3	Fill=Gravelly Sand, fine-medium sand, well-graded gravel (30-40%), medium dense, dry, mixed, brown-light brown	SW	contains white bricks at 6.0'
			8.0-9.0	NONE	NS	—	TP-19-4-6	Fill=Gravely Sand, well-graded gravel (45-60%), medium dense, dry, mixed, medium-coarse sand	SW-GW	
			9.0-9.5	NONE	NS	—	TP-19-6-10	Fill=Gravelly Sand, fine-medium gravel (25-35%) dense, dry, mixed, gray	SW	
			9.5-10.5	NONE	NS			Clayey Silty Sand, fine-medium sand, silt (25-35%), clay (10-15%), laminated, medium dense, stiff, moist, gray	SM-ML	native material?
TP-20	Grid Location	10.5	0.0-2.2	NONE	NS	—	TP-20-0-1	Fill=Sandy Gravel, gravel (50-60%), medium course sand, dense, compacted, moist, mixed	GW	
			2.2-4.3	SL PH	NS	—	TP-20-2-3	Fill=Sandy Gravel/Gravelly Sand, well-graded gravel (45-55%), well graded sand, dry, dense, mixed, stained	GW-SW	contains brick, metal and wood debris
			4.3-6.0	NONE	NS	—	TP-20-4-6	Fill= Sandy Gravel, 50-60% gravel, course sand, dense, compacted, dry, mixed	GW	
			6.0-7.5	NONE	NS	—	TP-20-6-10	Fill=Sandy Gravel, 55-60% gravel, some sand 40% silt, moist, dense, mixed	GM	
			7.5-10.5	NONE	NS			Fill=wood debris in sandy clayey silt matrix (15-25%), medium-stiff, wet, gray	(ML)	boards, timber, chips, pressboard
TP-21	Grid Location	10	0.0-3.0	NONE	NS	—	TP-21-0-1	Fill=Gravelly Sand, medium-course sand, gravel (20-25%), loose, dry, mixed, brown,	SW	contains metal debris, capacitors, and other debris
			3.0-5.0	NONE	NS	—	TP-21-2-3	Fill=Gravelly Sand/Sandy Gravel, well graded gravel (45-60%), dense, dry, brown, mixed	GW-SW	contains lenses of sandy silt
			5.0-7.0	NONE	NS	—	TP-21-4-6	Fill=Gravelly Sand, medium sand, fine-medium gravel (10%), loose, dry, gray	SW	
			7.0-10.0	NONE	NS	—	TP-21-6-10	Fill=wood debris, matrix 10-15%, sand and silty sand with clay, loose, dry, mixed	(SM-ML)	wood chips, boards, timbers
TP-22	Grid Location	10	0.0-4.0	NONE	NS	—	TP-22-0-1	Fill=Gravelly Sand w/ ash cinders, poorly graded fine-medium sand, well-graded gravel (25-30%), loose, dry, mixed, brown, stained	SW	Contains metal debris, stained, oxidized (Cu)
			4.0-5.0	NONE	NS	—	TP-22-2-3	Fill=Sandy Gravel , well graded gravel (55-60%), well-graded sand, dense, dry, mixed, brown	GW	
			5.0-7.0	NONE	NS	—	TP-22-4-6	Fill=Gravelly Sand, medium sand , fine-medium gravel (20%), loose, dense, dry, mixed, brown	SW	
			7.0-8.0	NONE	NS	—	TP-22-6-10	Fill=Fine-Medium Sand, medium dense, dry, mixed, brown	SP	
			8.0-10.0	NONE	NS			Fill=wood debris, matrix 20%, brown silty sand, silt (30-35%), medium dense, moist	(SM)	logs, timbers, chips; entirely wood debris 8.0-10.0', matrix present at 10.0'
TP-23	Grid Location	10	0.0-2.0	NONE	NS	0.0	TP-23-0-1	Fill=Sandy Gravel, well graded gravel (50-55%), medium course sand, dense, moist, mixed, gray	GW	
			2.0-7.0	MOD PH	NS	19.4?	TP-23-2-3	Fill=Gravelly Sand/Sandy Gravel, well graded sand, well graded gravel (45-55%), dense, mixed, stained, brown	GW-SW	contains metal debris
			7.0-8.0	NONE	NS	13.4?	TP-23-4-6	Fill=wood debris, no soil	—	logs, chips, timber, boards
			8.0-10.0	NONE	NS	17.2?	TP-23-8-10	Clayey Silty Sand, very fine sand, silt (35%), clay (10%), medium dense, plastic fines, moist-wet, laminar, some organics (grasses), gray	ML	native material?
TP-24	Grid Location	10	0.0-2.0	NONE	NS	1.4?	TP-24-0-1	Fill=Gravelly Sand/Sandy Gravel, well graded gravel (45-60%), well graded sand, dense, mixed, moist, brown	GW-SW	contains some brick debris
			2.0-5.8	NONE	NS	10.6?	TP-24-2-3	Fill=Gravelly Sand, well graded gravel (25-40%), dense, dry, brown	SW	gravel content increases with depth
			5.8-8.0	SL ORGANIC	NS	5.6?	TP-24-4-6	Fill=wood debris, dark brown fine-medium sand and gray silty fine sand matrix	(SP-SM)	wood chips, timber
			8.0-10.0	NONE	NS	4.3?	TP-24-6-10	Sandy Clayey Silt, very fine sand (20%), clay (20%), silt (60%), medium-stiff, moderately plastic, gray	ML	native materials?
TP-25	Grid Location	10.3	0.0-4.1	NONE	NS	17.8?	TP-25-0-1	Fill=Sandy Gravel, fine-medium gravel (35-45%), coarse sand, dense, compacted, moist, brown	SW	
			4.1-6.8	NONE	NS	148?	TP-25-2-3	Fill=Fine to Medium Sand, some fine-medium gravel (<10%), medium-dense, dry, dark gray	SP	
			6.8-8.0	NONE	NS	163?	TP-25-4-6	Fill=wood debris in sandy silt/fine sand matrix (25%), very soft, plastic, wet, mixed, brown	(ML)	timber, logs, wood chips, wood dust
			8.0-9.8	NONE	NS	3.5?	TP-25-6-10	Fill=Sandy Clayey Silt, very fine sand (20-30%), clay (20-30%), stiff, mod-plastic, moist, w/organics (estuary grasses), blocky, gray	ML	
			9.8-10.3	NONE	NS			Fill=wood debris, no soil	—	logs, chips, dust, timbers
TP-26	Grid Location	10	0.0-4.5	NONE	NS	12.2	TP-26-0-1	Fill=Gravelly Sand, well graded sand, well graded medium gravel (35-45%), dense, moist-dry, brown	SW	
			4.5-6.0	NONE	NS	13.3	TP-26-2-3	Fill=Gravelly Sand, medium-course sand, well graded gravel (30-35%), contains charcoal, medium dense, dry, dk. Gray	SW	
			6.0-8.0	NONE	NS	1171	TP-26-4-6	Fill=Silty Sand, silt (30%), medium stiff, moist, mixed, grades to sandy silt @ 7.0', fine sand (30%)	SM-ML	some wood debris
			8.0-10.0	NONE	NS	65.6	TP-26-6-10	Fill=Silty Sand/Sandy Silt, some clay (5-15%), very fine sand, silt (35-55%), contains abundant organics, dense, moist, gray	ML	abundant wood debris at 10'
TP-27	Southeast of former UST area	10	0.0-2.0	MD PH	MS	>2000?	TP-27-0-1	Fill=Gravelly Sand, well graded sand, well graded medium gravel (35-40%), dense, mixed, dry, brown, stained	SW	contains metal debris
			2.0-5.5	VSL	NS	566	TP-27-2-3	Fill=Sandy Gravel, medium-course sand, well graded gravel (50-55%), dense, compact, moist	GW	slight unknown oder (detergent-like)
			5.5-9.0	VSL	NS	22.3	TP-27-4-6	Fill=Gravelly Sand, medium-course sand, well graded gravel (30-35%), dense, brown	SW	
			9.0-9.5	NONE	NS	17.6	TP-27-6-10	Fill?=Clayey Silt, clay (25-35%), moist, stiff to very stiff, plastic,brown	ML	native material?
			9.5-10.0	NONE	NS			Fill?=Gravelly Sand, medium sand, well graded gravel (30-35%), dense, dry, brown	SW	native material?

APPENDIX B

SUMMARY OF TEST PIT OBSERVATIONS
Former Tacoma Metals Facility

Test Pit Number	Test Pit Location	Depth (feet)	Unit Depths (feet)	Noticeable Odors[a]	Water Sheen[b]	OVM (ppm)	Soil Sample Number[c]	Description	USCS Symbol	Comments
TP-28	Grid Location	10	0.0-0.9	NONE	NS	2.4	TP-28-0-1	Fill=Gravelly Sand, medium-course sand, well graded gravel (45-50%), dense, dry, brown	SW	
			0.9-3.5	VS PH	MS	58.4	TP-28-2-3	Fill=Gravelly Sand,well graded sand, well graded gravel (40-50%), dense, dry, brown	SW	contains metal debris, heavily stained, (Cu) oxidation @ 0.9-1.2'
			3.5-6.0	NONE	NS	8	TP-28-4-6	Fill=Gravelly Sand/Sandy Gravel, medium-course sand, well graded gravel (40-55%), dense, moist, brown	SW-GW	
			6.0-9.0	NONE	NS	5.3	TP-28-6-10	Fill=wood debris, clayey sandy silt matrix, very fine sand (30%), clay (10-15%), medium stiff, wet, mod-plastic, gray	(ML)	
			9.0-10.0	NONE	NS			Silty Sand, silt (30-35%), stratified	SM	native material?
TP-29	Grid Location	10	0.0-4.5	NONE	NS	1100?	TP-29-0-1	Fill=Sandy Gravel, well graded gravel (50-60%), medium-coarse sand, dense, moist, brown/gray	GW	
			4.5-7.0	NONE	NS	560?	TP-29-2-3	Fill=Gravelly Sand, fine-medium sand, well graded gravel (35-40%), medium-dense, moist, brown	SW	
			7.0-8.0	NONE	NS	480?	TP-29-4-6	Fill=wood debris, no soil	—	timber, wood chips
			8.0-10.0	NONE	NS	—	TP-29-6-10	Sandy Clayey Silt, very fine sand (20%), clay (15-20%), stiff, moist, plastic, laminar, contains organics (estuary grasses)	ML	native material?
TP-30	South corner of former foundation	10	0.0-1.8	MOD PH	MS	—	TP-30-0-1	Fill=Gravelly Sand, well graded sand, well graded gravel (30-40%), medium-dense, stained	SW	contains abundant metal debris
			1.8-5.0	NONE	NS	—	TP-30-2-3	Fill=Sandy Gravel/Gravelly Sand, medium-course sand, well graded gravel (45-55%), dense, dry-moist, brown	GW-SW	
			5.0-7.0	NONE	NS	—	TP-30-4-6	Fill=Gravelly Sand/Sandy Gravel, medium-course sand, well graded gravel (45-55%), dense, moist, brown	GW-SW	
			7.0-8.0	NONE	NS			Fill=Silty Sand, silt (10%), dense, moist, mixed	SM	
			8.0-9.0	NONE	NS	---	TP-30-6-10	Fill=wood debris, brown silty sand matrix (20%), wet, dense	(SM)	logs, boards, wood chips, logs
			9.0-10.0	NONE	NS			Clayey Sandy Silt, clay (15%), very fine sand (30%), soft, medium stiff, plastic, w/organics (estuary gass), gray	ML	native material?
TP-31	Grid Location	10.3	0.0-2.2	MOD PH	MS	---	TP-31-0-1	Fill=Gravelly Sand, well graded sand, well graded gravel (30-40%), medium-dense, stained, brown	SW	contains abundant metal debris
			2.2-6.0	NONE	NS	---	TP-31-2-3	Fill= Gravelly Sand/ Sandy Gravel, medium-course sand, well graded gravel (45-55%), dense, dry, gray	GW-SW	
			6.0-7.0	MOD ORGANIC	NS	---	TP-31-4-6	Fill= medium sand w/ some gravel, poorly graded sand, fine-medium gravel (5-10%), dense, dry, mixed, brown	SP-SW	
			7.0-9.0	NONE	NS	---	TP31--6-10	Fill=wood debris, no soil	---	wood chips, timber, logs, boards, bark dust
			9.0-10.3	NONE	NS	---		Clayey Silty Sand/Clayey Sandy Silt, silt (40-55%), clay (10-15%), very fine sand, dense, dry, laminar, contains estuary grasses	ML	native material?
TP-32	West corner of former foundation	2	0.0-2.0	MOD PH	MS	—	TP-32-0-1	Fill=Gravelly Sand, well graded sand, well graded gravel (30-40%), dense, dry, heavily stained, brown	SW	contains abundant metal debris Refusal: concrete pad @2' Pad extends for 25-50' N, E, S, W, of Test Pit
TP-33	Grid Location	10	0.0-2.0	NONE	NS	—	TP-33-0-1	Fill=Gravely Sand, well-graded gravel (20-30%)	SW	contains abundant metal debris, glass, styrofoam, brick, and wood
			2.0-4.5	NONE	NS	—	TP-33-2-3	Fill=Gravelly Sand/Sandy Gravel, medium-course sand, well graded gravel (45-60%), dense, dry, brown, mixed	SW-GW	
			4.5-6.0	NONE	NS	---	TP-33-4-6	Fill=Gravelly Sand/Sandy Gravel, medium course sand, well graded gravel (45-60%), dense, dry, mixed, gray	SW-GW	
			6.0-7.0	NONE	NS	—	TP-33-6-10	Fill=Silty Sand, very fine-fine sand, silt (30-35%), dense, dry, gray/brown	SM-ML	
			7.0-10.0	NONE	NS			Fill=wood debris, silty sand matrix (15%), medium dense, mixed	(SM)	logs, timber, chips, boards
TP-34	Grid Location	10	0.0-4.0	MOD PH	MS	—	TP-34-0-1	Fill=Gravelly Sand, well graded sand, well graded gravel (30-35%), dense, heavily stained	SW	contans abundant metal debris-car parts, sheet metal, cable, wire
			4.0-6.0	NONE	VS	---	TP-34-2-3	Fill=Medium Sand, well graded gravel (10-20%), medium dense, mixed, brown	SW	
			6.0-8.0	NONE	NS	---	TP-34-4-6	Fill=wood debris, no soil	—	boards, wood ships, bark dust, timber
			8.0-10.0	NONE	NS	---	TP-34-6-10	Clayey Silty Sand/Sandy Silt, very fine sand, silt (40-45%), dense/stiff, clay (20%), dry, slightly plastic, gray, estuary grasses	ML	native materials?
TP-35	Grid Location	10	0.0-1.0	NONE	NS	---	TP-35-0-1	Fill=Gravelly Sand, well graded sand, well graded gravel (35-40%), dense, mixed, stained, dk. Gray, moist	SW	some metal debris and oxidation staining
			1.0-5.0	NONE	NS	—	TP-35-2-3	Fill=Gravelly Sand, medium-course sand, well graded gravel (40-50%), dense, moist, brown	SW	
			6.0-7.8	NONE	NS	---	TP-35-4-6	Fill=Gravelly Sand, medium-course sand, well graded gravel (20-35%), medium dense, moist, dk. Brown	SW	
			7.8-9.0	NONE	NS	---	TP-35-6-10	Fill=wood debris, silty sand (fine-medium sand) matrix, medium dense, moist, mixed	(SM)	
			9.0-10.0	NONE	NS	—		Clayey Sandy Silt, very fine sand (20%), clay (20%), stiff, moist, abundant organics (estuary grasses), gray, massive	ML	native materials?
TP-36	Grid Location	10	0.0-4.6	NONE	NS	—	TP-36-0-1	Fill=Gravelly Sand/Sandy Gravel, well graded sand, well graded gravel (35-50%),dense, mixed, brown/gray	SW-GW	heavily stained from 2.7 to 3.4'
			4.5-7.0	NONE	NS	---	TP-36-2-3	Fill=Silty Sand, fine-medium sand, silt (15-20%), dense, dry, mixed, gray	SM	
			7.0-9.0	MOD CREOSOTE	HS	—	TP-36-4-6	Fill=wood debris, fine-medium sand matrix (5-10%), medium dense, mixed	(SP)	logs, timber, chips, boards
			9.0-10.0	NONE	NS	—	TP-36-6-10	Silty Fine-Medium Sand, silt (5%), poorly graded sand, stratified, dense, dry-moist, gray	SP-SM	native material?

APPENDIX B

SUMMARY OF TEST PIT OBSERVATIONS
Former Tacoma Metals Facility

Test Pit Number	Test Pit Location	Depth (feet)	Unit Depths (feet)	Noticeable Odors[a]	Water Sheen[b]	OVM (ppm)	Soil Sample Number[c]	Description	USCS Symbol	Comments
TP-37	Grid Location	10	0.0-0.5	NONE	NS	1010?	TP-37-0-1	CSTC	GW	
			0.5-3.3	MOD PH	SS	781?	TP-37-2-3	Fill=Gravelly Sand, well graded sand, well graded gravel (35-40%), dense, mixed, brown	SW	contains metal debris and brick
			3.3-4.0	NONE	NS			Fill=Gravelly Sand, well graded sand, well graded gravel (30-40%), dense, dry, mixed, gray	SW	
			4.0-5.2	NONE	NS	620?	TP-37-4-6	Fill=Fine-Medium Sand, trace gravel (3-5%), loose, dry, brown/charcoal gray	SP	
			5.2-7.0	SL PH	NS	600?	TP-37-6-10	Fill=Fine-Medium Sand, medium-course gravel (10%), dry, brown	SP-SW	abundant wood debris
			7.0-8.0	SL ORGANIC	NS			Fill=wood debris, medium-fine sand matrix (5%)	(SP)	logs, timber, chips, boards
			8.0-10.0	NONE	NS			Clayey Sandy Silt, very fine sand (30-40%), clay (10-20%), silt (40-50%), very stiff, dry, mod-plastic, gray, estuary grasses	ML	native material?
TP-38	Grid Location	10	0.0-3.0	NONE	NS	625?	TP-38-0-1	Fill=Gravelly Sand, fine-medium sand, well-graded gravel (20-25%), loose-medium dense, dry, brown	SW	contains metal debris 0-2', charcoal cinders 1.5-2'
			3.0-5.5	NONE	NS	700?	TP-38-2-3	Fill=Medium Sand, some gravel (5-10%), some fine sand, loose, dry, brown	SW-SP	
			5.5-6.5	NONE	NS	965?	TP-38-4-6	Fill=wood debris, silty sand matrix (20%), fine-medium sand, silt (15-20%), medium-dense, dry	(SM)	logs, timber, boards, wood chips; piling in test pit from 6.0' down
			6.5-10.0	NONE	NS	800?	TP-38-6-10	Fine-Medium Sand, silt (10%), non-plastic fines, medium-dense, moist, gray, stratified, contains estuary grasses	SP-SM	native material?
TP-39	Grid Location	10.5	0.0-1.8	NONE	NS	2000?	TP-39-0-1	Fill=Fine-Medium Sand, well-graded gravel (15-25%), poorly graded sand, loose, dry, brown	SW	slag material 1.6-1.8'
			1.8-3.0	NONE	NS	2000?	TP-39-2-3	Fill=Gravelly Sand/Sandy Gravel w/ cobble (0.7"), well graded sand, well graded gravel (40-55%), dense, dry, brown	SW-GW	
			3.0-5.2	NONE	NS	685?	TP-39-4-6	Fill=Fine-Medium Sand, trace well graded gravel (3-5%), loose, dry, brown	SP	
			5.2-7.0	NONE	NS	780?	TP-39-6-10	Fill=wood debris, brown fine-medium sand to silty sand matrix (5-15%)	(SP-SM)	timbers, logs, chips, boards
			7.0-10.5	NONE	NS			Medium-course sand, medium dense, wet	SP	native material?
TP-40	Grid Location	10	0.0-4.0	MOD PH	SS	---	TP-40-0-1	Fill=Gravelly Sand, well graded sand, well graded gravel (30-35%), dense, stained	SW	contains abundant metal and brick debris
			4.0-5.0	NONE	NS	—	TP-40-2-3	Fill=Gravelly sand, medium-course sand, well graded gravel (40-45%), dense, moist, gray, mixed	SW	
			5.0-6.0	NONE	NS	—	TP-40-4-6	Fill=medium Sand, charcoal gray/mauvish, loose, dry, massive	SP	
			6.0-7.0	NONE	NS	—	TP-40-6-10	Fill=wood debris, no soil matrix	—	logs, chips, bark, timber
			7.0-10.0	NONE	NS			Fine-Medium Sand, some silt, contains estuary grasses, dense, dry, gray, stratified	SM	contains silty sand lenses, native material?
TP-41	Grid Location	11.8	0.0-6.0	NONE	NS	—	TP-41-0-1	Fill=Gravelly Sand, medium-course sand,well graded gravel (40-50%), dense, moist, gray	SW	
						---	TP-41-2-3			
			6.0-9.0	NONE	NS	—	TP-41-4-6	Fill=Fine-Medium Sand, fine-medium gravel (10-15%), poorly graded sand,medium dense, dry, mixed, gray	SP	contains some wood debris
			9.0-11.8	NONE	NS	---	TP-41-6-10	Fill=wood debris, no soil matix	—	logs, timber, chips, dust
TP-42	Grid Location	10	0.0-6.8	NONE	NS	---	TP-42-0-1	Fill-Gravelly Sand, medium-course sand, well graded gravel (35-50%), dense, moist, gray, mixed	SW	
						—	TP-42-2-3			
						—	TP-42-4-6			
			8.8-10.0	NONE	NS	—	TP-42-6-10	Fill=wood debris, no soil matrix	—	timber, wood chips, boards, sawdust, bark
TP-43	Grid Location	10	0.0-3.5	NONE	NS	—	TP-43-0-1	Fill=Gravelly Sand, well graded sand, well graded gravel (30-35%), dense, moist, mixed, stained, dk. Brown	SW	contains metal and brick debris, Cu oxidation stains
			3.5-4.2	NONE	NS	—	TP-43-2-3	Fill=Gravelly Sand, medium-course sand, well graded gravel (40-40%), dense, moist, gray/brown	SW	
			4.2-7.0	NONE	NS	—	TP-43-4-6	Fill=Medium-Course Sand, medium gravel (5%), medium-dense, moist, dk gray	SP	
			7.0-9.0	NONE	NS	—	TP-43-6-10	Fill=wood debris, brown silty sand/sandy silt matrix	(SM-ML)	logs, chips, timber, boards, no soil below 7.8'
			9.0-10.0	NONE	NS			Clayey Sandy Silt , very fine sand (30%), clay (10%), plastic fines, soft-medium, stiff, moist-wet, laminar, contains estuary grass	ML	
TP-44	Grid Location	11	0.0-2.2	NONE	NS	—	TP-44-0-1	Fill=Gravelly Sand, well graded sand, well graded gravel (20-45%), dense, dry, mixed, brown	SW	
			2.2-5.0	NONE	NS	---	TP-44-2-3	Fill=Fine-Medium Sand, trace well graded gravel (3-5%), loose, dry, brown	SP	
			5.0-8.0	NONE	NS	—	TP-44-4-6	Fill=wood debris, sand/clay/silt matrix	(ML)	board, logs, chips; matrix 25-35% @ 7.0', entirely wood 6.0-7.0'
			8.0-11.0	NONE	NS	—	TP-44-6-10	Medium-Course Sand, medium gravel (5%), medium-dense, moist, dk gray	SP	native material?
TP-45	Grid Location	10.5	0.0-3.0	NONE	NS	0	TP-45-0-1	Fill=Gravelly Sand, fine-medium sand, well-graded gravel (15-20%), loose, dry, brown, mixed, stained	SW	contains metal, brick, and concrete debris
			3.0-7.0	NONE	NS	0	TP-45-2-3	Fill=Gravelly Sand, well graded sand, well graded gravel (30-35%), medium dense, dry, light brown	SW	
			7.0-8.5	NONE	NS	0	TP-45-4-6	Fill=wood debris, clayey sandy silt matrix at 8.0'	(ML)	no soil at 7.0-8.0'
			8.5-9.2	NONE	NS	0	TP-45-6-10	Clayey Silty Sand, very fine sand, plastic fines, silt (30-35%), clay (10-15%), medium dense, moist, some organics, gray, laminar	ML	native material?
			9.2-10.5	NONE	NS			Medium-Course Sand, trace fine gravel (3%), medium-dense, moist-wet, dk gray	SP	native material?

APPENDIX B

SUMMARY OF TEST PIT OBSERVATIONS
Former Tacoma Metals Facility

Test Pit Number	Test Pit Location	Depth (feet)	Unit Depths (feet)	Noticeable Odors[c]	Water Sheen[b]	OVM (ppm)	Soil Sample Number[d]	Description	USCS Symbol	Comments
TP-46	Grid Location	10	0.0-2.5	NONE	NS	0	TP-46-0-1	Fill=Gravelly Sand, well graded sand, well graded gravel (20-25%), dense, mixed, dark brown	SW	contains some metal debris and Cu oxidization, stained
			2.5-3.4	NONE	NS	0	TP-46-2-3	Fill=Gravelly Sand, well graded sand, well graded gravel (35-40%), dense, mixed, dry, brown	SW	contains metal debris
			3.4-5.9	MOD HC	MS	0	TP-46-4-6	Fill=Gravelly Sand, well graded sand, well graded gravel (25-35%), dense, mixed, charcoal gray	SW	abundant metal and glass debris, heavily stained
			5.9-8.8	NONE	NS	0	TP-46-6-10	Fill=Gravelly Sand, well graded sand, well graded gravel (40-45%), dense, moist, gray, mixed	SW	
			8.8-10	NONE	NS			Fill=wood debris, no soil matrix	—	logs, timber, boards, chips
TP-47	Grid Location	10.5	0.0-1.4	NONE	NS	0	TP-47-0-1	Fill=Medium Sand, some gravel (5%), loose, dry, brown	SP	
			1.4-8.0	NONE	NS	0	TP-47-2-3	Fill=Gravelly Sand, medium-course sand, well graded gravel (35-50%), dense, dry, brown	SW	
						0	TP-47-4-6			
			8.0-10.5	NONE	NS	0	TP-47-6-10	Fill=wood debris, brown silty sand matrix (30%), fine-medium sand, silt (35%)	(SM)	timber, boards, chips
TP-48	Northwest corner of property	8.5	0.0-1.4	NONE	NS	0	TP-48-0-1	Fill=Gravelly Sand, well graded sand, well graded gravel (30-35%), dense, dry, brown	SW	
			1.4-4.4	NONE	NS	0	TP-48-2-3	Fill=Fine-Medium Sand, some fine-medium gravel (<5%), loose, dry, gray	SP	
			4.4-8.5	SL PH	MS	0	TP-48-4-6	Fill=wood debris, silty sand matrix (<10%), moist, mixed	(SM)	wood chips, boards, bark, wood dust
						0	TP-48-6-8.5			water at 7.4', heavy sheen on water surface
TP-49	Former creosoting plant area	10	0.0-2.0	NONE	NS	0	TP-49-0-1	Fill=Gravelly Sand, well graded sand, well graded gravel (40-50%), dense, dry-moist, gray	SW	
			2.0-3.3	SL PH	NS	0.2	TP-49-2-3	Fill=Gravelly Sand, medium sand, well graded gravel (25-30%), dense, dry, mixed, gray	SW	
			3.3-7.0	VS CREOSOTE	HS	6.5	TP-49-4-6	Fill=Fine-Course Sand, well graded gravel (20-25%), dark gray	SW	heavily stained, locally saturated with PH/creosote product, contians wood debris
			7.0-10.0	VS CREOSOTE	HS	1.7	TP-49-6-10	Fill=wood debris, brown silty sand matrix (10-30%), loose, moist, mixed	(SM)	wood chips, boards, bark; water @ 8.5', PH product on surface; heavily stained
TP-50	South of NMW-3 (north corner)	10	0.0-3.3	NONE	NS	0.4	TP-50-0-1	Fill=Gravelly Sand, medium-coarse sand, well graded gravel (35-45%), dry, mixed, gray	SW	
			3.3-6.3	SL PH	NS	0.2	TP-50-2-3	Fill=Gravelly Sand, medium-coarse sand, well graded gravel (25-35%), medium-dense, stained, brown, mixed	SW	contains wood, brick, slag, cable, glass debris
			6.3-7.5	NONE	NS	0	TP-50-4-6	Fill=Gravely Sand, well graded sand, well graded gravel (25-30%), silt (30%), wet, mixed, brown	SP-SM	contains 45-55% wood debris
			7.5-10	MOD CREOSOTE	SS	0	TP-50-6-10	Fill-wood debris, silty sand matrix (20-40%), very fine to fine sand, brown, lt gray, wet, sandy clayey silt matrix @ 9'	(SM-ML)	chips, boards, timber
TP-51	SW Corner	8	0.0-1.0	NONE	NS	0	TP-51-0-1	Fill=Sandy Gravel, well-graded gravel (60-65%), fine to medium sand, <10% fines, loose, brown, dry, mixed	GW	some metal and rubber debris
			1.0-4.3	NONE	NS	0	TP-51-2-3	Fill=Sandy Gravel, well-graded gravel, fine to medium sand (40-45%), gray	GW	
			4.3-5.0	NONE	NS	0	TP-51-4-6	Fill=Fine Sand, poorly graded sand, some gravel (<5%), brown, mixed	SP	
			5.0-6.5	NONE	NS			Fill=Fine Sand, sand/silt/clay mixture, 15-20% wood debris	SM-ML	fibrous to blocky wood debris
			6.5-8.0	NONE	NS	0	TP-51-6-8	Fill=wood debris, silty clay matrix (5-20%), brown, wet	(ML-CL)	sheen visible on water in the test pit
TP-52	East of TP-5	10	0.0-0.8	NONE	NS	0	TP-52-0-1	Fill=Sandy Gravel, well-graded gravel (55-60%), gray/brown, dry, mixed	GW	
			0.8-1.6	NONE	NS			Fill=Sandy Gravel, well-graded gravel with sand/silt, dark brown, dry, mixed	GW	some metal debris
			1.8-2.2	NONE	NS	0	TP-52-2-3	Fill=Sandy Gravel, well-graded gravel, gray, dry, mixed	GW	
			2.2-5.0	MOD CREOSOTE	MS	2.3	TP-52-4-6	Fill=wood debris, clayey sandy silt matrix (10-20%)	(SM-ML)	
			5.0-10.0	MOD CREOSOTE	MS	2.5	TP-52-6-10	Fill=wood debris, silty/clayey matrix (10%)	(ML-CL)	water @ 9.8', heavy sheen/product film on water surface
TP-53	North of TP-5	7	0.0-2.3	NONE	NS	0	TP-53-0-1	Fill=Sandy Gravel, well-graded gravel (55-60%) with sandy matrix, gray/brown, dry, mixed	GW	trace silt in dark brown layers
			2.3-3.8	NONE	NS	0	TP-53-2-3	Fill?=Silty Clay and Fine Sand, layered, hard, crumbly, light brown	ML-CL	gradational with underlying material
			3.8-4.5	NONE	NS	0	TP-53-4-6	Fill?=Silt, isolated small pods/lenses of fine sand/silt/clay	ML	pilings are visible in the pit sidewall below 4.5', no other wood material
			4.5-7.0	MOD CREOSOTE	MS	1.2	TP-53-6-7	Fill?=Gravelly Sand, sand to fine gravel material, cumbly, granular texture, dark brown, mixed	SP-SW	water @7.4", slight sheen on surface, gravel content increases with depth
TP-54	East of TP-7	10	0.0-1.5	NONE	NS	0	TP-54-0-1	Fill=Sandy Gravel, well graded gravel with sand and some silt, brown/tan, dry, mixed	GW	
			1.5-3.0	NONE	VSS	0	TP-54-2-3	Fill=Sandy Gravel, well graded gravel with sand and silt, dark brown	GW	contians some wood chip and metal debris
			3.0-5.2	NONE	NS	0	TP-54-4-6	Fill=Fine Sand, poorly graded sand, some gravel (5%), uniform texture	SP	
			5.2-6.0	NONE	NS			Fill=wood debris, silty/clayey matrix (5%), red/brown	(ML-CL)	primarily wood chips
			6.0-10.0	VSL	SS	0.6	TP-54-6-10	Fill=wood debris, silty/clayey matrix (5-10%)	(ML-CL)	decaying wood material, coarser with depth, wood surfaces coated with silt/clay

APPENDIX B

SUMMARY OF TEST PIT OBSERVATIONS
Former Tacoma Metals Facility

Test Pit Number	Test Pit Location	Depth (feet)	Unit Depths (feet)	Noticeable Odors[a]	Water Sheen[b]	OVM (ppm)	Soil Sample Number[c]	Description	USCS Symbol	Comments
TP-55	NE of TP-10	10	0.0-1.5	NONE	NS	0.7	TP-55-0-1	Fill=Sandy Gravel, well graded gravel with sand and some silt, brown/grey, dry, mixed	GW	contains some metal debris
			1.5-2.9	MOD HC	MS	3.6	TP-55-2-3	Fill=Gravelly Sand, well graded sand, gray, slightly moist, mixed	SW	
			2.9-3.8	MOD HC	NS	4.1	TP-55-4-6	Fill=Sandy Gravel, well graded gravel with sand and some silt, gray, mixed	GW	
			3.8-6.0	MOD HC	MS			Fill=Fine Sand, poorly graded, mixed with silt below 5.0', dark gray/brown, mixed	SP-SM	3" diameter pipe at 4' depth, oriented N-S, with HC product inside
			6.0-10.0	MOD HC	MS	4.2	TP-55-6-10	Fill=wood debris, sand/silt matrix (80-90%), dark brown, wet	(SP-SM)	water @ 9.5', dark brown HC product entering at sides of TP
TP-56	East of TP-11	10	0.0-0.6	NONE	SS	0.7	TP-56-0-1	Fill=Sandy Gravel, well graded gravel with sand and silt, dark brown, mixed	GW	
			0.6-3.0	NONE	SS	1.4	TP-56-2-3	Fill=Sandy Gravel, well graded gravel (55-60%) with sand, brown, slightly moist, mixed	GW	
			2.0-3.4	NONE	SS	1.9	TP-56-4-6	Fill=Gravelly Sand, well graded sand, gravel (45%), trace silt, dk brown, slightly moist, mixed	SW	
			3.4-5.8	NONE	NS			Fill=Fine Sand, slightly moist, dark brown	SP	
			5.8-10.0	NONE	NS	1.2	TP-56-6-10	Fill=wood debris, silt/clay/fine sand matrix (10-20%), dark red/brown, slightly moist	(ML-CL)	planks, wood chips, wood material becomes coarser with depth
TP-57	North of TP-9	10	0.0-0.3	NONE	NS	4.3	TP-57-0-1	Fill=Sandy Gravel, well graded gravel with sand, brown, mixed	GW	
			0.3-1.8	NONE	SS			Fill=Gravelly Sand, well graded sand, gravel (30-35%), some silt (5%), dark brown, mixed	SW	contains 20% metal and glass debris
			1.8-3.4	MOD HC	SS	16.2	TP-57-2-3	Fill=Sandy Gravel, gravel (55-60%), gray, dry, mixed	GW	
			3.4-6.2	NONE	VSS	6.7	TP-57-4-6	Fill=Fine Sand, granular coarse sand with some fine gravel, dark brown, trace silt, dry	SP	
			6.2-10.0	NONE	VSS	16	TP-57-6-10	Fill=wood debris, silty/clayey matrix (75-85%) with some fine sand, moist, dark red/brown to gray	(ML-CL)	wood content increases with depth and coarsens with depth
TP-58	North of TP-42	10	0.0-1.2	NONE	NS	0	TP-58-0-1	Fill=Sandy Gravel, well graded gravel (55-60%), medium sand, brown/tan, mixed	GW	
			1.2-2.2	NONE	VSS	0	TP-58-2-3	Fill=Sandy Gravel, well graded gravel (50-55%), well graded sand (40%), silt (5%), dk brown, mixed	GW	contains abundant metal debris (plates, cans pipes), bricks, minor glass
			2.2-5.8	NONE	NS	0	TP-58-4-6	Fill=Sandy Gravel, well graded gravel (55-60%), fine/medium sand (35-40%), silt (<5%), gray/brown, moist, mixed	GW	
			5.8-9.2	NONE	NS	0	TP-58-6-10	Fill=Sandy Gravel, well graded gravel (60%), medium sand, slightly moist, gray/brown	GW	
			9.2-10.0	NONE	NS			Fill=wood debris, silt matrix (15%), dark red/brown	(ML)	
TP-59	North of TP-41	10	0.0-0.6	NONE	NS	0	TP-59-0-1	Fill=Sandy Gravel, well graded gravel (55-60%), silt (5%), brown/tan, mixed	GW	
			0.6-2.0	NONE	NS	0	TP-59-2-3	Fill=Sandy Gravel, well graded gravel with sand and silt, red/brown, mixed	GW	contains abundant metal debris, granular charcoal-like material in 2-6" layer
			2.0-8.5	NONE	NS	0	TP-59-4-6	Fill=Sandy Gravel, well graded gravel (60%), sand (35-40%), trace silt, brown/tan, mixed	GW	
			8.5-10	NONE	NS	0	TP-59-6-10	Fill=wood debris, silt/clay matrix (10%) coating between wood fragments, brown, moist	(ML-CL)	coarse wood material
TP-60	East of TP-40	10	0.0-1.1	NONE	NS	0	TP-60-0-1	Fill=Sandy Gravel, well graded gravel (55-60%), sand, minor silt (<5%), tan/brown, dry, mixed	GW	
			1.1-4.3	NONE	NS	0	TP-60-2-3	Fill=Sandy Gravel, well graded gravel (50-55%), fine sand (30%), silt (15%), brown, dry, mixed	GW	contains 5-10% metal, brick, and glass debris
			4.3-6.5	NONE	NS	0	TP-60-4-6	Fill=Fine Sand, poorly graded, fine gravel (5%), dark gray	SP	
			6.5-8.10	NONE	NS	0	TP-60-6-10	Fill=wood debris; silt matrix, red/brown, moist, mixed	(ML)	contains some brick and metal debris
			8.10-10.0	NONE	NS			Silt, fine sand (5%), gray, moist	ML	native material?
TP-61	North of TP-36	10	0.0-3.2	SL HC	NS	0	TP-61-0-1	Fill=Sandy Gravel, well graded gravel (50-55%), fine sand (35%), silt (10-15%), gray/brown, dry, mixed	GW/GM	abundant brick, metal, glass, and rubber debris
			3.2-4.2	SL HC	SS	2.2	TP-61-2-3	Fill=Sandy Gravel, well graded gravel (55-60%), sand (35%), trace silt (5%), gray, dry, mixed	GW	
			4.2-6.10	SL HC	SS	0.6	TP-61-4-6	Fill=Fine to Medium Sand, poorly graded, locally with 10-15% silt, brown, dry	SP/SM	wood debris with silt at 4.2 to 4.8'
			6.10-7.10	NONE	NS	0	TP-61-6-10	Fill=wood debris, silt matrix (10-15%), red/brown, moist, mixed	(ML)	
			7.10-10.0	NONE	NS			Sandy Silt, silt (60-70%), fine sand (~30%), trace clay (<5%), moist, gray, irregularly layered, blocky at 10.0'	ML	wood pilings at 10', native material?
TP-62	SE of TP-38	10	0.0-1.0	NONE	NS	0	TP-62-0-1	Fill=Sandy Gravel, well graded gravel (55-60%), medium/fine sand (35%), trace silt (<5%), brown, dry, mixed	GW	
			1.0-3.5	NONE	NS	0	TP-62-2-3	Fill=Sandy Gravel, well graded gravel (50-55%), sand (30%), silt (15-20%), dark brown, dry, mixed	GW	
			3.5-4.0	NONE	VSS	0	TP-61-4-6	Fill=Sandy Gravel, well graded gravel with sand, trace silt, gray/brown, dry, mixed	GW	
			4.0-7.0	NONE	NS			Fill=Fine Sand, up to 5% coarse sand and fine gravel	SP	
			7.0-9.2	NONE	NS	0	TP-62-6-10	Fill=Silt, moderate organic content, moist, dark brown	ML-OL	contians wood, brick and metal debris (30-40% above 8.5'), wood abundant below 8.5'
			9.2-10.0	NONE	NS			Clayey Silt, silt (90%), clay (10%), gray, moist	ML	wood pilings at 9.5', native material?

APPENDIX B

SUMMARY OF TEST PIT OBSERVATIONS
Former Tacoma Metals Facility

Test Pit Number	Test Pit Location	Depth (feet)	Unit Depths (feet)	Noticeable Odors[a]	Water Sheen[b]	OVM (ppm)	Soil Sample Number[e]	Description	USCS Symbol	Comments
TP-63	East of TP-32	10	0.0-0.8	NONE	NS	4.3	TP-63-0-1	Fill=Sandy Gravel, poorly graded gravel (55-60%), medium sand (40%), trace silt, brown, dry, mixed	GW	three foot diameter steel pipe along west sidewall oriented east-west
			0.8-2.4	MOD HC	SS	15.1	TP-63-2-3	Fill=Sandy Gravel, well graded gravel with sand and silt, dark brown, mixed	GW	abundant metal debris (30%), springs, wire, hubcaps, sheet metal, minor glass debris
			2.4-4.5	MOD HC	SS-MOD			Fill=Sandy Gravel, gravel with sand and silt, gray/brown, moist, mixed	GW	liquid with strong HC sheen seeping into pit at top of gravel layer
			4.5-6.10	NONE	SS	15.2	TP-63-4-6	Fill=wood debris, silt matrix (30%), brown, moist, mixed	(ML)	soft brown silt above wood debris (4.5-5.2'), contains brick debris
			6.10-10.0	NONE	NS	0	TP-63-6-8	Clayey Silt, silt (90%), clay (10%), gray, moist	ML	interbedded silt/clay/clayey silt at 9.0-10.0', native material?
TP-64	NE of TP-17	8	0.0-0.9	NONE	NS	0	TP-64-0-1	Fill=Sandy Gravel, well graded gravel with sand, trace silt, brown, dry, mixed	GW	
			0.9-4.0	NONE	VSS	0	TP-74-2-3	Fill=Sandy Gravel, well graded gravel (55-65%), sand (30-35%), trace silt (<5%), gray/brown, dry, mixed	GW	contains 10-15% metal and glass debris at 1.0-1.5'
			4.0-4.6	NONE	NS	0	TP-64-4-6	Fill=Sandy Gravel, well graded fine gravel with sand and silt, dark brown, mixed	GW	contains coarse wood debris
			4.6-5.8	NONE	NS			Fill=Fine Sand, poorly graded, local pods of silt/clayey silt (15%), brown, mixed	SP-SM	
			5.8-7.10	NONE	VSS	0	TP-64-6-8	Fill=wood debris, silt matrix (10%), red/brown, mixed	(ML)	coarse wood material
			7.10-8.0	NONE	NS			Silty Clay/Clayey Silt, gray, moist, contains roots	ML-CL	water entering test pit @ 9'
TP-65	NE of TP-7	9	0.0-1.2	NONE	NS	0	TP-65-0-1	Fill=Sandy Gravel, well graded gravel with sand and trace silt, brown/tan, dry, mixed	GW	
			1.2-3.0	NONE	NS	0	TP-65-2-3	Fill=Sandy Gravel, well graded gravel (55-60%), sand (30-35%), some silt, dark brown, dry, mixed	GW	3" diameter pipe at ~3' depth, exposed from east side of pit oriented E-W
			3.0-5.0	NONE	NS	0	TP-65-4-6	Fill=Gravelly Sand, poorly graded medium to fine sand with 5-10% fine gravel, brown, mixed	SP-SW	
			5.0-7.0	NONE	NS	0	TP-65-6-9	Fill=wood debris, silt/clay matrix (10%), brown/gray, moist, mixed	(ML-CL)	
			7.0-9.0	SL Creosote	VSS			Fill=wood debris, clayey silt to silty clay matrix (10%), brown/gray, mixed	(ML-CL)	water entering test pit @ 9', coarse wood material

Notes:

(a) Noticeable odors: none = no odor, VSL = very slight, SL = slight, MOD = moderate, S = strong, VS = very strong, PH = petroleum hydrocarbon

(b) Water sheen: NS = no sheen, VSS = very slight sheen, SS = slight sheen, MS = moderate sheen, HS = heavy sheen.

(c) OVM = organic vapor meter. Photoionization detector (PID) calibrated to 100 ppm isobutylene. Background = 0.0 ppm; ? = PID/OVM data questionable

(e) – = not tested

(f) Soil sample number with depth of soil sample indicated (i.e., sample TP-1-6-10 is a composite sample obtained from 6.0 to 10.0 feet below ground surface [bgs]).

Appendix D

Monitoring Well Construction and Soil Boring Logs

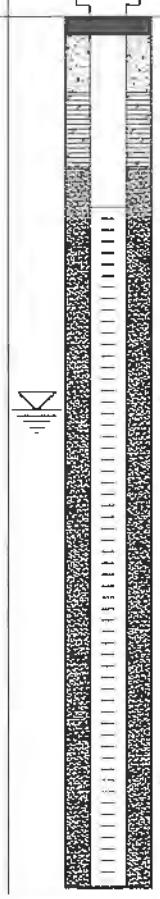
Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION	EAST–NORTHEAST OF RED BRICK BUILDING		
DRILLING COMPANY	CASCADE DRILLING, INC.	DRILLER	SCOTT KREUGER
DRILLING METHOD	HOLLOW STEM AUGER	DRILL BIT(S) SIZE	9 INCH
ISOLATION CASING	NONE	FROM TO FT.	
BLANK CASING	2" DIA. SCH 40 PVC	FROM 0.0 TO 5.0 FT.	
PERFORATED CASING	2" DIA. SCH 40 PVC 0.010 SLOTTED	FROM 5.0 TO 22.8 FT.	
SIZE AND TYPE OF FILTER PACK	LAPIS LUSTRE #2/12 SILICA	FROM 4.0 TO 22.8 FT.	
SEAL	BENTONITE CHIPS	FROM 2.0 TO 4.0 FT.	
GROUT	CONCRETE	FROM 0.0 TO 2.0 FT.	

Boring/Well Name	MW–4(R)
Project Name	TACOMA METALS
Project Number	996098.00
ELEVATION AND DATUM 10.0	TOTAL DEPTH 22.8
DATE STARTED 05/09/2000	DATE COMPLETED 05/09/2000
INITIAL WATER DEPTH (FT) 10.3	
LOGGED BY TAH/DKM	
SAMPLING METHODS 2.5" ID SPLIT SPOON	WELL COMPLETION: SURFACE HOUSING; STAND PIPE 3.0 FT.

SAMPLES TYPE	RECOVERY (FEET)	PENETRATION RESIST (BLOWS/6 IN.)	DEPTH (FEET)	SAMPLE NO.	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
S	1.5	24 25 28		NMW–2–0.0	SW	**Well-graded SAND with gravel** Mixed gravelly sand. Well–graded sand, well–graded gravel (~20%), medium dense, moist, brown, contains wood, glass, and metal fragments, moderate to strong creosote–like odor, no sheen.
S	1.5	5 5 6	5	NMW–2–5.0		
S	1.5	15 17 20	10	NMW–2–10.0	SP/SM	**Poorly graded SAND with silt** Highly organic (woody) silty sand, fine sand, dense, brown, wet. Organic material is partially decomposed wood w/strong to very strong creosote–like odor. Very strong odor at 15.0 feet bgs.
S	1.0	32 50	15	NMW–2–15.0		
S	1.5	27 30 32	20	NMW–2–21.3	SP	**Poorly graded SAND** Angular to sub–angular medium to coarse clean sand (predominantly coarse sand), dense, charcoal gray/black, wet, massive, strong creosote–like odor.



Notes:

1. Creosote–like odor detected in all soil samples collected. Strongest odor occurs at elevation of wood fill material.

2. Below depth of 10 feet bgs, soil also has diesel–like petroleum odor

Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION	NORTHEAST CORNER OF SITE		
DRILLING COMPANY	CASCADE DRILLING, INC.	DRILLER	SCOTT KREUGER
DRILLING METHOD	HOLLOW STEM AUGER	DRILL BIT(S) SIZE	9 INCH
ISOLATION CASING	NONE	FROM TO FT.	
BLANK CASING	2" DIA. SCH 40 PVC	FROM 0.0 TO 5.0 FT.	
PERFORATED CASING	2" DIA. SCH 40 PVC 0.010 SLOTTED	FROM 5.0 TO 23.6 FT.	
SIZE AND TYPE OF FILTER PACK	LAPIS LUSTRE #2/12 SILICA	FROM 4.0 TO 23.6 FT.	
SEAL	BENTONITE CHIPS	FROM 2.0 TO 4.0 FT.	
GROUT	CONCRETE	FROM 0.0 TO 2.0 FT.	

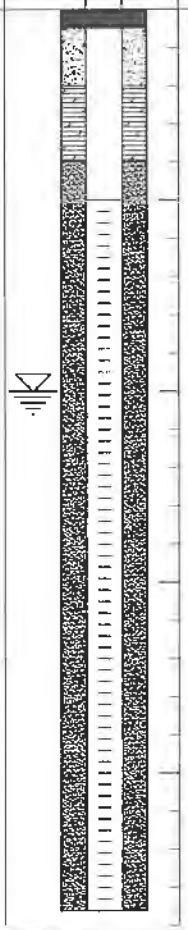
Boring/Well Name MW-8(R)

Project Name TACOMA METALS

Project Number 996098.00

ELEVATION AND DATUM 8.5	TOTAL DEPTH 23.6
DATE STARTED 05/09/2000	DATE COMPLETED 05/09/2000
INITIAL WATER DEPTH (FT) 10.0	
LOGGED BY TAH/DKM	
SAMPLING METHODS 2.5" ID SPLIT SPOON	WELL COMPLETION SURFACE HOUSING; STAND PIPE 3.0 FT.

SAMPLES TYPE	RECOVERY (FEET)	PENETRATION RESIST (BLOWS/6 IN.)	DEPTH (FEET)	SAMPLE NO.	WELL CONSTRUCTION	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
S	1.5	25 25 22					SW	**Well-graded SAND with gravel** Mixed gravelly sand with some silt, medium dense, brown, moist, mixed, contains some small metal scrap, no hydrocarbon sheen, no odor.
S	1.5	5 5 6	5	NMW-3-5.0			ML	**Sandy SILT** Sandy silt/silty sand. Fine sand, loose, gray, wet, heterogeneous, contains trace small wood fragments, no hydrocarbon odor, no sheen.
S	1.5	12 15 16	10	NMW-3-10.0			SP	**Poorly graded SAND** Angular to sub-angular fine to medium clean sand, dense, charcoal gray/black, wet, massive. Heavy sheen, very strong hydrocarbon odor. At 15' bgs, strong odor, no sheen. At 20' bgs, moderate odor, no sheen.
S	1.5	12 13 15	15					
			20					
S	1.5	12 15 15		NMW-3-22.1				



Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION	EAST OF STORAGE BUILDING		
DRILLING COMPANY	CASCADE DRILLING, INC.	DRILLER	SCOTT KREUGER
DRILLING METHOD	HOLLOW STEM AUGER	DRILL BIT(S) SIZE:	9 INCH
ISOLATION CASING	NONE	FROM TO FT.	
BLANK CASING	2" DIA. SCH 40 PVC	FROM 0.0 TO 5.0 FT.	
PERFORATED CASING	2" DIA. SCH 40 PVC 0.010 SLOTTED	FROM 5.0 TO 23.5 FT.	
SIZE AND TYPE OF FILTER PACK	LAPIS LUSTRE #2/12 SILICA	FROM 4.0 TO 23.5 FT.	
SEAL	BENTONITE CHIPS	FROM 2.0 TO 4.0 FT.	
GROUT	CONCRETE	FROM 0.0 TO 2.0 FT.	

Boring/Well Name MW-9

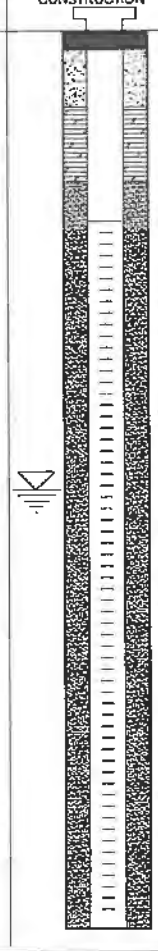
Project Name TACOMA METALS

Project Number 996098.00

ELEVATION AND DATUM 12.0	TOTAL DEPTH 23.5
DATE STARTED 05/09/2000	DATE COMPLETED 05/09/2000
INITIAL WATER DEPTH (FT) 12.0	
LOGGED BY TAH/DKM	
SAMPLING METHODS 2.5" ID SPLIT SPOON	WELL COMPLETION: SURFACE HOUSING; STAND PIPE 3.0 FT.

SAMPLES TYPE	RECOVERY (FEET)	PENETRATION RESIST (BLOWS/6 IN.)	DEPTH (FEET)	SAMPLE NO.	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
S	0.7	16 12 12		NMW-1-0.0		SW/SM	**Well-graded SAND with silt and gravel** Mixed gravelly sand with some silt, medium dense, brown, moist, contains some wood and small metal scrap, no hydrocarbon sheen, no odor.
S	1.5	3 4 12	5	NMW-1-5.0		SP	**Poorly graded SAND** Fine to medium sand (predominantly medium), medium dense, wet, gray, contains small glass fragments, no hydrocarbon sheen, no odor.
S	1.5	15 15 16	10	NMW-1-10.0		SM	**Silty SAND** Fine sand, medium dense, gray, wet, homogeneous, no hydrocarbon sheen, no odor.
S	1.5	42 35 37	15	NMW-1-15.0		SP	**Poorly graded SAND** Medium Sand, medium dense, gray, wet, homogeneous, no hydrocarbon sheen, no odor.
S	1.5	18 29 30	20	NMW-1-22.0		SP	**Poorly graded SAND** Angular to sub-angular fine to medium clean sand, dense, charcool gray/black, wet, massive, no sheen, no odor

WELL CONSTRUCTION



Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION	WEST PROPERTY LINE		
DRILLING COMPANY	CASCADE	DRILLER	
DRILLING METHOD	HSA	DRILL BIT(S) SIZE:	9 INCH
ISOLATION CASING		FROM	TO FT.
BLANK CASING	2-INCH SCHEDULE 40 PVC	FROM 0.0	TO 8.0 FT.
PERFORATED CASING	2-INCH SCHEDULE 40 PVC 0.010 SLOT	FROM 8.0	TO 20.0 FT.
SIZE AND TYPE OF FILTER PACK	RMC #2/12 LAPIS LUSTRE SAND	FROM 7.0	TO 20.0 FT.
SEAL	PURE GOLD MEDIUM BENTONITE CHIPS	FROM 1.0	TO 7.0 FT.
GROUT	CONCRETE	FROM 0.0	TO 1.0 FT.

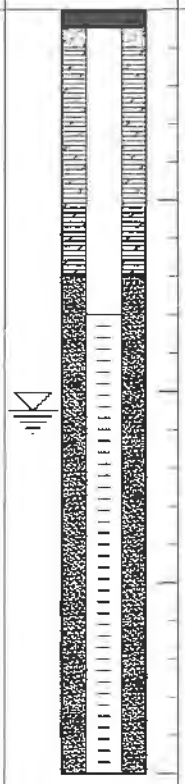
Boring/Well Name MW-10

Project Name TACOMA METALS

Project Number 996098.00

ELEVATION AND DATUM	TOTAL DEPTH
DATE STARTED 11/10/1900	DATE COMPLETED 11/10/1900
INITIAL WATER DEPTH (FT) 10.5	
LOGGED BY DKM	
SAMPLING METHODS SPLIT SPOON	WELL COMPLETION ■ SURFACE HOUSING ▭ STAND PIPE _____ FT.

SAMPLES TYPE	RECOVERY (FEET)	PENETRATION RESIST (BLOWS/6 IN.)	DEPTH (FEET)	SAMPLE NO.	OVA	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
						GW	**Well-graded GRAVEL with sand** Brown, dry, gravel (60%) with medium and fine sand (35%) and minor (<5%) silt.
S	1.0	16 12 9		NMW-4-2.5	0.0	GW	
			5			ML/CL	**Well-graded GRAVEL with sand** Medium brown, dry, gravel (50%) with fine and medium sand (50%). Gravel material is generally fine-grained.
S	1.5	4 5 6		NMW-4-5.0	0.0	ML/CL	
S	0.5	6		NMW-4-7.5	10		**Clayey SILT with sand** Light brown, crumbly, moderately dense silt with 5-10% fine sand. Includes some clay.
S	1.0	10 7 50/3	10			ML/CL	**Clayey SILT** Mixed silt and clay, dark brown, soft, low density.
S	0.3	35 25 20	15				**Clayey SILT** Brown to gray, wet, soft silt and fine sand with some clay. Mixed with wood debris. Wood debris is typically 85%-95% of material. Silt, sand and clay are around and coating the wood material.
S	1.5	5 7 10		NMW-4-17.5	7	SP	**Poorly graded SAND** Dark brown, wet, poorly graded medium to fine grained sand.
S	1.0	4 10 10	20	NMW-4-20.0	6		
			25				
			30				



Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION	WEST OF OCTAGON FOUNDATION		
DRILLING COMPANY	CASCADE	DRILLER	
DRILLING METHOD	HSA	DRILL BIT(S) SIZE:	12 INCH
ISOLATION CASING		FROM TO FT.	
BLANK CASING	4-INCH SCHEDULE 40 PVC	FROM 0.0 TO 6.0 FT.	
PERFORATED CASING	4-INCH SCHEDULE 40 PVC 0.020 SLOT	FROM 6.0 TO 20.0 FT.	
SIZE AND TYPE OF FILTER PACK	RMC #2/12 LAPIS LUSTRE SAND	FROM 5.0 TO 20.0 FT.	
SEAL	PURE GOLD MEDIUM BENTONITE CHIPS	FROM 1.0 TO 5.0 FT.	
GROUT	CONCRETE	FROM 0.0 TO 1.0 FT.	

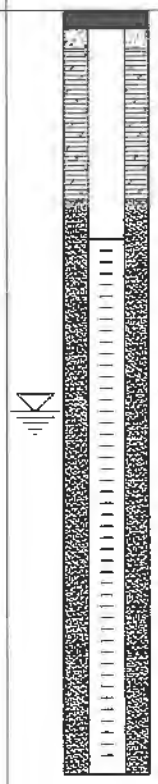
Boring/Well Name MW-11

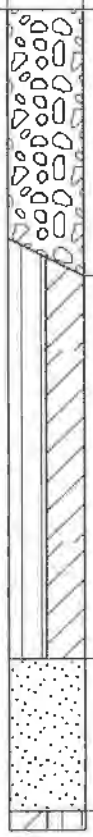
Project Name TACOMA METALS

Project Number 996098.00

ELEVATION AND DATUM	TOTAL DEPTH
DATE STARTED 11/10/1900	DATE COMPLETED 11/10/1900
INITIAL WATER DEPTH (FT) 10.5	
LOGGED BY DKM	
SAMPLING METHODS SPLIT SPOON	WELL COMPLETION ▬ SURFACE HOUSING ▭ STAND PIPE _____ FT.

SAMPLES TYPE	RECOVERY (FEET)	PENETRATION RESIST (BLOWS/6 IN.)	DEPTH (FEET)	SAMPLE NO.	OVA	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
						GW	**Well-graded GRAVEL with sand** Gray to brown-orange, slightly moist, gravel with 25-30% sand and some (<5%) silt. Fill material.
S	0.7	20 20 9		NMW-5-2.5	0.8		
			5				
S	0.5	5 3 2		NMW-5-5.0	2.0		
S		40 18 10				ML/CL	**Clayey SILT** Brown to gray, wet, soft silt and fine sand with some clay. Mixed with wood debris. Wood debris is typically 85%-95% of material. Silt, sand and clay are around and coating the wood material.
			10				
S	0.2	23 13 8		NMW-5-10.0	12		
S		50/3					
			15				
S	0.2	25 20 50/2					
S	0.4	7 10 12		NMW-5-17.5	38	SP	**Poorly graded SAND** Dark brown, wet, poorly graded medium to fine grained sand.
			20				
S	1.5	2 5 37		NMW-5-20.0	33	CL/ML	**Silty CLAY** Light brown, soft slay to silty clay with small fibrous wood fragments.
			25				
			30				





SHEET 1 OF 1

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Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION	WEST OF MACHINE SHED		
DRILLING COMPANY	CASCADE	DRILLER	
DRILLING METHOD	HSA	DRILL BIT(S) SIZE:	12 INCH
ISOLATION CASING		FROM	TO FT.
BLANK CASING	4-INCH SCHEDULE 40 PVC	FROM 0.0	TO 7.0 FT.
PERFORATED CASING	4-INCH SCHEDULE 40 PVC 0.020 SLOT	FROM 7.0	TO 19.0 FT.
SIZE AND TYPE OF FILTER PACK	RMC #2/12 LAPIS LUSTRE SAND	FROM 6.0	TO 19.0 FT.
SEAL	PURE GOLD MEDIUM BENTONITE CHIPS	FROM 1.0	TO 6.0 FT.
GROUT	CONCRETE	FROM 0.0	TO 1.0 FT.

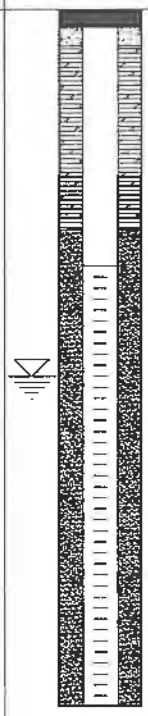
Boring/Well Name MW-12

Project Name TACOMA METALS

Project Number 996098.00

ELEVATION AND DATUM	TOTAL DEPTH
DATE STARTED 11/10/1900	DATE COMPLETED 11/10/1900
INITIAL WATER DEPTH (FT) 10	
LOGGED BY DKM	
SAMPLING METHODS SPLIT SPOON	WELL COMPLETION ■ SURFACE HOUSING ☐ STAND PIPE _____ FT.

SAMPLES TYPE	RECOVERY (FEET)	PENETRATION RESIST (BLOWS/6 IN.)	DEPTH (FEET)	SAMPLE NO.	OVA	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
						GW	**Well-graded GRAVEL with sand** Dark brown to gray, slightly moist, gravel (55-60%) with sand (35%) and some silt (<5%).
S	0.3	6 14 14				SW	**Well-graded SAND with gravel** Medium brown sand and gravel (40%) with some silt (5%), moist, includes some wood fragments.
S	1.0	8 6 6	5	NMW-6-5.0	0.8	GW	**Well-graded GRAVEL with sand** Dark gray to brown, moist, gravel (60-65%) with sand.
S	0.1	8 2 6					
S	0.5	5 5 15	10			ML/CL	**Clayey SILT** Brown to gray, wet, soft silt and fine sand with some clay. Mixed with wood debris. Wood debris is typically 85%-95% of material. Silt, sand and clay are around and coating the wood material.
S	0.3	5 10 25					
S	0.2	4 7 35	15				
S	1.5	7 20 20		NMW-6-17.5	1	SP	**Poorly graded SAND** Gray/brown, wet, poorly graded medium to fine grained sand.
S	1.0	2 5 8	20	NMW-6-20.0	1		
			25				
			30				



Appendix E

Groundwater Purge and Sample Forms

Groundwater Purge and Sample Form Date: 3/14/00 **Kennedy/Jenks Consultants**

PROJECT NAME: Tacoma Metals WELL NUMBER: MW-1

PROJECT NUMBER: PERSONNEL: T Leavitt

STATIC WATER LEVEL (FT): 10.11 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: Solinst PURGE METHOD: Peristaltic

TIME START PURGE: 10:05 PURGE DEPTH (FT) 14'

TIME END PURGE: 10:25

TIME SAMPLED: 10:15

COMMENTS:

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	CASING VOLUME (GAL)
	15.75	-	10.11	=	5.64	X	0.16	0.64	1.44	=	.9

TIME	10:07	10:10	10:13	10:16			
VOLUME PURGED (GAL)	.5	.5	.5	.5			
PURGE RATE (GPM)	.2	.2	.2	.2			
TEMPERATURE (°C)	56.5	56.7	56.5	56.5			
pH	6.61	6.52	6.53	6.55			
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	419	384	387	371			
DISSOLVED OXYGEN (mg/L)	—	—	—	—			
eH(MV)Pt-AgCl ref.	—	—	—	—			
TURBIDITY/COLOR	clear	—	—	—			
ODOR	ND	—	—	—			
DEPTH OF PURGE INTAKE (FT)	14'	—	—	—			
DEPTH TO WATER DURING PURGE (FT)	—	—	—	—			
NUMBER OF CASING VOLUMES REMOVED	.5	—	—	—			
DEWATERED?	no	—	—	—			

Groundwater Purge and Sample Form Date: _____ **Kennedy/Jenks Consultants**

PROJECT NAME: Tacoma Metals WELL NUMBER: MW-1

PROJECT NUMBER: _____ PERSONNEL: T Levitt

SAMPLE DATA:

TIME SAMPLED: 10:05 COMMENTS: _____

DEPTH SAMPLED (FT): 14' _____

SAMPLING EQUIPMENT: Peristaltic _____

SAMPLE NO.	NO. OF CONTAINERS	CONTAINER TYPE	PRESERVATIVE	FIELD FILTRATION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUSTODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
MW-1	2	Amber	NO	NO / NO	500 / 500				PCB / PAH	
	2 / 3	VOA	HCL	NO	2 x 40ml / 3 x 40ml				TPH-G / VOCs	
	2	Amber	NO	NO	500 ml				TPH-D	
	1	HDPE	HNO3	Yes	500ml				metals	

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): Drum COMMENTS: _____

DISPOSAL METHOD: _____ _____

DRUM DESIGNATION(S)/VOLUME PER (GAL): _____

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: YES NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: YES NO

WELL CASING OK?: YES NO

COMMENTS: _____

GENERAL:

WEATHER CONDITIONS: _____

TEMPERATURE (SPECIFY °C OR °F): _____

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING? _____

cc: Project Manager: _____

Job File: _____

Other: _____

Groundwater Purge and Sample Form Date: 3 13 00 **Kennedy/Jenks Consultants**

PROJECT NAME: Tacoma Metals WELL NUMBER: MW-2

PROJECT NUMBER: PERSONNEL: T. Leavitt

STATIC WATER LEVEL (FT): 10.45 MEASURING POINT DESCRIPTION:

WATER LEVEL MEASUREMENT METHOD: Solinst PURGE METHOD:

TIME START PURGE: 3:43 PURGE DEPTH (FT)

TIME END PURGE:

TIME SAMPLED:

COMMENTS:

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	CASING VOLUME (GAL)
	15.64		10.45		5.19		0.16	0.64	1.44		.83

TIME	3:43	3:45	3:49	3:51	3:53	3:56	
VOLUME PURGED (GAL)	.5	.5	.5	.5	.5	.5	
PURGE RATE (GPM)	.2	.2	.2	.2	.2	.2	
TEMPERATURE (°C)	54.4	53.3	53.9	53.1	53.0	52.9	
pH	6.60	6.64	6.67	6.68	6.67	6.70	
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	980	975	960	925	890	880	
DISSOLVED OXYGEN (mg/L)	—	—	—				
eH(MV)Pt-AgCl ref.	—	—	—				
TURBIDITY/COLOR	Clear	→	→	→			
ODOR	None	→	→	→			
DEPTH OF PURGE INTAKE (FT)	14'	→	→	→			
DEPTH TO WATER DURING PURGE (FT)							
NUMBER OF CASING VOLUMES REMOVED	.5	1/2	1/2	1/2			
DEWATERED?	NO	→	→	→			

Groundwater Purge and Sample Form Date: _____ **Kennedy/Jenks Consultants**

PROJECT NAME: Tacoma metals WELL NUMBER: MW-2

PROJECT NUMBER: _____ PERSONNEL: _____

SAMPLE DATA:

TIME SAMPLED: _____ COMMENTS: _____

DEPTH SAMPLED (FT): _____

SAMPLING EQUIPMENT: _____

SAMPLE NO.	NO. OF CONTAIN-ERS	CON-TAINER TYPE	PRESER-VATIVE	FIELD FILTRA-TION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUS-TODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
MW2	2	Amber	no	no	1L				PCB / PAH	
	2/3	VOA	HCL	no	40mL				TPH-G / VOC	
	2	Amber	no	no	500				TPH-D	
✓	1	HDPE	HNO3	yes	500				metals	

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): _____ COMMENTS: _____

DISPOSAL METHOD: _____

DRUM DESIGNATION(S)/VOLUME PER (GAL): _____

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: YES NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: YES NO

WELL CASING OK?: YES NO

COMMENTS: _____

GENERAL:

WEATHER CONDITIONS: _____

TEMPERATURE (SPECIFY °C OR °F): _____

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING? _____

cc: Project Manager: _____
Job File: _____
Other: _____

Groundwater Purge and Sample Form Date: 3/14/00 **Kennedy/Jenks Consultants**

PROJECT NAME: Tacoma Metals WELL NUMBER: MW-5/Dup-1

PROJECT NUMBER: PERSONNEL: T Leavitt

STATIC WATER LEVEL (FT): 8.35 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: Solinst PURGE METHOD: Peristaltic

TIME START PURGE: 11:35 PURGE DEPTH (FT) 13'

TIME END PURGE:

TIME SAMPLED: 11:45

COMMENTS:

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	-	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	-	CASING VOLUME (GAL)
	15.91		8.35		7.56		0.16	0.64	1.44		1.2

TIME	11:36	11:40	11:42	11:44			
VOLUME PURGED (GAL)	.5	.5	.5	.5			
PURGE RATE (GPM)	.2	.2	.2	.2			
TEMPERATURE (°C)	54.4	54.5	54.4	54.3			
pH	6.95	6.94	7.02	7.06			
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	360	362	361	361			
DISSOLVED OXYGEN (mg/L)	—	—	—	—			
eH(MV)Pt-AgCl ref.	—	—	—	—			
TURBIDITY/COLOR	Clear	—	—	—			
ODOR	NO	—	—	—			
DEPTH OF PURGE INTAKE (FT)	13'	—	—	—			
DEPTH TO WATER DURING PURGE (FT)	—	—	—	—			
NUMBER OF CASING VOLUMES REMOVED	—	—	—	—			
DEWATERED?	—	—	—	—			

Groundwater Purge and Sample Form Date: _____ **Kennedy/Jenks Consultants**

PROJECT NAME: Tacoma metals WELL NUMBER: MW-5

PROJECT NUMBER: _____ PERSONNEL: T Leavitt

SAMPLE DATA:

TIME SAMPLED: _____ COMMENTS: _____

DEPTH SAMPLED (FT): _____

SAMPLING EQUIPMENT: _____

SAMPLE NO.	NO. OF CONTAINERS	CONTAINER TYPE	PRESERVATIVE	FIELD FILTRATION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUSTODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
MW-5	2	Amber	—	NO	1L				PCB / PAH	
	2/3	VOA	HCL	NO	40				TPH-G / VOC	
	2	Amb	—	NO	500				TPH-D	
	1	HDPE	HNO3	1/8	500				metals	

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): _____ COMMENTS: _____

DISPOSAL METHOD: _____

DRUM DESIGNATION(S)/VOLUME PER (GAL): _____

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: YES NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: YES NO

WELL CASING OK?: YES NO

COMMENTS: _____

GENERAL:

WEATHER CONDITIONS: _____

TEMPERATURE (SPECIFY °C OR °F): _____

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING? _____

cc: Project Manager: _____
Job File: _____
Other: _____

Groundwater Purge and Sample Form Date: 3/14/00 **Kennedy/Jenks Consultants**

PROJECT NAME: Tacoma Metals WELL NUMBER: MW-6

PROJECT NUMBER: PERSONNEL: T Lewis

STATIC WATER LEVEL (FT): 8.10 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: Solinst PURGE METHOD: Peristaltic

TIME START PURGE: 10:46 PURGE DEPTH (FT) 13'

TIME END PURGE:

TIME SAMPLED: 11:09

COMMENTS:

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	CASING VOLUME (GAL)
	15.86	-	8.10	=	7.76	X	0.16	0.64	1.44	=	1.2

TIME	10:50	10:54	10:57	10:59	11:02	11:05	
VOLUME PURGED (GAL)	.5	.5	.5	.5	.5	.5	
PURGE RATE (GPM)	.2	.2	.2	.2	.2	.2	
TEMPERATURE (°C)	54.6	54.5	54.3	54.5	54.7	54.6	
pH	6.55	6.56	6.55	6.56	6.57	6.58	
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	959	901	876	821	792	788	
DISSOLVED OXYGEN (mg/L)	—	—	—	—	—	—	
eH(MV)Pt-AgCl ref.	—	—	—	—	—	—	
TURBIDITY/COLOR	slight	—	—	—	—	—	
ODOR	—	—	—				
DEPTH OF PURGE INTAKE (FT)	—	—	—	—	—		
DEPTH TO WATER DURING PURGE (FT)	—	—	—	—	—	—	
NUMBER OF CASING VOLUMES REMOVED	—	—	—	—	—	—	
DEWATERED?	—	—	—	—	—	—	

Groundwater Purge and Sample Form Date: _____ **Kennedy/Jenks Consultants**

PROJECT NAME: Tacoma metals WELL NUMBER: MW-5

PROJECT NUMBER: _____ PERSONNEL: T Leavitt

SAMPLE DATA:

TIME SAMPLED: _____ COMMENTS: _____

DEPTH SAMPLED (FT): _____

SAMPLING EQUIPMENT: _____

SAMPLE NO.	NO. OF CONTAIN-ERS	CON-TAINER TYPE	PRESER-VATIVE	FIELD FILTRA-TION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUS-TODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
Mw-5	2	Amb	—	↓	1L				PCB / PAH	
	2/3	VOA	HCL	↓	40				TPH-G / VOC	
	2	Amb	—	↓	500				TPH-D	
	1	HDPE	HNO3	Yes	500				metals	

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): _____ COMMENTS: _____

DISPOSAL METHOD: _____

DRUM DESIGNATION(S)/VOLUME PER (GAL): _____

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: YES NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: YES NO

WELL CASING OK?: YES NO

COMMENTS: _____

GENERAL:

WEATHER CONDITIONS: _____

TEMPERATURE (SPECIFY °C OR °F): _____

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING? _____

cc: Project Manager: _____
Job File: _____
Other: _____

Groundwater Purge and Sample Form Date: 3/17/00 **Kennedy/Jenks Consultants**

PROJECT NAME: Tacoma Metals WELL NUMBER: MW-7

PROJECT NUMBER: PERSONNEL: T Leavitt

STATIC WATER LEVEL (FT): 4.50 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: Solinst PURGE METHOD: Peristaltic

TIME START PURGE: 2:30 PURGE DEPTH (FT) 13'

TIME END PURGE:

TIME SAMPLED: 2:50

COMMENTS:

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	-	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	CASING VOLUME (GAL)
	13.81	-	4.50	-	9.3	X	0.16	0.64	1.44	=	1.5

TIME	2:40	2:43	2:45	2:48			
VOLUME PURGED (GAL)	.5	.5	.5	.5			
PURGE RATE (GPM)	.2	.2	.2	.2			
TEMPERATURE (°C)	50.7	50.3	50.0	50.1			
pH	6.62	6.57	6.55	6.54			
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	220	210	215	213			
DISSOLVED OXYGEN (mg/L)	—	—	—	—			
eH(MV)Pt-AgCl ref.	—	—	—	—			
TURBIDITY/COLOR	clear	—	—	—			
ODOR	No	—	—	—			
DEPTH OF PURGE INTAKE (FT)	13'	—	—	—			
DEPTH TO WATER DURING PURGE (FT)	—	—	—	—			
NUMBER OF CASING VOLUMES REMOVED	—	—	—	—			
DEWATERED?	—	—	—	—			

Groundwater Purge and Sample Form Date: _____ **Kennedy/Jenks Consultants**

PROJECT NAME: Tacoma Metals WELL NUMBER: MW-7

PROJECT NUMBER: _____ PERSONNEL: T Lewiff

SAMPLE DATA:

TIME SAMPLED: 2:50 COMMENTS: _____

DEPTH SAMPLED (FT): 13' _____

SAMPLING EQUIPMENT: Peristaltic _____

SAMPLE NO.	NO. OF CONTAIN-ERS	CON-TAINER TYPE	PRESER-VATIVE	FIELD FILTRA-TION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUS-TODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
MW-7	2	Amber	—	—	1L				PCB / PAH	
	2/3	VOA	HCL	—	40				TPH-G / VOC	
	2	Amber	—	—	500				TPH-D	
	1	HDPE	HNO3	Yes	500				metals	

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): Drum COMMENTS: _____

DISPOSAL METHOD: _____ _____

DRUM DESIGNATION(S)/VOLUME PER (GAL): _____

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: YES (NO)

INSIDE OF WELL HEAD AND OUTER CASING DRY?: (YES) NO

WELL CASING OK?: (YES) NO

COMMENTS: _____

GENERAL:

WEATHER CONDITIONS: _____

TEMPERATURE (SPECIFY °C OR °F): _____

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING? _____

cc: Project Manager: _____

Job File: _____

Other: _____

Groundwater Purge and Sample Form Date: 11/17/00 **Kennedy/Jenks Consultants**

PROJECT NAME: TACOMA METALS WELL NUMBER: NMW-5

PROJECT NUMBER: 996098.00 PERSONNEL: DKM/JRB

STATIC WATER LEVEL (FT): 7.36 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: PURGE METHOD: SUB. PUMP

TIME START PURGE: 11:05 PURGE DEPTH (FT) VARIABLE

TIME END PURGE: 12:15

TIME SAMPLED:

COMMENTS: INITIAL WELL DEVELOPMENT

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	CASING VOLUME (GAL)
	20		7.36		12.64		0.16	0.64	1.44		8.09

TIME	11:20	11:30	11:45	11:55	12:02	12:06	12:10
VOLUME PURGED (GAL)	20	35	50	65	75	85	95
PURGE RATE (GPM)							
TEMPERATURE (°C)	13.0	12.7	12.6	12.2	12.3	12.2	12.1
pH	7.04	7.00	7.02	7.05	7.02	7.01	7.00
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	519	514	275	256	255	251	249
DISSOLVED OXYGEN (mg/L)							
eH(MV)Pt-AgCl ref.							
TURBIDITY/COLOR	MED-BROWN	MED BROWN	MED BROWN	MED BROWN	LT BROWN	LT BROWN	LT BROWN
ODOR	MOD HC MS	MOD HC MS	MOD HC SS	MOD HC SS	SL HC VSS	SL HC VSS	SL HC NS
DEPTH OF PURGE INTAKE (FT)							
DEPTH TO WATER DURING PURGE (FT)							
NUMBER OF CASING VOLUMES REMOVED							
DEWATERED?							

Groundwater Purge and Sample Form Date: 11/17/00 **Kennedy/Jenks Consultants**

PROJECT NAME: Tacoma Metals WELL NUMBER: MW-5

PROJECT NUMBER: 996098.00 PERSONNEL:

SAMPLE DATA:

TIME SAMPLED: COMMENTS:

DEPTH SAMPLED (FT):

SAMPLING EQUIPMENT:

SAMPLE NO.	NO. OF CONTAIN-ERS	CON-TAINER TYPE	PRESER-VATIVE	FIELD FILTRA-TION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUS-TODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): COMMENTS:

DISPOSAL METHOD: DRUM.

DRUM DESIGNATION(S)/VOLUME PER (GAL):

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: YES NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: YES NO

WELL CASING OK?: YES NO

COMMENTS:

GENERAL:

WEATHER CONDITIONS:

TEMPERATURE (SPECIFY °C OR °F):

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING?

cc: Project Manager:
Job File:
Other:

Groundwater Purge and Sample Form Date: 11/17/00 **Kennedy/Jenks Consultants**

PROJECT NAME: DAROMA MODALS WELL NUMBER: NMW-6

PROJECT NUMBER: 9960048.00 PERSONNEL: DKM/SRB

STATIC WATER LEVEL (FT): 8.7 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: PURGE METHOD: SUB. PUMP

TIME START PURGE: 12:30 PURGE DEPTH (FT) VARIABLE

TIME END PURGE:

TIME SAMPLED:

COMMENTS: INITIAL WELL DEVELOPMENT

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	CASING VOLUME (GAL)
	19		8.7		10.3		0.16	0.64	1.44		6.6

TIME	12:44	1:00	1:10	1:20	1:25	1:32	
VOLUME PURGED (GAL)	20	35	50	60	70	80	
PURGE RATE (GPM)							
TEMPERATURE (°C)	13.4	13.1	13.0	15.1	15.1	13.9	
pH	7.02	6.98	6.97	6.91	6.91	6.97	
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	451	458	455	438	452	450	
DISSOLVED OXYGEN (mg/L)							
eH(MV)Pt-AgCl ref.							
TURBIDITY/COLOR	High Brown	High Brown	MOD Brown	LT Brown LOW	LT LOW Brown	LT LOW Brown	
ODOR	mod sl. sheen HC	MOD SS HC	MOD SS HC	SL SS HC	SL SS HC	SL VSS HC	
DEPTH OF PURGE INTAKE (FT)							
DEPTH TO WATER DURING PURGE (FT)							
NUMBER OF CASING VOLUMES REMOVED							
DEWATERED?							

Groundwater Purge and Sample Form Date: 11/01 **Kennedy/Jenks Consultants**

PROJECT NAME: Tacoma Metals WELL NUMBER: DMW-6

PROJECT NUMBER: 996092.00 PERSONNEL:

SAMPLE DATA:

TIME SAMPLED: COMMENTS:

DEPTH SAMPLED (FT):

SAMPLING EQUIPMENT:

SAMPLE NO.	NO. OF CONTAIN-ERS	CON-TAINER TYPE	PRESER-VATIVE	FIELD FILTRA-TION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUS-TODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): COMMENTS:

DISPOSAL METHOD:

DRUM DESIGNATION(S)/VOLUME PER (GAL):

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: YES NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: YES NO

WELL CASING OK?: YES NO

COMMENTS:

GENERAL:

WEATHER CONDITIONS:

TEMPERATURE (SPECIFY °C OR °F):

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING?

cc: Project Manager:
Job File:
Other:

Groundwater Purge and Sample Form Date: 11/20/00 **Kennedy/Jenks Consultants**

PROJECT NAME: Tacoma Metals WELL NUMBER: NMW-4

PROJECT NUMBER: PERSONNEL: DKM/JRB

STATIC WATER LEVEL (FT): 8.21 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: Heron PURGE METHOD: Peristaltic

TIME START PURGE: 9:38 PURGE DEPTH (FT) ~14

TIME END PURGE:

TIME SAMPLED: 10:00

COMMENTS:

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	CASING VOLUME (GAL)
	20		8.21		11.79		0.16	0.64	1.44		1.89

TIME	9:43	9:52	9:54	9:57			
VOLUME PURGED (GAL)	1/2	1	1 1/2	2			
PURGE RATE (GPM)							
TEMPERATURE (°C)	15.8	15.8	15.7	15.5			
pH	6.23	6.32	6.33	6.28			
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	300	293	293	299			
DISSOLVED OXYGEN (mg/L)							
eH(MV)Pt-AgCl ref.							
TURBIDITY/COLOR	clear	clear	clear	clear			
ODOR	MOD HC	MOD HC	MOD HC	MOD HC			
DEPTH OF PURGE INTAKE (FT)	~14	→					
DEPTH TO WATER DURING PURGE (FT)							
NUMBER OF CASING VOLUMES REMOVED				≈2			
DEWATERED?	N	→					

Groundwater Purge and Sample Form Date: 11/20/00 **Kennedy/Jenks Consultants**

PROJECT NAME: Tacoma Metals WELL NUMBER: NMW-4

PROJECT NUMBER: PERSONNEL: DKM/JRB

SAMPLE DATA:

TIME SAMPLED: COMMENTS:

DEPTH SAMPLED (FT): ~14

SAMPLING EQUIPMENT: Peristaltic

SAMPLE NO.	NO. OF CONTAINERS	CONTAINER TYPE	PRESERVATIVE	FIELD FILTRATION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUSTODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
1	1	P	HNO_3	N	1 L	Clear		Y	Tot. Metal	
2	1	P	HNO_3	Y	1 L				Diss Metal	
3	1	A	—	N	1 L				Diesel	
4	1	A	—	N	1 L				PCB	
5	1	A	—	N	1 L				PAH	
6	3	VOA	HCl	N	120 ml				VOC	
7	2	VOA	HCl	N	80 ml				Gas	

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): 2 COMMENTS:

DISPOSAL METHOD: Drummed on site

DRUM DESIGNATION(S)/VOLUME PER (GAL):

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: YES NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: YES NO

WELL CASING OK?: YES NO

COMMENTS:

GENERAL:

WEATHER CONDITIONS: Cold & Clear

TEMPERATURE (SPECIFY °C OR °F): 40

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING?

cc: Project Manager:
Job File:
Other:

Groundwater Purge and Sample Form Date: 11/20/00 **Kennedy/Jenks Consultants**

PROJECT NAME: TACOMA METALS WELL NUMBER: NMW-5

PROJECT NUMBER: PERSONNEL: RB

STATIC WATER LEVEL (FT): 7.70 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: HERON PURGE METHOD: PERISTALTIC

TIME START PURGE: 10:21 PURGE DEPTH (FT) ~13'

TIME END PURGE:

TIME SAMPLED:

COMMENTS:

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	(4)	6	=	CASING VOLUME (GAL)
	20		7.70		12.3		0.16	0.64	1.44		7.87

TIME	10:40	10:58	11:15	11:22	11:28	11:32	
VOLUME PURGED (GAL)	2	4	6	7	7½	8	
PURGE RATE (GPM)							
TEMPERATURE (°C)	12.5	12.8	12.5	12.9	12.6	12.5	
pH	6.7	6.7	6.6	6.57	6.55	6.55	
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	303	306	296	287	286	283	
DISSOLVED OXYGEN (mg/L)							
eH(MV)Pt-AgCl ref.							
TURBIDITY/COLOR	clear	clear	clear	clear	clear	clear	
ODOR	MOD HC	MOD HC	MOD HC	MOD HC	MOD HC	MOD HC	
DEPTH OF PURGE INTAKE (FT)	~13						
DEPTH TO WATER DURING PURGE (FT)							
NUMBER OF CASING VOLUMES REMOVED						≈1	
DEWATERED?	N						

Groundwater Purge and Sample Form Date: _____ **Kennedy/Jenks Consultants**

PROJECT NAME: TACOMA METALS WELL NUMBER: NMW-5

PROJECT NUMBER: _____ PERSONNEL: JRB

SAMPLE DATA:

TIME SAMPLED: _____ COMMENTS: _____

DEPTH SAMPLED (FT): ~13

SAMPLING EQUIPMENT: PERISTALTIC

SAMPLE NO.	NO. OF CONTAINERS	CONTAINER TYPE	PRESERVATIVE	FIELD FILTRATION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUSTODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
1	1	P	HNO_3	N	1L	clear		Y	Total Metal	
2	1	P	HNO_3	Y	1L				Diss Metal	
3	1	A	—	N	1L				Diesel	
4	1	A	—	N	1L				PCB	
5	1	A	—	N	1L				PAH	
6	3	VOA	HCl	N	120ml				VOC	
7	2	VOA	HCl	N	80ml				GAS	

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): ~8 COMMENTS: _____

DISPOSAL METHOD: DRUMMED ON SITE

DRUM DESIGNATION(S)/VOLUME PER (GAL): _____

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: YES NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: YES NO

WELL CASING OK?: YES NO

COMMENTS: _____

GENERAL:

WEATHER CONDITIONS: _____

TEMPERATURE (SPECIFY °C OR °F): COLD/CLEAR 40'

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING? _____

cc: Project Manager: _____
Job File: _____
Other: _____

Groundwater Purge and Sample Form Date: 11/20/00 **Kennedy/Jenks Consultants**

PROJECT NAME: TACOMA METALS WELL NUMBER: NMW-6

PROJECT NUMBER: 996098.00 PERSONNEL: JRB DKM

STATIC WATER LEVEL (FT): 9.22 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: HERON PURGE METHOD: PERISTALTIC

TIME START PURGE: 12:02 PURGE DEPTH (FT) ~12

TIME END PURGE:

TIME SAMPLED:

COMMENTS:

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	CASING VOLUME (GAL)
	19		9.22		9.78		0.16	0.64	1.44		6.26

TIME	12:15	11:20	12:35	12:40	12:46	12:52	
VOLUME PURGED (GAL)	1 1/2	2 1/2	4	5	6	6 1/2	
PURGE RATE (GPM)							
TEMPERATURE (°C)	12.7	12.6	12.2	12.1	12.2	12.3	
pH	6.28	6.42	6.36	6.45	6.43	6.46	
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	500	472	436	435	432	431	
DISSOLVED OXYGEN (mg/L)							
eH(MV)Pt-AgCl ref.							
TURBIDITY/COLOR	clear →						
ODOR	SL-MOD HC	SL-MOD HC					
DEPTH OF PURGE INTAKE (FT)	~12						
DEPTH TO WATER DURING PURGE (FT)							
NUMBER OF CASING VOLUMES REMOVED						~1	
DEWATERED?	N →						

Groundwater Purge and Sample Form Date: 1/20/00 **Kennedy/Jenks Consultants**

PROJECT NAME: TACOMA METALS WELL NUMBER: NMW-6

PROJECT NUMBER: PERSONNEL: SRB

SAMPLE DATA:

TIME SAMPLED: COMMENTS:

DEPTH SAMPLED (FT): ~12'

SAMPLING EQUIPMENT: PERISTALTIC

SAMPLE NO.	NO. OF CONTAINERS	CONTAINER TYPE	PRESERVATIVE	FIELD FILTRATION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUSTODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
1	1	P	HNO_3	N	1L	Clear		Y	TOTAL METAL	
2	1	P	HNO_3	Y	1L				DISS METAL	
3	1	A	—	N	1L				DIESEL	
4	1	A	—	N	1L				PCB	
5	1	A	—	N	1L				PAH	
6	3	VOA	HCl	N	120ml				VOC	
7	2	VOA	HCl	N	80ml				GAS	

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): 6.5 COMMENTS:

DISPOSAL METHOD: DRUMMED ON SITE

DRUM DESIGNATION(S)/VOLUME PER (GAL):

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: (YES) NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: (YES) NO

WELL CASING OK?: (YES) NO

COMMENTS:

GENERAL:

WEATHER CONDITIONS:

TEMPERATURE (SPECIFY °C OR °F): LOW / CLEAR 40°

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING?

cc: Project Manager:
Job File:
Other:

Groundwater Purge and Sample Form Date: 11/20 **Kennedy/Jenks Consultants**

PROJECT NAME: TACOMA METALS WELL NUMBER: NMW-3

PROJECT NUMBER: PERSONNEL: RB

STATIC WATER LEVEL (FT): 9.1 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: HERON PURGE METHOD: PERASTALTIC

TIME START PURGE: 1:24 PURGE DEPTH (FT) ~14

TIME END PURGE:

TIME SAMPLED:

COMMENTS:

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	CASING VOLUME (GAL)
	23.5		9.1		14.4		0.16	0.64	1.44		2.304

TIME	1:42	1:46	1:51	1:56	2:02		
VOLUME PURGED (GAL)	1/2	1	1 1/2	2	2 1/2		
PURGE RATE (GPM)							
TEMPERATURE (°C)	14.2	14.1	13.8	13.6	13.7		
pH	6.50	6.57	6.61	6.66	6.68		
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	433	429	425	424	419		
DISSOLVED OXYGEN (mg/L)							
eH(MV)Pt-AgCl ref.							
TURBIDITY/COLOR	clear	→			→		
ODOR	MOD HC	MOD HC	MOD HC	MOD HC	MOD HC		
DEPTH OF PURGE INTAKE (FT)							
DEPTH TO WATER DURING PURGE (FT)	~14						
NUMBER OF CASING VOLUMES REMOVED					≈ 1		
DEWATERED?	N	→			→		

Groundwater Purge and Sample Form Date: 11/20/00 **Kennedy/Jenks Consultants**

PROJECT NAME: TACOMA METALS WELL NUMBER: NMW-3

PROJECT NUMBER: 996098.00 PERSONNEL: JRB

SAMPLE DATA:

TIME SAMPLED: COMMENTS:

DEPTH SAMPLED (FT): ~14

SAMPLING EQUIPMENT: PERISTALTIC

SAMPLE NO.	NO. OF CONTAINERS	CONTAINER TYPE	PRESERVATIVE	FIELD FILTRATION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUSTODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
1	1	P	HNO_3	N	1L	clear		Y	TOTAL	METALS
2	1	P	HNO_3	Y	1L				DISS	METALS
3	1	A	—	N	1L				DIESEL	
4	1	A	—	N	1L				PCB	
5	1	A	—	N	1L				PAH	
6	3	VOA	HCl	N	120ml				VOC	
7	2	VOA	HCl	N	80ml				GAS	

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): 2 1/2 COMMENTS:

DISPOSAL METHOD: DRUMMED ON SITE

DRUM DESIGNATION(S)/VOLUME PER (GAL):

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: (YES) NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: YES (NO)

WELL CASING OK?: (YES) NO

COMMENTS:

GENERAL:

WEATHER CONDITIONS:

TEMPERATURE (SPECIFY °C OR °F): COLD/WARM @40°

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING?

cc: Project Manager:
Job File:
Other:

Groundwater Purge and Sample Form Date: 11/20/00 **Kennedy/Jenks Consultants**

PROJECT NAME: Tacoma Metals WELL NUMBER: MW-2

PROJECT NUMBER: PERSONNEL: JRB

STATIC WATER LEVEL (FT): 10.2 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: Heron PURGE METHOD: PERISTALTIC

TIME START PURGE: 2:56 PURGE DEPTH (FT) ~14

TIME END PURGE:

TIME SAMPLED:

COMMENTS:

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	CASING VOLUME (GAL)
	23		10.2		12.8		0.16	0.64	1.44		2.05

TIME	3:01	3:06	3:12	3:17	3:22		
VOLUME PURGED (GAL)	1/2	1	1 1/2	2	2 1/2		
PURGE RATE (GPM)							
TEMPERATURE (°C)	11.7	13.0	13.1	13.0	13.0		
pH	6.40	6.41	6.41	6.43	6.42		
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	595	562	543	535	536		
DISSOLVED OXYGEN (mg/L)							
eH(MV)Pt-AgCl ref.							
TURBIDITY/COLOR	clear →						
ODOR	SL→MOD HC	SL-MOD HC	SL-MOD HC	SL-MOD HC	SL-MOD HC		
DEPTH OF PURGE INTAKE (FT)							
DEPTH TO WATER DURING PURGE (FT)	~14						
NUMBER OF CASING VOLUMES REMOVED					≈1		
DEWATERED?	N →				D		

Groundwater Purge and Sample Form Date: 4/20/00 **Kennedy/Jenks Consultants**

PROJECT NAME: TACOMA METALS WELL NUMBER: NMW - 2

PROJECT NUMBER: PERSONNEL: JRB

SAMPLE DATA:

TIME SAMPLED: COMMENTS: TOC

DEPTH SAMPLED (FT): ~ 14 PERISTALTIC

SAMPLING EQUIPMENT: PERISTALTIC

SAMPLE NO.	NO. OF CONTAINERS	CONTAINER TYPE	PRESERVATIVE	FIELD FILTRATION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUSTODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
1	1	P	HNO_3	N	1L	clear		Y	TOTAL	METAL
2	1	P	HNO_3	Y	1L				DISS	METAL
3	1	A	—	N	1L				DIESEL	
4	1	A	—	N	1L				PCB	
5	1	A	—	N	1L				PAH	
6	3	VOA	HCl	N	120ML				VOC	
7	2	VOA	HCl	N	80ML				GAS	

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): 2.5 COMMENTS:

DISPOSAL METHOD: DRUMMED ON SITE

DRUM DESIGNATION(S)/VOLUME PER (GAL):

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: (YES) NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: (YES) NO

WELL CASING OK?: (YES) NO

COMMENTS:

GENERAL:

WEATHER CONDITIONS: COLD/NEAR 40°

TEMPERATURE (SPECIFY °C OR °F):

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING?

cc: Project Manager:
Job File:
Other:

Groundwater Purge and Sample Form Date: 11/21/00 **Kennedy/Jenks Consultants**

PROJECT NAME: Tacoma Metals WELL NUMBER: MW-5

PROJECT NUMBER: PERSONNEL: JRB

STATIC WATER LEVEL (FT): 10.5 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: HERON PURGE METHOD: PERISTALTIC

TIME START PURGE: 8:41 PURGE DEPTH (FT) ~13

TIME END PURGE:

TIME SAMPLED:

COMMENTS:

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	CASING VOLUME (GAL)
	16		10.5		5.5		0.16	0.64	1.44		.88

TIME	8:47	8:53	8:59				
VOLUME PURGED (GAL)	1/2	1	1 1/2				
PURGE RATE (GPM)							
TEMPERATURE (°C)	12.1	12.4	12.2				
pH	6.2	6.26	6.27				
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	536	525	504				
DISSOLVED OXYGEN (mg/L)							
eH(MV)Pt-AgCl ref.							
TURBIDITY/COLOR	clear						
ODOR	organic						
DEPTH OF PURGE INTAKE (FT)	~13						
DEPTH TO WATER DURING PURGE (FT)							
NUMBER OF CASING VOLUMES REMOVED			~	1			
DEWATERED?	N						

Groundwater Purge and Sample Form Date: _____ **Kennedy/Jenks Consultants**

PROJECT NAME: TACOMA METALS WELL NUMBER: MW-5

PROJECT NUMBER: _____ PERSONNEL: JRB

SAMPLE DATA:

TIME SAMPLED: _____ COMMENTS: _____

DEPTH SAMPLED (FT): ~13

SAMPLING EQUIPMENT: PERISTALTIC

SAMPLE NO.	NO. OF CONTAINERS	CONTAINER TYPE	PRESERVATIVE	FIELD FILTRATION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUSTODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
1	1	P	HNO_3	N	1L	clear		Y	TOTAL	Metal
2	1	P	HNO_3	Y	1L				DISS	metal
3	1	A	—	N	1L				Diesel	
4	1	A	—	N	1L				PCB	
5	1	A	—	N	1L				PAH	
6	3	VOA	HCl	N	120ml				VOC	
7	2	VOA	HCl	N	80ml				GAS	

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): 1 1/2 COMMENTS: _____

DISPOSAL METHOD: Drummed onsite

DRUM DESIGNATION(S)/VOLUME PER (GAL): _____

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: (YES) NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: (YES) NO

WELL CASING OK?: (YES) NO

COMMENTS: _____

GENERAL:

WEATHER CONDITIONS: COLD / CLEAR

TEMPERATURE (SPECIFY °C OR °F): @40°

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING? _____

cc: Project Manager: _____
Job File: _____
Other: _____

Groundwater Purge and Sample Form Date: 11/21/00 **Kennedy/Jenks Consultants**

PROJECT NAME: Tacoma Metals WELL NUMBER: MW-6

PROJECT NUMBER: 996098.00 PERSONNEL: RB

STATIC WATER LEVEL (FT): 9.6 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: Heron PURGE METHOD: Peristaltic

TIME START PURGE: 9:36 PURGE DEPTH (FT) ~13

TIME END PURGE:

TIME SAMPLED:

COMMENTS:

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	CASING VOLUME (GAL)
	16		9.6		6.4		0.16	0.64	1.44		1.024

TIME	9:41	9:47	9:52				
VOLUME PURGED (GAL)	1/2	1	1 1/2				
PURGE RATE (GPM)							
TEMPERATURE (°C)	12.1	11.9	11.8				
pH	6.63	6.60	6.56				
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	621	619	623				
DISSOLVED OXYGEN (mg/L)							
eH(MV)Pt-AgCl ref.							
TURBIDITY/COLOR	clear						
ODOR	organic						
DEPTH OF PURGE INTAKE (FT)							
DEPTH TO WATER DURING PURGE (FT)	13						
NUMBER OF CASING VOLUMES REMOVED							
DEWATERED?							

Groundwater Purge and Sample Form Date: 4/21/00 **Kennedy/Jenks Consultants**

PROJECT NAME: _____ WELL NUMBER: _____

PROJECT NUMBER: _____ PERSONNEL: _____

SAMPLE DATA:

TIME SAMPLED: _____ COMMENTS: _____

DEPTH SAMPLED (FT): _____

SAMPLING EQUIPMENT: _____

SAMPLE NO.	NO. OF CONTAINERS	CONTAINER TYPE	PRESERVATIVE	FIELD FILTRATION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUSTODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
1	1	P	HNO_3	N	1L	clear		Y		
2	1	P	HNO_3	Y	1L					
3	1	A	–	N	1L					
4	1	A	–	N	1L					
5	1	A	–	N	1L					
6	3	VOA	HCl	N	120ml					
7	2	VOA	HCl	N	80ml					

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): _____ COMMENTS: _____

DISPOSAL METHOD: _____

DRUM DESIGNATION(S)/VOLUME PER (GAL): _____

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: (YES) NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: (YES) NO

WELL CASING OK?: (YES) NO

COMMENTS: _____

GENERAL:

WEATHER CONDITIONS: COLD/CLEAR

TEMPERATURE (SPECIFY °C OR °F): 40° F

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING? _____

cc: Project Manager: _____
Job File: _____
Other: _____

Groundwater Purge and Sample Form Date: 11/21/00 **Kennedy/Jenks Consultants**

PROJECT NAME: TACOMA METALS WELL NUMBER: MW-2

PROJECT NUMBER: PERSONNEL: JRB

STATIC WATER LEVEL (FT): 11.4 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: HETU PURGE METHOD: PERISTALTIC

TIME START PURGE: 11:24 PURGE DEPTH (FT) ~13

TIME END PURGE:

TIME SAMPLED:

COMMENTS:

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	CASING VOLUME (GAL)
	16		11.4		4.6		0.16	0.64	1.44		.736

TIME	11:24	11:30	11:36				
VOLUME PURGED (GAL)	1/2	1	1 1/2				
PURGE RATE (GPM)							
TEMPERATURE (°C)	11.8	11.9	12.0				
pH	6.48	6.46	6.44				
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	662	654	657				
DISSOLVED OXYGEN (mg/L)							
eH(MV)Pt-AgCl ref.							
TURBIDITY/COLOR	CLEAR	→	→				
ODOR	None	→	→				
DEPTH OF PURGE INTAKE (FT)	~13						
DEPTH TO WATER DURING PURGE (FT)							
NUMBER OF CASING VOLUMES REMOVED			≈ 1				
DEWATERED?	N	→	→				

Groundwater Purge and Sample Form Date: 11/21/00 **Kennedy/Jenks Consultants**

PROJECT NAME: TACOMA METALS WELL NUMBER: MW-2

PROJECT NUMBER: PERSONNEL:

SAMPLE DATA:

TIME SAMPLED: COMMENTS:

DEPTH SAMPLED (FT): ~13

SAMPLING EQUIPMENT: PERISTALTIC

SAMPLE NO.	NO. OF CONTAINERS	CONTAINER TYPE	PRESERVATIVE	FIELD FILTRATION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUSTODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
1	1	P	HNO_3	N	1L	Clear		Y	TOTAL	METAL
2	1	P	HNO_3	Y	1L				DISS	METAL
3	1	A	—	N	1L				DISSEL	
4	1	A	—	N	1L				PCB	
5	1	A	—	N	1L				PAH	
6	3	VOA	HCl	N	120 ml				VOC	
7	2	VOA	HCl	N	80 ml				GAS	

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): 1 1/2 COMMENTS:

DISPOSAL METHOD: Plumed onsite

DRUM DESIGNATION(S)/VOLUME PER (GAL):

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: YES NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: YES NO

WELL CASING OK?: YES NO

COMMENTS:

GENERAL:

WEATHER CONDITIONS: COLD / CLEAR

TEMPERATURE (SPECIFY °C OR °F): 40°

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING?

cc: Project Manager:
Job File:
Other:

Groundwater Purge and Sample Form Date: 11/21/00 **Kennedy/Jenks Consultants**

PROJECT NAME: TACOMA METALS WELL NUMBER: NMW-1

PROJECT NUMBER: 996098.00 PERSONNEL: JRB

STATIC WATER LEVEL (FT): 12.65 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: HERON PURGE METHOD: PERISTALTIC

TIME START PURGE: 12:05 PURGE DEPTH (FT) ~14

TIME END PURGE:

TIME SAMPLED:

COMMENTS:

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	CASING VOLUME (GAL)
	23.5		12.65		10.85		0.16	0.64	1.44		1.73

TIME	12:11	12:16	12:21	12:26			
VOLUME PURGED (GAL)	1/2	1	1 1/2	2			
PURGE RATE (GPM)							
TEMPERATURE (°C)	12.4	12.2	12.1	12.0			
pH	6.64	6.63	6.61	6.61			
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	783	812	819	831			
DISSOLVED OXYGEN (mg/L)							
eH(MV)Pt-AgCl ref.							
TURBIDITY/COLOR	clear →						
ODOR	none →						
DEPTH OF PURGE INTAKE (FT)	~14						
DEPTH TO WATER DURING PURGE (FT)							
NUMBER OF CASING VOLUMES REMOVED				≈1			
DEWATERED?	N →						

Groundwater Purge and Sample Form Date: 11/21/00 **Kennedy/Jenks Consultants**

PROJECT NAME: TACOMA METALS WELL NUMBER: DMW-1

PROJECT NUMBER: PERSONNEL: JRB

SAMPLE DATA:

TIME SAMPLED: COMMENTS:

DEPTH SAMPLED (FT): ~14

SAMPLING EQUIPMENT: PERISTALTIC

SAMPLE NO.	NO. OF CONTAINERS	CONTAINER TYPE	PRESERVATIVE	FIELD FILTRATION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUSTODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
1	1	P	HNO_3	N	1L	clear		Y	TOTAL	METAL
2	1	P	HNO_3	Y	1L				DISS	METAL
3	1	A	—	N	1L				DIESEL	
4	1	A	—	N	1L				PCB	
5	1	A	—	N	1L				PAH	
6	3	VOA	HCl	N	120ml				VOC	
7	2	VOA	HCl	N	80ml				GAS	

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): 2 COMMENTS:

DISPOSAL METHOD: DRUMMED ON SITE

DRUM DESIGNATION(S)/VOLUME PER (GAL):

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: YES NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: YES NO

WELL CASING OK?: YES NO

COMMENTS:

GENERAL:

WEATHER CONDITIONS: COLD / CLEAR 40'

TEMPERATURE (SPECIFY °C OR °F):

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING?

cc: Project Manager:
Job File:
Other:

Groundwater Purge and Sample Form Date: 11/21/00 **Kennedy/Jenks Consultants**

PROJECT NAME: TACOMA METALS WELL NUMBER: MW-7

PROJECT NUMBER: 99609800 PERSONNEL:

STATIC WATER LEVEL (FT): 7.68 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: Heron PURGE METHOD: Peristaltic

TIME START PURGE: 1:15 PURGE DEPTH (FT)

TIME END PURGE:

TIME SAMPLED:

COMMENTS:

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	CASING VOLUME (GAL)
	14		7.68		6.32		0.16	0.64	1.44		1.01

TIME	1:20	1:25	1:30				
VOLUME PURGED (GAL)	½	1	1½				
PURGE RATE (GPM)							
TEMPERATURE (°C)	13.5	13.6	13.3				
pH	6.36	6.35	6.34				
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	428	407	409				
DISSOLVED OXYGEN (mg/L)							
eH(MV)Pt-AgCl ref.							
TURBIDITY/COLOR	clear →						
ODOR	SL HC	SL HC	SL HC				
DEPTH OF PURGE INTAKE (FT)	~11						
DEPTH TO WATER DURING PURGE (FT)							
NUMBER OF CASING VOLUMES REMOVED							
DEWATERED?	N →						

Groundwater Purge and Sample Form Date: _____ **Kennedy/Jenks Consultants**

PROJECT NAME: _____ WELL NUMBER: MW-7

PROJECT NUMBER: _____ PERSONNEL: _____

SAMPLE DATA:

TIME SAMPLED: _____ COMMENTS: _____

DEPTH SAMPLED (FT): _____

SAMPLING EQUIPMENT: _____

SAMPLE NO.	NO. OF CONTAINERS	CONTAINER TYPE	PRESERVATIVE	FIELD FILTRATION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUSTODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
1	1	P	HNO_3	N	1L	clear		Y		
2	1	P	HNO_3	Y	1L					
3	1	A	–	N	1L					
4	1	A	–	N	1L					
5	1	A	–	N	1L					
6	3	VOA	HCl	N	120ml					
7	2	VOA	HCl	N	80ml					

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): _____ COMMENTS: _____

DISPOSAL METHOD: _____

DRUM DESIGNATION(S)/VOLUME PER (GAL): _____

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: (YES) NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: (YES) NO

WELL CASING OK?: (YES) NO

COMMENTS: _____

GENERAL:

WEATHER CONDITIONS: COLD / CLEAR

TEMPERATURE (SPECIFY °C OR °F): 40°F

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING? _____

cc: Project Manager: _____
Job File: _____
Other: _____

Groundwater Purge and Sample Form Date: 4/21/00 **Kennedy/Jenks Consultants**

PROJECT NAME: Tacoma Meters WELL NUMBER: MW-1

PROJECT NUMBER: 940098.00 PERSONNEL: JRR

STATIC WATER LEVEL (FT): 11.52 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: HERON PURGE METHOD: PERISTALTIC

TIME START PURGE: 10:35 PURGE DEPTH (FT) ≈ 13

TIME END PURGE:

TIME SAMPLED:

COMMENTS:

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	CASING VOLUME (GAL)
	16		11.52		4.48		0.16	0.64	1.44		.72

TIME	10:35	10:40	10:45				
VOLUME PURGED (GAL)	1/2	1	1 1/2				
PURGE RATE (GPM)							
TEMPERATURE (°C)	13.5	13.5	13.8				
pH	6.47	6.48	6.48				
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	548	536	531				
DISSOLVED OXYGEN (mg/L)							
eH(MV)Pt-AgCl ref.							
TURBIDITY/COLOR	clear →						
ODOR	NONE →						
DEPTH OF PURGE INTAKE (FT)	~13						
DEPTH TO WATER DURING PURGE (FT)							
NUMBER OF CASING VOLUMES REMOVED					≈ 1		
DEWATERED?	N →						

Groundwater Purge and Sample Form Date: 11/21/00 **Kennedy/Jenks Consultants**

PROJECT NAME: TACOMA METALS WELL NUMBER: MW-1

PROJECT NUMBER: PERSONNEL: ARZ

SAMPLE DATA:

TIME SAMPLED: COMMENTS:

DEPTH SAMPLED (FT): ~13

SAMPLING EQUIPMENT:

SAMPLE NO.	NO. OF CONTAINERS	CONTAINER TYPE	PRESERVATIVE	FIELD FILTRATION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUSTODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
1	1	P	HNO_3	N	1L	clear		Y		
2	1	P	HNO_3	Y	1L					
3	1	A	—	N	1L					
4	1	A	—	N	1L					
5	1	A	—	N	1L					
6	3	VOA	HCl	N	120mL					
7	2	VOA	HCl	N	80mL					

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): 1 1/2 COMMENTS:

DISPOSAL METHOD: Drummed onsite

DRUM DESIGNATION(S)/VOLUME PER (GAL):

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: YES NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: YES NO

WELL CASING OK?: YES NO

COMMENTS:

GENERAL:

WEATHER CONDITIONS:

TEMPERATURE (SPECIFY °C OR °F): COLD/CLEAR 40°

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING? NO

cc: Project Manager:
Job File:
Other:

Groundwater Purge and Sample Form Date: 11/29/00 **Kennedy/Jenks Consultants**

PROJECT NAME: TACOMA METALS WELL NUMBER: MW-3

PROJECT NUMBER: 996098.00 PERSONNEL: DMK, JRB

STATIC WATER LEVEL (FT): 9.0 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: HERON PURGE METHOD: PERASTALTIC

TIME START PURGE: 9:47 PURGE DEPTH (FT) ~19

TIME END PURGE:

TIME SAMPLED:

COMMENTS:

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	CASING VOLUME (GAL)
	23.5		9		14.5		0.16	0.64	1.44		2.32

TIME	10:00	10:07	10:14	10:20			
VOLUME PURGED (GAL)	1	1½	2	2½			
PURGE RATE (GPM)							
TEMPERATURE (°C)	13.45	13.47	13.50	13.45			
pH	6.50	6.45	6.44	6.44			
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	437	416	412	408			
DISSOLVED OXYGEN (mg/L)	4.42	4.95	4.29	5.43			
eH(MV)Pt-AgCl ref. ORP	-32.6	-21.7	-29.7	-16.4			
TURBIDITY/COLOR	clear	—	—	—			
ODOR	non HC	—	—	—			
DEPTH OF PURGE INTAKE (FT)	≈14						
DEPTH TO WATER DURING PURGE (FT)							
NUMBER OF CASING VOLUMES REMOVED				≈1			
DEWATERED?	N	—	—	—			

Groundwater Purge and Sample Form Date: 11/29/00 **Kennedy/Jenks Consultants**

PROJECT NAME: TACOMA METALS WELL NUMBER: NMW-3

PROJECT NUMBER: 996018.00 PERSONNEL: DMK, JRB

SAMPLE DATA:

TIME SAMPLED: COMMENTS:

DEPTH SAMPLED (FT):

SAMPLING EQUIPMENT: PERISTALTIC

SAMPLE NO.	NO. OF CONTAINERS	CONTAINER TYPE	PRESERVATIVE	FIELD FILTRATION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUSTODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
1	1	P	HNO_3	N	1 Liter	CLEAR		Y	METALS HARDNESS	CA, MN FE
2	1	P	—	N	1g OJ				TDS	
3	1	P	—	N	½ liter				SULFATE	

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): COMMENTS:

DISPOSAL METHOD: DRUMMED ONSITE

DRUM DESIGNATION(S)/VOLUME PER (GAL):

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: (YES) NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: YES (NO)

WELL CASING OK?: (YES) NO

COMMENTS:

GENERAL:

WEATHER CONDITIONS: RAIN

TEMPERATURE (SPECIFY °C OR °F): 45°F

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING?

cc: Project Manager:
Job File:
Other:

Groundwater Purge and Sample Form Date: 11/29/00 **Kennedy/Jenks Consultants**

PROJECT NAME: TACOMA METALS WELL NUMBER: MW-5

PROJECT NUMBER: 996098.00 PERSONNEL: DMK, JRB

STATIC WATER LEVEL (FT): 9' MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: HERON PURGE METHOD: PERISTALTIC

TIME START PURGE: 11:56 PURGE DEPTH (FT) ~13

TIME END PURGE:

TIME SAMPLED:

COMMENTS:

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT) (10.5)	=	WATER COLUMN (FT) (1.5)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	CASING VOLUME (GAL) (.08 ~13)
	16		9.0		7		0.16	0.64	1.44		1.12

TIME	12:02	12:07	12:15				
VOLUME PURGED (GAL)	1/2	1	1 1/2				
PURGE RATE (GPM)							
TEMPERATURE (°C)	14.5	14.52	14.48				
pH	6.20	6.19	6.18				
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	526	527	528				
DISSOLVED OXYGEN (mg/L)	3.88	3.78	3.52				
eH(MV)Pt-AgCl ref. ORP	18.3	13.4	12.3				
TURBIDITY/COLOR	Clear	norm	→				
ODOR							
DEPTH OF PURGE INTAKE (FT)	~13						
DEPTH TO WATER DURING PURGE (FT)							
NUMBER OF CASING VOLUMES REMOVED			≈1				
DEWATERED?	N	→					

Groundwater Purge and Sample Form Date: 11/29/00 **Kennedy/Jenks Consultants**

PROJECT NAME: TACOMA METALS WELL NUMBER: MW-5

PROJECT NUMBER: PERSONNEL: DMC, JRB

SAMPLE DATA:

TIME SAMPLED: COMMENTS:

DEPTH SAMPLED (FT): ~13

SAMPLING EQUIPMENT:

SAMPLE NO.	NO. OF CONTAINERS	CONTAINER TYPE	PRESERVATIVE	FIELD FILTRATION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUSTODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
1	1	P	HNO_3	N	1 liter	clear		Y	METALS HARDNESS	CA, MG FE
2	1	P	–	N	1 qt	↓		↓	TDS	
3	1	P	–	N	½ Ltr	↓		↓	SULFATE	

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): COMMENTS:

DISPOSAL METHOD: DRUMMED ONSITE

DRUM DESIGNATION(S)/VOLUME PER (GAL):

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: (YES) NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: YES (NO)

WELL CASING OK?: (YES) NO

COMMENTS:

GENERAL:

WEATHER CONDITIONS: RAIN 45 F

TEMPERATURE (SPECIFY °C OR °F):

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING?

cc: Project Manager:
Job File:
Other:

Groundwater Purge and Sample Form

Date: 11/29/00 **Kennedy/Jenks Consultants**

PROJECT NAME: TACOMA METALS

WELL NUMBER: MW-1

PROJECT NUMBER: 996098.00

PERSONNEL:

STATIC WATER LEVEL (FT): 9.0

MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: HERON

PURGE METHOD: PERISTALTIC

TIME START PURGE: 10:40

PURGE DEPTH (FT) ~13

TIME END PURGE:

TIME SAMPLED:

COMMENTS:

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	11.52 DEPTH TO WATER (FT)	=	4.13 WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	.72 ~13 CASING VOLUME (GAL)
	16		9		7		0.16	0.64	1.44		1.12

TIME	10:45	10:52	10:58				
VOLUME PURGED (GAL)	1/2	1	1 1/2				
PURGE RATE (GPM)							
TEMPERATURE (°C)	16.04	16.16	16.31				
pH	6.30	6.30	6.29				
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	522	524	544				
DISSOLVED OXYGEN (mg/L)	3.87	4.0	4.04				
eH(MV)Pt-AgCl ref.	-4.6	-16.4	-30.5				
TURBIDITY/COLOR	clear →						
ODOR	none →						
DEPTH OF PURGE INTAKE (FT)	~13						
DEPTH TO WATER DURING PURGE (FT)							
NUMBER OF CASING VOLUMES REMOVED			≈ 1				
DEWATERED?	N →						

Groundwater Purge and Sample Form Date: 11/29/00 **Kennedy/Jenks Consultants**

PROJECT NAME: TALOHA METALS WELL NUMBER: MW-1

PROJECT NUMBER: 996098.00 PERSONNEL: DMK, JRB

SAMPLE DATA:

TIME SAMPLED: COMMENTS:

DEPTH SAMPLED (FT):

SAMPLING EQUIPMENT: PERISTALTIC

SAMPLE NO.	NO. OF CONTAINERS	CONTAINER TYPE	PRESERVATIVE	FIELD FILTRATION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUSTODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
1	1	P	HNO_3	N	1L	clear		Y	METAL HARDNESS	CA, MG, FE
2	1	P	–	N	Lg OJ				TDS	
3	1	P	–	N	1/2 Ltr				SULFATE	

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): COMMENTS:

DISPOSAL METHOD: DRUMMED ONSITE

DRUM DESIGNATION(S)/VOLUME PER (GAL):

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: YES NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: YES NO

WELL CASING OK?: YES NO

COMMENTS:

GENERAL:

WEATHER CONDITIONS: RAIN

TEMPERATURE (SPECIFY °C OR °F): 45°F

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING? NO

cc: Project Manager:
Job File:
Other:

Groundwater Purge and Sample Form Date: 11/29/00 **Kennedy/Jenks Consultants**

PROJECT NAME: TACOMA METALS WELL NUMBER: MW-2

PROJECT NUMBER: 996098.00 PERSONNEL:

STATIC WATER LEVEL (FT): 9.0 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: HERON PURGE METHOD: PERISTALTIC

TIME START PURGE: 11:12 PURGE DEPTH (FT) 13

TIME END PURGE:

TIME SAMPLED:

COMMENTS:

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	11.4 DEPTH TO WATER (FT)	=	4.6 WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	1.32 CASING VOLUME (GAL)
	16		9.0		7		0.16	0.64	1.44		1.12

TIME	11:18	11:23	11:28				
VOLUME PURGED (GAL)	1/2	1	1 1/2				
PURGE RATE (GPM)							
TEMPERATURE (°C)	13.28	13.25	13.26				
pH	6.32	6.38	6.41				
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	1570	1870	1967				
DISSOLVED OXYGEN (mg/L)	11.21	14.03	14.29				
eH(MV)Pt-AgCl ref.	39.2	15.5	7.8				
TURBIDITY/COLOR	clear/none ~~tow~~						
ODOR	none						
DEPTH OF PURGE INTAKE (FT)	~13						
DEPTH TO WATER DURING PURGE (FT)							
NUMBER OF CASING VOLUMES REMOVED			≃1				
DEWATERED?	N						

Groundwater Purge and Sample Form Date: 11/29/00 **Kennedy/Jenks Consultants**

PROJECT NAME: TACOMA METALS WELL NUMBER: MW-2

PROJECT NUMBER: PERSONNEL: DMK JRB

SAMPLE DATA:

TIME SAMPLED: COMMENTS:

DEPTH SAMPLED (FT):

SAMPLING EQUIPMENT: PERISTALTIC

SAMPLE NO.	NO. OF CONTAIN-ERS	CON-TAINER TYPE	PRESER-VATIVE	FIELD FILTRA-TION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUS-TODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
1	1	P	HNO_3	N	1L	clear		Y	METAL HARDNESS	CA, MG FE
2	1	P	—	N	40 ml	↓		↓	TDS	
3	1	P	—	N	1/2 L	↓		↓	SULFATE	

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): COMMENTS:

DISPOSAL METHOD: DRUMMED ONSITE

DRUM DESIGNATION(S)/VOLUME PER (GAL):

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: (YES) NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: YES (NO)

WELL CASING OK?: (YES) NO

COMMENTS:

GENERAL:

WEATHER CONDITIONS: RAIN

TEMPERATURE (SPECIFY °C OR °F): NS

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING?

cc: Project Manager:
Job File:
Other:

Groundwater Purge and Sample Form Date: 3/5/01 **Kennedy/Jenks Consultants**

PROJECT NAME: TACOMA METALS WELL NUMBER: MW-1

PROJECT NUMBER: 996098.00 PERSONNEL: RB

STATIC WATER LEVEL (FT): 10.45 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: Heron PURGE METHOD: Peristaltic (Micro)

TIME START PURGE: 9:50 PURGE DEPTH (FT) ~13

TIME END PURGE: 10:05

TIME SAMPLED: 10:10

COMMENTS:

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	CASING VOLUME (GAL)
	16		10.45		5.55		0.16	0.64	1.44		.88

TIME	9:50	9:57	10:01	10:05			
VOLUME PURGED (GAL)	0	1/2	3/4	1			
PURGE RATE (GPM)							
TEMPERATURE (°C)	13.73	13.61	13.61	13.61			
pH	6.24	6.30	6.31	6.32			
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	419	353	341	338			
DISSOLVED OXYGEN (mg/L)	1.42	0.84	0.75	0.73			
eH(MV)Pt-AgCl ref. ORP	-35.8	-45.0	-43.2	-46.1			
TURBIDITY/COLOR	clear	→	→	→			
ODOR	N	→	→	→			
DEPTH OF PURGE INTAKE (FT)	~13	→	→	→			
DEPTH TO WATER DURING PURGE (FT)							
NUMBER OF CASING VOLUMES REMOVED							
DEWATERED?	N	→	→	→			

Groundwater Purge and Sample Form Date: _____ **Kennedy/Jenks Consultants**

PROJECT NAME: _____ WELL NUMBER: MW-1

PROJECT NUMBER: _____ PERSONNEL: _____

SAMPLE DATA:

TIME SAMPLED: _____ COMMENTS: _____

DEPTH SAMPLED (FT): _____

SAMPLING EQUIPMENT: _____

SAMPLE NO.	NO. OF CONTAIN-ERS	CON-TAINER TYPE	PRESER-VATIVE	FIELD FILTRA-TION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUS-TODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
1	1	OJ	N	N	L	clear		Y	TDS	
2	1	OJ	N	N	L				Hardness/Metals	i.e. Mg Fe
3	1	P	HNO_3	N					TOTAL Metals	
4	1	P	HNO_3	Y	L				DISSOLVED Metals	
5	1	A	N	N	L				Diesel	
6	1	A	N	N	L				PCB	
7	1	A	N	N	L				PAH	
8	3	VOA	HCl		120ml				VOC	
9	2	VOA	HCl	N	80ml				GAS	

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): 1 COMMENTS: _____

DISPOSAL METHOD: Drum

DRUM DESIGNATION(S)/VOLUME PER (GAL): _____

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: (YES) NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: (YES) NO

WELL CASING OK?: (YES) NO

COMMENTS: _____

GENERAL:

WEATHER CONDITIONS: Clear

TEMPERATURE (SPECIFY °C OR °F): 55°

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING? _____

cc: Project Manager: _____
Job File: _____
Other: _____

Groundwater Purge and Sample Form Date: 3/5/01 **Kennedy/Jenks Consultants**

PROJECT NAME: TACOMA METALS WELL NUMBER: MW-2

PROJECT NUMBER: 996078.00 PERSONNEL: JB

STATIC WATER LEVEL (FT): 10.62 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: Heron PURGE METHOD: Peristaltic

TIME START PURGE: 10 43 PURGE DEPTH (FT) ~13

TIME END PURGE: 10:59

TIME SAMPLED: 11.00

COMMENTS:

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	CASING VOLUME (GAL)
	16		10.62		5.38		0.16	0.64	1.44		.86

TIME	10:48	10:53	10:59				
VOLUME PURGED (GAL)	1/2	1	1 1/2				
PURGE RATE (GPM)							
TEMPERATURE (°C)	11.56	11.53	11.51				
pH	6.27	6.28	6.32				
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	1588	1573	1556				
DISSOLVED OXYGEN (mg/L)	0.67	0.46	0.38				
eH(MV)Pt-AgCl ref.	47.9	45.9	39.9				
TURBIDITY/COLOR	clear →						
ODOR	none →						
DEPTH OF PURGE INTAKE (FT)	~13						
DEPTH TO WATER DURING PURGE (FT)							
NUMBER OF CASING VOLUMES REMOVED			≈1				
DEWATERED?	N →						

Groundwater Purge and Sample Form Date: _____ **Kennedy/Jenks Consultants**

PROJECT NAME: TACOMA METALS WELL NUMBER: MW-2

PROJECT NUMBER: 996018.00 PERSONNEL: JB

SAMPLE DATA:

TIME SAMPLED: _____ COMMENTS: _____

DEPTH SAMPLED (FT): _____

SAMPLING EQUIPMENT: _____

SAMPLE NO.	NO. OF CONTAINERS	CONTAINER TYPE	PRESERVATIVE	FIELD FILTRATION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUSTODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
1	1	OJ	N	N	L	Clear	non	Y	TDS	
2	1	OJ	N	N	L				Hardness/Metals CA MG	
3	1	P	HNO_3	N	L				TOTAL METALS	
4	1	P	HNO_3	Y	L				DISSOLVED METALS	
5	1	A	N	N	L				DIESEL	
6	1	A	N	N	1				PCB	
7	1	A	N	N	L				PAH	
8	3	VOA	HCl	N	120				VOC	
9	2	VOA	HCl	N	80				GAS	

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): 1½ COMMENTS: _____

DISPOSAL METHOD: Drum

DRUM DESIGNATION(S)/VOLUME PER (GAL): _____

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: (YES) NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: (YES) NO

WELL CASING OK?: (YES) NO

COMMENTS: _____

GENERAL:

WEATHER CONDITIONS: Clear

TEMPERATURE (SPECIFY °C OR °F): 55°

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING? _____

cc: Project Manager: _____
Job File: _____
Other: _____

Groundwater Purge and Sample Form Date: 3/5/01 **Kennedy/Jenks Consultants**

PROJECT NAME: Tacoma Metals WELL NUMBER: MW-9

PROJECT NUMBER: 99609800 PERSONNEL: JB

STATIC WATER LEVEL (FT): 11.69 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: HERON PURGE METHOD: PERISTALTIC PUMP

TIME START PURGE: 11:50 PURGE DEPTH (FT) ~17

TIME END PURGE: 12:15

TIME SAMPLED: 12:15

COMMENTS:

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	CASING VOLUME (GAL)
	23.5		11.69		11.81		0.16	0.64	1.44		1.88

TIME	11:55	12:02	12:08	12:15			
VOLUME PURGED (GAL)	½	1	1½	2			
PURGE RATE (GPM)							
TEMPERATURE (°C)	12.01	12.00	11.97	11.95			
pH	6.34	6.36	6.37	6.38			
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	1796	1833	1741	1620			
DISSOLVED OXYGEN (mg/L)	0.56	0.67	0.67	0.58			
eH(MV)Pt-AgCl ref.	-16.0	-25.4	-33.0	-36.4			
TURBIDITY/COLOR	clear	→	→	→			
ODOR	none	→	→	→			
DEPTH OF PURGE INTAKE (FT)	~17						
DEPTH TO WATER DURING PURGE (FT)							
NUMBER OF CASING VOLUMES REMOVED				≈ 1			
DEWATERED?	N	→	→	→			

Groundwater Purge and Sample Form Date: ____ ____ **Kennedy/Jenks Consultants**

PROJECT NAME: _____ WELL NUMBER: MW-9

PROJECT NUMBER: 996098.00 PERSONNEL: AZ

SAMPLE DATA:

TIME SAMPLED: _____ COMMENTS: _____

DEPTH SAMPLED (FT): _____

SAMPLING EQUIPMENT: _____

SAMPLE NO.	NO. OF CONTAINERS	CONTAINER TYPE	PRESERVATIVE	FIELD FILTRATION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUSTODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
1	1	OS	N	N	L	Clear		YES	TDS	
2	1	OS	N	N	L	None			Hardness/metals Ca Mg	
3	1	P	HNO3	N	L				Total metals	
4	1	P	HNO3	Y	L				Dissolved metals	
5	1	A	N	N	L				Diesel	
6	1	A	N	N	L				Pb	
7	1	A	N	N	L				PAH	
8	3	VOA	HCl	N	120				VOC	
9	2	VOA	HCl	N	80				GAS	

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): 2 COMMENTS: _____

DISPOSAL METHOD: Drum

DRUM DESIGNATION(S)/VOLUME PER (GAL): _____

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: YES NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: YES NO

WELL CASING OK?: YES NO

COMMENTS: _____

GENERAL:

WEATHER CONDITIONS: _____

TEMPERATURE (SPECIFY °C OR °F): CLEAR

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING? 55° F

cc: Project Manager: _____

Job File: _____

Other: _____

Groundwater Purge and Sample Form Date: 3/5/01 **Kennedy/Jenks Consultants**

PROJECT NAME: Tacoma Metals WELL NUMBER: MW-6

PROJECT NUMBER: 996093.00 PERSONNEL: JB

STATIC WATER LEVEL (FT): 7.54 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: HERON PURGE METHOD: PERISTALTIC & MICR

TIME START PURGE: 1:00 PURGE DEPTH (FT) ~12

TIME END PURGE: 1:15

TIME SAMPLED: 1:15

COMMENTS:

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	CASING VOLUME (GAL)
	16		7.54		8.46		0.16	0.64	1.44		1.35

TIME	1:05	1:10	1:15				
VOLUME PURGED (GAL)	½	1	1½				
PURGE RATE (GPM)							
TEMPERATURE (°C)	12.14	12.15	12.17				
pH	6.31	6.29	6.28				
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	920	916	881				
DISSOLVED OXYGEN (mg/L)	0.70	0.51	0.43				
eH(MV)Pt-AgCl ref.	44.3	23.3	5.7				
TURBIDITY/COLOR	clear	—	—				
ODOR	sl organic	—	—				
DEPTH OF PURGE INTAKE (FT)	~12						
DEPTH TO WATER DURING PURGE (FT)							
NUMBER OF CASING VOLUMES REMOVED			≈1				
DEWATERED?	N	—	—				

Groundwater Purge and Sample Form Date: _____ **Kennedy/Jenks Consultants**

PROJECT NAME: T. Metals WELL NUMBER: MW-6

PROJECT NUMBER: 9960980.00 PERSONNEL: AB

SAMPLE DATA:

TIME SAMPLED: _____ COMMENTS: _____

DEPTH SAMPLED (FT): _____

SAMPLING EQUIPMENT: _____

SAMPLE NO.	NO. OF CONTAINERS	CONTAINER TYPE	PRESERVATIVE	FIELD FILTRATION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUSTODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
1	1	OJ	N	N	L	Clear		YES	TDS	
2	1	OJ	N	N	L				Hardness/metals	CA MG FE
3	1	P	HNO_3	N	L				TOTAL METALS	
4	1	P	HNO_3	Y	L				DISSOLVED METALS	
5	1	A	N	N	L				PIEZEL	
6	1	A	N	N	L				PCB	
7	1	A	N	N	L				PAH	
8	3	VOA	HCl	N	120				VOC	
9	2	VOA	HCl	N	80				GAS	

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): 1½ COMMENTS: _____

DISPOSAL METHOD: Drum

DRUM DESIGNATION(S)/VOLUME PER (GAL): _____

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: (YES) NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: (YES) NO

WELL CASING OK?: (YES) NO

COMMENTS: _____

GENERAL:

WEATHER CONDITIONS: Clear

TEMPERATURE (SPECIFY °C OR °F): 55°

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING? _____

cc: Project Manager: _____
Job File: _____
Other: _____

Groundwater Purge and Sample Form Date: 3/5/01 **Kennedy/Jenks Consultants**

PROJECT NAME: Tacoma Metals WELL NUMBER: MW-5

PROJECT NUMBER: 996098.20 PERSONNEL: [illegible]

STATIC WATER LEVEL (FT): 8.46 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: Heron PURGE METHOD: Peristaltic (micro)

TIME START PURGE: 2:07 PURGE DEPTH (FT) ~12.5

TIME END PURGE: 2:24

TIME SAMPLED: 2:25

COMMENTS:

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	CASING VOLUME (GAL)
	16		8.46		7.54		0.16	0.64	1.44		1.21

TIME	2:12	2:18	2:24				
VOLUME PURGED (GAL)	1/2	1	1 1/2				
PURGE RATE (GPM)							
TEMPERATURE (°C)	12.96	12.93	12.84				
pH	6.08	6.07	6.05				
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	568	569	570				
DISSOLVED OXYGEN (mg/L)	1.34	1.21	0.96				
eH(MV)Pt-AgCl ref.	22	22.4	19.5				
TURBIDITY/COLOR	clear →						
ODOR	SL HYDROCARB →						
DEPTH OF PURGE INTAKE (FT)	~12.5						
DEPTH TO WATER DURING PURGE (FT)							
NUMBER OF CASING VOLUMES REMOVED			≈ 1				
DEWATERED?	N →						

Groundwater Purge and Sample Form Date: _____ **Kennedy/Jenks Consultants**

PROJECT NAME: T. Meadows WELL NUMBER: MW-5

PROJECT NUMBER: 996098.00 PERSONNEL: JB

SAMPLE DATA:

TIME SAMPLED: _____ COMMENTS: _____

DEPTH SAMPLED (FT): _____

SAMPLING EQUIPMENT: _____

SAMPLE NO.	NO. OF CONTAINERS	CONTAINER TYPE	PRESERVATIVE	FIELD FILTRATION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUSTODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
1	1	OJ	N	N	L	Clear		Y	TPS	
2	1	OJ	N	N	L				Hardness/metals	CA MG FE
3	1	P	HNO3	N	L				TOTAL METALS	
4	1	P	HNO3	Y	L				DISSOLVED METALS	
5	1	A	N	N	L				DIESEL	
6	1	A	N	N	L				PCB	
7	1	A	N	N	L				PAH	
8	3	VOA	HCl	N	120				VOC	
9	2	VOA	HCl	N	80				GRAS	

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): 1 1/2 COMMENTS: _____

DISPOSAL METHOD: Drum

DRUM DESIGNATION(S)/VOLUME PER (GAL): _____

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: (YES) NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: (YES) NO

WELL CASING OK?: (YES) NO

COMMENTS: _____

GENERAL:

WEATHER CONDITIONS: Clear

TEMPERATURE (SPECIFY °C OR °F): 55°

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING? _____

cc: Project Manager: _____

Job File: _____

Other: _____

Groundwater Purge and Sample Form Date: Thu 3/5/01 **Kennedy/Jenks Consultants**

PROJECT NAME: T. Metals WELL NUMBER: MW - 4

PROJECT NUMBER: 996098.00 PERSONNEL: SB

STATIC WATER LEVEL (FT): 10.02 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: HERON PURGE METHOD: Peristaltic

TIME START PURGE: 2:55 PURGE DEPTH (FT) ~16

TIME END PURGE: 3:20

TIME SAMPLED: 3:20

COMMENTS:

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	CASING VOLUME (GAL)
	23		10.02		12.98		0.16	0.64	1.44		2.07

TIME	3:00	3:05	3:10	3:15	3:20		
VOLUME PURGED (GAL)	1/2	1	1 1/2	2	2 1/2		
PURGE RATE (GPM)							
TEMPERATURE (°C)	13.18	13.18	13.19	13.19	13.19		
pH	6.05	6.05	6.05	6.05	6.05		
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	456	457	456	457	459		
DISSOLVED OXYGEN (mg/L)	1.03	.91	0.72	0.64	0.65		
eH(MV)Pt-AgCl ref.	-9.8	-10.9	-13.7	-16.2	-17.4		
TURBIDITY/COLOR	Clear →						
ODOR	S - Mod HC →						
DEPTH OF PURGE INTAKE (FT)	~16						
DEPTH TO WATER DURING PURGE (FT)							
NUMBER OF CASING VOLUMES REMOVED					≈ 1		
DEWATERED?	N →						

Groundwater Purge and Sample Form Date: ___ **Kennedy/Jenks Consultants**

PROJECT NAME: T. Metals WELL NUMBER: MW-4

PROJECT NUMBER: 996098.00 PERSONNEL: JB

SAMPLE DATA:

TIME SAMPLED: ___ COMMENTS: ___

DEPTH SAMPLED (FT): ___

SAMPLING EQUIPMENT: ___

SAMPLE NO.	NO. OF CONTAINERS	CONTAINER TYPE	PRESERVATIVE	FIELD FILTRATION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUSTODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
1	1	OJ	N	N	L	clear		Y	TDS	
2	1	OJ	N	N	L				Hardness / METALS CA MG FE	
3	1	P	HNO_3	N	L				TOTAL METALS	
4	1	P	HNO_3	Y	L				DISSOLVED METALS	
5	1	A	N	N	L				DIESEL	
6	1	A	N	N	L				PCB	
7	1	A	N	N	L				PAH	
8	3	VOA	HCl	N	120				VOC	
9	2	VOA	HCl	N	80				GAS	

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): 2 1/2 COMMENTS: ___

DISPOSAL METHOD: Drum

DRUM DESIGNATION(S)/VOLUME PER (GAL): ___

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: YES NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: YES NO

WELL CASING OK?: YES NO

COMMENTS: ___

GENERAL:

WEATHER CONDITIONS: Clear

TEMPERATURE (SPECIFY °C OR °F): 55°

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING? ___

cc: Project Manager: ___
Job File: ___
Other: ___

Groundwater Purge and Sample Form Date: 3/6/01 **Kennedy/Jenks Consultants**

PROJECT NAME: T. Metals WELL NUMBER: MW-12

PROJECT NUMBER: 994098.00 PERSONNEL: JB

STATIC WATER LEVEL (FT): 8.51 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: HERON PURGE METHOD: Peristaltic

TIME START PURGE: 1:50 PURGE DEPTH (FT) ~13

TIME END PURGE: 3:00

TIME SAMPLED: 3:00

COMMENTS:

8.37 product
8.73 8.72 8.51 8.52

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	CASING VOLUME (GAL)
	19		8.51		10.49		0.16	0.64	1.44		6.71

TIME	2:10	2:30	2:50	2:55	3:00		
VOLUME PURGED (GAL)	2	4	6	6½	7		
PURGE RATE (GPM)							
TEMPERATURE (°C)	13.51	13.6	13.63	13.09	13.10		
pH	6.42	6.28	6.27	6.23	6.22		
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	220	211	209	211	210		
DISSOLVED OXYGEN (mg/L)	5.72	7.72	7.71	5.46	5.42		
eH(MV)Pt-AgCl ref.	36.5	28.5	26.3	25.4	21.7		
TURBIDITY/COLOR	clear	→			→		
ODOR	MOD HC smell	product	→		product 8.37	water	8.51?
DEPTH OF PURGE INTAKE (FT)	~13						
DEPTH TO WATER DURING PURGE (FT)							
NUMBER OF CASING VOLUMES REMOVED					≈1		
DEWATERED?	N	→			→		

Groundwater Purge and Sample Form Date: _____ **Kennedy/Jenks Consultants**

PROJECT NAME: T. Metals WELL NUMBER: MW-12

PROJECT NUMBER: 996098.00 PERSONNEL: AB

SAMPLE DATA:

TIME SAMPLED: _____ COMMENTS: _____

DEPTH SAMPLED (FT): _____

SAMPLING EQUIPMENT: _____

SAMPLE NO.	NO. OF CONTAINERS	CONTAINER TYPE	PRESERVATIVE	FIELD FILTRATION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUSTODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
1	1	OJ	N	N	L	clear		Y	TDS	
2	1	OJ	N	N	L				Hardness/metals	CA
3	1	P	HNO3	N	L				TOTAL METALS	MG FE
4	1	P	HNO3	Y	L				DISSOLVED METALS	
5	1	A	N	N	L				DIESEL	
6	1	A	N	N	L				PCB	
7	1	A	N	N	L				PAH	
8	3	VOA	HCl	N	120				VOC	
9	2	VOA	HCl	N	90				GAS	

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): 7 COMMENTS: _____

DISPOSAL METHOD: Drum

DRUM DESIGNATION(S)/VOLUME PER (GAL): _____

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: YES NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: YES NO

WELL CASING OK?: YES NO

COMMENTS: _____

GENERAL:

WEATHER CONDITIONS: Clear

TEMPERATURE (SPECIFY °C OR °F): 55°

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING? _____

cc: Project Manager: _____
Job File: _____
Other: _____

Groundwater Purge and Sample Form Date: 3/6/01 **Kennedy/Jenks Consultants**

PROJECT NAME: TACOMA METALS WELL NUMBER: MW-8

PROJECT NUMBER: 996098.00 PERSONNEL: JRB

STATIC WATER LEVEL (FT): 8.61 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: HERON PURGE METHOD: Peristaltic

TIME START PURGE: 1:00 PURGE DEPTH (FT) ~16

TIME END PURGE: 1.25

TIME SAMPLED: 1:25

COMMENTS:

Hardness & Dup

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	CASING VOLUME (GAL)
	23.5		8.61		14.89		0.16	0.64	1.44		2.38

TIME	1:10	1:15	1:20	1:25			
VOLUME PURGED (GAL)	1	1½	2	2½			
PURGE RATE (GPM)							
TEMPERATURE (°C)	13.47	13.38	13.37	13.34			
pH	6.43	6.34	6.33	6.32			
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	203	199	193	172			
DISSOLVED OXYGEN (mg/L)	6.00	7.70	7.79	7.76			
eH(MV)Pt-AgCl ref.	33.2	18.2	7.4	3.2			
TURBIDITY/COLOR	clear						
ODOR	MOD HC						
DEPTH OF PURGE INTAKE (FT)	~16						
DEPTH TO WATER DURING PURGE (FT)							
NUMBER OF CASING VOLUMES REMOVED				≈1			
DEWATERED?	N						

Groundwater Purge and Sample Form Date: ____ **Kennedy/Jenks Consultants**

PROJECT NAME: T. Mutters WELL NUMBER: MW-8

PROJECT NUMBER: 9960 98.00 PERSONNEL: DB

SAMPLE DATA:

TIME SAMPLED: ____ COMMENTS: ____

DEPTH SAMPLED (FT): ____

SAMPLING EQUIPMENT: ____

SAMPLE NO.	NO. OF CONTAINERS	CONTAINER TYPE	PRESERVATIVE	FIELD FILTRATION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUSTODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
1	1	~~OI~~	N	N	L	clear		Y	TDS	
2	1	~~OI~~	N	N	L				Hardness/metals	CA MG FE
3	1	P	HNO_3	N	L				TOTAL METALS	
4	1	P	HNO_3	Y	L				DISSOLVED METALS	
5	1	A	N	N	L				DIESEL	
6	1	A	N	N	L				PCB	
7	1	A	N	N	L				PAH	
8	3	VOA	HCl	N	120				VOC	
9	2	VOA	HCl	N	80				GAS	

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): 2 1/2 COMMENTS: ____

DISPOSAL METHOD: Drum

DRUM DESIGNATION(S)/VOLUME PER (GAL): ____

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: (YES) NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: (YES) NO

WELL CASING OK?: (YES) NO

COMMENTS: ____

GENERAL:

WEATHER CONDITIONS: Clear

TEMPERATURE (SPECIFY °C OR °F): 55°

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING? ____

cc: Project Manager: ____
Job File: ____
Other: ____

1-3

Groundwater Purge and Sample Form Date: 3/6/01 **Kennedy/Jenks Consultants**

PROJECT NAME: T. Metals WELL NUMBER: MW-10

PROJECT NUMBER: 996098.00 PERSONNEL: JB

STATIC WATER LEVEL (FT): 7.04 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: HERON PURGE METHOD: Peristaltic

TIME START PURGE: 10:37 PURGE DEPTH (FT) ~13

TIME END PURGE: 10:57

TIME SAMPLED: 11:00

COMMENTS:

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	CASING VOLUME (GAL)
	20		7.04		12.96		0.16	0.64	1.44		2.07

TIME	10:42	10:47	10:52	10:57			
VOLUME PURGED (GAL)	½	1	1½	2			
PURGE RATE (GPM)							
TEMPERATURE (°C)	11.82	11.85	11.88	11.89			
pH	6.05	6.04	6.03	6.03			
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	286	287	287	286			
DISSOLVED OXYGEN (mg/L)	1.54	1.01	0.76	0.69			
eH(MV)Pt-AgCl ref.	2.5	-2.9	-6.0	-8.3			
TURBIDITY/COLOR	clear	—	—	—			
ODOR	MOD HC	—	—	—			
DEPTH OF PURGE INTAKE (FT)	~13						
DEPTH TO WATER DURING PURGE (FT)							
NUMBER OF CASING VOLUMES REMOVED				~1			
DEWATERED?	N	—	—	—			

Groundwater Purge and Sample Form Date: 7/6/01 **Kennedy/Jenks Consultants**

PROJECT NAME: T. Metals WELL NUMBER: MW-10

PROJECT NUMBER: 996098.00 PERSONNEL: SB

SAMPLE DATA:

TIME SAMPLED: _____ COMMENTS: _____

DEPTH SAMPLED (FT): _____

SAMPLING EQUIPMENT: _____

SAMPLE NO.	NO. OF CONTAINERS	CONTAINER TYPE	PRESERVATIVE	FIELD FILTRATION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUSTODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
1	1	OJ	N	N	L	Clear		Y	TDS	
2	1	OJ	N	N	L				Hardness/metals	CA FE
3	1	P	HNO_3	N	L				Total metals	MG
4	1	P	HNO_3	Y	L				Dissolved metals	
5	1	A	N	N	L				DIESEL	
6	1	A	N	N	L				PCB	
7	1	A	N	N	L				PAH	
8	3	VOA	HCl	N	80				VOC	
9	2	VOA	HCl	N	80				GAS	

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): 2 gal COMMENTS: _____

DISPOSAL METHOD: DRUM

DRUM DESIGNATION(S)/VOLUME PER (GAL): _____

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: YES NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: YES NO

WELL CASING OK?: YES NO

COMMENTS: _____

GENERAL:

WEATHER CONDITIONS: Clear

TEMPERATURE (SPECIFY °C OR °F): 55°

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING? _____

cc: Project Manager: _____

Job File: _____

Other: _____

Groundwater Purge and Sample Form Date: 3/6/01 **Kennedy/Jenks Consultants**

PROJECT NAME: I. Metals WELL NUMBER: MW-11

PROJECT NUMBER: 996098.00 PERSONNEL: JB

STATIC WATER LEVEL (FT): 7.13 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: HERON PURGE METHOD: Peristaltic

TIME START PURGE: 11:20 PURGE DEPTH (FT) ~13

TIME END PURGE: 12:45

TIME SAMPLED: 12:45

COMMENTS:

Hardness +

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	CASING VOLUME (GAL)
	20		7.13		12.87		0.16	0.64	1.44		8.23

TIME	11:40	12:00	12:20	12:40	12:45		
VOLUME PURGED (GAL)	2	4	6	8	8½		
PURGE RATE (GPM)							
TEMPERATURE (°C)	12.19	12.34	12.27	12.25	12.28		
pH	6.30	6.41	6.44	6.45	6.44		
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	127	126	128	127	130		
DISSOLVED OXYGEN (mg/L)	8.65	5.04	4.79	4.72	4.89		
eH(MV)Pt-AgCl ref.	15.5	1.8	5.7	6.4	5.9		
TURBIDITY/COLOR	clear						
ODOR	MOD HC						
DEPTH OF PURGE INTAKE (FT)	~13						
DEPTH TO WATER DURING PURGE (FT)							
NUMBER OF CASING VOLUMES REMOVED					≈1		
DEWATERED?	N						

Groundwater Purge and Sample Form Date: _____ **Kennedy/Jenks Consultants**

PROJECT NAME: T. Metals WELL NUMBER: MW-11

PROJECT NUMBER: 9960980 00 PERSONNEL: JB

SAMPLE DATA:

TIME SAMPLED: _____ COMMENTS: _____

DEPTH SAMPLED (FT): _____

SAMPLING EQUIPMENT: _____

SAMPLE NO.	NO. OF CONTAINERS	CONTAINER TYPE	PRESERVATIVE	FIELD FILTRATION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUSTODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
1	1	OJ	N	N	L	Clear		Y	TDS	
2	1	OJ	N	N	L				Hardness/metals CA MG FE	
3	1	P	HNO3	N	L				TOTAL METALS	
4	1	P	HNO3	Y	L				DISSOLVED METALS	
5	1	A	N	N	L				DIESEL	
6	1	A	N	N	L				PCB	
7	1	A	N	N	L				PAH	
8	3	VOA	HCl	N	120				VOC	
9	2	VOA	HCl	N	30				GAS	

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): 8 1/2 COMMENTS: _____

DISPOSAL METHOD: Drum

DRUM DESIGNATION(S)/VOLUME PER (GAL): _____

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: YES NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: YES NO

WELL CASING OK?: YES NO

COMMENTS: _____

GENERAL:

WEATHER CONDITIONS: Clear

TEMPERATURE (SPECIFY °C OR °F): 55°

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING? _____

cc: Project Manager: _____
Job File: _____
Other: _____

Groundwater Purge and Sample Form Date: 3/6 **Kennedy/Jenks Consultants**

PROJECT NAME: Tacoma Metals WELL NUMBER: MW-7

PROJECT NUMBER: 996098.00 PERSONNEL: JB

STATIC WATER LEVEL (FT): 7.10 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: Heron PURGE METHOD: Persitaltic

TIME START PURGE: 9.40 PURGE DEPTH (FT) ~11

TIME END PURGE: 9:55

TIME SAMPLED: 10:00

COMMENTS:

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	CASING VOLUME (GAL)
	14		7.10		6.9		0.16	0.64	1.44		1.104

TIME	9:45	9:50	9:55				
VOLUME PURGED (GAL)	1/2	1	1 1/2				
PURGE RATE (GPM)							
TEMPERATURE (°C)	11.91	11.88	11.87				
pH	6.06	6.04	6.03				
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	373	366	358				
DISSOLVED OXYGEN (mg/L)	2.2	1.61	1.10				
eH(MV)Pt-AgCl ref.	55.7	51.1	43.7				
TURBIDITY/COLOR	clear →						
ODOR	SL HC →						
DEPTH OF PURGE INTAKE (FT)	~11						
DEPTH TO WATER DURING PURGE (FT)							
NUMBER OF CASING VOLUMES REMOVED			≈1				
DEWATERED?	N →						

Groundwater Purge and Sample Form Date: ___ **Kennedy/Jenks Consultants**

PROJECT NAME: T. Meters WELL NUMBER: MW-7

PROJECT NUMBER: 996098.00 PERSONNEL: JB

SAMPLE DATA:

TIME SAMPLED: ___ COMMENTS: ___

DEPTH SAMPLED (FT): ___

SAMPLING EQUIPMENT: ___

SAMPLE NO.	NO. OF CONTAINERS	CONTAINER TYPE	PRESERVATIVE	FIELD FILTRATION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUSTODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
1	1	OJ	N	N	L	Clear	none	Y	TDS	
2	1	OJ	N	N	L				HARDNESS METALS CA MG FE	
3	1	P	HNO_3	N	L				TOTAL METALS	
4	1	P	HNO_3	Y	L				DISSOLVED METALS	
5	1	A	N	N	L				DIESEL	
6	1	A	N	N	L				PCB	
7	1	A	N	N	L				PAH	
8	3	VOA	HCl	N	120				VOC	
9	2	VOA	HCl	N	80				GAS	

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): 1½ COMMENTS: ___

DISPOSAL METHOD: Drum

DRUM DESIGNATION(S)/VOLUME PER (GAL): ___

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: YES NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: YES NO

WELL CASING OK?: YES NO

COMMENTS: ___

GENERAL:

WEATHER CONDITIONS: CLEAR

TEMPERATURE (SPECIFY °C OR °F): 55°

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING? ___

cc: Project Manager: ___
Job File: ___
Other: ___

Groundwater Purge and Sample Form Date: 9/9/01 **Kennedy/Jenks Consultants**

PROJECT NAME: T. Metals WELL NUMBER: MW-11

PROJECT NUMBER: 996098.00 PERSONNEL:

STATIC WATER LEVEL (FT): 8.53 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: Heron PURGE METHOD: Peristaltic

TIME START PURGE: 2:40 PURGE DEPTH (FT)

TIME END PURGE:

TIME SAMPLED: 4:00

COMMENTS:

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	CASING VOLUME (GAL)
	20		8.53		11.47		0.16	0.64	1.44		7.34

TIME	3:00	3:20	3:40	3:50	3:55		
VOLUME PURGED (GAL)	2	4	6	7	7½		
PURGE RATE (GPM)							
TEMPERATURE (°C)	14.8	14.5	14.1	14.1	14.0		
pH	6.47	6.41	6.38	6.36	6.30		
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	240	242	238	216	227		
DISSOLVED OXYGEN (mg/L)							
eH(MV)Pt-AgCl ref.							
TURBIDITY/COLOR							
ODOR	Mod	HC					
DEPTH OF PURGE INTAKE (FT)	~16						
DEPTH TO WATER DURING PURGE (FT)	-						
NUMBER OF CASING VOLUMES REMOVED	~1						
DEWATERED?	N						

Groundwater Purge and Sample Form Date: 5/14/01 **Kennedy/Jenks Consultants**

PROJECT NAME: T. Metals WELL NUMBER: MW-11

PROJECT NUMBER: 996098.00 PERSONNEL:

SAMPLE DATA:

TIME SAMPLED: COMMENTS:

DEPTH SAMPLED (FT):

SAMPLING EQUIPMENT:

SAMPLE NO.	NO. OF CONTAIN-ERS	CON-TAINER TYPE	PRESER-VATIVE	FIELD FILTRA-TION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUS-TODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
1	1	A	N	Y	L	clear		YES	PAH	

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): COMMENTS:

DISPOSAL METHOD:

DRUM DESIGNATION(S)/VOLUME PER (GAL):

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: YES NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: YES NO

WELL CASING OK?: YES NO

COMMENTS:

GENERAL:

WEATHER CONDITIONS: Rainy

TEMPERATURE (SPECIFY °C OR °F): 54°

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING?

cc: Project Manager:
Job File:
Other:

F-43.2 (5-89)

Page 2 of 2

Groundwater Purge and Sample Form Date: 7/4/01 **Kennedy/Jenks Consultants**

PROJECT NAME: T. Metals WELL NUMBER: MW-10

PROJECT NUMBER: 996078.00 PERSONNEL: JS

STATIC WATER LEVEL (FT): 7.02 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: Heron PURGE METHOD: Peristaltic

TIME START PURGE: 1:15 PURGE DEPTH (FT)

TIME END PURGE:

TIME SAMPLED: 1:40

COMMENTS:

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	CASING VOLUME (GAL)
	20	-	7.02	=	12.98	X	0.16	0.64	1.44	=	2.07

TIME	120	125	130	135			
VOLUME PURGED (GAL)	1/2	1	1 1/2	2			
PURGE RATE (GPM)							
TEMPERATURE (°C)	14.3	14.1	13.9	13.8			
pH	6.27	6.23	6.24	6.21			
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	272	274	271	269			
DISSOLVED OXYGEN (mg/L)							
eH(MV)Pt-AgCl ref.							
TURBIDITY/COLOR	clear						
ODOR	Mod						
DEPTH OF PURGE INTAKE (FT)	~16						
DEPTH TO WATER DURING PURGE (FT)							
NUMBER OF CASING VOLUMES REMOVED	~1						
DEWATERED?	N						

Groundwater Purge and Sample Form Date: 5/4/01 **Kennedy/Jenks Consultants**

PROJECT NAME: T. Metals WELL NUMBER: MW-10

PROJECT NUMBER: 996098.00 PERSONNEL:

SAMPLE DATA:

TIME SAMPLED: COMMENTS:

DEPTH SAMPLED (FT):

SAMPLING EQUIPMENT:

SAMPLE NO.	NO. OF CONTAIN-ERS	CON-TAINER TYPE	PRESER-VATIVE	FIELD FILTRA-TION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUS-TODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
1	1	A	N	Y	L	clear		Y	PAH	

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): COMMENTS:

DISPOSAL METHOD:

DRUM DESIGNATION(S)/VOLUME PER (GAL):

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: YES NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: YES NO

WELL CASING OK?: YES NO

COMMENTS:

GENERAL:

WEATHER CONDITIONS: Rainy

TEMPERATURE (SPECIFY °C OR °F): 59°

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING?

cc: Project Manager:
Job File:
Other:

Groundwater Purge and Sample Form Date: 5/4/01 **Kennedy/Jenks Consultants**

PROJECT NAME: T. METALS WELL NUMBER: MW-8

PROJECT NUMBER: 996098.00 PERSONNEL:

STATIC WATER LEVEL (FT): 9.19 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: Heron PURGE METHOD: Peristaltic

TIME START PURGE: 1:50 PURGE DEPTH (FT)

TIME END PURGE:

TIME SAMPLED: 2:20

COMMENTS:

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	CASING VOLUME (GAL)
	23.5		9.19		14.31		0.16	0.64	1.44		2.28

TIME	2:00	2:05	2:10	2:15			
VOLUME PURGED (GAL)	1	1½	2	2½			
PURGE RATE (GPM)							
TEMPERATURE (°C)	14.4	14.3	14.1	13.9			
pH	6.72	6.69	6.61	6.63			
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	452	448	442	437			
DISSOLVED OXYGEN (mg/L)							
eH(MV)Pt-AgCl ref.							
TURBIDITY/COLOR	Clear						
ODOR	MOD HC						
DEPTH OF PURGE INTAKE (FT)	~18						
DEPTH TO WATER DURING PURGE (FT)							
NUMBER OF CASING VOLUMES REMOVED	~1						
DEWATERED?	N						

Groundwater Purge and Sample Form Date: 5/14/01 **Kennedy/Jenks Consultants**

PROJECT NAME: T. Metals WELL NUMBER: MW-8

PROJECT NUMBER: 996098.00 PERSONNEL:

SAMPLE DATA:

TIME SAMPLED: COMMENTS:

DEPTH SAMPLED (FT):

SAMPLING EQUIPMENT:

SAMPLE NO.	NO. OF CONTAIN-ERS	CON-TAINER TYPE	PRESER-VATIVE	FIELD FILTRA-TION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUS-TODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
1	1	A	N	Y	L	clear		Y	PAH	

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): COMMENTS:

DISPOSAL METHOD:

DRUM DESIGNATION(S)/VOLUME PER (GAL):

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: (YES) NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: (YES) NO

WELL CASING OK?: (YES) NO

COMMENTS:

GENERAL:

WEATHER CONDITIONS: 54° Raining

TEMPERATURE (SPECIFY °C OR °F): 54°

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING?

cc: Project Manager:
Job File:
Other:

Appendix F

Geotechnical Analytical Reports

REG Lab WMBE
Rosa Environmental & Geotechnical Laboratory, LLC

1001 SW Klickitat Way, Suite 107
Seattle, WA 98134
(206) 287-9122

June 2, 2000

Mr. Ty Schreiner
Kennedy / Jenks Consultants
530 South 336th St.
Federal Way, WA 98003

Subject: REGL Project No.: 1009-003; Kennedy / Jenks Project: Tacoma Metals

Dear Mr. Schreiner;

Samples from the referenced project were received for hydraulic conductivity, grain size distribution, cation exchange capacity and organic carbon analysis on May 15, 1998. The TOC and CEC analyses were subcontracted to Analytical Resources Inc. The results of the analysis are discussed on the attached narrative and summary tables.

Please call me to discuss any questions, or comments you may have on the data or its presentation.

Best Regards,
Rosa Environmental & Geotechnical Laboratory, LLC.

Harold Benny
QA Manager

REG Lab WMBE
Rosa Environmental & Geotechnical Laboratory, LLC

1001 SW Klickitat Way, Suite 107
Seattle, WA 98134
(206) 287-9122

Client: Kennedy Jenks Consultants, Inc.	REGL Project No.: 1009-003
Client Project: Tacoma Metals	Sample Batch No.: 1009-003-01

Case Narrative

1. Four samples were received on May 15, 2000 for analysis.
2. The samples were sub-sampled for the organic carbon and cation exchange capacity tests, which were sub contracted to Analytical Resources, Inc. Their report is attached.
3. The samples were visually examined to determine the most appropriate hydraulic conductivity test method. Two were selected for rigid wall tests and two were selected for flexible wall tests.
4. Sample NMW-1-10 was selected for flexible wall testing, based on the apparent grain size. The sample was a fine sand with silt lenses. Afterward, it was apparent that this sample could have been run on the rigid wall apparatus, and the charges reflect this. See enclosed disk for digital images of this sample. The orientation of the silt lenses in the sample might indicate some disturbance during the sampling effort. The saturation and porosity were calculated using an assumed specific gravity of 2.65.
5. Sample NMW-1-15, a fairly dense black sand, was selected for rigid wall testing. It was a little disturbed, from lying on its side during transport to our lab. The disturbed portion was mostly removed for the TOC/CEC analysis. The saturation and porosity were calculated using an assumed specific gravity of 2.75, which is consistent with a basalt sand. The test remains for this sample are being returned to you, per your request.
6. Sample NMW-2-0 was selected for rigid wall testing. This sample contained mostly debris, including metal shavings, a large lump of metal, glass, and other material. The large lump of metal had a white oxide residue on it and was very dense. It was assumed that this was lead. The saturation and porosity were calculated using an assumed specific gravity of 2.80, to account for all of the metal in the sample.
7. Sample NMW-3-5 was selected for flexible wall testing, based on the apparent grain size. The sample was a fine sand with silt lenses, and wood chunks throughout. See the enclosed disk for digital images of this sample. The orientation of the silt lenses in the sample might indicate some disturbance during the sampling effort. The saturation and porosity were calculated using an assumed specific gravity of 2.65. However, this led to very low saturation values so the specific gravity was measured and found to be 2.59, which is consistent with the wood content of the sample.
8. The grain size analyses were run according to ASTM D-422. Samples NMW-1-15 was run on the sieve only portion of the analysis, the others were run on sieve and hydrometer.
9. There were no other anomalies in the samples or methods on this project.

Approved by: _____ Date: 6/2/00
Title: Laboratory Manager

CCI Analytical Laboratories, Inc.
3229 Pine Street
Everett, WA 98201
Phone (425) 252-2620
(206) 292-9059 Seattle
(425) 259-6289 Fax

Chain Of Custody/ Laboratory Analysis Request

CCI Job# (Laboratory Use Only) 005063

Date 5/12/00 Page 3 Of 3

PROJECT ID: TACOMA METALS
REPORT TO COMPANY: KENNEDY/JENKS CONSULTANTS
PROJECT MANAGER: TY SCHREINER
ADDRESS: 530 SOUTH 336th ST
FEDERAL WAY, WA 98003
PHONE: (253) 927-8688 FAX: (253) 952-3435
INVOICE TO COMPANY: SAME AS ABOVE (K/J)
ATTENTION: TY SCHREINER
ADDRESS: SAME

P.O. NUMBER CCI QUOTE:

ANALYSIS REQUESTED / OTHER (Specify)

SAMPLE I.D.	DATE	TIME	TYPE	LAB#	NWTPH-GX	BTEX	NWTPH-DX	NWTPH-HCID	EPA 8021 ☐ 602 ☐	EPA 8010 ☐ 601 ☐	EPA 8260 ☐ 624 ☐	EPA 8270 ☐ 625 ☐	EPA 8081/8082 ☐ 608 ☐ PCB only ☐ Pest only ☐	Metals Priority Pollutant ☐ RCRA ☐ TAL ☐	Metals Other (Specify)	TCLP-Metals ☐ VOA ☐ Semi-Vol ☐ Pest ☐ Herbs ☐	Vertical conductivity (ASTM D4422)	Soil grain size (ASTM D2434)	Organic carbon content (EPA 415.2)	Cation Exchange Capacity (EPA 9081A)						NUMBER OF CONTAINERS 2"Ø Tubes	RECEIVED IN GOOD CONDITION?
1. NMW-1-10	5/9	10:00a	SOIL														X	X	X	X						1	
2. NMW-1-15	↓	10:20a	↓														X	X	X	X						1	
3. NMW-2-0		11:30a																	X	X						1	
4. NMW-3-5		1:30p															X	X	X	X						1	
5.																											
6. RETURN																											
7. ALL																											
8. K/J ICE PACKS																											
9.																											
10.																											

SEND THESE SAMPLES TO:
ROSA ENVIRONMENTAL LABORATORY, LLC
1001 SW KLICKITAT WAY, SUITE 107
SEATTLE, WA 98134
(206) 287-9122

SPECIAL INSTRUCTIONS HAVE ROSA FAX TO KENNEDY/JENKS, ATTN: TY SCHREINER. SHIP VERTICALLY

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: K/J 5/12/00 2:00pm
Received By: CCI 5/12/00 [illegible]
2. Relinquished By: CCI 5/15/00 11:45
Received By: MARC ROSA ROSA 5/15/00 11:45

TURNAROUND REQUESTED in Business Days*

Organic, Metals & Inorganic Analysis: 10 (Standard) 5 3 2 1 SAME DAY

Fuels & Hydrocarbon Analysis: 5 (Standard) 3 1 SAME DAY

OTHER: Specify: RETURN YELLOW COPY TO K/J WHEN FORM COMPLETED

ANALYTICAL RESOURCES INCORPORATED

QA Report - Matrix Spike/Matrix Spike Duplicate Analysis

QC Report No: BR07-REGL, LLC
Matrix: Soil
Project: 1009-003
Date Received: 05/19/00

Data Release Authorized:
Reported: 05/31/00 Dr. M.A. Perkins

MATRIX SPIKE QA/QC REPORT
CONVENTIONALS

Constituent	Units	Sample Value	Spike Value	Spike Added	Recovery
ARI ID: 00-7858, BR07 B	**Client Sample ID: NMW-1-10 10.5-11**				
Total Organic Carbon	Percent	0.989	2.84	2.11	87.8%

MS/MSD Recovery Limits: 75 - 125 %

ANALYTICAL RESOURCES INCORPORATED

QA Report - Replicate Analysis

QC Report No: BR07-REGL, LLC
Project: 1009-003
Date Received: 05/19/00

Matrix: Soil

Data Release Authorized:
Reported: 05/31/00 Dr. M.A. Perkins

DUPLICATE ANALYSIS RESULTS
CONVENTIONALS

Constituent	Units	Sample Value	Duplicate Value	RPD
ARI ID: 00-7858, BR07 B	**Client Sample ID: NMW-1-10 10.5-11**			
Total Solids	Percent	69.6	69.6	RPD: 0.0%
Total Organic Carbon	Percent	0.99	0.89	RPD: 10.6%
ARI ID: 00-7860, BR07 D	**Client Sample ID: NMW-1-15 15.5-16**			
Cation Exchange Capacity	meq/100 g	2.4	2.4	0.0%

ANALYTICAL RESOURCES INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: NMW-3-5 6-6.5

Lab Sample ID: BR07A
LIMS ID: 00-7857
Matrix: Soil

QC Report No: BR07-REGL, LLC
Project: 1009-003

Date Sampled: 05/18/00
Date Received: 05/19/00

Data Release Authorized:
Reported: 05/31/00 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	05/22/00 05220#1	EPA 160.3 SM 2540 B		0.01	Percent	54.8
Cation Exchange Capacity	05/25/00 05250#1	1N NH4OAc pH 7			meq/100 g	26
Total Organic Carbon	05/30/00 05300#1	Plumb,1981		0.0050	Percent	7.3

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for BR07 received 05/19/00

ANALYTICAL RESOURCES INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: NMW-1-10 10.5-11

Lab Sample ID: BR07B
LIMS ID: 00-7858
Matrix: Soil

QC Report No: BR07-REGL, LLC
Project: 1009-003

Date Sampled: 05/18/00
Date Received: 05/19/00

Data Release Authorized: MB
Reported: 05/31/00 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	05/22/00 05220#1	EPA 160.3 SM 2540 B		0.01	Percent	69.6
Cation Exchange Capacity	05/25/00 05250#1	1N NH4OAc pH 7			meq/100 g	6.5
Total Organic Carbon	05/30/00 05300#1	Plumb,1981		0.0050	Percent	0.99

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for BR07 received 05/19/00

ANALYTICAL RESOURCES INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: NMW-2-0 0.5-1

Lab Sample ID: BR07C
LIMS ID: 00-7859
Matrix: Soil

QC Report No: BR07-REGL, LLC
Project: 1009-003

Date Sampled: 05/18/00
Date Received: 05/19/00

Data Release Authorized:
Reported: 05/31/00 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	05/22/00 05220#1	EPA 160.3 SM 2540 B		0.01	Percent	93.1
Cation Exchange Capacity	05/25/00 05250#1	1N NH4OAc pH 7			meq/100 g	4.9
Total Organic Carbon	05/30/00 05300#1	Plumb,1981		0.0050	Percent	16

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for BR07 received 05/19/00

ANALYTICAL RESOURCES INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: NMW-1-15 15.5-16

Lab Sample ID: BR07D
LIMS ID: 00-7860
Matrix: Soil

QC Report No: BR07-REGL, LLC
Project: 1009-003

Date Sampled: 05/18/00
Date Received: 05/19/00

Data Release Authorized:
Reported: 05/31/00 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	05/22/00 05220#1	EPA 160.3 SM 2540 B		0.01	Percent	82.8
Cation Exchange Capacity	05/25/00 05250#1	1N NH4OAc pH 7			meq/100 g	2.4
Total Organic Carbon	05/30/00 05300#1	Plumb,1981		0.0050	Percent	0.47

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for BR07 received 05/19/00

ANALYTICAL RESOURCES INCORPORATED

QA Report - Method Blank Analysis

QC Report No: BR07-REGL, LLC
Matrix: Soil
Project: 1009-003
Date Received: NA

Data Release Authorized: MB
Reported: 05/31/00 Dr. M.A. Perkins

METHOD BLANK RESULTS
CONVENTIONALS

Analysis Date & Batch	Constituent	Units	Result
Method Blank 05/22/00 05220#1	Total Solids	mg residue	< 1.00 U
Method Blank 05/30/00 05300#1	Total Organic Carbon	Percent	<0.0050 U

00-7857 to 00-7860 BRO

CHAIN OF CUSTODY RECORD & LABORATORY ANALYSIS REQUEST

Date: 5/18/00 Page: 1 of: 1

REGL Job ID 1009-003

4.0

Rosa Environmental & Geotechnical Laboratory, LLC
~~400 Ninth Avenue North, Suite B, Seattle, WA 98109~~
PH (206) 287-9122 ~~FAX (206) 654-0540~~ 206-264-1995

Client Company: Rosa / Kennedy Jenks
Address:
CONTACT: H Benny
Phone:
Project Name:
Project Number: PO#

Sample receipt
Shipped by:
Number of coolers in shipment:
Custody seals present/intact:
Cooler temperatures:
Bottle seals present/intact:
Client contact w/discrepancies:

Analysis Requested

	Sample ID	Date	Time	Matrix	#Cont	LAB#	TOC	CEC
1	NMW-3-5 6-6.5	5/18/00	10:00	Soil	1		✓	✓
2	NMW-1-10 10.5-11	5/18/00	10:05	↓	1		✓	✓
3	NMW-2-0 0.5-1	5/18/00	10:10	↓	1		✓	✓
4	NMW-1-15 15.5-16	5/18/00	10:15	↓	1		✓	✓
5								
6								
7								
8								
9								
10								

Turnaround requested:
Known hazardous content/rating:
Special instructions/comments:
Data by 6/6/00

Relinquished by:	Relinquished by:	Relinquished by:
Printed name: H. Benny	Printed name:	Printed name:
Company: REGL	Company:	Company:
Date: 5/18/00 Time: 12:40	Date: Time:	Date: Time:
Received by:	Received by:	Received by:
Printed name:	Printed name:	Printed name:
Company:	Company:	Company:
Date: 5/18/00 Time: 1000	Date: Time:	Date: Time:

Limits of Liability: REGL will perform requested services in accordance with appropriate methodology following Standard Operating Procedures, REGL Quality Assurance Program or REGL approved Project Quality Assurance Plans. The total liability of REGL, its members, employees or successors arising out of or in connection with the requested services shall not exceed the invoiced amount of said services. The acceptance by the CLIENT of a proposal for services by REGL releases REGL from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order, or co-signed agreement between REGL and the CLIENT.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

31 May 2000

Harold Benny
Rosa Environmental & Geotechnical Laboratory, L.L.C.
1001 SW Klickitat Way Suite 107
Seattle, Washington 98134

RE: Project: 1009-003
ARI Job No: BR07

Dear Harold:

Please find enclosed the original Chain-of-Custody record and the final results for the samples from the project referenced above. Four soil samples were received on May 19, 2000. The samples were received intact and there were no discrepancies in the paperwork. The samples were analyzed for TOC and CEC as requested.

No analytical complications were encountered for these analyses.

A copy of these reports will be kept on file at ARI. Should you have any questions or problems, please feel free to contact me at your convenience.

Sincerely,

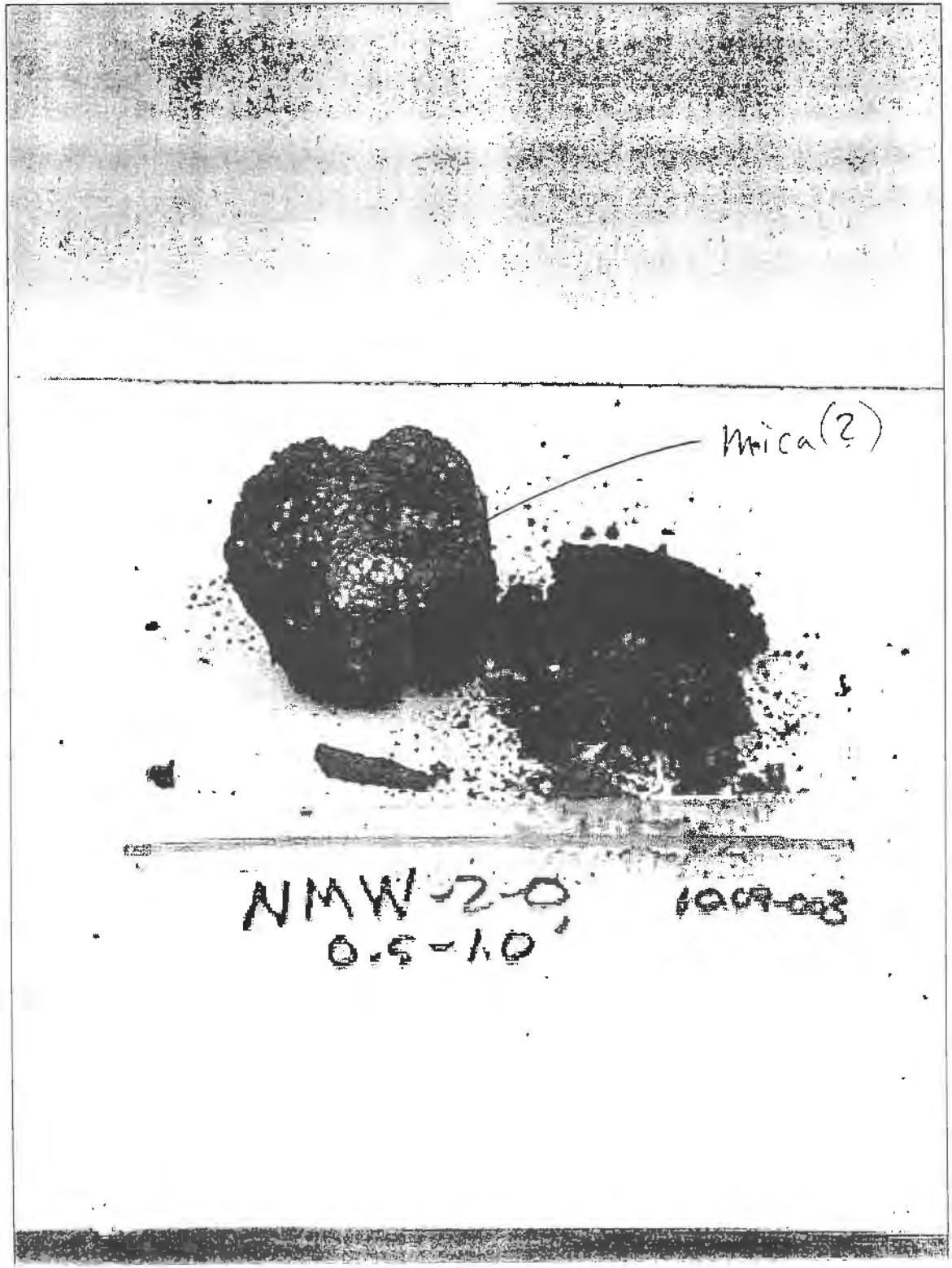
ANALYTICAL RESOURCES, INC.

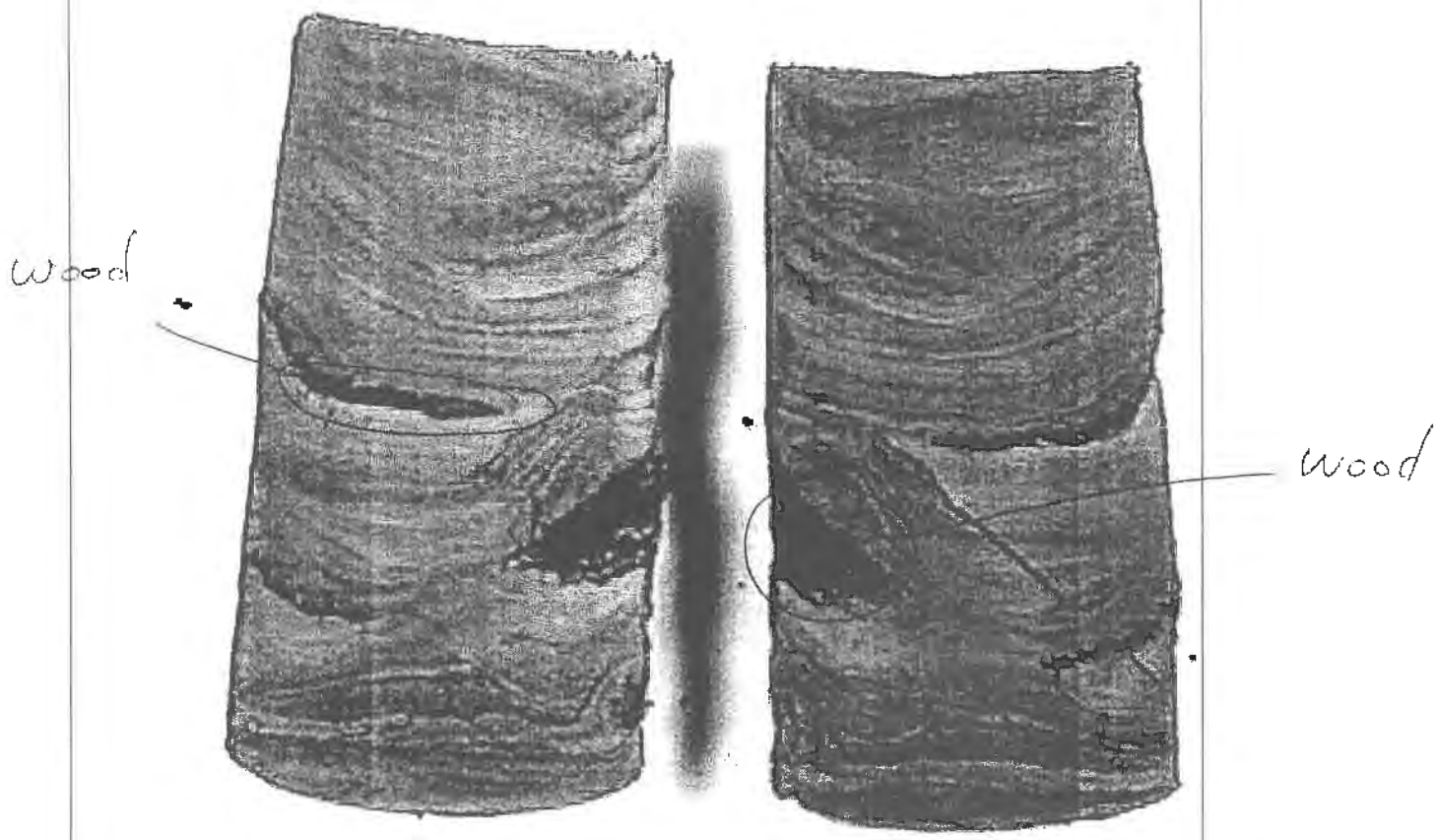
Mark D. Harris
Project Manager
(206) 389-6150
mark@arilabs.com

Enclosures

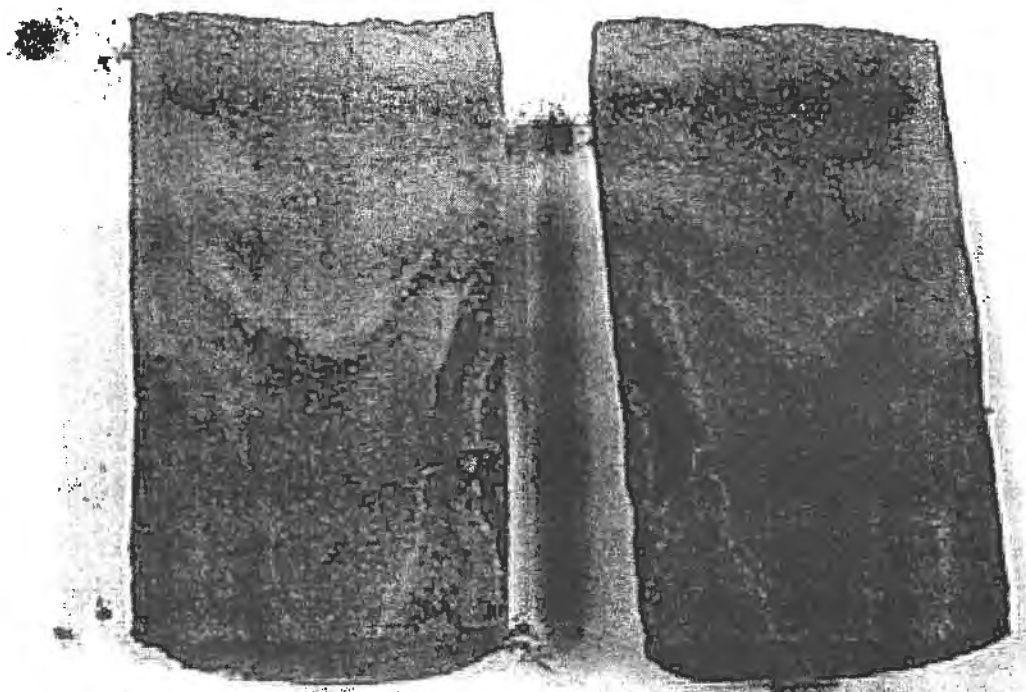
cc: file BR07

MDH/mdh


mica(?)
NMW-2-0
0.5-1.0
1009-003



NMW-3-S 6-6.



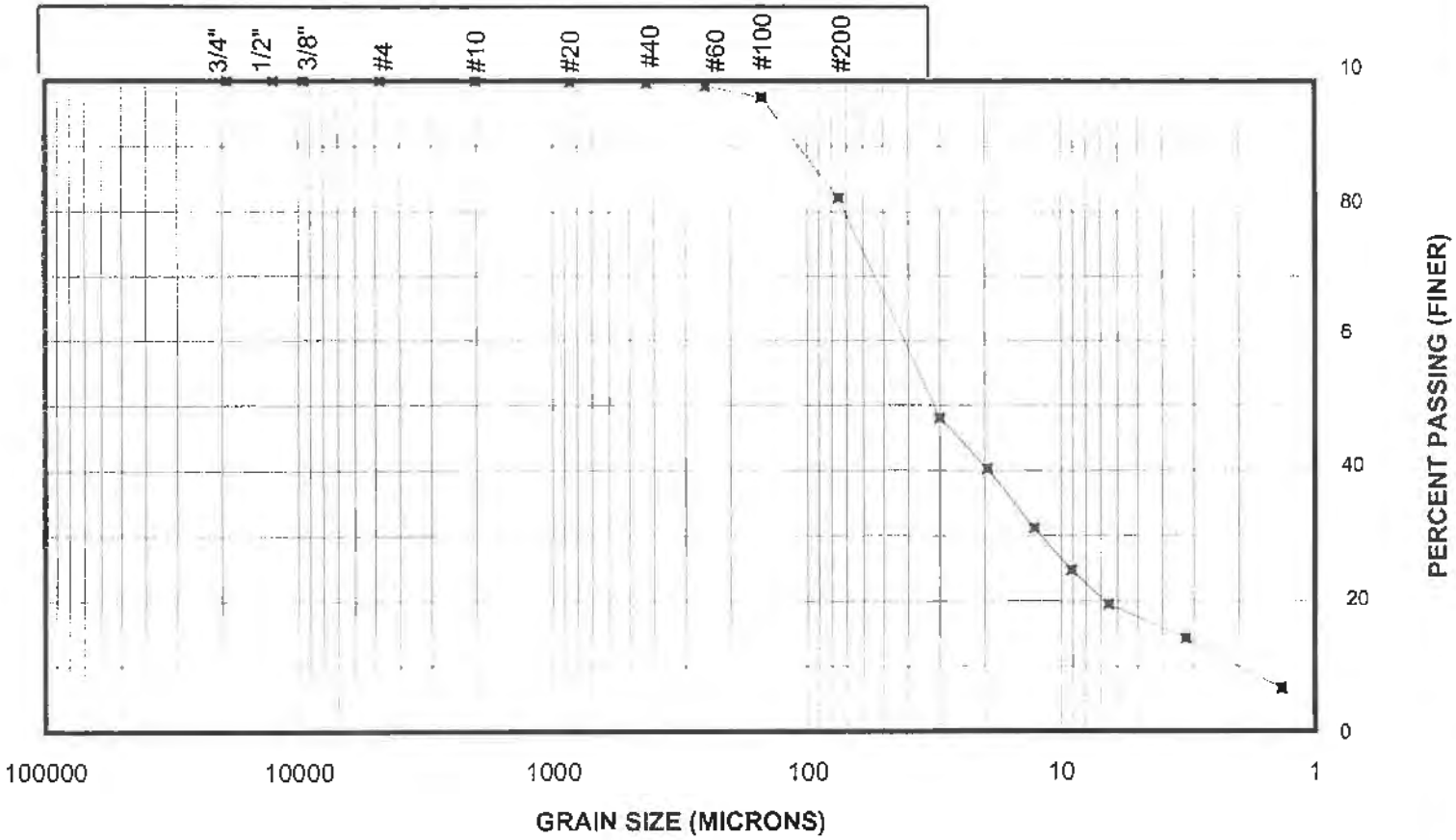
NMW-1-10 1009-003

10.5-11'

ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

ASTM D-422 GRAIN SIZE DISTRIBUTION

Kennedy Jenks Consultants, Inc.
Sample No.: NMW-3-5

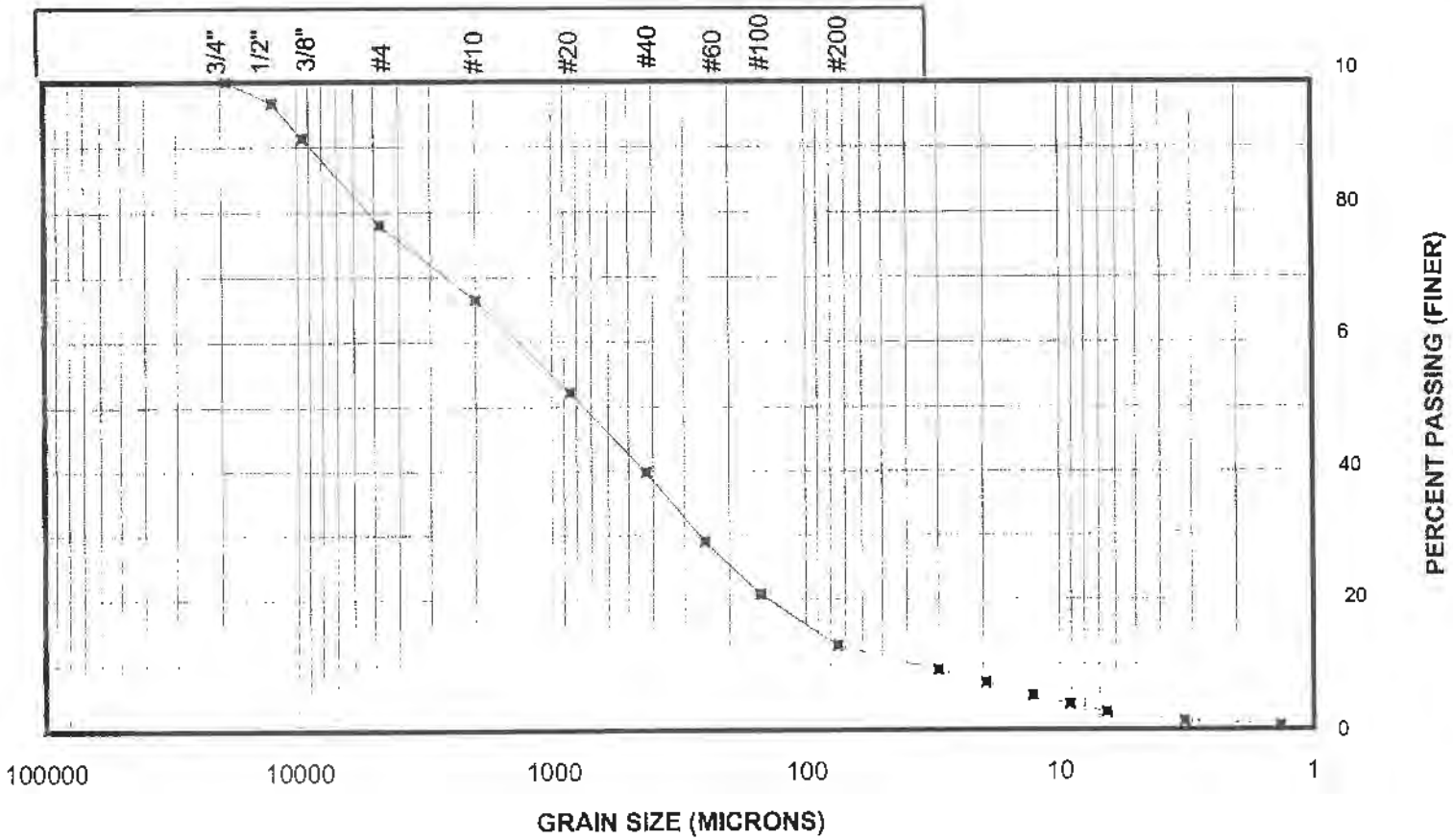


1009-003

ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

ASTM D-422 GRAIN SIZE DISTRIBUTION

Kennedy Jenks Consultants, Inc.
Sample No.: NMW-2-0

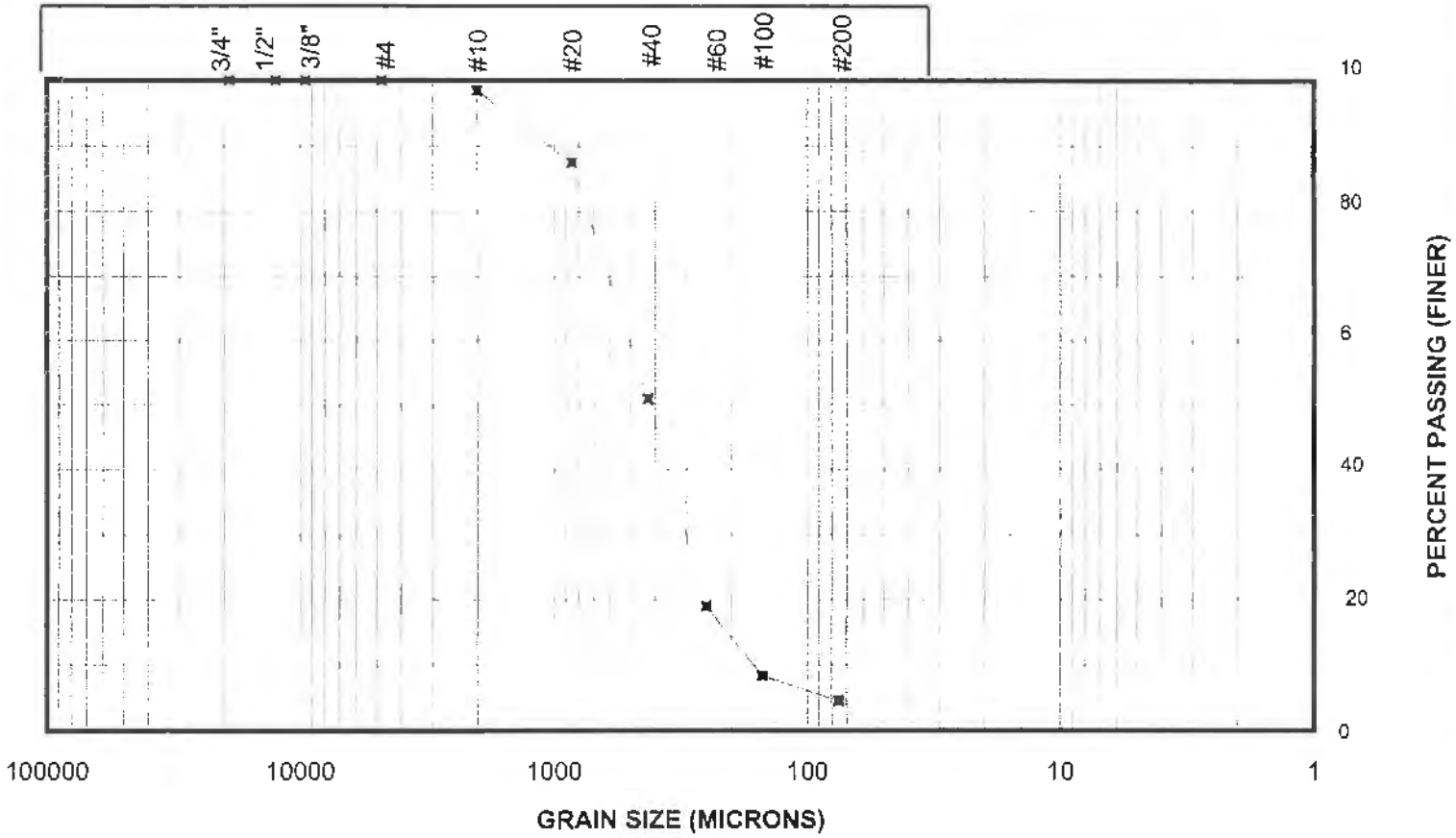


1009-003

ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

ASTM D-422 GRAIN SIZE DISTRIBUTION

Kennedy Jenks Consultants, Inc.
Sample No.: NMW-1-15

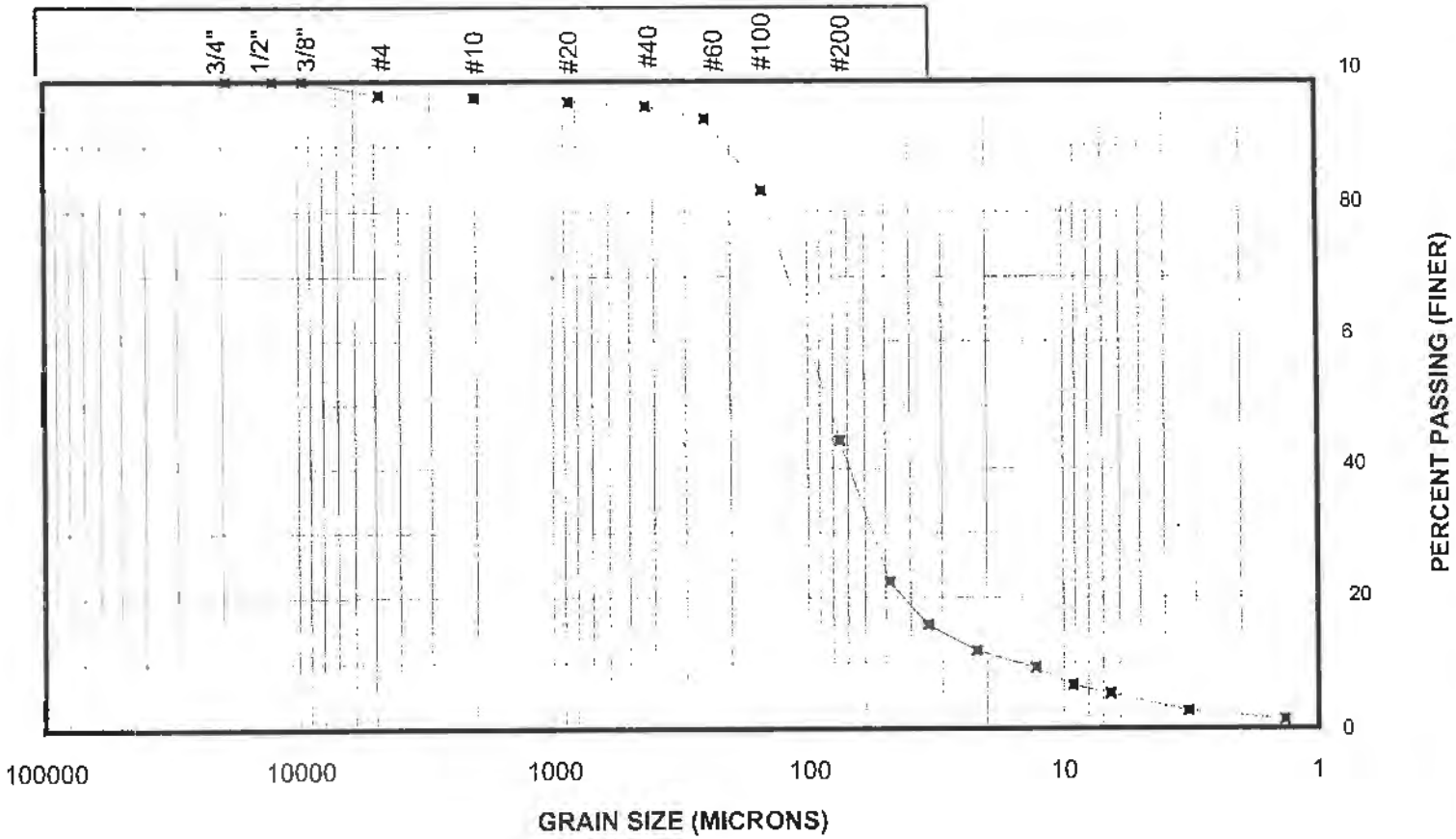


1009-003

ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

ASTM D-422 GRAIN SIZE DISTRIBUTION

Kennedy Jenks Consultants, Inc.
Sample No.: NMW-1-10



1009-003

ROSA ENVIRONMENTAL AND GEOTECHNICAL LABORATORY

Kennedy Jenks Consultants, Inc.
Project: Tacoma Metals

Percent Retained in Each Size Fraction

Sample No.	% Gravel	% Coarse Sand	% Medium Sand	% Fine Sand	% Total Sand	% Silt	% Clay
Size (microns)	> 4750	4750-2000	2000-425	425-75	4750-75	75-3	<3
NMW-2-0	21.9	11.6	26.6	26.9	65.2	11.6	1.3
NMW-3-5	0.0	0.0	0.4	17.4	17.8	75.7	6.5
NMW-1-10	2.2	0.3	1.3	51.8	53.4	41.8	2.6
NMW-1-15	0.0	1.6	47.5	46.4	95.5	NA	NA

Rosa Environmental Geotechnical Laboratory, LLC

Kennedy Jenks Consultants, Inc.
Project: Tacoma Metals

Percent Finer (Passing) Than the Indicated Size

Sieve Size (microns)	1"	3/4"	1/2"	3/8"	#4 (4750)	#10 (2000)	#20 (850)	#40 (425)	#60 (250)	#100 (125)	#200 (75)	32	22	13	9	7	3.2	1.3
NMW-2-0	100.0	100.0	96.7	91.3	78.1	66.5	52.3	39.9	29.1	20.8	12.9	9.1	7.2	5.2	3.9	2.6	1.3	0.7
NMW-3-5	100.0	100.0	100.0	100.0	100.0	100.0	99.8	99.6	99.1	97.4	82.2	40.3	31.2	24.7	19.5	14.3	6.5	2.6
NMW-1-10	100.0	100.0	100.0	100.0	97.8	97.5	96.8	96.2	94.2	83.2	44.4	15.8	11.9	9.2	6.6	5.3	2.6	1.3
NMW-1-15	100.0	100.0	100.0	100.0	100.0	98.4	87.5	50.9	19.0	8.4	4.5	NA	NA	NA	NA	NA	NA	NA

Testing performed according to ASTM D421/D422

ROSA ENVIRONMENTAL AND GEOTECHNICAL LABORATORY

Kennedy Jenks Consultants, Inc.
Tacoma Metals Project

Test Results for Rigid Wall Hydraulic Conductivity Testing

Sample ID	Depth (ft)	Before Parameters				After Parameters				Hydraulic Conductivity cm/s
		Wet Density (lbs/ft^3)	Total Porosity	Saturation	Moisture Content (%)	Wet Density (lbs/ft^3)	Total Porosity	Saturation	Moisture Content (%)	
NMW-1-15	15.-16	128.3	0.39	0.98	22.9	128.6	0.39	0.99	23.3	3.8×10^{-3}
NMW-2-0	0.5-1.0	102.8	0.53	0.25	8.8	127.5	0.53	1.00	34.9	2.0×10^{-2}

Notes:

1. The testing was performed in general accordance with ASTM D-2434.
2. The test was performed using tap water for the permeant.
3. The porosity and the saturation were calculated using estimated specific gravity values. A value of 2.75 was used for NMW-1-15, which is consistent with a balsaltic sand. a value of 2.8 was used for NMW-2-0, to accont for the metal (possibly lead) debris in the sample.
4. See the attached disk for digital pictures of the samples. The portions of the samples are also being returned, as requested.

ROSA ENVIRONMENTAL AND GEOTECHNICAL LABORATORY

Kennedy Jenks Consultants, Inc.
Tacoma Metals Project

Test Results for Flexible Wall Hydraulic Conductivity Testing

Sample ID	Depth (ft)	Before Parameters				After Parameters				Gradient (h/l)	Hydraulic Conductivity (cm/s)
		Wet Density (lbs/ft^3)	Total Porosity	Saturation	Moisture Content (%)	Wet Density (lbs/ft^3)	Total Porosity	Saturation	Moisture Content (%)		
NMW-1-10	10.5-11	113	0.480	0.90	31.3	120	0.438	0.99	29.0	2.80	3.2×10^{-5}
NMW-3-5	6-6.5	103	0.552	0.88	41.5	111	0.510	0.98	39.3	2.90	8.3×10^{-7}

Notes:

1. Testing was conducted according to ASTM D-5084.
2. The test was performed using tap water for the permeant.
3. The porosity and the saturation were calculated using an assumed specific gravity of 2.65. However, the final saturation for sample NMW-3-5 was low. The sample specific gravity was measured and found to be 2.59. This is consistent with the wood found in the sample.

Sample Description and Dimensions

Sample ID	Visual Description	Depth (ft)	Confining Pressure (psi)	Initial Average Length (cm)	Initial Average Diameter (cm)	Final Average Length (cm)	Final Average Diameter (cm)
NMW-1-10	Fine Sand With Silt Lenses	10.5-11	9.8	10.71	6.06	9.95	6.04
NMW-3-5		6-6.5	5.0	11.42	6.16	10.86	6.04

ANALYTICAL RESOURCES INCORPORATED

QA Report - Standard Reference Material Analysis

QC Report No: BR07-REGL, LLC
Project: 1009-003
Date Received: NA

Data Release Authorized MC
Reported: 05/31/00 Dr. M.A Perkins

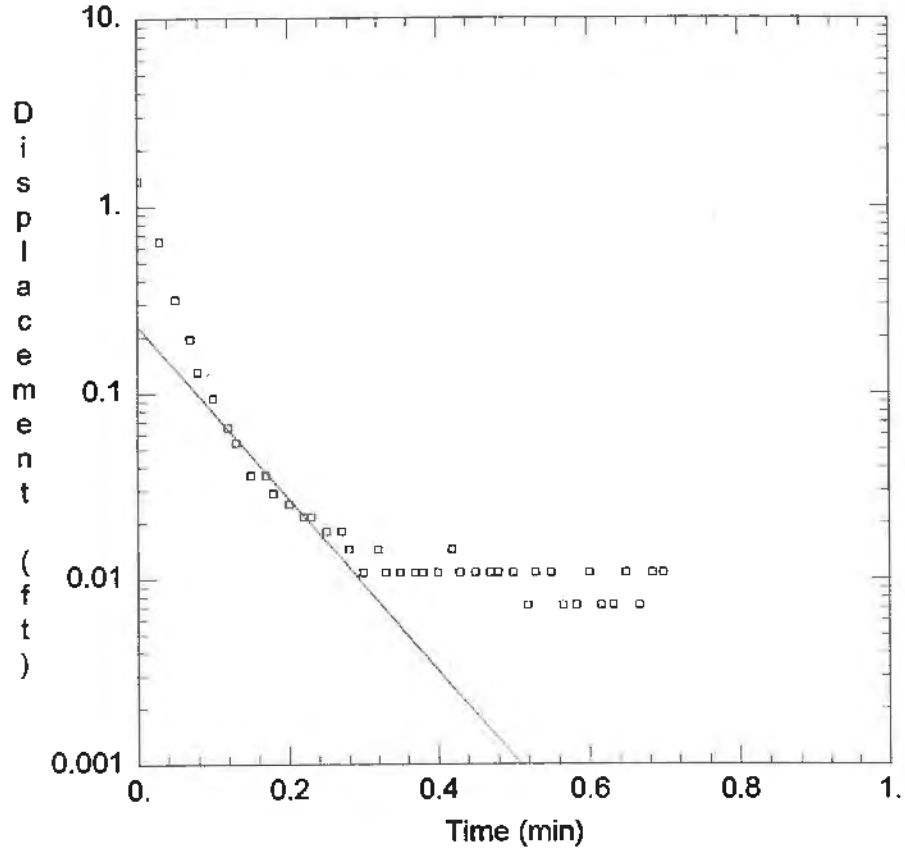
STANDARD REFERENCE MATERIAL ANALYSIS
CONVENTIONALS

Constituent	Units	Value	True Value	Recovery
NBS #2704				
Total Organic Carbon	Percent	3.28	3.35	97.9%

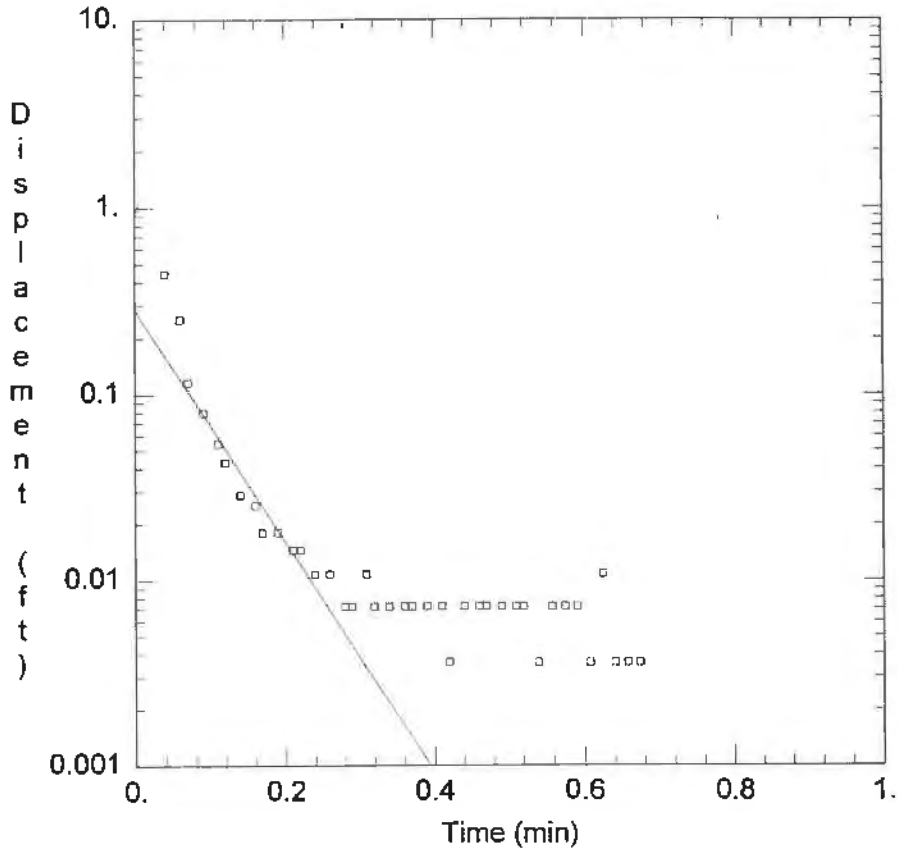
Date analyzed: 05/30/00 Batch ID: 05300#1

Appendix G

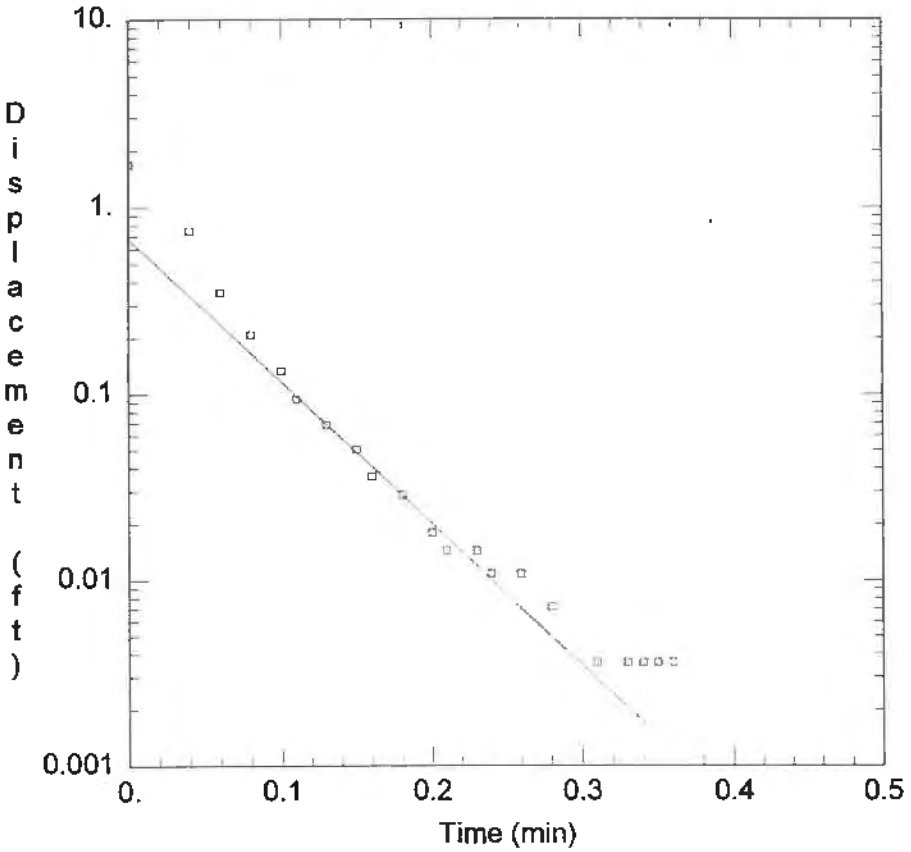
Slug Test Plots



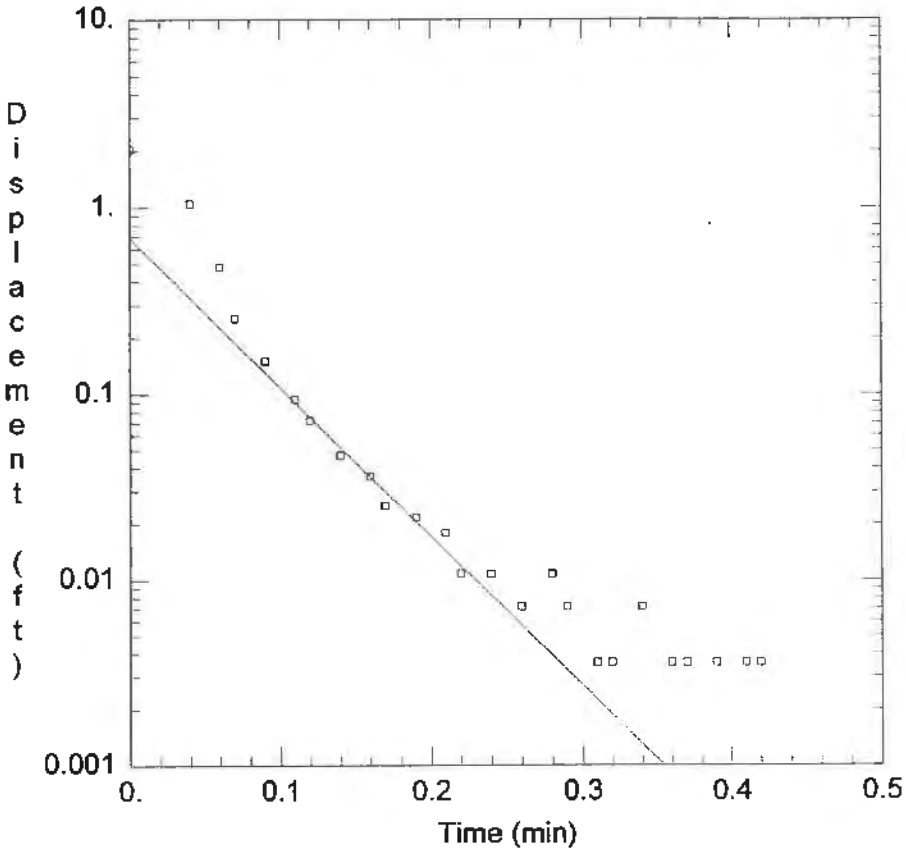
PROJECT INFORMATION	
Test Well: Tacoma Metals MW1-Slug1	
SOLUTION	
Aquifer Model: Unconfined	K = 0.02347 ft/min
Solution Method: Bouwer-Rice	y0 = 0.2292 ft



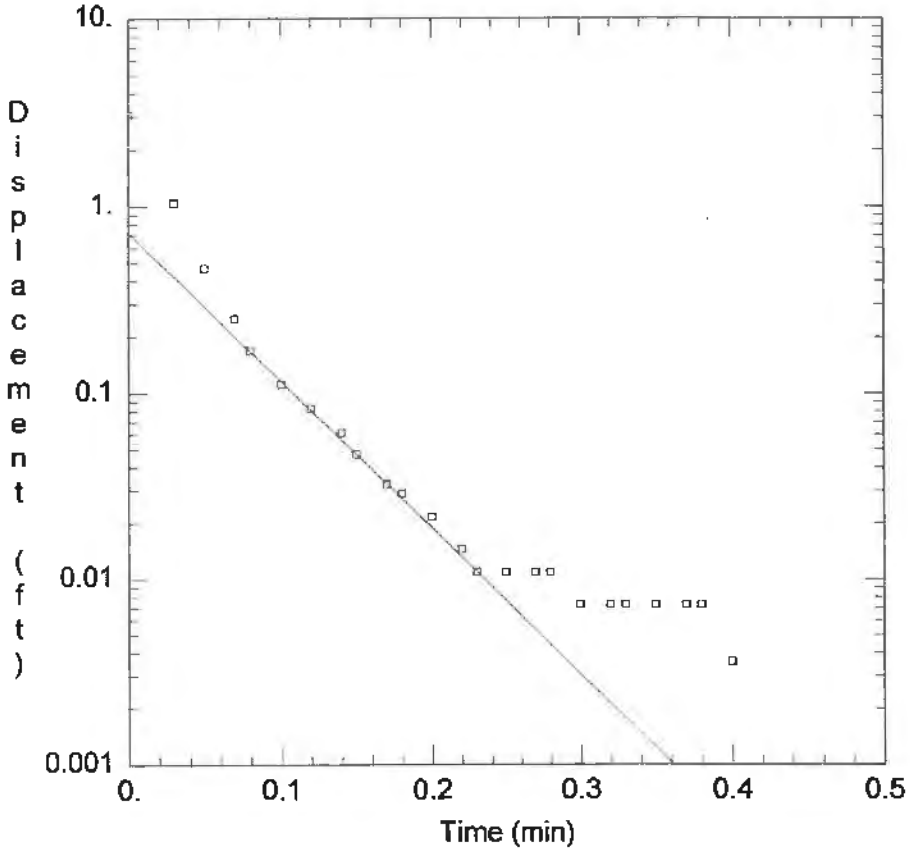
PROJECT INFORMATION	
Test Well: Tacoma Metals MW1-Slug2	
SOLUTION	
Aquifer Model: Unconfined	K = 0.03154 ft/min
Solution Method: Bouwer-Rice	y0 = 0.2843 ft



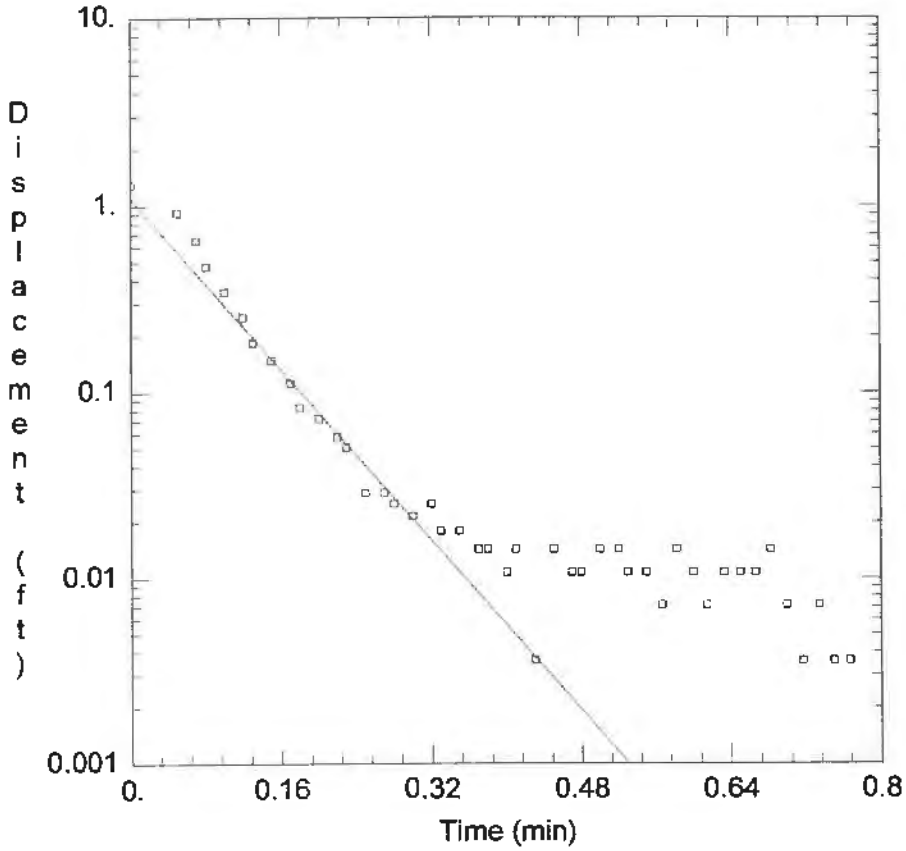
PROJECT INFORMATION	
Test Well: Tacoma Metals MW1-Slug3	
SOLUTION	
Aquifer Model: Unconfined	K = 0.03866 ft/min
Solution Method: Bouwer-Rice	y0 = 0.6786 ft



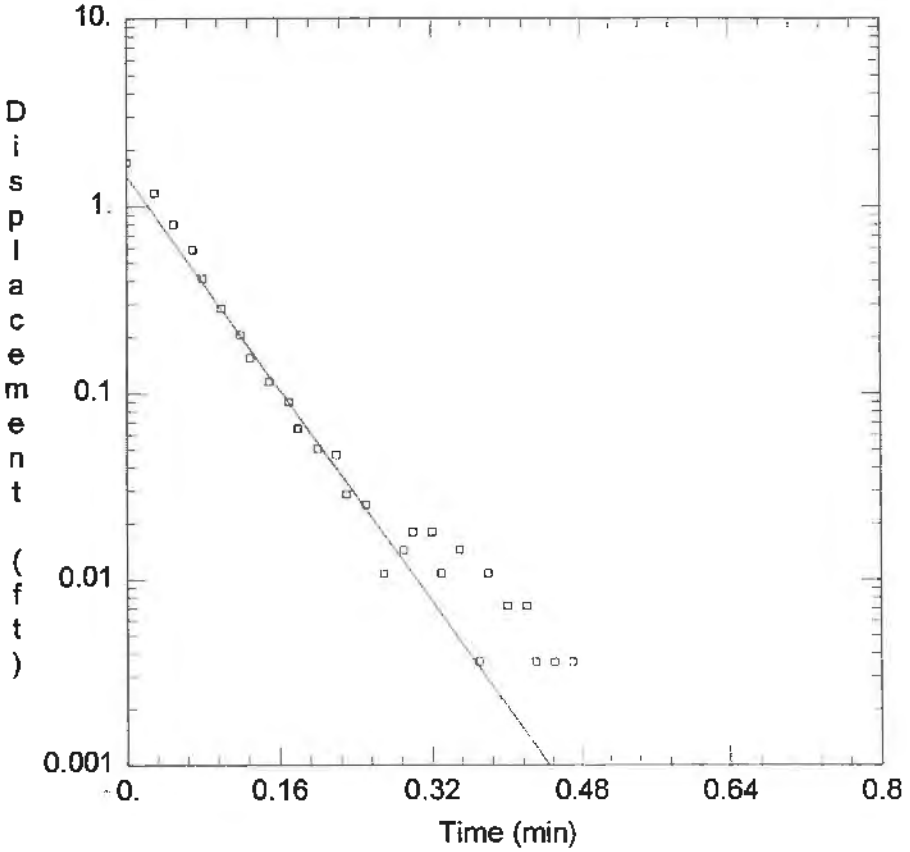
PROJECT INFORMATION	
Test Well: Tacoma Metals MW1-Slug4	
SOLUTION	
Aquifer Model: Unconfined	K = 0.0405 ft/min
Solution Method: Bouwer-Rice	y0 = 0.6836 ft



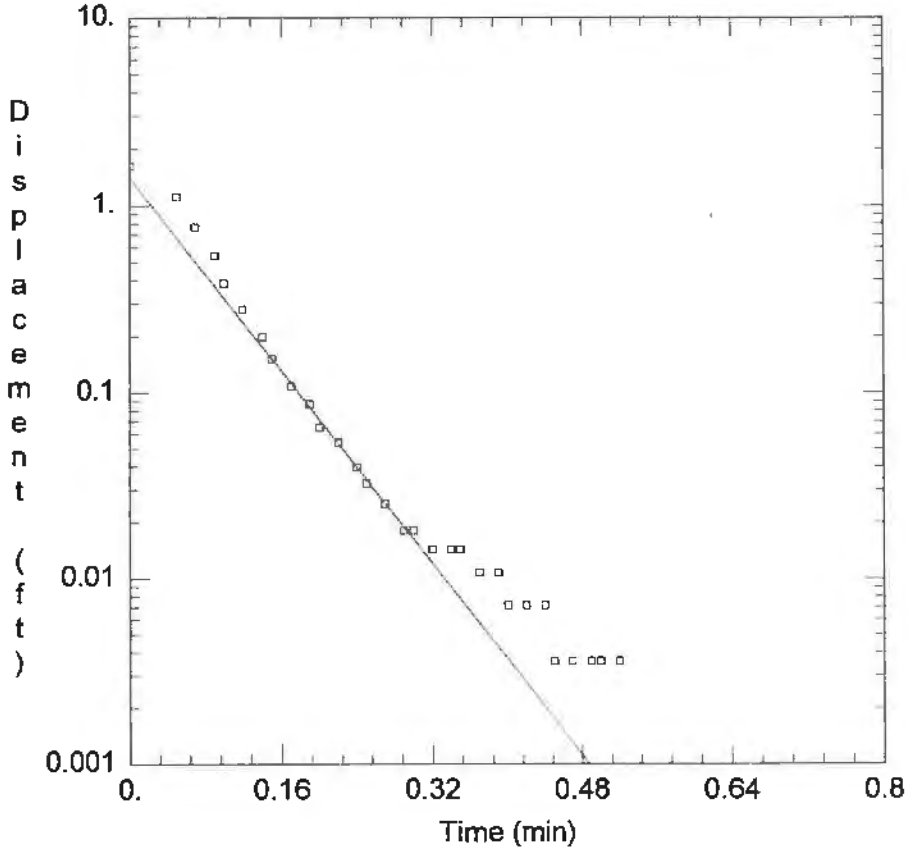
PROJECT INFORMATION	
Test Well: Tacoma Metals MW1-Slug5	
SOLUTION	
Aquifer Model: Unconfined	K = 0.04007 ft/min
Solution Method: Bouwer-Rice	y0 = 0.7236 ft



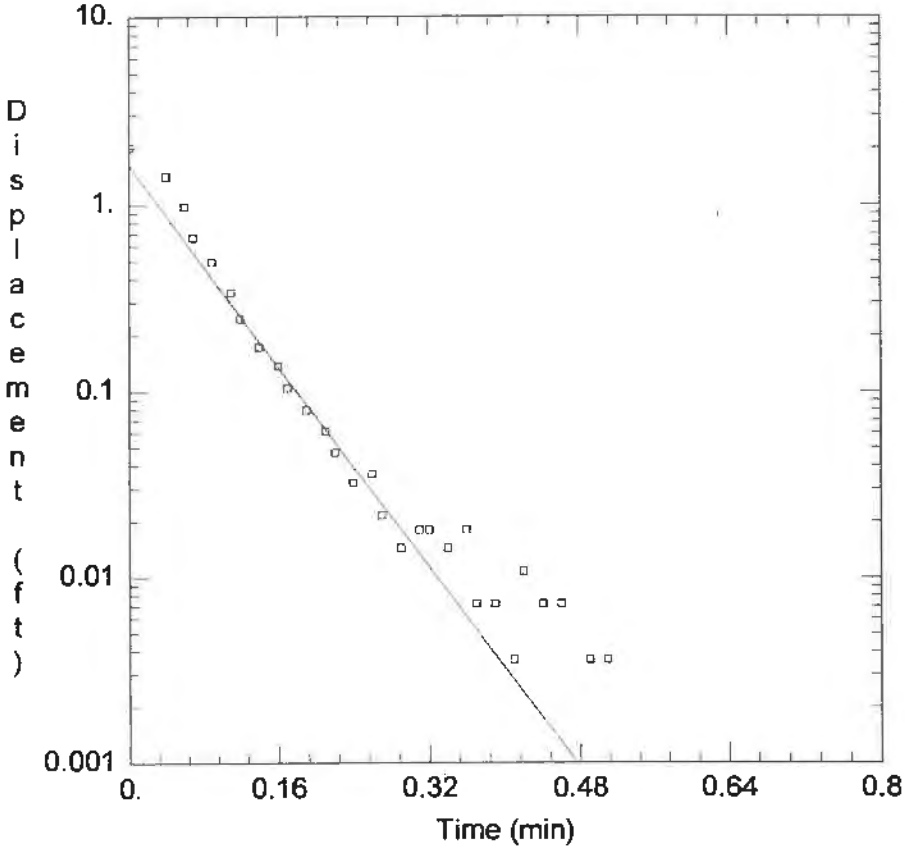
PROJECT INFORMATION	
Test Well: Tacoma Metals MW2-Slug1	
SOLUTION	
Aquifer Model: Unconfined	K = 0.02906 ft/min
Solution Method: Bouwer-Rice	y0 = 1.098 ft



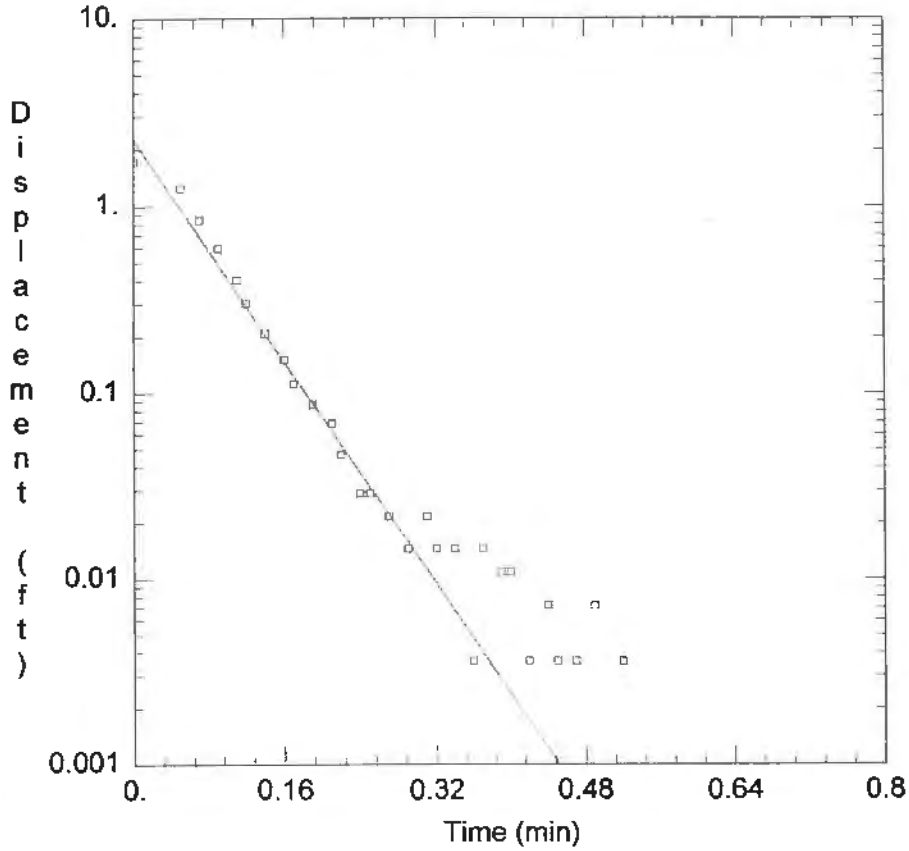
PROJECT INFORMATION	
Test Well: Tacoma Metals MW2-Slug2	
SOLUTION	
Aquifer Model: Unconfined	K = 0.03607 ft/min
Solution Method: Bouwer-Rice	y0 = 1.457 ft



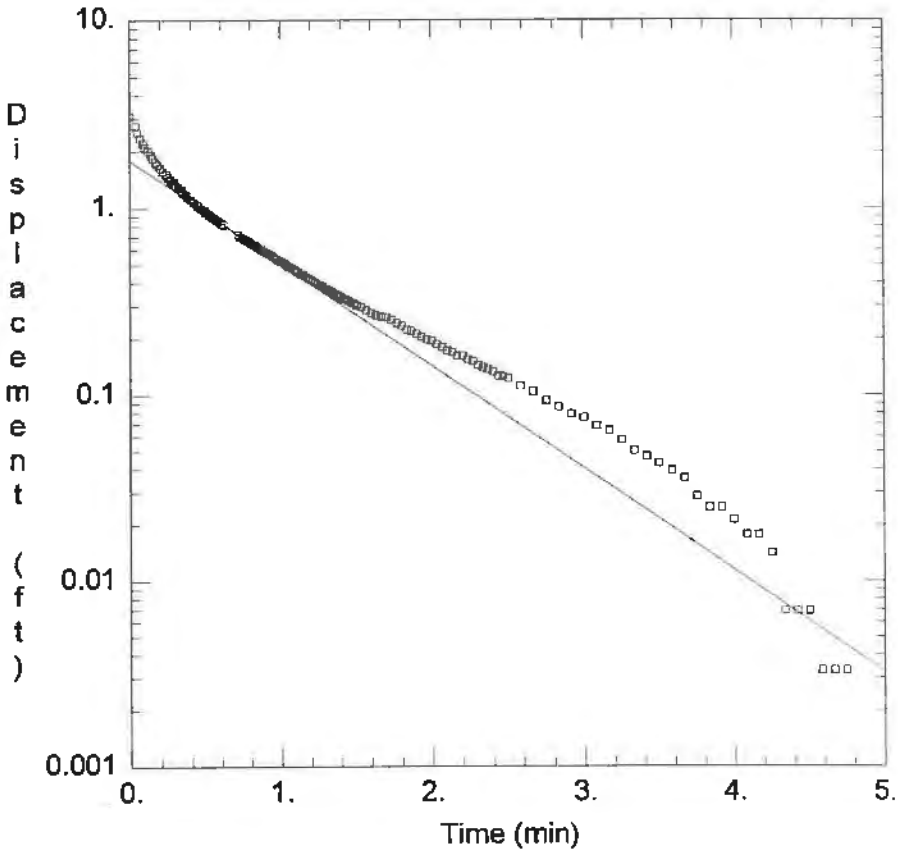
PROJECT INFORMATION	
Test Well: Tacoma Metals MW2-Slug3	
SOLUTION	
Aquifer Model: Unconfined	K = 0.03274 ft/min
Solution Method: Bouwer-Rice	y0 = 1.412 ft



PROJECT INFORMATION	
Test Well: Tacoma Metals MW2-Slug4	
SOLUTION	
Aquifer Model: Unconfined	K = 0.03414 ft/min
Solution Method: Bouwer-Rice	y0 = 1.629 ft



PROJECT INFORMATION	
Test Well: Tacoma Metals MW2-Slug5	
SOLUTION	
Aquifer Model: Unconfined	K = 0.03767 ft/min
Solution Method: Bouwer-Rice	y0 = 2.273 ft



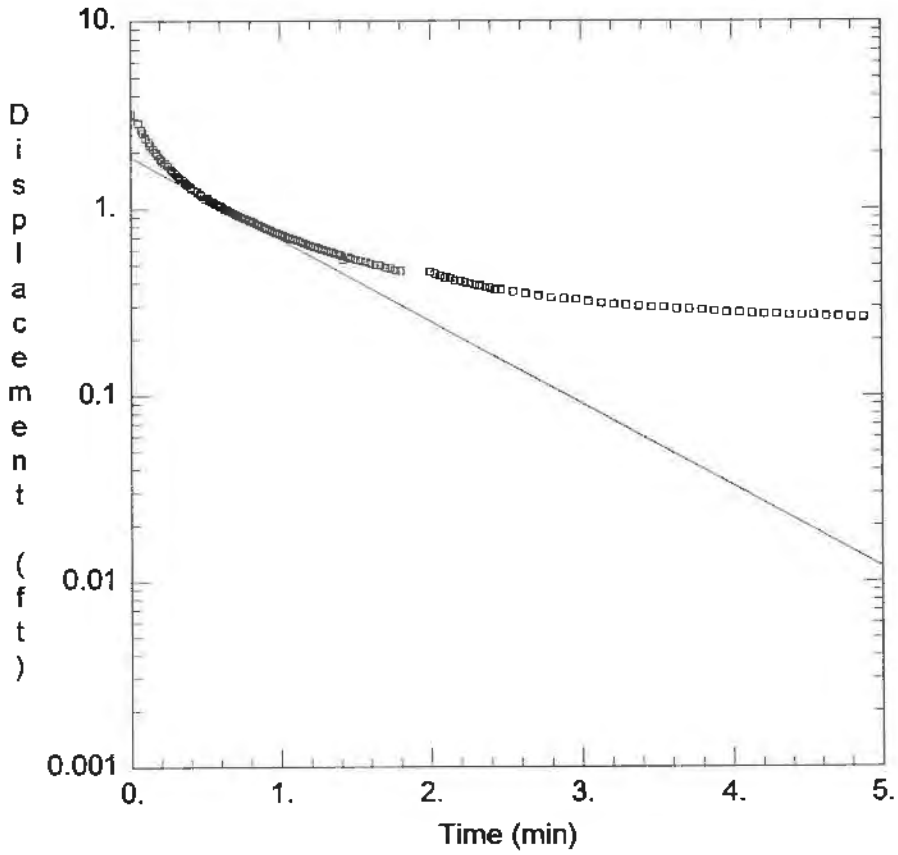
PROJECT INFORMATION

Test Well: Tacoma Metals MW5-Slug1

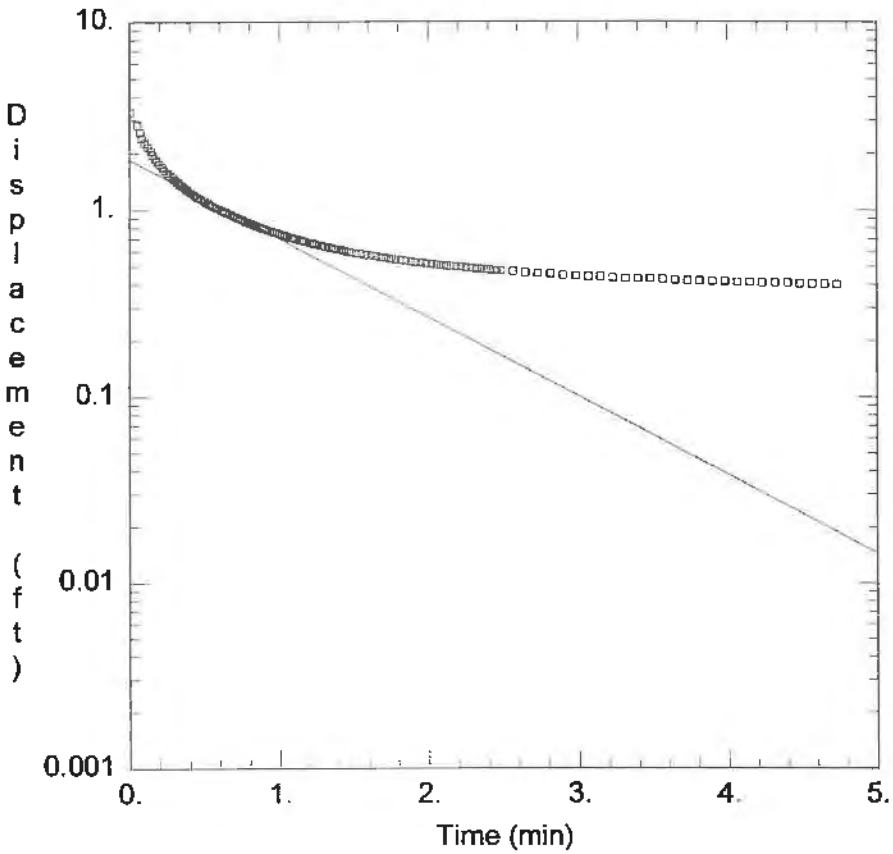
SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

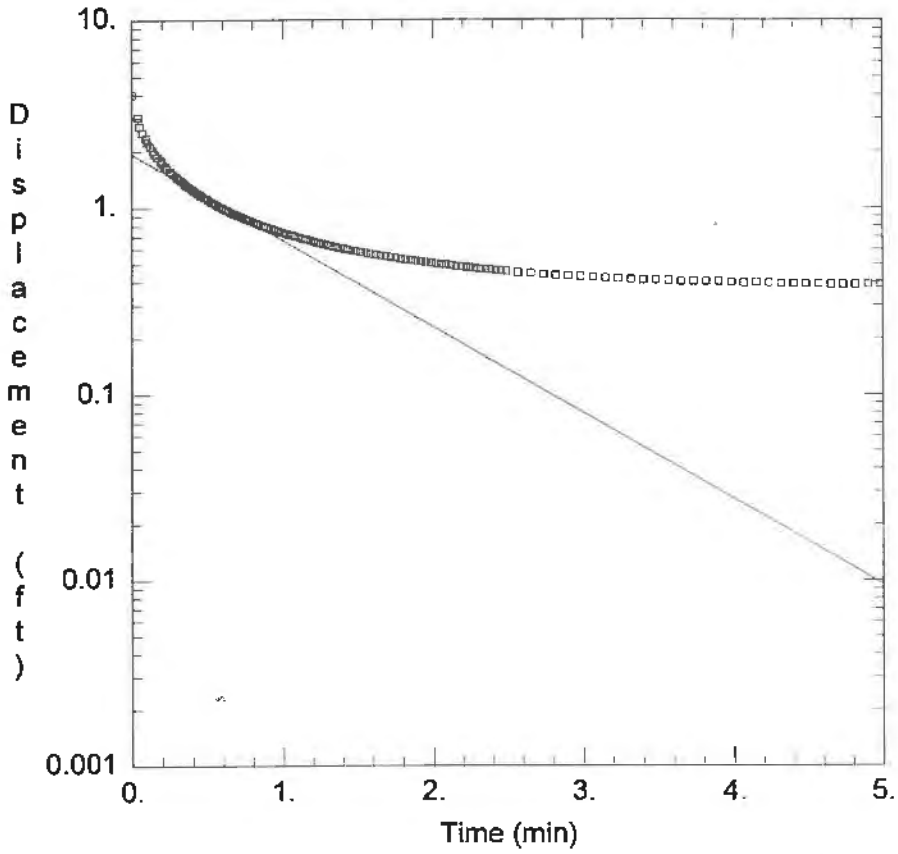
K = 0.002779 ft/min
y0 = 1.801 ft



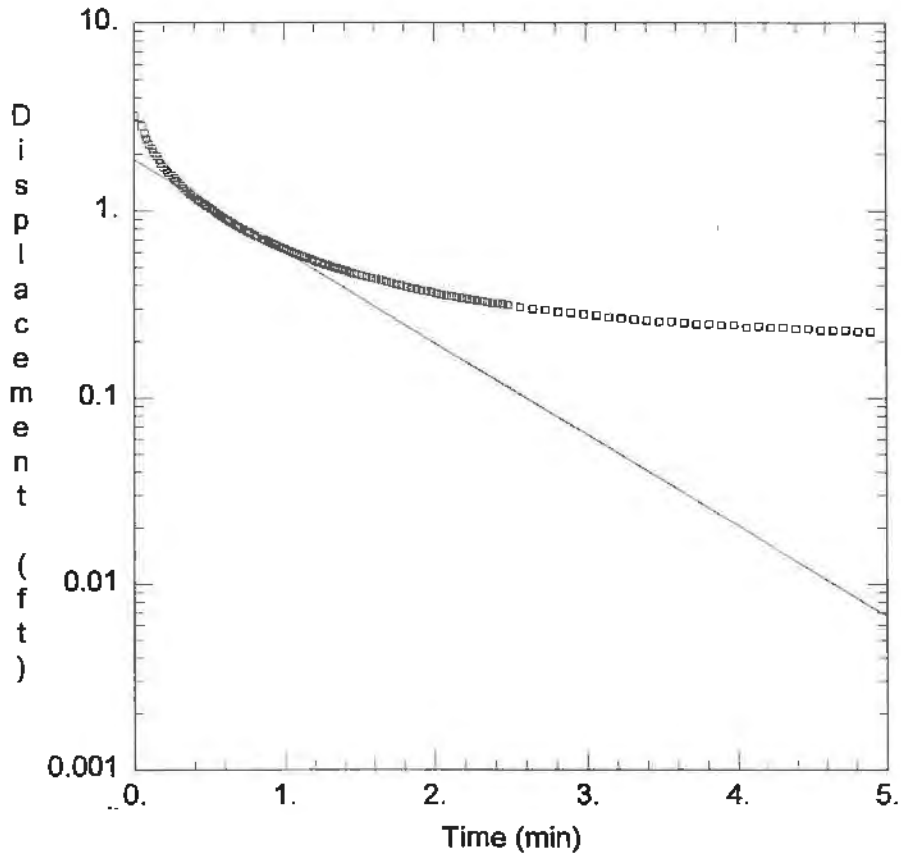
PROJECT INFORMATION	
Test Well: Tacoma Metals MW5-Slug2	
SOLUTION	
Aquifer Model: Unconfined	K = 0.002224 ft/min
Solution Method: Bouwer-Rice	y0 = 1.885 ft



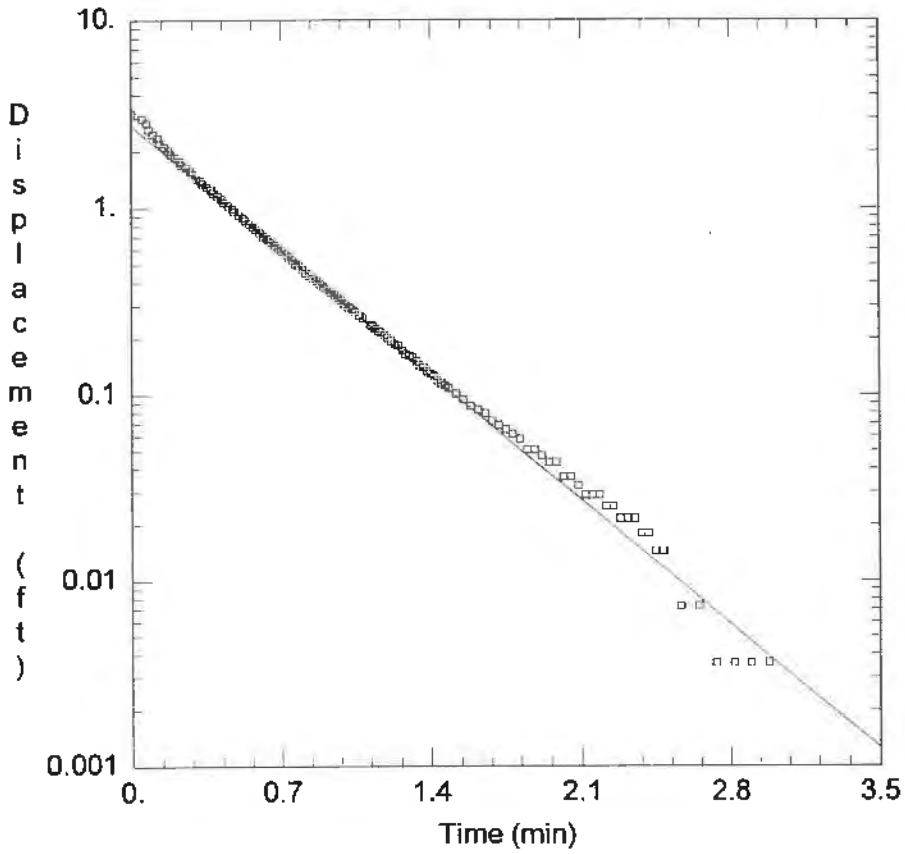
PROJECT INFORMATION	
Test Well: Tacoma Metals MW5-Slug3	
SOLUTION	
Aquifer Model: Unconfined	K = 0.002132 ft/min
Solution Method: Bouwer-Rice	y0 = 1.847 ft



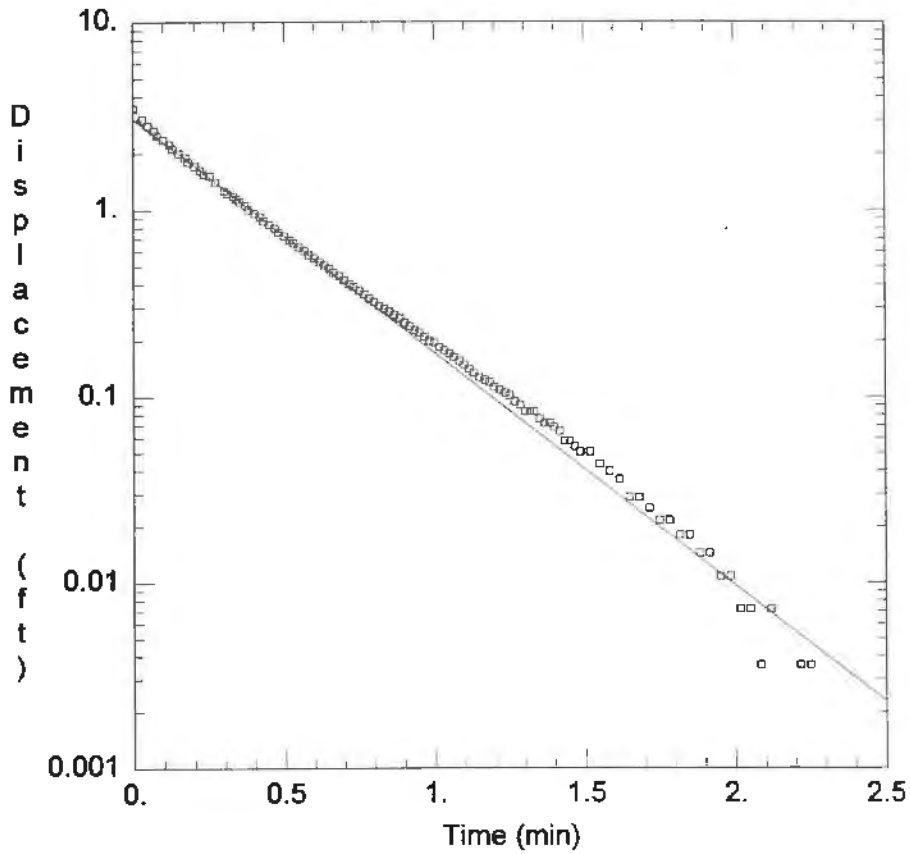
PROJECT INFORMATION	
Test Well: Tacoma Metals MW5-Slug4	
SOLUTION	
Aquifer Model: Unconfined	K = 0.002337 ft/min
Solution Method: Bouwer-Rice	y0 = 1.93 ft



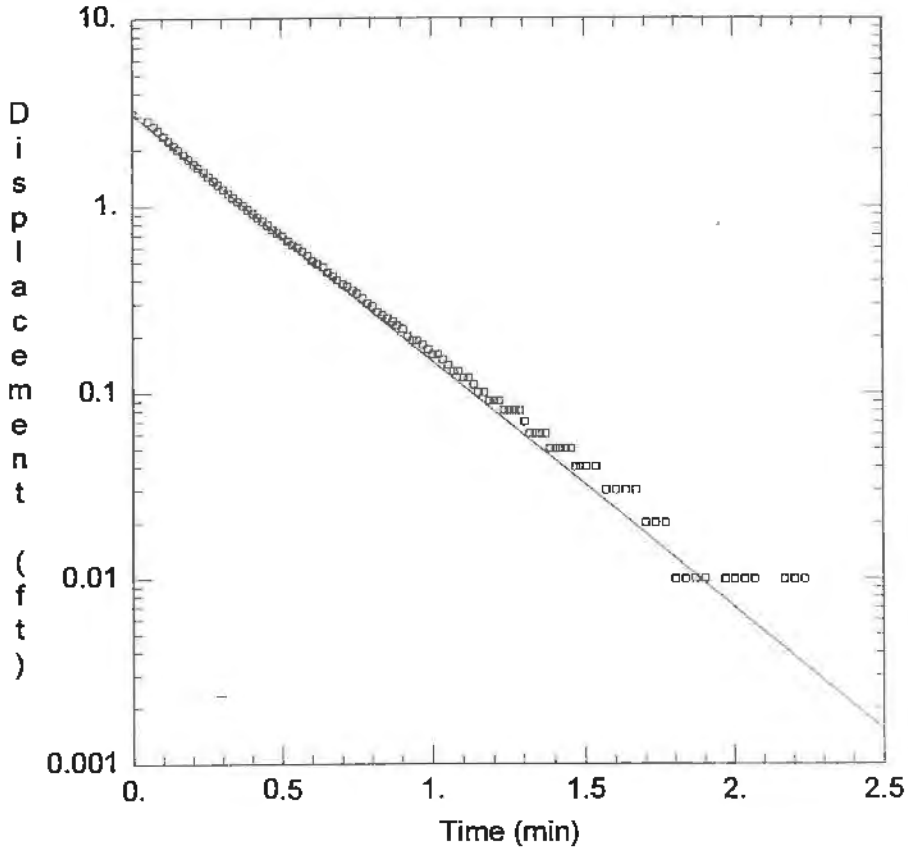
PROJECT INFORMATION	
Test Well: Tacoma Metals MW5-Slug5	
SOLUTION	
Aquifer Model: Unconfined	K = 0.002475 ft/min
Solution Method: Bouwer-Rice	y0 = 1.873 ft



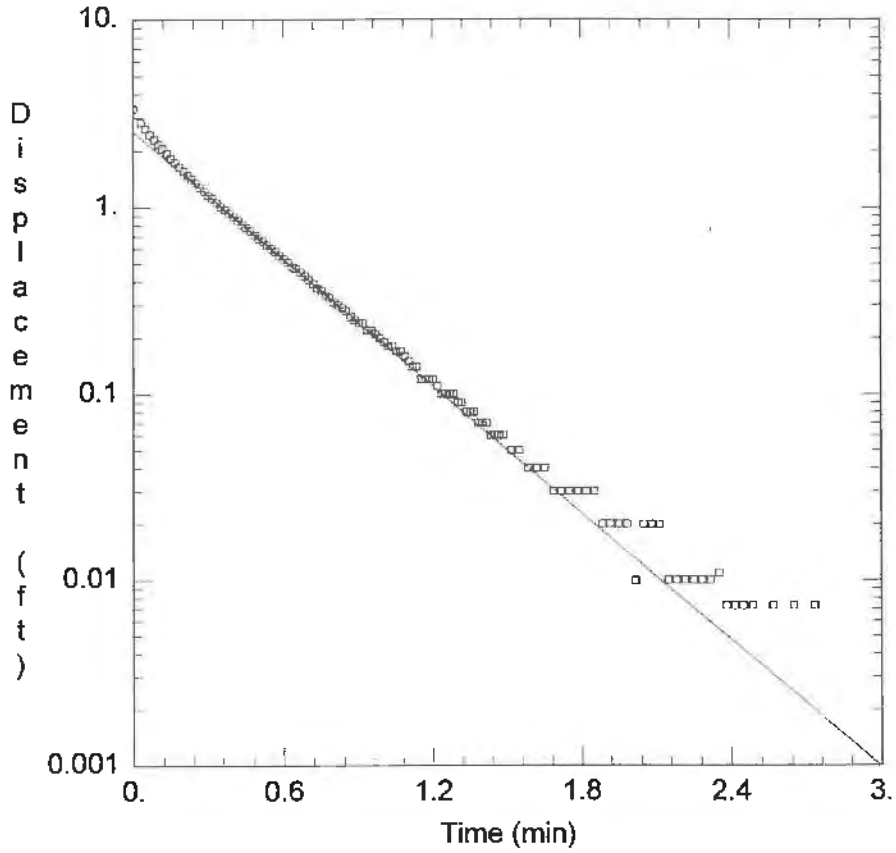
PROJECT INFORMATION	
Test Well: Tacoma Metals MW7-Slug1	
SOLUTION	
Aquifer Model: Unconfined	K = 0.004829 ft/min
Solution Method: Bouwer-Rice	y0 = 2.742 ft



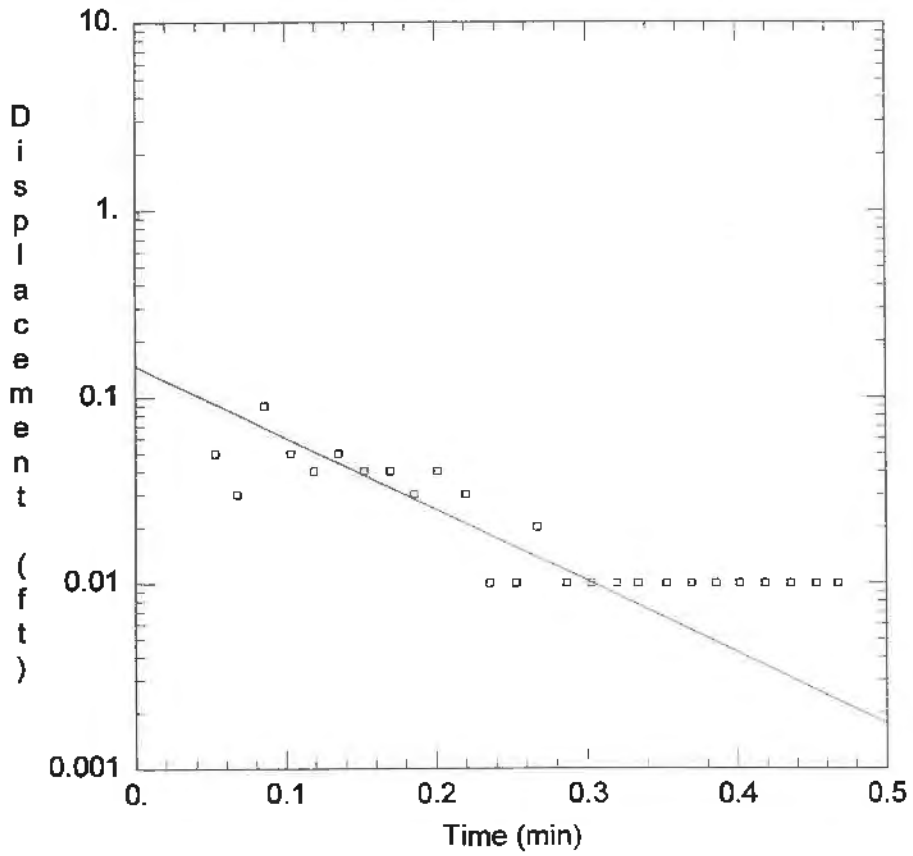
PROJECT INFORMATION	
Test Well: Tacoma Metals MW7-Slug2	
SOLUTION	
Aquifer Model: Unconfined	K = 0.006333 ft/min
Solution Method: Bouwer-Rice	y0 = 3.069 ft



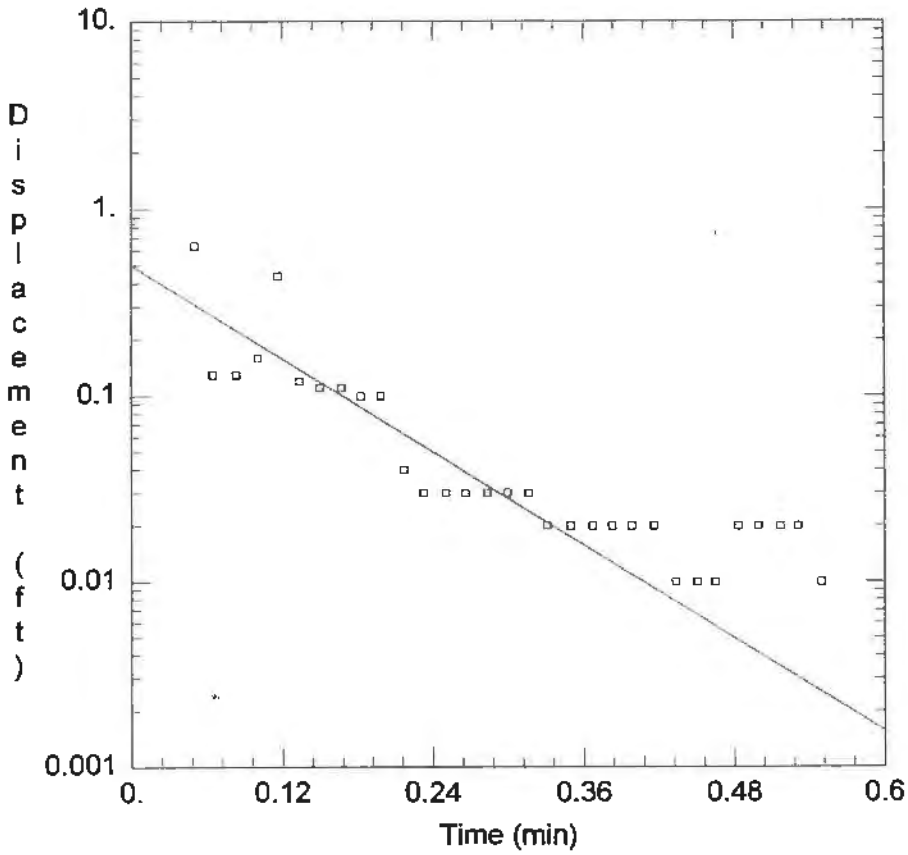
PROJECT INFORMATION	
Test Well: Tacoma Metals MW7-Slug3	
SOLUTION	
Aquifer Model: Unconfined	K = 0.006691 ft/min
Solution Method: Bouwer-Rice	y0 = 3.106 ft



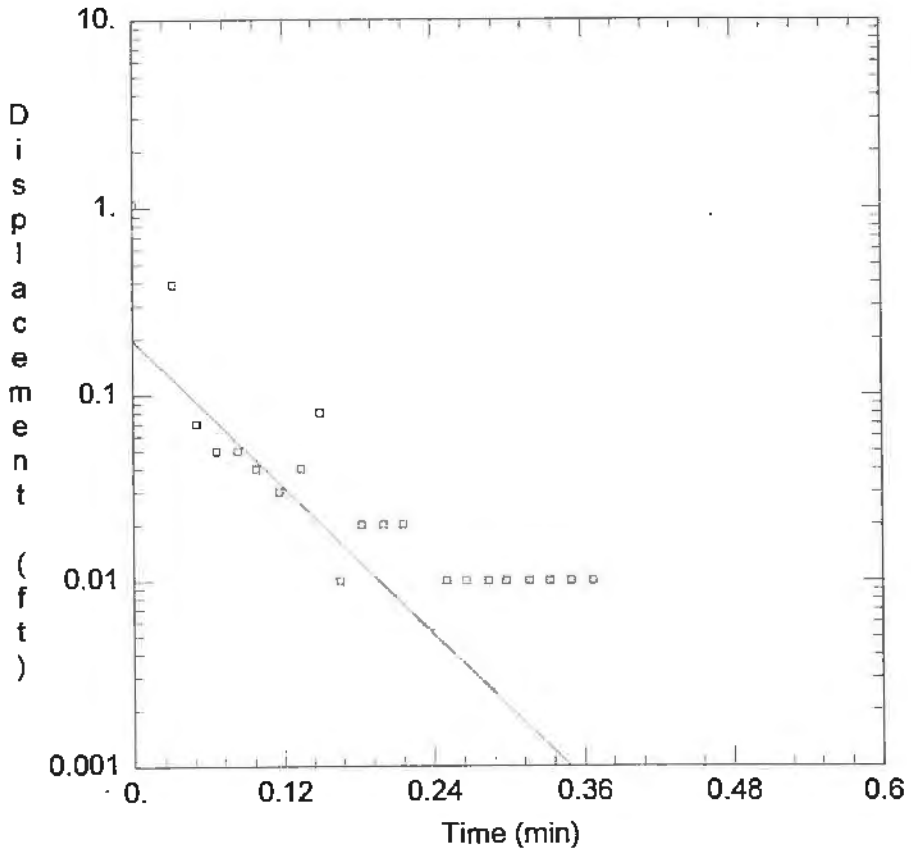
PROJECT INFORMATION	
Test Well: Tacoma Metals MW7-Slug5	
SOLUTION	
Aquifer Model: Unconfined	K = 0.00575 ft/min
Solution Method: Bouwer-Rice	y0 = 2.532 ft



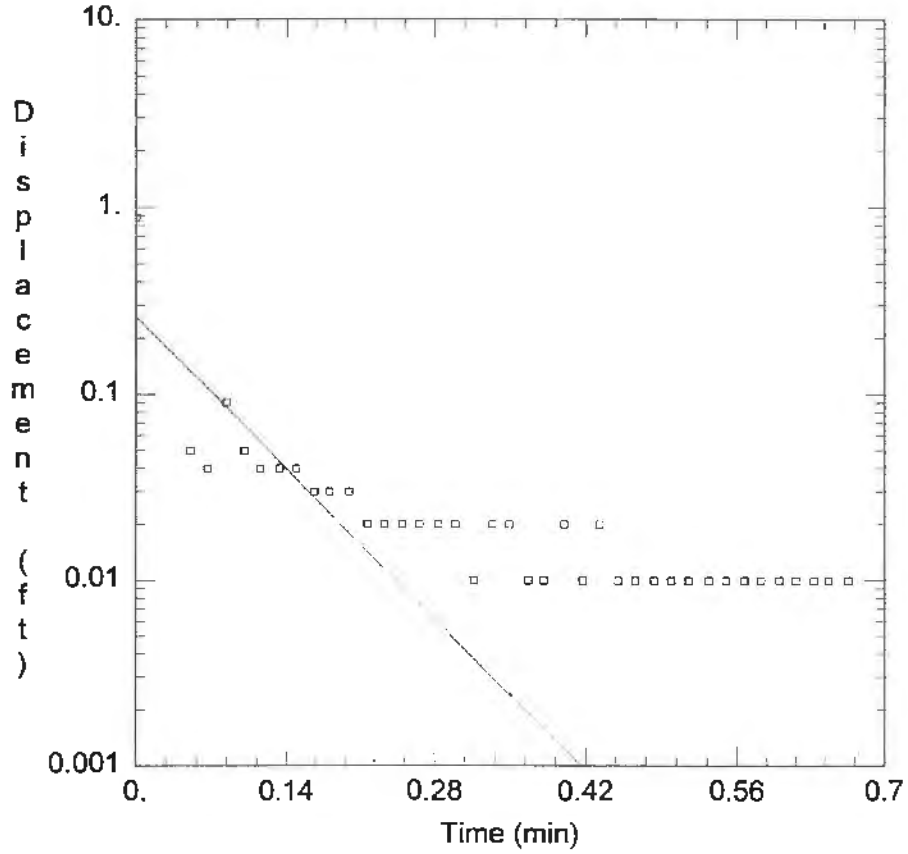
PROJECT INFORMATION	
Test Well: Tacoma Metals MW8-Slug1	
SOLUTION	
Aquifer Model: Unconfined	K = 0.01617 ft/min
Solution Method: Bouwer-Rice	y0 = 0.1472 ft



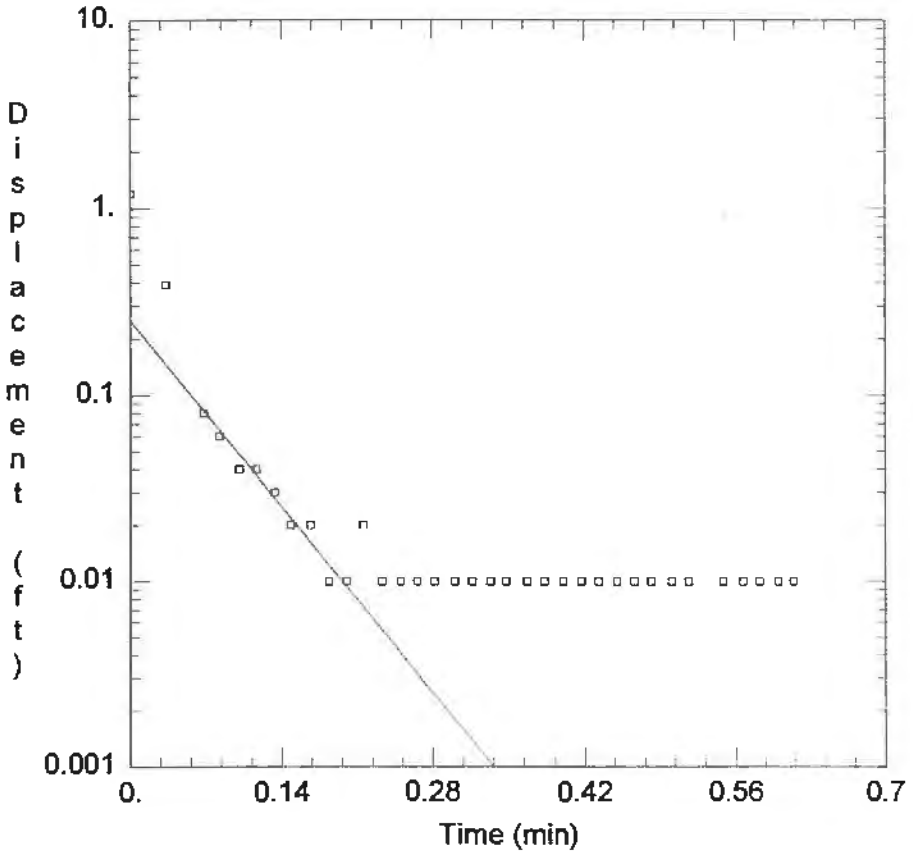
PROJECT INFORMATION	
Test Well: Tacoma Metals MW8-Slug2	
SOLUTION	
Aquifer Model: Unconfined	K = 0.01752 ft/min
Solution Method: Bouwer-Rice	y0 = 0.5003 ft



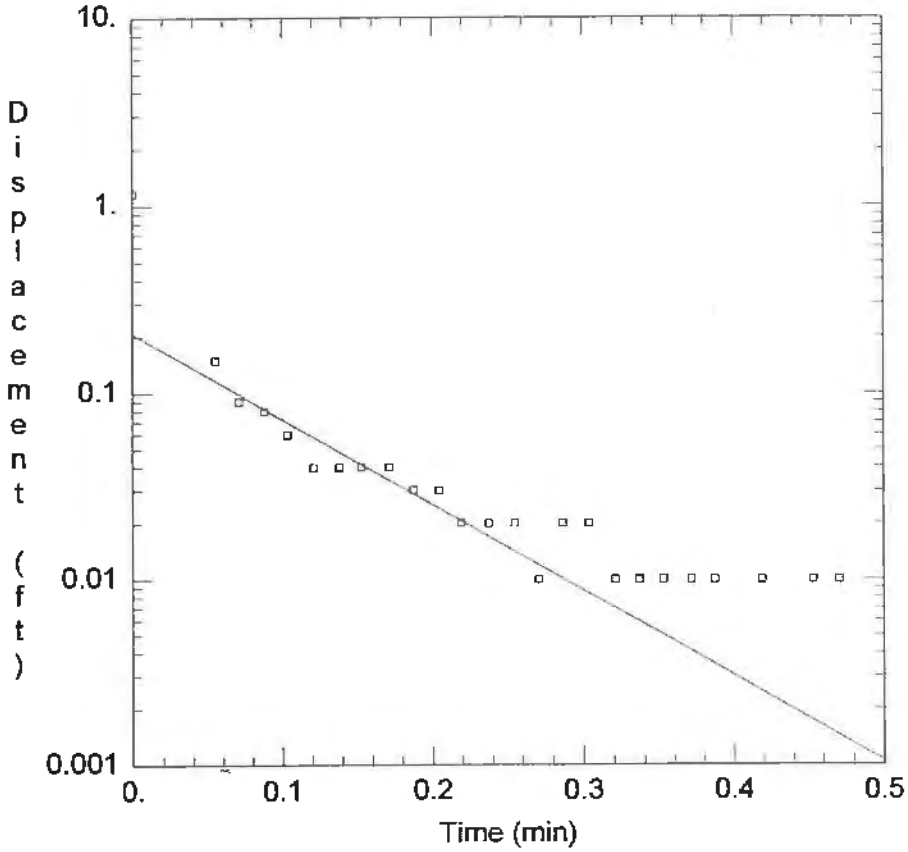
PROJECT INFORMATION	
Test Well: Tacoma Metals MW8-Slug3	
SOLUTION	
Aquifer Model: Unconfined	K = 0.02761 ft/min
Solution Method: Bouwer-Rice	y0 = 0.1955 ft



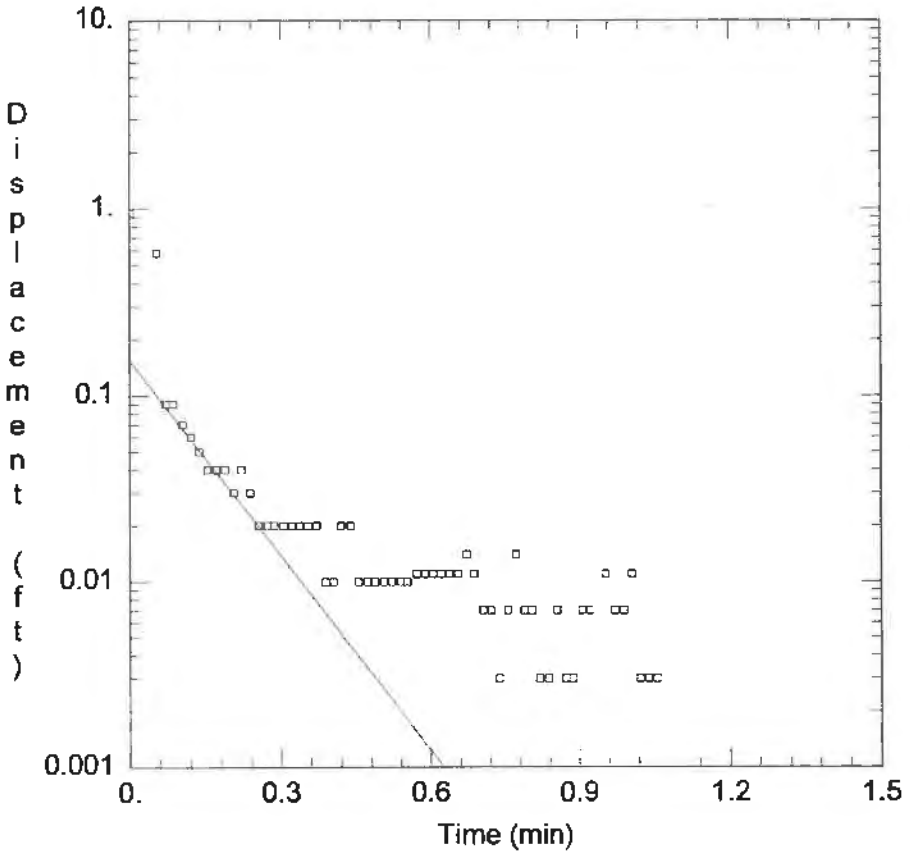
PROJECT INFORMATION	
Test Well: Tacoma Metals MW8-Slug4	
SOLUTION	
Aquifer Model: Unconfined	K = 0.0244 ft/min
Solution Method: Bouwer-Rice	y0 = 0.261 ft



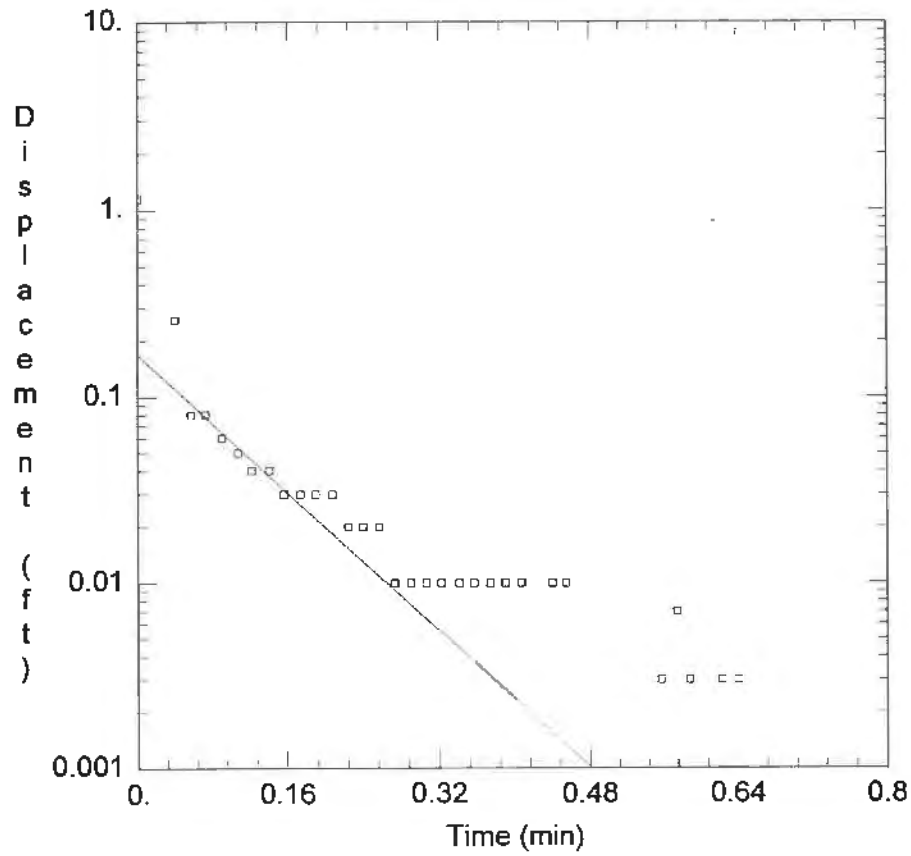
PROJECT INFORMATION	
Test Well: Tacoma Metals MW8-Slug5	
SOLUTION	
Aquifer Model: Unconfined	K = 0.02998 ft/min
Solution Method: Bouwer-Rice	y0 = 0.2512 ft



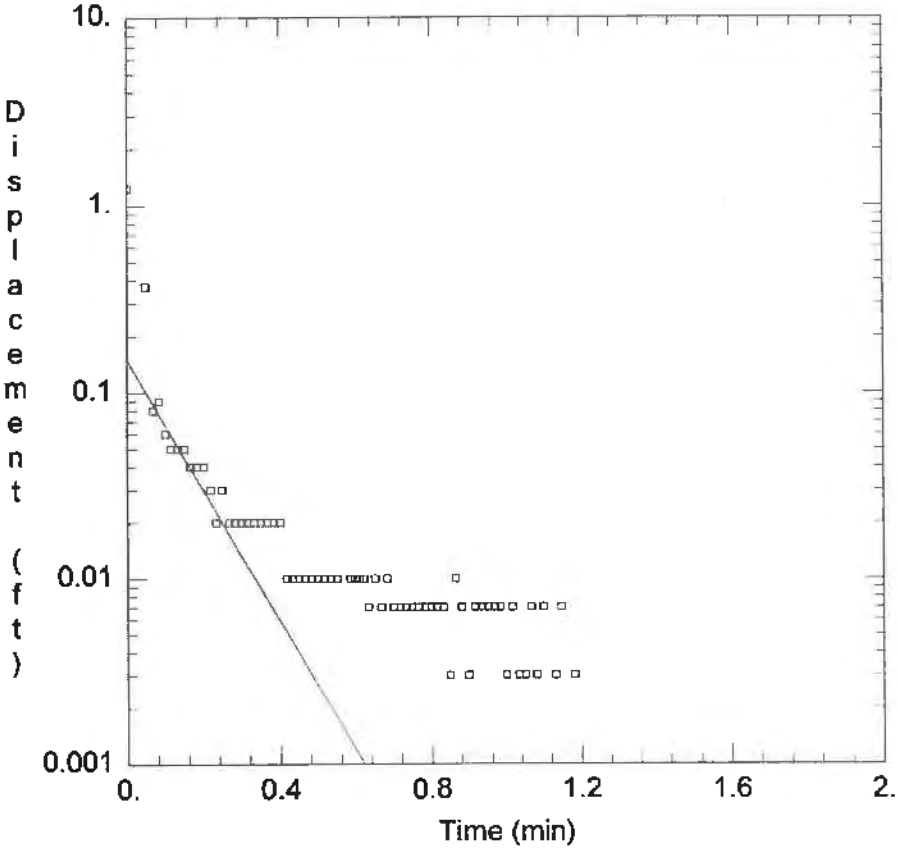
PROJECT INFORMATION	
Test Well: Tacoma Metals MW9-Slug1	
SOLUTION	
Aquifer Model: Unconfined	K = 0.01887 ft/min
Solution Method: Bouwer-Rice	y0 = 0.2079 ft



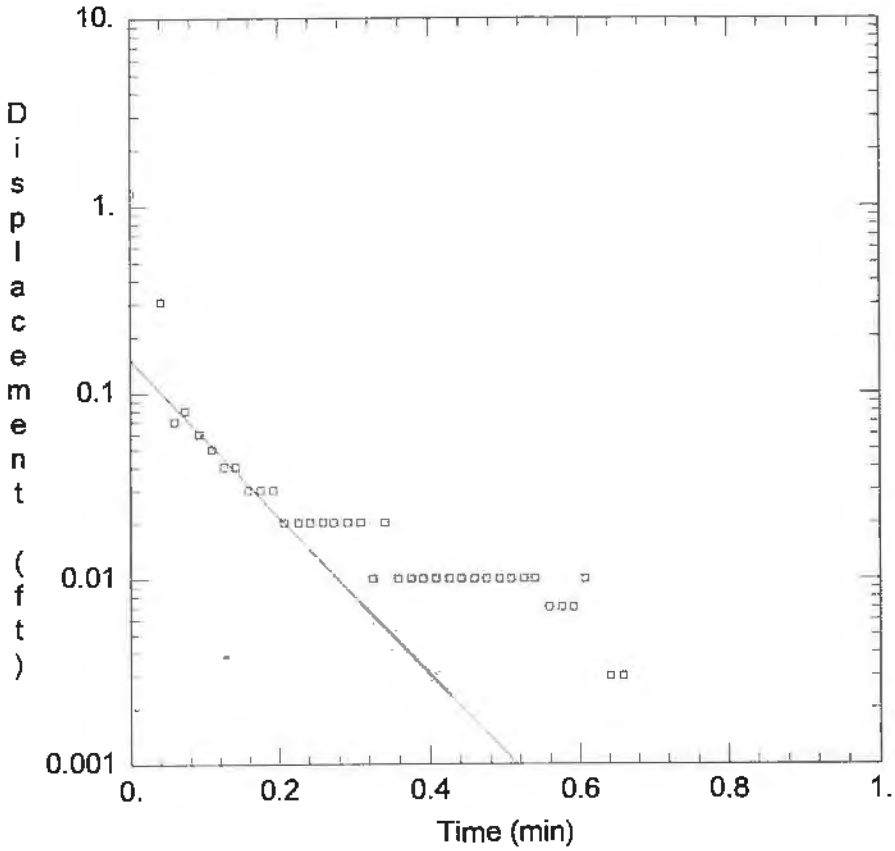
PROJECT INFORMATION	
Test Well: Tacoma Metals MW9-Slug2	
SOLUTION	
Aquifer Model: Unconfined	K = 0.01438 ft/min
Solution Method: Bouwer-Rice	y0 = 0.1542 ft



PROJECT INFORMATION	
Test Well: Tacoma Metals MW9-Slug3	
SOLUTION	
Aquifer Model: Unconfined	K = 0.01903 ft/min
Solution Method: Bouwer-Rice	y0 = 0.1686 ft



PROJECT INFORMATION	
Test Well: Tacoma Metals MW9-Slug4	
SOLUTION	
Aquifer Model: Unconfined	K = 0.01442 ft/min
Solution Method: Bouwer-Rice	y0 = 0.1501 ft



PROJECT INFORMATION	
Test Well: Tacoma Metals MW9-Slug5	
SOLUTION	
Aquifer Model: Unconfined	K = 0.01739 ft/min
Solution Method: Bouwer-Rice	y0 = 0.1508 ft

Appendix H

Soil Analytical Reports and
Chain-of-Custody Documents

Analytical Resources, Incorporated
Analytical Chemists and Consultants

October 30, 2000

Ty Schreiner
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: Project: Tacoma Metals / ARI Job: CF88

Dear Ty:

Please find enclosed sample custody records and final analytical results for the above referenced project. Sixteen soil samples were received in good condition on September 28, 2000. Selected samples were placed on hold at –18 degrees celcius pending further instruction.

Selected samples were analyzed for volatiles referencing EPA 8260, PCBs referencing EPA 8082, and total metals referencing EPA 6010/7471. Total diesel and motor oil range hydrocarbons were determined referencing WDOE method NWTPH-Dx.

All samples were run as concentrated as possible for volatile organics to provide the lowest possible detection limits for the undetected analytes. Some samples required one to two reruns using a smaller sample size or methanol extraction in order to quantitate all target analytes within the linear range of the GC/MS.

Initial analysis of samples **TP-2-6-10** and **TP-4-6-10** showed suppressed response for the d4-1,4-dichlorobenzene internal standard (less than 50% of the daily CCAL response). The secondary runs of each sample showed acceptable internal standard areas.

Acetone was detected in the 10/2/00 volatile organics method blank. Associated sample results were qualified with a "B" flag, indicating possible lab contamination.

The initial extract set prepared for TPH analysis showed no spike in the lab control sample or in the MS/MSD set associated with **TP-2-0-1**. All samples and QC samples were re-extracted within the holding time and only the re-extract data has been reported.

The initial TPH chromatogram generated by **TP-4-6-10** showed a different elution pattern than the re-extract. The sample was re-extracted a third time and reanalyzed. Results for the third extract matched those of the second extract. Only data for the second and third extracts have been reported.

The TPH MSD QC sample showed a poor spike recovery. As the TPH lab control samples showed acceptable spike recoveries, the poor MSD result appears to be a function of the matrix.

RECEIVED
NOV - 1 2000
K/J Federal Way
K/J No/File
Route
Return To/By

333 Ninth Avenue North • Seattle WA 98109-5187 • 206-621-6490 • 206-621-7523 fax

The metals matrix QC samples showed low spike recoveries for mercury and chromium and showed elevated duplicate RPDs for lead and silver. As the lab control samples showed acceptable recoveries for all target analytes, low spikes and high RPDs appear to be a function of matrix heterogeneity and subsampling variability.

No other analytical complications were noted. Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Jeff J. Reitan
Client Services Manager
jeff@arilabs.com

JJR/jr
Enclosures

cc: Anthony Harding, Kennedy Jenks Consultants

ARI 00-18314 to 00-18329

~~00-18133 to 00-181~~ 1.5°C

(F88

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

18939 120th Avenue N.E., Suite 101, Bothell, WA 98011-9508 (206) 481-9200 FAX 485-2992
East 11115 Montgomery, Suite B, Spokane, WA 99206-4779 (509) 924-9200 FAX 924-9290
9405 S.W. Nimbus Avenue, Beaverton, OR 97008-7132 (503) 643-9200 FAX 644-2202

CHAIN OF CUSTODY REPORT

Work Order #

REPORT TO:
ATTENTION: TY SCHREINER KENNEDY/JENKS CONSULTANTS
ADDRESS: 530 S. 336th ST
FEDERAL WAY, WA 98003
PHONE: 253 874-0555 FAX:
PROJECT NAME: TACOMA METALS
PROJECT NUMBER: 996098.00
SAMPLED BY:

INVOICE TO:
ATTENTION:
ADDRESS:
P.O. NUMBER: NCA QUOTE #:

TURNAROUND REQUEST in Business Days *
Organic & Inorganic Analyses: 10 (Standard) | 7 | 5 | 4 | 3 | 2 | 1 | Same Day
Fuels & Hydrocarbon Analyses: 5 (Standard) | 3-4 | 2 | 1 | Same Day
OTHER Specify:
* Turnaround Requests less than standard may incur Rush Charges.

Analysis Request:

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NCA SAMPLE ID (Laboratory Use Only)	NWTPH-DX	RCRA METALS	CU	PCB'S	VOC'S	HOLD	MATRIX (W, S, A, O)	# OF CONTAINERS	COMMENTS
1.	TP-1-0-1	9/27/00 8:45a	SOIL	X	X	X	X		X		3	
2.	TP-1-2-3	8:45a							X		3	
3.	TP-1-4-6	9:50a							X		3	
4.	TP-1-6-10	9:50a							X		3	
5.	TP-2-0-1	9/27/00 10:30		X	X	X			X		3	
6.	TP-2-2-3	11:30 9/27		X	X	X		X	X		3	
7.	TP-2-4-6	11:45 9/27/00		X	X	X		X	X		3	
8.	TP-2-6-10	12:00 9/27/00		X	X	X		X	X		3	
9.	TP-3-0-1	12:50 9/27/00		X	X	X	X		X		3	
10.	TP-3-2-3	1:00 9/27/00							X		3	

RELINQUISHED BY (Signature): [signature] DATE:
PRINT NAME: JODIE Brundage FIRM: KENNEDY/JENKS TIME:
RECEIVED BY (Signature): [signature] DATE: 9/28/00
PRINT NAME: Carrie McDougal FIRM: ARI TIME: 1200
RELINQUISHED BY (Signature): DATE:
PRINT NAME: FIRM: TIME:
RECEIVED BY (Signature): DATE:
PRINT NAME: FIRM: TIME:

ADDITIONAL REMARKS: HOLD XTRA SAMPLES - FREEZE FOR STORAGE

ARI

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

18939 120th Avenue N.E., Suite 101, Bothell, WA 98011-9508 (206) 481-9200 FAX 485-2992
East 11115 Montgomery, Suite B, Spokane, WA 99206-4779 (509) 924-9200 FAX 924-9290
9405 S.W. Nimbus Avenue, Beaverton, OR 97008-7132 (503) 643-9200 FAX 644-2202

CHAIN OF CUSTODY REPORT

Work Order #

REPORT TO: KENNEDY / JENKS CONSULTANTS
ATTENTION: TY SCHREINER
ADDRESS: 530 S 336th ST
Federal WAY, WA 98003
PHONE: 253 874-0555 FAX:
PROJECT NAME: TACOMA METALS
PROJECT NUMBER: 996098.00
SAMPLED BY:

INVOICE TO:
ATTENTION:
ADDRESS:
P.O. NUMBER: NCA QUOTE #:

TURNAROUND REQUEST in Business Days *
Organic & Inorganic Analyses: 10 (Standard) | 7 | 5 | 4 | 3 | 2 | 1 | Same Day
Fuels & Hydrocarbon Analyses: 5 (Standard) | 3-4 | 2 | 1 | Same Day
OTHER Specify:
* Turnaround Requests less than standard may incur Rush Charges.

Analysis Request:

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NCA SAMPLE ID (Laboratory Use Only)	NW TPH-DX	RCRA METALS	CU	PCB'S	VOC'S	HOLD	MATRIX (W, S, A, O)	# OF CONTAINERS	COMMENTS
1.	TP-3-4-6	9/27/00 1:15	SOIL	X	X	X		X	X		3	
2.	TP-3-6-10	9/27 1:30		X	X	X		X	X		3	
3.	TP-4-0-1	9/27 2:25		X	X	X			X		2	
4.	TP-4-2-3	9/27 2:30							X		2	
5.	TP-4-4-6	9/27 2:45							X		2	
6.	TP-4-6-10	9/27 3:05		X	X	X		X	X		2	
7.												
8.												
9.												
10.												

RELINQUISHED BY (Signature): [signature] DATE:
PRINT NAME: JODIE Brundage FIRM: KENNEDY/JENKS TIME:
RECEIVED BY (Signature): [signature] DATE: 9/28/00
PRINT NAME: Carrie McDougal FIRM: ARI TIME: 1200
RELINQUISHED BY (Signature): DATE:
PRINT NAME: FIRM: TIME:
RECEIVED BY (Signature): DATE:
PRINT NAME: FIRM: TIME:

ADDITIONAL REMAP
HOLD XTRA SAMPLES - WHEELE FOR STORAGE

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ORGANICS ANALYSIS
DATA REPORTING QUALIFIERS

U Indicates the compound is undetected at the reported concentration.

J Indicates an estimated value when the value is less than the calculated detection limit.

NR Indicates the surrogate recovery cannot be reported due to matrix interference.

E Indicates value reported exceeds the linear range of the detector. Sample dilution required.

S Indicates no value reported due to saturation of the detector. Sample dilution required.

Y Indicates raised detection limit due to background interference or activity on the instrument.

NA Indicates compound not analyzed for.

M Indicates an estimated value of analyte detected and confirmed by analyst with low spectral match parameters.

B Indicates possible/probable blank contamination. Flagged when the analyte is detected in the sample and in the method blank.

333 Ninth Avenue North • Seattle WA 98109-5187 • **206-621-6490** • **206-621-7523** fax

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-2-2-3

Lab Sample ID: CF88C
LIMS ID: 00-18316
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Instrument: FINN5
Date Analyzed: 10/03/00 17:03

Sample Amount: 4.17 g dry Wt
Percent Moisture: 16.1%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	1.2 U
74-83-9	Bromomethane	1.2 U
75-01-4	Vinyl Chloride	1.2 U
75-00-3	Chloroethane	1.2 U
75-09-2	Methylene Chloride	3.6 U
67-64-1	**Acetone**	**200 B**
75-15-0	Carbon Disulfide	1.2 U
75-35-4	1,1-Dichloroethene	1.2 U
75-34-3	1,1-Dichloroethane	1.2 U
156-60-5	trans-1,2-Dichloroethene	1.2 U
156-59-2	cis-1,2-Dichloroethene	1.2 U
67-66-3	Chloroform	1.2 U
107-06-2	1,2-Dichloroethane	1.2 U
78-93-3	**2-Butanone**	**47**
71-55-6	1,1,1-Trichloroethane	1.2 U
56-23-5	Carbon Tetrachloride	1.2 U
108-05-4	Vinyl Acetate	6.0 U
75-27-4	Bromodichloromethane	1.2 U
78-87-5	1,2-Dichloropropane	1.2 U
10061-01-5	cis-1,3-Dichloropropene	1.2 U
79-01-6	Trichloroethene	1.2 U
124-48-1	Dibromochloromethane	1.2 U
79-00-5	1,1,2-Trichloroethane	1.2 U
71-43-2	**Benzene**	**3.6**
10061-02-6	trans-1,3-Dichloropropene	1.2 U
110-75-8	2-Chloroethylvinylether	6.0 U
75-25-2	Bromoform	1.2 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	6.0 U
591-78-6	2-Hexanone	6.0 U
127-18-4	Tetrachloroethene	1.2 U
79-34-5	1,1,2,2-Tetrachloroethane	1.2 U
108-88-3	**Toluene**	**120**
108-90-7	Chlorobenzene	1.2 U
100-41-4	**Ethylbenzene**	**6.0**
100-42-5	**Styrene**	**2.4**
75-69-4	Trichlorofluoromethane	1.2 U
76-13-1	1,1,2-Trichlorotrifluoroethane	1.2 U
1330-20-7	**m,p-Xylene**	**10**

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-2-2-3

Lab Sample ID: CF88C
LIMS ID: 00-18316
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Instrument: FINN5
Date Analyzed: 10/03/00 17:03

Sample Amount: 4.17 g dry Wt
Percent Moisture: 16.1%

CAS Number	Analyte	ug/kg
95-47-6	**o-Xylene**	**4.4**
95-50-1	1,2-Dichlorobenzene	1.2 U
541-73-1	1,3-Dichlorobenzene	1.2 U
106-46-7	1,4-Dichlorobenzene	1.2 U
107-02-8	Acrolein	60 U
74-88-4	Methyl Iodide	1.2 U
74-96-4	Bromoethane	2.4 U
107-13-1	Acrylonitrile	6.0 U
563-58-6	1,1-Dichloropropene	1.2 U
74-95-3	Dibromomethane	1.2 U
630-20-6	1,1,1,2-Tetrachloroethane	1.2 U
96-12-8	1,2-Dibromo-3-chloropropane	6.0 U
96-18-4	1,2,3-Trichloropropane	2.4 U
110-57-6	trans-1,4-Dichloro-2-butene	6.0 U
108-67-8	**1,3,5-Trimethylbenzene**	**3.0**
95-63-6	**1,2,4-Trimethylbenzene**	**7.1**
87-68-3	Hexachlorobutadiene	6.0 U
106-93-4	Ethylene Dibromide	1.2 U
74-97-5	Bromochloromethane	1.2 U
594-20-7	2,2-Dichloropropane	1.2 U
142-28-9	1,3-Dichloropropane	1.2 U
98-82-8	Isopropylbenzene	1.2 U
103-65-1	n-Propylbenzene	1.2 U
108-86-1	Bromobenzene	1.2 U
95-49-8	2-Chlorotoluene	1.2 U
106-43-4	4-Chlorotoluene	1.2 U
98-06-6	tert-Butylbenzene	1.2 U
135-98-8	sec-Butylbenzene	1.2 U
99-87-6	4-Isopropyltoluene	1.2 U
104-51-8	n-Butylbenzene	2.4 U
120-82-1	1,2,4-Trichlorobenzene	6.0 U
91-20-3	**Naphthalene**	**120**
87-61-6	1,2,3-Trichlorobenzene	6.0 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	108%
d8-Toluene	97.4%
Bromofluorobenzene	93.2%
d4-1,2-Dichlorobenzene	94.4%

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-2-4-6

Lab Sample ID: CF88D
LIMS ID: 00-18317
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Instrument: FINN5
Date Analyzed: 10/02/00 18:04

Sample Amount: 3.44 g dry Wt
Percent Moisture: 28.5%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	1.5 U
74-83-9	Bromomethane	1.5 U
75-01-4	Vinyl Chloride	1.5 U
75-00-3	Chloroethane	1.5 U
75-09-2	Methylene Chloride	4.4 U
67-64-1	**Acetone**	**460 B**
75-15-0	**Carbon Disulfide**	**1.2 J**
75-35-4	1,1-Dichloroethene	1.5 U
75-34-3	1,1-Dichloroethane	1.5 U
156-60-5	trans-1,2-Dichloroethene	1.5 U
156-59-2	cis-1,2-Dichloroethene	1.5 U
67-66-3	Chloroform	1.5 U
107-06-2	1,2-Dichloroethane	1.5 U
78-93-3	**2-Butanone**	**120**
71-55-6	1,1,1-Trichloroethane	1.5 U
56-23-5	Carbon Tetrachloride	1.5 U
108-05-4	Vinyl Acetate	7.3 U
75-27-4	Bromodichloromethane	1.5 U
78-87-5	1,2-Dichloropropane	1.5 U
10061-01-5	cis-1,3-Dichloropropene	1.5 U
79-01-6	Trichloroethene	1.5 U
124-48-1	Dibromochloromethane	1.5 U
79-00-5	1,1,2-Trichloroethane	1.5 U
71-43-2	**Benzene**	**58**
10061-02-6	trans-1,3-Dichloropropene	1.5 U
110-75-8	2-Chloroethylvinylether	7.3 U
75-25-2	Bromoform	1.5 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	7.3 U
591-78-6	2-Hexanone	7.3 U
127-18-4	Tetrachloroethene	1.5 U
79-34-5	1,1,2,2-Tetrachloroethane	2.1 Y
108-88-3	**Toluene**	**620 E**
108-90-7	Chlorobenzene	1.5 U
100-41-4	**Ethylbenzene**	**140**
100-42-5	**Styrene**	**12 M**
75-69-4	Trichlorofluoromethane	1.5 U
76-13-1	1,1,2-Trichlorotrifluoroethane	1.5 U
1330-20-7	**m,p-Xylene**	**260**

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-2-4-6

Lab Sample ID: CF88D
LIMS ID: 00-18317
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Instrument: FINN5
Date Analyzed: 10/02/00 18:04

Sample Amount: 3.44 g dry Wt
Percent Moisture: 28.5%

CAS Number	Analyte	ug/kg
95-47-6	**o-Xylene**	**150**
95-50-1	1,2-Dichlorobenzene	1.5 U
541-73-1	1,3-Dichlorobenzene	1.5 U
106-46-7	1,4-Dichlorobenzene	1.5 U
107-02-8	Acrolein	73 U
74-88-4	Methyl Iodide	1.5 U
74-96-4	Bromoethane	2.9 U
107-13-1	Acrylonitrile	7.3 U
563-58-6	1,1-Dichloropropene	1.5 U
74-95-3	Dibromomethane	1.5 U
630-20-6	1,1,1,2-Tetrachloroethane	1.5 U
96-12-8	1,2-Dibromo-3-chloropropane	7.3 U
96-18-4	1,2,3-Trichloropropane	2.9 U
110-57-6	trans-1,4-Dichloro-2-butene	7.3 U
108-67-8	**1,3,5-Trimethylbenzene**	**310 E**
95-63-6	**1,2,4-Trimethylbenzene**	**700 E**
87-68-3	Hexachlorobutadiene	7.3 U
106-93-4	Ethylene Dibromide	1.5 U
74-97-5	Bromochloromethane	1.5 U
594-20-7	2,2-Dichloropropane	1.5 U
142-28-9	1,3-Dichloropropane	1.5 U
98-82-8	**Isopropylbenzene**	**55**
103-65-1	**n-Propylbenzene**	**31**
108-86-1	Bromobenzene	1.5 U
95-49-8	2-Chlorotoluene	1.5 U
106-43-4	4-Chlorotoluene	1.5 U
98-06-6	tert-Butylbenzene	1.5 U
135-98-8	sec-Butylbenzene	1.5 U
99-87-6	**4-Isopropyltoluene**	**91**
104-51-8	n-Butylbenzene	54 Y
120-82-1	1,2,4-Trichlorobenzene	7.3 U
91-20-3	**Naphthalene**	**2,200 E**
87-61-6	1,2,3-Trichlorobenzene	7.3 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	107%
d8-Toluene	97.4%
Bromofluorobenzene	84.9%
d4-1,2-Dichlorobenzene	93.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-2-4-6
REANALYSIS

Lab Sample ID: CF88D-RE
LIMS ID: 00-18317
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Instrument: FINN5
Date Analyzed: 10/03/00 17:55

Sample Amount: 28 mg dry Wt
Percent Moisture: 28.5%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	180 U
74-83-9	Bromomethane	180 U
75-01-4	Vinyl Chloride	180 U
75-00-3	Chloroethane	180 U
75-09-2	Methylene Chloride	530 U
67-64-1	**Acetone**	**1,000**
75-15-0	Carbon Disulfide	180 U
75-35-4	1,1-Dichloroethene	180 U
75-34-3	1,1-Dichloroethane	180 U
156-60-5	trans-1,2-Dichloroethene	180 U
156-59-2	cis-1,2-Dichloroethene	180 U
67-66-3	Chloroform	180 U
107-06-2	1,2-Dichloroethane	180 U
78-93-3	2-Butanone	880 U
71-55-6	1,1,1-Trichloroethane	180 U
56-23-5	Carbon Tetrachloride	180 U
108-05-4	Vinyl Acetate	880 U
75-27-4	Bromodichloromethane	180 U
78-87-5	1,2-Dichloropropane	180 U
10061-01-5	cis-1,3-Dichloropropene	180 U
79-01-6	Trichloroethene	180 U
124-48-1	Dibromochloromethane	180 U
79-00-5	1,1,2-Trichloroethane	180 U
71-43-2	Benzene	180 U
10061-02-6	trans-1,3-Dichloropropene	180 U
110-75-8	2-Chloroethylvinylether	880 U
75-25-2	Bromoform	180 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	880 U
591-78-6	2-Hexanone	880 U
127-18-4	Tetrachloroethene	180 U
79-34-5	1,1,2,2-Tetrachloroethane	180 U
108-88-3	**Toluene**	**850**
108-90-7	Chlorobenzene	180 U
100-41-4	**Ethylbenzene**	**240**
100-42-5	Styrene	180 U
75-69-4	Trichlorofluoromethane	180 U
76-13-1	1,1,2-Trichlorotrifluoroethane	180 U
1330-20-7	**m,p-Xylene**	**460**

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-2-4-6
REANALYSIS

Lab Sample ID: CF88D-RE
LIMS ID: 00-18317
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Instrument: FINN5
Date Analyzed: 10/03/00 17:55

Sample Amount: 28 mg dry Wt
Percent Moisture: 28.5%

CAS Number	Analyte	ug/kg
95-47-6	**o-Xylene**	**280**
95-50-1	1,2-Dichlorobenzene	180 U
541-73-1	1,3-Dichlorobenzene	180 U
106-46-7	1,4-Dichlorobenzene	180 U
107-02-8	Acrolein	8,800 U
74-88-4	Methyl Iodide	180 U
74-96-4	Bromoethane	350 U
107-13-1	Acrylonitrile	880 U
563-58-6	1,1-Dichloropropene	180 U
74-95-3	Dibromomethane	180 U
630-20-6	1,1,1,2-Tetrachloroethane	180 U
96-12-8	1,2-Dibromo-3-chloropropane	880 U
96-18-4	1,2,3-Trichloropropane	350 U
110-57-6	trans-1,4-Dichloro-2-butene	880 U
108-67-8	**1,3,5-Trimethylbenzene**	**520**
95-63-6	**1,2,4-Trimethylbenzene**	**1,400**
87-68-3	Hexachlorobutadiene	880 U
106-93-4	Ethylene Dibromide	180 U
74-97-5	Bromochloromethane	180 U
594-20-7	2,2-Dichloropropane	180 U
142-28-9	1,3-Dichloropropane	180 U
98-82-8	Isopropylbenzene	180 U
103-65-1	n-Propylbenzene	180 U
108-86-1	Bromobenzene	180 U
95-49-8	2-Chlorotoluene	180 U
106-43-4	4-Chlorotoluene	180 U
98-06-6	tert-Butylbenzene	180 U
135-98-8	sec-Butylbenzene	180 U
99-87-6	**4-Isopropyltoluene**	**210**
104-51-8	n-Butylbenzene	350 U
120-82-1	1,2,4-Trichlorobenzene	880 U
91-20-3	**Naphthalene**	**63,000 E**
87-61-6	1,2,3-Trichlorobenzene	880 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	108%
d8-Toluene	100%
Bromofluorobenzene	101%
d4-1,2-Dichlorobenzene	101%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-2-4-6
REANALYSIS-2

Lab Sample ID: CF88D-R2
LIMS ID: 00-18317
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Instrument: FINN5
Date Analyzed: 10/09/00 20:11

Sample Amount: 2.8 mg dry Wt
Percent Moisture: 28.5%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	1,800 U
74-83-9	Bromomethane	1,800 U
75-01-4	Vinyl Chloride	1,800 U
75-00-3	Chloroethane	1,800 U
75-09-2	Methylene Chloride	5,300 U
67-64-1	Acetone	8,800 U
75-15-0	Carbon Disulfide	1,800 U
75-35-4	1,1-Dichloroethene	1,800 U
75-34-3	1,1-Dichloroethane	1,800 U
156-60-5	trans-1,2-Dichloroethene	1,800 U
156-59-2	cis-1,2-Dichloroethene	1,800 U
67-66-3	Chloroform	1,800 U
107-06-2	1,2-Dichloroethane	1,800 U
78-93-3	2-Butanone	8,800 U
71-55-6	1,1,1-Trichloroethane	1,800 U
56-23-5	Carbon Tetrachloride	1,800 U
108-05-4	Vinyl Acetate	8,800 U
75-27-4	Bromodichloromethane	1,800 U
78-87-5	1,2-Dichloropropane	1,800 U
10061-01-5	cis-1,3-Dichloropropene	1,800 U
79-01-6	Trichloroethene	1,800 U
124-48-1	Dibromochloromethane	1,800 U
79-00-5	1,1,2-Trichloroethane	1,800 U
71-43-2	Benzene	1,800 U
10061-02-6	trans-1,3-Dichloropropene	1,800 U
110-75-8	2-Chloroethylvinylether	8,800 U
75-25-2	Bromoform	1,800 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	8,800 U
591-78-6	2-Hexanone	8,800 U
127-18-4	Tetrachloroethene	1,800 U
79-34-5	1,1,2,2-Tetrachloroethane	1,800 U
108-88-3	**Toluene**	**2,000**
108-90-7	Chlorobenzene	1,800 U
100-41-4	**Ethylbenzene**	**930 J**
100-42-5	Styrene	1,800 U
75-69-4	Trichlorofluoromethane	1,800 U
76-13-1	1,1,2-Trichlorotrifluoroethane	1,800 U
1330-20-7	**m,p-Xylene**	**2,100 J**

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-2-4-6
REANALYSIS-2

Lab Sample ID: CF88D-R2
LIMS ID: 00-18317
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Instrument: FINN5
Date Analyzed: 10/09/00 20:11

Sample Amount: 2.8 mg dry Wt
Percent Moisture: 28.5%

CAS Number	Analyte	ug/kg
95-47-6	**o-Xylene**	**930 J**
95-50-1	1,2-Dichlorobenzene	1,800 U
541-73-1	1,3-Dichlorobenzene	1,800 U
106-46-7	1,4-Dichlorobenzene	1,800 U
107-02-8	Acrolein	88,000 U
74-88-4	Methyl Iodide	1,800 U
74-96-4	Bromoethane	3,500 U
107-13-1	Acrylonitrile	8,800 U
563-58-6	1,1-Dichloropropene	1,800 U
74-95-3	Dibromomethane	1,800 U
630-20-6	1,1,1,2-Tetrachloroethane	1,800 U
96-12-8	1,2-Dibromo-3-chloropropane	8,800 U
96-18-4	1,2,3-Trichloropropane	3,500 U
110-57-6	trans-1,4-Dichloro-2-butene	8,800 U
108-67-8	**1,3,5-Trimethylbenzene**	**1,200 J**
95-63-6	**1,2,4-Trimethylbenzene**	**2,600**
87-68-3	Hexachlorobutadiene	8,800 U
106-93-4	Ethylene Dibromide	1,800 U
74-97-5	Bromochloromethane	1,800 U
594-20-7	2,2-Dichloropropane	1,800 U
142-28-9	1,3-Dichloropropane	1,800 U
98-82-8	Isopropylbenzene	1,800 U
103-65-1	n-Propylbenzene	1,800 U
108-86-1	Bromobenzene	1,800 U
95-49-8	2-Chlorotoluene	1,800 U
106-43-4	4-Chlorotoluene	1,800 U
98-06-6	tert-Butylbenzene	1,800 U
135-98-8	sec-Butylbenzene	1,800 U
99-87-6	4-Isopropyltoluene	1,800 U
104-51-8	n-Butylbenzene	3,500 U
120-82-1	1,2,4-Trichlorobenzene	8,800 U
91-20-3	**Naphthalene**	**120,000**
87-61-6	1,2,3-Trichlorobenzene	8,800 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	115%
d8-Toluene	97.8%
Bromofluorobenzene	102%
d4-1,2-Dichlorobenzene	105%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-2-6-10

Lab Sample ID: CF88E
LIMS ID: 00-18318
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Instrument: FINN5
Date Analyzed: 10/02/00 18:30

Sample Amount: 3.15 g dry Wt
Percent Moisture: 34.9%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	1.6 U
74-83-9	Bromomethane	1.6 U
75-01-4	Vinyl Chloride	1.6 U
75-00-3	Chloroethane	1.6 U
75-09-2	Methylene Chloride	4.8 U
67-64-1	**Acetone**	**470 B**
75-15-0	**Carbon Disulfide**	**8.5**
75-35-4	1,1-Dichloroethene	1.6 U
75-34-3	1,1-Dichloroethane	1.6 U
156-60-5	trans-1,2-Dichloroethene	1.6 U
156-59-2	cis-1,2-Dichloroethene	1.6 U
67-66-3	Chloroform	1.6 U
107-06-2	1,2-Dichloroethane	1.6 U
78-93-3	**2-Butanone**	**110**
71-55-6	1,1,1-Trichloroethane	1.6 U
56-23-5	Carbon Tetrachloride	1.6 U
108-05-4	Vinyl Acetate	7.9 U
75-27-4	Bromodichloromethane	1.6 U
78-87-5	1,2-Dichloropropane	1.6 U
10061-01-5	cis-1,3-Dichloropropene	1.6 U
79-01-6	Trichloroethene	1.6 U
124-48-1	Dibromochloromethane	1.6 U
79-00-5	1,1,2-Trichloroethane	1.6 U
71-43-2	**Benzene**	**73**
10061-02-6	trans-1,3-Dichloropropene	1.6 U
110-75-8	2-Chloroethylvinylether	7.9 U
75-25-2	Bromoform	1.6 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	7.9 U
591-78-6	2-Hexanone	7.9 U
127-18-4	Tetrachloroethene	1.6 U
79-34-5	1,1,2,2-Tetrachloroethane	81 Y
108-88-3	**Toluene**	**400 E**
108-90-7	Chlorobenzene	1.6 U
100-41-4	**Ethylbenzene**	**670 E**
100-42-5	Styrene	1.6 U
75-69-4	Trichlorofluoromethane	1.6 U
76-13-1	1,1,2-Trichlorotrifluoroethane	1.6 U
1330-20-7	**m,p-Xylene**	**1,600 E**

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-2-6-10

Lab Sample ID: CF88E
LIMS ID: 00-18318
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Instrument: FINN5
Date Analyzed: 10/02/00 18:30

Sample Amount: 3.15 g dry Wt
Percent Moisture: 34.9%

CAS Number	Analyte	ug/kg
95-47-6	**o-Xylene**	**1,000 E**
95-50-1	1,2-Dichlorobenzene	1.6 U
541-73-1	1,3-Dichlorobenzene	1.6 U
106-46-7	1,4-Dichlorobenzene	1.6 U
107-02-8	Acrolein	79 U
74-88-4	Methyl Iodide	1.6 U
74-96-4	Bromoethane	3.2 U
107-13-1	Acrylonitrile	7.9 U
563-58-6	1,1-Dichloropropene	1.6 U
74-95-3	Dibromomethane	1.6 U
630-20-6	1,1,1,2-Tetrachloroethane	1.6 U
96-12-8	1,2-Dibromo-3-chloropropane	7.9 U
96-18-4	1,2,3-Trichloropropane	3.2 U
110-57-6	trans-1,4-Dichloro-2-butene	7.9 U
108-67-8	**1,3,5-Trimethylbenzene**	**2,000 E**
95-63-6	**1,2,4-Trimethylbenzene**	**2,700 E**
87-68-3	Hexachlorobutadiene	7.9 U
106-93-4	Ethylene Dibromide	1.6 U
74-97-5	Bromochloromethane	1.6 U
594-20-7	2,2-Dichloropropane	1.6 U
142-28-9	1,3-Dichloropropane	1.6 U
98-82-8	**Isopropylbenzene**	**520 E**
103-65-1	n-Propylbenzene	1.6 U
108-86-1	Bromobenzene	1.6 U
95-49-8	2-Chlorotoluene	1.6 U
106-43-4	4-Chlorotoluene	1.6 U
98-06-6	tert-Butylbenzene	1.6 U
135-98-8	sec-Butylbenzene	1.6 U
99-87-6	**4-Isopropyltoluene**	**1,200 E**
104-51-8	n-Butylbenzene	400 Y
120-82-1	1,2,4-Trichlorobenzene	7.9 U
91-20-3	**Naphthalene**	**3,800 E**
87-61-6	1,2,3-Trichlorobenzene	7.9 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	98.6%
d8-Toluene	87.7%
Bromofluorobenzene	128%
d4-1,2-Dichlorobenzene	91.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-2-6-10
REANALYSIS

Lab Sample ID: CF88E-RE
LIMS ID: 00-18318
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Instrument: FINN5
Sample Amount: 26 **mg dry Wt**
Date Analyzed: 10/03/00 18:22
Percent Moisture: 34.9%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	190 U
74-83-9	Bromomethane	190 U
75-01-4	Vinyl Chloride	190 U
75-00-3	Chloroethane	190 U
75-09-2	Methylene Chloride	580 U
67-64-1	**Acetone**	**940 J**
75-15-0	Carbon Disulfide	190 U
75-35-4	1,1-Dichloroethene	190 U
75-34-3	1,1-Dichloroethane	190 U
156-60-5	trans-1,2-Dichloroethene	190 U
156-59-2	cis-1,2-Dichloroethene	190 U
67-66-3	Chloroform	190 U
107-06-2	1,2-Dichloroethane	190 U
78-93-3	2-Butanone	970 U
71-55-6	1,1,1-Trichloroethane	190 U
56-23-5	Carbon Tetrachloride	190 U
108-05-4	Vinyl Acetate	970 U
75-27-4	Bromodichloromethane	190 U
78-87-5	1,2-Dichloropropane	190 U
10061-01-5	cis-1,3-Dichloropropene	190 U
79-01-6	Trichloroethene	190 U
124-48-1	Dibromochloromethane	190 U
79-00-5	1,1,2-Trichloroethane	190 U
71-43-2	Benzene	190 U
10061-02-6	trans-1,3-Dichloropropene	190 U
110-75-8	2-Chloroethylvinylether	970 U
75-25-2	Bromoform	190 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	970 U
591-78-6	2-Hexanone	970 U
127-18-4	Tetrachloroethene	190 U
79-34-5	1,1,2,2-Tetrachloroethane	190 U
108-88-3	**Toluene**	**430**
108-90-7	Chlorobenzene	190 U
100-41-4	**Ethylbenzene**	**870**
100-42-5	Styrene	190 U
75-69-4	Trichlorofluoromethane	190 U
76-13-1	1,1,2-Trichlorotrifluoroethane	190 U
1330-20-7	**m,p-Xylene**	**2,300**

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-2-6-10
REANALYSIS

Lab Sample ID: CF88E-RE
LIMS ID: 00-18318
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Instrument: FINN5
Date Analyzed: 10/03/00 18:22

Sample Amount: 26 mg dry Wt
Percent Moisture: 34.9%

CAS Number	Analyte	ug/kg
95-47-6	**o-Xylene**	**1,300**
95-50-1	1,2-Dichlorobenzene	190 U
541-73-1	1,3-Dichlorobenzene	190 U
106-46-7	1,4-Dichlorobenzene	190 U
107-02-8	Acrolein	9,700 U
74-88-4	Methyl Iodide	190 U
74-96-4	Bromoethane	390 U
107-13-1	Acrylonitrile	970 U
563-58-6	1,1-Dichloropropene	190 U
74-95-3	Dibromomethane	190 U
630-20-6	1,1,1,2-Tetrachloroethane	190 U
96-12-8	1,2-Dibromo-3-chloropropane	970 U
96-18-4	1,2,3-Trichloropropane	390 U
110-57-6	trans-1,4-Dichloro-2-butene	970 U
108-67-8	**1,3,5-Trimethylbenzene**	**2,800**
95-63-6	**1,2,4-Trimethylbenzene**	**6,200**
87-68-3	Hexachlorobutadiene	970 U
106-93-4	Ethylene Dibromide	190 U
74-97-5	Bromochloromethane	190 U
594-20-7	2,2-Dichloropropane	190 U
142-28-9	1,3-Dichloropropane	190 U
98-82-8	**Isopropylbenzene**	**480**
103-65-1	**n-Propylbenzene**	**300**
108-86-1	Bromobenzene	190 U
95-49-8	2-Chlorotoluene	190 U
106-43-4	4-Chlorotoluene	190 U
98-06-6	tert-Butylbenzene	190 U
135-98-8	sec-Butylbenzene	190 U
99-87-6	**4-Isopropyltoluene**	**1,600**
104-51-8	n-Butylbenzene	820 Y
120-82-1	1,2,4-Trichlorobenzene	970 U
91-20-3	**Naphthalene**	**190,000 E**
87-61-6	1,2,3-Trichlorobenzene	970 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	107%
d8-Toluene	101%
Bromofluorobenzene	103%
d4-1,2-Dichlorobenzene	101%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-2-6-10
REANALYSIS-2

Lab Sample ID: CF88E-R2
LIMS ID: 00-18318
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Instrument: FINN5
Date Analyzed: 10/09/00 20:37

Sample Amount: 1.3 mg dry Wt
Percent Moisture: 34.9%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	3,900 U
74-83-9	Bromomethane	3,900 U
75-01-4	Vinyl Chloride	3,900 U
75-00-3	Chloroethane	3,900 U
75-09-2	Methylene Chloride	12,000 U
67-64-1	Acetone	19,000 U
75-15-0	Carbon Disulfide	3,900 U
75-35-4	1,1-Dichloroethene	3,900 U
75-34-3	1,1-Dichloroethane	3,900 U
156-60-5	trans-1,2-Dichloroethene	3,900 U
156-59-2	cis-1,2-Dichloroethene	3,900 U
67-66-3	Chloroform	3,900 U
107-06-2	1,2-Dichloroethane	3,900 U
78-93-3	2-Butanone	19,000 U
71-55-6	1,1,1-Trichloroethane	3,900 U
56-23-5	Carbon Tetrachloride	3,900 U
108-05-4	Vinyl Acetate	19,000 U
75-27-4	Bromodichloromethane	3,900 U
78-87-5	1,2-Dichloropropane	3,900 U
10061-01-5	cis-1,3-Dichloropropene	3,900 U
79-01-6	Trichloroethene	3,900 U
124-48-1	Dibromochloromethane	3,900 U
79-00-5	1,1,2-Trichloroethane	3,900 U
71-43-2	Benzene	3,900 U
10061-02-6	trans-1,3-Dichloropropene	3,900 U
110-75-8	2-Chloroethylvinylether	19,000 U
75-25-2	Bromoform	3,900 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	19,000 U
591-78-6	2-Hexanone	19,000 U
127-18-4	Tetrachloroethene	3,900 U
79-34-5	1,1,2,2-Tetrachloroethane	3,900 U
108-88-3	Toluene	3,900 U
108-90-7	Chlorobenzene	3,900 U
100-41-4	Ethylbenzene	3,900 U
100-42-5	Styrene	3,900 U
75-69-4	Trichlorofluoromethane	3,900 U
76-13-1	1,1,2-Trichlorotrifluoroethane	3,900 U
1330-20-7	m,p-Xylene	3,900 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-2-6-10
REANALYSIS-2

Lab Sample ID: CF88E-R2
LIMS ID: 00-18318
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Instrument: FINN5
Date Analyzed: 10/09/00 20:37

Sample Amount: 1.3 mg dry Wt
Percent Moisture: 34.9%

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	3,900 U
95-50-1	1,2-Dichlorobenzene	3,900 U
541-73-1	1,3-Dichlorobenzene	3,900 U
106-46-7	1,4-Dichlorobenzene	3,900 U
107-02-8	Acrolein	190,000 U
74-88-4	Methyl Iodide	3,900 U
74-96-4	Bromoethane	7,800 U
107-13-1	Acrylonitrile	19,000 U
563-58-6	1,1-Dichloropropene	3,900 U
74-95-3	Dibromomethane	3,900 U
630-20-6	1,1,1,2-Tetrachloroethane	3,900 U
96-12-8	1,2-Dibromo-3-chloropropane	19,000 U
96-18-4	1,2,3-Trichloropropane	7,800 U
110-57-6	trans-1,4-Dichloro-2-butene	19,000 U
108-67-8	**1,3,5-Trimethylbenzene**	**3,000 J**
95-63-6	**1,2,4-Trimethylbenzene**	**5,800**
87-68-3	Hexachlorobutadiene	19,000 U
106-93-4	Ethylene Dibromide	3,900 U
74-97-5	Bromochloromethane	3,900 U
594-20-7	2,2-Dichloropropane	3,900 U
142-28-9	1,3-Dichloropropane	3,900 U
98-82-8	Isopropylbenzene	3,900 U
103-65-1	n-Propylbenzene	3,900 U
108-86-1	Bromobenzene	3,900 U
95-49-8	2-Chlorotoluene	3,900 U
106-43-4	4-Chlorotoluene	3,900 U
98-06-6	tert-Butylbenzene	3,900 U
135-98-8	sec-Butylbenzene	3,900 U
99-87-6	4-Isopropyltoluene	3,900 U
104-51-8	n-Butylbenzene	7,800 U
120-82-1	1,2,4-Trichlorobenzene	19,000 U
91-20-3	**Naphthalene**	**390,000**
87-61-6	1,2,3-Trichlorobenzene	19,000 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	115%
d8-Toluene	99.4%
Bromofluorobenzene	101%
d4-1,2-Dichlorobenzene	103%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-3-4-6

Lab Sample ID: CF88G
LIMS ID: 00-18320
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Instrument: FINN5
Date Analyzed: 10/02/00 18:57

Sample Amount: 2.71 g dry Wt
Percent Moisture: 43.3%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	1.8 U
74-83-9	Bromomethane	1.8 U
75-01-4	Vinyl Chloride	1.8 U
75-00-3	Chloroethane	1.8 U
75-09-2	Methylene Chloride	5.5 U
67-64-1	**Acetone**	**430 B**
75-15-0	**Carbon Disulfide**	**1.6 J**
75-35-4	1,1-Dichloroethene	1.8 U
75-34-3	1,1-Dichloroethane	1.8 U
156-60-5	trans-1,2-Dichloroethene	1.8 U
156-59-2	cis-1,2-Dichloroethene	1.8 U
67-66-3	Chloroform	1.8 U
107-06-2	1,2-Dichloroethane	1.8 U
78-93-3	**2-Butanone**	**73**
71-55-6	1,1,1-Trichloroethane	1.8 U
56-23-5	Carbon Tetrachloride	1.8 U
108-05-4	Vinyl Acetate	9.2 U
75-27-4	Bromodichloromethane	1.8 U
78-87-5	1,2-Dichloropropane	1.8 U
10061-01-5	cis-1,3-Dichloropropene	1.8 U
79-01-6	Trichloroethene	1.8 U
124-48-1	Dibromochloromethane	1.8 U
79-00-5	1,1,2-Trichloroethane	1.8 U
71-43-2	Benzene	1.8 U
10061-02-6	trans-1,3-Dichloropropene	1.8 U
110-75-8	2-Chloroethylvinylether	9.2 U
75-25-2	Bromoform	1.8 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	9.2 U
591-78-6	2-Hexanone	9.2 U
127-18-4	Tetrachloroethene	1.8 U
79-34-5	1,1,2,2-Tetrachloroethane	1.8 U
108-88-3	**Toluene**	**540 E**
108-90-7	Chlorobenzene	1.8 U
100-41-4	Ethylbenzene	1.8 Y
100-42-5	Styrene	1.8 U
75-69-4	Trichlorofluoromethane	1.8 U
76-13-1	1,1,2-Trichlorotrifluoroethane	1.8 U
1330-20-7	m,p-Xylene	2.4 Y

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-3-4-6

Lab Sample ID: CF88G
LIMS ID: 00-18320
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Instrument: FINN5
Date Analyzed: 10/02/00 18:57

Sample Amount: 2.71 g dry Wt
Percent Moisture: 43.3%

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	1.8 U
95-50-1	1,2-Dichlorobenzene	1.8 U
541-73-1	1,3-Dichlorobenzene	1.8 U
106-46-7	1,4-Dichlorobenzene	1.8 U
107-02-8	Acrolein	92 U
74-88-4	Methyl Iodide	1.8 U
74-96-4	Bromoethane	3.7 U
107-13-1	Acrylonitrile	9.2 U
563-58-6	1,1-Dichloropropene	1.8 U
74-95-3	Dibromomethane	1.8 U
630-20-6	1,1,1,2-Tetrachloroethane	1.8 U
96-12-8	1,2-Dibromo-3-chloropropane	9.2 U
96-18-4	1,2,3-Trichloropropane	3.7 U
110-57-6	trans-1,4-Dichloro-2-butene	9.2 U
108-67-8	1,3,5-Trimethylbenzene	2.2 Y
95-63-6	1,2,4-Trimethylbenzene	4.7 Y
87-68-3	Hexachlorobutadiene	9.2 U
106-93-4	Ethylene Dibromide	1.8 U
74-97-5	Bromochloromethane	1.8 U
594-20-7	2,2-Dichloropropane	1.8 U
142-28-9	1,3-Dichloropropane	1.8 U
98-82-8	Isopropylbenzene	1.8 U
103-65-1	n-Propylbenzene	1.8 U
108-86-1	Bromobenzene	1.8 U
95-49-8	2-Chlorotoluene	1.8 U
106-43-4	4-Chlorotoluene	1.8 U
98-06-6	tert-Butylbenzene	1.8 U
135-98-8	sec-Butylbenzene	1.8 U
99-87-6	4-Isopropyltoluene	1.8 U
104-51-8	n-Butylbenzene	3.7 U
120-82-1	1,2,4-Trichlorobenzene	9.2 U
91-20-3	Naphthalene	1,200 Y
87-61-6	1,2,3-Trichlorobenzene	9.2 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	94.1%
d8-Toluene	95.8%
Bromofluorobenzene	80.4%
d4-1,2-Dichlorobenzene	95.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-3-4-6
REANALYSIS

Lab Sample ID: CF88G-RE
LIMS ID: 00-18320
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Instrument: FINN5
Date Analyzed: 10/03/00 17:29

Sample Amount: 0.27 g dry Wt
Percent Moisture: 43.3%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	19 U
74-83-9	Bromomethane	19 U
75-01-4	Vinyl Chloride	19 U
75-00-3	Chloroethane	19 U
75-09-2	Methylene Chloride	56 U
67-64-1	**Acetone**	**530**
75-15-0	Carbon Disulfide	19 U
75-35-4	1,1-Dichloroethene	19 U
75-34-3	1,1-Dichloroethane	19 U
156-60-5	trans-1,2-Dichloroethene	19 U
156-59-2	cis-1,2-Dichloroethene	19 U
67-66-3	Chloroform	19 U
107-06-2	1,2-Dichloroethane	19 U
78-93-3	**2-Butanone**	**93 J**
71-55-6	1,1,1-Trichloroethane	19 U
56-23-5	Carbon Tetrachloride	19 U
108-05-4	Vinyl Acetate	94 U
75-27-4	Bromodichloromethane	19 U
78-87-5	1,2-Dichloropropane	19 U
10061-01-5	cis-1,3-Dichloropropene	19 U
79-01-6	Trichloroethene	19 U
124-48-1	Dibromochloromethane	19 U
79-00-5	1,1,2-Trichloroethane	19 U
71-43-2	Benzene	19 U
10061-02-6	trans-1,3-Dichloropropene	19 U
110-75-8	2-Chloroethylvinylether	94 U
75-25-2	Bromoform	19 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	94 U
591-78-6	2-Hexanone	94 U
127-18-4	Tetrachloroethene	19 U
79-34-5	1,1,2,2-Tetrachloroethane	19 U
108-88-3	**Toluene**	**830**
108-90-7	Chlorobenzene	19 U
100-41-4	Ethylbenzene	19 U
100-42-5	Styrene	19 U
75-69-4	Trichlorofluoromethane	19 U
76-13-1	1,1,2-Trichlorotrifluoroethane	19 U
1330-20-7	m,p-Xylene	19 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-3-4-6
REANALYSIS

Lab Sample ID: CF88G-RE
LIMS ID: 00-18320
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Instrument: FINN5
Date Analyzed: 10/03/00 17:29

Sample Amount: 0.27 g dry Wt
Percent Moisture: 43.3%

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	19 U
95-50-1	1,2-Dichlorobenzene	19 U
541-73-1	1,3-Dichlorobenzene	19 U
106-46-7	1,4-Dichlorobenzene	19 U
107-02-8	Acrolein	940 U
74-88-4	Methyl Iodide	19 U
74-96-4	Bromoethane	38 U
107-13-1	Acrylonitrile	94 U
563-58-6	1,1-Dichloropropene	19 U
74-95-3	Dibromomethane	19 U
630-20-6	1,1,1,2-Tetrachloroethane	19 U
96-12-8	1,2-Dibromo-3-chloropropane	94 U
96-18-4	1,2,3-Trichloropropane	38 U
110-57-6	trans-1,4-Dichloro-2-butene	94 U
108-67-8	1,3,5-Trimethylbenzene	19 U
95-63-6	1,2,4-Trimethylbenzene	19 U
87-68-3	Hexachlorobutadiene	94 U
106-93-4	Ethylene Dibromide	19 U
74-97-5	Bromochloromethane	19 U
594-20-7	2,2-Dichloropropane	19 U
142-28-9	1,3-Dichloropropane	19 U
98-82-8	Isopropylbenzene	19 U
103-65-1	n-Propylbenzene	19 U
108-86-1	Bromobenzene	19 U
95-49-8	2-Chlorotoluene	19 U
106-43-4	4-Chlorotoluene	19 U
98-06-6	tert-Butylbenzene	19 U
135-98-8	sec-Butylbenzene	19 U
99-87-6	4-Isopropyltoluene	19 U
104-51-8	n-Butylbenzene	38 U
120-82-1	1,2,4-Trichlorobenzene	94 U
91-20-3	**Naphthalene**	130
87-61-6	1,2,3-Trichlorobenzene	94 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	105%
d8-Toluene	97.2%
Bromofluorobenzene	95.0%
d4-1,2-Dichlorobenzene	97.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-3-6-10

Lab Sample ID: CF88H
LIMS ID: 00-18321
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Instrument: FINN5
Date Analyzed: 10/09/00 19:18

Sample Amount: 1.50 g dry Wt
Percent Moisture: 69.8%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	3.3 U
74-83-9	Bromomethane	3.3 U
75-01-4	Vinyl Chloride	3.3 U
75-00-3	Chloroethane	3.3 U
75-09-2	Methylene Chloride	10 U
67-64-1	**Acetone**	**200**
75-15-0	**Carbon Disulfide**	**9.3**
75-35-4	1,1-Dichloroethene	3.3 U
75-34-3	1,1-Dichloroethane	3.3 U
156-60-5	trans-1,2-Dichloroethene	3.3 U
156-59-2	cis-1,2-Dichloroethene	3.3 U
67-66-3	Chloroform	3.3 U
107-06-2	1,2-Dichloroethane	3.3 U
78-93-3	**2-Butanone**	**27**
71-55-6	1,1,1-Trichloroethane	3.3 U
56-23-5	Carbon Tetrachloride	3.3 U
108-05-4	Vinyl Acetate	17 U
75-27-4	Bromodichloromethane	3.3 U
78-87-5	1,2-Dichloropropane	3.3 U
10061-01-5	cis-1,3-Dichloropropene	3.3 U
79-01-6	Trichloroethene	3.3 U
124-48-1	Dibromochloromethane	3.3 U
79-00-5	1,1,2-Trichloroethane	3.3 U
71-43-2	Benzene	3.3 U
10061-02-6	trans-1,3-Dichloropropene	3.3 U
110-75-8	2-Chloroethylvinylether	17 U
75-25-2	Bromoform	3.3 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	17 U
591-78-6	2-Hexanone	17 U
127-18-4	Tetrachloroethene	3.3 U
79-34-5	1,1,2,2-Tetrachloroethane	3.3 U
108-88-3	**Toluene**	**8.0**
108-90-7	Chlorobenzene	3.3 U
100-41-4	**Ethylbenzene**	**4.6**
100-42-5	Styrene	3.3 U
75-69-4	Trichlorofluoromethane	3.3 U
76-13-1	1,1,2-Trichlorotrifluoroethane	3.3 U
1330-20-7	**m,p-Xylene**	**16**

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-3-6-10

Lab Sample ID: CF88H
LIMS ID: 00-18321
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Instrument: FINN5
Date Analyzed: 10/09/00 19:18

Sample Amount: 1.50 g dry Wt
Percent Moisture: 69.8%

CAS Number	Analyte	ug/kg
95-47-6	**o-Xylene**	**11**
95-50-1	1,2-Dichlorobenzene	3.3 U
541-73-1	1,3-Dichlorobenzene	3.3 U
106-46-7	1,4-Dichlorobenzene	3.3 U
107-02-8	Acrolein	170 U
74-88-4	Methyl Iodide	3.3 U
74-96-4	Bromoethane	6.7 U
107-13-1	Acrylonitrile	17 U
563-58-6	1,1-Dichloropropene	3.3 U
74-95-3	Dibromomethane	3.3 U
630-20-6	1,1,1,2-Tetrachloroethane	3.3 U
96-12-8	1,2-Dibromo-3-chloropropane	17 U
96-18-4	1,2,3-Trichloropropane	6.7 U
110-57-6	trans-1,4-Dichloro-2-butene	17 U
108-67-8	**1,3,5-Trimethylbenzene**	**18**
95-63-6	**1,2,4-Trimethylbenzene**	**42**
87-68-3	Hexachlorobutadiene	17 U
106-93-4	Ethylene Dibromide	3.3 U
74-97-5	Bromochloromethane	3.3 U
594-20-7	2,2-Dichloropropane	3.3 U
142-28-9	1,3-Dichloropropane	3.3 U
98-82-8	**Isopropylbenzene**	**12**
103-65-1	n-Propylbenzene	3.8 Y
108-86-1	Bromobenzene	3.3 U
95-49-8	2-Chlorotoluene	3.3 U
106-43-4	4-Chlorotoluene	3.3 U
98-06-6	tert-Butylbenzene	3.3 U
135-98-8	sec-Butylbenzene	3.3 U
99-87-6	**4-Isopropyltoluene**	**27**
104-51-8	n-Butylbenzene	6.7 U
120-82-1	1,2,4-Trichlorobenzene	17 U
91-20-3	**Naphthalene**	**210**
87-61-6	1,2,3-Trichlorobenzene	17 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	109%
d8-Toluene	95.8%
Bromofluorobenzene	92.9%
d4-1,2-Dichlorobenzene	101%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-4-6-10

Lab Sample ID: CF88J
LIMS ID: 00-18323
Matrix: Soil
Data Release Authorized
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Instrument: FINN5
Date Analyzed: 10/09/00 19:44

Sample Amount: 2.92 g dry Wt
Percent Moisture: 38.7%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	1.7 U
74-83-9	Bromomethane	1.7 U
75-01-4	Vinyl Chloride	1.7 U
75-00-3	Chloroethane	1.7 U
75-09-2	Methylene Chloride	5.1 U
67-64-1	Acetone	8.6 U
75-15-0	Carbon Disulfide	1.7 U
75-35-4	1,1-Dichloroethene	1.7 U
75-34-3	1,1-Dichloroethane	1.7 U
156-60-5	trans-1,2-Dichloroethene	1.7 U
156-59-2	cis-1,2-Dichloroethene	1.7 U
67-66-3	Chloroform	1.7 U
107-06-2	1,2-Dichloroethane	1.7 U
78-93-3	2-Butanone	8.6 U
71-55-6	1,1,1-Trichloroethane	1.7 U
56-23-5	Carbon Tetrachloride	1.7 U
108-05-4	Vinyl Acetate	8.6 U
75-27-4	Bromodichloromethane	1.7 U
78-87-5	1,2-Dichloropropane	1.7 U
10061-01-5	cis-1,3-Dichloropropene	1.7 U
79-01-6	Trichloroethene	1.7 U
124-48-1	Dibromochloromethane	1.7 U
79-00-5	1,1,2-Trichloroethane	1.7 U
71-43-2	Benzene	1.7 U
10061-02-6	trans-1,3-Dichloropropene	1.7 U
110-75-8	2-Chloroethylvinylether	8.6 U
75-25-2	Bromoform	1.7 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	8.6 U
591-78-6	2-Hexanone	8.6 U
127-18-4	Tetrachloroethene	1.7 U
79-34-5	1,1,2,2-Tetrachloroethane	1.7 U
108-88-3	**Toluene**	**7.3**
108-90-7	Chlorobenzene	1.7 U
100-41-4	Ethylbenzene	1.7 U
100-42-5	Styrene	1.7 U
75-69-4	Trichlorofluoromethane	1.7 U
76-13-1	1,1,2-Trichlorotrifluoroethane	1.7 U
1330-20-7	m,p-Xylene	1.7 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-4-6-10

Lab Sample ID: CF88J
LIMS ID: 00-18323
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Instrument: FINN5
Date Analyzed: 10/09/00 19:44

Sample Amount: 2.92 g dry Wt
Percent Moisture: 38.7%

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	1.7 U
95-50-1	1,2-Dichlorobenzene	1.7 U
541-73-1	1,3-Dichlorobenzene	1.7 U
106-46-7	1,4-Dichlorobenzene	1.7 U
107-02-8	Acrolein	86 U
74-88-4	Methyl Iodide	1.7 U
74-96-4	Bromoethane	3.4 U
107-13-1	Acrylonitrile	8.6 U
563-58-6	1,1-Dichloropropene	1.7 U
74-95-3	Dibromomethane	1.7 U
630-20-6	1,1,1,2-Tetrachloroethane	1.7 U
96-12-8	1,2-Dibromo-3-chloropropane	8.6 U
96-18-4	1,2,3-Trichloropropane	3.4 U
110-57-6	trans-1,4-Dichloro-2-butene	8.6 U
108-67-8	1,3,5-Trimethylbenzene	1.7 U
95-63-6	1,2,4-Trimethylbenzene	1.7 U
87-68-3	Hexachlorobutadiene	8.6 U
106-93-4	Ethylene Dibromide	1.7 U
74-97-5	Bromochloromethane	1.7 U
594-20-7	2,2-Dichloropropane	1.7 U
142-28-9	1,3-Dichloropropane	1.7 U
98-82-8	Isopropylbenzene	1.7 U
103-65-1	n-Propylbenzene	1.7 U
108-86-1	Bromobenzene	1.7 U
95-49-8	2-Chlorotoluene	1.7 U
106-43-4	4-Chlorotoluene	1.7 U
98-06-6	tert-Butylbenzene	1.7 U
135-98-8	sec-Butylbenzene	1.7 U
99-87-6	4-Isopropyltoluene	1.7 U
104-51-8	n-Butylbenzene	3.4 U
120-82-1	1,2,4-Trichlorobenzene	8.6 U
91-20-3	**Naphthalene**	**8.6**
87-61-6	1,2,3-Trichlorobenzene	8.6 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	116%
d8-Toluene	91.2%
Bromofluorobenzene	90.1%
d4-1,2-Dichlorobenzene	106%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-4-6-10
REANALYSIS

Lab Sample ID: CF88J-RE
LIMS ID: 00-18323
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Instrument: FINN5
Date Analyzed: 10/10/00 15:24

Sample Amount: 0.32 g dry Wt
Percent Moisture: 38.7%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	15 U
74-83-9	Bromomethane	15 U
75-01-4	Vinyl Chloride	15 U
75-00-3	Chloroethane	15 U
75-09-2	Methylene Chloride	46 U
67-64-1	Acetone	77 U
75-15-0	Carbon Disulfide	15 U
75-35-4	1,1-Dichloroethene	15 U
75-34-3	1,1-Dichloroethane	15 U
156-60-5	trans-1,2-Dichloroethene	15 U
156-59-2	cis-1,2-Dichloroethene	15 U
67-66-3	Chloroform	15 U
107-06-2	1,2-Dichloroethane	15 U
78-93-3	2-Butanone	77 U
71-55-6	1,1,1-Trichloroethane	15 U
56-23-5	Carbon Tetrachloride	15 U
108-05-4	Vinyl Acetate	77 U
75-27-4	Bromodichloromethane	15 U
78-87-5	1,2-Dichloropropane	15 U
10061-01-5	cis-1,3-Dichloropropene	15 U
79-01-6	Trichloroethene	15 U
124-48-1	Dibromochloromethane	15 U
79-00-5	1,1,2-Trichloroethane	15 U
71-43-2	Benzene	15 U
10061-02-6	trans-1,3-Dichloropropene	15 U
110-75-8	2-Chloroethylvinylether	77 U
75-25-2	Bromoform	15 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	77 U
591-78-6	2-Hexanone	77 U
127-18-4	Tetrachloroethene	15 U
79-34-5	1,1,2,2-Tetrachloroethane	15 U
108-88-3	**Toluene**	**8.2 J**
108-90-7	Chlorobenzene	15 U
100-41-4	Ethylbenzene	15 U
100-42-5	Styrene	15 U
75-69-4	Trichlorofluoromethane	15 U
76-13-1	1,1,2-Trichlorotrifluoroethane	15 U
1330-20-7	m,p-Xylene	15 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-4-6-10
REANALYSIS

Lab Sample ID: CF88J-RE
LIMS ID: 00-18323
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Instrument: FINN5
Date Analyzed: 10/10/00 15:24

Sample Amount: 0.32 g dry Wt
Percent Moisture: 38.7%

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	15 U
95-50-1	1,2-Dichlorobenzene	15 U
541-73-1	1,3-Dichlorobenzene	15 U
106-46-7	1,4-Dichlorobenzene	15 U
107-02-8	Acrolein	770 U
74-88-4	Methyl Iodide	15 U
74-96-4	Bromoethane	31 U
107-13-1	Acrylonitrile	77 U
563-58-6	1,1-Dichloropropene	15 U
74-95-3	Dibromomethane	15 U
630-20-6	1,1,1,2-Tetrachloroethane	15 U
96-12-8	1,2-Dibromo-3-chloropropane	77 U
96-18-4	1,2,3-Trichloropropane	31 U
110-57-6	trans-1,4-Dichloro-2-butene	77 U
108-67-8	1,3,5-Trimethylbenzene	15 U
95-63-6	1,2,4-Trimethylbenzene	15 U
87-68-3	Hexachlorobutadiene	77 U
106-93-4	Ethylene Dibromide	15 U
74-97-5	Bromochloromethane	15 U
594-20-7	2,2-Dichloropropane	15 U
142-28-9	1,3-Dichloropropane	15 U
98-82-8	Isopropylbenzene	15 U
103-65-1	n-Propylbenzene	15 U
108-86-1	Bromobenzene	15 U
95-49-8	2-Chlorotoluene	15 U
106-43-4	4-Chlorotoluene	15 U
98-06-6	tert-Butylbenzene	15 U
135-98-8	sec-Butylbenzene	15 U
99-87-6	4-Isopropyltoluene	15 U
104-51-8	n-Butylbenzene	31 U
120-82-1	1,2,4-Trichlorobenzene	77 U
91-20-3	Naphthalene	77 U
87-61-6	1,2,3-Trichlorobenzene	77 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	107%
d8-Toluene	97.7%
Bromofluorobenzene	97.2%
d4-1,2-Dichlorobenzene	105%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 100200MB
LIMS ID: 00-18317
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN5
Date Analyzed: 10/02/00 10:27

Sample Amount: 5.00 g dry Wt Equiv
Percent Moisture: NA

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	3.0 U
67-64-1	**Acetone**	**2.8 J**
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	trans-1,2-Dichloroethene	1.0 U
156-59-2	cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
108-05-4	Vinyl Acetate	5.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-02-6	trans-1,3-Dichloropropene	1.0 U
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.0 U
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	1.0 U
1330-20-7	m,p-Xylene	1.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 100200MB
LIMS ID: 00-18317
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN5
Date Analyzed: 10/02/00 10:27

Sample Amount: 5.00 g dry Wt Equiv
Percent Moisture: NA

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	1.0 U
95-50-1	1,2-Dichlorobenzene	1.0 U
541-73-1	1,3-Dichlorobenzene	1.0 U
106-46-7	1,4-Dichlorobenzene	1.0 U
107-02-8	Acrolein	50 U
74-88-4	Methyl Iodide	1.0 U
74-96-4	Bromoethane	2.0 U
107-13-1	Acrylonitrile	5.0 U
563-58-6	1,1-Dichloropropene	1.0 U
74-95-3	Dibromomethane	1.0 U
630-20-6	1,1,1,2-Tetrachloroethane	1.0 U
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U
96-18-4	1,2,3-Trichloropropane	2.0 U
110-57-6	trans-1,4-Dichloro-2-butene	5.0 U
108-67-8	1,3,5-Trimethylbenzene	1.0 U
95-63-6	1,2,4-Trimethylbenzene	1.0 U
87-68-3	Hexachlorobutadiene	5.0 U
106-93-4	Ethylene Dibromide	1.0 U
74-97-5	Bromochloromethane	1.0 U
594-20-7	2,2-Dichloropropane	1.0 U
142-28-9	1,3-Dichloropropane	1.0 U
98-82-8	Isopropylbenzene	1.0 U
103-65-1	n-Propylbenzene	1.0 U
108-86-1	Bromobenzene	1.0 U
95-49-8	2-Chlorotoluene	1.0 U
106-43-4	4-Chlorotoluene	1.0 U
98-06-6	tert-Butylbenzene	1.0 U
135-98-8	sec-Butylbenzene	1.0 U
99-87-6	4-Isopropyltoluene	1.0 U
104-51-8	n-Butylbenzene	2.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0 U
91-20-3	Naphthalene	5.0 U
87-61-6	1,2,3-Trichlorobenzene	5.0 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	92.6%
d8-Toluene	100%
Bromofluorobenzene	96.5%
d4-1,2-Dichlorobenzene	97.7%

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CF88SB
LIMS ID: 00-18317
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00
Date Analyzed: 10/02/00
Instrument: FINN5

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: NA

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
Chloromethane	31.0	50.0	62.0%
Bromomethane	45.9	50.0	91.8%
Vinyl Chloride	40.4	50.0	80.8%
Chloroethane	42.5	50.0	85.0%
Methylene Chloride	42.0	50.0	84.0%
Acetone	238.	250	95.2%
Carbon Disulfide	55.2	50.0	110%
1,1-Dichloroethene	42.9	50.0	85.8%
1,1-Dichloroethane	42.2	50.0	84.4%
trans-1,2-Dichloroethene	42.6	50.0	85.2%
cis-1,2-Dichloroethene	44.2	50.0	88.4%
Chloroform	43.1	50.0	86.2%
1,2-Dichloroethane	41.6	50.0	83.2%
2-Butanone	235.	250	94.0%
1,1,1-Trichloroethane	45.3	50.0	90.6%
Carbon Tetrachloride	45.6	50.0	91.2%
Vinyl Acetate	38.3	50.0	76.6%
Bromodichloromethane	43.2	50.0	86.4%
1,2-Dichloropropane	46.0	50.0	92.0%
cis-1,3-Dichloropropene	42.1	50.0	84.2%
Trichloroethene	45.2	50.0	90.4%
Dibromochloromethane	43.0	50.0	86.0%
1,1,2-Trichloroethane	43.6	50.0	87.2%
Benzene	44.1	50.0	88.2%
trans-1,3-Dichloropropene	41.3	50.0	82.6%
2-Chloroethylvinylether	43.8	50.0	87.6%
Bromoform	42.2	50.0	84.4%
4-Methyl-2-Pentanone (MIBK)	236.	250	94.4%
2-Hexanone	231.	250	92.4%
Tetrachloroethene	45.9	50.0	91.8%
1,1,2,2-Tetrachloroethane	42.4	50.0	84.8%
Toluene	44.6	50.0	89.2%
Chlorobenzene	44.1	50.0	88.2%
Ethylbenzene	44.0	50.0	88.0%
Styrene	44.8	50.0	89.6%
Trichlorofluoromethane	44.1	50.0	88.2%
1,1,2-Trichlorotrifluoroethane	51.4	50.0	103%
m,p-Xylene	89.6	100	89.6%
O-Xylene	44.4	50.0	88.8%

Reported in ug/kg-dry-Wt

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CF88SB
LIMS ID: 00-18317
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00
Date Analyzed: 10/02/00
Instrument: FINN5

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: NA

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
1,2-Dichlorobenzene	43.2	50.0	86.4%
1,3-Dichlorobenzene	44.1	50.0	88.2%
1,4-Dichlorobenzene	43.8	50.0	87.6%
Acrolein	251.	250	100%
Methyl Iodide	48.5	50.0	97.0%
Bromoethane	50.0	50.0	100%
Acrylonitrile	41.9	50.0	83.8%
1,1-Dichloropropene	47.0	50.0	94.0%
Dibromomethane	43.0	50.0	86.0%
1,1,1,2-Tetrachloroethane	43.9	50.0	87.8%
1,2-Dibromo-3-chloropropane	43.8	50.0	87.6%
1,2,3-Trichloropropane	44.2	50.0	88.4%
trans-1,4-Dichloro-2-butene	44.2	50.0	88.4%
1,3,5-Trimethylbenzene	45.5	50.0	91.0%
1,2,4-Trimethylbenzene	44.4	50.0	88.8%
Hexachlorobutadiene	45.0	50.0	90.0%
Ethylene Dibromide	43.3	50.0	86.6%
Bromochloromethane	43.1	50.0	86.2%
2,2-Dichloropropane	44.6	50.0	89.2%
1,3-Dichloropropane	42.2	50.0	84.4%
Isopropylbenzene	45.7	50.0	91.4%
n-Propylbenzene	44.8	50.0	89.6%
Bromobenzene	44.4	50.0	88.8%
2-Chlorotoluene	43.9	50.0	87.8%
4-Chlorotoluene	43.6	50.0	87.2%
tert-Butylbenzene	44.8	50.0	89.6%
sec-Butylbenzene	44.8	50.0	89.6%
4-Isopropyltoluene	45.1	50.0	90.2%
n-Butylbenzene	44.2	50.0	88.4%
1,2,4-Trichlorobenzene	43.5	50.0	87.0%
Naphthalene	42.8	50.0	85.6%
1,2,3-Trichlorobenzene	42.2	50.0	84.4%

Spike Blank Surrogate Recovery	
d4-1,2-Dichloroethane	96.7%
d8-Toluene	100%
Bromofluorobenzene	99.1%
d4-1,2-Dichlorobenzene	99.4%

Reported in ug/kg-dry-Wt

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 100300MB
LIMS ID: 00-18316
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN5
Date Analyzed: 10/03/00 13:06

Sample Amount: 5.00 g dry Wt Equiv
Percent Moisture: NA

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	3.0 U
67-64-1	Acetone	5.0 U
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	trans-1,2-Dichloroethene	1.0 U
156-59-2	cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
108-05-4	Vinyl Acetate	5.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-02-6	trans-1,3-Dichloropropene	1.0 U
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.0 U
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	1.0 U
1330-20-7	m,p-Xylene	1.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 100300MB
LIMS ID: 00-18316
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN5
Date Analyzed: 10/03/00 13:06

Sample Amount: 5.00 g dry Wt Equiv
Percent Moisture: NA

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	1.0 U
95-50-1	1,2-Dichlorobenzene	1.0 U
541-73-1	1,3-Dichlorobenzene	1.0 U
106-46-7	1,4-Dichlorobenzene	1.0 U
107-02-8	Acrolein	50 U
74-88-4	Methyl Iodide	1.0 U
74-96-4	Bromoethane	2.0 U
107-13-1	Acrylonitrile	5.0 U
563-58-6	1,1-Dichloropropene	1.0 U
74-95-3	Dibromomethane	1.0 U
630-20-6	1,1,1,2-Tetrachloroethane	1.0 U
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U
96-18-4	1,2,3-Trichloropropane	2.0 U
110-57-6	trans-1,4-Dichloro-2-butene	5.0 U
108-67-8	1,3,5-Trimethylbenzene	1.0 U
95-63-6	1,2,4-Trimethylbenzene	1.0 U
87-68-3	Hexachlorobutadiene	5.0 U
106-93-4	Ethylene Dibromide	1.0 U
74-97-5	Bromochloromethane	1.0 U
594-20-7	2,2-Dichloropropane	1.0 U
142-28-9	1,3-Dichloropropane	1.0 U
98-82-8	Isopropylbenzene	1.0 U
103-65-1	n-Propylbenzene	1.0 U
108-86-1	Bromobenzene	1.0 U
95-49-8	2-Chlorotoluene	1.0 U
106-43-4	4-Chlorotoluene	1.0 U
98-06-6	tert-Butylbenzene	1.0 U
135-98-8	sec-Butylbenzene	1.0 U
99-87-6	4-Isopropyltoluene	1.0 U
104-51-8	n-Butylbenzene	2.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0 U
91-20-3	Naphthalene	5.0 U
87-61-6	1,2,3-Trichlorobenzene	5.0 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	105%
d8-Toluene	102%
Bromofluorobenzene	100%
d4-1,2-Dichlorobenzene	100%

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CF88SB
LIMS ID: 00-18316
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00
Date Analyzed: 10/03/00
Instrument: FINN5

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: NA

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
Chloromethane	45.5	50.0	91.0%
Bromomethane	53.9	50.0	108%
Vinyl Chloride	49.7	50.0	99.4%
Chloroethane	48.9	50.0	97.8%
Methylene Chloride	42.7	50.0	85.4%
Acetone	255.	250	102%
Carbon Disulfide	45.1	50.0	90.2%
1,1-Dichloroethene	41.8	50.0	83.6%
1,1-Dichloroethane	43.2	50.0	86.4%
trans-1,2-Dichloroethene	43.7	50.0	87.4%
cis-1,2-Dichloroethene	47.4	50.0	94.8%
Chloroform	47.3	50.0	94.6%
1,2-Dichloroethane	44.0	50.0	88.0%
2-Butanone	262.	250	105%
1,1,1-Trichloroethane	49.3	50.0	98.6%
Carbon Tetrachloride	49.0	50.0	98.0%
Vinyl Acetate	37.4	50.0	74.8%
Bromodichloromethane	46.1	50.0	92.2%
1,2-Dichloropropane	49.1	50.0	98.2%
cis-1,3-Dichloropropene	44.8	50.0	89.6%
Trichloroethene	47.4	50.0	94.8%
Dibromochloromethane	44.9	50.0	89.8%
1,1,2-Trichloroethane	46.7	50.0	93.4%
Benzene	47.8	50.0	95.6%
trans-1,3-Dichloropropene	44.2	50.0	88.4%
2-Chloroethylvinylether	48.7	50.0	97.4%
Bromoform	45.1	50.0	90.2%
4-Methyl-2-Pentanone (MIBK)	259.	250	104%
2-Hexanone	256.	250	102%
Tetrachloroethene	49.8	50.0	99.6%
1,1,2,2-Tetrachloroethane	44.2	50.0	88.4%
Toluene	47.7	50.0	95.4%
Chlorobenzene	46.9	50.0	93.8%
Ethylbenzene	47.1	50.0	94.2%
Styrene	47.6	50.0	95.2%
Trichlorofluoromethane	43.8	50.0	87.6%
1,1,2-Trichlorotrifluoroethane	40.7	50.0	81.4%
m,p-Xylene	92.7	100	92.7%
O-Xylene	47.4	50.0	94.8%

Reported in ug/kg-dry-Wt

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CF88SB
LIMS ID: 00-18316
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00
Date Analyzed: 10/03/00
Instrument: FINN5

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: NA

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
1,2-Dichlorobenzene	44.9	50.0	89.8%
1,3-Dichlorobenzene	46.8	50.0	93.6%
1,4-Dichlorobenzene	47.3	50.0	94.6%
Acrolein	291.	250	116%
Methyl Iodide	42.1	50.0	84.2%
Bromoethane	43.4	50.0	86.8%
Acrylonitrile	48.4	50.0	96.8%
1,1-Dichloropropene	52.2	50.0	104%
Dibromomethane	46.3	50.0	92.6%
1,1,1,2-Tetrachloroethane	46.3	50.0	92.6%
1,2-Dibromo-3-chloropropane	45.2	50.0	90.4%
1,2,3-Trichloropropane	46.4	50.0	92.8%
trans-1,4-Dichloro-2-butene	48.8	50.0	97.6%
1,3,5-Trimethylbenzene	47.8	50.0	95.6%
1,2,4-Trimethylbenzene	47.7	50.0	95.4%
Hexachlorobutadiene	52.8	50.0	106%
Ethylene Dibromide	46.0	50.0	92.0%
Bromochloromethane	45.1	50.0	90.2%
2,2-Dichloropropane	49.0	50.0	98.0%
1,3-Dichloropropane	46.1	50.0	92.2%
Isopropylbenzene	48.7	50.0	97.4%
n-Propylbenzene	49.1	50.0	98.2%
Bromobenzene	46.7	50.0	93.4%
2-Chlorotoluene	49.4	50.0	98.8%
4-Chlorotoluene	46.9	50.0	93.8%
tert-Butylbenzene	46.6	50.0	93.2%
sec-Butylbenzene	48.9	50.0	97.8%
4-Isopropyltoluene	49.0	50.0	98.0%
n-Butylbenzene	49.6	50.0	99.2%
1,2,4-Trichlorobenzene	47.6	50.0	95.2%
Naphthalene	49.7	50.0	99.4%
1,2,3-Trichlorobenzene	48.1	50.0	96.2%

Spike Blank Surrogate Recovery

d4-1,2-Dichloroethane	96.7%
d8-Toluene	101%
Bromofluorobenzene	99.7%
d4-1,2-Dichlorobenzene	98.1%

Reported in ug/kg-dry-Wt

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 100300MB
LIMS ID: 00-18318
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN5
Date Analyzed: 10/03/00 13:06

Sample Amount: 40 mg dry Wt Equiv
Percent Moisture: NA

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	120 U
74-83-9	Bromomethane	120 U
75-01-4	Vinyl Chloride	120 U
75-00-3	Chloroethane	120 U
75-09-2	Methylene Chloride	380 U
67-64-1	Acetone	620 U
75-15-0	Carbon Disulfide	120 U
75-35-4	1,1-Dichloroethene	120 U
75-34-3	1,1-Dichloroethane	120 U
156-60-5	trans-1,2-Dichloroethene	120 U
156-59-2	cis-1,2-Dichloroethene	120 U
67-66-3	Chloroform	120 U
107-06-2	1,2-Dichloroethane	120 U
78-93-3	2-Butanone	620 U
71-55-6	1,1,1-Trichloroethane	120 U
56-23-5	Carbon Tetrachloride	120 U
108-05-4	Vinyl Acetate	620 U
75-27-4	Bromodichloromethane	120 U
78-87-5	1,2-Dichloropropane	120 U
10061-01-5	cis-1,3-Dichloropropene	120 U
79-01-6	Trichloroethene	120 U
124-48-1	Dibromochloromethane	120 U
79-00-5	1,1,2-Trichloroethane	120 U
71-43-2	Benzene	120 U
10061-02-6	trans-1,3-Dichloropropene	120 U
110-75-8	2-Chloroethylvinylether	620 U
75-25-2	Bromoform	120 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	620 U
591-78-6	2-Hexanone	620 U
127-18-4	Tetrachloroethene	120 U
79-34-5	1,1,2,2-Tetrachloroethane	120 U
108-88-3	Toluene	120 U
108-90-7	Chlorobenzene	120 U
100-41-4	Ethylbenzene	120 U
100-42-5	Styrene	120 U
75-69-4	Trichlorofluoromethane	120 U
76-13-1	1,1,2-Trichlorotrifluoroethane	120 U
1330-20-7	m,p-Xylene	120 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 100300MB
LIMS ID: 00-18318
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN5
Date Analyzed: 10/03/00 13:06

Sample Amount: 40 mg dry Wt Equiv
Percent Moisture: NA

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	120 U
95-50-1	1,2-Dichlorobenzene	120 U
541-73-1	1,3-Dichlorobenzene	120 U
106-46-7	1,4-Dichlorobenzene	120 U
107-02-8	Acrolein	6,200 U
74-88-4	Methyl Iodide	120 U
74-96-4	Bromoethane	250 U
107-13-1	Acrylonitrile	620 U
563-58-6	1,1-Dichloropropene	120 U
74-95-3	Dibromomethane	120 U
630-20-6	1,1,1,2-Tetrachloroethane	120 U
96-12-8	1,2-Dibromo-3-chloropropane	620 U
96-18-4	1,2,3-Trichloropropane	250 U
110-57-6	trans-1,4-Dichloro-2-butene	620 U
108-67-8	1,3,5-Trimethylbenzene	120 U
95-63-6	1,2,4-Trimethylbenzene	120 U
87-68-3	Hexachlorobutadiene	620 U
106-93-4	Ethylene Dibromide	120 U
74-97-5	Bromochloromethane	120 U
594-20-7	2,2-Dichloropropane	120 U
142-28-9	1,3-Dichloropropane	120 U
98-82-8	Isopropylbenzene	120 U
103-65-1	n-Propylbenzene	120 U
108-86-1	Bromobenzene	120 U
95-49-8	2-Chlorotoluene	120 U
106-43-4	4-Chlorotoluene	120 U
98-06-6	tert-Butylbenzene	120 U
135-98-8	sec-Butylbenzene	120 U
99-87-6	4-Isopropyltoluene	120 U
104-51-8	n-Butylbenzene	250 U
120-82-1	1,2,4-Trichlorobenzene	620 U
91-20-3	Naphthalene	620 U
87-61-6	1,2,3-Trichlorobenzene	620 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	105%
d8-Toluene	102%
Bromofluorobenzene	100%
d4-1,2-Dichlorobenzene	100%

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CF88SB
LIMS ID: 00-18318
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00
Date Analyzed: 10/03/00
Instrument: FINN5

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: NA

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
Chloromethane	5690	6250	91.0%
Bromomethane	6740	6250	108%
Vinyl Chloride	6210	6250	99.4%
Chloroethane	6110	6250	97.8%
Methylene Chloride	5340	6250	85.4%
Acetone	31900	31200	102%
Carbon Disulfide	5640	6250	90.2%
1,1-Dichloroethene	5220	6250	83.5%
1,1-Dichloroethane	5400	6250	86.4%
trans-1,2-Dichloroethene	5460	6250	87.4%
cis-1,2-Dichloroethene	5920	6250	94.7%
Chloroform	5910	6250	94.6%
1,2-Dichloroethane	5500	6250	88.0%
2-Butanone	32800	31200	105%
1,1,1-Trichloroethane	6160	6250	98.6%
Carbon Tetrachloride	6120	6250	97.9%
Vinyl Acetate	4680	6250	74.9%
Bromodichloromethane	5760	6250	92.2%
1,2-Dichloropropane	6140	6250	98.2%
cis-1,3-Dichloropropene	5600	6250	89.6%
Trichloroethene	5920	6250	94.7%
Dibromochloromethane	5610	6250	89.8%
1,1,2-Trichloroethane	5840	6250	93.4%
Benzene	5980	6250	95.7%
trans-1,3-Dichloropropene	5520	6250	88.3%
2-Chloroethylvinylether	6090	6250	97.4%
Bromoform	5640	6250	90.2%
4-Methyl-2-Pentanone (MIBK)	32400	31200	104%
2-Hexanone	32000	31200	102%
Tetrachloroethene	6220	6250	99.5%
1,1,2,2-Tetrachloroethane	5520	6250	88.3%
Toluene	5960	6250	95.4%
Chlorobenzene	5860	6250	93.8%
Ethylbenzene	5890	6250	94.2%
Styrene	5950	6250	95.2%
Trichlorofluoromethane	5480	6250	87.7%
1,1,2-Trichlorotrifluoroethane	5090	6250	81.4%
m,p-Xylene	11600	12500	92.8%
O-Xylene	5920	6250	94.7%

Reported in ug/kg-dry-Wt

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CF88SB
LIMS ID: 00-18318
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00
Date Analyzed: 10/03/00
Instrument: FINN5

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: NA

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
1,2-Dichlorobenzene	5610	6250	89.8%
1,3-Dichlorobenzene	5850	6250	93.6%
1,4-Dichlorobenzene	5910	6250	94.6%
Acrolein	36400	31200	116%
Methyl Iodide	5260	6250	84.2%
Bromoethane	5420	6250	86.7%
Acrylonitrile	6050	6250	96.8%
1,1-Dichloropropene	6520	6250	104%
Dibromomethane	5790	6250	92.6%
1,1,1,2-Tetrachloroethane	5790	6250	92.6%
1,2-Dibromo-3-chloropropane	5650	6250	90.4%
1,2,3-Trichloropropane	5800	6250	92.8%
trans-1,4-Dichloro-2-butene	6100	6250	97.6%
1,3,5-Trimethylbenzene	5980	6250	95.7%
1,2,4-Trimethylbenzene	5960	6250	95.4%
Hexachlorobutadiene	6600	6250	106%
Ethylene Dibromide	5750	6250	92.0%
Bromochloromethane	5640	6250	90.2%
2,2-Dichloropropane	6120	6250	97.9%
1,3-Dichloropropane	5760	6250	92.2%
Isopropylbenzene	6090	6250	97.4%
n-Propylbenzene	6140	6250	98.2%
Bromobenzene	5840	6250	93.4%
2-Chlorotoluene	6180	6250	98.9%
4-Chlorotoluene	5860	6250	93.8%
tert-Butylbenzene	5820	6250	93.1%
sec-Butylbenzene	6110	6250	97.8%
4-Isopropyltoluene	6120	6250	97.9%
n-Butylbenzene	6200	6250	99.2%
1,2,4-Trichlorobenzene	5950	6250	95.2%
Naphthalene	6210	6250	99.4%
1,2,3-Trichlorobenzene	6010	6250	96.2%

Spike Blank Surrogate Recovery	
d4-1,2-Dichloroethane	96.7%
d8-Toluene	101%
Bromofluorobenzene	99.7%
d4-1,2-Dichlorobenzene	98.1%

Reported in ug/kg-dry-Wt

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 100900MB
LIMS ID: 00-18320
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN5
Date Analyzed: 10/09/00 18:52

Sample Amount: 40 mg dry Wt Equiv
Percent Moisture: NA

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	120 U
74-83-9	Bromomethane	120 U
75-01-4	Vinyl Chloride	120 U
75-00-3	Chloroethane	120 U
75-09-2	Methylene Chloride	380 U
67-64-1	Acetone	620 U
75-15-0	Carbon Disulfide	120 U
75-35-4	1,1-Dichloroethene	120 U
75-34-3	1,1-Dichloroethane	120 U
156-60-5	trans-1,2-Dichloroethene	120 U
156-59-2	cis-1,2-Dichloroethene	120 U
67-66-3	Chloroform	120 U
107-06-2	1,2-Dichloroethane	120 U
78-93-3	2-Butanone	620 U
71-55-6	1,1,1-Trichloroethane	120 U
56-23-5	Carbon Tetrachloride	120 U
108-05-4	Vinyl Acetate	620 U
75-27-4	Bromodichloromethane	120 U
78-87-5	1,2-Dichloropropane	120 U
10061-01-5	cis-1,3-Dichloropropene	120 U
79-01-6	Trichloroethene	120 U
124-48-1	Dibromochloromethane	120 U
79-00-5	1,1,2-Trichloroethane	120 U
71-43-2	Benzene	120 U
10061-02-6	trans-1,3-Dichloropropene	120 U
110-75-8	2-Chloroethylvinylether	620 U
75-25-2	Bromoform	120 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	620 U
591-78-6	2-Hexanone	620 U
127-18-4	Tetrachloroethene	120 U
79-34-5	1,1,2,2-Tetrachloroethane	120 U
108-88-3	Toluene	120 U
108-90-7	Chlorobenzene	120 U
100-41-4	Ethylbenzene	120 U
100-42-5	Styrene	120 U
75-69-4	Trichlorofluoromethane	120 U
76-13-1	1,1,2-Trichlorotrifluoroethane	120 U
1330-20-7	m,p-Xylene	120 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 100900MB
LIMS ID: 00-18320
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN5
Sample Amount: 40 **mg dry Wt Equiv**
Date Analyzed: 10/09/00 18:52
Percent Moisture: NA

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	120 U
95-50-1	1,2-Dichlorobenzene	120 U
541-73-1	1,3-Dichlorobenzene	120 U
106-46-7	1,4-Dichlorobenzene	120 U
107-02-8	Acrolein	6,200 U
74-88-4	Methyl Iodide	120 U
74-96-4	Bromoethane	250 U
107-13-1	Acrylonitrile	620 U
563-58-6	1,1-Dichloropropene	120 U
74-95-3	Dibromomethane	120 U
630-20-6	1,1,1,2-Tetrachloroethane	120 U
96-12-8	1,2-Dibromo-3-chloropropane	620 U
96-18-4	1,2,3-Trichloropropane	250 U
110-57-6	trans-1,4-Dichloro-2-butene	620 U
108-67-8	1,3,5-Trimethylbenzene	120 U
95-63-6	1,2,4-Trimethylbenzene	120 U
87-68-3	Hexachlorobutadiene	620 U
106-93-4	Ethylene Dibromide	120 U
74-97-5	Bromochloromethane	120 U
594-20-7	2,2-Dichloropropane	120 U
142-28-9	1,3-Dichloropropane	120 U
98-82-8	Isopropylbenzene	120 U
103-65-1	n-Propylbenzene	120 U
108-86-1	Bromobenzene	120 U
95-49-8	2-Chlorotoluene	120 U
106-43-4	4-Chlorotoluene	120 U
98-06-6	tert-Butylbenzene	120 U
135-98-8	sec-Butylbenzene	120 U
99-87-6	4-Isopropyltoluene	120 U
104-51-8	n-Butylbenzene	250 U
120-82-1	1,2,4-Trichlorobenzene	620 U
91-20-3	Naphthalene	620 U
87-61-6	1,2,3-Trichlorobenzene	620 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	108%
d8-Toluene	98.4%
Bromofluorobenzene	98.9%
d4-1,2-Dichlorobenzene	103%

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CF88SB
LIMS ID: 00-18320
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00
Date Analyzed: 10/09/00
Instrument: FINN5

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: NA

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
Chloromethane	4120	6250	65.9%
Bromomethane	4840	6250	77.4%
Vinyl Chloride	3480	6250	55.7%
Chloroethane	4690	6250	75.0%
Methylene Chloride	5160	6250	82.6%
Acetone	28100	31200	89.9%
Carbon Disulfide	7680	6250	123%
1,1-Dichloroethene	4750	6250	76.0%
1,1-Dichloroethane	5240	6250	83.8%
trans-1,2-Dichloroethene	5190	6250	83.0%
cis-1,2-Dichloroethene	5710	6250	91.4%
Chloroform	5680	6250	90.9%
1,2-Dichloroethane	5620	6250	89.9%
2-Butanone	30200	31200	96.6%
1,1,1-Trichloroethane	5760	6250	92.2%
Carbon Tetrachloride	5560	6250	89.0%
Vinyl Acetate	4960	6250	79.4%
Bromodichloromethane	5560	6250	89.0%
1,2-Dichloropropane	5950	6250	95.2%
cis-1,3-Dichloropropene	5520	6250	88.3%
Trichloroethene	5700	6250	91.2%
Dibromochloromethane	5610	6250	89.8%
1,1,2-Trichloroethane	5820	6250	93.1%
Benzene	5760	6250	92.2%
trans-1,3-Dichloropropene	5400	6250	86.4%
2-Chloroethylvinylether	6080	6250	97.3%
Bromoform	5850	6250	93.6%
4-Methyl-2-Pentanone (MIBK)	30500	31200	97.6%
2-Hexanone	29600	31200	94.7%
Tetrachloroethene	6010	6250	96.2%
1,1,2,2-Tetrachloroethane	6010	6250	96.2%
Toluene	5750	6250	92.0%
Chlorobenzene	5850	6250	93.6%
Ethylbenzene	5780	6250	92.5%
Styrene	5880	6250	94.1%
Trichlorofluoromethane	4440	6250	71.0%
1,1,2-Trichlorotrifluoroethane	5640	6250	90.2%
m,p-Xylene	11800	12500	94.4%
O-Xylene	5900	6250	94.4%

Reported in ug/kg-dry-Wt

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CF88SB
LIMS ID: 00-18320
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00
Date Analyzed: 10/09/00
Instrument: FINN5

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: NA

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
1,2-Dichlorobenzene	5900	6250	94.4%
1,3-Dichlorobenzene	5940	6250	95.0%
1,4-Dichlorobenzene	6050	6250	96.8%
Acrolein	37200	31200	119%
Methyl Iodide	6240	6250	99.8%
Bromoethane	6320	6250	101%
Acrylonitrile	5910	6250	94.6%
1,1-Dichloropropene	5910	6250	94.6%
Dibromomethane	5790	6250	92.6%
1,1,1,2-Tetrachloroethane	5780	6250	92.5%
1,2-Dibromo-3-chloropropane	5760	6250	92.2%
1,2,3-Trichloropropane	6160	6250	98.6%
trans-1,4-Dichloro-2-butene	6050	6250	96.8%
1,3,5-Trimethylbenzene	5920	6250	94.7%
1,2,4-Trimethylbenzene	5940	6250	95.0%
Hexachlorobutadiene	5780	6250	92.5%
Ethylene Dibromide	5750	6250	92.0%
Bromochloromethane	5780	6250	92.5%
2,2-Dichloropropane	5620	6250	89.9%
1,3-Dichloropropane	5820	6250	93.1%
Isopropylbenzene	6180	6250	98.9%
n-Propylbenzene	6020	6250	96.3%
Bromobenzene	6120	6250	97.9%
2-Chlorotoluene	6080	6250	97.3%
4-Chlorotoluene	5500	6250	88.0%
tert-Butylbenzene	6060	6250	97.0%
sec-Butylbenzene	6000	6250	96.0%
4-Isopropyltoluene	6090	6250	97.4%
n-Butylbenzene	5940	6250	95.0%
1,2,4-Trichlorobenzene	5950	6250	95.2%
Naphthalene	6250	6250	100%
1,2,3-Trichlorobenzene	5890	6250	94.2%

Spike Blank Surrogate Recovery	
d4-1,2-Dichloroethane	101%
d8-Toluene	99.1%
Bromofluorobenzene	99.4%
d4-1,2-Dichlorobenzene	103%

Reported in ug/kg-dry-Wt

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 100900MB
LIMS ID: 00-18321
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN5
Date Analyzed: 10/09/00 18:25

Sample Amount: 5.00 g dry Wt Equiv
Percent Moisture: NA

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	3.0 U
67-64-1	Acetone	5.0 U
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	trans-1,2-Dichloroethene	1.0 U
156-59-2	cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
108-05-4	Vinyl Acetate	5.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-02-6	trans-1,3-Dichloropropene	1.0 U
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.0 U
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	1.0 U
1330-20-7	m,p-Xylene	1.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 100900MB
LIMS ID: 00-18321
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN5
Date Analyzed: 10/09/00 18:25

Sample Amount: 5.00 g dry Wt Equiv
Percent Moisture: NA

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	1.0 U
95-50-1	1,2-Dichlorobenzene	1.0 U
541-73-1	1,3-Dichlorobenzene	1.0 U
106-46-7	1,4-Dichlorobenzene	1.0 U
107-02-8	Acrolein	50 U
74-88-4	Methyl Iodide	1.0 U
74-96-4	Bromoethane	2.0 U
107-13-1	Acrylonitrile	5.0 U
563-58-6	1,1-Dichloropropene	1.0 U
74-95-3	Dibromomethane	1.0 U
630-20-6	1,1,1,2-Tetrachloroethane	1.0 U
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U
96-18-4	1,2,3-Trichloropropane	2.0 U
110-57-6	trans-1,4-Dichloro-2-butene	5.0 U
108-67-8	1,3,5-Trimethylbenzene	1.0 U
95-63-6	1,2,4-Trimethylbenzene	1.0 U
87-68-3	Hexachlorobutadiene	5.0 U
106-93-4	Ethylene Dibromide	1.0 U
74-97-5	Bromochloromethane	1.0 U
594-20-7	2,2-Dichloropropane	1.0 U
142-28-9	1,3-Dichloropropane	1.0 U
98-82-8	Isopropylbenzene	1.0 U
103-65-1	n-Propylbenzene	1.0 U
108-86-1	Bromobenzene	1.0 U
95-49-8	2-Chlorotoluene	1.0 U
106-43-4	4-Chlorotoluene	1.0 U
98-06-6	tert-Butylbenzene	1.0 U
135-98-8	sec-Butylbenzene	1.0 U
99-87-6	4-Isopropyltoluene	1.0 U
104-51-8	n-Butylbenzene	2.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0 U
91-20-3	Naphthalene	5.0 U
87-61-6	1,2,3-Trichlorobenzene	5.0 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	116%
d8-Toluene	98.6%
Bromofluorobenzene	102%
d4-1,2-Dichlorobenzene	103%

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CF88SB
LIMS ID: 00-18321
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00
Date Analyzed: 10/09/00
Instrument: FINN5

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: NA

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT.	% RECOVERY
Chloromethane	33.0	50.0	66.0%
Bromomethane	38.7	50.0	77.4%
Vinyl Chloride	27.8	50.0	55.6%
Chloroethane	37.5	50.0	75.0%
Methylene Chloride	41.3	50.0	82.6%
Acetone	225.	250	90.0%
Carbon Disulfide	61.4	50.0	123%
1,1-Dichloroethene	38.0	50.0	76.0%
1,1-Dichloroethane	41.9	50.0	83.8%
trans-1,2-Dichloroethene	41.5	50.0	83.0%
cis-1,2-Dichloroethene	45.7	50.0	91.4%
Chloroform	45.4	50.0	90.8%
1,2-Dichloroethane	45.0	50.0	90.0%
2-Butanone	242.	250	96.8%
1,1,1-Trichloroethane	46.1	50.0	92.2%
Carbon Tetrachloride	44.5	50.0	89.0%
Vinyl Acetate	39.7	50.0	79.4%
Bromodichloromethane	44.5	50.0	89.0%
1,2-Dichloropropane	47.6	50.0	95.2%
cis-1,3-Dichloropropene	44.2	50.0	88.4%
Trichloroethene	45.6	50.0	91.2%
Dibromochloromethane	44.9	50.0	89.8%
1,1,2-Trichloroethane	46.6	50.0	93.2%
Benzene	46.1	50.0	92.2%
trans-1,3-Dichloropropene	43.2	50.0	86.4%
2-Chloroethylvinylether	48.6	50.0	97.2%
Bromoform	46.8	50.0	93.6%
4-Methyl-2-Pentanone (MIBK)	244.	250	97.6%
2-Hexanone	237.	250	94.8%
Tetrachloroethene	48.1	50.0	96.2%
1,1,2,2-Tetrachloroethane	48.1	50.0	96.2%
Toluene	46.0	50.0	92.0%
Chlorobenzene	46.8	50.0	93.6%
Ethylbenzene	46.2	50.0	92.4%
Styrene	47.0	50.0	94.0%
Trichlorofluoromethane	35.5	50.0	71.0%
1,1,2-Trichlorotrifluoroethane	45.1	50.0	90.2%
m,p-Xylene	94.5	100	94.5%
O-Xylene	47.2	50.0	94.4%

Reported in ug/kg-dry-Wt

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CF88SB
LIMS ID: 00-18321
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00
Date Analyzed: 10/09/00
Instrument: FINN5

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: NA

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
1,2-Dichlorobenzene	47.2	50.0	94.4%
1,3-Dichlorobenzene	47.5	50.0	95.0%
1,4-Dichlorobenzene	48.4	50.0	96.8%
Acrolein	298.	250	119%
Methyl Iodide	49.9	50.0	99.8%
Bromoethane	50.6	50.0	101%
Acrylonitrile	47.3	50.0	94.6%
1,1-Dichloropropene	47.3	50.0	94.6%
Dibromomethane	46.3	50.0	92.6%
1,1,1,2-Tetrachloroethane	46.2	50.0	92.4%
1,2-Dibromo-3-chloropropane	46.1	50.0	92.2%
1,2,3-Trichloropropane	49.3	50.0	98.6%
trans-1,4-Dichloro-2-butene	48.4	50.0	96.8%
1,3,5-Trimethylbenzene	47.4	50.0	94.8%
1,2,4-Trimethylbenzene	47.5	50.0	95.0%
Hexachlorobutadiene	46.2	50.0	92.4%
Ethylene Dibromide	46.0	50.0	92.0%
Bromochloromethane	46.2	50.0	92.4%
2,2-Dichloropropane	45.0	50.0	90.0%
1,3-Dichloropropane	46.6	50.0	93.2%
Isopropylbenzene	49.4	50.0	98.8%
n-Propylbenzene	48.2	50.0	96.4%
Bromobenzene	49.0	50.0	98.0%
2-Chlorotoluene	48.6	50.0	97.2%
4-Chlorotoluene	44.0	50.0	88.0%
tert-Butylbenzene	48.5	50.0	97.0%
sec-Butylbenzene	48.0	50.0	96.0%
4-Isopropyltoluene	48.7	50.0	97.4%
n-Butylbenzene	47.5	50.0	95.0%
1,2,4-Trichlorobenzene	47.6	50.0	95.2%
Naphthalene	50.0	50.0	100%
1,2,3-Trichlorobenzene	47.1	50.0	94.2%

Spike Blank Surrogate Recovery	
d4-1,2-Dichloroethane	101%
d8-Toluene	99.1%
Bromofluorobenzene	99.4%
d4-1,2-Dichlorobenzene	103%

Reported in ug/kg-dry-Wt

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 101000MB
LIMS ID: 00-18323
Matrix: Soil
Data Release Authorized
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN5
Date Analyzed: 10/10/00 12:04

Sample Amount: 5.00 g dry Wt Equiv
Percent Moisture: NA

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	**Methylene Chloride**	**4.3**
67-64-1	Acetone	5.0 U
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	trans-1,2-Dichloroethene	1.0 U
156-59-2	cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
108-05-4	Vinyl Acetate	5.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-02-6	trans-1,3-Dichloropropene	1.0 U
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.0 U
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	1.0 U
1330-20-7	m,p-Xylene	1.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 101000MB
LIMS ID: 00-18323
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN5
Date Analyzed: 10/10/00 12:04

Sample Amount: 5.00 g dry Wt Equiv
Percent Moisture: NA

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	1.0 U
95-50-1	1,2-Dichlorobenzene	1.0 U
541-73-1	1,3-Dichlorobenzene	1.0 U
106-46-7	1,4-Dichlorobenzene	1.0 U
107-02-8	Acrolein	50 U
74-88-4	Methyl Iodide	1.0 U
74-96-4	Bromoethane	2.0 U
107-13-1	Acrylonitrile	5.0 U
563-58-6	1,1-Dichloropropene	1.0 U
74-95-3	Dibromomethane	1.0 U
630-20-6	1,1,1,2-Tetrachloroethane	1.0 U
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U
96-18-4	1,2,3-Trichloropropane	2.0 U
110-57-6	trans-1,4-Dichloro-2-butene	5.0 U
108-67-8	1,3,5-Trimethylbenzene	1.0 U
95-63-6	1,2,4-Trimethylbenzene	1.0 U
87-68-3	Hexachlorobutadiene	5.0 U
106-93-4	Ethylene Dibromide	1.0 U
74-97-5	Bromochloromethane	1.0 U
594-20-7	2,2-Dichloropropane	1.0 U
142-28-9	1,3-Dichloropropane	1.0 U
98-82-8	Isopropylbenzene	1.0 U
103-65-1	n-Propylbenzene	1.0 U
108-86-1	Bromobenzene	1.0 U
95-49-8	2-Chlorotoluene	1.0 U
106-43-4	4-Chlorotoluene	1.0 U
98-06-6	tert-Butylbenzene	1.0 U
135-98-8	sec-Butylbenzene	1.0 U
99-87-6	4-Isopropyltoluene	1.0 U
104-51-8	n-Butylbenzene	2.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0 U
91-20-3	Naphthalene	5.0 U
87-61-6	1,2,3-Trichlorobenzene	5.0 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	109%
d8-Toluene	96.9%
Bromofluorobenzene	101%
d4-1,2-Dichlorobenzene	100%

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CF88SB
LIMS ID: 00-18323
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00
Date Analyzed: 10/10/00
Instrument: FINN5

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: NA

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
Chloromethane	36.4	50.0	72.8%
Bromomethane	45.1	50.0	90.2%
Vinyl Chloride	32.3	50.0	64.6%
Chloroethane	40.4	50.0	80.8%
Methylene Chloride	17.7	50.0	35.4%
Acetone	211.	250	84.4%
Carbon Disulfide	62.8	50.0	126%
1,1-Dichloroethene	37.9	50.0	75.8%
1,1-Dichloroethane	42.2	50.0	84.4%
trans-1,2-Dichloroethene	41.9	50.0	83.8%
cis-1,2-Dichloroethene	46.6	50.0	93.2%
Chloroform	44.9	50.0	89.8%
1,2-Dichloroethane	45.0	50.0	90.0%
2-Butanone	227.	250	90.8%
1,1,1-Trichloroethane	45.3	50.0	90.6%
Carbon Tetrachloride	44.4	50.0	88.8%
Vinyl Acetate	42.2	50.0	84.4%
Bromodichloromethane	45.3	50.0	90.6%
1,2-Dichloropropane	49.5	50.0	99.0%
cis-1,3-Dichloropropene	44.6	50.0	89.2%
Trichloroethene	46.6	50.0	93.2%
Dibromochloromethane	45.8	50.0	91.6%
1,1,2-Trichloroethane	47.0	50.0	94.0%
Benzene	46.8	50.0	93.6%
trans-1,3-Dichloropropene	44.9	50.0	89.8%
2-Chloroethylvinylether	50.6	50.0	101%
Bromoform	47.6	50.0	95.2%
4-Methyl-2-Pentanone (MIBK)	230.	250	92.0%
2-Hexanone	228.	250	91.2%
Tetrachloroethene	47.6	50.0	95.2%
1,1,2,2-Tetrachloroethane	46.4	50.0	92.8%
Toluene	47.3	50.0	94.6%
Chlorobenzene	46.8	50.0	93.6%
Ethylbenzene	46.1	50.0	92.2%
Styrene	47.6	50.0	95.2%
Trichlorofluoromethane	36.9	50.0	73.8%
1,1,2-Trichlorotrifluoroethane	45.6	50.0	91.2%
m,p-Xylene	95.6	100	95.6%
O-Xylene	47.4	50.0	94.8%

Reported in ug/kg-dry-Wt

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CF88SB
LIMS ID: 00-18323
Matrix: Soil
Data Release Authorized:
Reported: 10/16/00
Date Analyzed: 10/10/00
Instrument: FINN5

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: NA

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
1,2-Dichlorobenzene	47.2	50.0	94.4%
1,3-Dichlorobenzene	47.9	50.0	95.8%
1,4-Dichlorobenzene	48.4	50.0	96.8%
Acrolein	282.	250	113%
Methyl Iodide	53.4	50.0	107%
Bromoethane	53.0	50.0	106%
Acrylonitrile	46.9	50.0	93.8%
1,1-Dichloropropene	47.0	50.0	94.0%
Dibromomethane	46.4	50.0	92.8%
1,1,1,2-Tetrachloroethane	47.0	50.0	94.0%
1,2-Dibromo-3-chloropropane	46.2	50.0	92.4%
1,2,3-Trichloropropane	46.1	50.0	92.2%
trans-1,4-Dichloro-2-butene	47.7	50.0	95.4%
1,3,5-Trimethylbenzene	47.0	50.0	94.0%
1,2,4-Trimethylbenzene	47.0	50.0	94.0%
Hexachlorobutadiene	50.1	50.0	100%
Ethylene Dibromide	46.2	50.0	92.4%
Bromochloromethane	46.7	50.0	93.4%
2,2-Dichloropropane	45.2	50.0	90.4%
1,3-Dichloropropane	46.9	50.0	93.8%
Isopropylbenzene	46.9	50.0	93.8%
n-Propylbenzene	46.6	50.0	93.2%
Bromobenzene	47.2	50.0	94.4%
2-Chlorotoluene	50.2	50.0	100%
4-Chlorotoluene	44.8	50.0	89.6%
tert-Butylbenzene	44.5	50.0	89.0%
sec-Butylbenzene	47.1	50.0	94.2%
4-Isopropyltoluene	47.2	50.0	94.4%
n-Butylbenzene	46.2	50.0	92.4%
1,2,4-Trichlorobenzene	49.5	50.0	99.0%
Naphthalene	48.3	50.0	96.6%
1,2,3-Trichlorobenzene	50.1	50.0	100%

Spike Blank Surrogate Recovery	
d4-1,2-Dichloroethane	95.4%
d8-Toluene	99.0%
Bromofluorobenzene	100%
d4-1,2-Dichlorobenzene	101%

Reported in ug/kg-dry-Wt

ANALYTICAL RESOURCES INCORPORATED

SOIL VOLATILE SYSTEM MONITORING COMPOUND SUMMARY

Matrix: Soil

QC Report No: CF88

Lab ID	Client ID	DCE	TOL	BFB	DCB	TOT OUT
100300MB	Method Blank	105%	102%	100%	100%	0
CF88C	TP-2-2-3	108%	97%	93%	94%	0
CF88LCS	Lab Cntrl Sample	97%	101%	100%	98%	0
100200MB	Method Blank	93%	100%	96%	98%	0
CF88D	TP-2-4-6	107%	97%	85%	93%	0
CF88D-DIL	TP-2-4-6	108%	100%	101%	101%	0
CF88D-RE	TP-2-4-6	115%	98%	102%	105%	0
CF88LCS	Lab Cntrl Sample	97%	100%	99%	99%	0
MB	Method Blank	105%	102%	100%	100%	0
CF88E	TP-2-6-10	99%	88%	128%	91%	0
CF88E-DIL	TP-2-6-10	107%	101%	103%	101%	0
CF88E-RE	TP-2-6-10	115%	99%	101%	103%	0
CF88LCS	Lab Cntrl Sample	97%	101%	100%	98%	0
MB	Method Blank	108%	98%	99%	103%	0
CF88G	TP-3-4-6	94%	96%	80%	96%	0
CF88G-DIL	TP-3-4-6	105%	97%	95%	97%	0
CF88LCS	Lab Cntrl Sample	101%	99%	99%	103%	0
100900MB	Method Blank	116%	99%	102%	103%	0
CF88H	TP-3-6-10	109%	96%	93%	101%	0
CF88LCS	Lab Cntrl Sample	101%	99%	99%	103%	0
101000MB	Method Blank	109%	97%	101%	100%	0
CF88J	TP-4-6-10	116%	91%	90%	106%	0
CF88J-DIL	TP-4-6-10	107%	98%	97%	105%	0
CF88LCS	Lab Cntrl Sample	95%	99%	100%	101%	0

		LCS/MB LIMITS	QC LIMITS
(DCE)	= 1,2-Dichloroethane-d4	(70-130)	(70-130)
(TOL)	= Toluene-d8	(70-130)	(70-130)
(BFB)	= Bromofluorobenzene	(70-130)	(70-130)
(DCB)	= 1,2-Dichlorobenzene-d4	(70-130)	(70-130)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D System Monitoring Compound diluted out

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-1-0-1

Lab Sample ID: CF88A
LIMS ID: 00-18314
Matrix: Soil

Data Release Authorized: CM
Reported: 10/09/00 10/9/00

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Date extracted: 10/03/00
Date analyzed: 10/04/00 17:24
Instrument ID: ECD1
Sample Amount: 11.0 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 6.8

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 8.4 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	36 U
53469-21-9	Aroclor 1242	36 U
12672-29-6	Aroclor 1248	36 U
11097-69-1	**Aroclor 1254**	**640**
11096-82-5	**Aroclor 1260**	**500**
11104-28-2	Aroclor 1221	73 U
11141-16-5	Aroclor 1232	36 U

1249

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	93.5%
Tetrachlorometaxylene	71.2%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-3-0-1

Lab Sample ID: CF88F
LIMS ID: 00-18319
Matrix: Soil

Data Release Authorized
Reported: 10/09/00 10/4/0

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Date extracted: 10/03/00
Date analyzed: 10/04/00 18:21
Instrument ID: ECD1
Sample Amount: 11.3 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.2

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 5.6 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	35 U
53469-21-9	Aroclor 1242	35 U
12672-29-6	Aroclor 1248	35 U
11097-69-1	**Aroclor 1254**	**170**
11096-82-5	**Aroclor 1260**	**61**
11104-28-2	Aroclor 1221	70 U
11141-16-5	Aroclor 1232	35 U
		336

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	78 0%
Tetrachlorometaxylene	89.2%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: Method Blank

Lab Sample ID: CF88MB
LIMS ID: 00-18314
Matrix: Soil

Data Release Authorized: CH
Reported: 10/09/00 H/n

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Date extracted: 10/03/00
Date analyzed: 10/04/00 13:39
Instrument ID: ECD1
Sample Amount: 12.0 g-dry-wt
Final Ext Vol: 4.0 mL
pH: NA

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: NA

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	33 U
53469-21-9	Aroclor 1242	33 U
12672-29-6	Aroclor 1248	33 U
11097-69-1	Aroclor 1254	33 U
11096-82-5	Aroclor 1260	33 U
11104-28-2	Aroclor 1221	67 U
11141-16-5	Aroclor 1232	33 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	88.5%
Tetrachlorometaxylene	93.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Lab Sample ID: CF88
LIMS ID: 00-18314
Matrix: Soil

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized: CLr
Reported: 10/09/00 10/10/00

LABORATORY CONTROL SAMPLE SPIKE RECOVERY
Date extracted: 10/03/00

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	270	333	81.0%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	92.5%
Tetrachlorometaxylene	98.0%

Values Reported in Total ug/kg Dry Weight

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-3-0-1
MATRIX SPIKE

Lab Sample ID: CF88FMS
LIMS ID: 00-18319
Matrix: Soil

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Data Release Authorized: CM
Reported: 10/09/00 10/10/00

Date extracted: 10/03/00
Date analyzed: 10/04/00 18:49
Instrument ID: ECD1
Sample Amount: 11.3 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.2

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 5.6 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	35 U
53469-21-9	Aroclor 1242	---
12672-29-6	Aroclor 1248	35 U
11097-69-1	**Aroclor 1254**	**150**
11096-82-5	**Aroclor 1260**	**46**
11104-28-2	Aroclor 1221	70 U
11141-16-5	Aroclor 1232	35 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	72.5%
Tetrachlorometaxylene	76.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-3-0-1
SPIKE DUPLICATE

Lab Sample ID: CF88FMSD
LIMS ID: 00-18319
Matrix: Soil

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Data Release Authorized: C
Reported: 10/09/00 10/9/00

Date extracted: 10/03/00
Date analyzed: 10/04/00 19:17
Instrument ID: ECD1
Sample Amount: 11.3 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.2

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 5.6 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	35 U
53469-21-9	Aroclor 1242	---
12672-29-6	Aroclor 1248	35 U
11097-69-1	**Aroclor 1254**	**190**
11096-82-5	**Aroclor 1260**	**57**
11104-28-2	Aroclor 1221	70 U
11141-16-5	Aroclor 1232	35 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	89.0%
Tetrachlorometaxylene	94.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-3-0-1
Lab Sample ID: CF88F
QC Report No: CF88-Kennedy Jenks Consultants
LIMS ID: 00-18319
Project: Tacoma Metals
Matrix: Soil
996098.00
Date Received: 09/28/00

Data Release Authorized: CH
Reported: 10/09/00 10/9/00

MATRIX SPIKE/SPIKE DUPLICATE RECOVERY
Date extracted: 10/03/00

CONSTITUENT	SAMPLE VALUE	SPIKE FOUND	SPIKE ADDED	% RECOVERY	RPD
MATRIX SPIKE					
Aroclor 1242	< 35	247	352	70.1%	
MATRIX SPIKE DUPLICATE					
Aroclor 1242	< 35	300	352	85.1%	19%

Values Reported in Total ug/kg Dry Weight

ANALYTICAL RESOURCES INCORPORATED

SOIL AROCLOR SURROGATE SUMMARY

Matrix: Soil

QC Report No: CF88
Project: Tacoma Metals
996098.00

LIMS ID	Lab ID	Client ID	TCMX #	DCBP #	TOT OUT
00-18314MB	100300MB	Method Blank	93.5%	88.5%	0
00-18314SB	100300SB	Lab Control	98.0%	92.5%	0
00-18314	CF88A	TP-1-0-1	71.2%	93.5%	0
00-18319	CF88F	TP-3-0-1	89.2%	78.0%	0
00-18319MS	CF88F	TP-3-0-1-MS	76.0%	72.5%	0
00-18319MSD	CF88F	TP-3-0-1-MSD	94.5%	89.0%	0

	QC LIMITS
(TCMX) = Tetrachloro-m-xylene	(53-109)
(DCBP) = Decachlorobiphenyl	(54-127)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D Surrogate Compound diluted out

FORM-II PCB

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID
and Motor Oil

LIMS ID: 00-18314
Matrix: Soil

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized: CH
Reported: 10/16/00 10/16/0

Date Received: 09/28/00

Lab ID	Sample ID	Date Extracted	Date Analyzed	Dilution Factor	Diesel Range	*HC ID	Motor Oil Range	Surrogate Recovery
CF88MB	Method Blank	10/06/00	10/09/00	1:1	5.0 U	---	10 U	85.0%
CF88A	TP-1-0-1	10/06/00	10/09/00	1:10	560	NO	1,200	110%
CF88B	TP-2-0-1	10/06/00	10/09/00	1:2	130	NO	400	80.0%
CF88C	TP-2-2-3	10/06/00	10/09/00	1:20	1,700	NO	1,200	D
CF88D	TP-2-4-6	10/06/00	10/09/00	1:20	2,900	NO	1,700	D
CF88E	TP-2-6-10	10/06/00	10/09/00	1:50	10,000	NO	2,100	D
CF88F	TP-3-0-1	10/06/00	10/09/00	1:1	14	NO	26	75.0%
CF88G	TP-3-4-6	10/06/00	10/10/00	1:10	1,300	NO	1,200	60.0%
CF88H	TP-3-6-10	10/06/00	10/10/00	1:1	280	NO	240	46.0%
CF88I	TP-4-0-1	10/06/00	10/10/00	1:2	270	NO	530	62.0%
CF88MB	Method Blank	10/12/00	10/13/00	1:1	5.0 U	---	10 U	101%
CF88J	TP-4-6-10	10/06/00	10/10/00	1:1	67	NO	31	39.0%

Values reported in ppm (mg/kg) on a dry weight basis.

Surrogate is Methyl-Arachidate.

* ID indicates, in the opinion of the analyst, the petroleum product with the best pattern match. 'NO' indicates that there was not a good match for any of the requested products.
Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.

Data Qualifiers

U	Compound not detected at the given detection limit.
J	Indicates an estimated value below the calculated detection limit.
S	No value reported due to saturation of the detector. Dilution required.
D	Indicates the surrogate was not detected because of dilution of the extract.
E	Indicates a value above the linear range of the detector. Dilution required.
NR	Indicates no recovery due to matrix interference.
B	Indicates compound also detected in the method blank.

FORM-1 TPHD

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID
and Motor Oil

LIMS ID: 00-18323
Matrix: Soil

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized: CJF
Reported: 10/16/00 10/16/00

Date Received: 09/28/00

Lab ID	Sample ID	Date Extracted	Date Analyzed	Dilution Factor	Diesel Range	*HC ID	Motor Oil Range	Surrogate Recovery
CF88JR	**TP-4-6-10**	10/12/00	10/13/00	1:1	**43**	NO	**34**	73.0%

Values reported in ppm (mg/kg) on a dry weight basis.

Surrogate is Methyl-Arachidate.

* ID indicates, in the opinion of the analyst, the petroleum product with the best pattern match. 'NO' indicates that there was not a good match for any of the requested products
Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.

Data Qualifiers

U	Compound not detected at the given detection limit.
J	Indicates an estimated value below the calculated detection limit.
S	No value reported due to saturation of the detector. Dilution required.
D	Indicates the surrogate was not detected because of dilution of the extract
E	Indicates a value above the linear range of the detector. Dilution required.
NR	Indicates no recovery due to matrix interference.
B	Indicates compound also detected in the method blank.

FORM-1 TPHD

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CF88SB
LIMS ID: 00-18314
Matrix: Soil

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized: CIr
Reported: 10/16/00 10/16/00

LABORATORY CONTROL SAMPLE RECOVERY REPORT
Date extracted: 10/06/00
Date analyzed: 10/09/00

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
Diesel Range Hydrocarbons	92.4	100	92.4%

TPHd Surrogate Recovery

Methylarachidate 87.0%

Values reported in ppm (mg/kg) on a dry weight basis

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CF88SB
LIMS ID: 00-18323
Matrix: Soil

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized: CH
Reported: 10/16/00 [illegible]

LABORATORY CONTROL SAMPLE RECOVERY REPORT
Date extracted: 10/12/00
Date analyzed: 10/13/00

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
Diesel Range Hydrocarbons	97.8	100	97.8%

TPHd Surrogate Recovery

Methylarachidate 91 0%

Values reported in ppm (mg/kg) on a dry weight basis.

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-2-0-1
Lab Sample ID: CF88B
QC Report No: CF88-Kennedy Jenks Consultants
LIMS ID: 00-18315
Project: Tacoma Metals
Matrix: Soil
996098.00
Date Received: 09/28/00

Data Release Authorized:
Reported: 10/16/00

MATRIX SPIKE/SPIKE DUPLICATE RECOVERY

Date extracted: 10/06/00
Date analyzed: 10/09/00

CONSTITUENT	SAMPLE VALUE	SPIKE VALUE	SPIKE ADDED	% RECOVERY	RPD
MATRIX SPIKE					
Diesel Range Hydrocarbons	126	184	110	52.7%	
MATRIX SPIKE DUPLICATE					
Diesel Range Hydrocarbons	126	139	110	11.8%	127%

TPHd Surrogate Recovery

Matrix Spike	Methylarachidate	74 0%
Matrix Spike Dup	Methylarachidate	84.0%

Values reported in ppm (mg/kg) on a dry weight basis.

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL HYDROCARBONS COMPOUND SUMMARY

Matrix: Soil

QC Report No: CF88

LIMS ID	Lab ID	Extracted	Client ID	MeArach	TOT OUT
00-18314MB	100900MB	10/06/00	Method Blank	85%	0
00-18314LC	100900LC	10/06/00	Lab Control	87%	0
00-18314	CF88A	10/06/00	TP-1-0-1	110%	0
00-18315	CF88B	10/06/00	TP-2-0-1	80%	0
00-18315	CF88B-MS	10/06/00	TP-2-0-1-MS	74%	0
00-18315	CF88B-MSD	10/06/00	TP-2-0-1-MSD	84%	0
00-18316	CF88C	10/06/00	TP-2-2-3	D	0
00-18317	CF88D	10/06/00	TP-2-4-6	D	0
00-18318	CF88E	10/06/00	TP-2-6-10	D	0
00-18319	CF88F	10/06/00	TP-3-0-1	75%	0
00-18320	CF88G	10/06/00	TP-3-4-6	60%	0
00-18321	CF88H	10/06/00	TP-3-6-10	46%	0
00-18322	CF88I	10/06/00	TP-4-0-1	62%	0
00-18323MB	101300MB	10/12/00	Method Blank	101%	0
00-18323LC	101300LC	10/12/00	Lab Control	91%	0
00-18323	CF88J	10/06/00	TP-4-6-10	39%*	1
00-18323	CF88J-RE	10/12/00	TP-4-6-10-RE	73%	0

	Control QC LIMITS	Sample QC LIMITS
(MeArach) = Methylarachidate	(56-114)	(42-113)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D System Monitoring Compound diluted out

FORM-II TPHD

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-1-0-1**
TOTAL METALS

Lab Sample ID: CF88A
LIMS ID: 00-18314
Matrix: Soil

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Data Release Authorized:
Reported: 10/20/00

Percent Total Solids: 90.7%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/09/00	6010	10/16/00	7440-38-2	Arsenic	10	40
3050	10/09/00	6010	10/16/00	7440-39-3	Barium	0.8	290
3050	10/09/00	6010	10/16/00	7440-43-9	Cadmium	0.5	8.5
3050	10/09/00	6010	10/16/00	7440-47-3	Chromium	1	76
3050	10/09/00	6010	10/16/00	7440-50-8	Copper	0.5	873
3050	10/09/00	6010	10/16/00	7439-92-1	Lead	5	2,230
CLP	10/19/00	7471	10/19/00	7439-97-6	Mercury	0.04	1.53
3050	10/09/00	6010	10/16/00	7782-49-2	Selenium	10	10 U
3050	10/09/00	6010	10/16/00	7440-22-4	Silver	0.8	1.4

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-2-0-1**
TOTAL METALS

Lab Sample ID: CF88B
LIMS ID: 00-18315
Matrix: Soil

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Data Release Authorized:
Reported: 10/20/00

Percent Total Solids: 89.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/09/00	6010	10/16/00	7440-38-2	Arsenic	10	10 U
3050	10/09/00	6010	10/16/00	7440-39-3	Barium	0.8	404
3050	10/09/00	6010	10/16/00	7440-43-9	Cadmium	0.5	18.2
3050	10/09/00	6010	10/16/00	7440-47-3	Chromium	1	67
3050	10/09/00	6010	10/16/00	7440-50-8	Copper	0.5	1,090
3050	10/09/00	6010	10/16/00	7439-92-1	Lead	5	831
CLP	10/09/00	7471	10/17/00	7439-97-6	Mercury	0.04	0.88
3050	10/09/00	6010	10/16/00	7782-49-2	Selenium	10	10 U
3050	10/09/00	6010	10/16/00	7440-22-4	Silver	0.8	0.9

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-2-2-3**
TOTAL METALS

Lab Sample ID: CF88C
LIMS ID: 00-18316
Matrix: Soil

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Data Release Authorized:
Reported: 10/20/00

Percent Total Solids: 89.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/09/00	6010	10/16/00	7440-38-2	Arsenic	5	5 U
3050	10/09/00	6010	10/16/00	**7440-39-3**	**Barium**	0.3	**47.2**
3050	10/09/00	6010	10/16/00	7440-43-9	Cadmium	0.2	0.2 U
3050	10/09/00	6010	10/16/00	**7440-47-3**	**Chromium**	0.5	**18.6**
3050	10/09/00	6010	10/16/00	**7440-50-8**	**Copper**	0.2	**20.0**
3050	10/09/00	6010	10/16/00	**7439-92-1**	**Lead**	2	10
CLP	10/09/00	7471	10/17/00	**7439-97-6**	**Mercury**	0.04	0.04
3050	10/09/00	6010	10/16/00	7782-49-2	Selenium	5	5 U
3050	10/09/00	6010	10/16/00	7440-22-4	Silver	0.3	0.3 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-2-4-6**
TOTAL METALS

Lab Sample ID: CF88D
LIMS ID: 00-18317
Matrix: Soil

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Data Release Authorized
Reported: 10/20/00

Percent Total Solids: 78.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/09/00	6010	10/16/00	7440-38-2	Arsenic	6	6 U
3050	10/09/00	6010	10/16/00	**7440-39-3**	**Barium**	0.4	**58.1**
3050	10/09/00	6010	10/16/00	7440-43-9	Cadmium	0.2	0.2 U
3050	10/09/00	6010	10/16/00	**7440-47-3**	**Chromium**	0.6	**15.4**
3050	10/09/00	6010	10/16/00	**7440-50-8**	**Copper**	0.2	**35.2**
3050	10/09/00	6010	10/16/00	**7439-92-1**	**Lead**	2	**85**
CLP	10/09/00	7471	10/17/00	7439-97-6	Mercury	0.06	0.06 U
3050	10/09/00	6010	10/16/00	7782-49-2	Selenium	6	6 U
3050	10/09/00	6010	10/16/00	**7440-22-4**	**Silver**	0.4	**0.4**

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-2-6-10**
TOTAL METALS

Lab Sample ID: CF88E
LIMS ID: 00-18318
Matrix: Soil

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Data Release Authorized:
Reported: 10/20/00

Percent Total Solids: 77.7%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/09/00	6010	10/16/00	7440-38-2	Arsenic	6	6 U
3050	10/09/00	6010	10/16/00	7440-39-3	Barium	0.4	53.8
3050	10/09/00	6010	10/16/00	7440-43-9	Cadmium	0.3	1.1
3050	10/09/00	6010	10/16/00	7440-47-3	Chromium	0.6	18.6
3050	10/09/00	6010	10/16/00	7440-50-8	Copper	0.3	79.6
3050	10/09/00	6010	10/16/00	7439-92-1	Lead	3	72
CLP	10/09/00	7471	10/17/00	7439-97-6	Mercury	0.05	0.13
3050	10/09/00	6010	10/16/00	7782-49-2	Selenium	6	6 U
3050	10/09/00	6010	10/16/00	7440-22-4	Silver	0.4	0.4 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-3-0-1**
TOTAL METALS

Lab Sample ID: CF88F
LIMS ID: 00-18319
Matrix: Soil

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Data Release Authorized:
Reported: 10/20/00

Percent Total Solids: 93.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/09/00	6010	10/16/00	7440-38-2	Arsenic	5	5 U
3050	10/09/00	6010	10/16/00	7440-39-3	Barium	0.3	63.5
3050	10/09/00	6010	10/16/00	7440-43-9	Cadmium	0.2	2.7
3050	10/09/00	6010	10/16/00	7440-47-3	Chromium	0.5	26.9
3050	10/09/00	6010	10/16/00	7440-50-8	Copper	0.2	44.1
3050	10/09/00	6010	10/16/00	7439-92-1	Lead	2	46
CLP	10/09/00	7471	10/17/00	7439-97-6	Mercury	0.04	0.13
3050	10/09/00	6010	10/16/00	7782-49-2	Selenium	5	5 U
3050	10/09/00	6010	10/16/00	7440-22-4	Silver	0.3	0.3 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-3-4-6**
TOTAL METALS

Lab Sample ID: CF88G
LIMS ID: 00-18320
Matrix: Soil

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Data Release Authorized
Reported: 10/20/00

Percent Total Solids: 65.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/09/00	6010	10/16/00	7440-38-2	Arsenic	7	7
3050	10/09/00	6010	10/16/00	7440-39-3	Barium	0.4	63.8
3050	10/09/00	6010	10/16/00	7440-43-9	Cadmium	0.3	0.4
3050	10/09/00	6010	10/16/00	7440-47-3	Chromium	0.7	15.4
3050	10/09/00	6010	10/16/00	7440-50-8	Copper	0.3	33.2
3050	10/09/00	6010	10/16/00	7439-92-1	Lead	3	106
CLP	10/09/00	7471	10/17/00	7439-97-6	Mercury	0.07	0.21
3050	10/09/00	6010	10/16/00	7782-49-2	Selenium	7	7 U
3050	10/09/00	6010	10/16/00	7440-22-4	Silver	0.4	0.4 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-3-6-10**
TOTAL METALS

Lab Sample ID: CF88H
LIMS ID: 00-18321
Matrix: Soil

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Data Release Authorized:
Reported: 10/20/00

Percent Total Solids: 42.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/09/00	6010	10/16/00	7440-38-2	Arsenic	10	10 U
3050	10/09/00	6010	10/16/00	**7440-39-3**	**Barium**	0.7	**110**
3050	10/09/00	6010	10/16/00	7440-43-9	Cadmium	0.5	0.5 U
3050	10/09/00	6010	10/16/00	**7440-47-3**	**Chromium**	1	18
3050	10/09/00	6010	10/16/00	**7440-50-8**	**Copper**	0.5	**42.4**
3050	10/09/00	6010	10/16/00	**7439-92-1**	**Lead**	5	93
CLP	10/09/00	7471	10/17/00	**7439-97-6**	**Mercury**	0.08	**0.13**
3050	10/09/00	6010	10/16/00	7782-49-2	Selenium	10	10 U
3050	10/09/00	6010	10/16/00	7440-22-4	Silver	0.7	0.7 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-4-0-1**
TOTAL METALS

Lab Sample ID: CF88I
LIMS ID: 00-18322
Matrix: Soil

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Data Release Authorized:
Reported: 10/20/00

Percent Total Solids: 87.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/09/00	6010	10/16/00	7440-38-2	**Arsenic**	10	30
3050	10/09/00	6010	10/16/00	7440-39-3	**Barium**	0.8	609
3050	10/09/00	6010	10/16/00	7440-43-9	**Cadmium**	0.5	21.6
3050	10/09/00	6010	10/16/00	7440-47-3	**Chromium**	1	82
3050	10/09/00	6010	10/16/00	7440-50-8	**Copper**	0.5	4,650
3050	10/09/00	6010	10/16/00	7439-92-1	**Lead**	5	1,760
CLP	10/09/00	7471	10/17/00	7439-97-6	**Mercury**	0.06	0.55
3050	10/09/00	6010	10/16/00	7782-49-2	Selenium	10	10 U
3050	10/09/00	6010	10/16/00	7440-22-4	**Silver**	0.8	1.2

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-4-6-10**
TOTAL METALS

Lab Sample ID: CF88J
LIMS ID: 00-18323
Matrix: Soil

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Data Release Authorized:
Reported: 10/20/00

Percent Total Solids: 70.1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/09/00	6010	10/16/00	7440-38-2	Arsenic	7	7 U
3050	10/09/00	6010	10/16/00	**7440-39-3**	**Barium**	0.4	**60.1**
3050	10/09/00	6010	10/16/00	7440-43-9	Cadmium	0.3	0.3 U
3050	10/09/00	6010	10/16/00	**7440-47-3**	**Chromium**	0.7	**16.9**
3050	10/09/00	6010	10/16/00	**7440-50-8**	**Copper**	0.3	**24.6**
3050	10/09/00	6010	10/16/00	**7439-92-1**	**Lead**	3	**9**
CLP	10/09/00	7471	10/17/00	7439-97-6	Mercury	0.06	0.06 U
3050	10/09/00	6010	10/16/00	7782-49-2	Selenium	7	7 U
3050	10/09/00	6010	10/16/00	7440-22-4	Silver	0.4	0.4 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: Method Blank**
TOTAL METALS

Lab Sample ID: CF88MB
LIMS ID: 00-18315
Matrix: Soil

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized:
Reported: 10/20/00

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/09/00	6010	10/16/00	7440-38-2	Arsenic	5	5 U
3050	10/09/00	6010	10/16/00	7440-39-3	Barium	0.3	0.3 U
3050	10/09/00	6010	10/16/00	7440-43-9	Cadmium	0.2	0.2 U
3050	10/09/00	6010	10/16/00	7440-47-3	Chromium	0.5	0.5 U
3050	10/09/00	6010	10/16/00	7440-50-8	Copper	0.2	0.2 U
3050	10/09/00	6010	10/16/00	7439-92-1	Lead	2	2 U
CLP	10/09/00	7471	10/17/00	7439-97-6	Mercury	0.05	0.05 U
3050	10/09/00	6010	10/16/00	7782-49-2	Selenium	5	5 U
3050	10/09/00	6010	10/16/00	7440-22-4	Silver	0.3	0.3 U

U Analyte undetected at given RL

RL Reporting Limit

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CF88LCS
LIMS ID: 00-18315
Matrix: Soil

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 10/20/00

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike mg/kg-dry	Spike Added	% Recovery	Q
Arsenic	6010	198	200	99.0%	
Barium	6010	209	200	104%	
Cadmium	6010	48.7	50.0	97.4%	
Chromium	6010	50.8	50.0	102%	
Copper	6010	51.9	50.0	104%	
Lead	6010	198	200	99.0%	
Mercury	7471	0.93	1.00	93.0%	
Selenium	6010	206	200	103%	
Silver	6010	49.6	50.0	99.2%	

'Q' codes: N = control limit not met

Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: Method Blank

Lab Sample ID: CF88MB
LIMS ID: 00-18314
Matrix: Soil

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized:
Reported: 10/20/00

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
CLP	10/19/00	7470	10/19/00	7439-97-6	Mercury	0.05	0.05 U

U Analyte undetected at given RL

RL Limit of Detection

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CF88LCS
LIMS ID: 00-18314
Matrix: Soil

QC Report No: CF88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized
Reported: 10/20/00

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike mg/kg-dry	Spike Added	% Recovery	Q
Mercury	7471	0.92	1.00	92.0%	

'Q' codes: N = control limit not met

Control Limits: 80-120%

FORM-VII

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-1-0-1
Lab Sample ID: CF88A
QC Report No: CF88-Kennedy Jenks Consultants
LIMS ID: 00-18314
Project: Tacoma Metals
Matrix: Soil
996098.00
Date Received: 09/28/00

Data Release Authorized:
Reported: 10/20/00

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample mg/kg-dry	Spike mg/kg-dry	Spike Added	% Recovery	Q
Arsenic	6010	40	230	210	90.5%	
Barium	6010	290	472	212	85.8%	
Cadmium	6010	8.5	59.5	52.9	96.4%	
Chromium	6010	76	108	53	60.4%	N
Copper	6010	873	903	52.9	56.7%	H
Lead	6010	2230	2990	212	358%	H
Mercury	7471	1.53	1.77	0.42	57.1%	N
Selenium	6010	10 U	200	210	95.2%	
Silver	6010	1.4	50.1	52.9	92.1%	

'Q' codes:
- N control limit not met
- H %R not applicable, sample concentration too high
- * RPD control limit not met
- NA Not applicable - analyte not spiked

Control Limits:
- Percent Recovery: 75-125%
- RPD: +/-20%

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET
TOTAL METALS

Sample No: TP-1-0-1
Lab Sample ID: CF88A
QC Report No: CF88-Kennedy Jenks Consultants
LIMS ID: 00-18314
Project: Tacoma Metals
Matrix: Soil
996098.00
Date Received: 09/28/00

Data Release Authorized:
Reported: 10/20/00

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample mg/kg-dry	Duplicate mg/kg-dry	RPD	Control Limit	Q
Arsenic	6010	40	40	0.0%	+/- 10	L
Barium	6010	290	299	3.1%	+/- 20 %	
Cadmium	6010	8.5	9.6	12.2%	+/- 20 %	
Chromium	6010	76	70	8.2%	+/- 20 %	
Copper	6010	873	939	7.3%	+/- 20 %	
Lead	6010	2230	9430	123%	+/- 20 %	*
Mercury	7471	1.53	1.48	3.3%	+/- 20 %	
Selenium	6010	10 U	10 U	0.0%	+/- 10	L
Silver	6010	1.4	19.5	173%	+/- 0.8	L*

'Q' codes: * = control limit not met
L = RPD not valid, alternate limit = detection limit

Analytical Resources, Incorporated
Analytical Chemists and Consultants

November 3, 2000

Ty Schreiner
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: ARI Job: CH43 – Tacoma Metals

Dear Ty:

Please find enclosed sample custody records and final analytical results for the above referenced project. Forty-three soil samples were received in good condition on October 9, 2000. Selected samples were placed on hold at –18 degrees Celsius. Other samples were analyzed for volatiles referencing EPA8260, PCBs referencing EPA8082, and total metals referencing EPA6010/7471. Diesel and motor oil range hydrocarbons were determined referencing WDOE method NWTPH-Dx.

All samples were run as concentrated as possible for volatile organics to provide the lowest possible detection limits for the undetected analytes. Method blanks were clean and surrogates for reported results were within acceptance limits.

Initial analysis of samples **TP-10-0-1** and **TP-12-0-1** for TPHD showed low surrogate recoveries and high RPDs of the MS/MSD recoveries. Samples were reextracted and both sets of results are included on the summary. Please note that the reextract of **TP-12-0-1** is listed last on the report.

Analysis of the Lab Control sample for PCBs showed a low recovery for one surrogate that was not outside action limits, so no corrective action was taken. Two sample extracts analyzed for PCBs showed no recoveries for one of the two surrogates. As these analyses showed acceptable recoveries for one of the surrogates, and the missing surrogate was masked behind high target analyte concentrations, no corrective action was taken.

Barium, lead and copper were detected in the metals method blank. As the sample concentrations were greater than 10 times the method blank concentration, no corrective action was required.

No other analytical complications were noted. Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Susan D. Dunnihoo
sue@arilabs.com

Enclosures

333 Ninth Avenue North • Seattle WA 98109-5187 • **206-621-6490** • **206-621-7523** fax

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
400 Ninth Avenue North
Seattle, WA 98109-4708
206-621-6490 206-621-7523 (fax)

Turn Around Requested: _____

Report to: Ty Schreiner	Proj Name: Tacoma Metals
Company: Kennedy/Jenks	Proj Number: 0116098.00
Address: 530 33rd St	Sampler:
Federal Way WA 98003	
Phone: 253 874-0555	Shipping Method:
Fax:	AirBill:

Sample ID	Sample Date	Sample Time	Sample Matrix	No Containers	NWTPH-Dx	RCRA Metals	TCL	VOCs	PCBs		HOLD				Notes/Comments
TP-10-2-3	10/5/00	7:50	SOIL	2							X				
TP-10-4-6		8:00		2	X	X	X				X				
TP-10-6-10		8:45		2	X	X	X	X			X				
TP-11-0-1		9:15		2	X	X	X		X						
TP-11-2-3		9:20		2							X				
TP-11-4-6		9:30		2							X				
TP-11-6-10		9:40		2	X	X	X				X				
TP-12-0-1		10:35		2	X	X	X				X				
TP-12-2-3		10:45		2							X				
TP-12-4-6		11:00		2							X				
12-6-10		11:40		2							X				
TP-13-0-1		12:30		2	X	X	X		X						
TP-13-2-3		12:40		2							X				
TP-13-4-6		12:45		2							X				
TP-13-6-10		1:00		2							X				

Relinquished: (Signature)	Relinquished: (Signature)	Relinquished: (Signature)	Special Instructions/Notes
Printed name: Josie Bridges	Printed name:	Printed name:	Please freeze all "HOLDS"
Company: KJ	Company:	Company:	
Date: 10/9/00 Time: 9:00	Date: Time:	Date: Time:	
Received by:	**Received by:**	**Received by:**	
Printed name: Ric McDougal	Printed name:	Printed name:	
Company: ARI	Company:	Company:	Number of Coolers:
			Cooler Temp(s):
Date: 10/9/00 Time: 1030	Date: Time:	Date: Time:	COC Seals Intact?
			Bottles Intact?

00-19069 to 00-19088 CH43

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
400 Ninth Avenue North
Seattle, WA 98109-4708
206-621-6490 206-621-7523 (fax)

Turn Around Requested: _____

Report to: TY Schreiner	Proj Name: TACOMA METALS
Company: Kennedy/Jenks	Proj Number: 990098.00
Address: 530 S. 336th St	Sampler:
Federal Way, WA 98003	
Phone: 253 874-0555	Shipping Method:
Fax:	AirBill:

Analyses Requested

Sample ID	Sample Date	Sample Time	Sample Matrix	No Containers	MERCURY-OX	ZERO METALS	CU	VOCS	PCB'S		HOLD				Notes/Comments
TP-14-0-1	10/6/00	8:00	SOIL	2	X	X	X				X				
TP-14-2-3		8:10		2							X				
TP-14-4-6		8:20		2							X				
TP-14-6-10		8:30		2	X	X	X				X				
TP-15-0-1		9:30		2	X	X	X		X						
TP-15-2-3		9:40		2							X				
TP-15-4-6		9:45		2							X				
TP-15-6-10		10:30		2							X				
TP-16-0-1		12:15		2	X	X	X	X	X						
TP-16-2-3		1:00									X				
TP-16-0-1		1:10		2	X	X	X	X	X						
TP-17-0-1		1:35		2	X	X	X		X						
TP-17-2-3		1:50		2							X				
TP-17-4-6		2:05		2							X				
TP-17-6-10		2:35		2							X				

Relinquished (Signature)	Relinquished: (Signature)	Relinquished: (Signature)	Special Instructions/Notes
Printed name: Jodie Bruhze	Printed name:	Printed name:	Please freeze all "f" holds"
Company: KJS	Company:	Company:	
Date: 10/9/00 Time: 9:00	Date: Time:	Date: Time:	
Received by:	Received by:	Received by:	
Printed name: Eric McDougal	Printed name:	Printed name:	
Company: API	Company:	Company:	Number of Coolers:
Date: 10/9/00 Time: 1030	Date: Time:	Date: Time:	Cooler Temp(s):
			COC Seals Intact?
			Bottles Intact?

N 27TH CREEK ANALYTICAL
Environmental Laboratory Services

18939 120th Avenue N.E., Suite 101, Bothell, WA 98011-9508 (206)) FAX 485-2992
East 11115 Montgomery, Suite B, Spokane, WA 99206-4779 (509) 92 200 FAX 924-9290
9405 S.W. Nimbus Avenue, Beaverton, OR 97008-7132 (503) 643-9200 FAX 644-2202

A.R.I

CHAIN OF CUSTODY REPORT

Work Order #

REPORT TO:
ATTENTION: Ty Schreiner K/J
ADDRESS: 5305 336th ST
Federal Way, WA 98003
PHONE: 253 874-0555 FAX:
PROJECT NAME: TACOMA METALS
PROJECT NUMBER: 7946 098.00
SAMPLED BY:

INVOICE TO:
ATTENTION:
ADDRESS:
P.O. NUMBER: NCA QUOTE #:

TURNAROUND REQUEST in Business Days *
Organic & Inorganic Analyses: 10 (Standard) | 7 | 5 | 4 | 3 | 2 | 1 | Same Day
Fuels & Hydrocarbon Analyses: 5 (Standard) | 3-4 | 2 | 1 | Same Day
OTHER Specify:
* Turnaround Requests less than standard may incur Rush Charges.

Analysis Request:

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NCA SAMPLE ID (Laboratory Use Only)	# Containers	Swipe-DX	Pure Metals	C.W.	VOCs	PCBs	HOLD				MATRIX (W, S, A, O)	# OF CONTAINERS	COMMENTS
1. TP-9-4-6	10/4/00 3:50	SOIL	2	X	X	X	X								
2. TP-9-6-10	3:50		2							X					
3. TP-10-0-1	4:10		2	X	X	X				X					
4.															
5.															
6.															
7.															
8.															
9.															
10.															

RELINQUISHED BY (Signature):	DATE: 10/9/00	RECEIVED BY (Signature):	DATE: 10/9/00
PRINT NAME: Jodie Bonlagne FIRM: K/J	TIME: 9:00	PRINT NAME: Carrie McDougal FIRM: ARI	TIME: 1030
RELINQUISHED BY (Signature):	DATE:	RECEIVED BY (Signature):	DATE:
PRINT NAME: FIRM:	TIME:	PRINT NAME: FIRM:	TIME:

ADDITIONAL REMARKS: Please freeze all "Holds"

PAGE 3 OF 3

COC Rev 8 1/96

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

18939 120th Avenue N.E., Suite 101, Bothell, WA 98011-9508 (206) [illegible] FAX 485-2992
East 11115 Montgomery, Suite B, Spokane, WA 99206-4779 (509) 924-[illegible]00 FAX 924-9290
9405 S.W. Nimbus Avenue, Beaverton, OR 97008-7132 (503) 643-9200 FAX 644-2202

A.R.I. 8.0, 9.0

CHAIN OF CUSTODY REPORT

Work Order #

REPORT TO:
ATTENTION: TY SCHREINER KENNEDY/JENKS CONSULTANTS
ADDRESS: 530 S. 336th ST.
FEDERAL WAY, WA 98003
PHONE: 253-874-0555 FAX:
PROJECT NAME: TACOMA METALS
PROJECT NUMBER: 996098.00
SAMPLED BY:

INVOICE TO:
ATTENTION:
ADDRESS:
P.O. NUMBER: NCA QUOTE #:

TURNAROUND REQUEST in Business Days *
Organic & Inorganic Analyses: 10 (Standard) | 7 | 5 | 4 | 3 | 2 | 1 | Same Day
Fuels & Hydrocarbon Analyses: 5 (Standard) | 3-4 | 2 | 1 | Same Day
OTHER Specify:
* Turnaround Requests less than standard may incur Rush Charges.

Analysis Request:

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NCA SAMPLE ID (Laboratory Use Only)	# Containers	NWTPH-DX	RCRA METALS	eu	JOE'S	PCB'S	HOLD	MATRIX (W, S, A, O)	# OF CONTAINERS	COMMENTS
1. TP-5-01	10/4/00 10:30	SOIL	2	X	X	X		X				
2. TP-5-2-3	10:30		2						X			
3. TP-5-4-6	10:35		2	X	X	X			X			
4. TP-5-6-10	11:00		3	X	X	X	X		X			
5. TP-6-0-1	11:15		2	X	X	X			X			
6. TP-600-0-1	11:25		1	X	X	X						
7. TP-6-2-3	11:35		2						X			
8. TP-6-4-6	11:45		2						X			
9. TP-6-6-10	11:55		2						X			
10. TP-7-0-1	1:00		2	X	X	X		X				

RELINQUISHED BY (Signature): [signature] DATE: 10/9/00
PRINT NAME: Jodie Bulage FIRM: KJ TIME: 9:00

RECEIVED BY (Signature): [signature] DATE: 10/9/00
PRINT NAME: Carrie McDougal FIRM: ARI TIME: 1030

RELINQUISHED BY (Signature): DATE:
PRINT NAME: FIRM: TIME:

RECEIVED BY (Signature): DATE:
PRINT NAME: FIRM: TIME:

ADDITIONAL REMARKS:

COC Rev 8 1/96

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

A.R.I

18939 120th Avenue N.E., Suite 101, Bothell, WA 98011-9508 (206) [illegible] FAX 485-2992
East 11115 Montgomery, Suite B, Spokane, WA 99206-4779 (509) 924-[illegible]200 FAX 924-9290
9405 S.W. Nimbus Avenue, Beaverton, OR 97008-7132 (503) 643-9200 FAX 644-2202

CHAIN OF CUSTODY REPORT

Work Order #

REPORT TO:
ATTENTION: Ty Schreiner K/J
ADDRESS: 530 S. 336th ST
Federal Way WA 98003
PHONE: 253 874-0555 FAX:
PROJECT NAME: TACOMA METALS
PROJECT NUMBER: 994098.00
SAMPLED BY:

INVOICE TO:
ATTENTION:
ADDRESS:
P.O. NUMBER: NCA QUOTE #:

TURNAROUND REQUEST in Business Days *
Organic & Inorganic Analyses: 10 (Standard) | 7 | 5 | 4 | 3 | 2 | 1 | Same Day
Fuels & Hydrocarbon Analyses: 5 (Standard) | 3-4 | 2 | 1 | Same Day
OTHER Specify:
* Turnaround Requests less than standard may incur Rush Charges.

Analysis Request:

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NCA SAMPLE ID (Laboratory Use Only)	# CONTAINERS	NWTPH-DX	RCRA METALS	CU	VOCs	PCBs		HOLD				MATRIX (W, S, A, O)	# OF CONTAINERS	COMMENTS
1. TP-7-2-3	10/4/00 1:20	SOIL	2							X						
2. TP-7-4-6	1:28		2							X						
3. TP-7-6-10	2:00		2							X						
4. TP-8-0-1	2:20		2	X	X	X				X						
5. TP-8-2-3	2:30		2							X						
6. TP-8-4-6	2:35		2	X	X	X				X						
7. TP-8-6-10	2:45		2							X						
8. TP-9-0-1	3:10		2	X	X	X	X	X								
9. TP-9-2-3	3:30		2							X						
10. TP-800-4-6	3:50	SOIL	2	X	X	X				X						

RELINQUISHED BY (Signature): [signature] DATE: 10/9/00
PRINT NAME: Jodie Brulage FIRM: K/J TIME: 9:00
RECEIVED BY (Signature): [signature] DATE: 10/9/00
PRINT NAME: Carrie McDougal FIRM: ARI TIME: 1030
RELINQUISHED BY (Signature): DATE:
PRINT NAME: FIRM: TIME:
RECEIVED BY (Signature): DATE:
PRINT NAME: FIRM: TIME:

ADDITIONAL REMARKS: Please Freeze all "Holds"

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-5-01

Lab Sample ID: CH43A
LIMS ID: 00-19069
Matrix: Soil

Data Release Authorized: CH
Reported: 10/23/00 10/25/00

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/04/00
Date Received: 10/09/00

Date extracted: 10/14/00
Date analyzed: 10/18/00 23:11
Instrument ID: ECD1
Sample Amount: 10.9 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.9

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 9.0 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	36 U
53469-21-9	Aroclor 1242	36 U
12672-29-6	Aroclor 1248	36 U
11097-69-1	Aroclor 1254	36 U
11096-82-5	Aroclor 1260	36 U
11104-28-2	Aroclor 1221	73 U
11141-16-5	Aroclor 1232	36 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	105%
Tetrachlorometaxylene	96.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CH43SB
LIMS ID: 00-19079
Matrix: Soil
Data Release Authorized:
Reported: 10/25/00
Date Analyzed: 10/19/00
Instrument: FINN5

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: NA

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
1,2-Dichlorobenzene	46.8	50.0	93.6%
1,3-Dichlorobenzene	47.1	50.0	94.2%
1,4-Dichlorobenzene	47.3	50.0	94.6%
Acrolein	259.	250	104%
Methyl Iodide	53.8	50.0	108%
Bromoethane	58.2	50.0	116%
Acrylonitrile	49.2	50.0	98.4%
1,1-Dichloropropene	50.1	50.0	100%
Dibromomethane	47.4	50.0	94.8%
1,1,1,2-Tetrachloroethane	47.7	50.0	95.4%
1,2-Dibromo-3-chloropropane	45.2	50.0	90.4%
1,2,3-Trichloropropane	46.3	50.0	92.6%
trans-1,4-Dichloro-2-butene	45.4	50.0	90.8%
1,3,5-Trimethylbenzene	47.1	50.0	94.2%
1,2,4-Trimethylbenzene	46.7	50.0	93.4%
Hexachlorobutadiene	48.2	50.0	96.4%
Ethylene Dibromide	48.0	50.0	96.0%
Bromochloromethane	47.1	50.0	94.2%
2,2-Dichloropropane	48.3	50.0	96.6%
1,3-Dichloropropane	48.0	50.0	96.0%
Isopropylbenzene	48.3	50.0	96.6%
n-Propylbenzene	47.9	50.0	95.8%
Bromobenzene	47.2	50.0	94.4%
2-Chlorotoluene	53.3	50.0	107%
4-Chlorotoluene	42.7	50.0	85.4%
tert-Butylbenzene	47.3	50.0	94.6%
sec-Butylbenzene	48.4	50.0	96.8%
4-Isopropyltoluene	48.8	50.0	97.6%
n-Butylbenzene	47.6	50.0	95.2%
1,2,4-Trichlorobenzene	45.8	50.0	91.6%
Naphthalene	46.8	50.0	93.6%
1,2,3-Trichlorobenzene	46.7	50.0	93.4%

Spike Blank Surrogate Recovery	
d4-1,2-Dichloroethane	103%
d8-Toluene	101%
Bromofluorobenzene	104%
d4-1,2-Dichlorobenzene	102%

Reported in ug/kg-dry-Wt

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CH43SB
LIMS ID: 00-19079
Matrix: Soil
Data Release Authorized:
Reported: 10/25/00
Date Analyzed: 10/19/00
Instrument: FINN5

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: NA

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
Chloromethane	39.6	50.0	79.2%
Bromomethane	43.3	50.0	86.6%
Vinyl Chloride	33.9	50.0	67.8%
Chloroethane	41.1	50.0	82.2%
Methylene Chloride	45.2	50.0	90.4%
Acetone	222.	250	88.8%
Carbon Disulfide	75.4	50.0	151%
1,1-Dichloroethene	41.5	50.0	83.0%
1,1-Dichloroethane	45.5	50.0	91.0%
trans-1,2-Dichloroethene	44.5	50.0	89.0%
cis-1,2-Dichloroethene	48.0	50.0	96.0%
Chloroform	47.8	50.0	95.6%
1,2-Dichloroethane	46.3	50.0	92.6%
2-Butanone	237.	250	94.8%
1,1,1-Trichloroethane	49.5	50.0	99.0%
Carbon Tetrachloride	48.3	50.0	96.6%
Vinyl Acetate	41.0	50.0	82.0%
Bromodichloromethane	46.8	50.0	93.6%
1,2-Dichloropropane	49.5	50.0	99.0%
cis-1,3-Dichloropropene	42.3	50.0	84.6%
Trichloroethene	48.2	50.0	96.4%
Dibromochloromethane	46.5	50.0	93.0%
1,1,2-Trichloroethane	49.0	50.0	98.0%
Benzene	48.4	50.0	96.8%
trans-1,3-Dichloropropene	46.1	50.0	92.2%
2-Chloroethylvinylether	48.8	50.0	97.6%
Bromoform	47.4	50.0	94.8%
4-Methyl-2-Pentanone (MIBK)	239.	250	95.6%
2-Hexanone	227.	250	90.8%
Tetrachloroethene	49.9	50.0	99.8%
1,1,2,2-Tetrachloroethane	46.1	50.0	92.2%
Toluene	49.5	50.0	99.0%
Chlorobenzene	48.2	50.0	96.4%
Ethylbenzene	48.6	50.0	97.2%
Styrene	48.3	50.0	96.6%
Trichlorofluoromethane	40.6	50.0	81.2%
1,1,2-Trichlorotrifluoroethane	58.8	50.0	118%
m,p-Xylene	99.9	100	99.9%
O-Xylene	48.5	50.0	97.0%

Reported in ug/kg-dry-Wt

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 101900MB
LIMS ID: 00-19079
Matrix: Soil
Data Release Authorized:
Reported: 10/25/00

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN5
Date Analyzed: 10/19/00 11:52

Sample Amount: 5.00 g dry Wt Equiv
Percent Moisture: NA

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	1.0 U
95-50-1	1,2-Dichlorobenzene	1.0 U
541-73-1	1,3-Dichlorobenzene	1.0 U
106-46-7	1,4-Dichlorobenzene	1.0 U
107-02-8	Acrolein	50 U
74-88-4	Methyl Iodide	1.0 U
74-96-4	Bromoethane	2.0 U
107-13-1	Acrylonitrile	5.0 U
563-58-6	1,1-Dichloropropene	1.0 U
74-95-3	Dibromomethane	1.0 U
630-20-6	1,1,1,2-Tetrachloroethane	1.0 U
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U
96-18-4	1,2,3-Trichloropropane	2.0 U
110-57-6	trans-1,4-Dichloro-2-butene	5.0 U
108-67-8	1,3,5-Trimethylbenzene	1.0 U
95-63-6	1,2,4-Trimethylbenzene	1.0 U
87-68-3	Hexachlorobutadiene	5.0 U
106-93-4	Ethylene Dibromide	1.0 U
74-97-5	Bromochloromethane	1.0 U
594-20-7	2,2-Dichloropropane	1.0 U
142-28-9	1,3-Dichloropropane	1.0 U
98-82-8	Isopropylbenzene	1.0 U
103-65-1	n-Propylbenzene	1.0 U
108-86-1	Bromobenzene	1.0 U
95-49-8	2-Chlorotoluene	1.0 U
106-43-4	4-Chlorotoluene	1.0 U
98-06-6	tert-Butylbenzene	1.0 U
135-98-8	sec-Butylbenzene	1.0 U
99-87-6	4-Isopropyltoluene	1.0 U
104-51-8	n-Butylbenzene	2.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0 U
91-20-3	Naphthalene	5.0 U
87-61-6	1,2,3-Trichlorobenzene	5.0 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	112%
d8-Toluene	99.3%
Bromofluorobenzene	104%
d4-1,2-Dichlorobenzene	102%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 101900MB
LIMS ID: 00-19079
Matrix: Soil
Data Release Authorized:
Reported: 10/25/00

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN5
Date Analyzed: 10/19/00 11:52

Sample Amount: 5.00 g dry Wt Equiv
Percent Moisture: NA

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	3.0 U
67-64-1	Acetone	5.0 U
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	trans-1,2-Dichloroethene	1.0 U
156-59-2	cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
108-05-4	Vinyl Acetate	5.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-02-6	trans-1,3-Dichloropropene	1.0 U
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.0 U
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	1.0 U
1330-20-7	m,p-Xylene	1.0 U

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CH43SB
LIMS ID: 00-19077
Matrix: Soil
Data Release Authorized:
Reported: 10/25/00
Date Analyzed: 10/19/00
Instrument: FINN5

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: NA

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
1,2-Dichlorobenzene	5850	6250	93.6%
1,3-Dichlorobenzene	5890	6250	94.2%
1,4-Dichlorobenzene	5910	6250	94.6%
Acrolein	32400	31200	104%
Methyl Iodide	6720	6250	108%
Bromoethane	7280	6250	116%
Acrylonitrile	6150	6250	98.4%
1,1-Dichloropropene	6260	6250	100%
Dibromomethane	5920	6250	94.7%
1,1,1,2-Tetrachloroethane	5960	6250	95.4%
1,2-Dibromo-3-chloropropane	5650	6250	90.4%
1,2,3-Trichloropropane	5790	6250	92.6%
trans-1,4-Dichloro-2-butene	5680	6250	90.9%
1,3,5-Trimethylbenzene	5890	6250	94.2%
1,2,4-Trimethylbenzene	5840	6250	93.4%
Hexachlorobutadiene	6020	6250	96.3%
Ethylene Dibromide	6000	6250	96.0%
Bromochloromethane	5890	6250	94.2%
2,2-Dichloropropane	6040	6250	96.6%
1,3-Dichloropropane	6000	6250	96.0%
Isopropylbenzene	6040	6250	96.6%
n-Propylbenzene	5990	6250	95.8%
Bromobenzene	5900	6250	94.4%
2-Chlorotoluene	6660	6250	107%
4-Chlorotoluene	5340	6250	85.4%
tert-Butylbenzene	5910	6250	94.6%
sec-Butylbenzene	6050	6250	96.8%
4-Isopropyltoluene	6100	6250	97.6%
n-Butylbenzene	5950	6250	95.2%
1,2,4-Trichlorobenzene	5720	6250	91.5%
Naphthalene	5850	6250	93.6%
1,2,3-Trichlorobenzene	5840	6250	93.4%

Spike Blank Surrogate Recovery

d4-1,2-Dichloroethane	103%
d8-Toluene	101%
Bromofluorobenzene	104%
d4-1,2-Dichlorobenzene	102%

Reported in ug/kg-dry-Wt

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CH43SB
LIMS ID: 00-19077
Matrix: Soil
Data Release Authorized:
Reported: 10/25/00
Date Analyzed: 10/19/00
Instrument: FINN5

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: NA

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
Chloromethane	4950	6250	79.2%
Bromomethane	5410	6250	86.6%
Vinyl Chloride	4240	6250	67.8%
Chloroethane	5140	6250	82.2%
Methylene Chloride	5650	6250	90.4%
Acetone	27800	31200	89.0%
Carbon Disulfide	9420	6250	151%
1,1-Dichloroethene	5190	6250	83.0%
1,1-Dichloroethane	5690	6250	91.0%
trans-1,2-Dichloroethene	5560	6250	89.0%
cis-1,2-Dichloroethene	6000	6250	96.0%
Chloroform	5980	6250	95.7%
1,2-Dichloroethane	5790	6250	92.6%
2-Butanone	29600	31200	94.7%
1,1,1-Trichloroethane	6190	6250	99.0%
Carbon Tetrachloride	6040	6250	96.6%
Vinyl Acetate	5120	6250	81.9%
Bromodichloromethane	5850	6250	93.6%
1,2-Dichloropropane	6190	6250	99.0%
cis-1,3-Dichloropropene	5290	6250	84.6%
Trichloroethene	6020	6250	96.3%
Dibromochloromethane	5810	6250	93.0%
1,1,2-Trichloroethane	6120	6250	97.9%
Benzene	6050	6250	96.8%
trans-1,3-Dichloropropene	5760	6250	92.2%
2-Chloroethylvinylether	6100	6250	97.6%
Bromoform	5920	6250	94.7%
4-Methyl-2-Pentanone (MIBK)	29900	31200	95.7%
2-Hexanone	28400	31200	90.9%
Tetrachloroethene	6240	6250	99.8%
1,1,2,2-Tetrachloroethane	5760	6250	92.2%
Toluene	6190	6250	99.0%
Chlorobenzene	6020	6250	96.3%
Ethylbenzene	6080	6250	97.3%
Styrene	6040	6250	96.6%
Trichlorofluoromethane	5080	6250	81.3%
1,1,2-Trichlorotrifluoroethane	7350	6250	118%
m,p-Xylene	12500	12500	100%
O-Xylene	6060	6250	97.0%

Reported in ug/kg-dry-Wt

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 101900MB
LIMS ID: 00-19077
Matrix: Soil
Data Release Authorized
Reported: 10/25/00

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN5
Date Analyzed: 10/19/00 12:18

Sample Amount: 40 mg dry Wt Equiv
Percent Moisture: NA

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	120 U
95-50-1	1,2-Dichlorobenzene	120 U
541-73-1	1,3-Dichlorobenzene	120 U
106-46-7	1,4-Dichlorobenzene	120 U
107-02-8	Acrolein	6,200 U
74-88-4	Methyl Iodide	120 U
74-96-4	Bromoethane	250 U
107-13-1	Acrylonitrile	620 U
563-58-6	1,1-Dichloropropene	120 U
74-95-3	Dibromomethane	120 U
630-20-6	1,1,1,2-Tetrachloroethane	120 U
96-12-8	1,2-Dibromo-3-chloropropane	620 U
96-18-4	1,2,3-Trichloropropane	250 U
110-57-6	trans-1,4-Dichloro-2-butene	620 U
108-67-8	1,3,5-Trimethylbenzene	120 U
95-63-6	1,2,4-Trimethylbenzene	120 U
87-68-3	Hexachlorobutadiene	620 U
106-93-4	Ethylene Dibromide	120 U
74-97-5	Bromochloromethane	120 U
594-20-7	2,2-Dichloropropane	120 U
142-28-9	1,3-Dichloropropane	120 U
98-82-8	Isopropylbenzene	120 U
103-65-1	n-Propylbenzene	120 U
108-86-1	Bromobenzene	120 U
95-49-8	2-Chlorotoluene	120 U
106-43-4	4-Chlorotoluene	120 U
98-06-6	tert-Butylbenzene	120 U
135-98-8	sec-Butylbenzene	120 U
99-87-6	4-Isopropyltoluene	120 U
104-51-8	n-Butylbenzene	250 U
120-82-1	1,2,4-Trichlorobenzene	620 U
91-20-3	Naphthalene	620 U
87-61-6	1,2,3-Trichlorobenzene	620 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	106%
d8-Toluene	103%
Bromofluorobenzene	103%
d4-1,2-Dichlorobenzene	102%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 101900MB
LIMS ID: 00-19077
Matrix: Soil
Data Release Authorized:
Reported: 10/25/00

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN5
Date Analyzed: 10/19/00 12:18

Sample Amount: 40 mg dry Wt Equiv
Percent Moisture: NA

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	120 U
74-83-9	Bromomethane	120 U
75-01-4	Vinyl Chloride	120 U
75-00-3	Chloroethane	120 U
75-09-2	Methylene Chloride	380 U
67-64-1	Acetone	620 U
75-15-0	Carbon Disulfide	120 U
75-35-4	1,1-Dichloroethene	120 U
75-34-3	1,1-Dichloroethane	120 U
156-60-5	trans-1,2-Dichloroethene	120 U
156-59-2	cis-1,2-Dichloroethene	120 U
67-66-3	Chloroform	120 U
107-06-2	1,2-Dichloroethane	120 U
78-93-3	2-Butanone	620 U
71-55-6	1,1,1-Trichloroethane	120 U
56-23-5	Carbon Tetrachloride	120 U
108-05-4	Vinyl Acetate	620 U
75-27-4	Bromodichloromethane	120 U
78-87-5	1,2-Dichloropropane	120 U
10061-01-5	cis-1,3-Dichloropropene	120 U
79-01-6	Trichloroethene	120 U
124-48-1	Dibromochloromethane	120 U
79-00-5	1,1,2-Trichloroethane	120 U
71-43-2	Benzene	120 U
10061-02-6	trans-1,3-Dichloropropene	120 U
110-75-8	2-Chloroethylvinylether	620 U
75-25-2	Bromoform	120 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	620 U
591-78-6	2-Hexanone	620 U
127-18-4	Tetrachloroethene	120 U
79-34-5	1,1,2,2-Tetrachloroethane	120 U
108-88-3	Toluene	120 U
108-90-7	Chlorobenzene	120 U
100-41-4	Ethylbenzene	120 U
100-42-5	Styrene	120 U
75-69-4	Trichlorofluoromethane	120 U
76-13-1	1,1,2-Trichlorotrifluoroethane	120 U
1330-20-7	m,p-Xylene	120 U

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CH43SB
LIMS ID: 00-19082
Matrix: Soil
Data Release Authorized:
Reported: 10/25/00
Date Analyzed: 10/17/00
Instrument: FINN5

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: NA

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
1,2-Dichlorobenzene	6020	6250	96.3%
1,3-Dichlorobenzene	6100	6250	97.6%
1,4-Dichlorobenzene	6100	6250	97.6%
Acrolein	36000	31200	115%
Methyl Iodide	5200	6250	83.2%
Bromoethane	5140	6250	82.2%
Acrylonitrile	5980	6250	95.7%
1,1-Dichloropropene	6260	6250	100%
Dibromomethane	5980	6250	95.7%
1,1,1,2-Tetrachloroethane	6060	6250	97.0%
1,2-Dibromo-3-chloropropane	5950	6250	95.2%
1,2,3-Trichloropropane	5850	6250	93.6%
trans-1,4-Dichloro-2-butene	6100	6250	97.6%
1,3,5-Trimethylbenzene	5980	6250	95.7%
1,2,4-Trimethylbenzene	5990	6250	95.8%
Hexachlorobutadiene	6600	6250	106%
Ethylene Dibromide	5920	6250	94.7%
Bromochloromethane	5940	6250	95.0%
2,2-Dichloropropane	5960	6250	95.4%
1,3-Dichloropropane	6100	6250	97.6%
Isopropylbenzene	6020	6250	96.3%
n-Propylbenzene	5980	6250	95.7%
Bromobenzene	5990	6250	95.8%
2-Chlorotoluene	5800	6250	92.8%
4-Chlorotoluene	6010	6250	96.2%
tert-Butylbenzene	5960	6250	95.4%
sec-Butylbenzene	6090	6250	97.4%
4-Isopropyltoluene	6110	6250	97.8%
n-Butylbenzene	6180	6250	98.9%
1,2,4-Trichlorobenzene	6480	6250	104%
Naphthalene	6480	6250	104%
1,2,3-Trichlorobenzene	6440	6250	103%

Spike Blank Surrogate Recovery	
d4-1,2-Dichloroethane	98.8%
d8-Toluene	99.1%
Bromofluorobenzene	102%
d4-1,2-Dichlorobenzene	99.4%

Reported in ug/kg-dry-Wt

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CH43SB
LIMS ID: 00-19082
Matrix: Soil
Data Release Authorized:
Reported: 10/25/00
Date Analyzed: 10/17/00
Instrument: FINN5

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: NA

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
Chloromethane	5150	6250	82.4%
Bromomethane	6090	6250	97.4%
Vinyl Chloride	5780	6250	92.5%
Chloroethane	5820	6250	93.1%
Methylene Chloride	6060	6250	97.0%
Acetone	30500	31200	97.6%
Carbon Disulfide	4640	6250	74.2%
1,1-Dichloroethene	5700	6250	91.2%
1,1-Dichloroethane	5740	6250	91.8%
trans-1,2-Dichloroethene	5890	6250	94.2%
cis-1,2-Dichloroethene	6150	6250	98.4%
Chloroform	6010	6250	96.2%
1,2-Dichloroethane	5990	6250	95.8%
2-Butanone	30100	31200	96.3%
1,1,1-Trichloroethane	5950	6250	95.2%
Carbon Tetrachloride	5940	6250	95.0%
Vinyl Acetate	5010	6250	80.2%
Bromodichloromethane	6010	6250	96.2%
1,2-Dichloropropane	6360	6250	102%
cis-1,3-Dichloropropene	5760	6250	92.2%
Trichloroethene	6010	6250	96.2%
Dibromochloromethane	6020	6250	96.3%
1,1,2-Trichloroethane	6040	6250	96.6%
Benzene	6000	6250	96.0%
trans-1,3-Dichloropropene	5650	6250	90.4%
2-Chloroethylvinylether	6160	6250	98.6%
Bromoform	6080	6250	97.3%
4-Methyl-2-Pentanone (MIBK)	31200	31200	99.8%
2-Hexanone	31000	31200	99.2%
Tetrachloroethene	6080	6250	97.3%
1,1,2,2-Tetrachloroethane	5860	6250	93.8%
Toluene	5890	6250	94.2%
Chlorobenzene	6080	6250	97.3%
Ethylbenzene	5990	6250	95.8%
Styrene	6190	6250	99.0%
Trichlorofluoromethane	5810	6250	93.0%
1,1,2-Trichlorotrifluoroethane	4680	6250	74.9%
m,p-Xylene	12400	12500	99.2%
O-Xylene	6200	6250	99.2%

Reported in ug/kg-dry-Wt

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 101700MB
LIMS ID: 00-19082
Matrix: Soil
Data Release Authorized:
Reported: 10/25/00

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN5
Date Analyzed: 10/17/00 17:56

Sample Amount: 40 mg dry Wt Equiv
Percent Moisture: NA

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	120 U
95-50-1	1,2-Dichlorobenzene	120 U
541-73-1	1,3-Dichlorobenzene	120 U
106-46-7	1,4-Dichlorobenzene	120 U
107-02-8	Acrolein	6,200 U
74-88-4	Methyl Iodide	120 U
74-96-4	Bromoethane	250 U
107-13-1	Acrylonitrile	620 U
563-58-6	1,1-Dichloropropene	120 U
74-95-3	Dibromomethane	120 U
630-20-6	1,1,1,2-Tetrachloroethane	120 U
96-12-8	1,2-Dibromo-3-chloropropane	620 U
96-18-4	1,2,3-Trichloropropane	250 U
110-57-6	trans-1,4-Dichloro-2-butene	620 U
108-67-8	1,3,5-Trimethylbenzene	120 U
95-63-6	1,2,4-Trimethylbenzene	120 U
87-68-3	Hexachlorobutadiene	620 U
106-93-4	Ethylene Dibromide	120 U
74-97-5	Bromochloromethane	120 U
594-20-7	2,2-Dichloropropane	120 U
142-28-9	1,3-Dichloropropane	120 U
98-82-8	Isopropylbenzene	120 U
103-65-1	n-Propylbenzene	120 U
108-86-1	Bromobenzene	120 U
95-49-8	2-Chlorotoluene	120 U
106-43-4	4-Chlorotoluene	120 U
98-06-6	tert-Butylbenzene	120 U
135-98-8	sec-Butylbenzene	120 U
99-87-6	4-Isopropyltoluene	120 U
104-51-8	n-Butylbenzene	250 U
120-82-1	1,2,4-Trichlorobenzene	620 U
91-20-3	Naphthalene	620 U
87-61-6	1,2,3-Trichlorobenzene	620 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	101%
d8-Toluene	98.6%
Bromofluorobenzene	96.7%
d4-1,2-Dichlorobenzene	100%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 101700MB
LIMS ID: 00-19082
Matrix: Soil
Data Release Authorized:
Reported: 10/25/00

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN5
Date Analyzed: 10/17/00 17:56

Sample Amount: 40 mg dry Wt Equiv
Percent Moisture: NA

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	120 U
74-83-9	Bromomethane	120 U
75-01-4	Vinyl Chloride	120 U
75-00-3	Chloroethane	120 U
75-09-2	Methylene Chloride	380 U
67-64-1	Acetone	620 U
75-15-0	Carbon Disulfide	120 U
75-35-4	1,1-Dichloroethene	120 U
75-34-3	1,1-Dichloroethane	120 U
156-60-5	trans-1,2-Dichloroethene	120 U
156-59-2	cis-1,2-Dichloroethene	120 U
67-66-3	Chloroform	120 U
107-06-2	1,2-Dichloroethane	120 U
78-93-3	2-Butanone	620 U
71-55-6	1,1,1-Trichloroethane	120 U
56-23-5	Carbon Tetrachloride	120 U
108-05-4	Vinyl Acetate	620 U
75-27-4	Bromodichloromethane	120 U
78-87-5	1,2-Dichloropropane	120 U
10061-01-5	cis-1,3-Dichloropropene	120 U
79-01-6	Trichloroethene	120 U
124-48-1	Dibromochloromethane	120 U
79-00-5	1,1,2-Trichloroethane	120 U
71-43-2	Benzene	120 U
10061-02-6	trans-1,3-Dichloropropene	120 U
110-75-8	2-Chloroethylvinylether	620 U
75-25-2	Bromoform	120 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	620 U
591-78-6	2-Hexanone	620 U
127-18-4	Tetrachloroethene	120 U
79-34-5	1,1,2,2-Tetrachloroethane	120 U
108-88-3	Toluene	120 U
108-90-7	Chlorobenzene	120 U
100-41-4	Ethylbenzene	120 U
100-42-5	Styrene	120 U
75-69-4	Trichlorofluoromethane	120 U
76-13-1	1,1,2-Trichlorotrifluoroethane	120 U
1330-20-7	m,p-Xylene	120 U

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CH43N
LIMS ID: 00-19082
Matrix: Soil

Sample No: TP-10-6-10
QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 10/09/00

Data Release Authorized:
Reported: 10/25/00

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY
Date Analyzed: 10/17/00

CONSTITUENT		SAMPLE VALUE	SPIKE VALUE	SPIKE AMT	% RECOVERY	RPD
MATRIX SPIKE DUPLICATE						
1,1,2-Trichlorotrifluoroethan	<	154.	7580	7690	98.5%	5.9%
m,p-Xylene	<	154.	15000	15400	97.5%	6.9%
O-Xylene	<	154.	7720	7690	100%	8.1%
1,2-Dichlorobenzene	<	154.	7370	7690	95.8%	9.4%
1,3-Dichlorobenzene	<	154.	7120	7690	92.6%	8.4%
1,4-Dichlorobenzene	<	154.	7220	7690	93.9%	9.0%
Acrolein	<	7690	48500	38500	126%	15%
Methyl Iodide	<	154.	9690	7690	126%	5.4%
Bromoethane	<	308.	8830	7690	115%	2.6%
Acrylonitrile	<	769.	7920	7690	103%	0.8%
1,1-Dichloropropene	<	154.	7220	7690	93.9%	7.8%
Dibromomethane	<	154.	7910	7690	103%	10%
1,1,1,2-Tetrachloroethane	<	154.	7650	7690	99.4%	7.3%
1,2-Dibromo-3-chloropropane	<	769.	7880	7690	102%	9.3%
1,2,3-Trichloropropane	<	308.	7420	7690	96.5%	4.3%
trans-1,4-Dichloro-2-butene	<	769.	7180	7690	93.3%	2.8%
1,3,5-Trimethylbenzene	<	154.	6940	7690	90.2%	6.8%
1,2,4-Trimethylbenzene	<	154.	6860	7690	89.2%	6.0%
Hexachlorobutadiene	<	769.	7200	7690	93.6%	15%
Ethylene Dibromide	<	154.	8180	7690	106%	13%
Bromochloromethane	<	154.	7780	7690	101%	7.9%
2,2-Dichloropropane	<	154.	7150	7690	93.0%	9.0%
1,3-Dichloropropane	<	154.	7660	7690	99.6%	5.0%
Isopropylbenzene	<	154.	6980	7690	90.7%	4.8%
n-Propylbenzene	<	154.	6780	7690	88.1%	6.2%
Bromobenzene	<	154.	7380	7690	95.9%	7.4%
2-Chlorotoluene	<	154.	6630	7690	86.2%	2.3%
4-Chlorotoluene	<	154.	7000	7690	91.0%	6.2%
tert-Butylbenzene	<	154.	6970	7690	90.6%	8.0%
sec-Butylbenzene	<	154.	6910	7690	89.8%	8.4%
4-Isopropyltoluene	<	154.	6940	7690	90.2%	10%
n-Butylbenzene	<	308.	6630	7690	86.2%	10%
1,2,4-Trichlorobenzene	<	769.	7170	7690	93.2%	13%
Naphthalene	<	769.	8280	7690	108%	16%
1,2,3-Trichlorobenzene	<	769.	7570	7690	98.4%	13%

Reported in ug/kg-dry-Wt

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-10-6-10
QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 10/09/00

Lab Sample ID: CH43N
LIMS ID: 00-19082
Matrix: Soil

Data Release Authorized:
Reported: 10/25/00

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY
Date Analyzed: 10/17/00

CONSTITUENT	SAMPLE VALUE	SPIKE VALUE	SPIKE AMT	% RECOVERY	RPD
MATRIX SPIKE DUPLICATE					
Chloromethane	< 154.	6540	7690	85.0%	6.8%
Bromomethane	< 154.	6770	7690	88.0%	0.7%
Vinyl Chloride	< 154.	4380	7690	56.9%	6.0%
Chloroethane	< 154.	6490	7690	84.4%	6.9%
Methylene Chloride	< 462.	6750	7690	87.8%	3.5%
Acetone	< 769.	36000	38500	93.6%	5.1%
Carbon Disulfide	< 154.	11100	7690	144%	3.5%
1,1-Dichloroethene	< 154.	5940	7690	77.2%	4.4%
1,1-Dichloroethane	< 154.	7110	7690	92.4%	7.0%
trans-1,2-Dichloroethene	< 154.	6880	7690	89.4%	7.2%
cis-1,2-Dichloroethene	< 154.	7680	7690	99.8%	7.7%
Chloroform	< 154.	7630	7690	99.2%	7.8%
1,2-Dichloroethane	< 154.	7520	7690	97.8%	9.8%
2-Butanone	< 769.	39700	38500	103%	6.3%
1,1,1-Trichloroethane	< 154.	7420	7690	96.5%	9
Carbon Tetrachloride	< 154.	6720	7690	87.4%	8
Vinyl Acetate	< 769.	6920	7690	90.0%	7.4%
Bromodichloromethane	< 154.	7580	7690	98.5%	9.1%
1,2-Dichloropropane	< 154.	8230	7690	107%	9.4%
cis-1,3-Dichloropropene	< 154.	7370	7690	95.8%	10%
Trichloroethene	< 154.	7350	7690	95.6%	9.5%
Dibromochloromethane	< 154.	7520	7690	97.8%	8.1%
1,1,2-Trichloroethane	< 154.	7940	7690	103%	9.6%
Benzene	< 154.	7580	7690	98.5%	6.4%
trans-1,3-Dichloropropene	< 154.	7480	7690	97.2%	11%
2-Chloroethylvinylether	< 769.	8050	7690	105%	8.3%
Bromoform	< 154.	7980	7690	104%	13%
4-Methyl-2-Pentanone (MIBK)	< 769.	41700	38500	108%	7.6%
2-Hexanone	< 769.	38600	38500	100%	4.4%
Tetrachloroethene	< 154.	6950	7690	90.4%	8.6%
1,1,2,2-Tetrachloroethane	< 154.	7400	7690	96.2%	4.8%
Toluene	1820	9080	7690	94.4%	13%
Chlorobenzene	< 154.	7510	7690	97.6%	7.9%
Ethylbenzene	< 154.	7280	7690	94.6%	7.5%
Styrene	< 154.	7720	7690	100%	9.0%
Trichlorofluoromethane	< 154.	5660	7690	73.6%	7.4%

Reported in ug/kg-dry-Wt

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-10-6-10
QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 10/09/00

Lab Sample ID: CH43N
LIMS ID: 00-19082
Matrix: Soil

Data Release Authorized:
Reported: 10/25/00

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY
Date Analyzed: 10/17/00

CONSTITUENT		SAMPLE VALUE	SPIKE VALUE	SPIKE AMT	% RECOVERY	RPD
MATRIX SPIKE						
1,1,2-Trichlorotrifluoroethan	<	154.	7140	7690	92.8%	
m,p-Xylene	<	154.	14000	15400	91.0%	
O-Xylene	<	154.	7090	7690	92.2%	
1,2-Dichlorobenzene	<	154.	6710	7690	87.2%	
1,3-Dichlorobenzene	<	154.	6550	7690	85.2%	
1,4-Dichlorobenzene	<	154.	6600	7690	85.8%	
Acrolein	<	7690	41700	38500	108%	
Methyl Iodide	<	154.	9180	7690	119%	
Bromoethane	<	308.	8620	7690	112%	
Acrylonitrile	<	769.	7860	7690	102%	
1,1-Dichloropropene	<	154.	6680	7690	86.8%	
Dibromomethane	<	154.	7140	7690	92.8%	
1,1,1,2-Tetrachloroethane	<	154.	7110	7690	92.4%	
1,2-Dibromo-3-chloropropane	<	769.	7150	7690	93.0%	
1,2,3-Trichloropropane	<	308.	7110	7690	92.4%	
trans-1,4-Dichloro-2-butene	<	769.	6980	7690	90.7%	
1,3,5-Trimethylbenzene	<	154.	6480	7690	84.2%	
1,2,4-Trimethylbenzene	<	154.	6460	7690	84.0%	
Hexachlorobutadiene	<	769.	6220	7690	80.9%	
Ethylene Dibromide	<	154.	7140	7690	92.8%	
Bromochloromethane	<	154.	7180	7690	93.3%	
2,2-Dichloropropane	<	154.	6540	7690	85.0%	
1,3-Dichloropropane	<	154.	7290	7690	94.8%	
Isopropylbenzene	<	154.	6650	7690	86.4%	
n-Propylbenzene	<	154.	6370	7690	82.8%	
Bromobenzene	<	154.	6850	7690	89.0%	
2-Chlorotoluene	<	154.	6480	7690	84.2%	
4-Chlorotoluene	<	154.	6580	7690	85.5%	
tert-Butylbenzene	<	154.	6430	7690	83.6%	
sec-Butylbenzene	<	154.	6350	7690	82.6%	
4-Isopropyltoluene	<	154.	6250	7690	81.2%	
n-Butylbenzene	<	308.	6000	7690	78.0%	
1,2,4-Trichlorobenzene	<	769.	6290	7690	81.8%	
Naphthalene	<	769.	7050	7690	91.6%	
1,2,3-Trichlorobenzene	<	769.	6630	7690	86.2%	

Reported in ug/kg-dry-Wt

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-10-6-10
QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 10/09/00

Lab Sample ID: CH43N
LIMS ID: 00-19082
Matrix: Soil

Data Release Authorized:
Reported: 10/25/00

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY
Date Analyzed: 10/17/00

CONSTITUENT	SAMPLE VALUE	SPIKE VALUE	SPIKE AMT	% RECOVERY	RPD
MATRIX SPIKE					
Chloromethane	< 154.	6110	7690	79.4%	
Bromomethane	< 154.	6720	7690	87.4%	
Vinyl Chloride	< 154.	4120	7690	53.6%	
Chloroethane	< 154.	6060	7690	78.8%	
Methylene Chloride	< 462.	6520	7690	84.8%	
Acetone	< 769.	34200	38500	88.9%	
Carbon Disulfide	< 154.	10700	7690	139%	
1,1-Dichloroethene	< 154.	5680	7690	73.8%	
1,1-Dichloroethane	< 154.	6630	7690	86.2%	
trans-1,2-Dichloroethene	< 154.	6400	7690	83.2%	
cis-1,2-Dichloroethene	< 154.	7110	7690	92.4%	
Chloroform	< 154.	7060	7690	91.8%	
1,2-Dichloroethane	< 154.	6820	7690	88.7%	
2-Butanone	< 769.	37200	38500	96.7%	
1,1,1-Trichloroethane	< 154.	6780	7690	88.1%	
Carbon Tetrachloride	< 154.	6170	7690	80.2%	
Vinyl Acetate	< 769.	6430	7690	83.6%	
Bromodichloromethane	< 154.	6920	7690	90.0%	
1,2-Dichloropropane	< 154.	7490	7690	97.4%	
cis-1,3-Dichloropropene	< 154.	6660	7690	86.6%	
Trichloroethene	< 154.	6690	7690	87.0%	
Dibromochloromethane	< 154.	6940	7690	90.2%	
1,1,2-Trichloroethane	< 154.	7200	7690	93.6%	
Benzene	< 154.	7110	7690	92.4%	
trans-1,3-Dichloropropene	< 154.	6680	7690	86.8%	
2-Chloroethylvinylether	< 769.	7430	7690	96.6%	
Bromoform	< 154.	7050	7690	91.6%	
4-Methyl-2-Pentanone (MIBK)	< 769.	38500	38500	100%	
2-Hexanone	< 769.	36800	38500	95.7%	
Tetrachloroethene	< 154.	6380	7690	82.9%	
1,1,2,2-Tetrachloroethane	< 154.	7050	7690	91.6%	
Toluene	1820	8170	7690	82.6%	
Chlorobenzene	< 154.	6940	7690	90.2%	
Ethylbenzene	< 154.	6750	7690	87.8%	
Styrene	< 154.	7030	7690	91.4%	
Trichlorofluoromethane	< 154.	5260	7690	68.4%	

Reported in ug/kg-dry-Wt

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-10-6-10
SPIKE DUPLICATE

Lab Sample ID: CH43N-MSD
LIMS ID: 00-19082
Matrix: Soil
Data Release Authorized:
Reported: 10/25/00

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/05/00
Date Received: 10/09/00

Instrument: FINN5
Date Analyzed: 10/17/00 20:33

Sample Amount: 32 mg dry Wt
Percent Moisture: 17.0%

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	---
95-50-1	1,2-Dichlorobenzene	---
541-73-1	1,3-Dichlorobenzene	---
106-46-7	1,4-Dichlorobenzene	---
107-02-8	Acrolein	---
74-88-4	Methyl Iodide	---
74-96-4	Bromoethane	---
107-13-1	Acrylonitrile	---
563-58-6	1,1-Dichloropropene	---
74-95-3	Dibromomethane	---
630-20-6	1,1,1,2-Tetrachloroethane	---
96-12-8	1,2-Dibromo-3-chloropropane	---
96-18-4	1,2,3-Trichloropropane	---
110-57-6	trans-1,4-Dichloro-2-butene	---
108-67-8	1,3,5-Trimethylbenzene	---
95-63-6	1,2,4-Trimethylbenzene	---
87-68-3	Hexachlorobutadiene	---
106-93-4	Ethylene Dibromide	---
74-97-5	Bromochloromethane	---
594-20-7	2,2-Dichloropropane	---
142-28-9	1,3-Dichloropropane	---
98-82-8	Isopropylbenzene	---
103-65-1	n-Propylbenzene	---
108-86-1	Bromobenzene	---
95-49-8	2-Chlorotoluene	---
106-43-4	4-Chlorotoluene	---
98-06-6	tert-Butylbenzene	---
135-98-8	sec-Butylbenzene	---
99-87-6	4-Isopropyltoluene	---
104-51-8	n-Butylbenzene	---
120-82-1	1,2,4-Trichlorobenzene	---
91-20-3	Naphthalene	---
87-61-6	1,2,3-Trichlorobenzene	---

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	104%
d8-Toluene	102%
Bromofluorobenzene	103%
d4-1,2-Dichlorobenzene	101%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-10-6-10
SPIKE DUPLICATE

Lab Sample ID: CH43N-MSD
LIMS ID: 00-19082
Matrix: Soil
Data Release Authorized:
Reported: 10/25/00

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/05/00
Date Received: 10/09/00

Instrument: FINN5
Date Analyzed: 10/17/00 20:33

Sample Amount: 32 mg dry Wt
Percent Moisture: 17.0%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	---
74-83-9	Bromomethane	---
75-01-4	Vinyl Chloride	---
75-00-3	Chloroethane	---
75-09-2	Methylene Chloride	---
67-64-1	Acetone	---
75-15-0	Carbon Disulfide	---
75-35-4	1,1-Dichloroethene	---
75-34-3	1,1-Dichloroethane	---
156-60-5	trans-1,2-Dichloroethene	---
156-59-2	cis-1,2-Dichloroethene	---
67-66-3	Chloroform	---
107-06-2	1,2-Dichloroethane	---
78-93-3	2-Butanone	---
71-55-6	1,1,1-Trichloroethane	---
56-23-5	Carbon Tetrachloride	---
108-05-4	Vinyl Acetate	---
75-27-4	Bromodichloromethane	---
78-87-5	1,2-Dichloropropane	---
10061-01-5	cis-1,3-Dichloropropene	---
79-01-6	Trichloroethene	---
124-48-1	Dibromochloromethane	---
79-00-5	1,1,2-Trichloroethane	---
71-43-2	Benzene	---
10061-02-6	trans-1,3-Dichloropropene	---
110-75-8	2-Chloroethylvinylether	---
75-25-2	Bromoform	---
108-10-1	4-Methyl-2-Pentanone (MIBK)	---
591-78-6	2-Hexanone	---
127-18-4	Tetrachloroethene	---
79-34-5	1,1,2,2-Tetrachloroethane	---
108-88-3	Toluene	---
108-90-7	Chlorobenzene	---
100-41-4	Ethylbenzene	---
100-42-5	Styrene	---
75-69-4	Trichlorofluoromethane	---
76-13-1	1,1,2-Trichlorotrifluoroethane	---
1330-20-7	m,p-Xylene	---

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-10-6-10
MATRIX SPIKE

Lab Sample ID: CH43N-MS
LIMS ID: 00-19082
Matrix: Soil
Data Release Authorized:
Reported: 10/25/00

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/05/00
Date Received: 10/09/00

Instrument: FINN5
Date Analyzed: 10/17/00 20:07

Sample Amount: 32 **mg dry Wt**
Percent Moisture: 17.0%

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	---
95-50-1	1,2-Dichlorobenzene	---
541-73-1	1,3-Dichlorobenzene	---
106-46-7	1,4-Dichlorobenzene	---
107-02-8	Acrolein	---
74-88-4	Methyl Iodide	---
74-96-4	Bromoethane	---
107-13-1	Acrylonitrile	---
563-58-6	1,1-Dichloropropene	---
74-95-3	Dibromomethane	---
630-20-6	1,1,1,2-Tetrachloroethane	---
96-12-8	1,2-Dibromo-3-chloropropane	---
96-18-4	1,2,3-Trichloropropane	---
110-57-6	trans-1,4-Dichloro-2-butene	---
108-67-8	1,3,5-Trimethylbenzene	---
95-63-6	1,2,4-Trimethylbenzene	---
87-68-3	Hexachlorobutadiene	---
106-93-4	Ethylene Dibromide	---
74-97-5	Bromochloromethane	---
594-20-7	2,2-Dichloropropane	---
142-28-9	1,3-Dichloropropane	---
98-82-8	Isopropylbenzene	---
103-65-1	n-Propylbenzene	---
108-86-1	Bromobenzene	---
95-49-8	2-Chlorotoluene	---
106-43-4	4-Chlorotoluene	---
98-06-6	tert-Butylbenzene	---
135-98-8	sec-Butylbenzene	---
99-87-6	4-Isopropyltoluene	---
104-51-8	n-Butylbenzene	---
120-82-1	1,2,4-Trichlorobenzene	---
91-20-3	Naphthalene	---
87-61-6	1,2,3-Trichlorobenzene	---

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	102%
d8-Toluene	99.6%
Bromofluorobenzene	102%
d4-1,2-Dichlorobenzene	100%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-10-6-10
MATRIX SPIKE

Lab Sample ID: CH43N-MS
LIMS ID: 00-19082
Matrix: Soil
Data Release Authorized:
Reported: 10/25/00

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/05/00
Date Received: 10/09/00

Instrument: FINN5
Date Analyzed: 10/17/00 20:07

Sample Amount: 32 **mg dry Wt**
Percent Moisture: 17.0%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	---
74-83-9	Bromomethane	---
75-01-4	Vinyl Chloride	---
75-00-3	Chloroethane	---
75-09-2	Methylene Chloride	---
67-64-1	Acetone	---
75-15-0	Carbon Disulfide	---
75-35-4	1,1-Dichloroethene	---
75-34-3	1,1-Dichloroethane	---
156-60-5	trans-1,2-Dichloroethene	---
156-59-2	cis-1,2-Dichloroethene	---
67-66-3	Chloroform	---
107-06-2	1,2-Dichloroethane	---
78-93-3	2-Butanone	---
71-55-6	1,1,1-Trichloroethane	---
56-23-5	Carbon Tetrachloride	---
108-05-4	Vinyl Acetate	---
75-27-4	Bromodichloromethane	---
78-87-5	1,2-Dichloropropane	---
10061-01-5	cis-1,3-Dichloropropene	---
79-01-6	Trichloroethene	---
124-48-1	Dibromochloromethane	---
79-00-5	1,1,2-Trichloroethane	---
71-43-2	Benzene	---
10061-02-6	trans-1,3-Dichloropropene	---
110-75-8	2-Chloroethylvinylether	---
75-25-2	Bromoform	---
108-10-1	4-Methyl-2-Pentanone (MIBK)	---
591-78-6	2-Hexanone	---
127-18-4	Tetrachloroethene	---
79-34-5	1,1,2,2-Tetrachloroethane	---
108-88-3	Toluene	---
108-90-7	Chlorobenzene	---
100-41-4	Ethylbenzene	---
100-42-5	Styrene	---
75-69-4	Trichlorofluoromethane	---
76-13-1	1,1,2-Trichlorotrifluoroethane	---
1330-20-7	m,p-Xylene	---

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-10-6-10

Lab Sample ID: CH43N
LIMS ID: 00-19082
Matrix: Soil
Data Release Authorized:
Reported: 10/25/00

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/05/00
Date Received: 10/09/00

Instrument: FINN5
Date Analyzed: 10/19/00 13:26

Sample Amount: 32 mg dry Wt
Percent Moisture: 17.0%

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	150 U
95-50-1	1,2-Dichlorobenzene	150 U
541-73-1	1,3-Dichlorobenzene	150 U
106-46-7	1,4-Dichlorobenzene	150 U
107-02-8	Acrolein	7,700 U
74-88-4	Methyl Iodide	150 U
74-96-4	Bromoethane	310 U
107-13-1	Acrylonitrile	770 U
563-58-6	1,1-Dichloropropene	150 U
74-95-3	Dibromomethane	150 U
630-20-6	1,1,1,2-Tetrachloroethane	150 U
96-12-8	1,2-Dibromo-3-chloropropane	770 U
96-18-4	1,2,3-Trichloropropane	310 U
110-57-6	trans-1,4-Dichloro-2-butene	770 U
108-67-8	1,3,5-Trimethylbenzene	150 U
95-63-6	1,2,4-Trimethylbenzene	150 U
87-68-3	Hexachlorobutadiene	770 U
106-93-4	Ethylene Dibromide	150 U
74-97-5	Bromochloromethane	150 U
594-20-7	2,2-Dichloropropane	150 U
142-28-9	1,3-Dichloropropane	150 U
98-82-8	Isopropylbenzene	150 U
103-65-1	n-Propylbenzene	150 U
108-86-1	Bromobenzene	150 U
95-49-8	2-Chlorotoluene	150 U
106-43-4	4-Chlorotoluene	150 U
98-06-6	tert-Butylbenzene	150 U
135-98-8	sec-Butylbenzene	150 U
99-87-6	4-Isopropyltoluene	150 U
104-51-8	n-Butylbenzene	310 U
120-82-1	1,2,4-Trichlorobenzene	770 U
91-20-3	Naphthalene	770 U
87-61-6	1,2,3-Trichlorobenzene	770 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	106%
d8-Toluene	102%
Bromofluorobenzene	104%
d4-1,2-Dichlorobenzene	102%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-10-6-10

Lab Sample ID: CH43N
LIMS ID: 00-19082
Matrix: Soil
Data Release Authorized:
Reported: 10/25/00

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/05/00
Date Received: 10/09/00

Instrument: FINN5
Date Analyzed: 10/19/00 13:26

Sample Amount: 32 mg dry Wt
Percent Moisture: 17.0%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	150 U
74-83-9	Bromomethane	150 U
75-01-4	Vinyl Chloride	150 U
75-00-3	Chloroethane	150 U
75-09-2	Methylene Chloride	460 U
67-64-1	Acetone	770 U
75-15-0	Carbon Disulfide	150 U
75-35-4	1,1-Dichloroethene	150 U
75-34-3	1,1-Dichloroethane	150 U
156-60-5	trans-1,2-Dichloroethene	150 U
156-59-2	cis-1,2-Dichloroethene	150 U
67-66-3	Chloroform	150 U
107-06-2	1,2-Dichloroethane	150 U
78-93-3	2-Butanone	770 U
71-55-6	1,1,1-Trichloroethane	150 U
56-23-5	Carbon Tetrachloride	150 U
108-05-4	Vinyl Acetate	770 U
75-27-4	Bromodichloromethane	150 U
78-87-5	1,2-Dichloropropane	150 U
10061-01-5	cis-1,3-Dichloropropene	150 U
79-01-6	Trichloroethene	150 U
124-48-1	Dibromochloromethane	150 U
79-00-5	1,1,2-Trichloroethane	150 U
71-43-2	Benzene	150 U
10061-02-6	trans-1,3-Dichloropropene	150 U
110-75-8	2-Chloroethylvinylether	770 U
75-25-2	Bromoform	150 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	770 U
591-78-6	2-Hexanone	770 U
127-18-4	Tetrachloroethene	150 U
79-34-5	1,1,2,2-Tetrachloroethane	150 U
108-88-3	**Toluene**	**1,800**
108-90-7	Chlorobenzene	150 U
100-41-4	Ethylbenzene	150 U
100-42-5	Styrene	150 U
75-69-4	Trichlorofluoromethane	150 U
76-13-1	1,1,2-Trichlorotrifluoroethane	150 U
1330-20-7	m,p-Xylene	150 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-9-4-6

Lab Sample ID: CH43K
LIMS ID: 00-19079
Matrix: Soil
Data Release Authorized:
Reported: 10/25/00

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/04/00
Date Received: 10/09/00

Instrument: FINN5
Date Analyzed: 10/19/00 13:52

Sample Amount: 0.72 g dry Wt
Percent Moisture: 23.6%

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	7.0 U
95-50-1	1,2-Dichlorobenzene	7.0 U
541-73-1	1,3-Dichlorobenzene	7.0 U
106-46-7	1,4-Dichlorobenzene	7.0 U
107-02-8	Acrolein	350 U
74-88-4	Methyl Iodide	7.0 U
74-96-4	Bromoethane	14 U
107-13-1	Acrylonitrile	35 U
563-58-6	1,1-Dichloropropene	7.0 U
74-95-3	Dibromomethane	7.0 U
630-20-6	1,1,1,2-Tetrachloroethane	7.0 U
96-12-8	1,2-Dibromo-3-chloropropane	35 U
96-18-4	1,2,3-Trichloropropane	14 U
110-57-6	trans-1,4-Dichloro-2-butene	35 U
108-67-8	**1,3,5-Trimethylbenzene**	**6.9 J**
95-63-6	**1,2,4-Trimethylbenzene**	**6.8 J**
87-68-3	Hexachlorobutadiene	35 U
106-93-4	Ethylene Dibromide	7.0 U
74-97-5	Bromochloromethane	7.0 U
594-20-7	2,2-Dichloropropane	7.0 U
142-28-9	1,3-Dichloropropane	7.0 U
98-82-8	Isopropylbenzene	7.0 U
103-65-1	**n-Propylbenzene**	**4.0 JM**
108-86-1	Bromobenzene	7.0 U
95-49-8	2-Chlorotoluene	7.0 U
106-43-4	4-Chlorotoluene	7.0 U
98-06-6	**tert-Butylbenzene**	**4.2 J**
135-98-8	**sec-Butylbenzene**	**6.7 J**
99-87-6	4-Isopropyltoluene	7.0 U
104-51-8	n-Butylbenzene	14 U
120-82-1	1,2,4-Trichlorobenzene	35 U
91-20-3	Naphthalene	35 U
87-61-6	1,2,3-Trichlorobenzene	35 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	110%
d8-Toluene	99.7%
Bromofluorobenzene	101%
d4-1,2-Dichlorobenzene	103%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-9-4-6

Lab Sample ID: CH43K
LIMS ID: 00-19079
Matrix: Soil
Data Release Authorized:
Reported: 10/25/00

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/04/00
Date Received: 10/09/00

Instrument: FINN5
Date Analyzed: 10/19/00 13:52

Sample Amount: 0.72 g dry Wt
Percent Moisture: 23.6%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	7.0 U
74-83-9	Bromomethane	7.0 U
75-01-4	Vinyl Chloride	7.0 U
75-00-3	Chloroethane	7.0 U
75-09-2	Methylene Chloride	21 U
67-64-1	Acetone	35 U
75-15-0	**Carbon Disulfide**	**8.9**
75-35-4	1,1-Dichloroethene	7.0 U
75-34-3	1,1-Dichloroethane	7.0 U
156-60-5	trans-1,2-Dichloroethene	7.0 U
156-59-2	cis-1,2-Dichloroethene	7.0 U
67-66-3	Chloroform	7.0 U
107-06-2	1,2-Dichloroethane	7.0 U
78-93-3	2-Butanone	35 U
71-55-6	1,1,1-Trichloroethane	7.0 U
56-23-5	Carbon Tetrachloride	7.0 U
108-05-4	Vinyl Acetate	35 U
75-27-4	Bromodichloromethane	7.0 U
78-87-5	1,2-Dichloropropane	7.0 U
10061-01-5	cis-1,3-Dichloropropene	7.0 U
79-01-6	Trichloroethene	7.0 U
124-48-1	Dibromochloromethane	7.0 U
79-00-5	1,1,2-Trichloroethane	7.0 U
71-43-2	Benzene	7.0 U
10061-02-6	trans-1,3-Dichloropropene	7.0 U
110-75-8	2-Chloroethylvinylether	35 U
75-25-2	Bromoform	7.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	35 U
591-78-6	2-Hexanone	35 U
127-18-4	Tetrachloroethene	7.0 U
79-34-5	1,1,2,2-Tetrachloroethane	7.0 U
108-88-3	**Toluene**	**130**
108-90-7	Chlorobenzene	7.0 U
100-41-4	Ethylbenzene	7.0 U
100-42-5	Styrene	7.0 U
75-69-4	Trichlorofluoromethane	7.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	7.0 U
1330-20-7	**m,p-Xylene**	12 J

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-9-0-1

Lab Sample ID: CH43I
LIMS ID: 00-19077
Matrix: Soil
Data Release Authorized:
Reported: 10/25/00

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/04/00
Date Received: 10/09/00

Instrument: FINN5
Date Analyzed: 10/17/00 18:48

Sample Amount: 36 mg dry Wt
Percent Moisture: 12.6%

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	140 U
95-50-1	1,2-Dichlorobenzene	140 U
541-73-1	1,3-Dichlorobenzene	140 U
106-46-7	1,4-Dichlorobenzene	140 U
107-02-8	Acrolein	7,000 U
74-88-4	Methyl Iodide	140 U
74-96-4	Bromoethane	280 U
107-13-1	Acrylonitrile	700 U
563-58-6	1,1-Dichloropropene	140 U
74-95-3	Dibromomethane	140 U
630-20-6	1,1,1,2-Tetrachloroethane	140 U
96-12-8	1,2-Dibromo-3-chloropropane	700 U
96-18-4	1,2,3-Trichloropropane	280 U
110-57-6	trans-1,4-Dichloro-2-butene	700 U
108-67-8	**1,3,5-Trimethylbenzene**	**490**
95-63-6	**1,2,4-Trimethylbenzene**	**220**
87-68-3	Hexachlorobutadiene	700 U
106-93-4	Ethylene Dibromide	140 U
74-97-5	Bromochloromethane	140 U
594-20-7	2,2-Dichloropropane	140 U
142-28-9	1,3-Dichloropropane	140 U
98-82-8	Isopropylbenzene	140 U
103-65-1	n-Propylbenzene	140 U
108-86-1	Bromobenzene	140 U
95-49-8	2-Chlorotoluene	140 U
106-43-4	4-Chlorotoluene	140 U
98-06-6	tert-Butylbenzene	140 U
135-98-8	sec-Butylbenzene	140 U
99-87-6	**4-Isopropyltoluene**	**74 J**
104-51-8	n-Butylbenzene	280 U
120-82-1	1,2,4-Trichlorobenzene	700 U
91-20-3	**Naphthalene**	**710**
87-61-6	1,2,3-Trichlorobenzene	700 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	106%
d8-Toluene	98.8%
Bromofluorobenzene	103%
d4-1,2-Dichlorobenzene	100%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-9-0-1

Lab Sample ID: CH43T
LIMS ID: 00-19077
Matrix: Soil
Data Release Authorized:
Reported: 10/25/00

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/04/00
Date Received: 10/09/00

Instrument: FINN5
Date Analyzed: 10/17/00 18:48

Sample Amount: 36 **mg dry Wt**
Percent Moisture: 12.6%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	140 U
74-83-9	Bromomethane	140 U
75-01-4	Vinyl Chloride	140 U
75-00-3	Chloroethane	140 U
75-09-2	Methylene Chloride	420 U
67-64-1	Acetone	700 U
75-15-0	Carbon Disulfide	140 U
75-35-4	1,1-Dichloroethene	140 U
75-34-3	1,1-Dichloroethane	140 U
156-60-5	trans-1,2-Dichloroethene	140 U
156-59-2	cis-1,2-Dichloroethene	140 U
67-66-3	Chloroform	140 U
107-06-2	1,2-Dichloroethane	140 U
78-93-3	2-Butanone	700 U
71-55-6	1,1,1-Trichloroethane	140 U
56-23-5	Carbon Tetrachloride	140 U
108-05-4	Vinyl Acetate	700 U
75-27-4	Bromodichloromethane	140 U
78-87-5	1,2-Dichloropropane	140 U
10061-01-5	cis-1,3-Dichloropropene	140 U
79-01-6	Trichloroethene	140 U
124-48-1	Dibromochloromethane	140 U
79-00-5	1,1,2-Trichloroethane	140 U
71-43-2	Benzene	140 U
10061-02-6	trans-1,3-Dichloropropene	140 U
110-75-8	2-Chloroethylvinylether	700 U
75-25-2	Bromoform	140 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	700 U
591-78-6	2-Hexanone	700 U
127-18-4	Tetrachloroethene	140 U
79-34-5	1,1,2,2-Tetrachloroethane	140 U
108-88-3	**Toluene**	**98 J**
108-90-7	Chlorobenzene	140 U
100-41-4	Ethylbenzene	140 U
100-42-5	Styrene	140 U
75-69-4	Trichlorofluoromethane	140 U
76-13-1	1,1,2-Trichlorotrifluoroethane	140 U
1330-20-7	m,p-Xylene	140 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-5-6-10

Lab Sample ID: CH43C
LIMS ID: 00-19071
Matrix: Soil
Data Release Authorized:
Reported: 10/25/00

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/04/00
Date Received: 10/09/00

Instrument: FINN5
Date Analyzed: 10/19/00 12:54

Sample Amount: **21 mg dry Wt**
Percent Moisture: 48.0%

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	230 U
95-50-1	1,2-Dichlorobenzene	230 U
541-73-1	1,3-Dichlorobenzene	230 U
106-46-7	1,4-Dichlorobenzene	230 U
107-02-8	Acrolein	12,000 U
74-88-4	Methyl Iodide	230 U
74-96-4	Bromoethane	470 U
107-13-1	Acrylonitrile	1,200 U
563-58-6	1,1-Dichloropropene	230 U
74-95-3	Dibromomethane	230 U
630-20-6	1,1,1,2-Tetrachloroethane	230 U
96-12-8	1,2-Dibromo-3-chloropropane	1,200 U
96-18-4	1,2,3-Trichloropropane	470 U
110-57-6	trans-1,4-Dichloro-2-butene	1,200 U
108-67-8	**1,3,5-Trimethylbenzene**	**360**
95-63-6	**1,2,4-Trimethylbenzene**	**660**
87-68-3	Hexachlorobutadiene	1,200 U
106-93-4	Ethylene Dibromide	230 U
74-97-5	Bromochloromethane	230 U
594-20-7	2,2-Dichloropropane	230 U
142-28-9	1,3-Dichloropropane	230 U
98-82-8	Isopropylbenzene	230 U
103-65-1	n-Propylbenzene	230 U
108-86-1	Bromobenzene	230 U
95-49-8	2-Chlorotoluene	230 U
106-43-4	4-Chlorotoluene	230 U
98-06-6	tert-Butylbenzene	230 U
135-98-8	sec-Butylbenzene	230 U
99-87-6	**4-Isopropyltoluene**	**750**
104-51-8	n-Butylbenzene	470 U
120-82-1	1,2,4-Trichlorobenzene	1,200 U
91-20-3	**Naphthalene**	**26,000**
87-61-6	1,2,3-Trichlorobenzene	1,200 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	104%
d8-Toluene	102%
Bromofluorobenzene	103%
d4-1,2-Dichlorobenzene	103%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-5-6-10

Lab Sample ID: CH43C
LIMS ID: 00-19071
Matrix: Soil
Data Release Authorized:
Reported: 10/25/00

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/04/00
Date Received: 10/09/00

Instrument: FINN5
Date Analyzed: 10/19/00 12:54

Sample Amount: 21 mg dry Wt
Percent Moisture: 48.0%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	230 U
74-83-9	Bromomethane	230 U
75-01-4	Vinyl Chloride	230 U
75-00-3	Chloroethane	230 U
75-09-2	Methylene Chloride	700 U
67-64-1	Acetone	1,200 U
75-15-0	Carbon Disulfide	230 U
75-35-4	1,1-Dichloroethene	230 U
75-34-3	1,1-Dichloroethane	230 U
156-60-5	trans-1,2-Dichloroethene	230 U
156-59-2	cis-1,2-Dichloroethene	230 U
67-66-3	Chloroform	230 U
107-06-2	1,2-Dichloroethane	230 U
78-93-3	2-Butanone	1,200 U
71-55-6	1,1,1-Trichloroethane	230 U
56-23-5	Carbon Tetrachloride	230 U
108-05-4	Vinyl Acetate	1,200 U
75-27-4	Bromodichloromethane	230 U
78-87-5	1,2-Dichloropropane	230 U
10061-01-5	cis-1,3-Dichloropropene	230 U
79-01-6	Trichloroethene	230 U
124-48-1	Dibromochloromethane	230 U
79-00-5	1,1,2-Trichloroethane	230 U
71-43-2	Benzene	230 U
10061-02-6	trans-1,3-Dichloropropene	230 U
110-75-8	2-Chloroethylvinylether	1,200 U
75-25-2	Bromoform	230 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	1,200 U
591-78-6	2-Hexanone	1,200 U
127-18-4	Tetrachloroethene	230 U
79-34-5	1,1,2,2-Tetrachloroethane	230 U
108-88-3	**Toluene**	**1,200**
108-90-7	Chlorobenzene	230 U
100-41-4	Ethylbenzene	230 U
100-42-5	Styrene	230 U
75-69-4	Trichlorofluoromethane	230 U
76-13-1	1,1,2-Trichlorotrifluoroethane	230 U
1330-20-7	m,p-Xylene	230 U

ANALYTICAL RESOURCES INCORPORATED

SOIL VOLATILE SYSTEM MONITORING COMPOUND SUMMARY

Matrix: Soil

QC Report No: CH43

Lab ID	Client ID	DCE	TOL	BFB	DCB	TOT OUT
CH43C	TP-5-6-10	104%	102%	103%	103%	0
MB	Method Blank	106%	103%	103%	102%	0
CH43I	TP-9-0-1	106%	99%	103%	100%	0
CH43LCS	Lab Cntrl Sample	103%	101%	104%	102%	0
101900MB	Method Blank	112%	99%	104%	102%	0
CH43K	TP-9-4-6	110%	100%	101%	103%	0
CH43LCS	Lab Cntrl Sample	103%	101%	104%	102%	0
MB	Method Blank	101%	99%	97%	100%	0
CH43N	TP-10-6-10	106%	102%	104%	102%	0
CH43N-MS	TP-10-6-10	102%	100%	102%	100%	0
CH43N-MSD	TP-10-6-10	104%	102%	103%	101%	0
CH43LCS	Lab Cntrl Sample	99%	99%	102%	99%	0

		LCS/MB LIMITS	QC LIMITS
(DCE)	= 1,2-Dichloroethane-d4	(70-130)	(70-130)
(TOL)	= Toluene-d8	(70-130)	(70-130)
(BFB)	= Bromofluorobenzene	(70-130)	(70-130)
(DCB)	= 1,2-Dichlorobenzene-d4	(70-130)	(70-130)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D System Monitoring Compound diluted out

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-7-0-1

Lab Sample ID: CH43F
LIMS ID: 00-19074
Matrix: Soil

Data Release Authorized: CH
Reported: 10/23/00 [illegible]

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/04/00
Date Received: 10/09/00

Date extracted: 10/14/00
Date analyzed: 10/19/00 16:54
Instrument ID: ECD1
Sample Amount: 10.7 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.5

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:10
Percent Moisture: 10.5%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	370 U
53469-21-9	Aroclor 1242	370 U
12672-29-6	**Aroclor 1248**	**4,300**
11097-69-1	**Aroclor 1254**	**7,700**
11096-82-5	**Aroclor 1260**	**2,700**
11104-28-2	Aroclor 1221	740 U
11141-16-5	Aroclor 1232	370 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	NR
Tetrachlorometaxylene	77.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-9-0-1

Lab Sample ID: CH43I
LIMS ID: 00-19077
Matrix: Soil

Data Release Authorized: CLR
Reported: 10/23/00 10/23/00

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/04/00
Date Received: 10/09/00

Date extracted: 10/14/00
Date analyzed: 10/19/00 17:22
Instrument ID: ECD1
Sample Amount: 9.89 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.2

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 17.9%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	40 U
53469-21-9	**Aroclor 1242**	**530**
12672-29-6	Aroclor 1248	40 U
11097-69-1	**Aroclor 1254**	**870**
11096-82-5	**Aroclor 1260**	**1,100**
11104-28-2	Aroclor 1221	81 U
11141-16-5	Aroclor 1232	40 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	97.2%
Tetrachlorometaxylene	53.8%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-11-0-1

Lab Sample ID: CH43O
LIMS ID: 00-19083
Matrix: Soil

Data Release Authorized:
Reported: 10/23/00

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/05/00
Date Received: 10/09/00

Date extracted: 10/14/00
Date analyzed: 10/19/00 17:51
Instrument ID: ECD1
Sample Amount: 10.9 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.5

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 8.9 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	36 U
53469-21-9	Aroclor 1242	36 U
12672-29-6	**Aroclor 1248**	**520**
11097-69-1	Aroclor 1254	1,500 Y
11096-82-5	**Aroclor 1260**	**1,100**
11104-28-2	Aroclor 1221	73 U
11141-16-5	Aroclor 1232	36 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	NR
Tetrachlorometaxylene	88.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-13-0-1

Lab Sample ID: CH43R
LIMS ID: 00-19086
Matrix: Soil

Data Release Authorized: CH
Reported: 10/23/00

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/05/00
Date Received: 10/09/00

Date extracted: 10/14/00
Date analyzed: 10/20/00 06:25
Instrument ID: ECD1
Sample Amount: 11.6 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.6

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 3.1 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	34 U
53469-21-9	Aroclor 1242	34 U
12672-29-6	Aroclor 1248	34 U
11097-69-1	**Aroclor 1254**	**1,000**
11096-82-5	**Aroclor 1260**	**1,900 E**
11104-28-2	Aroclor 1221	69 U
11141-16-5	Aroclor 1232	34 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	92.2%
Tetrachlorometaxylene	81.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-13-0-1
DILUTION

Lab Sample ID: CH43RDL
LIMS ID: 00-19086
Matrix: Soil

Data Release Authorized: CH
Reported: 10/23/00 10/23/00

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/05/00
Date Received: 10/09/00

Date extracted: 10/14/00
Date analyzed: 10/20/00 13:28
Instrument ID: ECD1
Sample Amount: 11.6 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.6

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:2
Percent Moisture: 3.1 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	69 U
53469-21-9	Aroclor 1242	69 U
12672-29-6	Aroclor 1248	69 U
11097-69-1	**Aroclor 1254**	**1,000**
11096-82-5	**Aroclor 1260**	**2,000**
11104-28-2	Aroclor 1221	140 U
11141-16-5	Aroclor 1232	69 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	97.5%
Tetrachlorometaxylene	72.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Lab Sample ID: CH43
LIMS ID: 00-19069
Matrix: Soil

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized: CH
Reported: 10/23/00 10/23/00

LABORATORY CONTROL SAMPLE SPIKE RECOVERY
Date extracted: 10/14/00

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	337	333	101%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	111%
Tetrachlorometaxylene	112%

Values Reported in Total ug/kg Dry Weight

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-6-0-1**
TOTAL METALS

Lab Sample ID: CH43D
LIMS ID: 00-19072
Matrix: Soil

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/04/00
Date Received: 10/09/00

Data Release Authorized:
Reported: 11/02/00

Percent Total Solids: 89.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/20/00	6010	10/30/00	7440-38-2	Arsenic	10	30
3050	10/20/00	6010	10/30/00	7440-39-3	Barium	0.7	196
3050	10/20/00	6010	10/30/00	7440-43-9	Cadmium	0.4	5.6
3050	10/20/00	6010	10/30/00	7440-47-3	Chromium	1	92
3050	10/20/00	6010	10/30/00	7440-50-8	Copper	0.4	711
3050	10/20/00	6010	10/30/00	7439-92-1	Lead	4	1,550
CLP	10/20/00	7471	10/24/00	7439-97-6	Mercury	0.04	0.50
3050	10/20/00	6010	10/30/00	7782-49-2	Selenium	10	20
3050	10/20/00	6010	10/30/00	7440-22-4	Silver	0.7	1.9

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-5-6-10**
TOTAL METALS

Lab Sample ID: CH43C
LIMS ID: 00-19071
Matrix: Soil

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/04/00
Date Received: 10/09/00

Data Release Authorized:
Reported: 11/02/00

Percent Total Solids: 36.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/20/00	6010	10/29/00	7440-38-2	Arsenic	10	10 U
3050	10/20/00	6010	10/29/00	**7440-39-3**	**Barium**	0.8	**52.3**
3050	10/20/00	6010	10/29/00	7440-43-9	Cadmium	0.5	0.5 U
3050	10/20/00	6010	10/29/00	**7440-47-3**	**Chromium**	1	**24**
3050	10/20/00	6010	10/29/00	**7440-50-8**	**Copper**	0.5	**56.1**
3050	10/20/00	6010	10/29/00	**7439-92-1**	**Lead**	5	**248**
CLP	10/20/00	7471	10/24/00	**7439-97-6**	**Mercury**	0.1	**0.3**
3050	10/20/00	6010	10/29/00	7782-49-2	Selenium	10	10 U
3050	10/20/00	6010	10/29/00	7440-22-4	Silver	0.8	0.8 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-5-4-6**
TOTAL METALS

Lab Sample ID: CH43B
LIMS ID: 00-19070
Matrix: Soil

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/04/00
Date Received: 10/09/00

Data Release Authorized
Reported: 11/02/00

Percent Total Solids: 76.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/20/00	6010	10/29/00	7440-38-2	Arsenic	6	6 U
3050	10/20/00	6010	10/29/00	**7440-39-3**	**Barium**	0.4	**67.7**
3050	10/20/00	6010	10/29/00	7440-43-9	Cadmium	0.3	0.3 U
3050	10/20/00	6010	10/29/00	**7440-47-3**	**Chromium**	0.6	**38.2**
3050	10/20/00	6010	10/29/00	**7440-50-8**	**Copper**	0.3	**37.3**
3050	10/20/00	6010	10/29/00	**7439-92-1**	**Lead**	3	**56**
CLP	10/20/00	7471	10/24/00	**7439-97-6**	**Mercury**	0.05	**0.20**
3050	10/20/00	6010	10/29/00	7782-49-2	Selenium	6	6 U
3050	10/20/00	6010	10/29/00	7440-22-4	Silver	0.4	0.4 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-5-01**
TOTAL METALS

Lab Sample ID: CH43A
LIMS ID: 00-19069
Matrix: Soil

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/04/00
Date Received: 10/09/00

Data Release Authorized:
Reported: 11/02/00

Percent Total Solids: 89.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/20/00	6010	10/29/00	7440-38-2	Arsenic	5	5 U
3050	10/20/00	6010	10/29/00	7440-39-3	Barium	0.3	59.4
3050	10/20/00	6010	10/29/00	7440-43-9	Cadmium	0.2	0.2 U
3050	10/20/00	6010	10/29/00	7440-47-3	Chromium	0.5	59.9
3050	10/20/00	6010	10/29/00	7440-50-8	Copper	0.2	28.0
3050	10/20/00	6010	10/29/00	7439-92-1	Lead	2	8
CLP	10/20/00	7471	10/24/00	7439-97-6	Mercury	0.05	0.05 U
3050	10/20/00	6010	10/29/00	7782-49-2	Selenium	5	5
3050	10/20/00	6010	10/29/00	7440-22-4	Silver	0.3	0.4

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL HYDROCARBONS COMPOUND SUMMARY

Matrix: Soil

QC Report No: CH43

LIMS ID	Lab ID	Extracted	Client ID	MeArach	TOT OUT
00-20186	CH43Q	10/25/00	TP-12-0-1RE	75%	0
00-20186	CH43Q-MS	10/24/00	TP-12-0-1RE-MS	77%	0
00-20186	CH43Q-MSD	10/24/00	TP-12-0-1RE-MSD	76%	0

	Control QC LIMITS	Sample QC LIMITS
(MeArach) = Methylarachidate	(56-114)	(42-113)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D System Monitoring Compound diluted out

FORM-II TPHD

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL HYDROCARBONS COMPOUND SUMMARY

Matrix: Soil

QC Report No: CH43

LIMS ID	Lab ID	Extracted	Client ID	MeArach	TOT OUT
00-19069MB	102100MB	10/12/00	Method Blank	122%*	1
00-19069LC	102100LC	10/12/00	Lab Control	112%	0
00-19069	CH43A	10/12/00	TP-5-01	110%	0
00-19070	CH43B	10/12/00	TP-5-4-6	NR	0
00-19071	CH43C	10/12/00	TP-5-6-10	100%	0
00-19072	CH43D	10/12/00	TP-6-0-1	76%	0
00-19073	CH43E	10/12/00	TP-600-0-1	84%	0
00-19074	CH43F	10/12/00	TP-7-0-1	110%	0
00-19075	CH43G	10/12/00	TP-8-0-1	65%	0
00-19076	CH43H	10/12/00	TP-8-4-6	80%	0
00-19077	CH43I	10/12/00	TP-9-0-1	D	0
00-19078	CH43J	10/12/00	TP-800-4-6	75%	0
00-19079	CH43K	10/12/00	TP-9-4-6	68%	0
00-19080MB	102700MB	10/24/00	Method Blank	88%	0
00-19080LC	102700LC	10/24/00	Lab Control	78%	0
00-19080	CH43L	10/12/00	TP-10-0-1	79%	0
00-19080	CH43L-RE	10/26/00	TP-10-0-1-RE	78%	0
00-19081	CH43M	10/12/00	TP-10-4-6	50%	0
00-19082	CH43N	10/12/00	TP-10-6-10	D	0
00-19083	CH43O	10/12/00	TP-11-0-1	D	0
00-19084	CH43P	10/12/00	TP-11-6-10	D	0
00-19085	CH43Q	10/12/00	TP-12-0-1	48%	0
00-19085	CH43Q-MS	10/12/00	TP-12-0-1-MS	56%	0
00-19085	CH43Q-MSD	10/12/00	TP-12-0-1-MSD	59%	0
00-19086	CH43R	10/12/00	TP-13-0-1	44%	0
00-19086	CH43R-DP	10/12/00	TP-13-0-1-DP	45%	0
00-19087	CH43S	10/12/00	TP-14-0-1	37%*	1
00-19087	CH43S-DP	10/12/00	TP-14-0-1-DP	27%*	1
00-19088	CH43T	10/12/00	TP-14-6-10	80%	0
00-20186MB	102500MB	10/26/00	Method Blank	86%	0
00-20186LC	102500LC	10/26/00	Lab Control	81%	0

	Control QC LIMITS	Sample QC LIMITS
(MeArach) = Methylarachidate	(56-114)	(42-113)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D System Monitoring Compound diluted out

FORM-II TPHD

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CH43SB
LIMS ID: 00-20186
Matrix: Soil

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
966098.00

Data Release Authorized:
Reported: 10/30/00 CR 10/30/00

LABORATORY CONTROL SAMPLE RECOVERY REPORT
Date extracted: 10/26/00
Date analyzed: 10/25/00

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
Diesel Range Hydrocarbons	111	100	111%

TPHd Surrogate Recovery

Methylarachidate 81.0%

Values reported in ppm (mg/kg) on a dry weight basis.

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CH43SB
LIMS ID: 00-19080
Matrix: Soil

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 10/30/00 CL 10/30/00

LABORATORY CONTROL SAMPLE RECOVERY REPORT
Date extracted: 10/24/00
Date analyzed: 10/27/00

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
Diesel Range Hydrocarbons	88.4	100	88.4%

TPHd Surrogate Recovery

Methylarachidate 78.0%

Values reported in ppm (mg/kg) on a dry weight basis

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-12-0-1
Lab Sample ID: CH43Q
QC Report No: CH43-Kennedy Jenks Consultants
LIMS ID: 00-20186
Project: Tacoma Metals
Matrix: Soil
966098.00
Date Received: 10/09/00

Data Release Authorized:
Reported: 10/30/00 CR 10/30/00

MATRIX SPIKE/SPIKE DUPLICATE RECOVERY

Date extracted: 10/24/00
Date analyzed: 10/25/00

CONSTITUENT	SAMPLE VALUE	SPIKE VALUE	SPIKE ADDED	% RECOVERY	RPD
MATRIX SPIKE					
Diesel Range Hydrocarbons	16.6	125	104	104%	
MATRIX SPIKE DUPLICATE					
Diesel Range Hydrocarbons	16.6	109	104	88.8%	16.0%

TPHd Surrogate Recovery

Matrix Spike	Methylarachidate	77.0%
Matrix Spike Dup	Methylarachidate	76.0%

Values reported in ppm (mg/kg) on a dry weight basis.

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CH43SB
LIMS ID: 00-19069
Matrix: Soil

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 10/30/00 CR 10/30/00

LABORATORY CONTROL SAMPLE RECOVERY REPORT
Date extracted: 10/12/00
Date analyzed: 10/21/00

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
Diesel Range Hydrocarbons	105	100	105%

TPHd Surrogate Recovery

Methylarachidate 112%

Values reported in ppm (mg/kg) on a dry weight basis.

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-12-0-1
Lab Sample ID: CH43Q
QC Report No: CH43-Kennedy Jenks Consultants
LIMS ID: 00-19085
Project: Tacoma Metals
Matrix: Soil
996098.00
Date Received: 10/09/00
Data Release Authorized:
Reported: 10/30/00 CR 10/30/00

MATRIX SPIKE/SPIKE DUPLICATE RECOVERY

Date extracted: 10/12/00
Date analyzed: 10/20/00

CONSTITUENT	SAMPLE VALUE	SPIKE VALUE	SPIKE ADDED	% RECOVERY	RPD
MATRIX SPIKE					
Diesel Range Hydrocarbons	17.2	25.8	104	8.3%	
MATRIX SPIKE DUPLICATE					
Diesel Range Hydrocarbons	17.2	58.0	104	39.2%	130%

TPHd Surrogate Recovery

Matrix Spike	Methylarachidate	56.0%
Matrix Spike Dup	Methylarachidate	59.0%

Values reported in ppm (mg/kg) on a dry weight basis.

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID
and Motor Oil

LIMS ID: 00-19088
Matrix: Soil

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized: CR 10/30/00
Reported: 10/30/00

Date Received: 10/09/00

Lab ID	Sample ID	Date Extracted	Date Analyzed	Dilution Factor	Diesel Range	*HC ID	Motor Oil Range	Surrogate Recovery
CH43T	**TP-14-6-10**	10/12/00	10/21/00	1:1	**48**	NO	**110**	80.0%
CH43MB	Method Blank	10/26/00	10/25/00	1:1	5.0 U	---	10 U	86.0%
CH43Q	**TP-12-0-1RE**	10/25/00	10/25/00	1:1	**17**	NO	**21**	75.0%

Values reported in ppm (mg/kg) on a dry weight basis.

Surrogate is Methyl-Arachidate.

* ID indicates, in the opinion of the analyst, the petroleum product with the best pattern match. 'NO' indicates that there was not a good match for any of the requested products.
Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.

Data Qualifiers

U Compound not detected at the given detection limit.
J Indicates an estimated value below the calculated detection limit.
S No value reported due to saturation of the detector. Dilution required.
D Indicates the surrogate was not detected because of dilution of the extract.
E Indicates a value above the linear range of the detector. Dilution required.
NR Indicates no recovery due to matrix interference.
B Indicates compound also detected in the method blank.

FORM-1 TPHD

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID
and Motor Oil

LIMS ID: 00-19080
Matrix: Soil

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 10/30/00 CR 10/30/00

Date Received: 10/09/00

Lab ID	Sample ID	Date Extracted	Date Analyzed	Dilution Factor	Diesel Range	*HC ID	Motor Oil Range	Surrogate Recovery
CH43MB	Method Blank	10/24/00	10/27/00	1:1	5.0 U	---	10 U	88.0%
CH43L	TP-10-0-1	10/12/00	10/25/00	1:1	64	NO	260	79.0%
CH43LR	TP-10-0-1	10/26/00	10/27/00	1:1	48	NO	230	78.0%
CH43M	TP-10-4-6	10/12/00	10/20/00	1:5	440	NO	2,000	50.0%
CH43N	TP-10-6-10	10/12/00	10/21/00	1:40	1,400	M.OIL	8,700	D
CH43O	TP-11-0-1	10/12/00	10/20/00	1:5	800	NO	2,400	40.0%
CH43P	TP-11-6-10	10/12/00	10/21/00	1:20	3,900	NO	8,500	D
CH43Q	TP-12-0-1	10/12/00	10/20/00	1:1	17	NO	17	48.0%
CH43R	TP-13-0-1	10/12/00	10/20/00	1:1	27	NO	59	44.0%
CH43RD	TP-13-0-1-DUPL	10/12/00	10/20/00	1:1	31	NO	83	45.0%
CH43S	TP-14-0-1	10/12/00	10/20/00	1:1	5.2 U	NO	15	37.0%
CH43SD	TP-14-0-1-DUPL	10/12/00	10/25/00	1:1	5.2 U	NO	18	27.0%

Values reported in ppm (mg/kg) on a dry weight basis.

Surrogate is Methyl-Arachidate.

* ID indicates, in the opinion of the analyst, the petroleum product with the best pattern match. 'NO' indicates that there was not a good match for any of the requested products
Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.

Data Qualifiers

U	Compound not detected at the given detection limit.
J	Indicates an estimated value below the calculated detection limit.
S	No value reported due to saturation of the detector. Dilution required.
D	Indicates the surrogate was not detected because of dilution of the extract.
E	Indicates a value above the linear range of the detector. Dilution required.
NR	Indicates no recovery due to matrix interference.
B	Indicates compound also detected in the method blank

FORM-1 TPHD

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID
and Motor Oil

LIMS ID: 00-19069
Matrix: Soil

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized: CR 10/30/00
Reported: 10/30/00

Date Received: 10/09/00

Lab ID	Sample ID	Date Extracted	Date Analyzed	Dilution Factor	Diesel Range	*HC ID	Motor Oil Range	Surrogate Recovery
CH43MB	Method Blank	10/12/00	10/21/00	1:1	5.0 U	---	10 U	122%
CH43A	TP-5-01	10/12/00	10/21/00	1:1	18	NO	21	110%
CH43B	TP-5-4-6	10/12/00	10/21/00	1:10	2,000	NO	2,300	NR
CH43C	TP-5-6-10	10/12/00	10/20/00	1:10	23,000	NO	8,600	100%
CH43D	TP-6-0-1	10/12/00	10/20/00	1:1	160	NO	210	76.0%
CH43E	TP-600-0-1	10/12/00	10/20/00	1:1	190	NO	220	84.0%
CH43F	TP-7-0-1	10/12/00	10/20/00	1:5	330	NO	760	110%
CH43G	TP-8-0-1	10/12/00	10/20/00	1:5	440	NO	1,200	65.0%
CH43H	TP-8-4-6	10/12/00	10/20/00	1:1	32	NO	49	80.0%
CH43I	TP-9-0-1	10/12/00	10/20/00	1:20	1,900	NO	3,000	D
CH43J	TP-800-4-6	10/12/00	10/20/00	1:1	34	NO	70	75.0%
CH43K	TP-9-4-6	10/12/00	10/20/00	1:1	160	NO	250	68.0%

Values reported in ppm (mg/kg) on a dry weight basis.

Surrogate is Methyl-Arachidate.

* ID indicates, in the opinion of the analyst, the petroleum product with the best pattern match. 'NO' indicates that there was not a good match for any of the requested products.
Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.

Data Qualifiers

U	Compound not detected at the given detection limit.
J	Indicates an estimated value below the calculated detection limit.
S	No value reported due to saturation of the detector. Dilution required.
D	Indicates the surrogate was not detected because of dilution of the extract.
E	Indicates a value above the linear range of the detector. Dilution required
NR	Indicates no recovery due to matrix interference.
B	Indicates compound also detected in the method blank.

FORM-1 TPHD

ANALYTICAL RESOURCES INCORPORATED

SOIL AROCLOR SURROGATE SUMMARY

Matrix: Soil

QC Report No: CH43
Project: Tacoma Metals
996098.00

LIMS ID	Lab ID	Client ID	TCMX	#	DCBP	#	TOT OUT
00-19069MB	101400MB	Method Blank	91.2%		89.5%		0
00-19069SB	101400SB	Lab Control	112%	*	111%		1
00-19069	CH43A	TP-5-01	96.0%		105%		0
00-19074	CH43F	TP-7-0-1	77.5%		NR	*	1
00-19077	CH43I	TP-9-0-1	53.8%		97.2%		0
00-19083	CH43O	TP-11-0-1	88.0%		NR	*	1
00-19086	CH43R	TP-13-0-1	81.5%		92.2%		0
00-19086DL	CH43R	TP-13-0-1-DL	72.5%		97.5%		0

	QC LIMITS
(TCMX) = Tetrachloro-m-xylene	(53-109)
(DCBP) = Decachlorobiphenyl	(54-127)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D Surrogate Compound diluted out

FORM-II PCB

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: Method Blank

Lab Sample ID: CH43MB
LIMS ID: 00-19069
Matrix: Soil

Data Release Authorized: CM
Reported: 10/23/00 10/25/00

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Date extracted: 10/14/00
Date analyzed: 10/18/00 22:14
Instrument ID: ECD1
Sample Amount: 12.0 g-dry-wt
Final Ext Vol: 4.0 mL
pH: NA

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: NA

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	33 U
53469-21-9	Aroclor 1242	33 U
12672-29-6	Aroclor 1248	33 U
11097-69-1	Aroclor 1254	33 U
11096-82-5	Aroclor 1260	33 U
11104-28-2	Aroclor 1221	67 U
11141-16-5	Aroclor 1232	33 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	89.5%
Tetrachlorometaxylene	91.2%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: TP-600-0-1

Lab Sample ID: CH43E
LIMS ID: 00-19073
Matrix: Soil

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/04/00
Date Received: 10/09/00

Data Release Authorized
Reported: 11/02/00

Percent Total Solids: 88.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/20/00	6010	10/30/00	7440-38-2	Arsenic	10	30
3050	10/20/00	6010	10/30/00	7440-39-3	Barium	0.7	208
3050	10/20/00	6010	10/30/00	7440-43-9	Cadmium	0.4	4.9
3050	10/20/00	6010	10/30/00	7440-47-3	Chromium	1	59
3050	10/20/00	6010	10/30/00	7440-50-8	Copper	0.4	237
3050	10/20/00	6010	10/30/00	7439-92-1	Lead	4	867
CLP	10/20/00	7471	10/24/00	7439-97-6	Mercury	0.05	0.45
3050	10/20/00	6010	10/30/00	7782-49-2	Selenium	10	20
3050	10/20/00	6010	10/30/00	7440-22-4	Silver	0.7	2.1

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-7-0-1**
TOTAL METALS

Lab Sample ID: CH43F
LIMS ID: 00-19074
Matrix: Soil

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/04/00
Date Received: 10/09/00

Data Release Authorized:
Reported: 11/02/00

Percent Total Solids: 90.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/20/00	6010	10/29/00	7440-38-2	Arsenic	5	10
3050	10/20/00	6010	10/29/00	7440-39-3	Barium	0.3	697
3050	10/20/00	6010	10/29/00	7440-43-9	Cadmium	0.2	12.3
3050	10/20/00	6010	10/29/00	7440-47-3	Chromium	0.5	103
3050	10/20/00	6010	10/29/00	7440-50-8	Copper	0.2	361
3050	10/20/00	6010	10/29/00	7439-92-1	Lead	2	796
CLP	10/20/00	7471	10/24/00	7439-97-6	Mercury	0.04	0.88
3050	10/20/00	6010	10/29/00	7782-49-2	Selenium	5	8
3050	10/20/00	6010	10/29/00	7440-22-4	Silver	0.3	1.5

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET Sample No: TP-8-0-1
TOTAL METALS

Lab Sample ID: CH43G
LIMS ID: 00-19075
Matrix: Soil

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/04/00
Date Received: 10/09/00

Data Release Authorized:
Reported: 11/02/00

Percent Total Solids: 89.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/20/00	6010	10/29/00	7440-38-2	Arsenic	5	5 U
3050	10/20/00	6010	10/29/00	7440-39-3	Barium	0.3	235
3050	10/20/00	6010	10/29/00	7440-43-9	Cadmium	0.2	0.9
3050	10/20/00	6010	10/29/00	7440-47-3	Chromium	0.5	33.9
3050	10/20/00	6010	10/29/00	7440-50-8	Copper	0.2	41.0
3050	10/20/00	6010	10/29/00	7439-92-1	Lead	2	31
CLP	10/20/00	7471	10/24/00	7439-97-6	Mercury	0.05	0.05 U
3050	10/20/00	6010	10/29/00	7782-49-2	Selenium	5	5 U
3050	10/20/00	6010	10/29/00	7440-22-4	Silver	0.3	0.3

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-8-4-6**
TOTAL METALS

Lab Sample ID: CH43H
LIMS ID: 00-19076
Matrix: Soil

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/04/00
Date Received: 10/09/00

Data Release Authorized:
Reported: 11/02/00

Percent Total Solids: 80 1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/20/00	6010	10/29/00	7440-38-2	Arsenic	6	6 U
3050	10/20/00	6010	10/29/00	**7440-39-3**	**Barium**	0.4	**38.4**
3050	10/20/00	6010	10/29/00	**7440-43-9**	**Cadmium**	0.2	**0.3**
3050	10/20/00	6010	10/29/00	**7440-47-3**	**Chromium**	0.6	**17.5**
3050	10/20/00	6010	10/29/00	**7440-50-8**	**Copper**	0.2	**29.6**
3050	10/20/00	6010	10/29/00	**7439-92-1**	**Lead**	2	**25**
CLP	10/20/00	7471	10/24/00	7439-97-6	Mercury	0.06	0.06 U
3050	10/20/00	6010	10/29/00	7782-49-2	Selenium	6	6 U
3050	10/20/00	6010	10/29/00	7440-22-4	Silver	0.4	0.4 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-9-0-1**
TOTAL METALS

Lab Sample ID: CH43I
LIMS ID: 00-19077
Matrix: Soil

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/04/00
Date Received: 10/09/00

Data Release Authorized:
Reported: 11/02/00

Percent Total Solids: 82.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/20/00	6010	11/01/00	7440-38-2	Arsenic	30	40
3050	10/20/00	6010	11/01/00	7440-39-3	Barium	2	1,990
3050	10/20/00	6010	11/01/00	7440-43-9	Cadmium	1	59
3050	10/20/00	6010	11/01/00	7440-47-3	Chromium	3	132
3050	10/20/00	6010	11/01/00	7440-50-8	Copper	1	1,260
3050	10/20/00	6010	11/01/00	7439-92-1	Lead	10	1,960
CLP	10/20/00	7471	10/24/00	7439-97-6	Mercury	0.04	0.90
3050	10/20/00	6010	11/01/00	7782-49-2	Selenium	30	30 U
3050	10/20/00	6010	11/01/00	7440-22-4	Silver	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-800-4-6**
TOTAL METALS

Lab Sample ID: CH43J
LIMS ID: 00-19078
Matrix: Soil

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/04/00
Date Received: 10/09/00

Data Release Authorized:
Reported: 11/02/00

Percent Total Solids: 89.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/20/00	6010	10/29/00	7440-38-2	Arsenic	5	5 U
3050	10/20/00	6010	10/29/00	**7440-39-3**	**Barium**	0.3	**42.1**
3050	10/20/00	6010	10/29/00	7440-43-9	Cadmium	0.2	0.2 U
3050	10/20/00	6010	10/29/00	**7440-47-3**	**Chromium**	0.5	**15.7**
3050	10/20/00	6010	10/29/00	**7440-50-8**	**Copper**	0.2	**47.8**
3050	10/20/00	6010	10/29/00	**7439-92-1**	**Lead**	2	**26**
CLP	10/20/00	7471	10/24/00	7439-97-6	Mercury	0.05	0.05 U
3050	10/20/00	6010	10/29/00	7782-49-2	Selenium	5	5 U
3050	10/20/00	6010	10/29/00	**7440-22-4**	**Silver**	0.3	**0.7**

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-9-4-6**
TOTAL METALS

Lab Sample ID: CH43K
LIMS ID: 00-19079
Matrix: Soil

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/04/00
Date Received: 10/09/00

Data Release Authorized
Reported: 11/02/00

Percent Total Solids: 73 8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/20/00	6010	10/29/00	7440-38-2	Arsenic	6	6 U
3050	10/20/00	6010	10/29/00	**7440-39-3**	**Barium**	0.4	**224**
3050	10/20/00	6010	10/29/00	**7440-43-9**	**Cadmium**	0.3	**2.1**
3050	10/20/00	6010	10/29/00	**7440-47-3**	**Chromium**	0.6	**24.2**
3050	10/20/00	6010	10/29/00	**7440-50-8**	Copper	0.3	59.9
3050	10/20/00	6010	10/29/00	**7439-92-1**	**Lead**	3	93
CLP	10/20/00	7471	10/24/00	7439-97-6	Mercury	0.05	0.05 U
3050	10/20/00	6010	10/29/00	7782-49-2	Selenium	6	6 U
3050	10/20/00	6010	10/29/00	7440-22-4	Silver	0.4	0.4 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-10-0-1**
TOTAL METALS

Lab Sample ID: CH43L
LIMS ID: 00-19080
Matrix: Soil

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/04/00
Date Received: 10/09/00

Data Release Authorized:
Reported: 11/02/00

Percent Total Solids: 89.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/20/00	6010	10/29/00	7440-38-2	Arsenic	5	5 U
3050	10/20/00	6010	10/29/00	7440-39-3	Barium	0.3	218
3050	10/20/00	6010	10/29/00	7440-43-9	Cadmium	0.2	4.2
3050	10/20/00	6010	10/29/00	7440-47-3	Chromium	0.5	49.2
3050	10/20/00	6010	10/29/00	7440-50-8	Copper	0.2	217
3050	10/20/00	6010	10/29/00	7439-92-1	Lead	2	460
CLP	10/20/00	7471	10/24/00	7439-97-6	Mercury	0.04	0.54
3050	10/20/00	6010	10/29/00	7782-49-2	Selenium	5	7
3050	10/20/00	6010	10/29/00	7440-22-4	Silver	0.3	0.5

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-10-4-6**
TOTAL METALS

Lab Sample ID: CH43M
LIMS ID: 00-19081
Matrix: Soil

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/05/00
Date Received: 10/09/00

Data Release Authorized:
Reported: 11/02/00

Percent Total Solids: 90.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/20/00	6010	10/29/00	7440-38-2	Arsenic	5	5 U
3050	10/20/00	6010	10/29/00	7440-39-3	Barium	0.3	61.0
3050	10/20/00	6010	10/29/00	7440-43-9	Cadmium	0.2	0.7
3050	10/20/00	6010	10/29/00	7440-47-3	Chromium	0.5	32.2
3050	10/20/00	6010	10/29/00	7440-50-8	Copper	0.2	60.3
3050	10/20/00	6010	10/29/00	7439-92-1	Lead	2	72
CLP	10/20/00	7471	10/24/00	7439-97-6	Mercury	0.05	0.07
3050	10/20/00	6010	10/29/00	7782-49-2	Selenium	5	5 U
3050	10/20/00	6010	10/29/00	7440-22-4	Silver	0.3	0.3

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-10-6-10**
TOTAL METALS

Lab Sample ID: CH43N
LIMS ID: 00-19082
Matrix: Soil

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/05/00
Date Received: 10/09/00

Data Release Authorized:
Reported: 11/02/00

Percent Total Solids: 82.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/20/00	6010	10/29/00	7440-38-2	Arsenic	6	6 U
3050	10/20/00	6010	10/29/00	**7440-39-3**	**Barium**	0.4	**49.5**
3050	10/20/00	6010	10/29/00	**7440-43-9**	**Cadmium**	0.2	**0.4**
3050	10/20/00	6010	10/29/00	**7440-47-3**	**Chromium**	0.6	**28.8**
3050	10/20/00	6010	10/29/00	**7440-50-8**	**Copper**	0.2	**29.3**
3050	10/20/00	6010	10/29/00	**7439-92-1**	**Lead**	2	**15**
CLP	10/20/00	7471	10/24/00	7439-97-6	Mercury	0.06	0.06 U
3050	10/20/00	6010	10/29/00	7782-49-2	Selenium	6	6 U
3050	10/20/00	6010	10/29/00	7440-22-4	Silver	0.4	0.4 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-11-0-1**
TOTAL METALS

Lab Sample ID: CH43O
LIMS ID: 00-19083
Matrix: Soil

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/05/00
Date Received: 10/09/00

Data Release Authorized:
Reported: 11/02/00

Percent Total Solids: 90.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/20/00	6010	10/29/00	7440-38-2	Arsenic	5	5 U
3050	10/20/00	6010	10/29/00	**7440-39-3**	**Barium**	0.3	**254**
3050	10/20/00	6010	10/29/00	**7440-43-9**	**Cadmium**	0.2	**5.7**
3050	10/20/00	6010	10/29/00	**7440-47-3**	**Chromium**	0.5	**54.4**
3050	10/20/00	6010	10/29/00	**7440-50-8**	**Copper**	0.2	**157**
3050	10/20/00	6010	10/29/00	**7439-92-1**	**Lead**	2	**202**
CLP	10/20/00	7471	10/24/00	**7439-97-6**	**Mercury**	0.05	**0.27**
3050	10/20/00	6010	10/29/00	**7782-49-2**	**Selenium**	5	**6**
3050	10/20/00	6010	10/29/00	**7440-22-4**	**Silver**	0.3	**0.7**

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-11-6-10**
TOTAL METALS

Lab Sample ID: CH43P
LIMS ID: 00-19084
Matrix: Soil

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/05/00
Date Received: 10/09/00

Data Release Authorized:
Reported: 11/02/00

Percent Total Solids: 55.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/20/00	6010	10/29/00	7440-38-2	Arsenic	9	9 U
3050	10/20/00	6010	10/29/00	7440-39-3	Barium	0.5	164
3050	10/20/00	6010	10/29/00	7440-43-9	Cadmium	0.3	0.3 U
3050	10/20/00	6010	10/29/00	7440-47-3	Chromium	0.9	18.4
3050	10/20/00	6010	10/29/00	7440-50-8	Copper	0.3	31.5
3050	10/20/00	6010	10/29/00	7439-92-1	Lead	3	57
CLP	10/20/00	7471	10/24/00	7439-97-6	Mercury	0.08	0.10
3050	10/20/00	6010	10/29/00	7782-49-2	Selenium	9	9 U
3050	10/20/00	6010	10/29/00	7440-22-4	Silver	0.5	0.5 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-12-0-1**
TOTAL METALS

Lab Sample ID: CH43Q
LIMS ID: 00-19085
Matrix: Soil

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/05/00
Date Received: 10/09/00

Data Release Authorized:
Reported: 11/02/00

Percent Total Solids: 96.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/20/00	6010	10/29/00	7440-38-2	Arsenic	5	5 U
3050	10/20/00	6010	10/29/00	**7440-39-3**	**Barium**	0.3	**37.5**
3050	10/20/00	6010	10/29/00	**7440-43-9**	**Cadmium**	0.2	**3.3**
3050	10/20/00	6010	10/29/00	**7440-47-3**	**Chromium**	0.5	**19.4**
3050	10/20/00	6010	10/29/00	**7440-50-8**	**Copper**	0.2	**21.3**
3050	10/20/00	6010	10/29/00	**7439-92-1**	**Lead**	2	**17**
CLP	10/20/00	7471	10/24/00	7439-97-6	Mercury	0.04	0.04 U
3050	10/20/00	6010	10/29/00	7782-49-2	Selenium	5	5 U
3050	10/20/00	6010	10/29/00	7440-22-4	Silver	0.3	0.3 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-13-0-1**
TOTAL METALS

Lab Sample ID: CH43R
LIMS ID: 00-19086
Matrix: Soil

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/05/00
Date Received: 10/09/00

Data Release Authorized:
Reported: 11/02/00

Percent Total Solids: 95.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/20/00	6010	10/29/00	7440-38-2	Arsenic	5	5 U
3050	10/20/00	6010	10/29/00	7440-39-3	Barium	0.3	96.0
3050	10/20/00	6010	10/29/00	7440-43-9	Cadmium	0.2	3.0
3050	10/20/00	6010	10/29/00	7440-47-3	Chromium	0.5	49.3
3050	10/20/00	6010	10/29/00	7440-50-8	Copper	0.2	266
3050	10/20/00	6010	10/29/00	7439-92-1	Lead	2	167
CLP	10/20/00	7471	10/24/00	7439-97-6	Mercury	0.04	0.71
3050	10/20/00	6010	10/29/00	7782-49-2	Selenium	5	5 U
3050	10/20/00	6010	10/29/00	7440-22-4	Silver	0.3	1.0

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-14-0-1**
TOTAL METALS

Lab Sample ID: CH43S
LIMS ID: 00-19087
Matrix: Soil

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/06/00
Date Received: 10/09/00

Data Release Authorized:
Reported: 11/02/00

Percent Total Solids: 95.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/20/00	6010	10/29/00	7440-38-2	Arsenic	5	5 U
3050	10/20/00	6010	10/29/00	**7440-39-3**	**Barium**	0.3	**41.8**
3050	10/20/00	6010	10/29/00	7440-43-9	Cadmium	0.2	0.2 U
3050	10/20/00	6010	10/29/00	**7440-47-3**	**Chromium**	0.5	**22.2**
3050	10/20/00	6010	10/29/00	7440-50-8	Copper	0.2	**13.0**
3050	10/20/00	6010	10/29/00	**7439-92-1**	**Lead**	2	**8**
CLP	10/20/00	7471	10/24/00	7439-97-6	Mercury	0.05	0.05 U
3050	10/20/00	6010	10/29/00	7782-49-2	Selenium	5	5 U
3050	10/20/00	6010	10/29/00	7440-22-4	Silver	0.3	0.3 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-14-6-10**
TOTAL METALS

Lab Sample ID: CH43T
LIMS ID: 00-19088
Matrix: Soil

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/06/00
Date Received: 10/09/00

Data Release Authorized:
Reported: 11/02/00

Percent Total Solids: 79.5%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/20/00	6010	10/29/00	7440-38-2	Arsenic	6	6 U
3050	10/20/00	6010	10/29/00	**7440-39-3**	**Barium**	0.4	**84.9**
3050	10/20/00	6010	10/29/00	**7440-43-9**	**Cadmium**	0.2	**2.3**
3050	10/20/00	6010	10/29/00	**7440-47-3**	**Chromium**	0.6	**35.3**
3050	10/20/00	6010	10/29/00	**7440-50-8**	**Copper**	0.2	**78.6**
3050	10/20/00	6010	10/29/00	**7439-92-1**	**Lead**	2	**152**
CLP	10/20/00	7471	10/24/00	**7439-97-6**	**Mercury**	0.06	**0.07**
3050	10/20/00	6010	10/29/00	7782-49-2	Selenium	6	6 U
3050	10/20/00	6010	10/29/00	7440-22-4	Silver	0.4	0.4 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: Method Blank**
TOTAL METALS

Lab Sample ID: CH43MB
LIMS ID: 00-19070
Matrix: Soil

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized:
Reported: 11/02/00

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/20/00	6010	10/29/00	7440-38-2	Arsenic	5	5 U
3050	10/20/00	6010	10/29/00	**7440-39-3**	**Barium**	0.3	**0.4**
3050	10/20/00	6010	10/29/00	7440-43-9	Cadmium	0.2	0.2 U
3050	10/20/00	6010	10/29/00	7440-47-3	Chromium	0.5	0.5 U
3050	10/20/00	6010	10/29/00	**7440-50-8**	**Copper**	0.2	**0.2**
3050	10/20/00	6010	10/29/00	**7439-92-1**	**Lead**	2	**2**
CLP	10/20/00	7471	10/24/00	7439-97-6	Mercury	0.05	0.05 U
3050	10/20/00	6010	10/29/00	7782-49-2	Selenium	5	5 U
3050	10/20/00	6010	10/29/00	7440-22-4	Silver	0.3	0.3 U

U Analyte undetected at given RL

RL Reporting Limit

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CH43LCS
LIMS ID: 00-19070
Matrix: Soil

QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 11/02/00

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike mg/kg-dry	Spike Added	% Recovery	Q
Arsenic	6010	210	200	105%	
Barium	6010	209	200	104%	
Cadmium	6010	51.1	50.0	102%	
Chromium	6010	52.1	50.0	104%	
Copper	6010	54.4	50.0	109%	
Lead	6010	210	200	105%	
Mercury	7471	1.07	1.00	107%	
Selenium	6010	210	200	105%	
Silver	6010	51.6	50.0	103%	

'Q' codes: N = control limit not met

Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET
TOTAL METALS

Sample No: TP-5-01
QC Report No: CH43-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 10/09/00

Lab Sample ID: CH43A
LIMS ID: 00-19069
Matrix: Soil

Data Release Authorized
Reported: 11/02/00

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample mg/kg-dry	Duplicate mg/kg-dry	RPD	Control Limit	Q
Arsenic	6010	5 U	5 U	0.0%	+/- 5	L
Barium	6010	59.4	72.7	20.1%	+/- 20 %	*
Cadmium	6010	0.2 U	0.2 U	0.0%	+/- 0.2	L
Chromium	6010	59.9	29.8	67.1%	+/- 20 %	*
Copper	6010	28.0	25.8	8.2%	+/- 20 %	
Lead	6010	8	9	11.8%	+/- 2	L
Mercury	7471	0.05 U	0.05 U	0.0%	+/- 0.05	L
Selenium	6010	5	5 U	0.0%	+/- 5	L
Silver	6010	0.4	0.3 U	28.6%	+/- 0.3	L

'Q' codes: * = control limit not met
L = RPD not valid, alternate limit = detection limit

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-5-01
Lab Sample ID: CH43A
QC Report No: CH43-Kennedy Jenks Consultants
LIMS ID: 00-19069
Project: Tacoma Metals
Matrix: Soil
996098.00
Date Received: 10/09/00

Data Release Authorized:
Reported: 11/02/00

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample mg/kg-dry	Spike mg/kg-dry	Spike Added	% Recovery	Q
Arsenic	6010	5 U	225	214	105%	
Barium	6010	59.4	298	214	111%	
Cadmium	6010	0.2 U	56.6	53.6	106%	
Chromium	6010	59.9	87.8	53.6	52.1%	N
Copper	6010	28.0	75.9	53.6	89.4%	
Lead	6010	8	236	214	107%	
Mercury	7471	0.05 U	0.61	0.53	115%	
Selenium	6010	5	231	214	106%	
Silver	6010	0.4	54.1	53.6	100%	

'Q' codes:
N = control limit not met
H = %R not applicable, sample concentration too high
* = RPD control limit not met
NA = Not applicable - analyte not spiked

Control Limits:
Percent Recovery: 75-125%
RPD: +/-20%

Analytical Resources, Incorporated
Analytical Chemists and Consultants

November 1, 2000

Ty Schreiner
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: Project: Tacoma Metals
ARI Job: CH49

Dear Ty:

Please find enclosed sample custody records and final analytical results for the above referenced project. Four soil samples were received in good condition on October 9, 2000. Selected samples were placed on hold at –18 degrees celcius pending further instruction.

Selected samples were analyzed for volatiles referencing EPA 8260, PCBs referencing EPA 8082, and total metals referencing EPA 6010/7471. Total diesel and motor oil range hydrocarbons were determined referencing WDOE method NWTPH-Dx.

All samples were run as concentrated as possible for volatile organics to provide the lowest possible detection limits for the undetected analytes. Acetone was detected in the 10/18/00 method blank. Associated sample results were qualified with a "B" flag, indicating possible lab contamination.

The TPH extractions technician noted that sample **TP-15-0-1** was possibly double surrogated. The recovery ended up being 170%, confirming the technician's notes. The GC supervisor adjusted the final recovery to reflect half of the observed recovery.

Initial analysis of **TP-15-0-1** for PCBs showed low surrogate recoveries. The sample was re-extracted past the holding time and was reanalyzed. The secondary extract showed acceptable recoveries for both surrogates. Both runs are reported for your review.

Other extracts analyzed for PCBs showed elevated recoveries for one of the two surrogates. As these extracts showed acceptable recoveries for at least one of the surrogates, no corrective action was taken.

Barium and copper were detected in the metals method blank. As the sample concentrations were greater than 10 times the method blank concentration, no corrective action was required.

No other analytical complications were noted. Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

RECEIVED
NOV - 3 2000
K/J Federal Way
K/J No/File
Route
Return To/By

333 Ninth Avenue North • Seattle WA 98109-5187 • **206-621-6490** • 206-621-7520

Sincerely,

ANALYTICAL RESOURCES, INC.

Jeff J. Reitan
Client Services Manager
jeff@arilabs.com

JJR/sl
Enclosures

00-14101 TO 00-14105
CH 49

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
400 Ninth Avenue North
Seattle, WA 98109-4708
206-621-6490 206-621-7523 (fax)

Turn Around Requested: _____

Report to: TY Schreiner
Company: Kennedy/Jenks
Address: 530 S. 336th St
Federal Way, WA 98003
Phone: 253 874-0555
Fax:

Proj Name: TACOMA METALS
Proj Number: 991008.00
Sampler:
Shipping Method:
AirBill:

Sample ID	Sample Date	Sample Time	Sample Matrix	No Containers	NWTPH-DX	2CPA METALS	CN	VOCS	PCBS		HOLD				Notes/Comments
TP-14-0-1	10/6/00	8:00	SOIL	2	X	X	X				X				
TP-14-2-3		8:10		2							X				
TP-14-4-6		8:20		2							X				
TP-14-6-10		8:30		2	X	X	X				X				20
TP-15-0-1		9:30		2	X	X	X		X						
TP-15-2-3		9:40		2							X				
TP-15-4-6		9:45		2							X				
TP-15-6-10		10:30		2							X				
TP-16-0-1		12:15		2	X	X	X	X	X						
TP-16-2-3		1:00									X				
TP-16-0-1		1:10		2	X	X	X	X	X						
TP-17-0-1		1:35		2	X	X	X		X						
TP-17-2-3		1:50		2							X				
TP-17-4-6		2:05		2							X				
TP-17-6-10		2:35		2							X				

Relinquished (Signature)	Relinquished (Signature)	Relinquished (Signature)	Special Instructions/Notes
Printed name: Sonice Bralyer	Printed name:	Printed name:	Please freeze all "1/16ds"
Company: KJS	Company:	Company:	
Date: 10/9/00 Time: 9:00	Date: Time:	Date: Time:	
Received by:	Received by:	Received by:	
Printed name: Terrie McDougal	Printed name:	Printed name:	
Company: API	Company:	Company:	Number of Coolers:
			Cooler Temp(s):
Date: 10/9/00 Time: 1030	Date: Time:	Date: Time:	COC Seals Intact?
			Bottles Intact?

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ORGANICS ANALYSIS
DATA REPORTING QUALIFIERS

U Indicates the compound is undetected at the reported concentration.

J Indicates an estimated value when the value is less than the calculated detection limit.

NR Indicates the surrogate recovery cannot be reported due to matrix interference.

E Indicates value reported exceeds the linear range of the detector. Sample dilution required.

S Indicates no value reported due to saturation of the detector. Sample dilution required.

Y Indicates raised detection limit due to background interference or activity on the instrument.

NA Indicates compound not analyzed for.

M Indicates an estimated value of analyte detected and confirmed by analyst with low spectral match parameters.

B Indicates possible/probable blank contamination. Flagged when the analyte is detected in the sample and in the method blank.

333 Ninth Avenue North • Seattle WA 98109-5187 • **206-621-6490** • **206-621-7523** fax

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-16-0-1

Lab Sample ID: CH49B
LIMS ID: 00-19102
Matrix: Soil
Data Release Authorized
Reported: 10/26/00

QC Report No: CH49-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/06/00
Date Received: 10/09/00

Instrument: FINN5
Date Analyzed: 10/18/00 17:06

Sample Amount: 0.51 g dry Wt
Percent Moisture: 7.9%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	9.9 U
74-83-9	Bromomethane	9.9 U
75-01-4	Vinyl Chloride	9.9 U
75-00-3	Chloroethane	9.9 U
75-09-2	Methylene Chloride	30 U
67-64-1	**Acetone**	**140 B**
75-15-0	Carbon Disulfide	9.9 U
75-35-4	1,1-Dichloroethene	9.9 U
75-34-3	1,1-Dichloroethane	9.9 U
156-60-5	trans-1,2-Dichloroethene	9.9 U
156-59-2	cis-1,2-Dichloroethene	9.9 U
67-66-3	Chloroform	9.9 U
107-06-2	1,2-Dichloroethane	9.9 U
78-93-3	2-Butanone	49 U
71-55-6	1,1,1-Trichloroethane	9.9 U
56-23-5	Carbon Tetrachloride	9.9 U
108-05-4	Vinyl Acetate	49 U
75-27-4	Bromodichloromethane	9.9 U
78-87-5	1,2-Dichloropropane	9.9 U
10061-01-5	cis-1,3-Dichloropropene	9.9 U
79-01-6	Trichloroethene	9.9 U
124-48-1	Dibromochloromethane	9.9 U
79-00-5	1,1,2-Trichloroethane	9.9 U
71-43-2	Benzene	9.9 U
10061-02-6	trans-1,3-Dichloropropene	9.9 U
110-75-8	2-Chloroethylvinylether	49 U
75-25-2	Bromoform	9.9 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	49 U
591-78-6	2-Hexanone	49 U
127-18-4	Tetrachloroethene	9.9 U
79-34-5	1,1,2,2-Tetrachloroethane	9.9 U
108-88-3	**Toluene**	**720**
108-90-7	Chlorobenzene	9.9 U
100-41-4	**Ethylbenzene**	**15**
100-42-5	Styrene	9.9 U
75-69-4	Trichlorofluoromethane	9.9 U
76-13-1	1,1,2-Trichlorotrifluoroethane	9.9 U
1330-20-7	**m,p-Xylene**	**56**

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-16-0-1

Lab Sample ID: CH49B
LIMS ID: 00-19102
Matrix: Soil
Data Release Authorized:
Reported: 10/26/00

QC Report No: CH49-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/06/00
Date Received: 10/09/00

Instrument: FINN5
Date Analyzed: 10/18/00 17:06

Sample Amount: 0.51 g dry Wt
Percent Moisture: 7.9%

CAS Number	Analyte	ug/kg
95-47-6	**o-Xylene**	**20**
95-50-1	1,2-Dichlorobenzene	9.9 U
541-73-1	1,3-Dichlorobenzene	9.9 U
106-46-7	1,4-Dichlorobenzene	9.9 U
107-02-8	Acrolein	490 U
74-88-4	Methyl Iodide	9.9 U
74-96-4	Bromoethane	20 U
107-13-1	Acrylonitrile	49 U
563-58-6	1,1-Dichloropropene	9.9 U
74-95-3	Dibromomethane	9.9 U
630-20-6	1,1,1,2-Tetrachloroethane	9.9 U
96-12-8	1,2-Dibromo-3-chloropropane	49 U
96-18-4	1,2,3-Trichloropropane	20 U
110-57-6	trans-1,4-Dichloro-2-butene	49 U
108-67-8	**1,3,5-Trimethylbenzene**	**83**
95-63-6	**1,2,4-Trimethylbenzene**	**90**
87-68-3	Hexachlorobutadiene	49 U
106-93-4	Ethylene Dibromide	9.9 U
74-97-5	Bromochloromethane	9.9 U
594-20-7	2,2-Dichloropropane	9.9 U
142-28-9	1,3-Dichloropropane	9.9 U
98-82-8	Isopropylbenzene	9.9 U
103-65-1	n-Propylbenzene	9.9 U
108-86-1	Bromobenzene	9.9 U
95-49-8	2-Chlorotoluene	9.9 U
106-43-4	4-Chlorotoluene	9.9 U
98-06-6	tert-Butylbenzene	9.9 U
135-98-8	sec-Butylbenzene	9.9 U
99-87-6	**4-Isopropyltoluene**	**44**
104-51-8	n-Butylbenzene	26 Y
120-82-1	1,2,4-Trichlorobenzene	49 U
91-20-3	Naphthalene	400 Y
87-61-6	1,2,3-Trichlorobenzene	49 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	107%
d8-Toluene	98.5%
Bromofluorobenzene	97.4%
d4-1,2-Dichlorobenzene	97.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-160-0-1

Lab Sample ID: CH49C
LIMS ID: 00-19103
Matrix: Soil
Data Release Authorized:
Reported: 10/26/00

QC Report No: CH49-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/06/00
Date Received: 10/09/00

Instrument: FINN5
Date Analyzed: 10/18/00 17:32

Sample Amount: 0.55 g dry Wt
Percent Moisture: 15.3%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	9.1 U
74-83-9	Bromomethane	9.1 U
75-01-4	Vinyl Chloride	9.1 U
75-00-3	Chloroethane	9.1 U
75-09-2	Methylene Chloride	27 U
67-64-1	Acetone	45 U
75-15-0	Carbon Disulfide	9.1 U
75-35-4	1,1-Dichloroethene	9.1 U
75-34-3	1,1-Dichloroethane	9.1 U
156-60-5	trans-1,2-Dichloroethene	9.1 U
156-59-2	cis-1,2-Dichloroethene	9.1 U
67-66-3	Chloroform	9.1 U
107-06-2	1,2-Dichloroethane	9.1 U
78-93-3	2-Butanone	45 U
71-55-6	1,1,1-Trichloroethane	9.1 U
56-23-5	Carbon Tetrachloride	9.1 U
108-05-4	Vinyl Acetate	45 U
75-27-4	Bromodichloromethane	9.1 U
78-87-5	1,2-Dichloropropane	9.1 U
10061-01-5	cis-1,3-Dichloropropene	9.1 U
79-01-6	Trichloroethene	9.1 U
124-48-1	Dibromochloromethane	9.1 U
79-00-5	1,1,2-Trichloroethane	9.1 U
71-43-2	Benzene	9.1 U
10061-02-6	trans-1,3-Dichloropropene	9.1 U
110-75-8	2-Chloroethylvinylether	45 U
75-25-2	Bromoform	9.1 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	45 U
591-78-6	2-Hexanone	45 U
127-18-4	Tetrachloroethene	9.1 U
79-34-5	1,1,2,2-Tetrachloroethane	9.1 U
108-88-3	**Toluene**	**380**
108-90-7	Chlorobenzene	9.1 U
100-41-4	Ethylbenzene	9.1 U
100-42-5	Styrene	9.1 U
75-69-4	Trichlorofluoromethane	9.1 U
76-13-1	1,1,2-Trichlorotrifluoroethane	9.1 U
1330-20-7	m,p-Xylene	9.1 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-160-0-1

Lab Sample ID: CH49C
LIMS ID: 00-19103
Matrix: Soil
Data Release Authorized:
Reported: 10/26/00

QC Report No: CH49-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/06/00
Date Received: 10/09/00

Instrument: FINN5
Date Analyzed: 10/18/00 17:32

Sample Amount: 0.55 g dry Wt
Percent Moisture: 15.3%

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	9.1 U
95-50-1	1,2-Dichlorobenzene	9.1 U
541-73-1	1,3-Dichlorobenzene	9.1 U
106-46-7	1,4-Dichlorobenzene	9.1 U
107-02-8	Acrolein	450 U
74-88-4	Methyl Iodide	9.1 U
74-96-4	Bromoethane	18 U
107-13-1	Acrylonitrile	45 U
563-58-6	1,1-Dichloropropene	9.1 U
74-95-3	Dibromomethane	9.1 U
630-20-6	1,1,1,2-Tetrachloroethane	9.1 U
96-12-8	1,2-Dibromo-3-chloropropane	45 U
96-18-4	1,2,3-Trichloropropane	18 U
110-57-6	trans-1,4-Dichloro-2-butene	45 U
108-67-8	1,3,5-Trimethylbenzene	9.1 U
95-63-6	1,2,4-Trimethylbenzene	9.1 U
87-68-3	Hexachlorobutadiene	45 U
106-93-4	Ethylene Dibromide	9.1 U
74-97-5	Bromochloromethane	9.1 U
594-20-7	2,2-Dichloropropane	9.1 U
142-28-9	1,3-Dichloropropane	9.1 U
98-82-8	Isopropylbenzene	9.1 U
103-65-1	n-Propylbenzene	9.1 U
108-86-1	Bromobenzene	9.1 U
95-49-8	2-Chlorotoluene	9.1 U
106-43-4	4-Chlorotoluene	9.1 U
98-06-6	tert-Butylbenzene	9.1 U
135-98-8	sec-Butylbenzene	9.1 U
99-87-6	4-Isopropyltoluene	9.1 U
104-51-8	n-Butylbenzene	18 U
120-82-1	1,2,4-Trichlorobenzene	45 U
91-20-3	Naphthalene	45 U
87-61-6	1,2,3-Trichlorobenzene	45 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	103%
d8-Toluene	97.1%
Bromofluorobenzene	97.6%
d4-1,2-Dichlorobenzene	99.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 101800MB
LIMS ID: 00-19103
Matrix: Soil
Data Release Authorized:
Reported: 10/26/00

QC Report No: CH49-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN5
Date Analyzed: 10/18/00 12:30

Sample Amount: 5.00 g dry Wt Equiv
Percent Moisture: NA

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	3.0 U
67-64-1	**Acetone**	**4.2 J**
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	trans-1,2-Dichloroethene	1.0 U
156-59-2	cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
108-05-4	Vinyl Acetate	5.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-02-6	trans-1,3-Dichloropropene	1.0 U
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.0 U
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	1.0 U
1330-20-7	m,p-Xylene	1.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 101800MB
LIMS ID: 00-19103
Matrix: Soil
Data Release Authorized:
Reported: 10/26/00

QC Report No: CH49-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN5
Date Analyzed: 10/18/00 12:30

Sample Amount: 5.00 g dry Wt Equiv
Percent Moisture: NA

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	1.0 U
95-50-1	1,2-Dichlorobenzene	1.0 U
541-73-1	1,3-Dichlorobenzene	1.0 U
106-46-7	1,4-Dichlorobenzene	1.0 U
107-02-8	Acrolein	50 U
74-88-4	Methyl Iodide	1.0 U
74-96-4	Bromoethane	2.0 U
107-13-1	Acrylonitrile	5.0 U
563-58-6	1,1-Dichloropropene	1.0 U
74-95-3	Dibromomethane	1.0 U
630-20-6	1,1,1,2-Tetrachloroethane	1.0 U
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U
96-18-4	1,2,3-Trichloropropane	2.0 U
110-57-6	trans-1,4-Dichloro-2-butene	5.0 U
108-67-8	1,3,5-Trimethylbenzene	1.0 U
95-63-6	1,2,4-Trimethylbenzene	1.0 U
87-68-3	Hexachlorobutadiene	5.0 U
106-93-4	Ethylene Dibromide	1.0 U
74-97-5	Bromochloromethane	1.0 U
594-20-7	2,2-Dichloropropane	1.0 U
142-28-9	1,3-Dichloropropane	1.0 U
98-82-8	Isopropylbenzene	1.0 U
103-65-1	n-Propylbenzene	1.0 U
108-86-1	Bromobenzene	1.0 U
95-49-8	2-Chlorotoluene	1.0 U
106-43-4	4-Chlorotoluene	1.0 U
98-06-6	tert-Butylbenzene	1.0 U
135-98-8	sec-Butylbenzene	1.0 U
99-87-6	4-Isopropyltoluene	1.0 U
104-51-8	n-Butylbenzene	2.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0 U
91-20-3	Naphthalene	5.0 U
87-61-6	1,2,3-Trichlorobenzene	5.0 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	111%
d8-Toluene	100%
Bromofluorobenzene	101%
d4-1,2-Dichlorobenzene	102%

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CH49SB
LIMS ID: 00-19103
Matrix: Soil
Data Release Authorized:
Reported: 10/26/00
Date Analyzed: 10/18/00
Instrument: FINN5

QC Report No: CH49-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: NA

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
Chloromethane	44.4	50.0	88.8%
Bromomethane	47.8	50.0	95.6%
Vinyl Chloride	38.7	50.0	77.4%
Chloroethane	44.2	50.0	88.4%
Methylene Chloride	41.5	50.0	83.0%
Acetone	199.	250	79.6%
Carbon Disulfide	81.7	50.0	163%
1,1-Dichloroethene	44.8	50.0	89.6%
1,1-Dichloroethane	48.4	50.0	96.8%
trans-1,2-Dichloroethene	47.2	50.0	94.4%
cis-1,2-Dichloroethene	51.6	50.0	103%
Chloroform	50.4	50.0	101%
1,2-Dichloroethane	46.7	50.0	93.4%
2-Butanone	231.	250	92.4%
1,1,1-Trichloroethane	52.9	50.0	106%
Carbon Tetrachloride	50.2	50.0	100%
Vinyl Acetate	42.3	50.0	84.6%
Bromodichloromethane	50.1	50.0	100%
1,2-Dichloropropane	52.6	50.0	105%
cis-1,3-Dichloropropene	48.2	50.0	96.4%
Trichloroethene	51.0	50.0	102%
Dibromochloromethane	49.9	50.0	99.8%
1,1,2-Trichloroethane	50.5	50.0	101%
Benzene	51.2	50.0	102%
trans-1,3-Dichloropropene	48.6	50.0	97.2%
2-Chloroethylvinylether	48.8	50.0	97.6%
Bromoform	51.6	50.0	103%
4-Methyl-2-Pentanone (MIBK)	240.	250	96.0%
2-Hexanone	233.	250	93.2%
Tetrachloroethene	52.8	50.0	106%
1,1,2,2-Tetrachloroethane	51.1	50.0	102%
Toluene	51.7	50.0	103%
Chlorobenzene	51.3	50.0	103%
Ethylbenzene	51.7	50.0	103%
Styrene	52.9	50.0	106%
Trichlorofluoromethane	44.7	50.0	89.4%
1,1,2-Trichlorotrifluoroethane	61.5	50.0	123%
m,p-Xylene	106.	100	106%
O-Xylene	52.7	50.0	105%

Reported in ug/kg-dry-Wt

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CH49SB
LIMS ID: 00-19103
Matrix: Soil
Data Release Authorized:
Reported: 10/26/00
Date Analyzed: 10/18/00
Instrument: FINN5

QC Report No: CH49-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: NA

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
1,2-Dichlorobenzene	51.2	50.0	102%
1,3-Dichlorobenzene	51.6	50.0	103%
1,4-Dichlorobenzene	52.2	50.0	104%
Acrolein	283.	250	113%
Methyl Iodide	58.4	50.0	117%
Bromoethane	59.5	50.0	119%
Acrylonitrile	49.8	50.0	99.6%
1,1-Dichloropropene	53.4	50.0	107%
Dibromomethane	49.9	50.0	99.8%
1,1,1,2-Tetrachloroethane	51.1	50.0	102%
1,2-Dibromo-3-chloropropane	49.8	50.0	99.6%
1,2,3-Trichloropropane	51.0	50.0	102%
trans-1,4-Dichloro-2-butene	48.1	50.0	96.2%
1,3,5-Trimethylbenzene	51.6	50.0	103%
1,2,4-Trimethylbenzene	51.5	50.0	103%
Hexachlorobutadiene	50.3	50.0	101%
Ethylene Dibromide	50.5	50.0	101%
Bromochloromethane	50.4	50.0	101%
2,2-Dichloropropane	51.9	50.0	104%
1,3-Dichloropropane	50.2	50.0	100%
Isopropylbenzene	52.4	50.0	105%
n-Propylbenzene	52.5	50.0	105%
Bromobenzene	50.3	50.0	101%
2-Chlorotoluene	54.7	50.0	109%
4-Chlorotoluene	48.3	50.0	96.6%
tert-Butylbenzene	50.8	50.0	102%
sec-Butylbenzene	53.3	50.0	107%
4-Isopropyltoluene	53.3	50.0	107%
n-Butylbenzene	53.6	50.0	107%
1,2,4-Trichlorobenzene	51.2	50.0	102%
Naphthalene	50.9	50.0	102%
1,2,3-Trichlorobenzene	50.2	50.0	100%

Spike Blank Surrogate Recovery

d4-1,2-Dichloroethane	101%
d8-Toluene	99.4%
Bromofluorobenzene	101%
d4-1,2-Dichlorobenzene	98.0%

Reported in ug/kg-dry-Wt

ANALYTICAL RESOURCES INCORPORATED

SOIL VOLATILE SYSTEM MONITORING COMPOUND SUMMARY

Matrix: Soil

QC Report No: CH49

Lab ID	Client ID	DCE	TOL	BFB	DCB	TOT OUT
CH49B	TP-16-0-1	107%	98%	97%	97%	0
101800MB	Method Blank	111%	100%	101%	102%	0
CH49C	TP-160-0-1	103%	97%	98%	100%	0
CH49LCS	Lab Cntrl Sample	101%	99%	101%	98%	0

	LCS/MB LIMITS	QC LIMITS
(DCE) = 1,2-Dichloroethane-d4	(70-130)	(70-130)
(TOL) = Toluene-d8	(70-130)	(70-130)
(BFB) = Bromofluorobenzene	(70-130)	(70-130)
(DCB) = 1,2-Dichlorobenzene-d4	(70-130)	(70-130)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D System Monitoring Compound diluted out

FORM-II VOA-1

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID
and Motor Oil

LIMS ID: 00-19101
Matrix: Soil

QC Report No: CH49-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized: C
Reported: 10/23/00

Date Received: 10/09/00

Lab ID	Sample ID	Date Extracted	Date Analyzed	Dilution Factor	Diesel Range	*HC ID	Motor Oil Range	Surrogate Recovery
CH49MB	Method Blank	10/13/00	10/19/00	1:1	5.0 U	---	10 U	96.0%
CH49A	**TP-15-0-1**	10/13/00	10/20/00	1:1	13	NO	30	85.0%
CH49B	**TP-16-0-1**	10/13/00	10/20/00	1:20	2,600	NO	2,500	D
CH49C	**TP-160-0-1**	10/13/00	10/20/00	1:20	300	NO	890	D
CH49D	**TP-17-0-1**	10/13/00	10/20/00	1:20	300	NO	1,200	D

Values reported in ppm (mg/kg) on a dry weight basis.

Surrogate is Methyl-Arachidate.

* ID indicates, in the opinion of the analyst, the petroleum product with the best pattern match. 'NO' indicates that there was not a good match for any of the requested products.
Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.

Data Qualifiers

U Compound not detected at the given detection limit.
J Indicates an estimated value below the calculated detection limit.
S No value reported due to saturation of the detector. Dilution required.
D Indicates the surrogate was not detected because of dilution of the extract.
E Indicates a value above the linear range of the detector. Dilution required.
NR Indicates no recovery due to matrix interference.
B Indicates compound also detected in the method blank.

FORM-1 TPHD

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CH49SB
LIMS ID: 00-19101
Matrix: Soil

QC Report No: CH49-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized: CH
Reported: 10/23/00 10/23/

LABORATORY CONTROL SAMPLE RECOVERY REPORT
Date extracted: 10/13/00
Date analyzed: 10/19/00

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
Diesel Range Hydrocarbons	86.0	100	86.0%

TPHd Surrogate Recovery

Methylarachidate 96 0%

Values reported in ppm (mg/kg) on a dry weight basis.

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL HYDROCARBONS COMPOUND SUMMARY

Matrix: Soil

QC Report No: CH49

LIMS ID	Lab ID	Extracted	Client ID	MeArach	TOT OUT
00-19101MB	101900MB	10/13/00	Method Blank	96%	0
00-19101LC	101900LC	10/13/00	Lab Control	96%	0
00-19101	CH49A	10/13/00	TP-15-0-1	85%	0
00-19102	CH49B	10/13/00	TP-16-0-1	D	0
00-19103	CH49C	10/13/00	TP-160-0-1	D	0
00-19104	CH49D	10/13/00	TP-17-0-1	D	0

	Control QC LIMITS	Sample QC LIMITS
(MeArach) = Methylarachidate	(56-114)	(42-113)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D System Monitoring Compound diluted out

FORM-II TPHD

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-15-0-1

Lab Sample ID: CH49A
LIMS ID: 00-19101
Matrix: Soil

Data Release Authorized: CH
Reported: 10/25/00 10/25/00

QC Report No: CH49-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/06/00
Date Received: 10/09/00

Date extracted: 10/14/00
Date analyzed: 10/19/00 22:08
Instrument ID: ECD1
Sample Amount: 11.4 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.3

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 5.1 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	35 U
53469-21-9	Aroclor 1242	35 U
12672-29-6	Aroclor 1248	35 U
11097-69-1	**Aroclor 1254**	**43**
11096-82-5	**Aroclor 1260**	**58**
11104-28-2	Aroclor 1221	70 U
11141-16-5	Aroclor 1232	35 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	34.2%
Tetrachlorometaxylene	37.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-15-0-1
Reextract

Lab Sample ID: CH49A-RE
LIMS ID: 00-19101
Matrix: Soil

QC Report No: CH49-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/06/00
Date Received: 10/09/00

Data Release Authorized:
Reported: 10/25/00

Date extracted: 10/21/00
Date analyzed: 10/24/00 14:05
Instrument ID: ECD1
Sample Amount: 11.4 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.3

GPC Cleanup: No
Florisil Cleanup: No
Sulfur Cleanup: No
Conc/Dilution Factor: 1:1
Percent Moisture: 5.1 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	35 U
53469-21-9	Aroclor 1242	35 U
12672-29-6	Aroclor 1248	35 U
11097-69-1	**Aroclor 1254**	**25 J**
11096-82-5	**Aroclor 1260**	**33 J**
11104-28-2	Aroclor 1221	70 U
11141-16-5	Aroclor 1232	35 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	94.8%
Tetrachlorometaxylene	93.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-16-0-1

Lab Sample ID: CH49B
LIMS ID: 00-19102
Matrix: Soil

Data Release Authorized: CM 6/15/01
Reported: 10/25/00

QC Report No: CH49-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/06/00
Date Received: 10/09/00

Date extracted: 10/16/00
Date analyzed: 10/16/00 20:32
Instrument ID: ECD1
Sample Amount: 1.75 g-dry-wt
Final Ext Vol: 20 mL
pH: 7.3

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 13.8%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1,100 U
53469-21-9	Aroclor 1242	1,100 U
12672-29-6	Aroclor 1248	1,000 J
11097-69-1	Aroclor 1254	3,100
11096-82-5	Aroclor 1260	4,600
11104-28-2	Aroclor 1221	2,300 U
11141-16-5	Aroclor 1232	1,100 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	118%
Tetrachlorometaxylene	101%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-160-0-1

Lab Sample ID: CH49C
LIMS ID: 00-19103
Matrix: Soil

Data Release Authorized: CH
Reported: 10/25/00 11/5/00

QC Report No: CH49-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/06/00
Date Received: 10/09/00

Date extracted: 10/14/00
Date analyzed: 10/19/00 22:46
Instrument ID: ECD1
Sample Amount: 9.94 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.1

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 17.3%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	40 U
53469-21-9	Aroclor 1242	40 U
12672-29-6	**Aroclor 1248**	**390**
11097-69-1	**Aroclor 1254**	**1,700 E**
11096-82-5	**Aroclor 1260**	**2,400 E**
11104-28-2	Aroclor 1221	80 U
11141-16-5	Aroclor 1232	40 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	124%
Tetrachlorometaxylene	77.2%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-160-0-1
DILUTION

Lab Sample ID: CH49CDL
LIMS ID: 00-19103
Matrix: Soil

QC Report No: CH49-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/06/00
Date Received: 10/09/00

Data Release Authorized: CH
Reported: 10/25/00 10/25 h

Date extracted: 10/14/00
Date analyzed: 10/19/00 23:25
Instrument ID: ECD1
Sample Amount: 9.94 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.1

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:2
Percent Moisture: 17.3%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	80 U
53469-21-9	Aroclor 1242	80 U
12672-29-6	**Aroclor 1248**	**400**
11097-69-1	**Aroclor 1254**	**1,900**
11096-82-5	**Aroclor 1260**	**2,700**
11104-28-2	Aroclor 1221	160 U
11141-16-5	Aroclor 1232	80 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	130%
Tetrachlorometaxylene	77.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-17-0-1

Lab Sample ID: CH49D
LIMS ID: 00-19104
Matrix: Soil

Data Release Authorized: CH
Reported: 10/25/00 10/25/00

QC Report No: CH49-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/06/00
Date Received: 10/09/00

Date extracted: 10/14/00
Date analyzed: 10/20/00 00:03
Instrument ID: ECD1
Sample Amount: 11.3 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.3

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 6.0 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	35 U
53469-21-9	Aroclor 1242	35 U
12672-29-6	**Aroclor 1248**	**430**
11097-69-1	**Aroclor 1254**	**670**
11096-82-5	**Aroclor 1260**	**1,400 E**
11104-28-2	Aroclor 1221	71 U
11141-16-5	Aroclor 1232	35 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	103%
Tetrachlorometaxylene	77.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-17-0-1
DILUTION

Lab Sample ID: CH49DDL
LIMS ID: 00-19104
Matrix: Soil

QC Report No: CH49-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/06/00
Date Received: 10/09/00

Data Release Authorized: CIF 10/25/00
Reported: 10/25/00

Date extracted: 10/14/00
Date analyzed: 10/20/00 00:41
Instrument ID: ECD1
Sample Amount: 11.3 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.3

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:2
Percent Moisture: 6.0 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	71 U
53469-21-9	Aroclor 1242	71 U
12672-29-6	**Aroclor 1248**	**460**
11097-69-1	**Aroclor 1254**	**720**
11096-82-5	**Aroclor 1260**	**1,600**
11104-28-2	Aroclor 1221	140 U
11141-16-5	Aroclor 1232	71 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	121%
Tetrachlorometaxylene	79.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: Method Blank

Lab Sample ID: CH49MB
LIMS ID: 00-19101
Matrix: Soil

Data Release Authorized: CH
Reported: 10/25/00 10/25/00

QC Report No: CH49-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Date extracted: 10/14/00
Date analyzed: 10/18/00 22:14
Instrument ID: ECD1
Sample Amount: 12.0 g-dry-wt
Final Ext Vol: 4.0 mL
pH: NA

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: NA

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	33 U
53469-21-9	Aroclor 1242	33 U
12672-29-6	Aroclor 1248	33 U
11097-69-1	Aroclor 1254	33 U
11096-82-5	Aroclor 1260	33 U
11104-28-2	Aroclor 1221	67 U
11141-16-5	Aroclor 1232	33 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	89.5%
Tetrachlorometaxylene	91.2%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Lab Sample ID: CH49
LIMS ID: 00-19101
Matrix: Soil

QC Report No: CH49-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 10/25/00

LABORATORY CONTROL SAMPLE SPIKE RECOVERY
Date extracted: 10/14/00

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	337	333	101%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	111%
Tetrachlorometaxylene	112%

Values Reported in Total ug/kg Dry Weight

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: Method Blank

Lab Sample ID: CH49MB
LIMS ID: 00-19102
Matrix: Soil

Data Release Authorized: CR
Reported: 10/25/00 10/25/00

QC Report No: CH49-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Date extracted: 10/16/00
Date analyzed: 10/16/00 19:36
Instrument ID: ECD1
Sample Amount: 2.00 g-dry-wt
Final Ext Vol: 20 mL
pH: NA

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: NA

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1,000 U
53469-21-9	Aroclor 1242	1,000 U
12672-29-6	Aroclor 1248	1,000 U
11097-69-1	Aroclor 1254	1,000 U
11096-82-5	Aroclor 1260	1,000 U
11104-28-2	Aroclor 1221	2,000 U
11141-16-5	Aroclor 1232	1,000 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	122%
Tetrachlorometaxylene	119%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Lab Sample ID: CH49
LIMS ID: 00-19102
Matrix: Soil

QC Report No: CH49-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized: [illegible]
Reported: 10/25/00

LABORATORY CONTROL SAMPLE SPIKE RECOVERY
Date extracted: 10/16/00

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	10900	10000	109%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	124%
Tetrachlorometaxylene	122%

Values Reported in Total ug/kg Dry Weight

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: Method Blank

Lab Sample ID: CH49MB
LIMS ID: 00-19103
Matrix: Soil

Data Release Authorized: CH
Reported: 10/25/00 1/25 h

QC Report No: CH49-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Date extracted: 10/21/00
Date analyzed: 10/24/00 13:09
Instrument ID: ECD1
Sample Amount: 12.0 g-dry-wt
Final Ext Vol: 4.0 mL
pH: NA

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: NA

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	33 U
53469-21-9	Aroclor 1242	33 U
12672-29-6	Aroclor 1248	33 U
11097-69-1	Aroclor 1254	33 U
11096-82-5	Aroclor 1260	33 U
11104-28-2	Aroclor 1221	67 U
11141-16-5	Aroclor 1232	33 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	98.2%
Tetrachlorometaxylene	102%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Lab Sample ID: CH49
LIMS ID: 00-19103
Matrix: Soil

QC Report No: CH49-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized: CIT
Reported: 10/25/00 10/25/00

LABORATORY CONTROL SAMPLE SPIKE RECOVERY
Date extracted: 10/21/00

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	318	333	95.4%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	102%
Tetrachlorometaxylene	107%

Values Reported in Total ug/kg Dry Weight

ANALYTICAL RESOURCES INCORPORATED

SOIL AROCLOR SURROGATE SUMMARY

Matrix: Soil

QC Report No: CH49
Project: Tacoma Metals
996098.00

LIMS ID	Lab ID	Client ID	TCMX	#	DCBP	#	TOT OUT
00-19101MB	101400MB	Method Blank	91.2%		89.5%		0
00-19101SB	101400SB	Lab Control	112%	*	111%		1
00-19101	CH49A	TP-15-0-1	37.5%	*	34.2%	*	2
00-19101RE	CH49A	TP-15-0-1-RE	93.0%		94.8%		0
00-19102MB	101600MB	Method Blank	119%	*	122%		1
00-19102SB	101600SB	Lab Control	122%	*	124%		1
00-19102	CH49B	TP-16-0-1	101%		118%		0
00-19103MB	102100MB	Method Blank	102%		98.2%		0
00-19103SB	102100SB	Lab Control	107%		102%		0
00-19103	CH49C	TP-160-0-1	77.2%		124%		0
00-19103DL	CH49C	TP-160-0-1-DL	77.5%		130%	*	1
00-19104	CH49D	TP-17-0-1	77.5%		103%		0
00-19104DL	CH49D	TP-17-0-1-DL	79.0%		121%		0

	QC LIMITS
(TCMX) = Tetrachloro-m-xylene	(53-109)
(DCBP) = Decachlorobiphenyl	(54-127)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D Surrogate Compound diluted out

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: TP-15-0-1

Lab Sample ID: CH49A
LIMS ID: 00-19101
Matrix: Soil

QC Report No: CH49-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/06/00
Date Received: 10/09/00

Data Release Authorized:
Reported: 10/31/00

Percent Total Solids: 94.7%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/20/00	6010	10/29/00	7440-38-2	Arsenic	5	5 U
3050	10/20/00	6010	10/29/00	**7440-39-3**	**Barium**	0.3	**42.6**
3050	10/20/00	6010	10/29/00	7440-43-9	Cadmium	0.2	0.2 U
3050	10/20/00	6010	10/29/00	**7440-47-3**	**Chromium**	0.5	**32.8**
3050	10/20/00	6010	10/29/00	**7440-50-8**	**Copper**	0.2	**29.4**
3050	10/20/00	6010	10/29/00	**7439-92-1**	**Lead**	2	**79**
CLP	10/20/00	7471	10/20/00	7439-97-6	Mercury	0.04	0.04 U
3050	10/20/00	6010	10/29/00	7782-49-2	Selenium	5	5 U
3050	10/20/00	6010	10/29/00	**7440-22-4**	**Silver**	0.3	**0.3**

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-16-0-1**
TOTAL METALS

Lab Sample ID: CH49B
LIMS ID: 00-19102
Matrix: Soil

QC Report No: CH49-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/06/00
Date Received: 10/09/00

Data Release Authorized:
Reported: 10/31/00

Percent Total Solids: 81.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/20/00	6010	10/29/00	7440-38-2	Arsenic	30	40
3050	10/20/00	6010	10/29/00	7440-39-3	Barium	2	999
3050	10/20/00	6010	10/29/00	7440-43-9	Cadmium	1	45
3050	10/20/00	6010	10/29/00	7440-47-3	Chromium	3	105
3050	10/20/00	6010	10/29/00	7440-50-8	Copper	1	804
3050	10/20/00	6010	10/29/00	7439-92-1	Lead	10	2,590
CLP	10/20/00	7471	10/20/00	7439-97-6	Mercury	0.05	1.82
3050	10/20/00	6010	10/29/00	7782-49-2	Selenium	30	30 U
3050	10/20/00	6010	10/29/00	7440-22-4	Silver	2	2

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-160-0-1**
TOTAL METALS

Lab Sample ID: CH49C
LIMS ID: 00-19103
Matrix: Soil

QC Report No: CH49-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/06/00
Date Received: 10/09/00

Data Release Authorized:
Reported: 10/31/00

Percent Total Solids: 79.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/20/00	6010	10/29/00	7440-38-2	Arsenic	30	30
3050	10/20/00	6010	10/29/00	7440-39-3	Barium	2	592
3050	10/20/00	6010	10/29/00	7440-43-9	Cadmium	1	22
3050	10/20/00	6010	10/29/00	7440-47-3	Chromium	3	85
3050	10/20/00	6010	10/29/00	7440-50-8	Copper	1	1,210
3050	10/20/00	6010	10/29/00	7439-92-1	Lead	10	2,040
CLP	10/24/00	7471	10/24/00	7439-97-6	Mercury	0 05	2.19
3050	10/20/00	6010	10/29/00	7782-49-2	Selenium	30	30 U
3050	10/20/00	6010	10/29/00	7440-22-4	Silver	2	2

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-17-0-1**
TOTAL METALS

Lab Sample ID: CH49D
LIMS ID: 00-19104
Matrix: Soil

QC Report No: CH49-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/06/00
Date Received: 10/09/00

Data Release Authorized:
Reported: 10/31/00

Percent Total Solids: 91.5%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/20/00	6010	10/30/00	7440-38-2	Arsenic	50	60
3050	10/20/00	6010	10/30/00	7440-39-3	Barium	3	272
3050	10/20/00	6010	10/30/00	7440-43-9	Cadmium	2	15
3050	10/20/00	6010	10/30/00	7440-47-3	Chromium	5	120
3050	10/20/00	6010	10/30/00	7440-50-8	Copper	2	2,930
3050	10/20/00	6010	10/30/00	7439-92-1	Lead	20	1,470
CLP	10/20/00	7471	10/20/00	7439-97-6	Mercury	0.05	0.40
3050	10/20/00	6010	10/30/00	7782-49-2	Selenium	50	50 U
3050	10/20/00	6010	10/30/00	7440-22-4	Silver	3	3 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: **Method Blank**

Lab Sample ID: CH49MB
LIMS ID: 00-19101
Matrix: Soil

QC Report No: CH49-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized
Reported: 10/31/00

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/20/00	6010	10/29/00	7440-38-2	Arsenic	5	5 U
3050	10/20/00	6010	10/29/00	**7440-39-3**	**Barium**	0.3	**0.4**
3050	10/20/00	6010	10/29/00	7440-43-9	Cadmium	0.2	0.2 U
3050	10/20/00	6010	10/29/00	7440-47-3	Chromium	0.5	0.5 U
3050	10/20/00	6010	10/29/00	**7440-50-8**	**Copper**	0.2	**0.2**
3050	10/20/00	6010	10/29/00	7439-92-1	Lead	2	2 U
CLP	10/20/00	7471	10/20/00	7439-97-6	Mercury	0.05	0.05 U
3050	10/20/00	6010	10/29/00	7782-49-2	Selenium	5	5 U
3050	10/20/00	6010	10/29/00	7440-22-4	Silver	0.3	0.3 U

U Analyte undetected at given RL

RL Reporting Limit

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CH49LCS
LIMS ID: 00-19101
Matrix: Soil

QC Report No: CH49-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 10/31/00

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike mg/kg-dry	Spike Added	% Recovery	Q
Arsenic	6010	199	200	99.5%	
Barium	6010	193	200	96.5%	
Cadmium	6010	49.0	50.0	98.0%	
Chromium	6010	50.5	50.0	101%	
Copper	6010	50.1	50.0	100%	
Lead	6010	199	200	99.5%	
Mercury	7471	0.90	1.00	90.0%	
Selenium	6010	202	200	101%	
Silver	6010	48.6	50.0	97.2%	

'Q' codes: N = control limit not met

Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: Method Blank

Lab Sample ID: CH49MB
LIMS ID: 00-19103
Matrix: Soil

QC Report No: CH49-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized
Reported: 10/31/00

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
CLP	10/24/00	7470	10/24/00	7439-97-6	Mercury	0.05	0.05 U

U Analyte undetected at given RL

RL Limit of Detection

FORM-I

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CH49LCS
LIMS ID: 00-19103
Matrix: Soil

QC Report No: CH49-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 10/31/00

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike mg/kg-dry	Spike Added	% Recovery	Q
Mercury	7471	1.01	1.00	101%	

'Q' codes: N = control limit not met

Control Limits: 80-120%

Analytical Resources, Incorporated
Analytical Chemists and Consultants

November 20, 2000

Ty Schreiner
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: Project: Tacoma Metals
ARI Job: CI24

Dear Ty:

Please find enclosed sample custody records and final analytical results for the above referenced project. Forty-eight soil samples were received in good condition on October 13, 2000. Per instruction, selected samples were placed on hold at –18 degrees celcius. The remaining samples were analyzed for volatiles referencing EPA 8260, PCBs referencing EPA 8082, and total metals referencing EPA 6010/7471. Total diesel and motor oil range hydrocarbons were determined referencing WDOE method NWTPH-Dx.

All samples for volatile analysis were run as concentrated as possible to provide the lowest possible detection limits for analytes. Acetone was detected in the 10/18 method blank. Associated sample results were qualified with a "B" to flag possible lab contamination.

Sample **TP-33-0-1** for the PCB analysis required dilution and re-analysis to quantitate aroclor 1254 within the linear range of the GC/ECD instrument. This sample also showed elevated recoveries for one of the two surrogates. As these extracts showed acceptable recoveries for at least one of the surrogates, no corrective action was taken. Quantitation of the Aroclor 1254 in the MS and MSD of sample **TP-23-0-1** are biased high due to inteference from the 1242 spike.

The barium duplicate for TP-23-0-1 was outside QC limits. No action was taken, as levels of metals found were magnitudes above detection.

No other analytical complications were noted. Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

Sue Dunnihoo

SD/kg
Enclosures

CC: Jodi Brundage, Kennedy Jenks Consultants,

RECEIVED
NOV 22 2000
KJ Federal Way
KJ No/File
Route
Return To/By

333 Ninth Avenue North • Seattle WA 98109-5187 • **206-621-6490** • **206-621-7523** fax

00-19682 to 00-19701 CI24

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
400 Ninth Avenue North
Seattle, WA 98109-4708
206-621-6490 206-621-7523 (fax)

Turn Around Requested: Normal

Report to: TY SCHREINER
Company: KENNEDY / JENKS
Address: 530 S. 336th ST
FEDERAL WAY, WA 98003
Phone (253) 874-0555
Fax: (253) 952-3435

Proj Name: TACOMA METALS
Proj Number: 996098.00
Sampler: TAH, JRB
Shipping Method: COURIER
AirBill:

Sample ID	Sample Date	Sample Time	Sample Matrix	No Containers	NWTPH-DX	RCRA METALS	CN	VOCS	PCBS		HOLD				Notes/Comments
TP-23-0-1	10/11/00	8:00	SOIL	2	X	X	X		X						
TP-23-2-3		8:15		2	X	X	X				X				Freeze all extras/ Holds
TP-23-4-6		8:35		2							X				
TP-23-6-10		9:00		2							X				
TP-24-0-1		9:30		2	X	X	X				X				
TP-24-2-3		9:45		2							X				
TP-24-4-6		9:55		2							X				
TP-24-6-10		10:05		2							X				
TP-25-0-1		10:20			X	X	X		X						
TP-25-2-3		10:30									X				
TP-25-4-6		10:40									X				
TP-25-6-10		11:00									X				
TP-26-0-1		11:20			X	X	X				X				
TP-26-2-3		11:30									X				
TP-26-4-6		11:45			X	X	X				X				
TP-26-6-10		12:00			X	X	X				X				
TP-28-0-1		12:00			X	X	X				X				
TP-28-2-3		1:05			X	X	X	X							
TP-28-4-6		1:10									X				
TP-28-6-10		1:25													

Relinquished: (Signature)	Relinquished: (Signature)	Relinquished: (Signature)	Special Instructions/Notes
Printed name: I. Anthony Harding	Printed name:	Printed name:	
Company: KJ Consultants	Company:	Company:	
Date: 10/12/00 Time: 9:00am	Date: Time:	Date: Time:	
Received by: Elizabeth Joshi	Received by:	Received by:	
Printed name: ELISEBETH JOSHI	Printed name:	Printed name:	
Company: ARI	Company:	Company:	Number of Coolers:
			Cooler Temp(s):
Date: 10/13/00 Time: 1000	Date: Time:	Date: Time:	COC Seals Intact?
			Bottles Intact?

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
400 Ninth Avenue North
Seattle, WA 98109-4708
206-621-6490 206-621-7523 (fax)

Turn Around Requested: _____

Report to: TY SCHREINER
Company: KENNEDY/JENKS
Address: 530 S. 336th ST.
Federal Way WA 98003
Phone: 253 874-0555
Fax:

Proj Name: TACOMA METALS
Proj Number: 996098.00
Sampler:
Shipping Method:
AirBill:

Sample ID	Sample Date	Sample Time	Sample Matrix	No Containers	NWTPH-DX	RCRA METALS	CN	VOCs	PCBs		HOLD				Notes/Comments
TP-27-0-1	10/11/00	2:30p	SOIL	2	X	X	X	X	X						Freeze all "Holds" & Extras
TP-27-2-3		2:55		2	X	X	X				X				
TP-27-4-6		3:50		2							X				
~~TP-28-0-1~~		~~[illegible]~~		~~2~~	~~X~~	~~X~~	~~X~~	~~X~~							
TP-27-6-10		3:20		2							X				
TP-27D-0-1		4:30p		2	X	X	X	X	X						
TP-29-0-1	10/12/00	8:50		2	X	X	X		X						
TP-29-2-3		9:00		2					[illegible]		X				
TP-29-4-6		9:15		2					[illegible]		X				
TP-29-6-10		9:25		2					[illegible]		X				
TP-30-0-1		9:50		2	X	X	X				X				
TP-30-2-3		10:00		2	X	X	X	X							
TP-30-4-6		10:30		2							X				
TP-30-6-10		10:45		2							X				
TP-31-0-1		11:00		2	X	X	X	X	X						
TP-31-2-3		11:10		2	X	X	X	X							
TP-31-4-6		11:20		2							X				
TP-31-6-10		11:[illegible]		2							X				
TP-32-0-1		12:25		2	X	X	X	X							
TP-33-0-1		12:45		2	X	X	X		X						

Relinquished:	Relinquished:	Relinquished:	Special Instructions/Notes
(Signature) [signature]	(Signature)	(Signature)	
Printed name: Anthony Harding	Printed name:	Printed name:	
Company: KJ Consultants	Company:	Company:	
Date: 10/13/00 Time: 9:00am	Date: Time:	Date: Time:	
Received by: [signature]	Received by:	Received by:	
Printed name: ELISEBETH JOSHI	Printed name:	Printed name:	
Company: ARI	Company:	Company:	Number of Coolers:
			Cooler Temp(s):
Date: 10/13/00 Time: 1000	Date: Time:	Date: Time:	COC Seals Intact?
			Bottles Intact?

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
400 Ninth Avenue North
Seattle, WA 98109-4708
206-621-6490 206-621-7523 (fax)

Turn Around Requested: _____

Report to: TY SCHREIJER
Company: KENNEDY JENKS
Address: 530 S. 336th ST
Federal Way, WA 98003
Phone: 253 874-0555
Fax:

Proj Name: TACOMA METALS
Proj Number: 996098.00
Sampler:
Shipping Method:
AirBill:

Sample ID	Sample Date	Sample Time	Sample Matrix	No Containers	NWTPH-DX	PERA METALS	EW	VOCS	PCBS		HOLD				Notes/Comments
TP-33-2-3	10/12/00	12:55	SOIL	2							X				Freeze all "Holds" & Extras
TP-33-4-6		1:05		2							X				
TP-33 6-10		1:30		2							X				
TP-34-0-1		1:50		2	X	X	X				X				
TP-34-2-3		2:00		2	X	X	X		X						
TP-34-4-6		2:15		2											
TP-34-6-10		2:30		2											
TP-340-0-1		2:40		2	X	X	X		X						

Relinquished: (Signature)	Relinquished: (Signature)	Relinquished: (Signature)	Special Instructions/Notes
Printed name: Anthony Harding	Printed name:	Printed name:	
Company: KJ Consultants	Company:	Company:	
Date: 10/13/00 Time: 9:00am	Date: Time:	Date: Time:	
Received by: Elizabeth Joshi	Received by:	Received by:	
Printed name: ELIZABETH JOSHI	Printed name:	Printed name:	
Company: ARI	Company:	Company:	Number of Coolers:
			Cooler Temp(s):
Date: 10/13/00 Time: 1000	Date: Time:	Date: Time:	COC Seals Intact?
			Bottles Intact?

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 102400MB
LIMS ID: 00-19693
Matrix: Soil
Data Release Authorized:
Reported: 10/27/00

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN5
Date Analyzed: 10/24/00 15:23

Sample Amount: 5.00 g dry Wt Equiv
Percent Moisture: NA

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	3.0 U
67-64-1	Acetone	5.0 U
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	trans-1,2-Dichloroethene	1.0 U
156-59-2	cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
108-05-4	Vinyl Acetate	5.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-02-6	trans-1,3-Dichloropropene	1.0 U
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.0 U
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	1.0 U
1330-20-7	m,p-Xylene	1.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 102400MB
LIMS ID: 00-19693
Matrix: Soil
Data Release Authorized:
Reported: 10/27/00

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN5
Date Analyzed: 10/24/00 15:23

Sample Amount: 5.00 g dry Wt Equiv
Percent Moisture: NA

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	1.0 U
95-50-1	1,2-Dichlorobenzene	1.0 U
541-73-1	1,3-Dichlorobenzene	1.0 U
106-46-7	1,4-Dichlorobenzene	1.0 U
107-02-8	Acrolein	50 U
74-88-4	Methyl Iodide	1.0 U
74-96-4	Bromoethane	2.0 U
107-13-1	Acrylonitrile	5.0 U
563-58-6	1,1-Dichloropropene	1.0 U
74-95-3	Dibromomethane	1.0 U
630-20-6	1,1,1,2-Tetrachloroethane	1.0 U
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U
96-18-4	1,2,3-Trichloropropane	2.0 U
110-57-6	trans-1,4-Dichloro-2-butene	5.0 U
108-67-8	1,3,5-Trimethylbenzene	1.0 U
95-63-6	1,2,4-Trimethylbenzene	1.0 U
87-68-3	Hexachlorobutadiene	5.0 U
106-93-4	Ethylene Dibromide	1.0 U
74-97-5	Bromochloromethane	1.0 U
594-20-7	2,2-Dichloropropane	1.0 U
142-28-9	1,3-Dichloropropane	1.0 U
98-82-8	Isopropylbenzene	1.0 U
103-65-1	n-Propylbenzene	1.0 U
108-86-1	Bromobenzene	1.0 U
95-49-8	2-Chlorotoluene	1.0 U
106-43-4	4-Chlorotoluene	1.0 U
98-06-6	tert-Butylbenzene	1.0 U
135-98-8	sec-Butylbenzene	1.0 U
99-87-6	4-Isopropyltoluene	1.0 U
104-51-8	n-Butylbenzene	2.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0 U
91-20-3	Naphthalene	5.0 U
87-61-6	1,2,3-Trichlorobenzene	5.0 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	99.8%
d8-Toluene	102%
Bromofluorobenzene	92.7%
d4-1,2-Dichlorobenzene	98.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-28-2-3

Lab Sample ID: CI24I
LIMS ID: 00-19690
Matrix: Soil
Data Release Authorized:
Reported: 10/27/00

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/11/00
Date Received: 10/13/00

Instrument: FINN5
Date Analyzed: 10/24/00 20:45

Sample Amount: 0.91 g dry Wt
Percent Moisture: 9.2%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	5.5 U
74-83-9	Bromomethane	5.5 U
75-01-4	Vinyl Chloride	5.5 U
75-00-3	Chloroethane	5.5 U
75-09-2	Methylene Chloride	17 U
67-64-1	Acetone	28 U
75-15-0	Carbon Disulfide	5.5 U
75-35-4	1,1-Dichloroethene	5.5 U
75-34-3	1,1-Dichloroethane	5.5 U
156-60-5	trans-1,2-Dichloroethene	5.5 U
156-59-2	cis-1,2-Dichloroethene	5.5 U
67-66-3	Chloroform	5.5 U
107-06-2	1,2-Dichloroethane	5.5 U
78-93-3	2-Butanone	28 U
71-55-6	1,1,1-Trichloroethane	5.5 U
56-23-5	Carbon Tetrachloride	5.5 U
108-05-4	Vinyl Acetate	28 U
75-27-4	Bromodichloromethane	5.5 U
78-87-5	1,2-Dichloropropane	5.5 U
10061-01-5	cis-1,3-Dichloropropene	5.5 U
79-01-6	Trichloroethene	5.5 U
124-48-1	Dibromochloromethane	5.5 U
79-00-5	1,1,2-Trichloroethane	5.5 U
71-43-2	Benzene	5.5 U
10061-02-6	trans-1,3-Dichloropropene	5.5 U
110-75-8	2-Chloroethylvinylether	28 U
75-25-2	Bromoform	5.5 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	28 U
591-78-6	2-Hexanone	28 U
127-18-4	Tetrachloroethene	5.5 U
79-34-5	1,1,2,2-Tetrachloroethane	5.5 U
108-88-3	**Toluene**	**150**
108-90-7	Chlorobenzene	5.5 U
100-41-4	Ethylbenzene	5.5 U
100-42-5	Styrene	5.5 U
75-69-4	Trichlorofluoromethane	5.5 U
76-13-1	1,1,2-Trichlorotrifluoroethane	5.5 U
1330-20-7	m,p-Xylene	5.5 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-28-2-3

Lab Sample ID: CI24I
LIMS ID: 00-19690
Matrix: Soil
Data Release Authorized:
Reported: 10/27/00

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/11/00
Date Received: 10/13/00

Instrument: FINN5
Date Analyzed: 10/24/00 20:45

Sample Amount: 0.91 g dry Wt
Percent Moisture: 9.2%

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	5.5 U
95-50-1	1,2-Dichlorobenzene	5.5 U
541-73-1	1,3-Dichlorobenzene	5.5 U
106-46-7	1,4-Dichlorobenzene	5.5 U
107-02-8	Acrolein	280 U
74-88-4	Methyl Iodide	5.5 U
74-96-4	Bromoethane	11 U
107-13-1	Acrylonitrile	28 U
563-58-6	1,1-Dichloropropene	5.5 U
74-95-3	Dibromomethane	5.5 U
630-20-6	1,1,1,2-Tetrachloroethane	5.5 U
96-12-8	1,2-Dibromo-3-chloropropane	28 U
96-18-4	1,2,3-Trichloropropane	11 U
110-57-6	trans-1,4-Dichloro-2-butene	28 U
108-67-8	1,3,5-Trimethylbenzene	5.5 U
95-63-6	1,2,4-Trimethylbenzene	5.5 U
87-68-3	Hexachlorobutadiene	28 U
106-93-4	Ethylene Dibromide	5.5 U
74-97-5	Bromochloromethane	5.5 U
594-20-7	2,2-Dichloropropane	5.5 U
142-28-9	1,3-Dichloropropane	5.5 U
98-82-8	Isopropylbenzene	5.5 U
103-65-1	n-Propylbenzene	5.5 U
108-86-1	Bromobenzene	5.5 U
95-49-8	2-Chlorotoluene	5.5 U
106-43-4	4-Chlorotoluene	5.5 U
98-06-6	tert-Butylbenzene	5.5 U
135-98-8	sec-Butylbenzene	5.5 U
99-87-6	4-Isopropyltoluene	5.5 U
104-51-8	n-Butylbenzene	11 U
120-82-1	1,2,4-Trichlorobenzene	28 U
91-20-3	Naphthalene	28 U
87-61-6	**1,2,3-Trichlorobenzene**	**30 M**

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	116%
d8-Toluene	104%
Bromofluorobenzene	102%
d4-1,2-Dichlorobenzene	99.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-27-0-1

Lab Sample ID: CI24J
LIMS ID: 00-19691
Matrix: Soil
Data Release Authorized:
Reported: 10/27/00

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/11/00
Date Received: 10/13/00

Instrument: FINN5
Date Analyzed: 10/24/00 21:11

Sample Amount: 0.88 g dry Wt
Percent Moisture: 13.3%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	5.7 U
74-83-9	Bromomethane	5.7 U
75-01-4	Vinyl Chloride	5.7 U
75-00-3	Chloroethane	5.7 U
75-09-2	Methylene Chloride	17 U
67-64-1	Acetone	28 U
75-15-0	Carbon Disulfide	5.7 U
75-35-4	1,1-Dichloroethene	5.7 U
75-34-3	1,1-Dichloroethane	5.7 U
156-60-5	trans-1,2-Dichloroethene	5.7 U
156-59-2	cis-1,2-Dichloroethene	5.7 U
67-66-3	Chloroform	5.7 U
107-06-2	1,2-Dichloroethane	5.7 U
78-93-3	2-Butanone	28 U
71-55-6	1,1,1-Trichloroethane	5.7 U
56-23-5	Carbon Tetrachloride	5.7 U
108-05-4	Vinyl Acetate	28 U
75-27-4	Bromodichloromethane	5.7 U
78-87-5	1,2-Dichloropropane	5.7 U
10061-01-5	cis-1,3-Dichloropropene	5.7 U
79-01-6	Trichloroethene	5.7 U
124-48-1	Dibromochloromethane	5.7 U
79-00-5	1,1,2-Trichloroethane	5.7 U
71-43-2	Benzene	5.7 U
10061-02-6	trans-1,3-Dichloropropene	5.7 U
110-75-8	2-Chloroethylvinylether	28 U
75-25-2	Bromoform	5.7 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	28 U
591-78-6	2-Hexanone	28 U
127-18-4	Tetrachloroethene	5.7 U
79-34-5	1,1,2,2-Tetrachloroethane	5.7 U
108-88-3	**Toluene**	**320**
108-90-7	Chlorobenzene	5.7 U
100-41-4	Ethylbenzene	5.7 U
100-42-5	Styrene	5.7 U
75-69-4	Trichlorofluoromethane	5.7 U
76-13-1	1,1,2-Trichlorotrifluoroethane	5.7 U
1330-20-7	m,p-Xylene	5.7 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-27-0-1

Lab Sample ID: CI24J
LIMS ID: 00-19691
Matrix: Soil
Data Release Authorized:
Reported: 10/27/00

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/11/00
Date Received: 10/13/00

Instrument: FINN5
Date Analyzed: 10/24/00 21:11

Sample Amount: 0.88 g dry Wt
Percent Moisture: 13.3%

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	5.7 U
95-50-1	1,2-Dichlorobenzene	5.7 U
541-73-1	1,3-Dichlorobenzene	5.7 U
106-46-7	1,4-Dichlorobenzene	5.7 U
107-02-8	Acrolein	280 U
74-88-4	Methyl Iodide	5.7 U
74-96-4	Bromoethane	11 U
107-13-1	Acrylonitrile	28 U
563-58-6	1,1-Dichloropropene	5.7 U
74-95-3	Dibromomethane	5.7 U
630-20-6	1,1,1,2-Tetrachloroethane	5.7 U
96-12-8	1,2-Dibromo-3-chloropropane	28 U
96-18-4	1,2,3-Trichloropropane	11 U
110-57-6	trans-1,4-Dichloro-2-butene	28 U
108-67-8	1,3,5-Trimethylbenzene	5.7 U
95-63-6	1,2,4-Trimethylbenzene	5.7 U
87-68-3	Hexachlorobutadiene	28 U
106-93-4	Ethylene Dibromide	5.7 U
74-97-5	Bromochloromethane	5.7 U
594-20-7	2,2-Dichloropropane	5.7 U
142-28-9	1,3-Dichloropropane	5.7 U
98-82-8	Isopropylbenzene	5.7 U
103-65-1	n-Propylbenzene	5.7 U
108-86-1	Bromobenzene	5.7 U
95-49-8	2-Chlorotoluene	5.7 U
106-43-4	4-Chlorotoluene	5.7 U
98-06-6	tert-Butylbenzene	5.7 U
135-98-8	sec-Butylbenzene	5.7 U
99-87-6	4-Isopropyltoluene	5.7 U
104-51-8	n-Butylbenzene	11 U
120-82-1	1,2,4-Trichlorobenzene	28 U
91-20-3	Naphthalene	28 U
87-61-6	1,2,3-Trichlorobenzene	28 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	116%
d8-Toluene	103%
Bromofluorobenzene	98.8%
d4-1,2-Dichlorobenzene	101%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-270-0-1

Lab Sample ID: CI24L
LIMS ID: 00-19693
Matrix: Soil
Data Release Authorized:
Reported: 10/27/00

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/11/00
Date Received: 10/13/00

Instrument: FINN5
Date Analyzed: 10/24/00 21:37

Sample Amount: 1.01 g dry Wt
Percent Moisture: 13.7%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	5.0 U
74-83-9	Bromomethane	5.0 U
75-01-4	Vinyl Chloride	5.0 U
75-00-3	Chloroethane	5.0 U
75-09-2	Methylene Chloride	15 U
67-64-1	Acetone	25 U
75-15-0	Carbon Disulfide	5.0 U
75-35-4	1,1-Dichloroethene	5.0 U
75-34-3	1,1-Dichloroethane	5.0 U
156-60-5	trans-1,2-Dichloroethene	5.0 U
156-59-2	cis-1,2-Dichloroethene	5.0 U
67-66-3	Chloroform	5.0 U
107-06-2	1,2-Dichloroethane	5.0 U
78-93-3	2-Butanone	25 U
71-55-6	1,1,1-Trichloroethane	5.0 U
56-23-5	Carbon Tetrachloride	5.0 U
108-05-4	Vinyl Acetate	25 U
75-27-4	Bromodichloromethane	5.0 U
78-87-5	1,2-Dichloropropane	5.0 U
10061-01-5	cis-1,3-Dichloropropene	5.0 U
79-01-6	Trichloroethene	5.0 U
124-48-1	Dibromochloromethane	5.0 U
79-00-5	1,1,2-Trichloroethane	5.0 U
71-43-2	Benzene	5.0 U
10061-02-6	trans-1,3-Dichloropropene	5.0 U
110-75-8	2-Chloroethylvinylether	25 U
75-25-2	Bromoform	5.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	25 U
591-78-6	2-Hexanone	25 U
127-18-4	Tetrachloroethene	5.0 U
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U
108-88-3	**Toluene**	**270**
108-90-7	Chlorobenzene	5.0 U
100-41-4	Ethylbenzene	5.0 U
100-42-5	Styrene	5.0 U
75-69-4	Trichlorofluoromethane	5.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	5.0 U
1330-20-7	m,p-Xylene	5.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-270-0-1

Lab Sample ID: CI24L
LIMS ID: 00-19693
Matrix: Soil
Data Release Authorized:
Reported: 10/27/00

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/11/00
Date Received: 10/13/00

Instrument: FINN5
Date Analyzed: 10/24/00 21:37

Sample Amount: 1.01 g dry Wt
Percent Moisture: 13.7%

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	5.0 U
95-50-1	1,2-Dichlorobenzene	5.0 U
541-73-1	1,3-Dichlorobenzene	5.0 U
106-46-7	1,4-Dichlorobenzene	5.0 U
107-02-8	Acrolein	250 U
74-88-4	Methyl Iodide	5.0 U
74-96-4	Bromoethane	9.9 U
107-13-1	Acrylonitrile	25 U
563-58-6	1,1-Dichloropropene	5.0 U
74-95-3	Dibromomethane	5.0 U
630-20-6	1,1,1,2-Tetrachloroethane	5.0 U
96-12-8	1,2-Dibromo-3-chloropropane	25 U
96-18-4	1,2,3-Trichloropropane	9.9 U
110-57-6	trans-1,4-Dichloro-2-butene	25 U
108-67-8	1,3,5-Trimethylbenzene	5.0 U
95-63-6	1,2,4-Trimethylbenzene	5.0 U
87-68-3	Hexachlorobutadiene	25 U
106-93-4	Ethylene Dibromide	5.0 U
74-97-5	Bromochloromethane	5.0 U
594-20-7	2,2-Dichloropropane	5.0 U
142-28-9	1,3-Dichloropropane	5.0 U
98-82-8	Isopropylbenzene	5.0 U
103-65-1	n-Propylbenzene	5.0 U
108-86-1	Bromobenzene	5.0 U
95-49-8	2-Chlorotoluene	5.0 U
106-43-4	4-Chlorotoluene	5.0 U
98-06-6	tert-Butylbenzene	5.0 U
135-98-8	sec-Butylbenzene	5.0 U
99-87-6	4-Isopropyltoluene	5.0 U
104-51-8	n-Butylbenzene	9.9 U
120-82-1	1,2,4-Trichlorobenzene	25 U
91-20-3	Naphthalene	25 U
87-61-6	1,2,3-Trichlorobenzene	25 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	116%
d8-Toluene	104%
Bromofluorobenzene	99.3%
d4-1,2-Dichlorobenzene	101%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-30-2-3

Lab Sample ID: CI240
LIMS ID: 00-19696
Matrix: Soil
Data Release Authorized:
Reported: 10/27/00

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Instrument: FINN5
Date Analyzed: 10/24/00 22:04

Sample Amount: 1.05 g dry Wt
Percent Moisture: 13.4%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	4.8 U
74-83-9	Bromomethane	4.8 U
75-01-4	Vinyl Chloride	4.8 U
75-00-3	Chloroethane	4.8 U
75-09-2	Methylene Chloride	14 U
67-64-1	**Acetone**	**130**
75-15-0	Carbon Disulfide	4.8 U
75-35-4	1,1-Dichloroethene	4.8 U
75-34-3	1,1-Dichloroethane	4.8 U
156-60-5	trans-1,2-Dichloroethene	4.8 U
156-59-2	cis-1,2-Dichloroethene	4.8 U
67-66-3	Chloroform	4.8 U
107-06-2	1,2-Dichloroethane	4.8 U
78-93-3	2-Butanone	24 U
71-55-6	1,1,1-Trichloroethane	4.8 U
56-23-5	Carbon Tetrachloride	4.8 U
108-05-4	Vinyl Acetate	24 U
75-27-4	Bromodichloromethane	4.8 U
78-87-5	1,2-Dichloropropane	4.8 U
10061-01-5	cis-1,3-Dichloropropene	4.8 U
79-01-6	Trichloroethene	4.8 U
124-48-1	Dibromochloromethane	4.8 U
79-00-5	1,1,2-Trichloroethane	4.8 U
71-43-2	Benzene	4.8 U
10061-02-6	trans-1,3-Dichloropropene	4.8 U
110-75-8	2-Chloroethylvinylether	24 U
75-25-2	Bromoform	4.8 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	24 U
591-78-6	2-Hexanone	24 U
127-18-4	Tetrachloroethene	4.8 U
79-34-5	1,1,2,2-Tetrachloroethane	4.8 U
108-88-3	**Toluene**	**640**
108-90-7	Chlorobenzene	4.8 U
100-41-4	Ethylbenzene	4.8 U
100-42-5	Styrene	4.8 U
75-69-4	Trichlorofluoromethane	4.8 U
76-13-1	1,1,2-Trichlorotrifluoroethane	4.8 U
1330-20-7	**m,p-Xylene**	**5.4**

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-30-2-3

Lab Sample ID: CI240
LIMS ID: 00-19696
Matrix: Soil
Data Release Authorized:
Reported: 10/27/00

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Instrument: FINN5
Date Analyzed: 10/24/00 22:04

Sample Amount: 1.05 g dry Wt
Percent Moisture: 13.4%

CAS Number	Analyte	ug/kg
95-47-6	**o-Xylene**	**11**
95-50-1	1,2-Dichlorobenzene	4.8 U
541-73-1	1,3-Dichlorobenzene	4.8 U
106-46-7	1,4-Dichlorobenzene	4.8 U
107-02-8	Acrolein	240 U
74-88-4	Methyl Iodide	4.8 U
74-96-4	Bromoethane	9.5 U
107-13-1	Acrylonitrile	24 U
563-58-6	1,1-Dichloropropene	4.8 U
74-95-3	Dibromomethane	4.8 U
630-20-6	1,1,1,2-Tetrachloroethane	4.8 U
96-12-8	1,2-Dibromo-3-chloropropane	24 U
96-18-4	1,2,3-Trichloropropane	9.5 U
110-57-6	trans-1,4-Dichloro-2-butene	24 U
108-67-8	**1,3,5-Trimethylbenzene**	**150**
95-63-6	**1,2,4-Trimethylbenzene**	**180**
87-68-3	Hexachlorobutadiene	24 U
106-93-4	Ethylene Dibromide	4.8 U
74-97-5	Bromochloromethane	4.8 U
594-20-7	2,2-Dichloropropane	4.8 U
142-28-9	1,3-Dichloropropane	4.8 U
98-82-8	**Isopropylbenzene**	**35**
103-65-1	**n-Propylbenzene**	**58**
108-86-1	Bromobenzene	4.8 U
95-49-8	2-Chlorotoluene	4.8 U
106-43-4	4-Chlorotoluene	4.8 U
98-06-6	tert-Butylbenzene	4.8 U
135-98-8	sec-Butylbenzene	4.8 U
99-87-6	4-Isopropyltoluene	4.8 U
104-51-8	n-Butylbenzene	9.5 U
120-82-1	1,2,4-Trichlorobenzene	24 U
91-20-3	Naphthalene	24 U
87-61-6	1,2,3-Trichlorobenzene	24 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	118%
d8-Toluene	102%
Bromofluorobenzene	100%
d4-1,2-Dichlorobenzene	102%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-31-0-1

Lab Sample ID: CI24P
LIMS ID: 00-19697
Matrix: Soil
Data Release Authorized:
Reported: 10/27/00

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Instrument: FINN5
Date Analyzed: 10/24/00 22:30

Sample Amount: 1.07 g dry Wt
Percent Moisture: 10.2%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	4.7 U
74-83-9	Bromomethane	4.7 U
75-01-4	Vinyl Chloride	4.7 U
75-00-3	Chloroethane	4.7 U
75-09-2	Methylene Chloride	14 U
67-64-1	**Acetone**	**92**
75-15-0	Carbon Disulfide	4.7 U
75-35-4	1,1-Dichloroethene	4.7 U
75-34-3	1,1-Dichloroethane	4.7 U
156-60-5	trans-1,2-Dichloroethene	4.7 U
156-59-2	cis-1,2-Dichloroethene	4.7 U
67-66-3	Chloroform	4.7 U
107-06-2	**1,2-Dichloroethane**	**43**
78-93-3	2-Butanone	23 U
71-55-6	1,1,1-Trichloroethane	4.7 U
56-23-5	Carbon Tetrachloride	4.7 U
108-05-4	Vinyl Acetate	23 U
75-27-4	Bromodichloromethane	4.7 U
78-87-5	1,2-Dichloropropane	4.7 U
10061-01-5	cis-1,3-Dichloropropene	4.7 U
79-01-6	Trichloroethene	4.7 U
124-48-1	Dibromochloromethane	4.7 U
79-00-5	1,1,2-Trichloroethane	4.7 U
71-43-2	Benzene	4.7 U
10061-02-6	trans-1,3-Dichloropropene	4.7 U
110-75-8	2-Chloroethylvinylether	23 U
75-25-2	Bromoform	4.7 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	23 U
591-78-6	2-Hexanone	23 U
127-18-4	Tetrachloroethene	4.7 U
79-34-5	1,1,2,2-Tetrachloroethane	4.7 U
108-88-3	**Toluene**	**640**
108-90-7	Chlorobenzene	4.7 U
100-41-4	Ethylbenzene	4.7 U
100-42-5	Styrene	4.7 U
75-69-4	Trichlorofluoromethane	4.7 U
76-13-1	1,1,2-Trichlorotrifluoroethane	4.7 U
1330-20-7	m,p-Xylene	4.7 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-31-0-1

Lab Sample ID: CI24P
LIMS ID: 00-19697
Matrix: Soil
Data Release Authorized:
Reported: 10/27/00

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Instrument: FINN5
Date Analyzed: 10/24/00 22:30

Sample Amount: 1.07 g dry Wt
Percent Moisture: 10.2%

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	4.7 U
95-50-1	1,2-Dichlorobenzene	4.7 U
541-73-1	1,3-Dichlorobenzene	4.7 U
106-46-7	1,4-Dichlorobenzene	4.7 U
107-02-8	Acrolein	230 U
74-88-4	Methyl Iodide	4.7 U
74-96-4	Bromoethane	9.3 U
107-13-1	Acrylonitrile	23 U
563-58-6	1,1-Dichloropropene	4.7 U
74-95-3	Dibromomethane	4.7 U
630-20-6	1,1,1,2-Tetrachloroethane	4.7 U
96-12-8	1,2-Dibromo-3-chloropropane	23 U
96-18-4	1,2,3-Trichloropropane	9.3 U
110-57-6	trans-1,4-Dichloro-2-butene	23 U
108-67-8	1,3,5-Trimethylbenzene	4.7 U
95-63-6	1,2,4-Trimethylbenzene	4.7 U
87-68-3	Hexachlorobutadiene	23 U
106-93-4	Ethylene Dibromide	4.7 U
74-97-5	Bromochloromethane	4.7 U
594-20-7	2,2-Dichloropropane	4.7 U
142-28-9	1,3-Dichloropropane	4.7 U
98-82-8	Isopropylbenzene	4.7 U
103-65-1	n-Propylbenzene	4.7 U
108-86-1	Bromobenzene	4.7 U
95-49-8	2-Chlorotoluene	4.7 U
106-43-4	4-Chlorotoluene	4.7 U
98-06-6	tert-Butylbenzene	4.7 U
135-98-8	sec-Butylbenzene	4.7 U
99-87-6	**4-Isopropyltoluene**	**7.6**
104-51-8	n-Butylbenzene	9.3 U
120-82-1	1,2,4-Trichlorobenzene	23 U
91-20-3	Naphthalene	23 U
87-61-6	1,2,3-Trichlorobenzene	23 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	114%
d8-Toluene	105%
Bromofluorobenzene	100%
d4-1,2-Dichlorobenzene	100%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-31-2-3

Lab Sample ID: CI24Q
LIMS ID: 00-19698
Matrix: Soil
Data Release Authorized:
Reported: 10/27/00

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Instrument: FINN5
Date Analyzed: 10/24/00 22:56

Sample Amount: 0.91 g dry Wt
Percent Moisture: 9.8%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	5.5 U
74-83-9	Bromomethane	5.5 U
75-01-4	Vinyl Chloride	5.5 U
75-00-3	Chloroethane	5.5 U
75-09-2	Methylene Chloride	16 U
67-64-1	**Acetone**	**76**
75-15-0	Carbon Disulfide	5.5 U
75-35-4	1,1-Dichloroethene	5.5 U
75-34-3	1,1-Dichloroethane	5.5 U
156-60-5	trans-1,2-Dichloroethene	5.5 U
156-59-2	cis-1,2-Dichloroethene	5.5 U
67-66-3	Chloroform	5.5 U
107-06-2	1,2-Dichloroethane	5.5 U
78-93-3	2-Butanone	27 U
71-55-6	1,1,1-Trichloroethane	5.5 U
56-23-5	Carbon Tetrachloride	5.5 U
108-05-4	Vinyl Acetate	27 U
75-27-4	Bromodichloromethane	5.5 U
78-87-5	1,2-Dichloropropane	5.5 U
10061-01-5	cis-1,3-Dichloropropene	5.5 U
79-01-6	Trichloroethene	5.5 U
124-48-1	Dibromochloromethane	5.5 U
79-00-5	1,1,2-Trichloroethane	5.5 U
71-43-2	Benzene	5.5 U
10061-02-6	trans-1,3-Dichloropropene	5.5 U
110-75-8	2-Chloroethylvinylether	27 U
75-25-2	Bromoform	5.5 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	27 U
591-78-6	2-Hexanone	27 U
127-18-4	Tetrachloroethene	5.5 U
79-34-5	1,1,2,2-Tetrachloroethane	7.5 Y
108-88-3	**Toluene**	**170**
108-90-7	Chlorobenzene	5.5 U
100-41-4	Ethylbenzene	5.5 U
100-42-5	Styrene	5.5 U
75-69-4	Trichlorofluoromethane	5.5 U
76-13-1	1,1,2-Trichlorotrifluoroethane	5.5 U
1330-20-7	**m,p-Xylene**	**6.6**

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-31-2-3

Lab Sample ID: CI24Q
LIMS ID: 00-19698
Matrix: Soil
Data Release Authorized:
Reported: 10/27/00

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Instrument: FINN5
Date Analyzed: 10/24/00 22:56

Sample Amount: 0.91 g dry Wt
Percent Moisture: 9.8%

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	5.5 U
95-50-1	1,2-Dichlorobenzene	5.5 U
541-73-1	1,3-Dichlorobenzene	5.5 U
106-46-7	1,4-Dichlorobenzene	5.5 U
107-02-8	Acrolein	270 U
74-88-4	Methyl Iodide	5.5 U
74-96-4	Bromoethane	11 U
107-13-1	Acrylonitrile	27 U
563-58-6	1,1-Dichloropropene	5.5 U
74-95-3	Dibromomethane	5.5 U
630-20-6	1,1,1,2-Tetrachloroethane	5.5 U
96-12-8	1,2-Dibromo-3-chloropropane	27 U
96-18-4	1,2,3-Trichloropropane	11 U
110-57-6	trans-1,4-Dichloro-2-butene	27 U
108-67-8	**1,3,5-Trimethylbenzene**	**14**
95-63-6	**1,2,4-Trimethylbenzene**	**22**
87-68-3	Hexachlorobutadiene	27 U
106-93-4	Ethylene Dibromide	5.5 U
74-97-5	Bromochloromethane	5.5 U
594-20-7	2,2-Dichloropropane	5.5 U
142-28-9	1,3-Dichloropropane	5.5 U
98-82-8	Isopropylbenzene	5.5 U
103-65-1	n-Propylbenzene	5.5 U
108-86-1	Bromobenzene	5.5 U
95-49-8	2-Chlorotoluene	5.5 U
106-43-4	4-Chlorotoluene	5.5 U
98-06-6	tert-Butylbenzene	5.5 U
135-98-8	sec-Butylbenzene	5.5 U
99-87-6	4-Isopropyltoluene	5.5 U
104-51-8	n-Butylbenzene	11 U
120-82-1	1,2,4-Trichlorobenzene	27 U
91-20-3	Naphthalene	27 U
87-61-6	1,2,3-Trichlorobenzene	27 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	116%
d8-Toluene	105%
Bromofluorobenzene	103%
d4-1,2-Dichlorobenzene	101%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-32-0-1

Lab Sample ID: CI24R
LIMS ID: 00-19699
Matrix: Soil
Data Release Authorized:
Reported: 10/27/00

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Instrument: FINN5
Date Analyzed: 10/24/00 23:23

Sample Amount: 0.99 g dry Wt
Percent Moisture: 17.1%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	5.1 U
74-83-9	Bromomethane	5.1 U
75-01-4	Vinyl Chloride	5.1 U
75-00-3	Chloroethane	5.1 U
75-09-2	Methylene Chloride	15 U
67-64-1	**Acetone**	**300**
75-15-0	Carbon Disulfide	5.1 U
75-35-4	1,1-Dichloroethene	5.1 U
75-34-3	1,1-Dichloroethane	5.1 U
156-60-5	trans-1,2-Dichloroethene	5.1 U
156-59-2	cis-1,2-Dichloroethene	5.1 U
67-66-3	Chloroform	5.1 U
107-06-2	1,2-Dichloroethane	5.1 U
78-93-3	**2-Butanone**	**45**
71-55-6	1,1,1-Trichloroethane	5.1 U
56-23-5	Carbon Tetrachloride	5.1 U
108-05-4	Vinyl Acetate	25 U
75-27-4	Bromodichloromethane	5.1 U
78-87-5	1,2-Dichloropropane	5.1 U
10061-01-5	cis-1,3-Dichloropropene	5.1 U
79-01-6	Trichloroethene	5.1 U
124-48-1	Dibromochloromethane	5.1 U
79-00-5	1,1,2-Trichloroethane	5.1 U
71-43-2	Benzene	5.1 U
10061-02-6	trans-1,3-Dichloropropene	5.1 U
110-75-8	2-Chloroethylvinylether	25 U
75-25-2	Bromoform	5.1 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	25 U
591-78-6	2-Hexanone	25 U
127-18-4	Tetrachloroethene	5.1 U
79-34-5	1,1,2,2-Tetrachloroethane	9.9 Y
108-88-3	**Toluene**	**780**
108-90-7	Chlorobenzene	5.1 U
100-41-4	Ethylbenzene	5.1 U
100-42-5	Styrene	5.1 U
75-69-4	Trichlorofluoromethane	5.1 U
76-13-1	1,1,2-Trichlorotrifluoroethane	5.1 U
1330-20-7	**m,p-Xylene**	**8.1**

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-32-0-1

Lab Sample ID: CI24R
LIMS ID: 00-19699
Matrix: Soil
Data Release Authorized:
Reported: 10/27/00

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Instrument: FINN5
Date Analyzed: 10/24/00 23:23

Sample Amount: 0.99 g dry Wt
Percent Moisture: 17.1%

CAS Number	Analyte	ug/kg
95-47-6	**o-Xylene**	**5.6**
95-50-1	1,2-Dichlorobenzene	5.1 U
541-73-1	1,3-Dichlorobenzene	5.1 U
106-46-7	1,4-Dichlorobenzene	5.1 U
107-02-8	Acrolein	250 U
74-88-4	Methyl Iodide	5.1 U
74-96-4	Bromoethane	10 U
107-13-1	Acrylonitrile	25 U
563-58-6	1,1-Dichloropropene	5.1 U
74-95-3	Dibromomethane	5.1 U
630-20-6	1,1,1,2-Tetrachloroethane	5.1 U
96-12-8	1,2-Dibromo-3-chloropropane	25 U
96-18-4	1,2,3-Trichloropropane	10 U
110-57-6	trans-1,4-Dichloro-2-butene	25 U
108-67-8	**1,3,5-Trimethylbenzene**	**9.0**
95-63-6	**1,2,4-Trimethylbenzene**	**12**
87-68-3	Hexachlorobutadiene	25 U
106-93-4	Ethylene Dibromide	5.1 U
74-97-5	Bromochloromethane	5.1 U
594-20-7	2,2-Dichloropropane	5.1 U
142-28-9	1,3-Dichloropropane	5.1 U
98-82-8	Isopropylbenzene	5.1 U
103-65-1	n-Propylbenzene	5.1 U
108-86-1	Bromobenzene	5.1 U
95-49-8	2-Chlorotoluene	5.1 U
106-43-4	4-Chlorotoluene	5.1 U
98-06-6	tert-Butylbenzene	5.1 U
135-98-8	sec-Butylbenzene	5.1 U
99-87-6	4-Isopropyltoluene	5.1 U
104-51-8	n-Butylbenzene	10 U
120-82-1	1,2,4-Trichlorobenzene	25 U
91-20-3	Naphthalene	25 U
87-61-6	1,2,3-Trichlorobenzene	25 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	119%
d8-Toluene	102%
Bromofluorobenzene	99.4%
d4-1,2-Dichlorobenzene	102%

ANALYTICAL RESOURCES INCORPORATED

SOIL VOLATILE SYSTEM MONITORING COMPOUND SUMMARY

Matrix: Soil

QC Report No: CI24

Lab ID	Client ID	DCE	TOL	BFB	DCB	TOT OUT
CI24I	TP-28-2-3	116%	104%	102%	100%	0
CI24J	TP-27-0-1	116%	103%	99%	101%	0
102400MB	Method Blank	100%	102%	93%	98%	0
CI24L	TP-270-0-1	116%	104%	99%	101%	0
CI24LCS	Lab Cntrl Sample	97%	100%	95%	102%	0
CI24O	TP-30-2-3	118%	102%	100%	102%	0
CI24P	TP-31-0-1	114%	105%	100%	100%	0
CI24Q	TP-31-2-3	116%	105%	103%	101%	0
CI24R	TP-32-0-1	119%	102%	99%	102%	0

		LCS/MB LIMITS	QC LIMITS
(DCE)	= 1,2-Dichloroethane-d4	(70-130)	(70-130)
(TOL)	= Toluene-d8	(70-130)	(70-130)
(BFB)	= Bromofluorobenzene	(70-130)	(70-130)
(DCB)	= 1,2-Dichlorobenzene-d4	(70-130)	(70-130)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D System Monitoring Compound diluted out

FORM-II VOA-1

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CI24SB
LIMS ID: 00-19693
Matrix: Soil
Data Release Authorized:
Reported: 10/30/00
Date Analyzed: 10/24/00
Instrument: FINNS

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: NA

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
Chloromethane	55.8	50.0	112%
Bromomethane	50.2	50.0	100%
Vinyl Chloride	52.0	50.0	104%
Chloroethane	52.7	50.0	105%
Methylene Chloride	50.0	50.0	100%
Acetone	249.	250	99.6%
Carbon Disulfide	45.0	50.0	90.0%
1,1-Dichloroethene	49.9	50.0	99.8%
1,1-Dichloroethane	51.6	50.0	103%
trans-1,2-Dichloroethene	49.5	50.0	99.0%
cis-1,2-Dichloroethene	52.6	50.0	105%
Chloroform	51.0	50.0	102%
1,2-Dichloroethane	48.3	50.0	96.6%
2-Butanone	261.	250	104%
1,1,1-Trichloroethane	51.4	50.0	103%
Carbon Tetrachloride	50.0	50.0	100%
Vinyl Acetate	42.6	50.0	85.2%
Bromodichloromethane	50.5	50.0	101%
1,2-Dichloropropane	52.4	50.0	105%
cis-1,3-Dichloropropene	47.1	50.0	94.2%
Trichloroethene	50.4	50.0	101%
Dibromochloromethane	50.6	50.0	101%
1,1,2-Trichloroethane	49.5	50.0	99.0%
Benzene	51.8	50.0	104%
trans-1,3-Dichloropropene	45.9	50.0	91.8%
2-Chloroethylvinylether	49.0	50.0	98.0%
Bromoform	47.6	50.0	95.2%
4-Methyl-2-Pentanone (MIBK)	268.	250	107%
2-Hexanone	258.	250	103%
Tetrachloroethene	52.4	50.0	105%
1,1,2,2-Tetrachloroethane	48.7	50.0	97.4%
Toluene	51.0	50.0	102%
Chlorobenzene	50.6	50.0	101%
Ethylbenzene	49.2	50.0	98.4%
Styrene	48.8	50.0	97.6%
Trichlorofluoromethane	46.7	50.0	93.4%
1,1,2-Trichlorotrifluoroethane	42.4	50.0	84.8%
m,p-Xylene	102.	100	102%
O-Xylene	49.8	50.0	99.6%

Reported in ug/kg-dry-Wt

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CI24SB
LIMS ID: 00-19693
Matrix: Soil
Data Release Authorized:
Reported: 10/30/00
Date Analyzed: 10/24/00
Instrument: FINN5

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: NA

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
1,2-Dichlorobenzene	49.4	50.0	98.8%
1,3-Dichlorobenzene	49.7	50.0	99.4%
1,4-Dichlorobenzene	49.3	50.0	98.6%
Acrolein	278.	250	111%
Methyl Iodide	45.7	50.0	91.4%
Bromoethane	44.9	50.0	89.8%
Acrylonitrile	48.8	50.0	97.6%
1,1-Dichloropropene	52.0	50.0	104%
Dibromomethane	49.7	50.0	99.4%
1,1,1,2-Tetrachloroethane	48.7	50.0	97.4%
1,2-Dibromo-3-chloropropane	48.9	50.0	97.8%
1,2,3-Trichloropropane	50.0	50.0	100%
trans-1,4-Dichloro-2-butene	51.4	50.0	103%
1,3,5-Trimethylbenzene	50.1	50.0	100%
1,2,4-Trimethylbenzene	51.8	50.0	104%
Hexachlorobutadiene	50.4	50.0	101%
Ethylene Dibromide	49.4	50.0	98.8%
Bromochloromethane	50.9	50.0	102%
2,2-Dichloropropane	50.5	50.0	101%
1,3-Dichloropropane	51.1	50.0	102%
Isopropylbenzene	50.6	50.0	101%
n-Propylbenzene	49.2	50.0	98.4%
Bromobenzene	50.6	50.0	101%
2-Chlorotoluene	52.0	50.0	104%
4-Chlorotoluene	44.9	50.0	89.8%
tert-Butylbenzene	48.1	50.0	96.2%
sec-Butylbenzene	51.9	50.0	104%
4-Isopropyltoluene	49.1	50.0	98.2%
n-Butylbenzene	47.4	50.0	94.8%
1,2,4-Trichlorobenzene	50.4	50.0	101%
Naphthalene	54.9	50.0	110%
1,2,3-Trichlorobenzene	53.6	50.0	107%

Spike Blank Surrogate Recovery	
d4-1,2-Dichloroethane	96.8%
d8-Toluene	100%
Bromofluorobenzene	95.4%
d4-1,2-Dichlorobenzene	102%

Reported in ug/kg-dry-Wt

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: Method Blank

Lab Sample ID: CI24MB
LIMS ID: 00-19682
Matrix: Soil

Data Release Authorized: clr
Reported: 10/25/00 p/25/n

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Date extracted: 10/19/00
Date analyzed: 10/24/00 15:58
Instrument ID: ECD1
Sample Amount: 12.0 g-dry-wt
Final Ext Vol: 4.0 mL
pH: NA

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: NA

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	33 U
53469-21-9	Aroclor 1242	33 U
12672-29-6	Aroclor 1248	33 U
11097-69-1	Aroclor 1254	33 U
11096-82-5	Aroclor 1260	33 U
11104-28-2	Aroclor 1221	67 U
11141-16-5	Aroclor 1232	33 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	92.2%
Tetrachlorometaxylene	104%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-23-0-1

Lab Sample ID: CI24A
LIMS ID: 00-19682
Matrix: Soil

Data Release Authorized: (/r
Reported: 10/25/00 10/25/00

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/11/00
Date Received: 10/13/00

Date extracted: 10/19/00
Date analyzed: 10/24/00 14:33
Instrument ID: ECD1
Sample Amount: 11.4 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.3

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 4.6 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	35 U
53469-21-9	Aroclor 1242	35 U
12672-29-6	Aroclor 1248	35 U
11097-69-1	**Aroclor 1254**	**19 J**
11096-82-5	**Aroclor 1260**	**20 J**
11104-28-2	Aroclor 1221	70 U
11141-16-5	Aroclor 1232	35 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	90 0%
Tetrachlorometaxylene	92.8%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-23-0-1
MATRIX SPIKE

Lab Sample ID: CI24AMS
LIMS ID: 00-19682
Matrix: Soil

Data Release Authorized: CH 10/25/00
Reported: 10/25/00

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/11/00
Date Received: 10/13/00

Date extracted: 10/19/00
Date analyzed: 10/24/00 01:50
Instrument ID: ECD1
Sample Amount: 11.4 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.3

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 4.6 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	35 U
53469-21-9	Aroclor 1242	---
12672-29-6	Aroclor 1248	35 U
11097-69-1	**Aroclor 1254**	**65**
11096-82-5	**Aroclor 1260**	**24 J**
11104-28-2	Aroclor 1221	70 U
11141-16-5	Aroclor 1232	35 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	92.2%
Tetrachlorometaxylene	87.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-23-0-1
SPIKE DUPLICATE

Lab Sample ID: CI24AMSD
LIMS ID: 00-19682
Matrix: Soil

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/11/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 10/25/00

Date extracted: 10/19/00
Date analyzed: 10/24/00 02:18
Instrument ID: ECD1
Sample Amount: 11.4 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.3

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 4.6 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	35 U
53469-21-9	Aroclor 1242	---
12672-29-6	Aroclor 1248	35 U
11097-69-1	Aroclor 1254	62
11096-82-5	Aroclor 1260	19 J
11104-28-2	Aroclor 1221	70 U
11141-16-5	Aroclor 1232	35 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	90.5%
Tetrachlorometaxylene	84.2%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-25-0-1

Lab Sample ID: CI24D
LIMS ID: 00-19685
Matrix: Soil

Data Release Authorized:
Reported: 10/25/00

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/11/00
Date Received: 10/13/00

Date extracted: 10/19/00
Date analyzed: 10/24/00 02:46
Instrument ID: ECD1
Sample Amount: 11.1 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.5

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 7.3 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	36 U
53469-21-9	Aroclor 1242	36 U
12672-29-6	**Aroclor 1248**	**42**
11097-69-1	**Aroclor 1254**	**43**
11096-82-5	**Aroclor 1260**	**48**
11104-28-2	Aroclor 1221	72 U
11141-16-5	Aroclor 1232	36 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	79.0%
Tetrachlorometaxylene	81.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-27-0-1

Lab Sample ID: CI24J
LIMS ID: 00-19691
Matrix: Soil

Data Release Authorized: CM
Reported: 10/25/00 10/25/00

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/11/00
Date Received: 10/13/00

Date extracted: 10/19/00
Date analyzed: 10/24/00 03:14
Instrument ID: ECD1
Sample Amount: 10.4 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.4

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 13.3%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	38 U
53469-21-9	Aroclor 1242	38 U
12672-29-6	**Aroclor 1248**	**140**
11097-69-1	**Aroclor 1254**	**530**
11096-82-5	**Aroclor 1260**	**940**
11104-28-2	Aroclor 1221	77 U
11141-16-5	Aroclor 1232	38 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	86.8%
Tetrachlorometaxylene	54.2%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-270-0-1

Lab Sample ID: CI24L
LIMS ID: 00-19693
Matrix: Soil

Data Release Authorized:
Reported: 10/25/00

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/11/00
Date Received: 10/13/00

Date extracted: 10/19/00
Date analyzed: 10/24/00 04:10
Instrument ID: ECD1
Sample Amount: 10.3 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.4

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 13.7%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	39 U
53469-21-9	Aroclor 1242	39 U
12672-29-6	**Aroclor 1248**	**140**
11097-69-1	**Aroclor 1254**	**490**
11096-82-5	**Aroclor 1260**	**930**
11104-28-2	Aroclor 1221	77 U
11141-16-5	Aroclor 1232	39 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	91.8%
Tetrachlorometaxylene	60.2%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-29-0-1

Lab Sample ID: CI24M
LIMS ID: 00-19694
Matrix: Soil

Data Release Authorized:
Reported: 10/25/00

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Date extracted: 10/19/00
Date analyzed: 10/24/00 04:39
Instrument ID: ECD1
Sample Amount: 11.2 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.6

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 6.5 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	36 U
53469-21-9	Aroclor 1242	36 U
12672-29-6	Aroclor 1248	36 U
11097-69-1	Aroclor 1254	36 U
11096-82-5	**Aroclor 1260**	**24 J**
11104-28-2	Aroclor 1221	71 U
11141-16-5	Aroclor 1232	36 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	85.5%
Tetrachlorometaxylene	86.2%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-31-0-1

Lab Sample ID: CI24P
LIMS ID: 00-19697
Matrix: Soil

Data Release Authorized: clr
Reported: 10/25/00

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Date extracted: 10/19/00
Date analyzed: 10/24/00 07:27
Instrument ID: ECD1
Sample Amount: 10.7 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.4

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 10.2%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	37 U
53469-21-9	Aroclor 1242	37 U
12672-29-6	**Aroclor 1248**	**150**
11097-69-1	**Aroclor 1254**	**710**
11096-82-5	**Aroclor 1260**	**760**
11104-28-2	Aroclor 1221	74 U
11141-16-5	Aroclor 1232	37 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	89.8%
Tetrachlorometaxylene	57.2%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-33-0-1

Lab Sample ID: CI24S
LIMS ID: 00-19700
Matrix: Soil

Data Release Authorized:
Reported: 10/25/00

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Date extracted: 10/19/00
Date analyzed: 10/24/00 07:56
Instrument ID: ECD1
Sample Amount: 10.6 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.6

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 11.0%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	37 U
53469-21-9	Aroclor 1242	37 U
12672-29-6	**Aroclor 1248**	**520**
11097-69-1	**Aroclor 1254**	**1,600 E**
11096-82-5	**Aroclor 1260**	**1,200**
11104-28-2	Aroclor 1221	75 U
11141-16-5	Aroclor 1232	37 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	122%
Tetrachlorometaxylene	57.2%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-33-0-1
DILUTION

Lab Sample ID: CI24SDL
LIMS ID: 00-19700
Matrix: Soil

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Data Release Authorized: clf
Reported: 10/25/00 10/25

Date extracted: 10/19/00
Date analyzed: 10/24/00 08:24
Instrument ID: ECD1
Sample Amount: 10.6 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.6

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:2
Percent Moisture: 11.0%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	75 U
53469-21-9	Aroclor 1242	75 U
12672-29-6	Aroclor 1248	500
11097-69-1	Aroclor 1254	1,700
11096-82-5	Aroclor 1260	1,200
11104-28-2	Aroclor 1221	150 U
11141-16-5	Aroclor 1232	75 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	130%
Tetrachlorometaxylene	51.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-23-0-1
Lab Sample ID: CI24A
QC Report No: CI24-Kennedy Jenks Consultants
LIMS ID: 00-19682
Project: Tacoma Metals
Matrix: Soil
996098.00
Date Received: 10/13/00

Data Release Authorized: CIR
Reported: 10/25/00 MLS

MATRIX SPIKE/SPIKE DUPLICATE RECOVERY
Date extracted: 10/19/00

CONSTITUENT	SAMPLE VALUE	SPIKE FOUND	SPIKE ADDED	% RECOVERY	RPD
MATRIX SPIKE					
Aroclor 1242	< 35	287	349	82.3%	
MATRIX SPIKE DUPLICATE					
Aroclor 1242	< 35	281	349	80.6%	2 1%

Values Reported in Total ug/kg Dry Weight

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Lab Sample ID: CI24
LIMS ID: 00-19682
Matrix: Soil

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 10/25/00

LABORATORY CONTROL SAMPLE SPIKE RECOVERY
Date extracted: 10/19/00

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	276	333	82.8%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	95.0%
Tetrachlorometaxylene	92.2%

Values Reported in Total ug/kg Dry Weight

ANALYTICAL RESOURCES INCORPORATED

SOIL AROCLOR SURROGATE SUMMARY

Matrix: Soil

QC Report No: CI24
Project: Tacoma Metals
996098.00

LIMS ID	Lab ID	Client ID	TCMX #	DCBP #	TOT OUT
00-19682MB	101900MB	Method Blank	104%	92.2%	0
00-19682SB	101900SB	Lab Control	92.2%	95.0%	0
00-19682	CI24A	TP-23-0-1	92.8%	90.0%	0
00-19682MS	CI24A	TP-23-0-1-MS	87.0%	92.2%	0
00-19682MSD	CI24A	TP-23-0-1-MSD	84.2%	90.5%	0
00-19685	CI24D	TP-25-0-1	81.5%	79.0%	0
00-19691	CI24J	TP-27-0-1	54.2%	86.8%	0
00-19693	CI24L	TP-270-0-1	60.2%	91.8%	0
00-19694	CI24M	TP-29-0-1	86.2%	85.5%	0
00-19697	CI24P	TP-31-0-1	57.2%	89.8%	0
00-19700	CI24S	TP-33-0-1	57.2%	122%	0
00-19700DL	CI24S	TP-33-0-1-DL	51.5% *	130% *	2

	QC LIMITS
(TCMX) = Tetrachloro-m-xylene	(53-109)
(DCBP) = Decachlorobiphenyl	(54-127)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D Surrogate Compound diluted out

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID
and Motor Oil

LIMS ID: 00-19682
Matrix: Soil

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 10/30/00 CR 10/30/00

Date Received: 10/13/00

Lab ID	Sample ID	Date Extracted	Date Analyzed	Dilution Factor	Diesel Range	*HC ID	Motor Oil Range	Surrogate Recovery
CI24MB	Method Blank	10/23/00	10/24/00	1:1	5.0 U	---	10 U	99.0%
CI24A	**TP-23-0-1**	10/23/00	10/24/00	1:1	5.2 U	M OIL	17	73.0%
CI24B	**TP-23-2-3**	10/23/00	10/25/00	1:5	260	M OIL	970	90.0%
CI24C	**TP-24-0-1**	10/23/00	10/24/00	1:1	28	M OIL	130	67.0%
CI24D	**TP-25-0-1**	10/23/00	10/25/00	1:2	58	M OIL	380	80.0%
CI24E	**TP-26-0-1**	10/23/00	10/24/00	1:1	6.4	NO	15	71.0%
CI24F	**TP-26-4-6**	10/23/00	10/25/00	1:1	120	M OIL	470	106%
CI24G	**TP-26-6-10**	10/23/00	10/24/00	1:1	26	NO	78	69.0%
CI24H	**TP-28-0-1**	10/23/00	10/25/00	1:5	190	M OIL	940	60.0%
CI24I	**TP-28-2-3**	10/23/00	10/25/00	1:5	930	DIES+	1,000	45.0%
CI24J	**TP-27-0-1**	10/23/00	10/25/00	1:10	610	DIES+	2,000	100%
CI24K	**TP-27-2-3**	10/23/00	10/27/00	1:2	120	NO	430	52.0%

Values reported in ppm (mg/kg) on a dry weight basis.

Surrogate is Methyl-Arachidate.

* ID indicates, in the opinion of the analyst, the petroleum product with the best pattern match. 'NO' indicates that there was not a good match for any of the requested products.
Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.

Data Qualifiers

U	Compound not detected at the given detection limit.
J	Indicates an estimated value below the calculated detection limit.
S	No value reported due to saturation of the detector. Dilution required.
D	Indicates the surrogate was not detected because of dilution of the extract.
E	Indicates a value above the linear range of the detector. Dilution required.
NR	Indicates no recovery due to matrix interference.
B	Indicates compound also detected in the method blank.

FORM-1 TPHD

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID
and Motor Oil

LIMS ID: 00-19693
Matrix: Soil
CR 10/30/00
Data Release Authorized:
Reported: 10/30/00

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 10/13/00

Lab ID	Sample ID	Date Extracted	Date Analyzed	Dilution Factor	Diesel Range	*HC ID	Motor Oil Range	Surrogate Recovery
CI24L	TP-270-0-1	10/23/00	10/25/00	1:10	670	DIES+	2,200	60.0%
CI24M	TP-29-0-1	10/23/00	10/25/00	1:2	39	M OIL	320	80.0%
CI24N	TP-30-0-1	10/23/00	10/25/00	1:5	330	M OIL	1,800	75.0%
CI24O	TP-30-2-3	10/23/00	10/25/00	1:10	700	M OIL	2,500	80.0%
CI24P	TP-31-0-1	10/23/00	10/25/00	1:5	490	M OIL	1,300	55.0%
CI24Q	TP-31-2-3	10/23/00	10/27/00	1:4	290	NO	610	52.0%
CI24R	TP-32-0-1	10/23/00	10/25/00	1:10	450	M OIL	1,700	70.0%
CI24S	TP-33-0-1	10/23/00	10/25/00	1:10	970	M OIL	2,000	90.0%
CI24T	TP-34-0-1	10/23/00	10/25/00	1:5	350	NO	1,100	80.0%
CI24TD	TP-34-0-1-DUPL	10/23/00	10/25/00	1:5	370	NO	930	95.0%

Values reported in ppm (mg/kg) on a dry weight basis.

Surrogate is Methyl-Arachidate.

* ID indicates, in the opinion of the analyst, the petroleum product with the best pattern match. 'NO' indicates that there was not a good match for any of the requested products.
Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.

Data Qualifiers

U Compound not detected at the given detection limit.
J Indicates an estimated value below the calculated detection limit.
S No value reported due to saturation of the detector. Dilution required.
D Indicates the surrogate was not detected because of dilution of the extract.
E Indicates a value above the linear range of the detector. Dilution required.
NR Indicates no recovery due to matrix interference.
B Indicates compound also detected in the method blank.

FORM-1 TPHD

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL HYDROCARBONS COMPOUND SUMMARY

Matrix: Soil

QC Report No: CI24

LIMS ID	Lab ID	Extracted	Client ID	MeArach	TOT OUT
00-19682MB	102400MB	10/23/00	Method Blank	99%	0
00-19682LC	102400LC	10/23/00	Lab Control	77%	0
00-19682	CI24A	10/23/00	TP-23-0-1	73%	0
00-19682	CI24A-MS	10/23/00	TP-23-0-1-MS	65%	0
00-19682	CI24A-MSD	10/23/00	TP-23-0-1-MSD	62%	0
00-19683	CI24B	10/23/00	TP-23-2-3	90%	0
00-19684	CI24C	10/23/00	TP-24-0-1	67%	0
00-19685	CI24D	10/23/00	TP-25-0-1	80%	0
00-19686	CI24E	10/23/00	TP-26-0-1	71%	0
00-19687	CI24F	10/23/00	TP-26-4-6	106%	0
00-19688	CI24G	10/23/00	TP-26-6-10	69%	0
00-19689	CI24H	10/23/00	TP-28-0-1	60%	0
00-19690	CI24I	10/23/00	TP-28-2-3	45%	0
00-19691	CI24J	10/23/00	TP-27-0-1	100%	0
00-19692	CI24K	10/23/00	TP-27-2-3	52%	0
00-19693	CI24L	10/23/00	TP-270-0-1	60%	0
00-19694	CI24M	10/23/00	TP-29-0-1	80%	0
00-19695	CI24N	10/23/00	TP-30-0-1	75%	0
00-19696	CI24O	10/23/00	TP-30-2-3	80%	0
00-19697	CI24P	10/23/00	TP-31-0-1	55%	0
00-19698	CI24Q	10/23/00	TP-31-2-3	52%	0
00-19699	CI24R	10/23/00	TP-32-0-1	70%	0
00-19700	CI24S	10/23/00	TP-33-0-1	90%	0
00-19701	CI24T	10/23/00	TP-34-0-1	80%	0
00-19701	CI24T-DP	10/23/00	TP-34-0-1-DP	95%	0

	Control QC LIMITS	Sample QC LIMITS
(MeArach) = Methylarachidate	(56-114)	(42-113)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D System Monitoring Compound diluted out

FORM-II TPHD

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-23-0-1
Lab Sample ID: CI24A
QC Report No: CI24-Kennedy Jenks Consultants
LIMS ID: 00-19682
Project: Tacoma Metals
Matrix: Soil
996098.00
Date Received: 10/13/00

Data Release Authorized:
Reported: 10/30/00 CK 10/30/00

MATRIX SPIKE/SPIKE DUPLICATE RECOVERY

Date extracted: 10/23/00
Date analyzed: 10/24/00

CONSTITUENT	SAMPLE VALUE	SPIKE VALUE	SPIKE ADDED	% RECOVERY	RPD
MATRIX SPIKE					
Diesel Range Hydrocarbons	5.2 U	77.1	105	73.4%	
MATRIX SPIKE DUPLICATE					
Diesel Range Hydrocarbons	5.2 U	77.3	105	73.6%	0.3%

TPHd Surrogate Recovery

Matrix Spike	Methylarachidate	65.0%
Matrix Spike Dup	Methylarachidate	62.0%

Values reported in ppm (mg/kg) on a dry weight basis.

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CI24SB
LIMS ID: 00-19682
Matrix: Soil

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 10/30/00 CK 10/30/00

LABORATORY CONTROL SAMPLE RECOVERY REPORT
Date extracted: 10/23/00
Date analyzed: 10/24/00

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
Diesel Range Hydrocarbons	78.0	100	78.0%

TPHd Surrogate Recovery

Methylarachidate 77.0%

Values reported in ppm (mg/kg) on a dry weight basis.

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: Method Blank**
TOTAL METALS

Lab Sample ID: CI24MB
LIMS ID: 00-19683
Matrix: Soil

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized:
Reported: 11/17/00

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/26/00	6010	11/13/00	7440-38-2	Arsenic	5	5 U
3050	10/26/00	6010	11/13/00	7440-39-3	Barium	0.3	0.3 U
3050	10/26/00	6010	11/13/00	7440-43-9	Cadmium	0.2	0.2 U
3050	10/26/00	6010	11/13/00	7440-47-3	Chromium	0.5	0.5 U
3050	10/26/00	6010	11/13/00	7440-50-8	Copper	0.2	0.2 U
3050	10/26/00	6010	11/13/00	7439-92-1	Lead	2	2 U
CLP	10/26/00	7471	10/31/00	7439-97-6	Mercury	0.05	0.05 U
3050	10/26/00	6010	11/13/00	7782-49-2	Selenium	5	5 U
3050	10/26/00	6010	11/13/00	7440-22-4	Silver	0.3	0.3 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: TP-23-0-1

Lab Sample ID: CI24A
LIMS ID: 00-19682
Matrix: Soil

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/11/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 11/17/00

Percent Total Solids: 94.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/26/00	6010	11/14/00	7440-38-2	Arsenic	5	5 U
3050	10/26/00	6010	11/14/00	**7440-39-3**	**Barium**	0.3	**40.4**
3050	10/26/00	6010	11/14/00	7440-43-9	Cadmium	0.2	0.2 U
3050	10/26/00	6010	11/14/00	**7440-47-3**	**Chromium**	0.5	**25.1**
3050	10/26/00	6010	11/14/00	**7440-50-8**	**Copper**	0.2	**21.9**
3050	10/26/00	6010	11/14/00	**7439-92-1**	**Lead**	2	**11**
CLP	10/26/00	7471	10/31/00	7439-97-6	Mercury	0.04	0.04 U
3050	10/26/00	6010	11/14/00	7782-49-2	Selenium	5	5 U
3050	10/26/00	6010	11/14/00	7440-22-4	Silver	0.3	0.3 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET
TOTAL METALS

Sample No: TP-23-0-1
QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 10/13/00

Lab Sample ID: CI24A
LIMS ID: 00-19682
Matrix: Soil

Data Release Authorized:
Reported: 11/17/00

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample mg/kg-dry	Duplicate mg/kg-dry	RPD	Control Limit	Q
Arsenic	6010	5 U	5 U	0.0%	+/- 5	L
Barium	6010	40.4	62.3	42.6%	+/- 20 %	*
Cadmium	6010	0.2 U	0.2	0.0%	+/- 0.2	L
Chromium	6010	25.1	26.0	3.5%	+/- 20 %	
Copper	6010	21.9	24.7	12.0%	+/- 20 %	
Lead	6010	11	13	16.7%	+/- 20 %	
Mercury	7471	0.04 U	0.04 U	0.0%	+/- 0.04	L
Selenium	6010	5 U	5 U	0.0%	+/- 5	L
Silver	6010	0.3 U	0.3 U	0.0%	+/- 0.3	L

'Q' codes: * = control limit not met
L = RPD not valid, alternate limit = detection limit

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-23-0-1
QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 10/13/00

Lab Sample ID: CI24A
LIMS ID: 00-19682
Matrix: Soil

Data Release Authorized:
Reported: 11/17/00

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample mg/kg-dry	Spike mg/kg-dry	Spike Added	% Recovery	Q
Arsenic	6010	5 U	199	199	100%	
Barium	6010	40.4	231	199	95.8%	
Cadmium	6010	0.2 U	48.5	49.8	97.4%	
Chromium	6010	25.1	74.2	49.8	98.6%	
Copper	6010	21.9	75.9	49.8	108%	
Lead	6010	11	201	199	95.5%	
Mercury	7471	0.04 U	0.45	0.41	110%	
Selenium	6010	5 U	204	199	103%	
Silver	6010	0.3 U	47.6	49.8	95.6%	

'Q' codes:
N = control limit not met
H = %R not applicable, sample concentration too high
* = RPD control limit not met
NA = Not applicable - analyte not spiked

Control Limits: Percent Recovery: 75-125%
RPD: +/-20%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-23-2-3**
TOTAL METALS

Lab Sample ID: CI24B
LIMS ID: 00-19683
Matrix: Soil

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/11/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 11/17/00

Percent Total Solids: 91.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/26/00	6010	11/14/00	7440-38-2	Arsenic	10	30
3050	10/26/00	6010	11/14/00	7440-39-3	Barium	0.6	376
3050	10/26/00	6010	11/14/00	7440-43-9	Cadmium	0.4	15.3
3050	10/26/00	6010	11/14/00	7440-47-3	Chromium	1	127
3050	10/26/00	6010	11/14/00	7440-50-8	Copper	0.4	1,560
3050	10/26/00	6010	11/14/00	7439-92-1	Lead	4	1,190
CLP	10/26/00	7471	10/31/00	7439-97-6	Mercury	0.04	1.21
3050	10/26/00	6010	11/14/00	7782-49-2	Selenium	10	10 U
3050	10/26/00	6010	11/14/00	7440-22-4	Silver	0.6	1.4

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-24-0-1**
TOTAL METALS

Lab Sample ID: CI24C
LIMS ID: 00-19684
Matrix: Soil

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/11/00
Date Received: 10/13/00

Data Release Authorized
Reported: 11/17/00

Percent Total Solids: 92.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/26/00	6010	11/14/00	7440-38-2	Arsenic	5	6
3050	10/26/00	6010	11/14/00	7440-39-3	Barium	0.3	105
3050	10/26/00	6010	11/14/00	7440-43-9	Cadmium	0.2	2.3
3050	10/26/00	6010	11/14/00	7440-47-3	Chromium	0.5	34.3
3050	10/26/00	6010	11/14/00	7440-50-8	Copper	0.2	539
3050	10/26/00	6010	11/14/00	7439-92-1	Lead	2	438
CLP	10/26/00	7471	10/31/00	7439-97-6	Mercury	0.04	0.70
3050	10/26/00	6010	11/14/00	7782-49-2	Selenium	5	6
3050	10/26/00	6010	11/14/00	7440-22-4	Silver	0.3	0.5

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-25-0-1**
TOTAL METALS

Lab Sample ID: CI24D
LIMS ID: 00-19685
Matrix: Soil

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/11/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 11/17/00

Percent Total Solids: 91.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/26/00	6010	11/14/00	7440-38-2	Arsenic	5	5 U
3050	10/26/00	6010	11/14/00	7440-39-3	Barium	0.3	52.5
3050	10/26/00	6010	11/14/00	7440-43-9	Cadmium	0.2	0.3
3050	10/26/00	6010	11/14/00	7440-47-3	Chromium	0.5	28.4
3050	10/26/00	6010	11/14/00	7440-50-8	Copper	0.2	151
3050	10/26/00	6010	11/14/00	7439-92-1	Lead	2	48
CLP	10/26/00	7471	10/31/00	7439-97-6	Mercury	0.05	0.14
3050	10/26/00	6010	11/14/00	7782-49-2	Selenium	5	5 U
3050	10/26/00	6010	11/14/00	7440-22-4	Silver	0.3	0.3 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-26-0-1**
TOTAL METALS

Lab Sample ID: CI24E
LIMS ID: 00-19686
Matrix: Soil

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/11/00
Date Received: 10/13/00

Data Release Authorized
Reported: 11/17/00

Percent Total Solids: 92.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/26/00	6010	11/14/00	7440-38-2	Arsenic	5	5 U
3050	10/26/00	6010	11/14/00	7440-39-3	Barium	0.3	47.4
3050	10/26/00	6010	11/14/00	7440-43-9	Cadmium	0.2	0.3
3050	10/26/00	6010	11/14/00	7440-47-3	Chromium	0.5	30.3
3050	10/26/00	6010	11/14/00	7440-50-8	Copper	0.2	21.6
3050	10/26/00	6010	11/14/00	7439-92-1	Lead	2	9
CLP	10/26/00	7471	10/31/00	7439-97-6	Mercury	0.05	0.05 U
3050	10/26/00	6010	11/14/00	7782-49-2	Selenium	5	5 U
3050	10/26/00	6010	11/14/00	7440-22-4	Silver	0.3	0.3 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-26-4-6**
TOTAL METALS

Lab Sample ID: CI24F
LIMS ID: 00-19687
Matrix: Soil

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/11/00
Date Received: 10/13/00

Data Release Authorized
Reported: 11/17/00

Percent Total Solids: 88.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/26/00	6010	11/14/00	7440-38-2	Arsenic	6	6 U
3050	10/26/00	6010	11/14/00	**7440-39-3**	**Barium**	0.3	**272**
3050	10/26/00	6010	11/14/00	**7440-43-9**	**Cadmium**	0.2	**0.2**
3050	10/26/00	6010	11/14/00	**7440-47-3**	**Chromium**	0.6	**20.8**
3050	10/26/00	6010	11/14/00	**7440-50-8**	**Copper**	0.2	**40.9**
3050	10/26/00	6010	11/14/00	**7439-92-1**	**Lead**	2	**17**
CLP	10/26/00	7471	10/31/00	7439-97-6	Mercury	0.05	0.05 U
3050	10/26/00	6010	11/14/00	7782-49-2	Selenium	6	6 U
3050	10/26/00	6010	11/14/00	7440-22-4	Silver	0.3	0.3 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-26-6-10**
TOTAL METALS

Lab Sample ID: CI24G
LIMS ID: 00-19688
Matrix: Soil

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/11/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 11/17/00

Percent Total Solids: 64.1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/26/00	6010	11/15/00	7440-38-2	Arsenic	7	7 U
3050	10/26/00	6010	11/15/00	**7440-39-3**	**Barium**	0.4	**80.1**
3050	10/26/00	6010	11/15/00	7440-43-9	Cadmium	0.3	0.3 U
3050	10/26/00	6010	11/15/00	**7440-47-3**	**Chromium**	0.7	**17.3**
3050	10/26/00	6010	11/15/00	**7440-50-8**	**Copper**	0.3	**31.1**
3050	10/26/00	6010	11/15/00	**7439-92-1**	**Lead**	3	**13**
CLP	10/26/00	7471	10/31/00	7439-97-6	Mercury	0.06	0.06 U
3050	10/26/00	6010	11/15/00	7782-49-2	Selenium	7	7 U
3050	10/26/00	6010	11/15/00	7440-22-4	Silver	0.4	0.4 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-28-0-1**
TOTAL METALS

Lab Sample ID: CI24H
LIMS ID: 00-19689
Matrix: Soil

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/11/00
Date Received: 10/13/00

Data Release Authorized
Reported: 11/17/00

Percent Total Solids: 90.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/26/00	6010	11/14/00	7440-38-2	Arsenic	10	20
3050	10/26/00	6010	11/14/00	7440-39-3	Barium	0.6	382
3050	10/26/00	6010	11/14/00	7440-43-9	Cadmium	0.4	16.5
3050	10/26/00	6010	11/14/00	7440-47-3	Chromium	1	91
3050	10/26/00	6010	11/14/00	7440-50-8	Copper	0.4	789
3050	10/26/00	6010	11/14/00	7439-92-1	Lead	4	1,430
CLP	10/26/00	7471	10/31/00	7439-97-6	Mercury	0.05	1.56
3050	10/26/00	6010	11/14/00	7782-49-2	Selenium	10	10
3050	10/26/00	6010	11/14/00	7440-22-4	Silver	0.6	1.5

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-28-2-3**
TOTAL METALS

Lab Sample ID: CI24I
LIMS ID: 00-19690
Matrix: Soil

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/11/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 11/17/00

Percent Total Solids: 89.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/26/00	6010	11/14/00	7440-38-2	Arsenic	10	20
3050	10/26/00	6010	11/14/00	7440-39-3	Barium	0.7	444
3050	10/26/00	6010	11/14/00	7440-43-9	Cadmium	0.4	16.5
3050	10/26/00	6010	11/14/00	7440-47-3	Chromium	1	88
3050	10/26/00	6010	11/14/00	7440-50-8	Copper	0.4	3,000
3050	10/26/00	6010	11/14/00	7439-92-1	Lead	4	2,340
CLP	10/26/00	7471	10/31/00	7439-97-6	Mercury	0.05	1.12
3050	10/26/00	6010	11/14/00	7782-49-2	Selenium	10	10 U
3050	10/26/00	6010	11/14/00	7440-22-4	Silver	0.7	1.8

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-27-0-1**
TOTAL METALS

Lab Sample ID: CI24J
LIMS ID: 00-19691
Matrix: Soil

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/11/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 11/17/00

Percent Total Solids: 85.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/26/00	6010	11/14/00	7440-38-2	Arsenic	10	30
3050	10/26/00	6010	11/14/00	7440-39-3	Barium	0.7	261
3050	10/26/00	6010	11/14/00	7440-43-9	Cadmium	0.5	6.8
3050	10/26/00	6010	11/14/00	7440-47-3	Chromium	1	99
3050	10/26/00	6010	11/14/00	7440-50-8	Copper	0.5	577
3050	10/26/00	6010	11/14/00	7439-92-1	Lead	5	5,000
CLP	10/26/00	7471	10/31/00	7439-97-6	Mercury	0.05	1.83
3050	10/26/00	6010	11/14/00	7782-49-2	Selenium	10	10 U
3050	10/26/00	6010	11/14/00	7440-22-4	Silver	0.7	1.2

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-27-2-3**
TOTAL METALS

Lab Sample ID: CI24K
LIMS ID: 00-19692
Matrix: Soil

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/11/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 11/17/00

Percent Total Solids: 90.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/26/00	6010	11/14/00	7440-38-2	Arsenic	10	10 U
3050	10/26/00	6010	11/14/00	7440-39-3	Barium	0.7	217
3050	10/26/00	6010	11/14/00	7440-43-9	Cadmium	0.4	6.2
3050	10/26/00	6010	11/14/00	7440-47-3	Chromium	1	49
3050	10/26/00	6010	11/14/00	7440-50-8	Copper	0.4	3,130
3050	10/26/00	6010	11/14/00	7439-92-1	Lead	4	575
CLP	10/26/00	7471	10/31/00	7439-97-6	Mercury	0.05	1.82
3050	10/26/00	6010	11/14/00	7782-49-2	Selenium	10	10 U
3050	10/26/00	6010	11/14/00	7440-22-4	Silver	0.7	1.3

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-270-0-1**
TOTAL METALS

Lab Sample ID: CI24L
LIMS ID: 00-19693
Matrix: Soil

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/11/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 11/17/00

Percent Total Solids: 86.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/26/00	6010	11/14/00	7440-38-2	Arsenic	10	40
3050	10/26/00	6010	11/14/00	7440-39-3	Barium	0.7	259
3050	10/26/00	6010	11/14/00	7440-43-9	Cadmium	0.4	8.4
3050	10/26/00	6010	11/14/00	7440-47-3	Chromium	1	119
3050	10/26/00	6010	11/14/00	7440-50-8	Copper	0.4	806
3050	10/26/00	6010	11/14/00	7439-92-1	Lead	4	14,700
CLP	10/26/00	7471	10/31/00	7439-97-6	Mercury	0.06	1.62
3050	10/26/00	6010	11/14/00	7782-49-2	Selenium	10	10 U
3050	10/26/00	6010	11/14/00	7440-22-4	Silver	0.7	1.7

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-29-0-1**
TOTAL METALS

Lab Sample ID: CI24M
LIMS ID: 00-19694
Matrix: Soil

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 11/17/00

Percent Total Solids: 93.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/26/00	6010	11/15/00	7440-38-2	Arsenic	5	5
3050	10/26/00	6010	11/15/00	7440-39-3	Barium	0.3	67.9
3050	10/26/00	6010	11/15/00	7440-43-9	Cadmium	0.2	0.2
3050	10/26/00	6010	11/15/00	7440-47-3	Chromium	0.5	29.7
3050	10/26/00	6010	11/15/00	7440-50-8	Copper	0.2	24.6
3050	10/26/00	6010	11/15/00	7439-92-1	Lead	2	16
CLP	10/26/00	7471	10/31/00	7439-97-6	Mercury	0.04	0.04 U
3050	10/26/00	6010	11/15/00	7782-49-2	Selenium	5	5 U
3050	10/26/00	6010	11/15/00	7440-22-4	Silver	0.3	0.3 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-30-0-1**
TOTAL METALS

Lab Sample ID: CI24N
LIMS ID: 00-19695
Matrix: Soil

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 11/17/00

Percent Total Solids: 84.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/26/00	6010	11/14/00	**7440-38-2**	**Arsenic**	10	**30**
3050	10/26/00	6010	11/14/00	**7440-39-3**	**Barium**	0.7	**733**
3050	10/26/00	6010	11/14/00	**7440-43-9**	**Cadmium**	0.5	**59.5**
3050	10/26/00	6010	11/14/00	**7440-47-3**	**Chromium**	1	**108**
3050	10/26/00	6010	11/14/00	**7440-50-8**	**Copper**	0.5	**1,960**
3050	10/26/00	6010	11/14/00	**7439-92-1**	**Lead**	5	**2,410**
CLP	10/26/00	7471	10/31/00	**7439-97-6**	**Mercury**	0.05	**2.06**
3050	10/26/00	6010	11/14/00	7782-49-2	Selenium	10	10 U
3050	10/26/00	6010	11/14/00	**7440-22-4**	**Silver**	0.7	**2.6**

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-30-2-3**
TOTAL METALS

Lab Sample ID: CI240
LIMS ID: 00-19696
Matrix: Soil

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 11/17/00

Percent Total Solids: 86.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/26/00	6010	11/14/00	7440-38-2	Arsenic	10	20
3050	10/26/00	6010	11/14/00	7440-39-3	Barium	0.7	805
3050	10/26/00	6010	11/14/00	7440-43-9	Cadmium	0.5	21.2
3050	10/26/00	6010	11/14/00	7440-47-3	Chromium	1	90
3050	10/26/00	6010	11/14/00	7440-50-8	Copper	0.5	540
3050	10/26/00	6010	11/14/00	7439-92-1	Lead	5	1,110
CLP	10/26/00	7471	10/31/00	7439-97-6	Mercury	0.04	0.57
3050	10/26/00	6010	11/14/00	7782-49-2	Selenium	10	10 U
3050	10/26/00	6010	11/14/00	7440-22-4	Silver	0.7	1.4

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-31-0-1**
TOTAL METALS

Lab Sample ID: CI24P
LIMS ID: 00-19697
Matrix: Soil

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 11/17/00

Percent Total Solids: 89.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/26/00	6010	11/14/00	7440-38-2	Arsenic	10	10 U
3050	10/26/00	6010	11/14/00	7440-39-3	Barium	0.6	558
3050	10/26/00	6010	11/14/00	7440-43-9	Cadmium	0.4	19.3
3050	10/26/00	6010	11/14/00	7440-47-3	Chromium	1	58
3050	10/26/00	6010	11/14/00	7440-50-8	Copper	0.4	417
3050	10/26/00	6010	11/14/00	7439-92-1	Lead	4	1,040
CLP	10/26/00	7471	10/31/00	7439-97-6	Mercury	0.05	0.63
3050	10/26/00	6010	11/14/00	7782-49-2	Selenium	10	10 U
3050	10/26/00	6010	11/14/00	7440-22-4	Silver	0.6	1.0

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-31-2-3**
TOTAL METALS

Lab Sample ID: CI24Q
LIMS ID: 00-19698
Matrix: Soil

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 11/17/00

Percent Total Solids: 89.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/26/00	6010	11/14/00	7440-38-2	Arsenic	10	10 U
3050	10/26/00	6010	11/14/00	7440-39-3	Barium	0.7	189
3050	10/26/00	6010	11/14/00	7440-43-9	Cadmium	0.4	6.4
3050	10/26/00	6010	11/14/00	7440-47-3	Chromium	1	40
3050	10/26/00	6010	11/14/00	7440-50-8	Copper	0.4	182
3050	10/26/00	6010	11/14/00	7439-92-1	Lead	4	387
CLP	10/26/00	7471	10/31/00	7439-97-6	Mercury	0.05	0.42
3050	10/26/00	6010	11/14/00	7782-49-2	Selenium	10	10 U
3050	10/26/00	6010	11/14/00	7440-22-4	Silver	0.7	0.7

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-32-0-1**
TOTAL METALS

Lab Sample ID: CI24R
LIMS ID: 00-19699
Matrix: Soil

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Data Release Authorized
Reported: 11/17/00

Percent Total Solids: 82.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/26/00	6010	11/15/00	7440-38-2	Arsenic	30	30
3050	10/26/00	6010	11/15/00	7440-39-3	Barium	2	2,010
3050	10/26/00	6010	11/15/00	7440-43-9	Cadmium	1	84
3050	10/26/00	6010	11/15/00	7440-47-3	Chromium	3	271
3050	10/26/00	6010	11/15/00	7440-50-8	Copper	1	3,720
3050	10/26/00	6010	11/15/00	7439-92-1	Lead	10	4,470
CLP	10/26/00	7471	10/31/00	7439-97-6	Mercury	0.06	2.36
3050	10/26/00	6010	11/15/00	7782-49-2	Selenium	30	30 U
3050	10/26/00	6010	11/15/00	7440-22-4	Silver	2	3

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-33-0-1**
TOTAL METALS

Lab Sample ID: CI24S
LIMS ID: 00-19700
Matrix: Soil

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 11/17/00

Percent Total Solids: 81.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/26/00	6010	11/15/00	7440-38-2	Arsenic	30	40
3050	10/26/00	6010	11/15/00	7440-39-3	Barium	2	3,070
3050	10/26/00	6010	11/15/00	7440-43-9	Cadmium	1	89
3050	10/26/00	6010	11/15/00	7440-47-3	Chromium	3	353
3050	10/26/00	6010	11/15/00	7440-50-8	Copper	1	2,970
3050	10/26/00	6010	11/15/00	7439-92-1	Lead	10	6,470
CLP	10/26/00	7471	10/31/00	7439-97-6	Mercury	0.04	2.91
3050	10/26/00	6010	11/15/00	7782-49-2	Selenium	30	30 U
3050	10/26/00	6010	11/15/00	7440-22-4	Silver	2	5

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-34-0-1**
TOTAL METALS

Lab Sample ID: CI24T
LIMS ID: 00-19701
Matrix: Soil

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Data Release Authorized
Reported: 11/17/00

Percent Total Solids: 95.5%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/26/00	6010	11/14/00	7440-38-2	Arsenic	10	10 U
3050	10/26/00	6010	11/14/00	7440-39-3	Barium	0.6	196
3050	10/26/00	6010	11/14/00	7440-43-9	Cadmium	0.4	4.0
3050	10/26/00	6010	11/14/00	7440-47-3	Chromium	1.0	65.6
3050	10/26/00	6010	11/14/00	7440-50-8	Copper	0.4	4,030
3050	10/26/00	6010	11/14/00	7439-92-1	Lead	4	1,530
CLP	10/26/00	7471	10/31/00	7439-97-6	Mercury	0.04	0.93
3050	10/26/00	6010	11/14/00	7782-49-2	Selenium	10	10 U
3050	10/26/00	6010	11/14/00	7440-22-4	Silver	0.6	1.6

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CI24LCS
LIMS ID: 00-19683
Matrix: Soil

QC Report No: CI24-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 11/17/00

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike mg/kg-dry	Spike Added	% Recovery	Q
Arsenic	6010	205	236	86.9%	
Barium	6010	200	236	84.7%	
Cadmium	6010	49.9	59.0	84.6%	
Chromium	6010	49.9	59.0	84.6%	
Copper	6010	51.3	59.0	86.9%	
Lead	6010	199	236	84.3%	
Mercury	7471	0.94	1.00	94.0%	
Selenium	6010	208	236	88.1%	
Silver	6010	50.2	59.0	85.1%	

'Q' codes: N = control limit not met

Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-34-2-3**
TOTAL METALS

Lab Sample ID: CI25A
LIMS ID: 00-19608
Matrix: Soil

QC Report No: CI25-Kennedy Jenks Consultants
Project: Tacoma Metals
966098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 11/15/00

Percent Total Solids: 81.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/26/00	6010	11/10/00	**7440-38-2**	**Arsenic**	30	**30**
3050	10/26/00	6010	11/10/00	**7440-39-3**	**Barium**	2	**1,400**
3050	10/26/00	6010	11/10/00	**7440-43-9**	**Cadmium**	1	**52**
3050	10/26/00	6010	11/10/00	**7440-47-3**	**Chromium**	3	**91**
3050	10/26/00	6010	11/10/00	**7440-50-8**	**Copper**	1	**1,570**
3050	10/26/00	6010	11/10/00	**7439-92-1**	**Lead**	10	**3,990**
CLP	10/26/00	7471	10/27/00	**7439-97-6**	**Mercury**	0.06	**1.08**
3050	10/26/00	6010	11/10/00	7782-49-2	Selenium	30	30 U
3050	10/26/00	6010	11/10/00	7440-22-4	Silver	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-340-0-1**
TOTAL METALS

Lab Sample ID: CI25B
LIMS ID: 00-19609
Matrix: Soil

QC Report No: CI25-Kennedy Jenks Consultants
Project: Tacoma Metals
966098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 11/15/00

Percent Total Solids: 81.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/26/00	6010	11/08/00	7440-38-2	Arsenic	30	30 U
3050	10/26/00	6010	11/08/00	**7440-39-3**	**Barium**	2	**1,740**
3050	10/26/00	6010	11/08/00	**7440-43-9**	**Cadmium**	1	**42**
3050	10/26/00	6010	11/08/00	**7440-47-3**	**Chromium**	3	**92**
3050	10/26/00	6010	11/08/00	**7440-50-8**	**Copper**	1	**1,640**
3050	10/26/00	6010	11/08/00	**7439-92-1**	**Lead**	10	**5,100**
CLP	10/26/00	7471	10/27/00	**7439-97-6**	**Mercury**	0.06	**1.23**
3050	10/26/00	6010	11/08/00	7782-49-2	Selenium	30	30 U
3050	10/26/00	6010	11/08/00	7440-22-4	Silver	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

Analytical Resources, Incorporated
Analytical Chemists and Consultants

November 16, 2000

Ty Schreiner
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: Project: Tacoma Metals
ARI Job: CI19 and CI25

Dear Mr. Schreiner:

Please find enclosed sample custody records and final analytical results for the above referenced project. Sixty-eight soil samples were received in good condition on October 13, 2000. Selected samples were placed on hold at –18 degrees celcius pending further instruction. Samples were logged in batches to separate ARI Job Numbers.

Selected samples were analyzed for PCBs referencing EPA 8082, and total metals referencing EPA 6010/7471. Total diesel and motor oil range hydrocarbons were determined referencing WDOE method NWTPH-Dx.

Samples **TP-21-0-1 and TP-21-2-3** for PCBs required dilution and re-analysis to quantitate aroclors within the linear range of the GC/ECD. Both sets of data have been submitted. Two extracts analyzed for PCBs showed poor recoveries for one of the two surrogates, and two extracts had high levels of Aroclors which interfere with quantitation of the surrogate. As these extracts showed acceptable recoveries for at least one of the surrogates, no corrective action was taken.

Sample **TP-19-0-1** contained an Aroclor pattern that the analyst feels matches well with Aroclor 1262; the material was quantitated against and reported as Aroclor 1260.

A matrix spike was prepared and analyzed in conjunction with sample **TP-18-0-1**. The percent recoveries for barium, lead and mercury were not within control limits following the initial analysis of the MS. Since the percent recoveries were within acceptable QC limits for the corresponding LCS, it was concluded that high concentrations in the sample matrix was the cause of the low MS recoveries. No further corrective actions were taken.

RECEIVED
NOV 17 2000
K/J Federal Way
K/J No/File
Route
Return To/By

333 Ninth Avenue North • Seattle WA 98109-5187 • **206-621-6490** • **206-621-7523** fax

Analytical Resources, Incorporated
Analytical Chemists and Consultants

No other analytical complications were noted. Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Sue Dunnihoo
CS Manager
Sue@arilabs.com

SD/kg
Enclosures

cc: Jodie Brundage, Kennedy Jenks

333 Ninth Avenue North • Seattle WA 98109-5187 • **206-621-6490** • **206-621-7523** fax

00-19608 to 00-19609 CI25

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporat
Analytical Chemists and Consulta
400 Ninth Avenue North
Seattle, WA 98109-4708
206-621-6490 206-621-7523 (f

Turn Around Requested: _____

Report to: TY SCHREINER	Proj Name: TACOMA METALS
Company: KENNEDY JENKS	Proj Number: 996098.00
Address: 530 S. 336th ST	Sampler:
Federal Way WA 98003	
Phone: 253 874-0555	Shipping Method:
Fax:	AirBill:

Analyses Requested

Sample ID	Sample Date	Sample Time	Sample Matrix	No Containers	NWTPH-DX	RCRA METALS	CU	VOC'S	PCB'S		HOLD				Notes/Comment
TP-33-2-3	10/12/00	12:55	SOIL	2							X				
TP-33-4-6		1:05		2							X				
TP-33 6-10		1:30		2							X				Freeze
TP-34-0-1		1:50		2	X	X	X				X				all
TP-34-2-3		2:00		2	X	X	X		X						"Holds"
TP-34-4-6		2:15		2											
TP-34-6-10		2:30		2											
TP-340-0-1		2:40		2	X	X	X		X						& Extras
															10/16/00

- ID'S on jar TP-340-2-3

Relinquished: (Signature)	Relinquished: (Signature)	Relinquished: (Signature)	Special Instructions/Note
Printed name: T. Anthony Harding	Printed name:	Printed name:	
Company: KJ Consultants	Company:	Company:	
Date: 10/13/00 Time: 9:00am	Date: Time:	Date: Time:	
Received by: Elizabeth Joshi	Received by:	Received by:	
Printed name: ELYSEBETH JOSHI	Printed name:	Printed name:	
Company: ARI	Company:	Company:	Number of Coolers:
			Cooler Temp(s):
Date: 10/13/00 Time: 1000	Date: Time:	Date: Time:	COC Seals Intact?
			Bottles Intact?

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
400 Ninth Avenue North
Seattle, WA 98109-4708
206-621-6490 206-621-752[illegible] (fax)

Page 1 of 3

Turn Around Requested: Normal

Report to: TY SCHREINER	Proj Name: TACOMA METALS
Company: KENNEDY / JENKS	Proj Number: 996098.00
Address: 530 S. 336th ST	Sampler: TAH, JRB
FEDERAL WAY, WA 98003	
Phone: (253) 874-0555	Shipping Method: COURIER
Fax: (253) 952-3435	AirBill:

Analyses Requested

Sample ID	Sample Date	Sample Time	Sample Matrix	No Containers	NWTPH-DX	RCRA METALS	CU	VOCs	PCBs		HOLD				Notes/Comments
TP-23-0-1	10/11/00	8:00	SOIL	2	X	X	X		X						
TP-23-2-3		8:15		2	X	X	X				X				Freeze all extras/ Holds
TP-23-4-6		8:35		2							X				
TP-23-6-10		9:00		2							X				
TP-24-0-1		9:30		2	X	X	X				X				
TP-24-2-3		9:45		2							X				
TP-24-4-6		9:55		2							X				
TP-24-6-10		10:05		2							X				
TP-25-0-1		10:20			X	X	X		X						
TP-25-2-3		10:30									X				
TP-25-4-6		10:40									X				
TP-25-6-10		11:00									X				
TP-26-0-1		11:20			X	X	X				X				
TP-26-2-3		11:30									X				
TP-26-4-6		11:45			X	X	X				X				
TP-26-6-10		12:00			X	X	X				X				
TP-28-0-1		1:00			X	X	X				X				
TP-28-2-3		1:05			X	X	X	X							
TP-28-4-6		1:10									X				
TP-28-6-10		1:25													

Relinquished: (Signature)	Relinquished: (Signature)	Relinquished: (Signature)	Special Instructions/Notes
Printed name: T. Anthony Harding	Printed name:	Printed name:	
Company: KJ Consultants	Company:	Company:	
Date: 10/12/00 Time: 9:00am	Date: Time:	Date: Time:	

Received by: Elizabeth Joshi	Received by:	Received by:	
Printed name: ELYSEPETH JOSHI	Printed name:	Printed name:	
Company: ARI	Company:	Company:	Number of Coolers:
			Cooler Temp(s):
Date: 10/13/00 Time: 1000	Date: Time:	Date: Time:	COC Seals Intact?
			Bottles Intact?

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorpora
Analytical Chemists and Consult
400 Ninth Avenue North
Seattle, WA 98109-4708
206-621-6490 206-621-7523 (

Turn Around Requested: _____

Report to: TY SCHREIFER	Proj Name: TACOMA METALS
Company: KENNEDY/JENKS	Proj Number: 996098.00
Address: 530 S. 336th ST.	Sampler:
Federal Way WA 98003	
Phone: 253 874-0555	Shipping Method:
Fax:	AirBill:

Analyses Requested

Sample ID	Sample Date	Sample Time	Sample Matrix	No Containers	NWTPH-DX	RCRA METALS	CN	VOC'S	PCB'S		HOLD				Notes/Commer
TP-27-0-1	10/11/00	2:30p	SOIL	2	X	X	X	X	X						
TP-27-2-3		2:55		2	X	X	X				X				Freeze all Holds & Extras
TP-27-4-6		3:00		2							X				
~~TP-27-0-1~~		~~[illegible]~~		~~2~~	~~X~~	~~X~~	~~X~~	~~X~~							
TP-27-6-10		3:20		2							X				
TP-270-0-1		4:30p		2	X	X	X	X	X						
TP-29-0-1	10/12/00	8:50		2	X	X	X		X						
TP-29-2-3		9:00		2					[illegible]		X				
TP-29-4-6		9:15		2					[illegible]		X				
TP-29-6-10		9:25		2					[illegible]		X				
TP-30-0-1		9:50		2	X	X	X				X				
TP-30-2-3		10:00		2	X	X	X	X							
TP-30-4-6		10:30		2							X				
TP-30-6-10		10:45		2							X				
TP-31-0-1		11:00		2	X	X	X	X	X						
TP-31-2-3		11:10		2	X	X	X	X							
TP-31-4-6		11:20		2							X				
TP-31-6-10		11:40		2							X				
TP-32-0-1		12:25		2	X	X	X	X							
TP-32-0-1		12:45		2	X	X	X		X						

Relinquished: (Signature)	Relinquished: (Signature)	Relinquished: (Signature)	Special Instructions/Note
Printed name: T. Anthony Harding	Printed name:	Printed name:	
Company: KJ Consultants	Company:	Company:	
Date: 10/13/00 Time: 9:00am	Date: Time:	Date: Time:	

Received by:	Received by:	Received by:	
Printed name: ELYSEBETH JOSHI	Printed name:	Printed name:	
Company: AKI	Company:	Company:	Number of Coolers:
			Cooler Temp(s):
Date: 10/13/00 Time: 1000	Date: Time:	Date: Time:	COC Seals Intact?
			Bottles Intact?

CI19 7.0, 5.0, 3.5
00-19613 to

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
400 Ninth Avenue North
Seattle, WA 98109-4708
206-621-6490 206-621-7522 (fax)

Page 1 of 2 Turn Around Requested: Normal

Report to: Anthony Harding	Proj Name: Tacoma Metals
Company: Kennedy/Jenks	Proj Number: 996098.00
Address: 530 S 336th St	Sampler: TAH, [illegible]
Federal Way WA	98003
Phone: (253)927-8688	Shipping Method: Courier
Fax: (253) 952-3435	AirBill:

Sample ID	Sample Date	Sample Time	Sample Matrix	No Containers	NWTPH-Dx	PCBs	Cu	PCBs	VOCs	Hold					Notes/Comments
TP-18-0-1	10/10/00	8:40a	Soil	2	X	X	X								Freeze all extras/holds
TP-18-2-3		8:50a								X					
TP-18-4-6		9:00a								X					
TP-18-6-10		9:25a								X					
TP-19-0-1		9:35a			X	X	X	X							
TP-19-2-3		9:55a								X					
TP-19-4-6		10:10a								X					
TP-19-6-10		10:45a								X					
TP-20-0-1		11:45a			X	X	X								
TP-20-2-3		11:55a			X	X	X								
TP-20-4-6		12:10p								X					
TP-20-6-10		12:45p								X					
TP-2000-2-3		12:55p			X	X	X								
TP-21-0-1		1:10p			X	X	X	X							
TP-21-2-3		1:15p			X	X	X	X							
TP-21-4-6		1:30p								X					
TP-21-6-10		2:00p								X					
TP-22-0-1		2:25p			X	X	X								
TP-22-2-3					X	X	X								
TP-22-4-6		2:45p								X					

Relinquished: (Signature)	Relinquished: (Signature)	Relinquished: (Signature)	Special Instructions/Notes
Printed name: T. Anthony Harding	Printed name:	Printed name:	
Company: Kennedy/Jenks Consultants	Company:	Company:	
Date: 10/13/00 Time: 9:00 am	Date: Time:	Date: Time:	
Received by: Elyseleth Joshi	Received by:	Received by:	
Printed name: ELYSEBETH JOSHI	Printed name:	Printed name:	
Company: ARI	Company:	Company:	Number of Coolers:
			Cooler Temp(s):
Date: 10/13/00 Time: 1000	Date: Time:	Date: Time:	COC Seals Intact?
			Bottles Intact?

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: Method Blank

Lab Sample ID: CI19MB
LIMS ID: 00-19614
Matrix: Soil

Data Release Authorized: clt
Reported: 10/26/00 10/26/00

QC Report No: CI19-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Date extracted: 10/19/00
Date analyzed: 10/24/00 15:58
Instrument ID: ECD1
Sample Amount: 12.0 g-dry-wt
Final Ext Vol: 4.0 mL
pH: NA

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: NA

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	33 U
53469-21-9	Aroclor 1242	33 U
12672-29-6	Aroclor 1248	33 U
11097-69-1	Aroclor 1254	33 U
11096-82-5	Aroclor 1260	33 U
11104-28-2	Aroclor 1221	67 U
11141-16-5	Aroclor 1232	33 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	92.2%
Tetrachlorometaxylene	104%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-19-0-1

Lab Sample ID: CI19B
LIMS ID: 00-19614
Matrix: Soil

Data Release Authorized: CLK
Reported: 10/26/00

QC Report No: CI19-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/10/00
Date Received: 10/13/00

Date extracted: 10/19/00
Date analyzed: 10/25/00 18:17
Instrument ID: ECD1
Sample Amount: 10.5 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.0

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 12.5%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	38 U
53469-21-9	Aroclor 1242	38 U
12672-29-6	Aroclor 1248	38 U
11097-69-1	**Aroclor 1254**	**57**
11096-82-5	**Aroclor 1260**	**60**
11104-28-2	Aroclor 1221	76 U
11141-16-5	Aroclor 1232	38 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	101%
Tetrachlorometaxylene	88.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-21-0-1

Lab Sample ID: CI19F
LIMS ID: 00-19618
Matrix: Soil

Data Release Authorized: CIR
Reported: 10/26/00 10/24/00

QC Report No: CI19-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/10/00
Date Received: 10/13/00

Date extracted: 10/19/00
Date analyzed: 10/25/00 18:46
Instrument ID: ECD1
Sample Amount: 9.77 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.3

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 18.7%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	41 U
53469-21-9	Aroclor 1242	41 U
12672-29-6	**Aroclor 1248**	**1,400**
11097-69-1	**Aroclor 1254**	**4,100 E**
11096-82-5	**Aroclor 1260**	**3,400 E**
11104-28-2	Aroclor 1221	82 U
11141-16-5	Aroclor 1232	41 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	NR
Tetrachlorometaxylene	64.2%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-21-0-1
DILUTION

Lab Sample ID: CI19FDL
LIMS ID: 00-19618
Matrix: Soil

QC Report No: CI19-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/10/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 10/26/00

Date extracted: 10/19/00
Date analyzed: 10/25/00 19:42
Instrument ID: ECD1
Sample Amount: 9.77 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.3

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:10
Percent Moisture: 18.7%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	410 U
53469-21-9	Aroclor 1242	410 U
12672-29-6	**Aroclor 1248**	**2,100**
11097-69-1	**Aroclor 1254**	**6,900**
11096-82-5	**Aroclor 1260**	**5,200**
11104-28-2	Aroclor 1221	820 U
11141-16-5	Aroclor 1232	410 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	NR
Tetrachlorometaxylene	77.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-21-2-3

Lab Sample ID: CI19G
LIMS ID: 00-19619
Matrix: Soil

Data Release Authorized: CH
Reported: 10/26/00

QC Report No: CI19-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/10/00
Date Received: 10/13/00

Date extracted: 10/19/00
Date analyzed: 10/25/00 20:10
Instrument ID: ECD1
Sample Amount: 9.96 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.3

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 17.2%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	40 U
53469-21-9	**Aroclor 1242**	88
12672-29-6	Aroclor 1248	40 U
11097-69-1	**Aroclor 1254**	**2,100 E**
11096-82-5	**Aroclor 1260**	**1,100**
11104-28-2	Aroclor 1221	80 U
11141-16-5	Aroclor 1232	40 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	102%
Tetrachlorometaxylene	41.2%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-21-2-3
DILUTION

Lab Sample ID: CI19GDL
LIMS ID: 00-19619
Matrix: Soil

Data Release Authorized:
Reported: 10/26/00

QC Report No: CI19-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/10/00
Date Received: 10/13/00

Date extracted: 10/19/00
Date analyzed: 10/25/00 20:38
Instrument ID: ECD1
Sample Amount: 9.96 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.3

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:2
Percent Moisture: 17.2%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	80 U
53469-21-9	**Aroclor 1242**	**110**
12672-29-6	Aroclor 1248	80 U
11097-69-1	**Aroclor 1254**	**2,300**
11096-82-5	**Aroclor 1260**	**1,200**
11104-28-2	Aroclor 1221	160 U
11141-16-5	Aroclor 1232	80 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	105%
Tetrachlorometaxylene	39.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-34-2-3

Lab Sample ID: CI25A
LIMS ID: 00-19608
Matrix: Soil

Data Release Authorized: CH
Reported: 10/25/00 10/25/00

QC Report No: CI25-Kennedy Jenks Consultants
Project: Tacoma Metals
966098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Date extracted: 10/19/00
Date analyzed: 10/24/00 08:52
Instrument ID: ECD1
Sample Amount: 9.85 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.4

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 18.2%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	41 U
53469-21-9	Aroclor 1242	41 U
12672-29-6	**Aroclor 1248**	**110**
11097-69-1	**Aroclor 1254**	**510**
11096-82-5	**Aroclor 1260**	**400**
11104-28-2	Aroclor 1221	81 U
11141-16-5	Aroclor 1232	41 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	82.8%
Tetrachlorometaxylene	43.2%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-340-0-1

Lab Sample ID: CI25B
LIMS ID: 00-19609
Matrix: Soil

QC Report No: CI25-Kennedy Jenks Consultants
Project: Tacoma Metals
966098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Data Release Authorized: CIr
Reported: 10/25/00 MJS/L

Date extracted: 10/19/00
Date analyzed: 10/24/00 09:20
Instrument ID: ECD1
Sample Amount: 10.0 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.4

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 16.6%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	40 U
53469-21-9	Aroclor 1242	40 U
12672-29-6	**Aroclor 1248**	**120**
11097-69-1	**Aroclor 1254**	**570**
11096-82-5	**Aroclor 1260**	**500**
11104-28-2	Aroclor 1221	80 U
11141-16-5	Aroclor 1232	40 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	98 8%
Tetrachlorometaxylene	51.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

SOIL AROCLOR SURROGATE SUMMARY

Matrix: Soil

QC Report No: CI19
Project: Tacoma Metals
996098.00

LIMS ID	Lab ID	Client ID	TCMX	#	DCBP	#	TOT OUT
00-19614MB	101900MB	Method Blank	104%		92.2%		0
00-19614SB	101900SB	Lab Control	92.2%		95.0%		0
00-19614	CI19B	TP-19-0-1	88.5%		101%		0
00-19618	CI19F	TP-21-0-1	64.2%		NR	*	1
00-19618DL	CI19F	TP-21-0-1-DL	77.5%		NR	*	1
00-19619	CI19G	TP-21-2-3	41.2%	*	102%		1
00-19619DL	CI19G	TP-21-2-3-DL	39.5%	*	105%		1

	QC LIMITS
(TCMX) = Tetrachloro-m-xylene	(53-109)
(DCBP) = Decachlorobiphenyl	(54-127)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D Surrogate Compound diluted out

FORM-II PCB

ANALYTICAL RESOURCES INCORPORATED

SOIL AROCLOR SURROGATE SUMMARY

Matrix: Soil

QC Report No: CI25
Project: Tacoma Metals
966098.00

LIMS ID	Lab ID	Client ID	TCMX #	DCBP #	TOT OUT
00-19608MB	101900MB	Method Blank	104%	92.2%	0
00-19608SB	101900SB	Lab Control	92.2%	95.0%	0
00-19608	CI25A	TP-34-2-3	43.2% *	82.8%	1
00-19609	CI25B	TP-340-0-1	51.0% *	98.8%	1

	QC LIMITS
(TCMX) = Tetrachloro-m-xylene	(53-109)
(DCBP) = Decachlorobiphenyl	(54-127)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D Surrogate Compound diluted out

FORM-II PCB

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Lab Sample ID: CI19
LIMS ID: 00-19614
Matrix: Soil

QC Report No: CI19-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 10/26/00

LABORATORY CONTROL SAMPLE SPIKE RECOVERY
Date extracted: 10/19/00

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	277	333	83.1%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	95.0%
Tetrachlorometaxylene	92.2%

Values Reported in Total ug/kg Dry Weight

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Lab Sample ID: CI25
LIMS ID: 00-19608
Matrix: Soil

QC Report No: CI25-Kennedy Jenks Consultants
Project: Tacoma Metals
966098.00

Data Release Authorized: CH
Reported: 10/25/00 WKS/n

LABORATORY CONTROL SAMPLE SPIKE RECOVERY
Date extracted: 10/19/00

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	276	333	82.8%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	95.0%
Tetrachlorometaxylene	92.2%

Values Reported in Total ug/kg Dry Weight

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID
and Motor Oil

LIMS ID: 00-19613
Matrix: Soil

QC Report No: CI19-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized: CH 10/25/0
Reported: 10/25/00

Date Received: 10/13/00

Lab ID	Sample ID	Date Extracted	Date Analyzed	Dilution Factor	Diesel Range	*HC ID	Motor Oil Range	Surrogate Recovery
CI19MB	Method Blank	10/19/00	10/20/00	1:1	5.0 U	---	10 U	72.0%
CI19A	TP-18-0-1	10/19/00	10/20/00	1:1	55	M OIL+	160	68.0%
CI19B	TP-19-0-1	10/19/00	10/20/00	1:1	75	M OIL	220	70.0%
CI19C	TP-20-0-1	10/19/00	10/20/00	1:1	5.2 U	---	10 U	70.0%
CI19D	TP-20-2-3	10/19/00	10/20/00	1:1	130	NO	380	68.0%
CI19E	TP-2000-2-3	10/19/00	10/20/00	1:1	140	NO	410	62.0%
CI19F	TP-21-0-1	10/19/00	10/20/00	1:5	200	NO	660	60.0%
CI19G	TP-21-2-3	10/19/00	10/20/00	1:1	100	NO	240	76.0%
CI19GD	TP-21-2-3-DUPL	10/19/00	10/20/00	1:1	83	NO	180	66.0%
CI19H	TP-22-0-1	10/19/00	10/20/00	1:1	60	M OIL	250	63.0%
CI19I	TP-22-2-3	10/19/00	10/20/00	1:1	48	M OIL	170	63.0%

Values reported in ppm (mg/kg) on a dry weight basis.

Surrogate is Methyl-Arachidate.

* ID indicates, in the opinion of the analyst, the petroleum product with the best pattern match. 'NO' indicates that there was not a good match for any of the requested products.
Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.

Data Qualifiers

U Compound not detected at the given detection limit.
J Indicates an estimated value below the calculated detection limit.
S No value reported due to saturation of the detector. Dilution required.
D Indicates the surrogate was not detected because of dilution of the extract.
E Indicates a value above the linear range of the detector. Dilution required.
NR Indicates no recovery due to matrix interference.
B Indicates compound also detected in the method blank.

FORM-1 TPHD

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CI19SB
LIMS ID: 00-19613
Matrix: Soil

QC Report No: CI19-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized: c/f
Reported: 10/25/00 10/25/0

LABORATORY CONTROL SAMPLE RECOVERY REPORT
Date extracted: 10/19/00
Date analyzed: 10/20/00

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
Diesel Range Hydrocarbons	71.0	100	71.0%

TPHd Surrogate Recovery

Methylarachidate 66.0%

Values reported in ppm (mg/kg) on a dry weight basis.

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-21-0-1
Lab Sample ID: CI19F
QC Report No: CI19-Kennedy Jenks Consultants
LIMS ID: 00-19618
Project: Tacoma Metals
Matrix: Soil
996098.00
Date Received: 10/13/00

Data Release Authorized: CH
Reported: 10/25/00

MATRIX SPIKE/SPIKE DUPLICATE RECOVERY

Date extracted: 10/19/00
Date analyzed: 10/21/00

CONSTITUENT	SAMPLE VALUE	SPIKE VALUE	SPIKE ADDED	% RECOVERY	RPD
MATRIX SPIKE					
Diesel Range Hydrocarbons	201	257	122	45.9%	
MATRIX SPIKE DUPLICATE					
Diesel Range Hydrocarbons	201	260	123	48.0%	4.5%

TPHd Surrogate Recovery

Matrix Spike	Methylarachidate	65.0%
Matrix Spike Dup	Methylarachidate	65.0%

Values reported in ppm (mg/kg) on a dry weight basis.

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL HYDROCARBONS COMPOUND SUMMARY

Matrix: Soil

QC Report No: CI19

LIMS ID	Lab ID	Extracted	Client ID	MeArach	TOT OUT
00-19613MB	102000MB	10/19/00	Method Blank	72%	0
00-19613LC	102000LC	10/19/00	Lab Control	66%	0
00-19613	CI19A	10/19/00	TP-18-0-1	68%	0
00-19614	CI19B	10/19/00	TP-19-0-1	70%	0
00-19615	CI19C	10/19/00	TP-20-0-1	70%	0
00-19616	CI19D	10/19/00	TP-20-2-3	68%	0
00-19617	CI19E	10/19/00	TP-2000-2-3	62%	0
00-19618	CI19F	10/19/00	TP-21-0-1	60%	0
00-19618	CI19F-MS	10/19/00	TP-21-0-1-MS	65%	0
00-19618	CI19F-MSD	10/19/00	TP-21-0-1-MSD	65%	0
00-19619	CI19G	10/19/00	TP-21-2-3	76%	0
00-19619	CI19G-DP	10/19/00	TP-21-2-3-DP	66%	0
00-19620	CI19H	10/19/00	TP-22-0-1	63%	0
00-19621	CI19I	10/19/00	TP-22-2-3	63%	0

	Control QC LIMITS	Sample QC LIMITS
(MeArach) = Methylarachidate	(56-114)	(42-113)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D System Monitoring Compound diluted out

FORM-II TPHD

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID
and Motor Oil

LIMS ID: 00-19608
Matrix: Soil

QC Report No: CI25-Kennedy Jenks Consultants
Project: Tacoma Metals
966098.00

Data Release Authorized: CH
Reported: 10/25/00

Date Received: 10/13/00

Lab ID	Sample ID	Date Extracted	Date Analyzed	Dilution Factor	Diesel Range	*HC ID	Motor Oil Range	Surrogate Recovery
CI25MB	Method Blank	10/19/00	10/20/00	1:1	5.0 U	---	10 U	72.0%
CI25A	**TP-34-2-3**	10/19/00	10/21/00	1:20	**710**	NO	**2,600**	D
CI25B	**TP-340-0-1**	10/19/00	10/21/00	1:20	**460**	NO	**1,400**	D

Values reported in ppm (mg/kg) on a dry weight basis.

Surrogate is Methyl-Arachidate.

* ID indicates, in the opinion of the analyst, the petroleum product with the best pattern match. 'NO' indicates that there was not a good match for any of the requested products.
Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.

Data Qualifiers

U	Compound not detected at the given detection limit.
J	Indicates an estimated value below the calculated detection limit.
S	No value reported due to saturation of the detector. Dilution required.
D	Indicates the surrogate was not detected because of dilution of the extract.
E	Indicates a value above the linear range of the detector. Dilution required.
NR	Indicates no recovery due to matrix interference.
B	Indicates compound also detected in the method blank.

FORM-1 TPHD

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CI25SB
LIMS ID: 00-19608
Matrix: Soil

QC Report No: CI25-Kennedy Jenks Consultants
Project: Tacoma Metals
966098.00

Data Release Authorized: clt
Reported: 10/25/00 10/25/00

LABORATORY CONTROL SAMPLE RECOVERY REPORT
Date extracted: 10/19/00
Date analyzed: 10/20/00

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
Diesel Range Hydrocarbons	71.0	100	71.0%

TPHd Surrogate Recovery

Methylarachidate 66.0%

Values reported in ppm (mg/kg) on a dry weight basis.

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL HYDROCARBONS COMPOUND SUMMARY

Matrix: Soil

QC Report No: CI25

LIMS ID	Lab ID	Extracted	Client ID	MeArach	TOT OUT
00-19608MB	102000MB	10/19/00	Method Blank	72%	0
00-19608LC	102000LC	10/19/00	Lab Control	66%	0
00-19608	CI25A	10/19/00	TP-34-2-3	D	0
00-19609	CI25B	10/19/00	TP-340-0-1	D	0

	Control QC LIMITS	Sample QC LIMITS
(MeArach) = Methylarachidate	(56-114)	(42-113)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D System Monitoring Compound diluted out

FORM-II TPHD

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: Method Blank**
TOTAL METALS

Lab Sample ID: CI19MB
LIMS ID: 00-19614
Matrix: Soil

QC Report No: CI19-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized
Reported: 11/15/00

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/26/00	6010	11/10/00	7440-38-2	Arsenic	5	5 U
3050	10/26/00	6010	11/10/00	7440-39-3	Barium	0.3	0.3 U
3050	10/26/00	6010	11/10/00	7440-43-9	Cadmium	0.2	0.2 U
3050	10/26/00	6010	11/10/00	7440-47-3	Chromium	0.5	0.5 U
3050	10/26/00	6010	11/10/00	7440-50-8	Copper	0.2	0.2 U
3050	10/26/00	6010	11/10/00	7439-92-1	Lead	2	2 U
CLP	10/26/00	7471	10/27/00	7439-97-6	Mercury	0.05	0.05 U
3050	10/26/00	6010	11/10/00	7782-49-2	Selenium	5	5 U
3050	10/26/00	6010	11/10/00	7440-22-4	Silver	0.3	0.3 U

U Analyte undetected at given RL

RL Reporting Limit

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CI19LCS
LIMS ID: 00-19614
Matrix: Soil

QC Report No: CI19-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 11/15/00

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike mg/kg-dry	Spike Added	% Recovery	Q
Arsenic	6010	207	200	104%	
Barium	6010	207	200	104%	
Cadmium	6010	52.5	50.0	105%	
Chromium	6010	51.9	50.0	104%	
Copper	6010	51.0	50.0	102%	
Lead	6010	205	200	102%	
Mercury	7471	0.96	1.00	96.0%	
Selenium	6010	210	200	105%	
Silver	6010	50.8	50.0	102%	

'Q' codes: N = control limit not met

Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: Method Blank**
TOTAL METALS

Lab Sample ID: CI19MB
LIMS ID: 00-19618
Matrix: Soil

QC Report No: CI19-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized:
Reported: 11/15/00

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
CLP	10/30/00	7470	10/31/00	7439-97-6	Mercury	0.05	0.05 U

U Analyte undetected at given RL

RL Limit of Detection

FORM-I

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CI19LCS
LIMS ID: 00-19618
Matrix: Soil

QC Report No: CI19-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 11/15/00

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike mg/kg-dry	Spike Added	% Recovery	Q
Mercury	7471	1.08	1.00	108%	

'Q' codes: N = control limit not met

Control Limits: 80-120%

FORM-VII

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-18-0-1**
TOTAL METALS

Lab Sample ID: CI19A
LIMS ID: 00-19613
Matrix: Soil

QC Report No: CI19-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/10/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 11/15/00

Percent Total Solids: 91.5%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/26/00	6010	11/07/00	7440-38-2	Arsenic	5	8
3050	10/26/00	6010	11/07/00	7440-39-3	Barium	0.3	107
3050	10/26/00	6010	11/07/00	7440-43-9	Cadmium	0.2	3.3
3050	10/26/00	6010	11/07/00	7440-47-3	Chromium	0.5	26.3
3050	10/26/00	6010	11/07/00	7440-50-8	Copper	0.2	451
3050	10/26/00	6010	11/07/00	7439-92-1	Lead	2	311
CLP	10/30/00	7471	10/31/00	7439-97-6	Mercury	0.05	0.88
3050	10/26/00	6010	11/07/00	7782-49-2	Selenium	5	5 U
3050	10/26/00	6010	11/07/00	7440-22-4	Silver	0.3	0.9

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET
TOTAL METALS

Sample No: TP-18-0-1
QC Report No: CI19-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 10/13/00

Lab Sample ID: CI19A
LIMS ID: 00-19613
Matrix: Soil

Data Release Authorized:
Reported: 11/15/00

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample mg/kg-dry	Duplicate mg/kg-dry	RPD	Control Limit	Q
Arsenic	6010	8	7	13.3%	+/- 5	L
Barium	6010	107	79.9	29.0%	+/- 20 %	*
Cadmium	6010	3.3	1.7	64.0%	+/- 20 %	*
Chromium	6010	26.3	21.8	18.7%	+/- 20 %	
Copper	6010	451	203	75.8%	+/- 20 %	*
Lead	6010	311	201	43.0%	+/- 20 %	*
Mercury	7471	0.88	0.52	51.4%	+/- 20 %	*
Selenium	6010	5 U	5 U	0.0%	+/- 5	L
Silver	6010	0.9	1.0	10.5%	+/- 0.3	L

'Q' codes: * = control limit not met
L = RPD not valid, alternate limit = detection limit

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-18-0-1
QC Report No: CI19-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 10/13/00

Lab Sample ID: CI19A
LIMS ID: 00-19613
Matrix: Soil

Data Release Authorized:
Reported: 11/15/00

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample mg/kg-dry	Spike mg/kg-dry	Spike Added	% Recovery	Q
Arsenic	6010	8	184	203	86.7%	
Barium	6010	107	254	203	72.4%	N
Cadmium	6010	3.3	46.3	50.7	84.8%	
Chromium	6010	26.3	67.8	50.7	81.9%	
Copper	6010	451	196	50.7	-503%	H
Lead	6010	311	289	203	-10.8%	N
Mercury	7471	0.88	1.22	0.53	64.2%	N
Selenium	6010	5 U	188	203	92.6%	
Silver	6010	0.9	44.1	50.7	85.2%	

'Q' codes:
N = control limit not met
H = %R not applicable, sample concentration too high
* = RPD control limit not met
NA = Not applicable - analyte not spiked

Control Limits: Percent Recovery: 75-125%
RPD: +/-20%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-19-0-1**
TOTAL METALS

Lab Sample ID: CI19B
LIMS ID: 00-19614
Matrix: Soil

QC Report No: CI19-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/10/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 11/15/00

Percent Total Solids: 87.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/26/00	6010	11/13/00	7440-38-2	Arsenic	10	20
3050	10/26/00	6010	11/13/00	7440-39-3	Barium	0.8	111
3050	10/26/00	6010	11/13/00	7440-43-9	Cadmium	0.5	4.0
3050	10/26/00	6010	11/13/00	7440-47-3	Chromium	1	46
3050	10/26/00	6010	11/13/00	7440-50-8	Copper	0.5	1,060
3050	10/26/00	6010	11/13/00	7439-92-1	Lead	5	204
CLP	10/26/00	7471	10/27/00	7439-97-6	Mercury	0.05	1.35
3050	10/26/00	6010	11/13/00	7782-49-2	Selenium	10	10 U
3050	10/26/00	6010	11/13/00	7440-22-4	Silver	0.8	3.4

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-20-0-1**
TOTAL METALS

Lab Sample ID: CI19C
LIMS ID: 00-19615
Matrix: Soil

QC Report No: CI19-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/10/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 11/15/00

Percent Total Solids: 83.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/26/00	6010	11/14/00	7440-38-2	Arsenic	6	6 U
3050	10/26/00	6010	11/14/00	7440-39-3	Barium	0.3	35.9
3050	10/26/00	6010	11/14/00	7440-43-9	Cadmium	0.2	0.2 U
3050	10/26/00	6010	11/14/00	7440-47-3	Chromium	0.6	22.0
3050	10/26/00	6010	11/14/00	7440-50-8	Copper	0.2	17.2
3050	10/26/00	6010	11/14/00	7439-92-1	Lead	2	6
CLP	10/26/00	7471	10/27/00	7439-97-6	Mercury	0.06	0.06 U
3050	10/26/00	6010	11/14/00	7782-49-2	Selenium	6	6
3050	10/26/00	6010	11/14/00	7440-22-4	Silver	0.3	0.3 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-20-2-3**
TOTAL METALS

Lab Sample ID: CI19D
LIMS ID: 00-19616
Matrix: Soil

QC Report No: CI19-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/10/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 11/15/00

Percent Total Solids: 92.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/26/00	6010	11/13/00	7440-38-2	Arsenic	30	30 U
3050	10/26/00	6010	11/13/00	**7440-39-3**	**Barium**	2	304
3050	10/26/00	6010	11/13/00	**7440-43-9**	**Cadmium**	1	17
3050	10/26/00	6010	11/13/00	**7440-47-3**	**Chromium**	3	84
3050	10/26/00	6010	11/13/00	**7440-50-8**	**Copper**	1	6,970
3050	10/26/00	6010	11/13/00	**7439-92-1**	**Lead**	10	2,400
CLP	10/26/00	7471	10/27/00	**7439-97-6**	**Mercury**	0.05	0.94
3050	10/26/00	6010	11/13/00	7782-49-2	Selenium	30	30 U
3050	10/26/00	6010	11/13/00	7440-22-4	Silver	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-2000-2-3**
TOTAL METALS

Lab Sample ID: CI19E
LIMS ID: 00-19617
Matrix: Soil

QC Report No: CI19-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/10/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 11/15/00

Percent Total Solids: 92.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/26/00	6010	11/13/00	7440-38-2	Arsenic	10	660
3050	10/26/00	6010	11/13/00	7440-39-3	Barium	0.8	292
3050	10/26/00	6010	11/13/00	7440-43-9	Cadmium	0.5	26.2
3050	10/26/00	6010	11/13/00	7440-47-3	Chromium	1	83
3050	10/26/00	6010	11/13/00	7440-50-8	Copper	0.5	4,350
3050	10/26/00	6010	11/13/00	7439-92-1	Lead	5	20,600
CLP	10/26/00	7471	10/27/00	7439-97-6	Mercury	0.05	0.95
3050	10/26/00	6010	11/13/00	7782-49-2	Selenium	10	10 U
3050	10/26/00	6010	11/13/00	7440-22-4	Silver	0.8	2.8

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-21-0-1**
TOTAL METALS

Lab Sample ID: CI19F
LIMS ID: 00-19618
Matrix: Soil

QC Report No: CI19-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/10/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 11/15/00

Percent Total Solids: 81.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/26/00	6010	11/13/00	7440-38-2	Arsenic	30	70
3050	10/26/00	6010	11/13/00	7440-39-3	Barium	2	1,580
3050	10/26/00	6010	11/13/00	7440-43-9	Cadmium	1	66
3050	10/26/00	6010	11/13/00	7440-47-3	Chromium	3	574
3050	10/26/00	6010	11/13/00	7440-50-8	Copper	1	12,800
3050	10/26/00	6010	11/13/00	7439-92-1	Lead	10	6,020
CLP	10/30/00	7471	10/31/00	7439-97-6	Mercury	0.5	22.4
3050	10/26/00	6010	11/13/00	7782-49-2	Selenium	30	30 U
3050	10/26/00	6010	11/13/00	7440-22-4	Silver	2	31

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-21-2-3**
TOTAL METALS

Lab Sample ID: CI19G
LIMS ID: 00-19619
Matrix: Soil

QC Report No: CI19-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/10/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 11/15/00

Percent Total Solids: 83.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/26/00	6010	11/10/00	7440-38-2	Arsenic	300	300 U
3050	10/26/00	6010	11/10/00	7440-39-3	Barium	20	4,190
3050	10/26/00	6010	11/10/00	7440-43-9	Cadmium	10	130
3050	10/26/00	6010	11/10/00	7440-47-3	Chromium	30	1,080
3050	10/26/00	6010	11/10/00	7440-50-8	Copper	10	13,200
3050	10/26/00	6010	11/10/00	7439-92-1	Lead	120	7,570
CLP	10/30/00	7471	10/31/00	7439-97-6	Mercury	0.5	10.2
3050	10/26/00	6010	11/10/00	7782-49-2	Selenium	300	300 U
3050	10/26/00	6010	11/10/00	7440-22-4	Silver	20	90

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-22-0-1**
TOTAL METALS

Lab Sample ID: CI19H
LIMS ID: 00-19620
Matrix: Soil

QC Report No: CI19-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/10/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 11/15/00

Percent Total Solids: 79.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/26/00	6010	11/13/00	7440-38-2	Arsenic	30	30
3050	10/26/00	6010	11/13/00	7440-39-3	Barium	2	372
3050	10/26/00	6010	11/13/00	7440-43-9	Cadmium	1	51
3050	10/26/00	6010	11/13/00	7440-47-3	Chromium	3	2,520
3050	10/26/00	6010	11/13/00	7440-50-8	Copper	1	13,000
3050	10/26/00	6010	11/13/00	7439-92-1	Lead	10	3,180
CLP	10/30/00	7471	10/31/00	7439-97-6	Mercury	0.6	5.3
3050	10/26/00	6010	11/13/00	7782-49-2	Selenium	30	30 U
3050	10/26/00	6010	11/13/00	7440-22-4	Silver	2	36

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-22-2-3**
TOTAL METALS

Lab Sample ID: CI19I
LIMS ID: 00-19621
Matrix: Soil

QC Report No: CI19-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/10/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 11/15/00

Percent Total Solids: 78.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/26/00	6010	11/14/00	7440-38-2	Arsenic	60	60 U
3050	10/26/00	6010	11/14/00	7440-39-3	Barium	4	464
3050	10/26/00	6010	11/14/00	7440-43-9	Cadmium	2	52
3050	10/26/00	6010	11/14/00	7440-47-3	Chromium	6	913
3050	10/26/00	6010	11/14/00	7440-50-8	Copper	2	20,200
3050	10/26/00	6010	11/14/00	7439-92-1	Lead	20	3,690
CLP	10/30/00	7471	10/31/00	7439-97-6	Mercury	0.6	5.1
3050	10/26/00	6010	11/14/00	7782-49-2	Selenium	60	60 U
3050	10/26/00	6010	11/14/00	7440-22-4	Silver	4	198

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-34-2-3**
TOTAL METALS

Lab Sample ID: CI25A
LIMS ID: 00-19608
Matrix: Soil

QC Report No: CI25-Kennedy Jenks Consultants
Project: Tacoma Metals
966098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 11/15/00

Percent Total Solids: 81.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/26/00	6010	11/10/00	7440-38-2	Arsenic	30	30
3050	10/26/00	6010	11/10/00	7440-39-3	Barium	2	1,400
3050	10/26/00	6010	11/10/00	7440-43-9	Cadmium	1	52
3050	10/26/00	6010	11/10/00	7440-47-3	Chromium	3	91
3050	10/26/00	6010	11/10/00	7440-50-8	Copper	1	1,570
3050	10/26/00	6010	11/10/00	7439-92-1	Lead	10	3,990
CLP	10/26/00	7471	10/27/00	7439-97-6	Mercury	0.06	1.08
3050	10/26/00	6010	11/10/00	7782-49-2	Selenium	30	30 U
3050	10/26/00	6010	11/10/00	7440-22-4	Silver	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-340-0-1**
TOTAL METALS

Lab Sample ID: CI25B
LIMS ID: 00-19609
Matrix: Soil

QC Report No: CI25-Kennedy Jenks Consultants
Project: Tacoma Metals
966098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 11/15/00

Percent Total Solids: 81.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/26/00	6010	11/08/00	7440-38-2	Arsenic	30	30 U
3050	10/26/00	6010	11/08/00	**7440-39-3**	**Barium**	2	**1,740**
3050	10/26/00	6010	11/08/00	**7440-43-9**	**Cadmium**	1	**42**
3050	10/26/00	6010	11/08/00	**7440-47-3**	**Chromium**	3	**92**
3050	10/26/00	6010	11/08/00	**7440-50-8**	**Copper**	1	**1,640**
3050	10/26/00	6010	11/08/00	**7439-92-1**	**Lead**	10	**5,100**
CLP	10/26/00	7471	10/27/00	**7439-97-6**	**Mercury**	0.06	**1.23**
3050	10/26/00	6010	11/08/00	7782-49-2	Selenium	30	30 U
3050	10/26/00	6010	11/08/00	7440-22-4	Silver	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

Analytical Resources, Incorporated
Analytical Chemists and Consultants

November 21, 2000

Ty Schreiner
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: Project: Tacoma Metals
ARI Job: CI18

Dear Ty:

Please find enclosed sample custody records and final analytical results for the above referenced project. Twenty-nine soil samples were received in good condition on October 16, 2000. Per instruction, selected samples were placed on hold at –18 degrees celcius. The remaining samples were analyzed for volatiles referencing EPA 8260, PCBs referencing EPA 8082, and total metals referencing EPA 6010/7471. Total diesel and motor oil range hydrocarbons were determined referencing WDOE method NWTPH-Dx. Six samples were sent to Lauck's Testing Laboratories for analysis of nitrotoluenes.

All samples for volatile analysis were run as concentrated as possible to provide the lowest possible detection limits for analytes. Acetone was detected in the 10/24 method blank. Associated sample results were qualified with a "B" to flag possible lab contamination.

Sample **TP-39-0-1** for the PCB analysis required dilution and re-analysis to quantitate aroclor 1254 within the linear range of the GC/ECD instrument.

A matrix spike and duplicate were prepared and analyzed in conjunction with metals analysis sample **TP-35-0.1**. The recovery and replication of mercury and several elements analyzed by ICP were not within control limits following the initial analysis of the QC samples. The blank spike was in control. No further action was taken for the elements analyzed by ICP, as previous samples from this site have been characteristically inhomogeneous. The sample and associated QC were redigested and reanalyzed for mercury with similar results.

No other analytical complications were noted. Quality control analysis results are included. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

Susan D Dunnihoo

SD/kg
Enclosures

CC: Jodi Brundage, Kennedy Jenks Consultants, Federal Way, WA

RECEIVED
NOV 27 2000
K/J Federal Way
K/J No/File
Route
Return To/By

333 Ninth Avenue North • Seattle WA 98109-5187 • **206-621-6490** • **206-621-7523** fax

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

ARI

18939 120th Avenue N.E., Suite 101, Bothell, WA 98011-9508 (206) FAX 485-2992
East 11115 Montgomery, Suite B, Spokane, WA 99206-4779 (509) 924-9200 FAX 924-9290
9405 S.W. Nimbus Avenue, Beaverton, OR 97008-7132 (503) 643-9200 FAX 644-2202

CHAIN OF CUSTODY REPORT

Work Order #

REPORT TO: KENNEDY / JENKS CONSULTANTS
ATTENTION: TY SCHREINER
ADDRESS: 530 S. 336th ST
FEDERAL WAY, WA 98003
PHONE: 253 874-0555 FAX:
PROJECT NAME: TACOMA METALS
PROJECT NUMBER: 996098.00
SAMPLED BY: TAM, JB

INVOICE TO:
ATTENTION:
ADDRESS:
P.O. NUMBER: NCA QUOTE #:

TURNAROUND REQUEST in Business Days *
Organic & Inorganic Analyses: 10 (Standard) | 7 | 5 | 4 | 3 | 2 | 1 | Same Day
Fuels & Hydrocarbon Analyses: 5 (Standard) | 3-4 | 2 | 1 | Same Day
OTHER Specify:
* Turnaround Requests less than standard may incur Rush Charges.

Analysis Request: NWTPH-DX | RCRA METALS | CN | VOCS | PCBS | TNT/DNT | HOLD

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NCA SAMPLE ID (Laboratory Use Only)	NWTPH-DX	RCRA METALS	CN	VOCS	PCBS	TNT/DNT	HOLD			MATRIX (W. S. A. O)	# OF CONTAINERS	COMMENTS
1.	TP-390-0-1	10/13/00 1:35		X	X	X		X	X				SOIL	2	FREEZE
2.	TP-40-0-1	1:43		X	X	X				X				2	ALL,
3.	TP-40-2-3	1:50		X	X	X				X				2	'HOLDS'
4.	TP-40-4-6	2:00		X	X	X				X				2	&
5.	TP-40-6-10	2:20								X				2	'XTRAS'
6.	TP-44-0-1	2:35		X	X	X		X	X					2	
7.	TP-44-2-3	2:10								X				2	
8.	TP-44-4-6	2:50								X				2	
9.	TP-44-6-10	3:10								X				2	
10.															

RELINQUISHED BY (Signature): [signature] DATE: 10/16/00
PRINT NAME: JODIE Brundage FIRM: Kennedy Jenks TIME: 9:00 AM
RECEIVED BY (Signature): [signature] DATE: 10/16/00
PRINT NAME: ELYSEBETH JOSHI FIRM: ARI TIME: 1000

RELINQUISHED BY (Signature): DATE:
PRINT NAME: FIRM: TIME:
RECEIVED BY (Signature): DATE:
PRINT NAME: FIRM: TIME:

ADDITIONAL REMARKS:

CI18 00-19593 to 00-19604

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
400 Ninth Avenue North
Seattle, WA 98109-4708
206-621-6490 206-621-7523 (fax)

Page 1 of 2

Turn Around Requested: Normal

Report to: Ty Schreiner	Proj Name: Tacoma Metals
Company: K/J Consultants	Proj Number: 996098.00
Address: 530 S 336th St	Sampler: TAH, JRB
Federal Way, WA 98003	
Phone: (253)927-8688	Shipping Method: Courier
Fax: (253)952-3435	AirBill:

Analyses Requested

Sample ID	Sample Date	Sample Time	Sample Matrix	No Containers	NWTPH-DX	RCRA Metals	Cu	VOCs	PCBs	Hold	TNT/DNT				Notes/Comments
TP-35-0-1	10/13/00	8:00a	Soil	2	X	X	X		X						
TP-35-2-3		8:10a								X					FREEZE
TP-35-4-6		8:25								X					ALL
TP-35-6-10		8:50a								X					"HOLDS"/
TP-36-0-1		9:20a			X	X	X								"EXTRAS"
TP-36-2-3		9:30								X					
TP-36-4-6		9:40								X					
TP-36-6-10		9:55			X	X	X	X							
TP-37-0-1		10:15			X	X	X		X						
TP-37-2-3		10:25			X	X	X								
TP-37-4-6		10:35								X					
TP-37-6-10		11:00								X					
TP-38-0-1		11:20			X	X	X			X					
TP-38-2-3		11:25								X					
TP-38-4-6		11:30								X					
TP-38-6-10		11:45								X					
TP-39-0-1		12:40			X	X	X		X		X				
TP-39-2-3		12:45									X				
TP-39-4-6		12:50									X				
TP-39-6-10		1:25									X				

Relinquished: (Signature)	Relinquished: (Signature)	Relinquished: (Signature)	Special Instructions/Notes
Printed name: Josie Bradford	Printed name:	Printed name:	
Company: Kennedy/Jenks	Company:	Company:	
Date: 10/16/00 Time: 9:00 am	Date: Time:	Date: Time:	
Received by: Elizabeth Joshi	Received by:	Received by:	
Printed name: ELIZABETH JOSHI	Printed name:	Printed name:	
Company: ARI	Company:	Company:	Number of Coolers:
			Cooler Temp(s):
Date: 10/16/00 Time: 1000	Date: Time:	Date: Time:	COC Seals Intact?
			Bottles Intact?

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
400 Ninth Avenue North
Seattle, WA 98109-4708
206-621-6490 206-621-7523 (fax)

Page 1 of 1

Turn Around Requested: ~~By~~

Report to: Jeff Reiton	Proj Name: Kennedy Jenks
Company: ARI	Proj Number:
Address: 400 9th Ave N	Sampler: Anthony Harding
Phone: 206-389-6153	Shipping Method:
Fax: 206-621-7523	AirBill:

Analyses Requested

Sample ID		Sample Date	Sample Time	Sample Matrix	No Containers	TNT/DNT										Notes/Comments
CI18	G	10/13/00	12:40	Soil	1	X										* please extract all by 10/27
↓	H	↓	13:35	↓	↓	X										
↓	L	↓	14:45	↓	↓	X										
CI22	A	↓	12:45	↓	↓	X										
↓	B	↓	12:50	↓	↓	X										
↓	C	↓	13:25	↓	↓	X										

Relinquished: (Signature) Elysebeth Joshi	Relinquished: (Signature)	Relinquished: (Signature)
Printed name: ELYSEBETH JOSHI	Printed name:	Printed name:
Company: ARI	Company:	Company:
Date: 10/24/00 Time: 10:20A	Date: Time:	Date: Time:

Received by: TPWeishaar	Received by:	Received by:
Printed name: TPWeishaar	Printed name:	Printed name:
Company: Laucks	Company:	Company:
Date: 10/24/2000 Time: 11:50A	Date: Time:	Date: Time:

Special Instructions/Notes

ANALYTE LIST:
2,4 - dinitrotoluene
2,6 - dinitrotoluene
2,4,6 - trinitrotoluene
4-amino - 2,6 - DNT
2-amino - 4,6 - DNT

Number of Coolers:
Cooler Temp(s):
COC Seals Intact?
Bottles Intact?

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 102400MB
LIMS ID: 00-19595
Matrix: Soil
Data Release Authorized:
Reported: 11/02/00

QC Report No: CI18-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN5
Date Analyzed: 10/24/00 15:23

Sample Amount: 1.0 g dry Wt Equiv
Percent Moisture: NA

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	5.0 U
74-83-9	Bromomethane	5.0 U
75-01-4	Vinyl Chloride	5.0 U
75-00-3	Chloroethane	5.0 U
75-09-2	Methylene Chloride	15 U
67-64-1	**Acetone**	**17 J**
75-15-0	Carbon Disulfide	5.0 U
75-35-4	1,1-Dichloroethene	5.0 U
75-34-3	1,1-Dichloroethane	5.0 U
156-60-5	trans-1,2-Dichloroethene	5.0 U
156-59-2	cis-1,2-Dichloroethene	5.0 U
67-66-3	Chloroform	5.0 U
107-06-2	1,2-Dichloroethane	5.0 U
78-93-3	2-Butanone	25 U
71-55-6	1,1,1-Trichloroethane	5.0 U
56-23-5	Carbon Tetrachloride	5.0 U
108-05-4	Vinyl Acetate	25 U
75-27-4	Bromodichloromethane	5.0 U
78-87-5	1,2-Dichloropropane	5.0 U
10061-01-5	cis-1,3-Dichloropropene	5.0 U
79-01-6	Trichloroethene	5.0 U
124-48-1	Dibromochloromethane	5.0 U
79-00-5	1,1,2-Trichloroethane	5.0 U
71-43-2	Benzene	5.0 U
10061-02-6	trans-1,3-Dichloropropene	5.0 U
110-75-8	2-Chloroethylvinylether	25 U
75-25-2	Bromoform	5.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	25 U
591-78-6	2-Hexanone	25 U
127-18-4	Tetrachloroethene	5.0 U
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U
108-88-3	Toluene	5.0 U
108-90-7	Chlorobenzene	5.0 U
100-41-4	Ethylbenzene	5.0 U
100-42-5	Styrene	5.0 U
75-69-4	Trichlorofluoromethane	5.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	5.0 U
1330-20-7	m,p-Xylene	5.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 102400MB
LIMS ID: 00-19595
Matrix: Soil
Data Release Authorized:
Reported: 11/02/00

QC Report No: CI18-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN5
Date Analyzed: 10/24/00 15:23

Sample Amount: 1.0 g dry Wt Equiv
Percent Moisture: NA

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	5.0 U
95-50-1	1,2-Dichlorobenzene	5.0 U
541-73-1	1,3-Dichlorobenzene	5.0 U
106-46-7	1,4-Dichlorobenzene	5.0 U
107-02-8	Acrolein	250 U
74-88-4	Methyl Iodide	5.0 U
74-96-4	Bromoethane	10 U
107-13-1	Acrylonitrile	25 U
563-58-6	1,1-Dichloropropene	5.0 U
74-95-3	Dibromomethane	5.0 U
630-20-6	1,1,1,2-Tetrachloroethane	5.0 U
96-12-8	1,2-Dibromo-3-chloropropane	25 U
96-18-4	1,2,3-Trichloropropane	10 U
110-57-6	trans-1,4-Dichloro-2-butene	25 U
108-67-8	1,3,5-Trimethylbenzene	5.0 U
95-63-6	1,2,4-Trimethylbenzene	5.0 U
87-68-3	Hexachlorobutadiene	25 U
106-93-4	Ethylene Dibromide	5.0 U
74-97-5	Bromochloromethane	5.0 U
594-20-7	2,2-Dichloropropane	5.0 U
142-28-9	1,3-Dichloropropane	5.0 U
98-82-8	Isopropylbenzene	5.0 U
103-65-1	n-Propylbenzene	5.0 U
108-86-1	Bromobenzene	5.0 U
95-49-8	2-Chlorotoluene	5.0 U
106-43-4	4-Chlorotoluene	5.0 U
98-06-6	tert-Butylbenzene	5.0 U
135-98-8	sec-Butylbenzene	5.0 U
99-87-6	4-Isopropyltoluene	5.0 U
104-51-8	n-Butylbenzene	10 U
120-82-1	1,2,4-Trichlorobenzene	25 U
91-20-3	Naphthalene	25 U
87-61-6	1,2,3-Trichlorobenzene	25 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	99.8%
d8-Toluene	102%
Bromofluorobenzene	92.7%
d4-1,2-Dichlorobenzene	98.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-36-6-10

Lab Sample ID: CI18C
LIMS ID: 00-19595
Matrix: Soil
Data Release Authorized:
Reported: 11/02/00

QC Report No: CI18-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Instrument: FINN5
Date Analyzed: 10/24/00 23:49

Sample Amount: 1.15 g dry Wt
Percent Moisture: 8.6%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	4.3 U
74-83-9	Bromomethane	4.3 U
75-01-4	Vinyl Chloride	4.3 U
75-00-3	Chloroethane	4.3 U
75-09-2	Methylene Chloride	13 U
67-64-1	**Acetone**	**30 B**
75-15-0	Carbon Disulfide	4.3 U
75-35-4	1,1-Dichloroethene	4.3 U
75-34-3	1,1-Dichloroethane	4.3 U
156-60-5	trans-1,2-Dichloroethene	4.3 U
156-59-2	cis-1,2-Dichloroethene	4.3 U
67-66-3	Chloroform	4.3 U
107-06-2	1,2-Dichloroethane	4.3 U
78-93-3	2-Butanone	22 U
71-55-6	1,1,1-Trichloroethane	4.3 U
56-23-5	Carbon Tetrachloride	4.3 U
108-05-4	Vinyl Acetate	22 U
75-27-4	Bromodichloromethane	4.3 U
78-87-5	1,2-Dichloropropane	4.3 U
10061-01-5	cis-1,3-Dichloropropene	4.3 U
79-01-6	Trichloroethene	4.3 U
124-48-1	Dibromochloromethane	4.3 U
79-00-5	1,1,2-Trichloroethane	4.3 U
71-43-2	Benzene	4.3 U
10061-02-6	trans-1,3-Dichloropropene	4.3 U
110-75-8	2-Chloroethylvinylether	22 U
75-25-2	Bromoform	4.3 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	22 U
591-78-6	2-Hexanone	22 U
127-18-4	Tetrachloroethene	4.3 U
79-34-5	1,1,2,2-Tetrachloroethane	4.3 U
108-88-3	**Toluene**	**84**
108-90-7	Chlorobenzene	4.3 U
100-41-4	**Ethylbenzene**	**3.0 J**
100-42-5	Styrene	4.3 U
75-69-4	Trichlorofluoromethane	4.3 U
76-13-1	1,1,2-Trichlorotrifluoroethane	4.3 U
1330-20-7	m,p-Xylene	4.3 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-36-6-10

Lab Sample ID: CI18C
LIMS ID: 00-19595
Matrix: Soil
Data Release Authorized:
Reported: 11/02/00

QC Report No: CI18-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Instrument: FINN5
Date Analyzed: 10/24/00 23:49

Sample Amount: 1.15 g dry Wt
Percent Moisture: 8.6%

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	4.3 U
95-50-1	1,2-Dichlorobenzene	4.3 U
541-73-1	1,3-Dichlorobenzene	4.3 U
106-46-7	1,4-Dichlorobenzene	4.3 U
107-02-8	Acrolein	220 U
74-88-4	Methyl Iodide	4.3 U
74-96-4	Bromoethane	8.7 U
107-13-1	Acrylonitrile	22 U
563-58-6	1,1-Dichloropropene	4.3 U
74-95-3	Dibromomethane	4.3 U
630-20-6	1,1,1,2-Tetrachloroethane	4.3 U
96-12-8	1,2-Dibromo-3-chloropropane	22 U
96-18-4	1,2,3-Trichloropropane	8.7 U
110-57-6	trans-1,4-Dichloro-2-butene	22 U
108-67-8	**1,3,5-Trimethylbenzene**	**10**
95-63-6	**1,2,4-Trimethylbenzene**	**6.2**
87-68-3	Hexachlorobutadiene	22 U
106-93-4	Ethylene Dibromide	4.3 U
74-97-5	Bromochloromethane	4.3 U
594-20-7	2,2-Dichloropropane	4.3 U
142-28-9	1,3-Dichloropropane	4.3 U
98-82-8	**Isopropylbenzene**	**2.2 J**
103-65-1	n-Propylbenzene	4.3 U
108-86-1	Bromobenzene	4.3 U
95-49-8	2-Chlorotoluene	4.3 U
106-43-4	4-Chlorotoluene	4.3 U
98-06-6	tert-Butylbenzene	4.3 U
135-98-8	sec-Butylbenzene	4.3 U
99-87-6	**4-Isopropyltoluene**	**7.4**
104-51-8	n-Butylbenzene	8.7 U
120-82-1	1,2,4-Trichlorobenzene	22 U
91-20-3	**Naphthalene**	**150**
87-61-6	1,2,3-Trichlorobenzene	22 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	114%
d8-Toluene	101%
Bromofluorobenzene	102%
d4-1,2-Dichlorobenzene	97.3%

ANALYTICAL RESOURCES INCORPORATED

SOIL VOLATILE SYSTEM MONITORING COMPOUND SUMMARY

Matrix: Soil

QC Report No: CI18

Lab ID	Client ID	DCE	TOL	BFB	DCB	TOT OUT
102400MB	Method Blank	100%	102%	93%	98%	0
CI18C	TP-36-6-10	114%	101%	102%	97%	0
CI18LCS	Lab Cntrl Sample	97%	100%	95%	102%	0

		LCS/MB LIMITS	QC LIMITS
(DCE)	= 1,2-Dichloroethane-d4	(70-130)	(70-130)
(TOL)	= Toluene-d8	(70-130)	(70-130)
(BFB)	= Bromofluorobenzene	(70-130)	(70-130)
(DCB)	= 1,2-Dichlorobenzene-d4	(70-130)	(70-130)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D System Monitoring Compound diluted out

FORM-II VOA-1

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CI18SB
LIMS ID: 00-19595
Matrix: Soil
Data Release Authorized: NB
Reported: 11/02/00
Date Analyzed: 10/24/00
Instrument: FINN5

QC Report No: CI18-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: NA

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
Chloromethane	55.8	50.0	112%
Bromomethane	50.2	50.0	100%
Vinyl Chloride	52.0	50.0	104%
Chloroethane	52.7	50.0	105%
Methylene Chloride	50.0	50.0	100%
Acetone	249.	250	99.6%
Carbon Disulfide	45.0	50.0	90.0%
1,1-Dichloroethene	49.9	50.0	99.8%
1,1-Dichloroethane	51.6	50.0	103%
trans-1,2-Dichloroethene	49.5	50.0	99.0%
cis-1,2-Dichloroethene	52.6	50.0	105%
Chloroform	51.0	50.0	102%
1,2-Dichloroethane	48.3	50.0	96.6%
2-Butanone	261.	250	104%
1,1,1-Trichloroethane	51.4	50.0	103%
Carbon Tetrachloride	50.0	50.0	100%
Vinyl Acetate	42.6	50.0	85.2%
Bromodichloromethane	50.5	50.0	101%
1,2-Dichloropropane	52.4	50.0	105%
cis-1,3-Dichloropropene	47.1	50.0	94.2%
Trichloroethene	50.4	50.0	101%
Dibromochloromethane	50.6	50.0	101%
1,1,2-Trichloroethane	49.5	50.0	99.0%
Benzene	51.8	50.0	104%
trans-1,3-Dichloropropene	45.9	50.0	91.8%
2-Chloroethylvinylether	49.0	50.0	98.0%
Bromoform	47.6	50.0	95.2%
4-Methyl-2-Pentanone (MIBK)	268.	250	107%
2-Hexanone	258.	250	103%
Tetrachloroethene	52.4	50.0	105%
1,1,2,2-Tetrachloroethane	48.7	50.0	97.4%
Toluene	51.0	50.0	102%
Chlorobenzene	50.6	50.0	101%
Ethylbenzene	49.2	50.0	98.4%
Styrene	48.8	50.0	97.6%
Trichlorofluoromethane	46.7	50.0	93.4%
1,1,2-Trichlorotrifluoroethane	42.4	50.0	84.8%
m,p-Xylene	102.	100	102%
O-Xylene	49.8	50.0	99.6%

Reported in ug/kg-dry-Wt

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CI18SB
LIMS ID: 00-19595
Matrix: Soil
Data Release Authorized:
Reported: 11/02/00
Date Analyzed: 10/24/00
Instrument: FINN5

QC Report No: CI18-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: NA

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
1,2-Dichlorobenzene	49.4	50.0	98.8%
1,3-Dichlorobenzene	49.7	50.0	99.4%
1,4-Dichlorobenzene	49.3	50.0	98.6%
Acrolein	278.	250	111%
Methyl Iodide	45.7	50.0	91.4%
Bromoethane	44.9	50.0	89.8%
Acrylonitrile	48.8	50.0	97.6%
1,1-Dichloropropene	52.0	50.0	104%
Dibromomethane	49.7	50.0	99.4%
1,1,1,2-Tetrachloroethane	48.7	50.0	97.4%
1,2-Dibromo-3-chloropropane	48.9	50.0	97.8%
1,2,3-Trichloropropane	50.0	50.0	100%
trans-1,4-Dichloro-2-butene	51.4	50.0	103%
1,3,5-Trimethylbenzene	50.1	50.0	100%
1,2,4-Trimethylbenzene	51.8	50.0	104%
Hexachlorobutadiene	50.4	50.0	101%
Ethylene Dibromide	49.4	50.0	98.8%
Bromochloromethane	50.9	50.0	102%
2,2-Dichloropropane	50.5	50.0	101%
1,3-Dichloropropane	51.1	50.0	102%
Isopropylbenzene	50.6	50.0	101%
n-Propylbenzene	49.2	50.0	98.4%
Bromobenzene	50.6	50.0	101%
2-Chlorotoluene	52.0	50.0	104%
4-Chlorotoluene	44.9	50.0	89.8%
tert-Butylbenzene	48.1	50.0	96.2%
sec-Butylbenzene	51.9	50.0	104%
4-Isopropyltoluene	49.1	50.0	98.2%
n-Butylbenzene	47.4	50.0	94.8%
1,2,4-Trichlorobenzene	50.4	50.0	101%
Naphthalene	54.9	50.0	110%
1,2,3-Trichlorobenzene	53.6	50.0	107%

Spike Blank Surrogate Recovery

d4-1,2-Dichloroethane	96.8%
d8-Toluene	100%
Bromofluorobenzene	95.4%
d4-1,2-Dichlorobenzene	102%

Reported in ug/kg-dry-Wt

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: Method Blank

Lab Sample ID: CI18MB
LIMS ID: 00-19593
Matrix: Soil

Data Release Authorized: CH
Reported: 10/30/00 10/30/00

QC Report No: CI18-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Date extracted: 10/19/00
Date analyzed: 10/24/00 15:58
Instrument ID: ECD1
Sample Amount: 12.0 g-dry-wt
Final Ext Vol: 4.0 mL
pH: NA

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: NA

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	33 U
53469-21-9	Aroclor 1242	33 U
12672-29-6	Aroclor 1248	33 U
11097-69-1	Aroclor 1254	33 U
11096-82-5	Aroclor 1260	33 U
11104-28-2	Aroclor 1221	67 U
11141-16-5	Aroclor 1232	33 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	92.2%
Tetrachlorometaxylene	104%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-35-0-1

Lab Sample ID: CI18A
LIMS ID: 00-19593
Matrix: Soil

Data Release Authorized: CH
Reported: 10/30/00 pilyla

QC Report No: CI18-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Date extracted: 10/19/00
Date analyzed: 10/24/00 09:48
Instrument ID: ECD1
Sample Amount: 11.0 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 6.9

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 8.4 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	36 U
53469-21-9	Aroclor 1242	36 U
12672-29-6	Aroclor 1248	36 U
11097-69-1	**Aroclor 1254**	**210**
11096-82-5	**Aroclor 1260**	**300**
11104-28-2	Aroclor 1221	73 U
11141-16-5	Aroclor 1232	36 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	67.8%
Tetrachlorometaxylene	62.8%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-37-0-1

Lab Sample ID: CI18D
LIMS ID: 00-19596
Matrix: Soil

Data Release Authorized: CH
Reported: 10/30/00 10/31

QC Report No: CI18-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Date extracted: 10/19/00
Date analyzed: 10/24/00 10:16
Instrument ID: ECD1
Sample Amount: 10.7 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.1

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 10.5%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	37 U
53469-21-9	Aroclor 1242	37 U
12672-29-6	**Aroclor 1248**	**460**
11097-69-1	**Aroclor 1254**	**1,500**
11096-82-5	**Aroclor 1260**	**1,300**
11104-28-2	Aroclor 1221	74 U
11141-16-5	Aroclor 1232	37 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	93.0%
Tetrachlorometaxylene	51.8%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-39-0-1

Lab Sample ID: CI18G
LIMS ID: 00-19599
Matrix: Soil

Data Release Authorized: CV
Reported: 10/30/00 10/4

QC Report No: CI18-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Date extracted: 10/19/00
Date analyzed: 10/27/00 03:17
Instrument ID: ECD1
Sample Amount: 11.5 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.7

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 4.2 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	35 U
53469-21-9	Aroclor 1242	35 U
12672-29-6	Aroclor 1248	35 U
11097-69-1	**Aroclor 1254**	**2,400 E**
11096-82-5	Aroclor 1260	35 U
11104-28-2	Aroclor 1221	69 U
11141-16-5	Aroclor 1232	35 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	86.2%
Tetrachlorometaxylene	77.8%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-39-0-1
DILUTION

Lab Sample ID: CI18GDL
LIMS ID: 00-19599
Matrix: Soil

QC Report No: CI18-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Data Release Authorized: cl
Reported: 10/30/00 10/31

Date extracted: 10/19/00
Date analyzed: 10/27/00 03:45
Instrument ID: ECD1
Sample Amount: 11.5 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.7

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:2
Percent Moisture: 4.2 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	69 U
53469-21-9	Aroclor 1242	69 U
12672-29-6	Aroclor 1248	69 U
11097-69-1	**Aroclor 1254**	2,700
11096-82-5	Aroclor 1260	69 U
11104-28-2	Aroclor 1221	140 U
11141-16-5	Aroclor 1232	69 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	81.0%
Tetrachlorometaxylene	77.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-390-0-1

Lab Sample ID: CI18H
LIMS ID: 00-19600
Matrix: Soil

Data Release Authorized: CJH
Reported: 10/30/00

QC Report No: CI18-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Date extracted: 10/19/00
Date analyzed: 10/27/00 06:06
Instrument ID: ECD1
Sample Amount: 9.55 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.4

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 20.6%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	42 U
53469-21-9	Aroclor 1242	42 U
12672-29-6	Aroclor 1248	42 U
11097-69-1	**Aroclor 1254**	**1,500**
11096-82-5	Aroclor 1260	42 U
11104-28-2	Aroclor 1221	84 U
11141-16-5	Aroclor 1232	42 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	62.0%
Tetrachlorometaxylene	52.8%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicatea no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-44-0-1

Lab Sample ID: CI18L
LIMS ID: 00-19604
Matrix: Soil

Data Release Authorized:
Reported: 10/30/00

QC Report No: CI18-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Date extracted: 10/19/00
Date analyzed: 10/27/00 06:34
Instrument ID: ECD1
Sample Amount: 11.4 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.0

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 4.8 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	35 U
53469-21-9	Aroclor 1242	35 U
12672-29-6	Aroclor 1248	35 U
11097-69-1	Aroclor 1254	35 U
11096-82-5	Aroclor 1260	35 U
11104-28-2	Aroclor 1221	70 U
11141-16-5	Aroclor 1232	35 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	87.5%
Tetrachlorometaxylene	79.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

SOIL AROCLOR SURROGATE SUMMARY

Matrix: Soil

QC Report No: CI18
Project: Tacoma Metals
996098.00

LIMS ID	Lab ID	Client ID	TCMX	#	DCBP	#	TOT OUT
00-19593MB	101900MB	Method Blank	104%		92.2%		0
00-19593SB	101900SB	Lab Control	92.2%		95.0%		0
00-19593	CI18A	TP-35-0-1	62.8%		67.8%		0
00-19596	CI18D	TP-37-0-1	51.8%	*	93.0%		1
00-19599	CI18G	TP-39-0-1	77.8%		86.2%		0
00-19599DL	CI18G	TP-39-0-1-DL	77.5%		81.0%		0
00-19600	CI18H	TP-390-0-1	52.8%	*	62.0%		1
00-19604	CI18L	TP-44-0-1	79.5%		87.5%		0

	QC LIMITS
(TCMX) = Tetrachloro-m-xylene	(53-109)
(DCBP) = Decachlorobiphenyl	(54-127)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D Surrogate Compound diluted out

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Lab Sample ID: CI18
LIMS ID: 00-19593
Matrix: Soil

QC Report No: CI18-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 10/30/00

LABORATORY CONTROL SAMPLE SPIKE RECOVERY
Date extracted: 10/19/00

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	277	333	83.1%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	95.0%
Tetrachlorometaxylene	92.2%

Values Reported in Total ug/kg Dry Weight

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID
and Motor Oil

LIMS ID: 00-19593
Matrix: Soil

QC Report No: CI18-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 10/31/00

Date Received: 10/16/00

Carolyn S Roberts 10/31/00

Lab ID	Sample ID	Date Extracted	Date Analyzed	Dilution Factor	Diesel Range	*HC ID	Motor Oil Range	Surrogate Recovery
CI18MB	Method Blank	10/24/00	10/25/00	1:1	5.0 U	---	10 U	77.0%
CI18A	**TP-35-0-1**	10/24/00	10/27/00	1:2	**190**	NO	**350**	56.0%
CI18B	**TP-36-0-1**	10/24/00	10/27/00	1:1	**15**	NO	**56**	66.0%
CI18BD	**TP-36-0-1-DUPL**	10/24/00	10/27/00	1:1	**11**	NO	**35**	69.0%
CI18C	**TP-36-6-10**	10/24/00	10/27/00	1:2	**280**	NO	**220**	NR
CI18D	**TP-37-0-1**	10/24/00	10/27/00	1:10	**810**	NO	**2,100**	70.0%
CI18E	**TP-37-2-3**	10/24/00	10/27/00	1:10	**970**	NO	**2,800**	50.0%
CI18F	**TP-38-0-1**	10/24/00	10/27/00	1:10	**1,400**	NO	**2,700**	NR
CI18G	**TP-39-0-1**	10/24/00	10/27/00	1:1	**81**	NO	**340**	NR
CI18H	**TP-390-0-1**	10/24/00	10/27/00	1:1	**83**	NO	**350**	89.0%
CI18I	**TP-40-0-1**	10/24/00	10/27/00	1:10	**1,100**	NO	**2,300**	NR
CI18J	**TP-40-2-3**	10/24/00	10/27/00	1:5	**670**	NO	**1,600**	NR

Values reported in ppm (mg/kg) on a dry weight basis.

Surrogate is Methyl-Arachidate.

* ID indicates, in the opinion of the analyst, the petroleum product with the best pattern match. 'NO' indicates that there was not a good match for any of the requested products
Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.

Data Qualifiers

U	Compound not detected at the given detection limit.
J	Indicates an estimated value below the calculated detection limit.
S	No value reported due to saturation of the detector. Dilution required.
D	Indicates the surrogate was not detected because of dilution of the extract.
E	Indicates a value above the linear range of the detector. Dilution required.
NR	Indicates no recovery due to matrix interference.
B	Indicates compound also detected in the method blank

FORM-1 TPHD

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID
and Motor Oil

LIMS ID: 00-19603
Matrix: Soil

QC Report No: CI18-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 10/31/00
Carolyn S Roberts 10/31/00

Date Received: 10/16/00

Lab ID	Sample ID	Date Extracted	Date Analyzed	Dilution Factor	Diesel Range	*HC ID	Motor Oil Range	Surrogate Recovery
CI18K	**TP-40-4-6**	10/24/00	10/27/00	1:1	**100**	NO	**230**	54.0%
CI18L	**TP-44-0-1**	10/24/00	10/27/00	1:1	**19**	NO	**28**	73.0%

Values reported in ppm (mg/kg) on a dry weight basis.

Surrogate is Methyl-Arachidate.

* ID indicates, in the opinion of the analyst, the petroleum product with the best pattern match. 'NO' indicates that there was not a good match for any of the requested products.
Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.

Data Qualifiers

U Compound not detected at the given detection limit.
J Indicates an estimated value below the calculated detection limit.
S No value reported due to saturation of the detector. Dilution required.
D Indicates the surrogate was not detected because of dilution of the extract.
E Indicates a value above the linear range of the detector. Dilution required.
NR Indicates no recovery due to matrix interference.
B Indicates compound also detected in the method blank.

FORM-1 TPHD

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-35-0-1
Lab Sample ID: CI18A
QC Report No: CI18-Kennedy Jenks Consultants
LIMS ID: 00-19593
Project: Tacoma Metals
Matrix: Soil
996098.00
Date Received: 10/16/00

Data Release Authorized:
Reported: 10/31/00

Carolyn S Roberts
10/31/00

MATRIX SPIKE/SPIKE DUPLICATE RECOVERY

Date extracted: 10/24/00
Date analyzed: 10/27/00

CONSTITUENT	SAMPLE VALUE	SPIKE VALUE	SPIKE ADDED	% RECOVERY	RPD
MATRIX SPIKE					
Diesel Range Hydrocarbons	193	203	109	9.2%	
MATRIX SPIKE DUPLICATE					
Diesel Range Hydrocarbons	193	200	109	6.4%	35.6%

TPHd Surrogate Recovery

Matrix Spike	Methylarachidate	62.0%
Matrix Spike Dup	Methylarachidate	68.0%

Values reported in ppm (mg/kg) on a dry weight basis.

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CI18SB
LIMS ID: 00-19593
Matrix: Soil

QC Report No: CI18-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized: Carolyn S. Roberts 10/31/00
Reported: 10/31/00

LABORATORY CONTROL SAMPLE RECOVERY REPORT
Date extracted: 10/24/00
Date analyzed: 10/25/00

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
Diesel Range Hydrocarbons	94.4	100	94.4%

TPHd Surrogate Recovery

Methylarachidate 81.0%

Values reported in ppm (mg/kg) on a dry weight basis.

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL HYDROCARBONS COMPOUND SUMMARY

Matrix: Soil

QC Report No: CI18

LIMS ID	Lab ID	Extracted	Client ID	MeArach	TOT OUT
00-19593MB	102500MB	10/24/00	Method Blank	77%	0
00-19593LC	102500LC	10/24/00	Lab Control	81%	0
00-19593	CI18A	10/24/00	TP-35-0-1	56%	0
00-19593	CI18A-MS	10/24/00	TP-35-0-1-MS	62%	0
00-19593	CI18A-MSD	10/24/00	TP-35-0-1-MSD	68%	0
00-19594	CI18B	10/24/00	TP-36-0-1	66%	0
00-19594	CI18B-DP	10/24/00	TP-36-0-1-DP	69%	0
00-19595	CI18C	10/24/00	TP-36-6-10	NR	0
00-19596	CI18D	10/24/00	TP-37-0-1	70%	0
00-19597	CI18E	10/24/00	TP-37-2-3	50%	0
00-19598	CI18F	10/24/00	TP-38-0-1	NR	0
00-19599	CI18G	10/24/00	TP-39-0-1	NR	0
00-19600	CI18H	10/24/00	TP-390-0-1	89%	0
00-19601	CI18I	10/24/00	TP-40-0-1	NR	0
00-19602	CI18J	10/24/00	TP-40-2-3	NR	0
00-19603	CI18K	10/24/00	TP-40-4-6	54%	0
00-19604	CI18L	10/24/00	TP-44-0-1	73%	0

	Control QC LIMITS	Sample QC LIMITS
(MeArach) = Methylarachidate	(56-114)	(42-113)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D System Monitoring Compound diluted out

FORM-II TPHD

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: Method Blank**
TOTAL METALS

Lab Sample ID: CI18MB
LIMS ID: 00-19594
Matrix: Soil

QC Report No: CI18-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized:
Reported: 11/20/00

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/31/00	6010	11/16/00	7440-38-2	Arsenic	5	5 U
3050	10/31/00	6010	11/16/00	7440-39-3	Barium	0.3	0.3 U
3050	10/31/00	6010	11/16/00	7440-43-9	Cadmium	0.2	0.2 U
3050	10/31/00	6010	11/16/00	7440-47-3	Chromium	0.5	0.5 U
3050	10/31/00	6010	11/16/00	7440-50-8	Copper	0.2	0.2 U
3050	10/31/00	6010	11/16/00	7439-92-1	Lead	2	2 U
CLP	10/26/00	7471	10/31/00	7439-97-6	Mercury	0.05	0.05 U
3050	10/31/00	6010	11/16/00	7782-49-2	Selenium	5	5 U
3050	10/31/00	6010	11/16/00	7440-22-4	Silver	0.3	0.3 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: Method Blank**
TOTAL METALS

Lab Sample ID: CI18MB
LIMS ID: 00-19593
Matrix: Soil

QC Report No: CI18-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized:
Reported: 11/20/00

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
CLP	11/02/00	7470	11/02/00	7439-97-6	Mercury	0.05	0.05 U

U Analyte undetected at given RL

RL Limit of Detection

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-35-0-1**
TOTAL METALS

Lab Sample ID: CI18A
LIMS ID: 00-19593
Matrix: Soil

QC Report No: CI18-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Data Release Authorized:
Reported: 11/20/00

Percent Total Solids: 91 1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/31/00	6010	11/15/00	7440-38-2	Arsenic	10	10 U
3050	10/31/00	6010	11/15/00	7440-39-3	Barium	0.6	290
3050	10/31/00	6010	11/15/00	7440-43-9	Cadmium	0.4	8.4
3050	10/31/00	6010	11/15/00	7440-47-3	Chromium	1	153
3050	10/31/00	6010	11/15/00	7440-50-8	Copper	0.4	1,260
3050	10/31/00	6010	11/15/00	7439-92-1	Lead	4	4,230
CLP	11/02/00	7471	11/02/00	7439-97-6	Mercury	0.05	0.52
3050	10/31/00	6010	11/15/00	7782-49-2	Selenium	10	10 U
3050	10/31/00	6010	11/15/00	7440-22-4	Silver	0.6	2.2

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-35-0-1
Lab Sample ID: CI18A
QC Report No: CI18-Kennedy Jenks Consultants
LIMS ID: 00-19593
Project: Tacoma Metals
Matrix: Soil
996098.00
Date Received: 10/16/00

Data Release Authorized:
Reported: 11/20/00

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample mg/kg-dry	Spike mg/kg-dry	Spike Added	% Recovery	Q
Arsenic	6010	10 U	210	200	105%	
Barium	6010	290	490	202	99.0%	
Cadmium	6010	8.4	58.9	50.4	100%	
Chromium	6010	153	101	50	-104%	N
Copper	6010	1260	1260	50.4	0.0%	H
Lead	6010	4230	3330	202	-446%	H
Mercury	7471	0.52	1.58	0.51	208%	N
Selenium	6010	10 U	200	200	100%	
Silver	6010	2.2	46.3	50.4	87.5%	

'Q' codes:
N = control limit not met
H = %R not applicable, sample concentration too high
* = RPD control limit not met
NA = Not applicable - analyte not spiked

Control Limits: Percent Recovery: 75-125%
RPD: +/-20%

FORM-V

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET
TOTAL METALS

Sample No: TP-35-0-1
QC Report No: CI18-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 10/16/00

Lab Sample ID: CI18A
LIMS ID: 00-19593
Matrix: Soil

Data Release Authorized:
Reported: 11/20/00

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample mg/kg-dry	Duplicate mg/kg-dry	RPD	Control Limit	Q
Arsenic	6010	10 U	10 U	0.0%	+/- 10	L
Barium	6010	290	304	4.7%	+/- 20 %	
Cadmium	6010	8.4	10.1	18.4%	+/- 20 %	
Chromium	6010	153	47	106%	+/- 20 %	*
Copper	6010	1260	1310	3.9%	+/- 20 %	
Lead	6010	4230	8640	68.5%	+/- 20 %	*
Mercury	7471	0.52	0.56	7.4%	+/- 20 %	
Selenium	6010	10 U	10 U	0.0%	+/- 10	L
Silver	6010	2.2	1.9	14.6%	+/- 0.6	L

'Q' codes: * = control limit not met
L = RPD not valid, alternate limit = detection limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-36-0-1**
TOTAL METALS

Lab Sample ID: CI18B
LIMS ID: 00-19594
Matrix: Soil

QC Report No: CI18-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Data Release Authorized:
Reported: 11/20/00

Percent Total Solids: 92.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/31/00	6010	11/15/00	7440-38-2	Arsenic	10	10 U
3050	10/31/00	6010	11/15/00	7440-39-3	Barium	0.6	54.5
3050	10/31/00	6010	11/15/00	7440-43-9	Cadmium	0.4	0.9
3050	10/31/00	6010	11/15/00	7440-47-3	Chromium	1	31
3050	10/31/00	6010	11/15/00	7440-50-8	Copper	0.4	39.3
3050	10/31/00	6010	11/15/00	7439-92-1	Lead	4	36
CLP	10/26/00	7471	10/31/00	7439-97-6	Mercury	0.05	0.12
3050	10/31/00	6010	11/15/00	7782-49-2	Selenium	10	10 U
3050	10/31/00	6010	11/15/00	7440-22-4	Silver	0.6	0.6 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-36-6-10**
TOTAL METALS

Lab Sample ID: CI18C
LIMS ID: 00-19595
Matrix: Soil

QC Report No: CI18-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Data Release Authorized:
Reported: 11/20/00

Percent Total Solids: 71.7%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/31/00	6010	11/15/00	7440-38-2	Arsenic	10	10 U
3050	10/31/00	6010	11/15/00	7440-39-3	Barium	0.8	31.7
3050	10/31/00	6010	11/15/00	7440-43-9	Cadmium	0.5	0.5
3050	10/31/00	6010	11/15/00	7440-47-3	Chromium	1	19
3050	10/31/00	6010	11/15/00	7440-50-8	Copper	0.5	25.3
3050	10/31/00	6010	11/15/00	7439-92-1	Lead	5	15
CLP	10/26/00	7471	10/31/00	7439-97-6	Mercury	0.06	0.06
3050	10/31/00	6010	11/15/00	7782-49-2	Selenium	10	10 U
3050	10/31/00	6010	11/15/00	7440-22-4	Silver	0.8	0.8 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-37-0-1**
TOTAL METALS

Lab Sample ID: CI18D
LIMS ID: 00-19596
Matrix: Soil

QC Report No: CI18-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Data Release Authorized:
Reported: 11/20/00

Percent Total Solids: 89.7%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/31/00	6010	11/15/00	7440-38-2	Arsenic	10	30
3050	10/31/00	6010	11/15/00	7440-39-3	Barium	0.6	979
3050	10/31/00	6010	11/15/00	7440-43-9	Cadmium	0.4	26.6
3050	10/31/00	6010	11/15/00	7440-47-3	Chromium	1	124
3050	10/31/00	6010	11/15/00	7440-50-8	Copper	0.4	625
3050	10/31/00	6010	11/15/00	7439-92-1	Lead	4	1,900
CLP	10/26/00	7471	10/31/00	7439-97-6	Mercury	0.04	4.18
3050	10/31/00	6010	11/15/00	7782-49-2	Selenium	10	10
3050	10/31/00	6010	11/15/00	7440-22-4	Silver	0.6	1.1

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-37-2-3**
TOTAL METALS

Lab Sample ID: CI18E
LIMS ID: 00-19597
Matrix: Soil

QC Report No: CI18-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Data Release Authorized
Reported: 11/20/00

Percent Total Solids: 85.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/31/00	6010	11/16/00	7440-38-2	Arsenic	10	20
3050	10/31/00	6010	11/16/00	7440-39-3	Barium	0.6	1,630
3050	10/31/00	6010	11/16/00	7440-43-9	Cadmium	0.4	24.7
3050	10/31/00	6010	11/16/00	7440-47-3	Chromium	1	112
3050	10/31/00	6010	11/16/00	7440-50-8	Copper	0.4	483
3050	10/31/00	6010	11/16/00	7439-92-1	Lead	4	1,630
CLP	10/26/00	7471	10/31/00	7439-97-6	Mercury	0.05	2.66
3050	10/31/00	6010	11/16/00	7782-49-2	Selenium	10	10 U
3050	10/31/00	6010	11/16/00	7440-22-4	Silver	0.6	0.6 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-38-0-1**
TOTAL METALS

Lab Sample ID: CI18F
LIMS ID: 00-19598
Matrix: Soil

QC Report No: CI18-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Data Release Authorized:
Reported: 11/20/00

Percent Total Solids: 82.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/31/00	6010	11/16/00	7440-38-2	Arsenic	30	60
3050	10/31/00	6010	11/16/00	7440-39-3	Barium	2	2,710
3050	10/31/00	6010	11/16/00	7440-43-9	Cadmium	1	125
3050	10/31/00	6010	11/16/00	7440-47-3	Chromium	3	263
3050	10/31/00	6010	11/16/00	7440-50-8	Copper	1	3,320
3050	10/31/00	6010	11/16/00	7439-92-1	Lead	10	9,380
CLP	10/26/00	7471	10/31/00	7439-97-6	Mercury	0.6	14.3
3050	10/31/00	6010	11/16/00	7782-49-2	Selenium	30	30
3050	10/31/00	6010	11/16/00	7440-22-4	Silver	2	6

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-39-0-1**
TOTAL METALS

Lab Sample ID: CI18G
LIMS ID: 00-19599
Matrix: Soil

QC Report No: CI18-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Data Release Authorized:
Reported: 11/20/00

Percent Total Solids: 75.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/31/00	6010	11/16/00	**7440-38-2**	**Arsenic**	10	10
3050	10/31/00	6010	11/16/00	**7440-39-3**	**Barium**	0.8	110
3050	10/31/00	6010	11/16/00	**7440-43-9**	**Cadmium**	0.5	13.2
3050	10/31/00	6010	11/16/00	**7440-47-3**	**Chromium**	1	30
3050	10/31/00	6010	11/16/00	**7440-50-8**	**Copper**	0.5	1,100
3050	10/31/00	6010	11/16/00	**7439-92-1**	**Lead**	5	1,040
CLP	10/26/00	7471	10/31/00	**7439-97-6**	**Mercury**	0.06	0.21
3050	10/31/00	6010	11/16/00	7782-49-2	Selenium	10	10 U
3050	10/31/00	6010	11/16/00	7440-22-4	Silver	0.8	0.8 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-390-0-1**
TOTAL METALS

Lab Sample ID: CI18H
LIMS ID: 00-19600
Matrix: Soil

QC Report No: CI18-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Data Release Authorized:
Reported: 11/20/00

Percent Total Solids: 80.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/31/00	6010	11/16/00	7440-38-2	Arsenic	10	10 U
3050	10/31/00	6010	11/16/00	7440-39-3	Barium	0.7	134
3050	10/31/00	6010	11/16/00	7440-43-9	Cadmium	0.5	16.8
3050	10/31/00	6010	11/16/00	7440-47-3	Chromium	1	27
3050	10/31/00	6010	11/16/00	7440-50-8	Copper	0.5	107
3050	10/31/00	6010	11/16/00	7439-92-1	Lead	5	374
CLP	10/26/00	7471	10/31/00	7439-97-6	Mercury	0.06	0.24
3050	10/31/00	6010	11/16/00	7782-49-2	Selenium	10	10 U
3050	10/31/00	6010	11/16/00	7440-22-4	Silver	0.7	0.7 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-40-0-1**
TOTAL METALS

Lab Sample ID: CI181
LIMS ID: 00-19601
Matrix: Soil

QC Report No: CI18-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Data Release Authorized:
Reported: 11/20/00

Percent Total Solids: 87.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/31/00	6010	11/16/00	7440-38-2	Arsenic	50	60
3050	10/31/00	6010	11/16/00	7440-39-3	Barium	3	738
3050	10/31/00	6010	11/16/00	7440-43-9	Cadmium	2	36
3050	10/31/00	6010	11/16/00	7440-47-3	Chromium	5	670
3050	10/31/00	6010	11/16/00	7440-50-8	Copper	2	2,530
3050	10/31/00	6010	11/16/00	7439-92-1	Lead	20	3,700
CLP	10/26/00	7471	10/31/00	7439-97-6	Mercury	0.9	15.0
3050	10/31/00	6010	11/16/00	7782-49-2	Selenium	50	50 U
3050	10/31/00	6010	11/16/00	7440-22-4	Silver	3	4

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-40-2-3**
TOTAL METALS

Lab Sample ID: CI18J
LIMS ID: 00-19602
Matrix: Soil

QC Report No: CI18-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Data Release Authorized:
Reported: 11/20/00

Percent Total Solids: 85.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/31/00	6010	11/16/00	7440-38-2	Arsenic	30	30 U
3050	10/31/00	6010	11/16/00	7440-39-3	Barium	2	851
3050	10/31/00	6010	11/16/00	7440-43-9	Cadmium	1	40
3050	10/31/00	6010	11/16/00	7440-47-3	Chromium	3	212
3050	10/31/00	6010	11/16/00	7440-50-8	Copper	1	1,240
3050	10/31/00	6010	11/16/00	7439-92-1	Lead	10	2,050
CLP	10/26/00	7471	10/31/00	7439-97-6	Mercury	0.05	3.19
3050	10/31/00	6010	11/16/00	7782-49-2	Selenium	30	30 U
3050	10/31/00	6010	11/16/00	7440-22-4	Silver	2	3

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-40-4-6**
TOTAL METALS

Lab Sample ID: CI18K
LIMS ID: 00-19603
Matrix: Soil

QC Report No: CI18-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Data Release Authorized:
Reported: 11/20/00

Percent Total Solids: 86.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/31/00	6010	11/16/00	7440-38-2	Arsenic	10	10 U
3050	10/31/00	6010	11/16/00	**7440-39-3**	**Barium**	0.7	**126**
3050	10/31/00	6010	11/16/00	**7440-43-9**	**Cadmium**	0.4	**3.7**
3050	10/31/00	6010	11/16/00	**7440-47-3**	**Chromium**	1	**31**
3050	10/31/00	6010	11/16/00	**7440-50-8**	**Copper**	0.4	**94.0**
3050	10/31/00	6010	11/16/00	**7439-92-1**	**Lead**	4	**192**
CLP	10/26/00	7471	10/31/00	**7439-97-6**	**Mercury**	0.05	**0.22**
3050	10/31/00	6010	11/16/00	7782-49-2	Selenium	10	10 U
3050	10/31/00	6010	11/16/00	7440-22-4	Silver	0.7	0.7 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-44-0-1**
TOTAL METALS

Lab Sample ID: CI18L
LIMS ID: 00-19604
Matrix: Soil

QC Report No: CI18-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Data Release Authorized:
Reported: 11/20/00

Percent Total Solids: 95.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/31/00	6010	11/16/00	7440-38-2	Arsenic	10	10 U
3050	10/31/00	6010	11/16/00	7440-39-3	Barium	0.6	27.2
3050	10/31/00	6010	11/16/00	7440-43-9	Cadmium	0.4	0.4
3050	10/31/00	6010	11/16/00	7440-47-3	Chromium	1.0	17.2
3050	10/31/00	6010	11/16/00	7440-50-8	Copper	0.4	21.5
3050	10/31/00	6010	11/16/00	7439-92-1	Lead	4	13
CLP	10/26/00	7471	10/31/00	7439-97-6	Mercury	0.05	0.05 U
3050	10/31/00	6010	11/16/00	7782-49-2	Selenium	10	10 U
3050	10/31/00	6010	11/16/00	7440-22-4	Silver	0.6	0.6 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CI16LCS
LIMS ID: 00-19594
Matrix: Soil

QC Report No: CI16-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized
Reported: 11/20/00

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike mg/kg-dry	Spike Added	% Recovery	Q
Arsenic	6010	206	200	103%	
Barium	6010	187	200	93.5%	
Cadmium	6010	50.5	50.0	101%	
Chromium	6010	49.4	50.0	98.8%	
Copper	6010	49.2	50.0	98.4%	
Lead	6010	190	200	95.0%	
Mercury	7471	0.98	1.00	98.0%	
Selenium	6010	209	200	104%	
Silver	6010	44.6	50.0	89.2%	

'Q' codes: N = control limit not met

Control Limits: 80-120%

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CI18LCS
LIMS ID: 00-19593
Matrix: Soil

QC Report No: CI18-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized
Reported: 11/20/00

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike mg/kg-dry	Spike Added	% Recovery	Q
Mercury	7471	0.85	1.00	85.0%	

'Q' codes: N = control limit not met

Control Limits: 80-120%

FORM-VII

Laucks Since 1908
Testing Laboratories, Inc.
940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX (206) 767-5063
Chemistry, Microbiology, and Technical Services

Certificate of Analysis

CLIENT: Analytical Resources, Inc.
400 9th Ave. North
Seattle, WA 98109

Work Order# : 00-10-522
DATE RECEIVED : 10/24/00
DATE OF REPORT: 11/14/00

ATTN : Jeff Reitan

Work ID : Kennedy Jenks
Taken By : Client
Transported by: Client
Type : Soil

SAMPLE IDENTIFICATION:

	Sample Description	Collection Date		Sample Description	Collection Date
01	CI18 G	10/13/00 12:40	04	CI22 A	10/13/00 12:45
02	CI18 H	10/13/00 13:35	05	CI22 B	10/13/00 12:50
03	CI18 L	10/13/00 14:45	06	CI22 C	10/13/00 13:25

FLAGGING:

The flag "U" indicates that the analyte of interest was not detected to the limit of detection indicated.

ATTACHMENTS:

Following presentation of sample results, the following appendices are attached to this report:

Appendix A: Method Blank Report and Surrogate Recovery Report
Appendix B: Matrix Spike/Matrix Spike Duplicate Report
Appendix C: Blank Spike Recovery Report
Appendix D: Chain-of-Custody

This report is submitted for the exclusive use of the person, partnership, or corporation to whom it is addressed. Subsequent use of the name of this company or any member of its staff in connection with the advertising or sale of any product or process will be granted only on contract. This company accepts no responsibility except for the due performance of inspection and/or analysis in good faith and according to the rules of the trade and of science.

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Laucks Since 1908
Testing Laboratories, Inc.
940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX (206) 767-5063

Chemistry, Microbiology, and Technical Services

CLIENT : Analytical Resources, Inc.

Certificate of Analysis

Work Order# : 00-10-522

Unless otherwise instructed all samples will be discarded on 12/22/00 with the exception of samples which are consumed during the analysis, such as microbiological samples.

Respectfully submitted,
Laucks Testing Laboratories, Inc.

J. M. Owens

This report is submitted for the exclusive use of the person, partnership, or corporation to whom it is addressed. Subsequent use of the name of this company or any member of its staff in connection with the advertising or sale of any product or process will be granted only on contract. This company accepts no responsibility except for the due performance of inspection and/or analysis in good faith and according to the rules of the trade and of science.

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ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE ID

CI18 G

Lab Name: LAUCKS TESTING LABS

Matrix: (soil/water) SOIL

Sample wt/vol: 2 (g/ml) g

% Moisture: 0

Extraction: SONC

Concentrated Extract Volume: 20000 (uL)

Dilution Factor: 1.0

SDG No.: 0010522

Lab Sample ID: 0010522-01

Lab File ID: 3B01028.D

Date Collected: 10/13/00

Date Received: 10/24/00

Date Prepared: 10/26/00

Date Analyzed: 11/02/00

CONCENTRATION UNITS:

CAS NO.	COMPOUND	mg/Kg	Q	SDL
121-14-2	2,4-Dinitrotoluene	0.50	U	0.50
606-20-2	2,6-Dinitrotoluene	0.50	U	0.50
118-96-7	2,4,6-Trinitrotoluene	0.50	U	0.50
1946-51-0	4-Amino-2,6-Dinitrotoluene	0.50	U	0.50
35572-78-2	2-Amino-4,6-Dinitrotoluene	0.50	U	0.50

CONFIRMATION SUMMARY WORKSHEET
FOR SINGLE COMPONENT ANALYTES

Client Sample ID

CI18 G

Lab Name:	Laucks Testing Labs, Inc.					
Lab Sample ID:	0010522-01					
Instrument ID (1):	HPLC3.i			Instrument ID (2):		
Column (1):	C18	ID	4.60 (mm)	Column (2):	ID:	(mm)
File (1):	3B01028.d			File (2):		
Date Analyzed (1)	11/02/00			Date Analyzed (2):		

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION Final Units: mg/Kg	%D

X = Concentration Reported

Data File: \\PIII600-02\DROOT\Chem\HPLC3.i\3B010+A.b\3B01028.d

Date : 02-NOV-2000 10:05

Client ID: CI18 G

Instrument: HPLC3.i

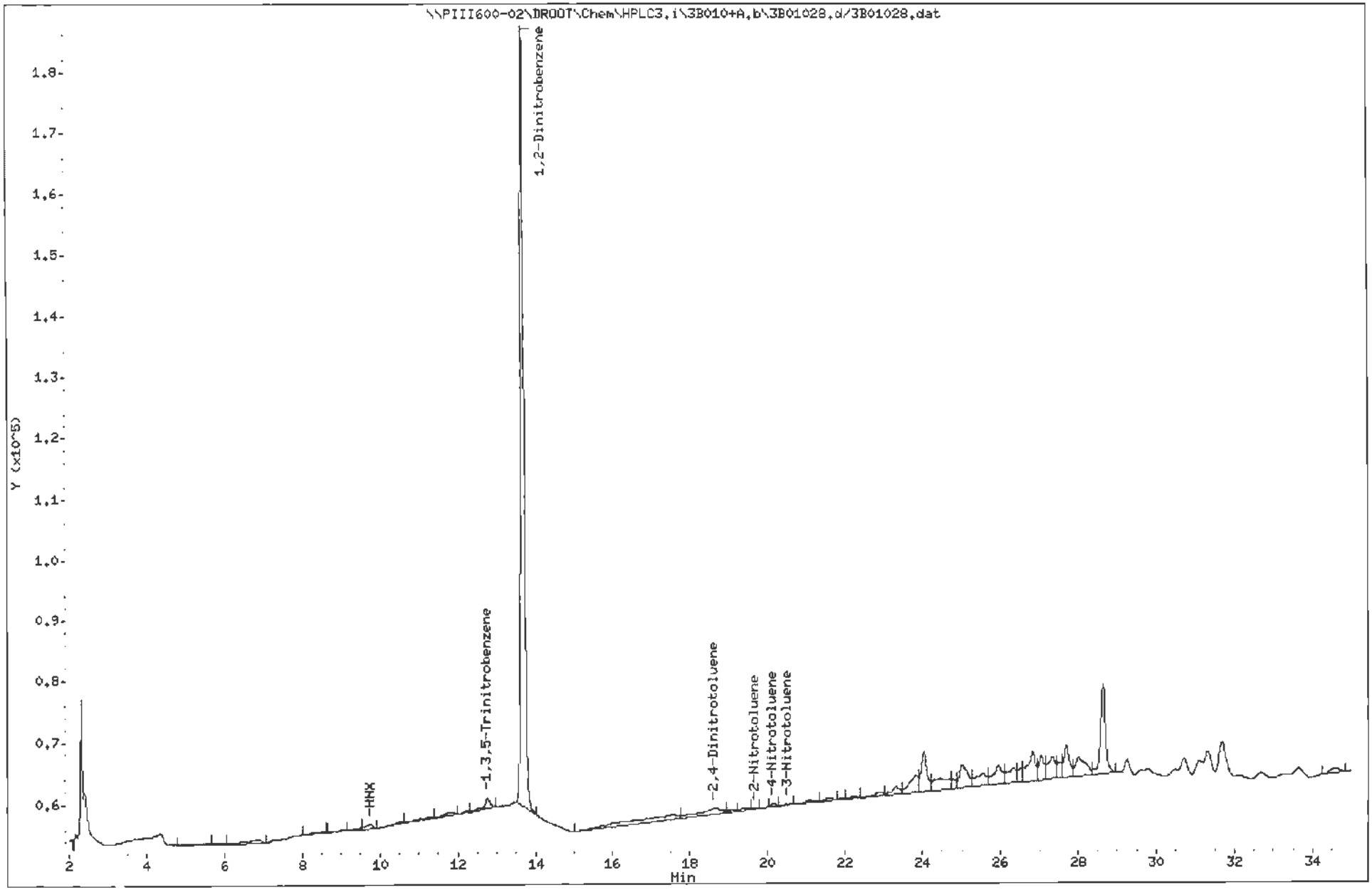
Sample Info: 0010522-01

Volume Injected (uL): 50.0

Operator: SMH

Column phase: C18

Column diameter: 4.60



Laucks Testing Labs
Quantitation Report

Data File : //PIII600-02/DROOT/Chem/HPLC3.i/3B010+A.b/3B01028.d
Injection Date : 02-NOV-2000 10:05
Sample Info : 0010522-01
Misc. Info :
Laboratory ID : 0010522-01
Instrument ID : HPLC3.i
Method : 3CB01+01.m
Quantitation : ESTD
Dilution Factor : 1.00
Column : C18

Integrator : HP Genie
Sample Type: SAMPLE
Column Size: 0.15m 4.60mm

UnitFactor : 0.001000
FinalVolume : 20000 uL
SampleWeight: 2.000 g
Moisture : 0.0000 %
InjectionVolume: 50.00 ul

Compound	RT	RT Window	Response		Concentrations Soln ng/mL	Concentrations Final mg/Kg
	5.61		7396			
	5.83		5549			
	6.81		27755			
	8.53		7512			
	8.60		728			
	9.04		4461			
	9.53		7933			
HMX	9.75	9.70 - 9.84	20105	MR	~~37.31~~	~~0.37~~ <RL
	10.52		12558			
	11.27		16626			
	11.79		15006			
	12.21		3404			
1,3,5-Trinitrobenzene	12.76	12.69 - 12.87	34449	MB	~~24.30~~	~~0.24~~
1,2-Dinitrobenzene	13.68	13.60 - 13.74	1618740	MB	1751.40	17.50
	17.52		154775			
2,4-Dinitrotoluene	18.64	18.27 - 19.15	81966		~~43.90~~	~~0.44~~ <RL
	19.10		8243			
	19.36		11311			
2-Nitrotoluene	19.67	19.33 - 20.31	2131		~~2.64~~	~~0.03~~
4-Nitrotoluene	20.14	19.87 - 20.75	7447		~~10.36~~	~~0.10~~
3-Nitrotoluene	20.54	20.20 - 21.14	5846		~~6.40~~	~~0.06~~
	21.09		15070			
	21.59		16388			
	21.91		4209			
	22.21		12014			
	22.86		22510			
	23.30		35848			
	23.82		88833			
	24.02		134386			
	24.43		97738			
	24.79		23540			

50
11-7-00

Response is in area units.
M - The peak was manually integrated.
E - The quantitated amount exceeds the calibration range.

ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE ID

CI18 H

Lab Name: LAUCKS TESTING LABS

Matrix: (soil/water) SOIL

Sample wt/vol: 2 (g/ml) g

% Moisture: 0

Extraction: SONC

Concentrated Extract Volume: 20000 (uL)

Dilution Factor: 1.0

SDG No.: 0010522

Lab Sample ID: 0010522-02

Lab File ID: 3B01029.D

Date Collected: 10/13/00

Date Received: 10/24/00

Date Prepared: 10/26/00

Date Analyzed: 11/02/00

CONCENTRATION UNITS:

CAS NO.	COMPOUND	mg/Kg	Q	SDL
121-14-2	2,4-Dinitrotoluene	0.50	U	0.50
606-20-2	2,6-Dinitrotoluene	0.50	U	0.50
118-96-7	2,4,6-Trinitrotoluene	0.50	U	0.50
1946-51-0	4-Amino-2,6-Dinitrotoluene	0.50	U	0.50
35572-78-2	2-Amino-4,6-Dinitrotoluene	0.50	U	0.50

290.0-1

CONFIRMATION SUMMARY WORKSHEET
FOR SINGLE COMPONENT ANALYTES

Client Sample ID

CI18 H

Lab Name:	Laucks Testing Labs, Inc.					
Lab Sample ID:	0010522-02					
Instrument ID (1):	HPLC3.i			Instrument ID (2):		
Column (1):	C18	ID	4.60 (mm)	Column (2):	ID:	(mm)
File (1):	3B01029.d			File (2):		
Date Analyzed (1)	11/02/00			Date Analyzed (2):		

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION Final Units: mg/Kg	%D

X = Concentration Reported

Data File: \\PIII600-02\DROOT\Chem\HPLC3.i\3B010+A.b\3B01029.d

Date : 02-NOV-2000 10:56

Client ID: CI18 H

Instrument: HPLC3.i

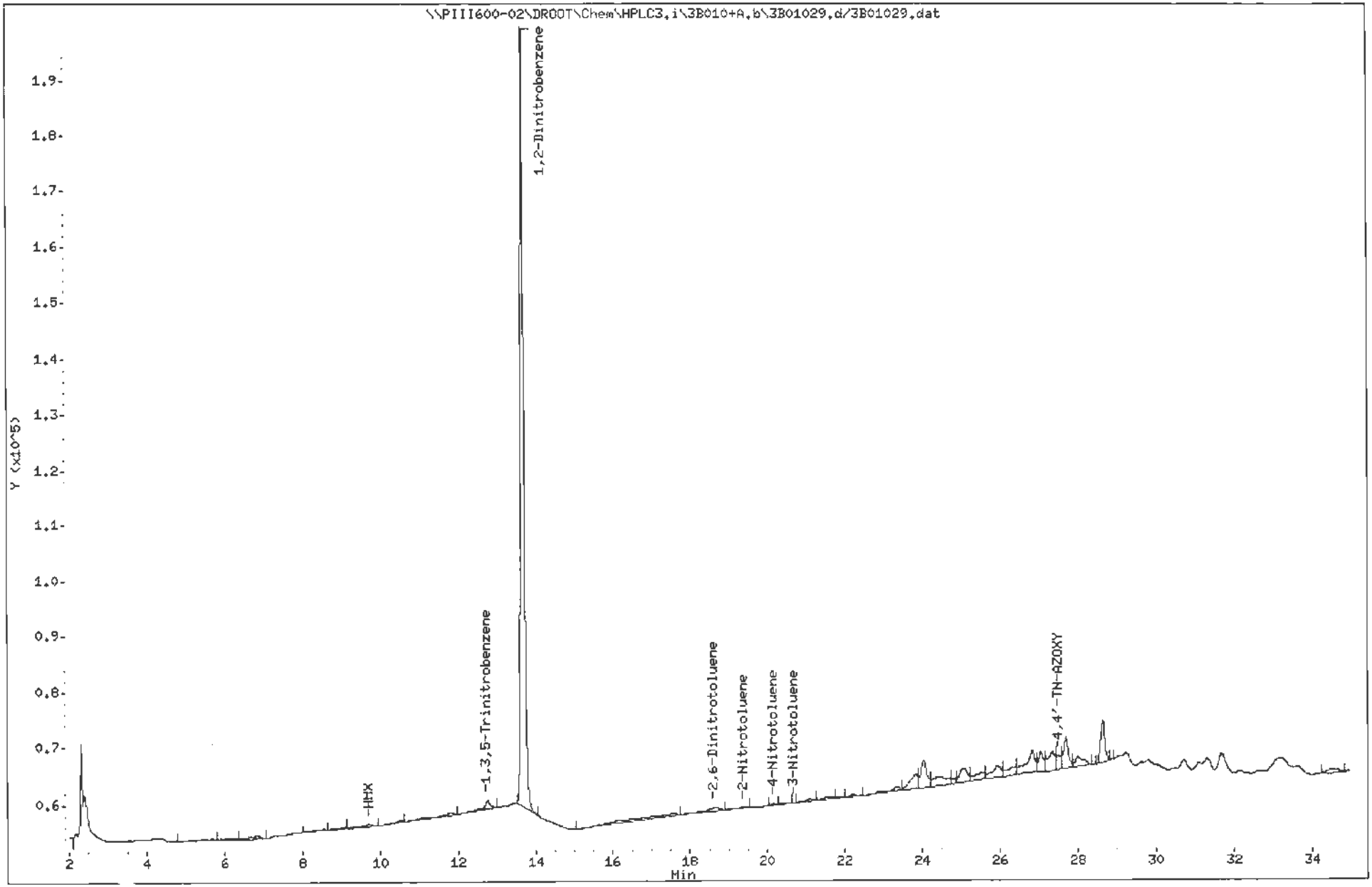
Sample Info: 0010522-02

Volume Injected (uL): 50.0

Operator: SMH

Column phase: C18

Column diameter: 4.60



Laucks Testing Labs
Quantitation Report

Data File : //PIII600-02/DROOT/Chem/HPLC3.i/3B010+A.b/3B01029.d
Injection Date : 02-NOV-2000 10:56
Sample Info : 0010522-02
Misc. Info :
Laboratory ID : 0010522-02
Instrument ID : HPLC3.i
Method : 3CB01+01.m
Quantitation : ESTD
Dilution Factor : 1.00
Column : C18

Integrator : HP Genie
Sample Type: SAMPLE
Column Size: 0.15m 4.60mm

UnitFactor : 0.001000
FinalVolume : 20000 uL
SampleWeight: 2.000 g
Moisture : 0.0000 %
InjectionVolume: 50.00 ul

Compound	RT	RT Window	Response		Concentrations Soln ng/mL	Final mg/Kg
	5.68		6617			
	6.26		8634			
	6.83		23763			
	8.56		9195			
	9.05		7089			
HMX	9.75	9.70 - 9.84	15708	MB	~~29.15~~	~~0.29~~ <RL
	10.52		9591			
	11.79		27836			
1,3,5-Trinitrobenzene	12.76	12.69 - 12.87	37253	MB	~~26.28~~	~~0.26~~
1,2-Dinitrobenzene	13.68	13.60 - 13.74	1788110	MB	1934.60	19.40
	17.53		71074			
2,6-Dinitrotoluene	18.63	18.12 - 18.86	25781	MB	~~29.05~~	~~0.29~~ <RL
2-Nitrotoluene	19.38	19.33 - 20.31	7563	MB	~~9.36~~	~~0.09~~
4-Nitrotoluene	20.15	19.87 - 20.75	4393		~~6.11~~	~~0.06~~
	20.57		5099			
3-Nitrotoluene	20.68	20.20 - 21.14	904		~~0.99~~	~~0.01~~
	21.09		12239			
	21.60		16044			
	21.93		6042			
	22.21		9770			
	23.33		31526			
	23.82		74736			
	24.03		105311			
	24.42		73613			
	24.78		12170			
	25.08		70146			
	25.53		47172			
	25.93		68889			
	26.34		52215			
	26.82		130215			
	27.04		61137			

SD
11-7-00

Response is in area units.
M - The peak was manually integrated.
E - The quantitated amount exceeds the calibration range.

ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE ID

CI18 L

Lab Name: LAUCKS TESTING LABS

Matrix: (soil/water) SOIL

Sample wt/vol: 2 (g/ml) g

% Moisture: 0

Extraction: SONC

Concentrated Extract Volume: 20000 (uL)

Dilution Factor: 1.0

SDG No.: 0010522

Lab Sample ID: 0010522-03

Lab File ID: 3B01030.D

Date Collected: 10/13/00

Date Received: 10/24/00

Date Prepared: 10/26/00

Date Analyzed: 11/02/00

CONCENTRATION UNITS:

CAS NO.	COMPOUND	mg/Kg	Q	SDL
121-14-2	2,4-Dinitrotoluene	0.50	U	0.50
606-20-2	2,6-Dinitrotoluene	0.50	U	0.50
118-96-7	2,4,6-Trinitrotoluene	0.50	U	0.50
1946-51-0	4-Amino-2,6-Dinitrotoluene	0.50	U	0.50
35572-78-2	2-Amino-4,6-Dinitrotoluene	0.50	U	0.50

AA-0-1

CONFIRMATION SUMMARY WORKSHEET
FOR SINGLE COMPONENT ANALYTES

Client Sample ID

CI18 L

Lab Name:	Laucks Testing Labs, Inc.					
Lab Sample ID:	0010522-03					
Instrument ID (1):	HPLC3.i			Instrument ID (2):		
Column (1):	C18	ID	4.60 (mm)	Column (2):	ID:	(mm)
File (1):	3B01030.d			File (2):		
Date Analyzed (1)	11/02/00			Date Analyzed (2):		

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION Final Units: mg/Kg	%D

X = Concentration Reported

Data File: \\PIII600-02\DROOT\Chem\HPLC3.i\3B010+A.b\3B01030.d

Date : 02-NOV-2000 11:47

Client ID: CI1B L

Instrument: HPLC3.i

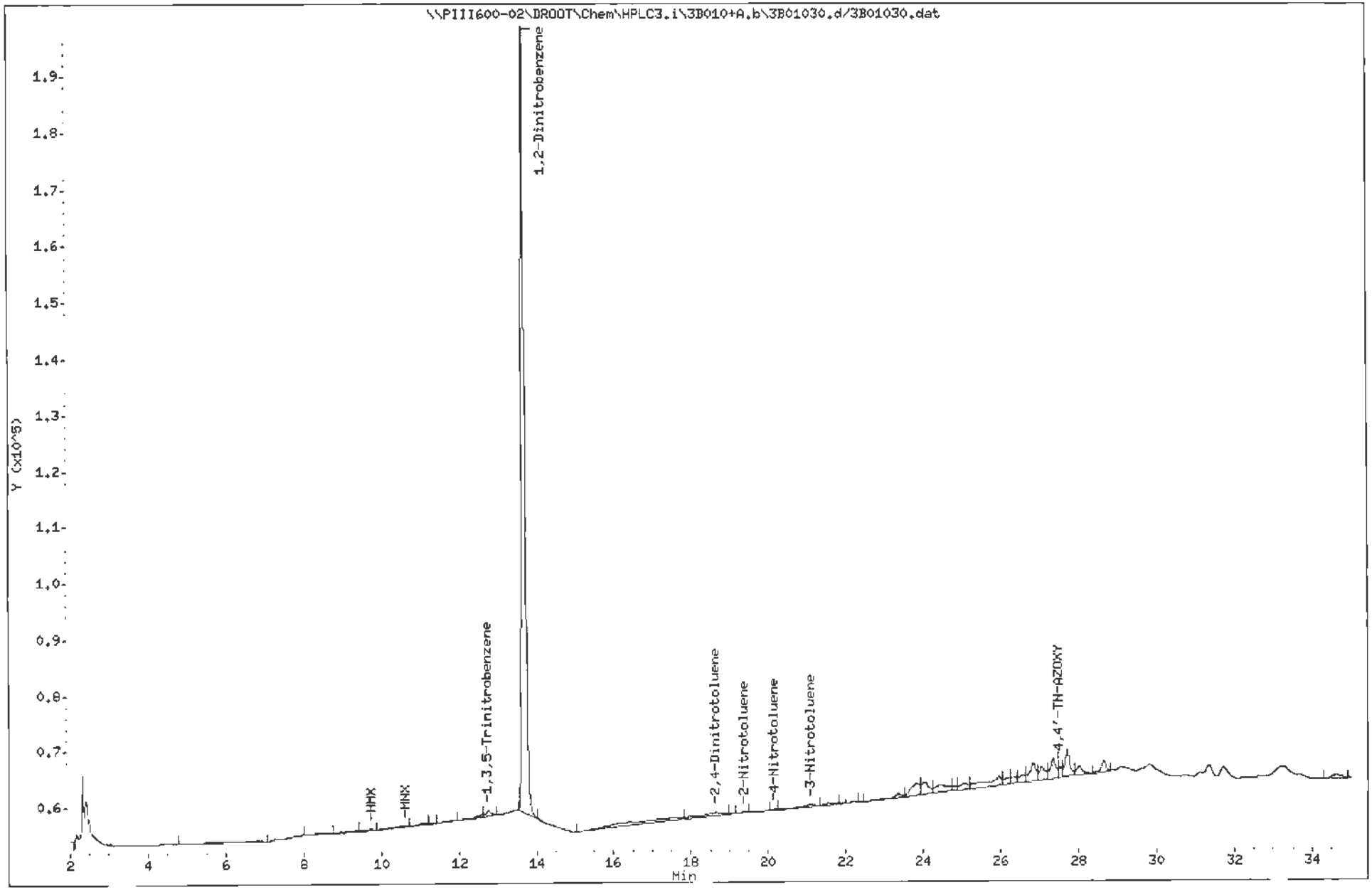
Sample Info: 0010522-03

Volume Injected (uL): 50.0

Operator: SHH

Column phase: C18

Column diameter: 4.60



Laucks Testing Labs
Quantitation Report

Data File : //PIII600-02/DROOT/Chem/HPLC3.i/3B010+A.b/3B01030.d
Injection Date : 02-NOV-2000 11:47
Sample Info : 0010522-03
Misc. Info :
Laboratory ID : 0010522-03
Instrument ID : HPLC3.i
Method : 3CB01+01.m
Quantitation : ESTD
Dilution Factor : 1.00
Column : C18

Integrator : HP Genie
Sample Type: SAMPLE
Column Size: 0.15m 4.60mm

UnitFactor : 0.001000
FinalVolume : 20000 uL
SampleWeight: 2.000 g
Moisture : 0.0000 %
InjectionVolume: 50.00 ul

Compound	RT	RT Window	Response		Concentrations Soln ng/mL	Concentrations Final mg/Kg
	6.77		35278			
	8.51		9106			
	9.37		11401			
HMX	9.75	9.70 - 9.84	9271	MB	~~17.20~~	~~0.17~~ <RL
MNX	10.64	0.00 - 0.00	15499	MB	~~0.00~~	~~0.00~~
	11.14		10881			
	11.35		4037			
	11.91		6722			
	12.58		8285			
1,3,5-Trinitrobenzene	12.76	12.69 - 12.87	16652	MB	~~11.75~~	~~0.12~~
1,2-Dinitrobenzene	13.68	13.60 - 13.74	1793723	MB	1940.70	19.40
	17.57		134974			
2,4-Dinitrotoluene	18.65	18.27 - 19.15	56199		~~30.10~~	~~0.30~~ <RL
	19.05		1832			
2-Nitrotoluene	19.40	19.33 - 20.31	3271		~~4.05~~	~~0.04~~
4-Nitrotoluene	20.16	19.87 - 20.75	1204		~~1.67~~	~~0.02~~
3-Nitrotoluene	21.11	20.20 - 21.14	12724		~~13.93~~	~~0.14~~
	21.61		9732			
	21.94		1286			
	22.22		3512			
	22.33		903			
	23.34		12979			
	23.82		67182			
	24.03		55264			
	24.44		59962			
	24.78		12169			
	25.06		30077			
	25.94		95486			
	26.19		21562			
	26.33		22685			
	26.56		27983			

SO
11-7-00

Response is in area units.
M - The peak was manually integrated.
E - The quantitated amount exceeds the calibration range.

ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE ID

CI22 A

Lab Name: LAUCKS TESTING LABS

Matrix: (soil/water) SOIL

Sample wt/vol: 2 (g/ml) g

% Moisture: 0

Extraction: SONC

Concentrated Extract Volume: 20000 (uL)

Dilution Factor: 1.0

SDG No.: 0010522

Lab Sample ID: 0010522-04

Lab File ID: 3B01031.D

Date Collected: 10/13/00

Date Received: 10/24/00

Date Prepared: 10/26/00

Date Analyzed: 11/02/00

TP-29-22

CONCENTRATION UNITS:

CAS NO.	COMPOUND	mg/Kg	Q	SDL
121-14-2	2,4-Dinitrotoluene	0.50	U	0.50
606-20-2	2,6-Dinitrotoluene	0.50	U	0.50
118-96-7	2,4,6-Trinitrotoluene	0.50	U	0.50
1946-51-0	4-Amino-2,6-Dinitrotoluene	0.50	U	0.50
35572-78-2	2-Amino-4,6-Dinitrotoluene	0.50	U	0.50

CONFIRMATION SUMMARY WORKSHEET
FOR SINGLE COMPONENT ANALYTES

Client Sample ID

CI22 A

Lab Name:	Laucks Testing Labs, Inc.					
Lab Sample ID:	0010522-04					
Instrument ID (1):	HPLC3.i			Instrument ID (2):		
Column (1):	C18	ID	4.60 (mm)	Column (2):	ID:	(mm)
File (1):	3B01031.d			File (2):		
Date Analyzed (1)	11/02/00			Date Analyzed (2):		

ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION Final Units: mg/Kg	%D

X = Concentration Reported

Data File: \\PIII600-02\DROOT\Chem\HPLC3.i\3B010+A.b\3B01031.d

Date : 02-NOV-2000 12:39

Client ID: CI22 A

Instrument: HPLC3.i

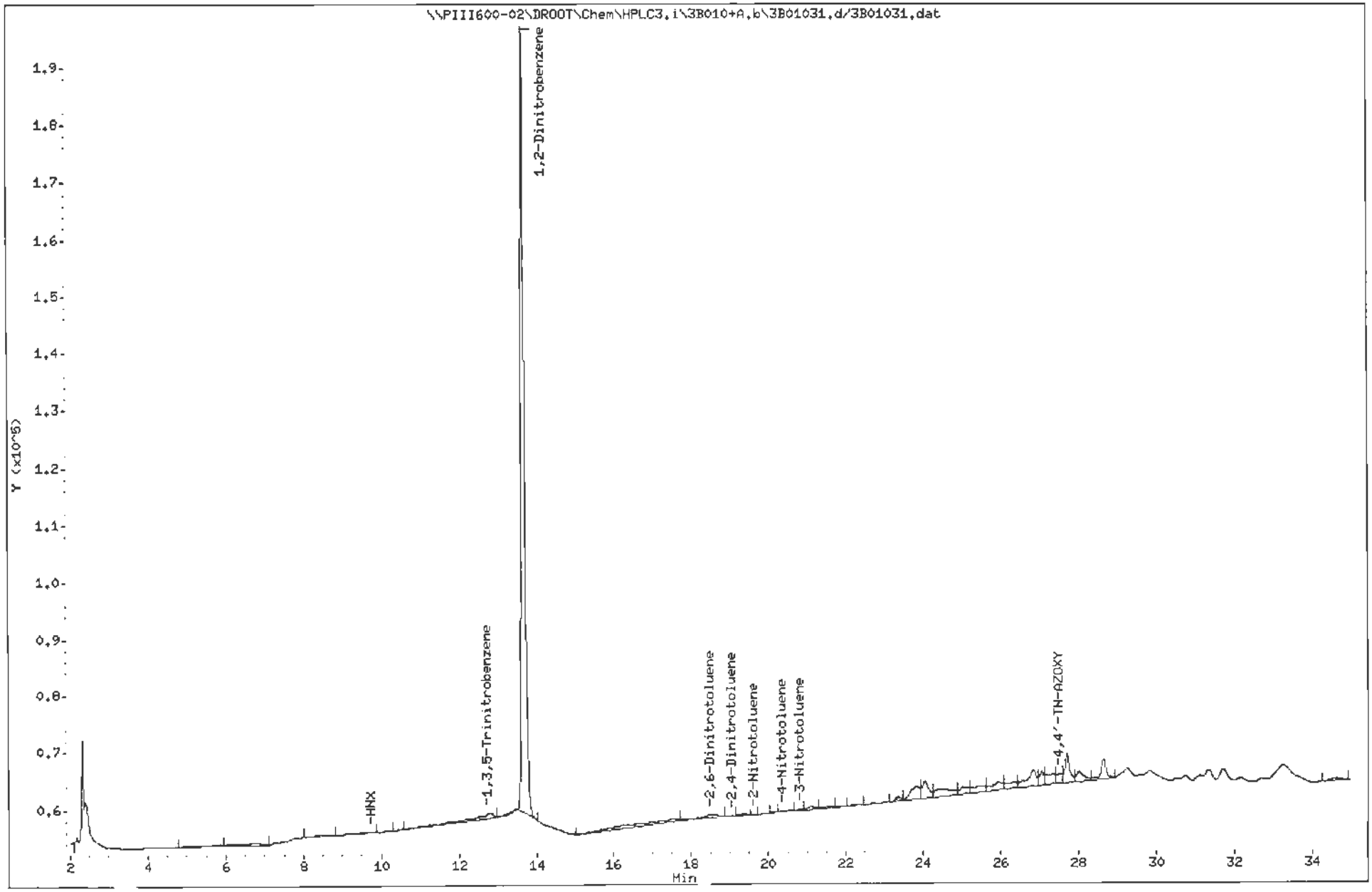
Sample Info: 0010522-04

Volume Injected (uL): 50.0

Operator: SHH

Column phase: C18

Column diameter: 4.60



Laucks Testing Labs
Quantitation Report

Data File : //PIII600-02/DROOT/Chem/HPLC3.i/3B010+A.b/3B01031.d
Injection Date : 02-NOV-2000 12:39
Sample Info : 0010522-04
Misc. Info :
Laboratory ID : 0010522-04
Instrument ID : HPLC3.i
Method : 3CB01+01.m
Quantitation : ESTD
Dilution Factor : 1.00
Column : C18

Integrator : HP Genie
Sample Type: SAMPLE
Column Size: 0.15m 4.60mm

UnitFactor : 0.001000
FinalVolume : 20000 uL
SampleWeight: 2.000 g
Moisture : 0.0000 %
InjectionVolume: 50.00 ul

Compound	RT	RT Window	Response		Concentrations Soln ng/mL	Concentrations Final mg/Kg
	5.77		13532			
	6.81		29409			
	8.51		10917			
HMX	9.77	9.70 - 9.84	18616	MB	~~34.54~~	~~0.34~~ <RL
	10.24		5934			
	10.54		6234			
1,3,5-Trinitrobenzene	12.76	12.69 - 12.87	68621	MB	~~48.41~~	~~0.48~~
	13.47		3194			
1,2-Dinitrobenzene	13.68	13.60 - 13.74	1730533	MB	1872.30	18.70
	17.53		82680			
2,6-Dinitrotoluene	18.52	18.12 - 18.86	29251	MB	~~32.96~~	~~0.33~~ <RL
2,4-Dinitrotoluene	19.09	18.27 - 19.15	4559	MB	~~2.44~~	~~0.02~~
	19.36		9238			
2-Nitrotoluene	19.64	19.33 - 20.31	1710		~~2.12~~	~~0.02~~
	20.16		3442			
4-Nitrotoluene	20.38	19.87 - 20.75	6620		~~9.21~~	~~0.09~~
3-Nitrotoluene	20.84	20.20 - 21.14	6050		~~6.62~~	~~0.07~~
	21.10		13972			
	21.62		10652			
	21.87		4324			
	22.20		6014			
	22.98		4915			
	23.34		17645			
	23.82		76740			
	24.04		74232			
	24.43		82988			
	25.02		37781			
	25.49		48577			
	25.94		59578			
	26.33		43068			
	26.82		99302			

SO
11-7-00

Response is in area units.
M - The peak was manually integrated.
E - The quantitated amount exceeds the calibration range.

ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE ID

CI22 B

Lab Name: LAUCKS TESTING LABS

Matrix: (soil/water) SOIL

Sample wt/vol: 2 (g/ml) g

% Moisture: 0

Extraction: SONC

Concentrated Extract Volume: 20000 (uL)

Dilution Factor: 1.0

SDG No.: 0010522

Lab Sample ID: 0010522-05

Lab File ID: 3B01036.D

Date Collected: 10/13/00

Date Received: 10/24/00

Date Prepared: 10/26/00

Date Analyzed: 11/02/00

CONCENTRATION UNITS:

CAS NO.	COMPOUND	mg/Kg	Q	SDL
121-14-2	2,4-Dinitrotoluene	0.50	U	0.50
606-20-2	2,6-Dinitrotoluene	0.50	U	0.50
118-96-7	2,4,6-Trinitrotoluene	0.50	U	0.50
1946-51-0	4-Amino-2,6-Dinitrotoluene	0.50	U	0.50
35572-78-2	2-Amino-4,6-Dinitrotoluene	0.50	U	0.50

CONFIRMATION SUMMARY WORKSHEET
FOR SINGLE COMPONENT ANALYTES

Client Sample ID

CI22 B

Lab Name:	Laucks Testing Labs, Inc.					
Lab Sample ID:	0010522-05					
Instrument ID (1):	HPLC3.i			Instrument ID (2):		
Column (1):	C18	ID	4.60 (mm)	Column (2):	ID:	(mm)
File (1):	3B01036.d			File (2):		
Date Analyzed (1)	11/02/00			Date Analyzed (2):		

ANALYTE	COL	RT	RT WINDOW FROM	TO	CONCENTRATION Final Units:mg/Kg	%D

X = Concentration Reported

Data File: \\PIII600-02\DROOT\Chem\HPLC3.i\3B010+A.b\3B01036.d

Date : 02-NOV-2000 16:55

Client ID: CI22 B

Instrument: HPLC3.i

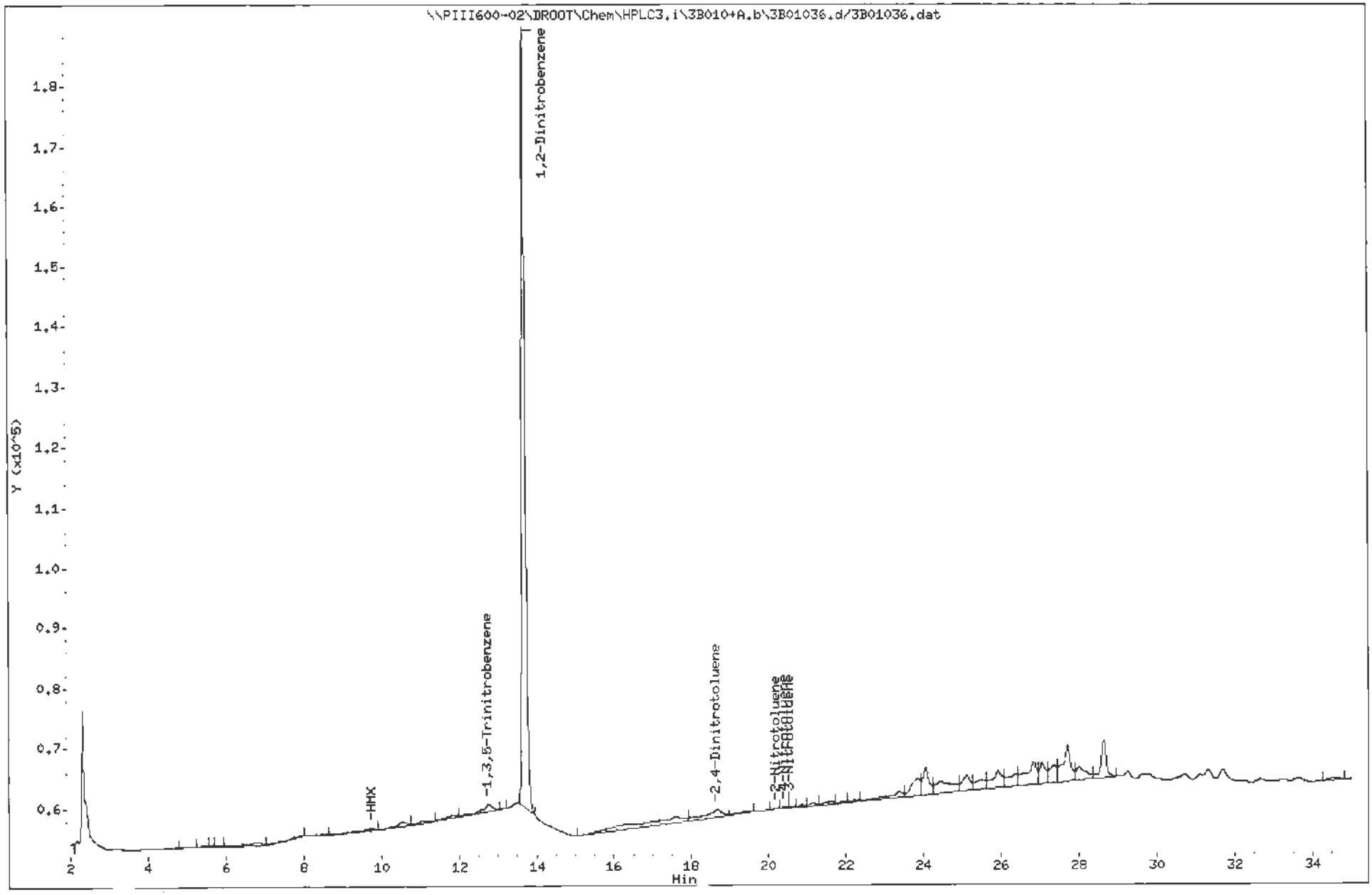
Sample Info: 0010522-05

Volume Injected (uL): 50.0

Operator: SMH

Column phase: C18

Column diameter: 4.60



Laucks Testing Labs
Quantitation Report

Data File : //PIII600-02/DROOT/Chem/HPLC3.i/3B010+A.b/3B01036.d
Injection Date : 02-NOV-2000 16:55
Sample Info : 0010522-05
Misc. Info :
Laboratory ID : 0010522-05
Instrument ID : HPLC3.i
Method : 3CB01+01.m
Quantitation : ESTD
Dilution Factor : 1.00
Column : C18

Integrator : HP Genie
Sample Type: SAMPLE
Column Size: 0.15m 4.60mm

UnitFactor : 0.001000
FinalVolume : 20000 uL
SampleWeight: 2.000 g
Moisture : 0.0000 %
InjectionVolume: 50.00 ul

Compound	RT	RT Window	Response		Concentrations Soln ng/mL	Concentrations Final mg/Kg
	5.16		1296			
	5.50		3846			
	5.61		1949			
	5.87		3330			
	6.81		25727			
	7.94		6302			
	8.47		7298			
HMX	9.75	9.70 - 9.84	20505	MB	~~38.05~~	~~0.38~~ <RL
	10.54		21759			
	11.34		10216			
	11.80		11945			
1,3,5-Trinitrobenzene	12.76	12.69 - 12.87	40125	MB	~~28.30~~	~~0.28~~
	13.15		1279			
	13.48		3742			
1,2-Dinitrobenzene	13.68	13.60 - 13.74	1651286	MB	1786.60	17.90
	17.56		168866			
2,4-Dinitrotoluene	18.67	18.27 - 19.15	71348		~~38.21~~	~~0.38~~ <RL
	19.42		13611			
2-Nitrotoluene	20.20	19.33 - 20.31	1296		~~1.60~~	~~0.02~~
4-Nitrotoluene	20.41	19.87 - 20.75	4607		~~6.41~~	~~0.06~~
3-Nitrotoluene	20.56	20.20 - 21.14	2485		~~2.72~~	~~0.03~~
	20.85		7075			
	21.13		10679			
	21.59		13753			
	21.96		5446			
	22.22		9316			
	23.36		48127			
	23.83		93798			
	24.05		101250			
	24.45		117741			
	25.11		78953			

SO
117-00

Response is in area units.
M - The peak was manually integrated.
E - The quantitated amount exceeds the calibration range.

ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE ID

CI22 C

Lab Name: LAUCKS TESTING LABS

Matrix: (soil/water) SOIL

Sample wt/vol: 2 (g/ml) g

% Moisture: 0

Extraction: SONC

Concentrated Extract Volume: 20000 (uL)

Dilution Factor: 1.0

SDG No.: 0010522

Lab Sample ID: 0010522-06

Lab File ID: 3B01037.D

Date Collected: 10/13/00

Date Received: 10/24/00

Date Prepared: 10/26/00

Date Analyzed: 11/02/00

CONCENTRATION UNITS:

CAS NO.	COMPOUND	mg/Kg	Q	SDL
121-14-2	2,4-Dinitrotoluene	0.50	U	0.50
606-20-2	2,6-Dinitrotoluene	0.50	U	0.50
118-96-7	2,4,6-Trinitrotoluene	0.50	U	0.50
1946-51-0	4-Amino-2,6-Dinitrotoluene	0.50	U	0.50
35572-78-2	2-Amino-4,6-Dinitrotoluene	0.50	U	0.50

CONFIRMATION SUMMARY WORKSHEET
FOR SINGLE COMPONENT ANALYTES

Client Sample ID

CI22 C

Lab Name:	Laucks Testing Labs, Inc.					
Lab Sample ID:	0010522-06					
Instrument ID (1):	HPLC3.i			Instrument ID (2):		
Column (1):	C18	ID	4.60 (mm)	Column (2):	ID:	(mm)
File (1):	3B01037.d			File (2):		
Date Analyzed (1)	11/02/00			Date Analyzed (2):		

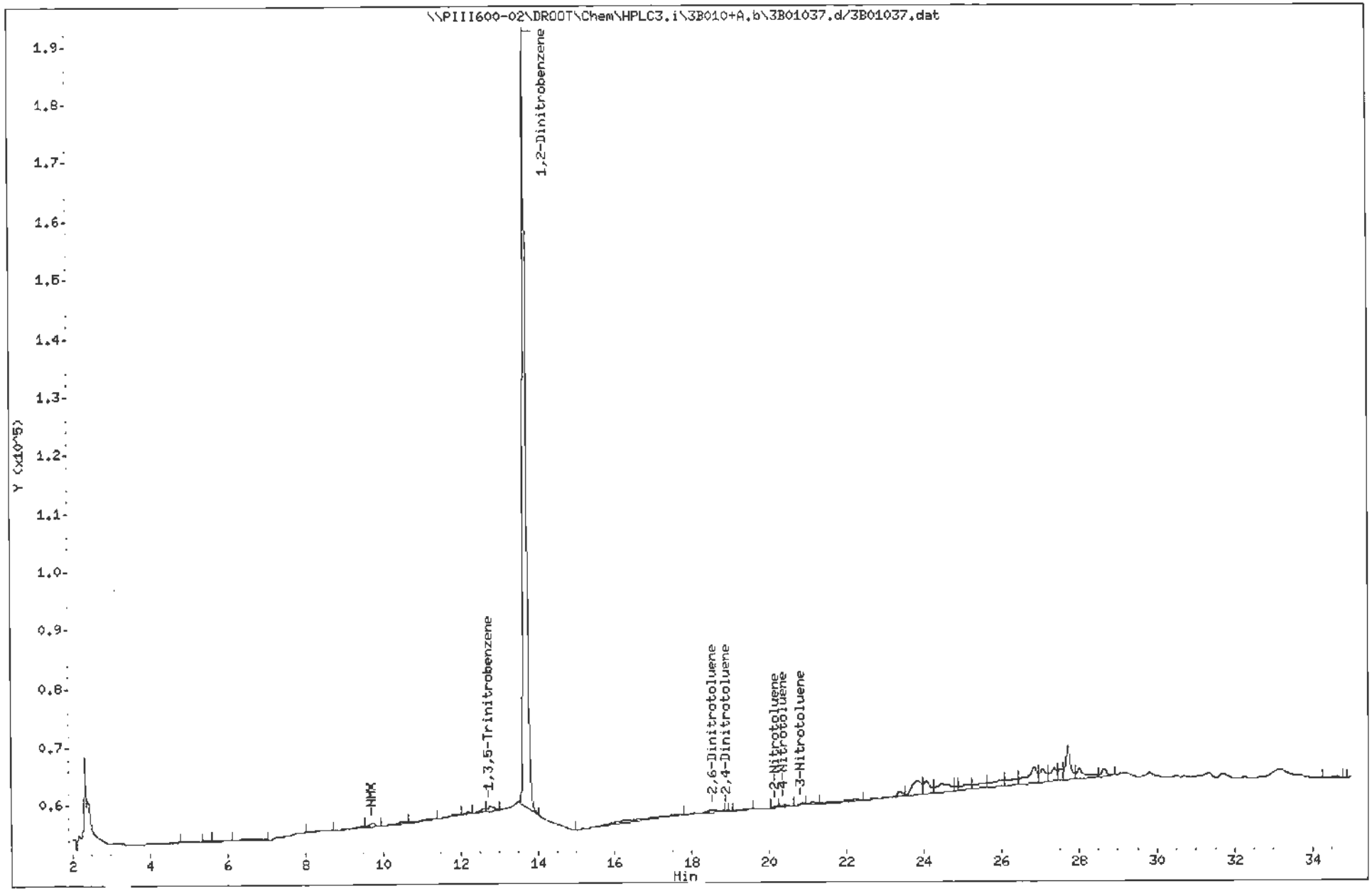
ANALYTE	COL	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION Final Units:mg/Kg	%D

X = Concentration Reported

Data File: \\PIII600-02\DROOT\Chem\HPLC3.i\3B010+A.b\3B01037.d
Date : 02-NOV-2000 17:47
Client ID: CI22 C
Sample Info: 0010522-06
Volume Injected (uL): 50.0
Column phase: C18

Instrument: HPLC3.i

Operator: SHH
Column diameter: 4.60



Laucks Testing Labs
Quantitation Report

Data File : //PIII600-02/DROOT/Chem/HPLC3.i/3B010+A.b/3B01037.d
Injection Date : 02-NOV-2000 17:47
Sample Info : 0010522-06
Misc. Info :
Laboratory ID : 0010522-06
Instrument ID : HPLC3.i
Method : 3CB01+01.m
Quantitation : ESTD
Dilution Factor : 1.00
Column : C18

Integrator : HP Genie
Sample Type: SAMPLE
Column Size: 0.15m 4.60mm

UnitFactor : 0.001000
FinalVolume : 20000 uL
SampleWeight: 2.000 g
Moisture : 0.0000 %
InjectionVolume: 50.00 ul

Compound	RT	RT Window	Response		Concentrations Soln ng/mL	Concentrations Final mg/Kg
	5.29		2834			
	5.51		3204			
	6.06		9940			
	6.84		21839			
	8.53		8015			
	9.50		11804			
HMX	9.73	9.70 - 9.84	16852	MB	~~21.27~~	~~0.31~~ <RL
	10.52		11533			
	11.28		10771			
	11.92		12165			
	12.21		6047			
	12.59		9793			
1,3,5-Trinitrobenzene	12.77	12.69 - 12.87	19417	MB	~~13.70~~	~~0.14~~
1,2-Dinitrobenzene	13.69	13.60 - 13.74	1688741	MB	1827.10	18.30
	17.55		67280			
2,6-Dinitrotoluene	18.56	18.12 - 18.86	26722	MB	~~30.11~~	~~0.30~~ <RL
2,4-Dinitrotoluene	18.89	18.27 - 19.15	1643	MB	~~0.88~~	~~0.01~~
	18.99		1163			
	19.38		7521			
2-Nitrotoluene	20.18	19.33 - 20.31	3007		~~3.72~~	~~0.04~~
4-Nitrotoluene	20.39	19.87 - 20.75	6431		~~8.94~~	~~0.09~~
3-Nitrotoluene	20.84	20.20 - 21.14	6928		~~7.59~~	~~0.08~~
	21.11		10138			
	22.22		21551			
	23.36		20944			
	23.83		82976			
	24.05		55358			
	24.44		70716			
	24.80		10938			
	25.10		31857			
	25.49		36638			

SO
11-7-00

Response is in area units.
M - The peak was manually integrated.
E - The quantitated amount exceeds the calibration range.

Laucks Since 1908
Testing Laboratories, Inc.
940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX (206) 767-5063
Chemistry, Microbiology, and Technical Services

Appendix A

Method Blank and Surrogate Recovery Report

This report is submitted for the exclusive use of the person, partnership, or corporation to whom it is addressed. Subsequent use of the name of this company or any member of its staff in connection with the advertising or sale of any product or process will be granted only on contract. This company accepts no responsibility except for the due performance of inspection and/or analysis in good faith and according to the rules of the trade and of science.

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Quality Control Report
Method Blanks for Work Order 0010522

Blank Name	Samples Verified	Test Description	Result	Units	Control Limit
B102600_HSV_S01	1-6	HMX	0.50 U	mg/Kg	0.50
		RDX	0.50 U		0.50
		1,3,5-Trinitrobenzene	0.50 U		0.50
		1,3-Dinitrobenzene	0.50 U		0.50
		Nitrobenzene	0.50 U		0.50
		Tetryl	0.50 U		0.50
		2,4,6-Trinitrotoluene	0.50 U		0.50
		4-Amino-2,6-Dinitrotoluene	0.50 U		0.50
		2-Amino-4,6-Dinitrotoluene	0.50 U		0.50
		2,6-Dinitrotoluene	0.50 U		0.50
		2,4-Dinitrotoluene	0.50 U		0.50
		2-Nitrotoluene	0.50 U		0.50
		4-Nitrotoluene	0.50 U		0.50
		3-Nitrotoluene	0.50 U		0.50

A method blank can validate more than one analyte on more than one work order. The method blanks in this report may validate analytes not determined on this work order, but nonetheless determined in the associated blank.

Because they validate more than one work order, method blank results are not always reported in the same concentration units or to the same detection limits that are used for sample results.

This report is submitted for the exclusive use of the person, partnership, or corporation to whom it is addressed. Subsequent use of the name of this company or any member of its staff in connection with the advertising or sale of any product or process will be granted only on contract. This company accepts no responsibility except for the due performance of inspection and/or analysis in good faith and according to the rules of the trade and of science.

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Quality Control Report
Multi-Component Method Blanks
Surrogate Recoveries for Work Order 0010522

Blank Name	Test Description	Surrogate Compound	Recov	LCL	UCL
B102600_HSV_S01	Ordnance by HPLC	1,2-Dinitrobenzene	91	70	130

* = Recovery exceeds control limit

Recov = Percent recovery of surrogate compound
LCL = Lower Control Limit
UCL = Upper Control Limit

This report is submitted for the exclusive use of the person, partnership, or corporation to whom it is addressed. Subsequent use of the name of this company or any member of its staff in connection with the advertising or sale of any product or process will be granted only on contract. This company accepts no responsibility except for the due performance of inspection and/or analysis in good faith and according to the rules of the trade and of science.

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Appendix B

Matrix Spike/Matrix Spike Duplicate Report

This report is submitted for the exclusive use of the person, partnership, or corporation to whom it is addressed. Subsequent use of the name of this company or any member of its staff in connection with the advertising or sale of any product or process will be granted only on contract. This company accepts no responsibility except for the due performance of inspection and/or analysis in good faith and according to the rules of the trade and of science.

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Testing Laboratories, Inc.
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Chemistry, Microbiology, and Technical Services

Quality Control Report
MS/MSD Report for Work Order 0010522

MS/MSD Name	Sample Fractions Verified	MS/MSD Sample	Analyte	Percent Recovery MS	MSD	RPD	Cont. Limits LCL	UCL	RPD
K102600_HSVS01	1-6	0010522-04	2,4,6-Trinitrotoluene	103	103	0	55	141	41
			4-Amino-2,6-Dinitrotoluene	96	98	2	68	139	16
			2-Amino-4,6-Dinitrotoluene	98	98	0	74	134	14
			2,6-Dinitrotoluene	98	96	2	81	134	11
			2,4-Dinitrotoluene	96	98	2	81	118	24

* = Value Exceeds Control Limit
RPD = Relative Percent Difference
LCL = Lower Control Limit
UCL = Upper Control Limit
-1 for recovery value indicates that recovery could not be calculated

An MS/MSD pair can validate the results for more than one work order. For this reason, results for analytes not requested on this work order may appear in this MS/MSD report.

This report is submitted for the exclusive use of the person, partnership, or corporation to whom it is addressed. Subsequent use of the name of this company or any member of its staff in connection with the advertising or sale of any product or process will be granted only on contract. This company accepts no responsibility except for the due performance of inspection and/or analysis in good faith and according to the rules of the trade and of science.

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Chemistry, Microbiology, and Technical Services

Appendix C

Blank Spike Recovery Report

This report is submitted for the exclusive use of the person, partnership, or corporation to whom it is addressed. Subsequent use of the name of this company or any member of its staff in connection with the advertising or sale of any product or process will be granted only on contract. This company accepts no responsibility except for the due performance of inspection and/or analysis in good faith and according to the rules of the trade and of science.

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Laucks Since 1908
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940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX (206) 767-5063
Chemistry, Microbiology, and Technical Services

Quality Control Report
Blank Spike Report for Work Order 0010522

Blank Spike Names Database	Lab Assigned	Fractions Verified	Analyte Name	Recov	LCL	UCL
S102600_HSVS01	S102600HORSM	1-6	2,4,6-Trinitrotoluene	108	83	125
			2,4-Dinitrotoluene	100	89	113
			2,6-Dinitrotoluene	97	85	135
			2-Amino-4,6-Dinitrotoluene	99	92	128
			4-Amino-2,6-Dinitrotoluene	107	81	137

* = Value Exceeds Control Limit
LCL = Lower Control Limit
UCL = Upper Control Limit

A blank spike can validate the results for more than one work order. For this reason, results for the work order may appear in this blank spike report.

This report is submitted for the exclusive use of the person, partnership, or corporation to whom it is addressed. Subsequent use of the name of this company or any member of its staff in connection with the advertising or sale of any product or process will be granted only on contract. This company accepts no responsibility except for the due performance of inspection and/or analysis in good faith and according to the rules of the trade and of science.

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Testing Laboratories, Inc.
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Chemistry, Microbiology, and Technical Services

Appendix D

Chain-of-Custody

This report is submitted for the exclusive use of the person, partnership, or corporation to whom it is addressed. Subsequent use of the name of this company or any member of its staff in connection with the advertising or sale of any product or process will be granted only on contract. This company accepts no responsibility except for the due performance of inspection and/or analysis in good faith and according to the rules of the trade and of science.

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0010522

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
400 Ninth Avenue North
Seattle, WA 98109-4708
206-621-6490 206-621-7523 (fax)

Page 1 of 1

Turn Around Requested: By

Report to: Jeff Reitan	Proj Name: Kennedy Jenks
Company: ARI	Proj Number:
Address: 400 9th Ave N	Sampler: Anthony Harding
Phone: 206-389-6153	Shipping Method:
Fax: 206-621-7523	AirBill:

Analyses Requested

Sample ID		Sample Date	Sample Time	Sample Matrix	No Containers	TNT/DNT										Notes/Comments
CI18	G	10/13/00	12:40	Soil	1	X										* please extract all by 10/27
↓	H	↓	13:35	↓	↓	X										
↓	L	↓	14:45	↓	↓	X										
CI22	A	↓	12:45	↓	↓	X										
↓	B	↓	12:50	↓	↓	X										
↓	C	↓	13:25	↓	↓	X										

Relinquished:	Relinquished:	Relinquished:
(Signature) Elysebeth Joshi	(Signature)	(Signature)
Printed name: ELYSEBETH JOSHI	Printed name:	Printed name:
Company: ARI	Company:	Company:
Date: 10/24/00 Time: 10:20A	Date: Time:	Date: Time:

Received by:	Received by:	Received by:
JPWeishaar		
Printed name: JPWeishaar	Printed name:	Printed name:
Company: Laucks	Company:	Company:
Date: 10/24/2000 Time: 11:00A	Date: Time:	Date: Time:

Special Instructions/Notes

ANALYTE LIST:
2,4 - dinitrotoluen
2,6 - dinitrotoluen
2,4,6 - trinitrotolue
4-amino - 2,6 - DN
2-amino - 4,6 - DN

Number of Coolers: 1
Cooler Temp(s): n/a
COC Seals Intact? n/a
Bottles Intact? yes

Analytical Resources, Incorporated
Analytical Chemists and Consultants

November 27, 2000

Ty Schreiner
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: Project: Tacoma Metals / ARI Job: CI62

Dear Ty:

Please find enclosed sample custody records and final analytical results for the above referenced project. Eighteen soil samples were received in good condition on October 18, 2000. Per instruction, selected samples were placed on hold at –18 degrees celcius. The remaining samples were analyzed for volatiles referencing EPA 8260, PCBs referencing EPA 8082, and total metals referencing EPA 6010/7471. Total diesel and motor oil range hydrocarbons were determined referencing WDOE method NWTPH-Dx.

All samples for volatile analysis were run as concentrated as possible to provide the lowest possible detection limits for analytes. Volatile samples **TP-49-4-6, TP-50-0-1, TP-50-2-3, TP-500-0-1,** and **TP-49-6-10** required dilution and reanalysis to quantitate all target analytes within the linear range of the GC/MS. Acetone and Methylene Chloride were detected in the 10/27 method blank. Associated sample results were qualified with a "B" to flag possible lab contamination.

Sample **TP-33-0-1** for the PCB analysis required dilution and re-analysis to quantitate aroclor 1254 within the linear range of the GC/ECD instrument. This sample also showed elevated recoveries for one of the two surrogates. As these extracts showed acceptable recoveries for at least one of the surrogates, no corrective action was taken. Quantitation of the Aroclor 1254 in the MS and MSD of sample **TP-23-0-1** are biased high due to inteference from the 1242 spike.

The PCB sample reports show raised detection limits for aroclors 1248 and 1254 due to background interference. These samples have been "Y" flagged.

Analysis of samples **TP-43-0-1, TP-43-2-3,** TP-45-0-1, **TP-430-0-1, TP-49-6-10,** the 10/24 **Method Blank** and the 10/24 **Laboratory Control Sample** for PCBs showed elevated recoveries for one of the two surrogates. As the second surrogate recovery was in control for these samples, no corrective action was taken.

No other analytical complications were noted. Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

Stephanie Lucas
Client Services

RECEIVED
NOV 28 2000
K/J Federal Way
K/J No/File
Route
Return To/By

SPL/sl
Enclosures

CC: Jodi Brundage, Kennedy Jenks Consultants, Federal Way, WA

333 Ninth Avenue North • Seattle WA 98109-5187 • **206-621-6490** • **206-621-7523** fax

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
400 Ninth Avenue North
Seattle, WA 98109-4708
206-621-6490 206-621-7523 (fax)

Turn Around Requested: Normal

Report to: Ty Schreiner	Proj Name: Tacoma Metals
Company: KJ Consultants	Proj Number: 996098.00
Address: 5[illegible]	Sampler: TAH/JRB
Federal Way, WA	98003
Phone: (253)927-8688	Shipping Method: Courier
Fax: (253)942-3435	AirBill:

Sample ID	Sample Date	Sample Time	Sample Matrix	No Containers	NWTPH-DX	RCRA Metals	Cu	PCBs	VOCs	TNT/DNT	Hold				Notes/Comments
TP-41-0-1	4/11/00	8:20	Soil	2	X	X	X	X							FREEZE ALL "HOLDS" "EXTRAS"
TP-41-2-3		8:30									X				
TP-41-4-6		8:35									X				
TP-41-6-10		8:55									X				
TP-42-0-1		9:30a			X	X	X								
TP-42-2-3		9:35									X				
TP-42-4-6		9:[illegible]									X				
TP-42-6-10		9:55a									X				
TP-43-0-1		10:25													
TP-43-2-3		10:35			X	X	X	X							
TP-43-4-6		10:40									X				
TP-43-6-10		10:45									X				
TP-45-0-1		11:15			X	X	X	X							
TP-45-2-3		11:20									X				
TP-45-4-6		11:30									X				
TP-45-6-10		12:0[illegible]									X				
TP-46-0-1		1[illegible]:50			X	X	X				X				
TP-46-2-3		1[illegible]									X				
TP-4[illegible]		[illegible]													
TP-4[illegible]		[illegible]			X	X	X	X							

Relinquished: (Signature)	Relinquished: (Signature)	Relinquished: (Signature)	Special Instructions/Notes
Printed name: Tanthony Harding	Printed name:	Printed name:	
Company: KJ Consultants	Company:	Company:	
Date: 4/18/00 Time: 9:00am	Date: Time:	Date: Time:	

Received by:	Received by:	Received by:	
Printed name:	Printed name:	Printed name:	
Company:	Company:	Company:	Number of Coolers:
			Cooler Temp(s):
Date: Time:	Date: Time:	Date: Time:	COC Seals Intact?
			Bottles Intact?

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
400 Ninth Avenue North
Seattle, WA 98109-4708
206-621-6490 206-621-7523 (fax)

Turn Around Requested: NORMAL

Report to: TY SCHREIVER	Proj Name: TACOMA METALS
Company: Kennedy/Jenks	Proj Number: 996098.00
Address: 530 S. 336th ST	Sampler: TNH JG
Federal Way WA 98003	
Phone: 253 874-0555	Shipping Method: COURIER
Fax: 253 952-3435	AirBill:

Analyses Requested

Sample ID	Sample Date	Sample Time	Sample Matrix	No Containers	NWTPH-DX	RCPA METALS	CU	VOCs	PCBs		HOLD				Notes/Comments
TP 46 - 4-6	10/16/00	1:10	SOIL	2	X	X	X								
TP - 46 - 6-10		1:20									X				FREEZE ALL "HOLDS" & "EXTRAS"
TP - 47 - 0-1		1:40			X	X	X		X						
TP - 47 - 2-3		1:50									X				
TP - 47 - 4-6		1:55									X				
TP - 47 - 6-10		2:15									X				
TP - 48 - 0-1	10/17/00	9:30			X	X	X				X				
TP - 48 - 2-3		9:40									X				
TP - 48 - 4-6		9:45									X				
TP - 48 - 6-8.5		10:00			X	X	X				X				
[illegible] - 49 - 0-1		10:30			X	X	X		X						
[illegible] - 49 - 2-3		10:35			X	X	X	X			✓				
TP - 49 - 4-6		10:45			X	X	X	X							
TP - 49 - 6-10		11:00			X	X	X	X	X						
TP - 50 - 0-1		1:15			X	X	X	X							
TP - 50 - 2-3		1:20			X	X	X	X			✓				
TP - 50 - 4-6		1:30			[illegible]	[illegible]					X				
TP - 50 - 6-10		1:50									X				
TP - 500 - 0-1		2:00			X	X	X	X							

Relinquished: (Signature) [signature]	Relinquished: (Signature)	Relinquished: (Signature)	Special Instructions/Notes
Printed name: SOPIE BRUNDAGE	Printed name:	Printed name:	
Company: K/J CONSULTANTS	Company:	Company:	
Date: 10/18/00 Time: 9:00 am	Date: Time:	Date: Time:	
Received by:	Received by:	Received by:	
Printed name:	Printed name:	Printed name:	
Company:	Company:	Company:	Number of Coolers:
			Cooler Temp(s):
Date: Time:	Date: Time:	Date: Time:	COC Seals Intact?
			Bottles Intact?

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-50-0-1

Lab Sample ID: CI620
LIMS ID: 00-19876
Matrix: Soil
Data Release Authorized:
Reported: 11/03/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Instrument: FINN5
Date Analyzed: 10/27/00 00:15

Sample Amount: 4.67 g dry Wt
Percent Moisture: 7.4%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	1.1 U
74-83-9	Bromomethane	1.1 U
75-01-4	Vinyl Chloride	1.1 U
75-00-3	Chloroethane	1.1 U
75-09-2	**Methylene Chloride**	**3.4**
67-64-1	**Acetone**	**90**
75-15-0	**Carbon Disulfide**	**1.4**
75-35-4	1,1-Dichloroethene	1.1 U
75-34-3	1,1-Dichloroethane	1.1 U
156-60-5	trans-1,2-Dichloroethene	1.1 U
156-59-2	cis-1,2-Dichloroethene	1.1 U
67-66-3	Chloroform	1.1 U
107-06-2	1,2-Dichloroethane	1.1 U
78-93-3	**2-Butanone**	**12**
71-55-6	1,1,1-Trichloroethane	1.1 U
56-23-5	Carbon Tetrachloride	1.1 U
108-05-4	Vinyl Acetate	5.4 U
75-27-4	Bromodichloromethane	1.1 U
78-87-5	1,2-Dichloropropane	1.1 U
10061-01-5	cis-1,3-Dichloropropene	1.1 U
79-01-6	Trichloroethene	1.1 U
124-48-1	Dibromochloromethane	1.1 U
79-00-5	1,1,2-Trichloroethane	1.1 U
71-43-2	**Benzene**	**1.2**
10061-02-6	trans-1,3-Dichloropropene	1.1 U
110-75-8	2-Chloroethylvinylether	5.4 U
75-25-2	Bromoform	1.1 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.4 U
591-78-6	2-Hexanone	5.4 U
127-18-4	Tetrachloroethene	1.1 U
79-34-5	1,1,2,2-Tetrachloroethane	1.1 U
108-88-3	**Toluene**	**340 E**
108-90-7	Chlorobenzene	1.1 U
100-41-4	Ethylbenzene	1.1 U
100-42-5	Styrene	1.1 U
75-69-4	Trichlorofluoromethane	1.1 U
76-13-1	1,1,2-Trichlorotrifluoroethane	1.1 U
1330-20-7	m,p-Xylene	1.1 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-49-4-6
REANALYSIS

Lab Sample ID: CI62N-RE
LIMS ID: 00-19875
Matrix: Soil
Data Release Authorized:
Reported: 11/03/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Instrument: FINN5
Date Analyzed: 10/30/00 14:48

Sample Amount: 23 **mg dry Wt**
Percent Moisture: 5.8%

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	220 U
95-50-1	1,2-Dichlorobenzene	220 U
541-73-1	1,3-Dichlorobenzene	220 U
106-46-7	1,4-Dichlorobenzene	220 U
107-02-8	Acrolein	11,000 U
74-88-4	Methyl Iodide	220 U
74-96-4	Bromoethane	430 U
107-13-1	Acrylonitrile	1,100 U
563-58-6	1,1-Dichloropropene	220 U
74-95-3	Dibromomethane	220 U
630-20-6	1,1,1,2-Tetrachloroethane	220 U
96-12-8	1,2-Dibromo-3-chloropropane	1,100 U
96-18-4	1,2,3-Trichloropropane	430 U
110-57-6	trans-1,4-Dichloro-2-butene	1,100 U
108-67-8	**1,3,5-Trimethylbenzene**	**640**
95-63-6	**1,2,4-Trimethylbenzene**	**1,100**
87-68-3	Hexachlorobutadiene	1,100 U
106-93-4	Ethylene Dibromide	220 U
74-97-5	Bromochloromethane	220 U
594-20-7	2,2-Dichloropropane	220 U
142-28-9	1,3-Dichloropropane	220 U
98-82-8	Isopropylbenzene	220 U
103-65-1	n-Propylbenzene	220 U
108-86-1	Bromobenzene	220 U
95-49-8	2-Chlorotoluene	220 U
106-43-4	4-Chlorotoluene	220 U
98-06-6	tert-Butylbenzene	220 U
135-98-8	sec-Butylbenzene	220 U
99-87-6	**4-Isopropyltoluene**	**290**
104-51-8	n-Butylbenzene	430 U
120-82-1	1,2,4-Trichlorobenzene	1,100 U
91-20-3	**Naphthalene**	**16,000**
87-61-6	1,2,3-Trichlorobenzene	1,100 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	118%
d8-Toluene	110%
Bromofluorobenzene	112%
d4-1,2-Dichlorobenzene	103%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-49-4-6
REANALYSIS

Lab Sample ID: CI62N-RE
LIMS ID: 00-19875
Matrix: Soil
Data Release Authorized:
Reported: 11/03/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Instrument: FINN5
Date Analyzed: 10/30/00 14:48

Sample Amount: 23 mg dry Wt
Percent Moisture: 5.8%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	220 U
74-83-9	Bromomethane	220 U
75-01-4	Vinyl Chloride	220 U
75-00-3	Chloroethane	220 U
75-09-2	Methylene Chloride	650 U
67-64-1	Acetone	1,100 U
75-15-0	Carbon Disulfide	220 U
75-35-4	1,1-Dichloroethene	220 U
75-34-3	1,1-Dichloroethane	220 U
156-60-5	trans-1,2-Dichloroethene	220 U
156-59-2	cis-1,2-Dichloroethene	220 U
67-66-3	Chloroform	220 U
107-06-2	1,2-Dichloroethane	220 U
78-93-3	2-Butanone	1,100 U
71-55-6	1,1,1-Trichloroethane	220 U
56-23-5	Carbon Tetrachloride	220 U
108-05-4	Vinyl Acetate	1,100 U
75-27-4	Bromodichloromethane	220 U
78-87-5	1,2-Dichloropropane	220 U
10061-01-5	cis-1,3-Dichloropropene	220 U
79-01-6	Trichloroethene	220 U
124-48-1	Dibromochloromethane	220 U
79-00-5	1,1,2-Trichloroethane	220 U
71-43-2	Benzene	220 U
10061-02-6	trans-1,3-Dichloropropene	220 U
110-75-8	2-Chloroethylvinylether	1,100 U
75-25-2	Bromoform	220 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	1,100 U
591-78-6	2-Hexanone	1,100 U
127-18-4	Tetrachloroethene	220 U
79-34-5	1,1,2,2-Tetrachloroethane	220 U
108-88-3	**Toluene**	**1,600**
108-90-7	Chlorobenzene	220 U
100-41-4	Ethylbenzene	220 U
100-42-5	Styrene	220 U
75-69-4	Trichlorofluoromethane	220 U
76-13-1	1,1,2-Trichlorotrifluoroethane	220 U
1330-20-7	m,p-Xylene	220 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-49-4-6

Lab Sample ID: CI62N
LIMS ID: 00-19875
Matrix: Soil
Data Release Authorized:
Reported: 11/03/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Instrument: FINN5
Date Analyzed: 10/27/00 02:27

Sample Amount: 0.56 g dry Wt
Percent Moisture: 5.8%

CAS Number	Analyte	ug/kg
95-47-6	**o-Xylene**	**35**
95-50-1	1,2-Dichlorobenzene	9.0 U
541-73-1	1,3-Dichlorobenzene	9.0 U
106-46-7	1,4-Dichlorobenzene	9.0 U
107-02-8	Acrolein	450 U
74-88-4	Methyl Iodide	9.0 U
74-96-4	Bromoethane	18 U
107-13-1	Acrylonitrile	45 U
563-58-6	1,1-Dichloropropene	9.0 U
74-95-3	Dibromomethane	9.0 U
630-20-6	1,1,1,2-Tetrachloroethane	9.0 U
96-12-8	1,2-Dibromo-3-chloropropane	45 U
96-18-4	1,2,3-Trichloropropane	18 U
110-57-6	trans-1,4-Dichloro-2-butene	45 U
108-67-8	**1,3,5-Trimethylbenzene**	**580**
95-63-6	**1,2,4-Trimethylbenzene**	**950**
87-68-3	Hexachlorobutadiene	45 U
106-93-4	Ethylene Dibromide	9.0 U
74-97-5	Bromochloromethane	9.0 U
594-20-7	2,2-Dichloropropane	9.0 U
142-28-9	1,3-Dichloropropane	9.0 U
98-82-8	**Isopropylbenzene**	**17**
103-65-1	n-Propylbenzene	9.0 U
108-86-1	Bromobenzene	9.0 U
95-49-8	2-Chlorotoluene	9.0 U
106-43-4	4-Chlorotoluene	9.0 U
98-06-6	tert-Butylbenzene	9.0 U
135-98-8	sec-Butylbenzene	9.0 U
99-87-6	**4-Isopropyltoluene**	**200**
104-51-8	n-Butylbenzene	200 Y
120-82-1	1,2,4-Trichlorobenzene	45 U
91-20-3	**Naphthalene**	**6,200 E**
87-61-6	1,2,3-Trichlorobenzene	45 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	118%
d8-Toluene	99.3%
Bromofluorobenzene	96.4%
d4-1,2-Dichlorobenzene	94.7%

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-49-4-6

Lab Sample ID: CI62N
LIMS ID: 00-19875
Matrix: Soil
Data Release Authorized:
Reported: 11/03/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Instrument: FINN5
Date Analyzed: 10/27/00 02:27

Sample Amount: 0.56 g dry Wt
Percent Moisture: 5.8%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	9.0 U
74-83-9	Bromomethane	9.0 U
75-01-4	Vinyl Chloride	9.0 U
75-00-3	Chloroethane	9.0 U
75-09-2	**Methylene Chloride**	**31**
67-64-1	**Acetone**	**510**
75-15-0	Carbon Disulfide	9.0 U
75-35-4	1,1-Dichloroethene	9.0 U
75-34-3	1,1-Dichloroethane	9.0 U
156-60-5	trans-1,2-Dichloroethene	9.0 U
156-59-2	cis-1,2-Dichloroethene	9.0 U
67-66-3	Chloroform	9.0 U
107-06-2	1,2-Dichloroethane	9.0 U
78-93-3	**2-Butanone**	**120**
71-55-6	1,1,1-Trichloroethane	9.0 U
56-23-5	Carbon Tetrachloride	9.0 U
108-05-4	Vinyl Acetate	45 U
75-27-4	Bromodichloromethane	9.0 U
78-87-5	1,2-Dichloropropane	9.0 U
10061-01-5	cis-1,3-Dichloropropene	9.0 U
79-01-6	Trichloroethene	9.0 U
124-48-1	Dibromochloromethane	9.0 U
79-00-5	1,1,2-Trichloroethane	9.0 U
71-43-2	Benzene	9.0 U
10061-02-6	trans-1,3-Dichloropropene	9.0 U
110-75-8	2-Chloroethylvinylether	45 U
75-25-2	Bromoform	9.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	45 U
591-78-6	2-Hexanone	45 U
127-18-4	Tetrachloroethene	9.0 U
79-34-5	1,1,2,2-Tetrachloroethane	9.0 U
108-88-3	**Toluene**	**1,600**
108-90-7	Chlorobenzene	9.0 U
100-41-4	**Ethylbenzene**	**27**
100-42-5	**Styrene**	**7.8 J**
75-69-4	Trichlorofluoromethane	9.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	9.0 U
1330-20-7	**m,p-Xylene**	**43**

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-49-2-3

Lab Sample ID: CI62M
LIMS ID: 00-19874
Matrix: Soil
Data Release Authorized
Reported: 11/03/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Instrument: FINN5
Date Analyzed: 10/26/00 23:49

Sample Amount: 4.40 g dry Wt
Percent Moisture: 10.6%

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	1.1 U
95-50-1	1,2-Dichlorobenzene	1.1 U
541-73-1	1,3-Dichlorobenzene	1.1 U
106-46-7	1,4-Dichlorobenzene	1.1 U
107-02-8	Acrolein	57 U
74-88-4	Methyl Iodide	1.1 U
74-96-4	Bromoethane	2.3 U
107-13-1	Acrylonitrile	5.7 U
563-58-6	1,1-Dichloropropene	1.1 U
74-95-3	Dibromomethane	1.1 U
630-20-6	1,1,1,2-Tetrachloroethane	1.1 U
96-12-8	1,2-Dibromo-3-chloropropane	5.7 U
96-18-4	1,2,3-Trichloropropane	2.3 U
110-57-6	trans-1,4-Dichloro-2-butene	5.7 U
108-67-8	1,3,5-Trimethylbenzene	1.1 U
95-63-6	1,2,4-Trimethylbenzene	1.1 U
87-68-3	Hexachlorobutadiene	5.7 U
106-93-4	Ethylene Dibromide	1.1 U
74-97-5	Bromochloromethane	1.1 U
594-20-7	2,2-Dichloropropane	1.1 U
142-28-9	1,3-Dichloropropane	1.1 U
98-82-8	Isopropylbenzene	1.1 U
103-65-1	n-Propylbenzene	1.1 U
108-86-1	Bromobenzene	1.1 U
95-49-8	2-Chlorotoluene	1.1 U
106-43-4	4-Chlorotoluene	1.1 U
98-06-6	tert-Butylbenzene	1.1 U
135-98-8	sec-Butylbenzene	1.1 U
99-87-6	4-Isopropyltoluene	1.1 U
104-51-8	n-Butylbenzene	2.3 U
120-82-1	1,2,4-Trichlorobenzene	5.7 U
91-20-3	Naphthalene	5.7 U
87-61-6	1,2,3-Trichlorobenzene	5.7 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	123%
d8-Toluene	102%
Bromofluorobenzene	110%
d4-1,2-Dichlorobenzene	102%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-49-2-3

Lab Sample ID: CI62M
LIMS ID: 00-19874
Matrix: Soil
Data Release Authorized:
Reported: 11/03/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Instrument: FINN5
Date Analyzed: 10/26/00 23:49

Sample Amount: 4.40 g dry Wt
Percent Moisture: 10.6%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	1.1 U
74-83-9	Bromomethane	1.1 U
75-01-4	Vinyl Chloride	1.1 U
75-00-3	Chloroethane	1.1 U
75-09-2	Methylene Chloride	3.4 U
67-64-1	Acetone	5.7 U
75-15-0	Carbon Disulfide	1.1 U
75-35-4	1,1-Dichloroethene	1.1 U
75-34-3	1,1-Dichloroethane	1.1 U
156-60-5	trans-1,2-Dichloroethene	1.1 U
156-59-2	cis-1,2-Dichloroethene	1.1 U
67-66-3	Chloroform	1.1 U
107-06-2	1,2-Dichloroethane	1.1 U
78-93-3	2-Butanone	5.7 U
71-55-6	1,1,1-Trichloroethane	1.1 U
56-23-5	Carbon Tetrachloride	1.1 U
108-05-4	Vinyl Acetate	5.7 U
75-27-4	Bromodichloromethane	1.1 U
78-87-5	1,2-Dichloropropane	1.1 U
10061-01-5	cis-1,3-Dichloropropene	1.1 U
79-01-6	Trichloroethene	1.1 U
124-48-1	Dibromochloromethane	1.1 U
79-00-5	1,1,2-Trichloroethane	1.1 U
71-43-2	Benzene	1.1 U
10061-02-6	trans-1,3-Dichloropropene	1.1 U
110-75-8	2-Chloroethylvinylether	5.7 U
75-25-2	Bromoform	1.1 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.7 U
591-78-6	2-Hexanone	5.7 U
127-18-4	Tetrachloroethene	1.1 U
79-34-5	1,1,2,2-Tetrachloroethane	1.1 U
108-88-3	**Toluene**	**3.7**
108-90-7	Chlorobenzene	1.1 U
100-41-4	Ethylbenzene	1.1 U
100-42-5	Styrene	1.1 U
75-69-4	Trichlorofluoromethane	1.1 U
76-13-1	1,1,2-Trichlorotrifluoroethane	1.1 U
1330-20-7	m,p-Xylene	1.1 U

ANALYTICAL RESOURCES INCORPORATED

SOIL VOLATILE SYSTEM MONITORING COMPOUND SUMMARY

Matrix: Soil

QC Report No: CI62

Lab ID	Client ID	DCE	TOL	BFB	DCB	TOT OUT
CI62M	TP-49-2-3	123%	102%	110%	102%	0
MB	Method Blank	131% *	112%	112%	101%	1
CI62N	TP-49-4-6	118%	99%	96%	95%	0
CI62N-DIL	TP-49-4-6	118%	110%	112%	103%	0
CI62LCS	Lab Cntrl Sample	117%	109%	104%	101%	0
102600MB	Method Blank	108%	103%	110%	101%	0
CI62O	TP-50-0-1	118%	101%	105%	102%	0
CI62O-DIL	TP-50-0-1	112%	101%	94%	95%	0
CI62O-MS	TP-50-0-1	117%	105%	105%	102%	0
CI62O-MSD	TP-50-0-1	119%	101%	104%	101%	0
CI62LCS	Lab Cntrl Sample	97%	98%	100%	97%	0
102700MB	Method Blank	98%	100%	98%	98%	0
CI62P	TP-50-2-3	121%	103%	106%	100%	0
CI62P-DIL	TP-50-2-3	100%	93%	100%	98%	0
CI62LCS	Lab Cntrl Sample	99%	100%	100%	99%	0
CI62Q	TP-500-0-1	120%	98%	101%	102%	0
CI62Q-DIL	TP-500-0-1	102%	95%	96%	99%	0
CI62R	TP-49-6-10	118%	98%	101%	96%	0
CI62R-DIL	TP-49-6-10	121%	113%	112%	101%	0

		LCS/MB LIMITS	QC LIMITS
(DCE)	= 1,2-Dichloroethane-d4	(70-130)	(70-130)
(TOL)	= Toluene-d8	(70-130)	(70-130)
(BFB)	= Bromofluorobenzene	(70-130)	(70-130)
(DCB)	= 1,2-Dichlorobenzene-d4	(70-130)	(70-130)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D System Monitoring Compound diluted out

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-50-0-1

Lab Sample ID: CI620
LIMS ID: 00-19876
Matrix: Soil
Data Release Authorized:
Reported: 11/03/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Instrument: FINN5
Date Analyzed: 10/27/00 00:15

Sample Amount: 4.67 g dry Wt
Percent Moisture: 7.4%

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	1.1 U
95-50-1	1,2-Dichlorobenzene	1.1 U
541-73-1	1,3-Dichlorobenzene	1.1 U
106-46-7	1,4-Dichlorobenzene	1.1 U
107-02-8	Acrolein	54 U
74-88-4	Methyl Iodide	1.1 U
74-96-4	Bromoethane	2.1 U
107-13-1	Acrylonitrile	5.4 U
563-58-6	1,1-Dichloropropene	1.1 U
74-95-3	Dibromomethane	1.1 U
630-20-6	1,1,1,2-Tetrachloroethane	1.1 U
96-12-8	1,2-Dibromo-3-chloropropane	5.4 U
96-18-4	1,2,3-Trichloropropane	2.1 U
110-57-6	trans-1,4-Dichloro-2-butene	5.4 U
108-67-8	1,3,5-Trimethylbenzene	1.1 U
95-63-6	1,2,4-Trimethylbenzene	1.1 U
87-68-3	Hexachlorobutadiene	5.4 U
106-93-4	Ethylene Dibromide	1.1 U
74-97-5	Bromochloromethane	1.1 U
594-20-7	2,2-Dichloropropane	1.1 U
142-28-9	1,3-Dichloropropane	1.1 U
98-82-8	Isopropylbenzene	1.1 U
103-65-1	n-Propylbenzene	1.1 U
108-86-1	Bromobenzene	1.1 U
95-49-8	2-Chlorotoluene	1.1 U
106-43-4	4-Chlorotoluene	1.1 U
98-06-6	tert-Butylbenzene	1.1 U
135-98-8	sec-Butylbenzene	1.1 U
99-87-6	4-Isopropyltoluene	1.1 U
104-51-8	n-Butylbenzene	2.1 U
120-82-1	1,2,4-Trichlorobenzene	5.4 U
91-20-3	Naphthalene	5.4 U
87-61-6	1,2,3-Trichlorobenzene	5.4 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	118%
d8-Toluene	101%
Bromofluorobenzene	105%
d4-1,2-Dichlorobenzene	102%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-50-0-1
REANALYSIS

Lab Sample ID: CI62O-RE
LIMS ID: 00-19876
Matrix: Soil
Data Release Authorized:
Reported: 11/03/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Instrument: FINN5
Date Analyzed: 10/27/00 17:26

Sample Amount: 0.46 g dry Wt
Percent Moisture: 7.4%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	11 U
74-83-9	Bromomethane	11 U
75-01-4	Vinyl Chloride	11 U
75-00-3	Chloroethane	11 U
75-09-2	Methylene Chloride	32 U
67-64-1	**Acetone**	**90 B**
75-15-0	Carbon Disulfide	11 U
75-35-4	1,1-Dichloroethene	11 U
75-34-3	1,1-Dichloroethane	11 U
156-60-5	trans-1,2-Dichloroethene	11 U
156-59-2	cis-1,2-Dichloroethene	11 U
67-66-3	Chloroform	11 U
107-06-2	1,2-Dichloroethane	11 U
78-93-3	2-Butanone	54 U
71-55-6	1,1,1-Trichloroethane	11 U
56-23-5	Carbon Tetrachloride	11 U
108-05-4	Vinyl Acetate	54 U
75-27-4	Bromodichloromethane	11 U
78-87-5	1,2-Dichloropropane	11 U
10061-01-5	cis-1,3-Dichloropropene	11 U
79-01-6	Trichloroethene	11 U
124-48-1	Dibromochloromethane	11 U
79-00-5	1,1,2-Trichloroethane	11 U
71-43-2	Benzene	11 U
10061-02-6	trans-1,3-Dichloropropene	11 U
110-75-8	2-Chloroethylvinylether	54 U
75-25-2	Bromoform	11 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	54 U
591-78-6	2-Hexanone	54 U
127-18-4	Tetrachloroethene	11 U
79-34-5	1,1,2,2-Tetrachloroethane	11 U
108-88-3	**Toluene**	**430**
108-90-7	Chlorobenzene	11 U
100-41-4	Ethylbenzene	11 U
100-42-5	Styrene	11 U
75-69-4	Trichlorofluoromethane	11 U
76-13-1	**1,1,2-Trichlorotrifluoroethane**	**12**
1330-20-7	**m,p-Xylene**	**12**

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-50-0-1
REANALYSIS

Lab Sample ID: CI620-RE
LIMS ID: 00-19876
Matrix: Soil
Data Release Authorized:
Reported: 11/03/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Instrument: FINN5
Date Analyzed: 10/27/00 17:26

Sample Amount: 0.46 g dry Wt
Percent Moisture: 7.4%

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	11 U
95-50-1	1,2-Dichlorobenzene	11 U
541-73-1	1,3-Dichlorobenzene	11 U
106-46-7	1,4-Dichlorobenzene	11 U
107-02-8	Acrolein	540 U
74-88-4	Methyl Iodide	11 U
74-96-4	Bromoethane	22 U
107-13-1	Acrylonitrile	54 U
563-58-6	1,1-Dichloropropene	11 U
74-95-3	Dibromomethane	11 U
630-20-6	1,1,1,2-Tetrachloroethane	11 U
96-12-8	1,2-Dibromo-3-chloropropane	54 U
96-18-4	1,2,3-Trichloropropane	22 U
110-57-6	trans-1,4-Dichloro-2-butene	54 U
108-67-8	1,3,5-Trimethylbenzene	11 U
95-63-6	1,2,4-Trimethylbenzene	11 U
87-68-3	Hexachlorobutadiene	54 U
106-93-4	Ethylene Dibromide	11 U
74-97-5	Bromochloromethane	11 U
594-20-7	2,2-Dichloropropane	11 U
142-28-9	1,3-Dichloropropane	11 U
98-82-8	Isopropylbenzene	11 U
103-65-1	n-Propylbenzene	11 U
108-86-1	Bromobenzene	11 U
95-49-8	2-Chlorotoluene	11 U
106-43-4	4-Chlorotoluene	11 U
98-06-6	tert-Butylbenzene	11 U
135-98-8	sec-Butylbenzene	11 U
99-87-6	4-Isopropyltoluene	11 U
104-51-8	n-Butylbenzene	22 U
120-82-1	1,2,4-Trichlorobenzene	54 U
91-20-3	Naphthalene	54 U
87-61-6	1,2,3-Trichlorobenzene	54 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	112%
d8-Toluene	101%
Bromofluorobenzene	94.1%
d4-1,2-Dichlorobenzene	95.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-50-2-3

Lab Sample ID: CI62P
LIMS ID: 00-19877
Matrix: Soil
Data Release Authorized:
Reported: 11/03/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Instrument: FINN5
Date Analyzed: 10/27/00 00:41

Sample Amount: 4.48 g dry Wt
Percent Moisture: 9.2%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	1.1 U
74-83-9	Bromomethane	1.1 U
75-01-4	Vinyl Chloride	1.1 U
75-00-3	Chloroethane	1.1 U
75-09-2	**Methylene Chloride**	**3.9**
67-64-1	**Acetone**	**49**
75-15-0	Carbon Disulfide	1.1 U
75-35-4	1,1-Dichloroethene	1.1 U
75-34-3	1,1-Dichloroethane	1.1 U
156-60-5	trans-1,2-Dichloroethene	1.1 U
156-59-2	cis-1,2-Dichloroethene	1.1 U
67-66-3	Chloroform	1.1 U
107-06-2	1,2-Dichloroethane	1.1 U
78-93-3	2-Butanone	5.6 U
71-55-6	1,1,1-Trichloroethane	1.1 U
56-23-5	Carbon Tetrachloride	1.1 U
108-05-4	Vinyl Acetate	5.6 U
75-27-4	Bromodichloromethane	1.1 U
78-87-5	1,2-Dichloropropane	1.1 U
10061-01-5	cis-1,3-Dichloropropene	1.1 U
79-01-6	Trichloroethene	1.1 U
124-48-1	Dibromochloromethane	1.1 U
79-00-5	1,1,2-Trichloroethane	1.1 U
71-43-2	**Benzene**	**0.9 J**
10061-02-6	trans-1,3-Dichloropropene	1.1 U
110-75-8	2-Chloroethylvinylether	5.6 U
75-25-2	Bromoform	1.1 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.6 U
591-78-6	2-Hexanone	5.6 U
127-18-4	Tetrachloroethene	1.1 U
79-34-5	1,1,2,2-Tetrachloroethane	1.1 U
108-88-3	**Toluene**	**270 E**
108-90-7	Chlorobenzene	1.1 U
100-41-4	Ethylbenzene	1.1 U
100-42-5	Styrene	1.1 U
75-69-4	Trichlorofluoromethane	1.1 U
76-13-1	1,1,2-Trichlorotrifluoroethane	1.1 U
1330-20-7	m,p-Xylene	1.1 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-50-2-3

Lab Sample ID: CI62P
LIMS ID: 00-19877
Matrix: Soil
Data Release Authorized:
Reported: 11/03/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Instrument: FINN5
Date Analyzed: 10/27/00 00:41

Sample Amount: 4.48 g dry Wt
Percent Moisture: 9.2%

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	1.1 U
95-50-1	1,2-Dichlorobenzene	1.1 U
541-73-1	1,3-Dichlorobenzene	1.1 U
106-46-7	1,4-Dichlorobenzene	1.1 U
107-02-8	Acrolein	56 U
74-88-4	Methyl Iodide	1.1 U
74-96-4	Bromoethane	2.2 U
107-13-1	Acrylonitrile	5.6 U
563-58-6	1,1-Dichloropropene	1.1 U
74-95-3	Dibromomethane	1.1 U
630-20-6	1,1,1,2-Tetrachloroethane	1.1 U
96-12-8	1,2-Dibromo-3-chloropropane	5.6 U
96-18-4	1,2,3-Trichloropropane	2.2 U
110-57-6	trans-1,4-Dichloro-2-butene	5.6 U
108-67-8	1,3,5-Trimethylbenzene	1.1 U
95-63-6	1,2,4-Trimethylbenzene	1.1 U
87-68-3	Hexachlorobutadiene	5.6 U
106-93-4	Ethylene Dibromide	1.1 U
74-97-5	Bromochloromethane	1.1 U
594-20-7	2,2-Dichloropropane	1.1 U
142-28-9	1,3-Dichloropropane	1.1 U
98-82-8	Isopropylbenzene	1.1 U
103-65-1	n-Propylbenzene	1.1 U
108-86-1	Bromobenzene	1.1 U
95-49-8	2-Chlorotoluene	1.1 U
106-43-4	4-Chlorotoluene	1.1 U
98-06-6	tert-Butylbenzene	1.1 U
135-98-8	sec-Butylbenzene	1.1 U
99-87-6	4-Isopropyltoluene	1.1 U
104-51-8	n-Butylbenzene	2.2 U
120-82-1	1,2,4-Trichlorobenzene	5.6 U
91-20-3	Naphthalene	5.6 U
87-61-6	1,2,3-Trichlorobenzene	5.6 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	121%
d8-Toluene	103%
Bromofluorobenzene	106%
d4-1,2-Dichlorobenzene	99.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-50-2-3
REANALYSIS

Lab Sample ID: CI62P-RE
LIMS ID: 00-19877
Matrix: Soil
Data Release Authorized:
Reported: 11/03/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Instrument: FINN5
Date Analyzed: 10/27/00 17:53

Sample Amount: 0.49 g dry Wt
Percent Moisture: 9.2%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	10 U
74-83-9	Bromomethane	10 U
75-01-4	Vinyl Chloride	10 U
75-00-3	Chloroethane	10 U
75-09-2	Methylene Chloride	31 U
67-64-1	Acetone	51 U
75-15-0	Carbon Disulfide	10 U
75-35-4	1,1-Dichloroethene	10 U
75-34-3	1,1-Dichloroethane	10 U
156-60-5	trans-1,2-Dichloroethene	10 U
156-59-2	cis-1,2-Dichloroethene	10 U
67-66-3	Chloroform	10 U
107-06-2	1,2-Dichloroethane	10 U
78-93-3	2-Butanone	51 U
71-55-6	1,1,1-Trichloroethane	10 U
56-23-5	Carbon Tetrachloride	10 U
108-05-4	Vinyl Acetate	51 U
75-27-4	Bromodichloromethane	10 U
78-87-5	1,2-Dichloropropane	10 U
10061-01-5	cis-1,3-Dichloropropene	10 U
79-01-6	Trichloroethene	10 U
124-48-1	Dibromochloromethane	10 U
79-00-5	1,1,2-Trichloroethane	10 U
71-43-2	Benzene	10 U
10061-02-6	trans-1,3-Dichloropropene	10 U
110-75-8	2-Chloroethylvinylether	51 U
75-25-2	Bromoform	10 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	51 U
591-78-6	2-Hexanone	51 U
127-18-4	Tetrachloroethene	10 U
79-34-5	1,1,2,2-Tetrachloroethane	10 U
108-88-3	**Toluene**	**270**
108-90-7	Chlorobenzene	10 U
100-41-4	Ethylbenzene	10 U
100-42-5	Styrene	10 U
75-69-4	Trichlorofluoromethane	10 U
76-13-1	1,1,2-Trichlorotrifluoroethane	10 U
1330-20-7	m,p-Xylene	10 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-50-2-3
REANALYSIS

Lab Sample ID: CI62P-RE
LIMS ID: 00-19877
Matrix: Soil
Data Release Authorized:
Reported: 11/03/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Instrument: FINN5
Date Analyzed: 10/27/00 17:53

Sample Amount: 0.49 g dry Wt
Percent Moisture: 9.2%

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	10 U
95-50-1	1,2-Dichlorobenzene	10 U
541-73-1	1,3-Dichlorobenzene	10 U
106-46-7	1,4-Dichlorobenzene	10 U
107-02-8	Acrolein	510 U
74-88-4	Methyl Iodide	10 U
74-96-4	Bromoethane	20 U
107-13-1	Acrylonitrile	51 U
563-58-6	1,1-Dichloropropene	10 U
74-95-3	Dibromomethane	10 U
630-20-6	1,1,1,2-Tetrachloroethane	10 U
96-12-8	1,2-Dibromo-3-chloropropane	51 U
96-18-4	1,2,3-Trichloropropane	20 U
110-57-6	trans-1,4-Dichloro-2-butene	51 U
108-67-8	1,3,5-Trimethylbenzene	10 U
95-63-6	1,2,4-Trimethylbenzene	10 U
87-68-3	Hexachlorobutadiene	51 U
106-93-4	Ethylene Dibromide	10 U
74-97-5	Bromochloromethane	10 U
594-20-7	2,2-Dichloropropane	10 U
142-28-9	1,3-Dichloropropane	10 U
98-82-8	Isopropylbenzene	10 U
103-65-1	n-Propylbenzene	10 U
108-86-1	Bromobenzene	10 U
95-49-8	2-Chlorotoluene	10 U
106-43-4	4-Chlorotoluene	10 U
98-06-6	tert-Butylbenzene	10 U
135-98-8	sec-Butylbenzene	10 U
99-87-6	4-Isopropyltoluene	10 U
104-51-8	n-Butylbenzene	20 U
120-82-1	1,2,4-Trichlorobenzene	51 U
91-20-3	Naphthalene	51 U
87-61-6	1,2,3-Trichlorobenzene	51 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	100%
d8-Toluene	93.3%
Bromofluorobenzene	99.6%
d4-1,2-Dichlorobenzene	97.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-500-0-1

Lab Sample ID: CI62Q
LIMS ID: 00-19878
Matrix: Soil
Data Release Authorized:
Reported: 11/03/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Instrument: FINN5
Date Analyzed: 10/27/00 01:08

Sample Amount: 4.39 g dry Wt
Percent Moisture: 7.5%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	1.1 U
74-83-9	Bromomethane	1.1 U
75-01-4	Vinyl Chloride	1.1 U
75-00-3	Chloroethane	1.1 U
75-09-2	**Methylene Chloride**	**4.2**
67-64-1	**Acetone**	**94**
75-15-0	**Carbon Disulfide**	**1.6**
75-35-4	1,1-Dichloroethene	1.1 U
75-34-3	1,1-Dichloroethane	1.1 U
156-60-5	trans-1,2-Dichloroethene	1.1 U
156-59-2	cis-1,2-Dichloroethene	1.1 U
67-66-3	**Chloroform**	**1.0 J**
107-06-2	1,2-Dichloroethane	1.1 U
78-93-3	**2-Butanone**	**12**
71-55-6	1,1,1-Trichloroethane	1.1 U
56-23-5	Carbon Tetrachloride	1.1 U
108-05-4	Vinyl Acetate	5.7 U
75-27-4	Bromodichloromethane	1.1 U
78-87-5	1,2-Dichloropropane	1.1 U
10061-01-5	cis-1,3-Dichloropropene	1.1 U
79-01-6	Trichloroethene	1.1 U
124-48-1	Dibromochloromethane	1.1 U
79-00-5	1,1,2-Trichloroethane	1.1 U
71-43-2	**Benzene**	**1.3**
10061-02-6	trans-1,3-Dichloropropene	1.1 U
110-75-8	2-Chloroethylvinylether	5.7 U
75-25-2	Bromoform	1.1 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.7 U
591-78-6	2-Hexanone	5.7 U
127-18-4	Tetrachloroethene	1.1 U
79-34-5	1,1,2,2-Tetrachloroethane	1.1 U
108-88-3	**Toluene**	**370 E**
108-90-7	Chlorobenzene	1.1 U
100-41-4	Ethylbenzene	1.1 U
100-42-5	Styrene	1.1 U
75-69-4	Trichlorofluoromethane	1.1 U
76-13-1	1,1,2-Trichlorotrifluoroethane	1.1 U
1330-20-7	**m,p-Xylene**	**1.1 J**

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-500-0-1

Lab Sample ID: CI62Q
LIMS ID: 00-19878
Matrix: Soil
Data Release Authorized:
Reported: 11/03/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Instrument: FINN5
Date Analyzed: 10/27/00 01:08

Sample Amount: 4.39 g dry Wt
Percent Moisture: 7.5%

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	1.1 U
95-50-1	1,2-Dichlorobenzene	1.1 U
541-73-1	1,3-Dichlorobenzene	1.1 U
106-46-7	1,4-Dichlorobenzene	1.1 U
107-02-8	Acrolein	57 U
74-88-4	Methyl Iodide	1.1 U
74-96-4	Bromoethane	2.3 U
107-13-1	Acrylonitrile	5.7 U
563-58-6	1,1-Dichloropropene	1.1 U
74-95-3	Dibromomethane	1.1 U
630-20-6	1,1,1,2-Tetrachloroethane	1.1 U
96-12-8	1,2-Dibromo-3-chloropropane	5.7 U
96-18-4	1,2,3-Trichloropropane	2.3 U
110-57-6	trans-1,4-Dichloro-2-butene	5.7 U
108-67-8	1,3,5-Trimethylbenzene	1.1 U
95-63-6	1,2,4-Trimethylbenzene	1.1 U
87-68-3	Hexachlorobutadiene	5.7 U
106-93-4	Ethylene Dibromide	1.1 U
74-97-5	Bromochloromethane	1.1 U
594-20-7	2,2-Dichloropropane	1.1 U
142-28-9	1,3-Dichloropropane	1.1 U
98-82-8	Isopropylbenzene	1.1 U
103-65-1	n-Propylbenzene	1.1 U
108-86-1	Bromobenzene	1.1 U
95-49-8	2-Chlorotoluene	1.1 U
106-43-4	4-Chlorotoluene	1.1 U
98-06-6	tert-Butylbenzene	1.1 U
135-98-8	sec-Butylbenzene	1.1 U
99-87-6	4-Isopropyltoluene	1.1 U
104-51-8	n-Butylbenzene	2.3 U
120-82-1	1,2,4-Trichlorobenzene	5.7 U
91-20-3	Naphthalene	5.7 U
87-61-6	1,2,3-Trichlorobenzene	5.7 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	120%
d8-Toluene	98.4%
Bromofluorobenzene	101%
d4-1,2-Dichlorobenzene	102%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-500-0-1
REANALYSIS

Lab Sample ID: CI62Q-RE
LIMS ID: 00-19878
Matrix: Soil
Data Release Authorized:
Reported: 11/03/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Instrument: FINN5
Date Analyzed: 10/27/00 18:19

Sample Amount: 0.45 g dry Wt
Percent Moisture: 7.5%

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	11 U
95-50-1	1,2-Dichlorobenzene	11 U
541-73-1	1,3-Dichlorobenzene	11 U
106-46-7	1,4-Dichlorobenzene	11 U
107-02-8	Acrolein	550 U
74-88-4	Methyl Iodide	11 U
74-96-4	Bromoethane	22 U
107-13-1	Acrylonitrile	55 U
563-58-6	1,1-Dichloropropene	11 U
74-95-3	Dibromomethane	11 U
630-20-6	1,1,1,2-Tetrachloroethane	11 U
96-12-8	1,2-Dibromo-3-chloropropane	55 U
96-18-4	1,2,3-Trichloropropane	22 U
110-57-6	trans-1,4-Dichloro-2-butene	55 U
108-67-8	1,3,5-Trimethylbenzene	11 U
95-63-6	1,2,4-Trimethylbenzene	11 U
87-68-3	Hexachlorobutadiene	55 U
106-93-4	Ethylene Dibromide	11 U
74-97-5	Bromochloromethane	11 U
594-20-7	2,2-Dichloropropane	11 U
142-28-9	1,3-Dichloropropane	11 U
98-82-8	Isopropylbenzene	11 U
103-65-1	n-Propylbenzene	11 U
108-86-1	Bromobenzene	11 U
95-49-8	2-Chlorotoluene	11 U
106-43-4	4-Chlorotoluene	11 U
98-06-6	tert-Butylbenzene	11 U
135-98-8	sec-Butylbenzene	11 U
99-87-6	4-Isopropyltoluene	11 U
104-51-8	n-Butylbenzene	22 U
120-82-1	1,2,4-Trichlorobenzene	55 U
91-20-3	Naphthalene	55 U
87-61-6	1,2,3-Trichlorobenzene	55 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	102%
d8-Toluene	95.0%
Bromofluorobenzene	95.7%
d4-1,2-Dichlorobenzene	99.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-500-0-1
REANALYSIS

Lab Sample ID: CI62Q-RE
LIMS ID: 00-19878
Matrix: Soil
Data Release Authorized:
Reported: 11/03/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Instrument: FINN5
Sample Amount: 0.45 g dry Wt
Date Analyzed: 10/27/00 18:19
Percent Moisture: 7.5%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	11 U
74-83-9	Bromomethane	11 U
75-01-4	Vinyl Chloride	11 U
75-00-3	Chloroethane	11 U
75-09-2	Methylene Chloride	33 U
67-64-1	**Acetone**	**110 B**
75-15-0	Carbon Disulfide	11 U
75-35-4	1,1-Dichloroethene	11 U
75-34-3	1,1-Dichloroethane	11 U
156-60-5	trans-1,2-Dichloroethene	11 U
156-59-2	cis-1,2-Dichloroethene	11 U
67-66-3	Chloroform	11 U
107-06-2	1,2-Dichloroethane	11 U
78-93-3	2-Butanone	55 U
71-55-6	1,1,1-Trichloroethane	11 U
56-23-5	Carbon Tetrachloride	11 U
108-05-4	Vinyl Acetate	55 U
75-27-4	Bromodichloromethane	11 U
78-87-5	1,2-Dichloropropane	11 U
10061-01-5	cis-1,3-Dichloropropene	11 U
79-01-6	Trichloroethene	11 U
124-48-1	Dibromochloromethane	11 U
79-00-5	1,1,2-Trichloroethane	11 U
71-43-2	Benzene	11 U
10061-02-6	trans-1,3-Dichloropropene	11 U
110-75-8	2-Chloroethylvinylether	55 U
75-25-2	Bromoform	11 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	55 U
591-78-6	2-Hexanone	55 U
127-18-4	**Tetrachloroethene**	**22**
79-34-5	1,1,2,2-Tetrachloroethane	11 U
108-88-3	**Toluene**	**610**
108-90-7	Chlorobenzene	11 U
100-41-4	Ethylbenzene	11 U
100-42-5	Styrene	11 U
75-69-4	Trichlorofluoromethane	11 U
76-13-1	1,1,2-Trichlorotrifluoroethane	11 U
1330-20-7	m,p-Xylene	11 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-49-6-10

Lab Sample ID: CI62R
LIMS ID: 00-19879
Matrix: Soil
Data Release Authorized:
Reported: 11/03/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Instrument: FINN5
Date Analyzed: 10/27/00 02:53

Sample Amount: 0.22 g dry Wt
Percent Moisture: 52.6%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	22 U
74-83-9	Bromomethane	22 U
75-01-4	Vinyl Chloride	22 U
75-00-3	Chloroethane	22 U
75-09-2	**Methylene Chloride**	**100**
67-64-1	**Acetone**	**530**
75-15-0	**Carbon Disulfide**	**12 J**
75-35-4	1,1-Dichloroethene	22 U
75-34-3	1,1-Dichloroethane	22 U
156-60-5	trans-1,2-Dichloroethene	22 U
156-59-2	cis-1,2-Dichloroethene	22 U
67-66-3	Chloroform	22 U
107-06-2	1,2-Dichloroethane	22 U
78-93-3	**2-Butanone**	**120**
71-55-6	1,1,1-Trichloroethane	22 U
56-23-5	Carbon Tetrachloride	22 U
108-05-4	Vinyl Acetate	110 U
75-27-4	Bromodichloromethane	22 U
78-87-5	1,2-Dichloropropane	22 U
10061-01-5	cis-1,3-Dichloropropene	22 U
79-01-6	Trichloroethene	22 U
124-48-1	Dibromochloromethane	22 U
79-00-5	1,1,2-Trichloroethane	22 U
71-43-2	Benzene	22 U
10061-02-6	trans-1,3-Dichloropropene	22 U
110-75-8	2-Chloroethylvinylether	110 U
75-25-2	Bromoform	22 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	110 U
591-78-6	2-Hexanone	110 U
127-18-4	Tetrachloroethene	22 U
79-34-5	1,1,2,2-Tetrachloroethane	22 U
108-88-3	**Toluene**	**270**
108-90-7	Chlorobenzene	22 U
100-41-4	**Ethylbenzene**	**24**
100-42-5	Styrene	22 U
75-69-4	Trichlorofluoromethane	22 U
76-13-1	1,1,2-Trichlorotrifluoroethane	22 U
1330-20-7	**m,p-Xylene**	**84**

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-49-6-10

Lab Sample ID: CI62R
LIMS ID: 00-19879
Matrix: Soil
Data Release Authorized:
Reported: 11/03/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Instrument: FINN5
Date Analyzed: 10/27/00 02:53

Sample Amount: 0.22 g dry Wt
Percent Moisture: 52.6%

CAS Number	Analyte	ug/kg
95-47-6	**o-Xylene**	**58**
95-50-1	1,2-Dichlorobenzene	22 U
541-73-1	1,3-Dichlorobenzene	22 U
106-46-7	1,4-Dichlorobenzene	22 U
107-02-8	Acrolein	1,100 U
74-88-4	Methyl Iodide	22 U
74-96-4	Bromoethane	45 U
107-13-1	Acrylonitrile	110 U
563-58-6	1,1-Dichloropropene	22 U
74-95-3	Dibromomethane	22 U
630-20-6	1,1,1,2-Tetrachloroethane	22 U
96-12-8	1,2-Dibromo-3-chloropropane	110 U
96-18-4	1,2,3-Trichloropropane	45 U
110-57-6	trans-1,4-Dichloro-2-butene	110 U
108-67-8	**1,3,5-Trimethylbenzene**	**490**
95-63-6	**1,2,4-Trimethylbenzene**	**820**
87-68-3	Hexachlorobutadiene	110 U
106-93-4	Ethylene Dibromide	22 U
74-97-5	Bromochloromethane	22 U
594-20-7	2,2-Dichloropropane	22 U
142-28-9	1,3-Dichloropropane	22 U
98-82-8	**Isopropylbenzene**	**39**
103-65-1	n-Propylbenzene	35 Y
108-86-1	Bromobenzene	22 U
95-49-8	2-Chlorotoluene	22 U
106-43-4	4-Chlorotoluene	22 U
98-06-6	tert-Butylbenzene	22 U
135-98-8	sec-Butylbenzene	22 U
99-87-6	**4-Isopropyltoluene**	**250**
104-51-8	n-Butylbenzene	240 Y
120-82-1	1,2,4-Trichlorobenzene	110 U
91-20-3	**Naphthalene**	**11,000 E**
87-61-6	1,2,3-Trichlorobenzene	110 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	118%
d8-Toluene	98.3%
Bromofluorobenzene	101%
d4-1,2-Dichlorobenzene	95.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-49-6-10
REANALYSIS

Lab Sample ID: CI62R-RE
LIMS ID: 00-19879
Matrix: Soil
Data Release Authorized:
Reported: 11/03/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Instrument: FINN5
Date Analyzed: 10/30/00 15:20

Sample Amount: 19 mg dry Wt
Percent Moisture: 52.6%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	260 U
74-83-9	Bromomethane	260 U
75-01-4	Vinyl Chloride	260 U
75-00-3	Chloroethane	260 U
75-09-2	Methylene Chloride	780 U
67-64-1	Acetone	1,300 U
75-15-0	Carbon Disulfide	260 U
75-35-4	1,1-Dichloroethene	260 U
75-34-3	1,1-Dichloroethane	260 U
156-60-5	trans-1,2-Dichloroethene	260 U
156-59-2	cis-1,2-Dichloroethene	260 U
67-66-3	Chloroform	260 U
107-06-2	1,2-Dichloroethane	260 U
78-93-3	2-Butanone	1,300 U
71-55-6	1,1,1-Trichloroethane	260 U
56-23-5	Carbon Tetrachloride	260 U
108-05-4	Vinyl Acetate	1,300 U
75-27-4	Bromodichloromethane	260 U
78-87-5	1,2-Dichloropropane	260 U
10061-01-5	cis-1,3-Dichloropropene	260 U
79-01-6	Trichloroethene	260 U
124-48-1	Dibromochloromethane	260 U
79-00-5	1,1,2-Trichloroethane	260 U
71-43-2	Benzene	260 U
10061-02-6	trans-1,3-Dichloropropene	260 U
110-75-8	2-Chloroethylvinylether	1,300 U
75-25-2	Bromoform	260 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	1,300 U
591-78-6	2-Hexanone	1,300 U
127-18-4	Tetrachloroethene	260 U
79-34-5	1,1,2,2-Tetrachloroethane	260 U
108-88-3	Toluene	260 U
108-90-7	Chlorobenzene	260 U
100-41-4	Ethylbenzene	260 U
100-42-5	Styrene	260 U
75-69-4	Trichlorofluoromethane	260 U
76-13-1	1,1,2-Trichlorotrifluoroethane	260 U
1330-20-7	m,p-Xylene	260 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-49-6-10
REANALYSIS

Lab Sample ID: CI62R-RE
LIMS ID: 00-19879
Matrix: Soil
Data Release Authorized:
Reported: 11/03/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Instrument: FINN5
Date Analyzed: 10/30/00 15:20

Sample Amount: **19 mg dry Wt**
Percent Moisture: 52.6%

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	260 U
95-50-1	1,2-Dichlorobenzene	260 U
541-73-1	1,3-Dichlorobenzene	260 U
106-46-7	1,4-Dichlorobenzene	260 U
107-02-8	Acrolein	13,000 U
74-88-4	Methyl Iodide	260 U
74-96-4	Bromoethane	520 U
107-13-1	Acrylonitrile	1,300 U
563-58-6	1,1-Dichloropropene	260 U
74-95-3	Dibromomethane	260 U
630-20-6	1,1,1,2-Tetrachloroethane	260 U
96-12-8	1,2-Dibromo-3-chloropropane	1,300 U
96-18-4	1,2,3-Trichloropropane	520 U
110-57-6	trans-1,4-Dichloro-2-butene	1,300 U
108-67-8	**1,3,5-Trimethylbenzene**	**330**
95-63-6	**1,2,4-Trimethylbenzene**	**570**
87-68-3	Hexachlorobutadiene	1,300 U
106-93-4	Ethylene Dibromide	260 U
74-97-5	Bromochloromethane	260 U
594-20-7	2,2-Dichloropropane	260 U
142-28-9	1,3-Dichloropropane	260 U
98-82-8	Isopropylbenzene	260 U
103-65-1	n-Propylbenzene	260 U
108-86-1	Bromobenzene	260 U
95-49-8	2-Chlorotoluene	260 U
106-43-4	4-Chlorotoluene	260 U
98-06-6	tert-Butylbenzene	260 U
135-98-8	sec-Butylbenzene	260 U
99-87-6	**4-Isopropyltoluene**	**230 J**
104-51-8	n-Butylbenzene	520 U
120-82-1	1,2,4-Trichlorobenzene	1,300 U
91-20-3	**Naphthalene**	**8,800**
87-61-6	1,2,3-Trichlorobenzene	1,300 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	**121%**
d8-Toluene	113%
Bromofluorobenzene	112%
d4-1,2-Dichlorobenzene	101%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-50-0-1
MATRIX SPIKE

Lab Sample ID: CI62O-MS
LIMS ID: 00-19876
Matrix: Soil
Data Release Authorized:
Reported: 11/03/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Instrument: FINN5
Sample Amount: 4.50 g dry Wt
Date Analyzed: 10/27/00 01:34
Percent Moisture: 7.4%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	---
74-83-9	Bromomethane	---
75-01-4	Vinyl Chloride	---
75-00-3	Chloroethane	---
75-09-2	Methylene Chloride	---
67-64-1	Acetone	---
75-15-0	Carbon Disulfide	---
75-35-4	1,1-Dichloroethene	---
75-34-3	1,1-Dichloroethane	---
156-60-5	trans-1,2-Dichloroethene	---
156-59-2	cis-1,2-Dichloroethene	---
67-66-3	Chloroform	---
107-06-2	1,2-Dichloroethane	---
78-93-3	2-Butanone	---
71-55-6	1,1,1-Trichloroethane	---
56-23-5	Carbon Tetrachloride	---
108-05-4	Vinyl Acetate	---
75-27-4	Bromodichloromethane	---
78-87-5	1,2-Dichloropropane	---
10061-01-5	cis-1,3-Dichloropropene	---
79-01-6	Trichloroethene	---
124-48-1	Dibromochloromethane	---
79-00-5	1,1,2-Trichloroethane	---
71-43-2	Benzene	---
10061-02-6	trans-1,3-Dichloropropene	---
110-75-8	2-Chloroethylvinylether	---
75-25-2	Bromoform	---
108-10-1	4-Methyl-2-Pentanone (MIBK)	---
591-78-6	2-Hexanone	---
127-18-4	Tetrachloroethene	---
79-34-5	1,1,2,2-Tetrachloroethane	---
108-88-3	Toluene	---
108-90-7	Chlorobenzene	---
100-41-4	Ethylbenzene	---
100-42-5	Styrene	---
75-69-4	Trichlorofluoromethane	---
76-13-1	1,1,2-Trichlorotrifluoroethane	---
1330-20-7	m,p-Xylene	---

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-50-0-1
MATRIX SPIKE

Lab Sample ID: CI62O-MS
LIMS ID: 00-19876
Matrix: Soil
Data Release Authorized:
Reported: 11/03/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Instrument: FINN5
Date Analyzed: 10/27/00 01:34

Sample Amount: 4.50 g dry Wt
Percent Moisture: 7.4%

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	---
95-50-1	1,2-Dichlorobenzene	---
541-73-1	1,3-Dichlorobenzene	---
106-46-7	1,4-Dichlorobenzene	---
107-02-8	Acrolein	---
74-88-4	Methyl Iodide	---
74-96-4	Bromoethane	---
107-13-1	Acrylonitrile	---
563-58-6	1,1-Dichloropropene	---
74-95-3	Dibromomethane	---
630-20-6	1,1,1,2-Tetrachloroethane	---
96-12-8	1,2-Dibromo-3-chloropropane	---
96-18-4	1,2,3-Trichloropropane	---
110-57-6	trans-1,4-Dichloro-2-butene	---
108-67-8	1,3,5-Trimethylbenzene	---
95-63-6	1,2,4-Trimethylbenzene	---
87-68-3	Hexachlorobutadiene	---
106-93-4	Ethylene Dibromide	---
74-97-5	Bromochloromethane	---
594-20-7	2,2-Dichloropropane	---
142-28-9	1,3-Dichloropropane	---
98-82-8	Isopropylbenzene	---
103-65-1	n-Propylbenzene	---
108-86-1	Bromobenzene	---
95-49-8	2-Chlorotoluene	---
106-43-4	4-Chlorotoluene	---
98-06-6	tert-Butylbenzene	---
135-98-8	sec-Butylbenzene	---
99-87-6	4-Isopropyltoluene	---
104-51-8	n-Butylbenzene	---
120-82-1	1,2,4-Trichlorobenzene	---
91-20-3	Naphthalene	---
87-61-6	1,2,3-Trichlorobenzene	---

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	117%
d8-Toluene	105%
Bromofluorobenzene	105%
d4-1,2-Dichlorobenzene	102%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-50-0-1
SPIKE DUPLICATE

Lab Sample ID: CI62O-MSD
LIMS ID: 00-19876
Matrix: Soil
Data Release Authorized:
Reported: 11/03/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Instrument: FINN5
Date Analyzed: 10/27/00 02:00

Sample Amount: 4.51 g dry Wt
Percent Moisture: 7.4%

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	---
74-83-9	Bromomethane	---
75-01-4	Vinyl Chloride	---
75-00-3	Chloroethane	---
75-09-2	Methylene Chloride	---
67-64-1	Acetone	---
75-15-0	Carbon Disulfide	---
75-35-4	1,1-Dichloroethene	---
75-34-3	1,1-Dichloroethane	---
156-60-5	trans-1,2-Dichloroethene	---
156-59-2	cis-1,2-Dichloroethene	---
67-66-3	Chloroform	---
107-06-2	1,2-Dichloroethane	---
78-93-3	2-Butanone	---
71-55-6	1,1,1-Trichloroethane	---
56-23-5	Carbon Tetrachloride	---
108-05-4	Vinyl Acetate	---
75-27-4	Bromodichloromethane	---
78-87-5	1,2-Dichloropropane	---
10061-01-5	cis-1,3-Dichloropropene	---
79-01-6	Trichloroethene	---
124-48-1	Dibromochloromethane	---
79-00-5	1,1,2-Trichloroethane	---
71-43-2	Benzene	---
10061-02-6	trans-1,3-Dichloropropene	---
110-75-8	2-Chloroethylvinylether	---
75-25-2	Bromoform	---
108-10-1	4-Methyl-2-Pentanone (MIBK)	---
591-78-6	2-Hexanone	---
127-18-4	Tetrachloroethene	---
79-34-5	1,1,2,2-Tetrachloroethane	---
108-88-3	Toluene	---
108-90-7	Chlorobenzene	---
100-41-4	Ethylbenzene	---
100-42-5	Styrene	---
75-69-4	Trichlorofluoromethane	---
76-13-1	1,1,2-Trichlorotrifluoroethane	---
1330-20-7	m,p-Xylene	---

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: TP-50-0-1
SPIKE DUPLICATE

Lab Sample ID: CI620-MSD
LIMS ID: 00-19876
Matrix: Soil
Data Release Authorized:
Reported: 11/03/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Instrument: FINN5
Date Analyzed: 10/27/00 02:00

Sample Amount: 4.51 g dry Wt
Percent Moisture: 7.4%

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	---
95-50-1	1,2-Dichlorobenzene	---
541-73-1	1,3-Dichlorobenzene	---
106-46-7	1,4-Dichlorobenzene	---
107-02-8	Acrolein	---
74-88-4	Methyl Iodide	---
74-96-4	Bromoethane	---
107-13-1	Acrylonitrile	---
563-58-6	1,1-Dichloropropene	---
74-95-3	Dibromomethane	---
630-20-6	1,1,1,2-Tetrachloroethane	---
96-12-8	1,2-Dibromo-3-chloropropane	---
96-18-4	1,2,3-Trichloropropane	---
110-57-6	trans-1,4-Dichloro-2-butene	---
108-67-8	1,3,5-Trimethylbenzene	---
95-63-6	1,2,4-Trimethylbenzene	---
87-68-3	Hexachlorobutadiene	---
106-93-4	Ethylene Dibromide	---
74-97-5	Bromochloromethane	---
594-20-7	2,2-Dichloropropane	---
142-28-9	1,3-Dichloropropane	---
98-82-8	Isopropylbenzene	---
103-65-1	n-Propylbenzene	---
108-86-1	Bromobenzene	---
95-49-8	2-Chlorotoluene	---
106-43-4	4-Chlorotoluene	---
98-06-6	tert-Butylbenzene	---
135-98-8	sec-Butylbenzene	---
99-87-6	4-Isopropyltoluene	---
104-51-8	n-Butylbenzene	---
120-82-1	1,2,4-Trichlorobenzene	---
91-20-3	Naphthalene	---
87-61-6	1,2,3-Trichlorobenzene	---

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	119%
d8-Toluene	101%
Bromofluorobenzene	104%
d4-1,2-Dichlorobenzene	101%

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-50-0-1
QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 10/18/00

Lab Sample ID: CI620
LIMS ID: 00-19876
Matrix: Soil

Data Release Authorized:
Reported: 11/03/00

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY
Date Analyzed: 10/27/00

CONSTITUENT	SAMPLE VALUE	SPIKE VALUE	SPIKE AMT	% RECOVERY	RPD
MATRIX SPIKE					
Chloromethane	< 1.1	51.0	55.6	91.8%	
Bromomethane	< 1.1	47.7	55.6	85.9%	
Vinyl Chloride	< 1.1	39.0	55.6	70.2%	
Chloroethane	< 1.1	43.4	55.6	78.1%	
Methylene Chloride	3.4	45.6	55.6	76.0%	
Acetone	90.3	351	278	93.9%	
Carbon Disulfide	1.4	32.4	55.6	55.8%	
1,1-Dichloroethene	< 1.1	39.9	55.6	71.8%	
1,1-Dichloroethane	< 1.1	48.3	55.6	86.9%	
trans-1,2-Dichloroethene	< 1.1	30.7	55.6	55.3%	
cis-1,2-Dichloroethene	< 1.1	36.7	55.6	66.1%	
Chloroform	< 1.1	45.1	55.6	81.2%	
1,2-Dichloroethane	< 1.1	43.8	55.6	78.8%	
2-Butanone	11.6	277	278	95.5%	
1,1,1-Trichloroethane	< 1.1	45.1	55.6	81.2%	
Carbon Tetrachloride	< 1.1	41.9	55.6	75.4%	
Vinyl Acetate	< 5.4	15.4	55.6	27.7%	
Bromodichloromethane	< 1.1	39.6	55.6	71.3%	
1,2-Dichloropropane	< 1.1	49.3	55.6	88.7%	
cis-1,3-Dichloropropene	< 1.1	29.3	55.6	52.7%	
Trichloroethene	< 1.1	36.1	55.6	65.0%	
Dibromochloromethane	< 1.1	37.7	55.6	67.9%	
1,1,2-Trichloroethane	< 1.1	40.7	55.6	73.3%	
Benzene	1.2	42.9	55.6	75.1%	
trans-1,3-Dichloropropene	< 1.1	25.2	55.6	45.4%	
2-Chloroethylvinylether	< 5.4	34.9	55.6	62.8%	
Bromoform	< 1.1	33.0	55.6	59.4%	
4-Methyl-2-Pentanone (MIBK)	< 5.4	240	278	86.4%	
2-Hexanone	< 5.4	247	278	88.9%	
Tetrachloroethene	< 1.1	30.6	55.6	55.1%	
1,1,2,2-Tetrachloroethane	< 1.1	43.3	55.6	77.9%	
Toluene	345.	379	55.6	61.2%	
Chlorobenzene	< 1.1	29.2	55.6	52.6%	
Ethylbenzene	< 1.1	32.9	55.6	59.2%	
Styrene	< 1.1	26.2	55.6	47.2%	
Trichlorofluoromethane	< 1.1	45.7	55.6	82.3%	

Reported in ug/kg-dry-Wt

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CI620
LIMS ID: 00-19876
Matrix: Soil

Sample No: TP-50-0-1
QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 10/18/00

Data Release Authorized:
Reported: 11/03/00

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY
Date Analyzed: 10/27/00

CONSTITUENT		SAMPLE VALUE	SPIKE VALUE	SPIKE AMT	% RECOVERY	RPD
MATRIX SPIKE						
1,1,2-Trichlorotrifluoroethan	<	1.1	40.1	55.6	72.2%	
m,p-Xylene	<	1.1	63.4	111	57.1%	
O-Xylene	<	1.1	32.4	55.6	58.3%	
1,2-Dichlorobenzene	<	1.1	24.4	55.6	43.9%	
1,3-Dichlorobenzene	<	1.1	23.3	55.6	41.9%	
1,4-Dichlorobenzene	<	1.1	22.2	55.6	40.0%	
Acrolein	<	53.5	147	278	52.9%	
Methyl Iodide	<	1.1	37.3	55.6	67.1%	
Bromoethane	<	2.1	44.9	55.6	80.8%	
Acrylonitrile	<	5.4	48.0	55.6	86.4%	
1,1-Dichloropropene	<	1.1	36.0	55.6	64.8%	
Dibromomethane	<	1.1	38.4	55.6	69.1%	
1,1,1,2-Tetrachloroethane	<	1.1	37.3	55.6	67.1%	
1,2-Dibromo-3-chloropropane	<	5.4	39.1	55.6	70.4%	
1,2,3-Trichloropropane	<	2.1	35.9	55.6	64.6%	
trans-1,4-Dichloro-2-butene	<	5.4	28.8	55.6	51.8%	
1,3,5-Trimethylbenzene	<	1.1	37.1	55.6	66.8%	
1,2,4-Trimethylbenzene	<	1.1	35.0	55.6	63.0%	
Hexachlorobutadiene	<	5.4	22.1	55.6	39.8%	
Ethylene Dibromide	<	1.1	32.4	55.6	58.3%	
Bromochloromethane	<	1.1	39.1	55.6	70.4%	
2,2-Dichloropropane	<	1.1	42.1	55.6	75.8%	
1,3-Dichloropropane	<	1.1	35.9	55.6	64.6%	
Isopropylbenzene	<	1.1	38.3	55.6	68.9%	
n-Propylbenzene	<	1.1	33.8	55.6	60.8%	
Bromobenzene	<	1.1	28.9	55.6	52.0%	
2-Chlorotoluene	<	1.1	31.9	55.6	57.4%	
4-Chlorotoluene	<	1.1	31.1	55.6	56.0%	
tert-Butylbenzene	<	1.1	34.8	55.6	62.6%	
sec-Butylbenzene	<	1.1	34.6	55.6	62.3%	
4-Isopropyltoluene	<	1.1	31.3	55.6	56.3%	
n-Butylbenzene	<	2.1	27.9	55.6	50.2%	
1,2,4-Trichlorobenzene	<	5.4	14.3	55.6	25.7%	
Naphthalene	<	5.4	17.0	55.6	30.6%	
1,2,3-Trichlorobenzene	<	5.4	14.7	55.6	26.5%	

Reported in ug/kg-dry-Wt

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-50-0-1
QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 10/18/00

Lab Sample ID: CI620
LIMS ID: 00-19876
Matrix: Soil

Data Release Authorized:
Reported: 11/03/00

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY
Date Analyzed: 10/27/00

CONSTITUENT	SAMPLE VALUE	SPIKE VALUE	SPIKE AMT	% RECOVERY	RPD
MATRIX SPIKE DUPLICATE					
Chloromethane	< 1.1	49.3	55.4	88.9%	3.2%
Bromomethane	< 1.1	45.8	55.4	82.6%	3.9%
Vinyl Chloride	< 1.1	35.6	55.4	64.2%	8.9%
Chloroethane	< 1.1	41.0	55.4	74.0%	5.4%
Methylene Chloride	3.4	45.7	55.4	76.4%	0.5%
Acetone	90.3	337	277	89.0%	5.3%
Carbon Disulfide	1.4	30.7	55.4	52.9%	5.3%
1,1-Dichloroethene	< 1.1	38.8	55.4	70.0%	2.6%
1,1-Dichloroethane	< 1.1	47.8	55.4	86.2%	0.9%
trans-1,2-Dichloroethene	< 1.1	30.8	55.4	55.6%	0.6%
cis-1,2-Dichloroethene	< 1.1	37.0	55.4	66.7%	1.0%
Chloroform	< 1.1	45.2	55.4	81.5%	0.4%
1,2-Dichloroethane	< 1.1	43.0	55.4	77.6%	1.6%
2-Butanone	11.6	276	277	95.4%	0.2%
1,1,1-Trichloroethane	< 1.1	43.5	55.4	78.5%	3.[illegible]
Carbon Tetrachloride	< 1.1	40.5	55.4	73.1%	3
Vinyl Acetate	< 5.4	15.3	55.4	27.6%	0.4%
Bromodichloromethane	< 1.1	39.7	55.4	71.6%	0.4%
1,2-Dichloropropane	< 1.1	48.8	55.4	88.0%	0.8%
cis-1,3-Dichloropropene	< 1.1	29.7	55.4	53.6%	1.6%
Trichloroethene	< 1.1	35.1	55.4	63.3%	2.6%
Dibromochloromethane	< 1.1	39.7	55.4	71.6%	5.4%
1,1,2-Trichloroethane	< 1.1	40.4	55.4	72.9%	0.5%
Benzene	1.2	42.2	55.4	74.0%	1.5%
trans-1,3-Dichloropropene	< 1.1	25.7	55.4	46.4%	2.3%
2-Chloroethylvinylether	< 5.4	35.0	55.4	63.1%	0.4%
Bromoform	< 1.1	34.3	55.4	61.9%	4.1%
4-Methyl-2-Pentanone (MIBK)	< 5.4	237	277	85.5%	1.0%
2-Hexanone	< 5.4	256	277	92.4%	3.8%
Tetrachloroethene	< 1.1	31.8	55.4	57.4%	4.1%
1,1,2,2-Tetrachloroethane	< 1.1	45.7	55.4	82.4%	5.6%
Toluene	345.	353	55.4	14.4%	120%
Chlorobenzene	< 1.1	30.7	55.4	55.4%	5.3%
Ethylbenzene	< 1.1	34.3	55.4	61.9%	4.4%
Styrene	< 1.1	27.1	55.4	48.9%	3.6%
Trichlorofluoromethane	< 1.1	43.2	55.4	77.9%	5.4%

Reported in ug/kg-dry-Wt

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CI62O
LIMS ID: 00-19876
Matrix: Soil

Sample No: TP-50-0-1
QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 10/18/00

Data Release Authorized:
Reported: 11/03/00

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY
Date Analyzed: 10/27/00

CONSTITUENT		SAMPLE VALUE	SPIKE VALUE	SPIKE AMT	% RECOVERY	RPD
MATRIX SPIKE DUPLICATE						
1,1,2-Trichlorotrifluoroethan	<	1.1	36.6	55.4	66.0%	8.9%
m,p-Xylene	<	1.1	65.4	111	59.0%	3.3%
O-Xylene	<	1.1	33.9	55.4	61.2%	4.8%
1,2-Dichlorobenzene	<	1.1	26.5	55.4	47.8%	8.5%
1,3-Dichlorobenzene	<	1.1	25.3	55.4	45.6%	8.4%
1,4-Dichlorobenzene	<	1.1	24.2	55.4	43.7%	8.9%
Acrolein	<	53.5	164	277	59.2%	11%
Methyl Iodide	<	1.1	37.8	55.4	68.2%	1.6%
Bromoethane	<	2.1	42.2	55.4	76.1%	6.0%
Acrylonitrile	<	5.4	47.2	55.4	85.1%	1.5%
1,1-Dichloropropene	<	1.1	35.4	55.4	63.9%	1.4%
Dibromomethane	<	1.1	38.7	55.4	69.8%	1.0%
1,1,1,2-Tetrachloroethane	<	1.1	39.5	55.4	71.3%	6.0%
1,2-Dibromo-3-chloropropane	<	5.4	41.9	55.4	75.6%	7.2%
1,2,3-Trichloropropane	<	2.1	38.4	55.4	69.3%	7.0%
trans-1,4-Dichloro-2-butene	<	5.4	31.2	55.4	56.3%	8.2%
1,3,5-Trimethylbenzene	<	1.1	39.7	55.4	71.6%	7.0%
1,2,4-Trimethylbenzene	<	1.1	38.8	55.4	70.0%	11%
Hexachlorobutadiene	<	5.4	22.7	55.4	41.0%	3.0%
Ethylene Dibromide	<	1.1	32.7	55.4	59.0%	1.2%
Bromochloromethane	<	1.1	40.0	55.4	72.2%	2.6%
2,2-Dichloropropane	<	1.1	40.5	55.4	73.1%	3.6%
1,3-Dichloropropane	<	1.1	37.6	55.4	67.8%	4.8%
Isopropylbenzene	<	1.1	40.0	55.4	72.2%	4.6%
n-Propylbenzene	<	1.1	36.0	55.4	64.9%	6.5%
Bromobenzene	<	1.1	31.5	55.4	56.8%	8.8%
2-Chlorotoluene	<	1.1	39.2	55.4	70.7%	21%
4-Chlorotoluene	<	1.1	29.5	55.4	53.2%	5.1%
tert-Butylbenzene	<	1.1	35.8	55.4	64.6%	3.1%
sec-Butylbenzene	<	1.1	35.6	55.4	64.2%	3.0%
4-Isopropyltoluene	<	1.1	32.4	55.4	58.4%	3.6%
n-Butylbenzene	<	2.1	28.6	55.4	51.6%	2.7%
1,2,4-Trichlorobenzene	<	5.4	16.2	55.4	29.2%	13%
Naphthalene	<	5.4	19.7	55.4	35.5%	15%
1,2,3-Trichlorobenzene	<	5.4	17.2	55.4	31.0%	16%

Reported in ug/kg-dry-Wt

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 102600MB
LIMS ID: 00-19876
Matrix: Soil
Data Release Authorized:
Reported: 11/03/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN5
Date Analyzed: 10/26/00 16:13

Sample Amount: 5.00 g dry Wt Equiv
Percent Moisture: NA

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	3.0 U
67-64-1	Acetone	5.0 U
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	trans-1,2-Dichloroethene	1.0 U
156-59-2	cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
108-05-4	Vinyl Acetate	5.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-02-6	trans-1,3-Dichloropropene	1.0 U
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.0 U
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	1.0 U
1330-20-7	m,p-Xylene	1.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 102600MB
LIMS ID: 00-19876
Matrix: Soil
Data Release Authorized:
Reported: 11/03/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN5
Date Analyzed: 10/26/00 16:13

Sample Amount: 5.00 g dry Wt Equiv
Percent Moisture: NA

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	1.0 U
95-50-1	1,2-Dichlorobenzene	1.0 U
541-73-1	1,3-Dichlorobenzene	1.0 U
106-46-7	1,4-Dichlorobenzene	1.0 U
107-02-8	Acrolein	50 U
74-88-4	Methyl Iodide	1.0 U
74-96-4	Bromoethane	2.0 U
107-13-1	Acrylonitrile	5.0 U
563-58-6	1,1-Dichloropropene	1.0 U
74-95-3	Dibromomethane	1.0 U
630-20-6	1,1,1,2-Tetrachloroethane	1.0 U
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U
96-18-4	1,2,3-Trichloropropane	2.0 U
110-57-6	trans-1,4-Dichloro-2-butene	5.0 U
108-67-8	1,3,5-Trimethylbenzene	1.0 U
95-63-6	1,2,4-Trimethylbenzene	1.0 U
87-68-3	Hexachlorobutadiene	5.0 U
106-93-4	Ethylene Dibromide	1.0 U
74-97-5	Bromochloromethane	1.0 U
594-20-7	2,2-Dichloropropane	1.0 U
142-28-9	1,3-Dichloropropane	1.0 U
98-82-8	Isopropylbenzene	1.0 U
103-65-1	n-Propylbenzene	1.0 U
108-86-1	Bromobenzene	1.0 U
95-49-8	2-Chlorotoluene	1.0 U
106-43-4	4-Chlorotoluene	1.0 U
98-06-6	tert-Butylbenzene	1.0 U
135-98-8	sec-Butylbenzene	1.0 U
99-87-6	4-Isopropyltoluene	1.0 U
104-51-8	n-Butylbenzene	2.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0 U
91-20-3	Naphthalene	5.0 U
87-61-6	1,2,3-Trichlorobenzene	5.0 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	108%
d8-Toluene	103%
Bromofluorobenzene	110%
d4-1,2-Dichlorobenzene	101%

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CI62SB
LIMS ID: 00-19876
Matrix: Soil
Data Release Authorized:
Reported: 11/03/00
Date Analyzed: 10/26/00
Instrument: FINN5

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: NA

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
Chloromethane	73.6	50.0	147%
Bromomethane	72.7	50.0	145%
Vinyl Chloride	66.5	50.0	133%
Chloroethane	81.3	50.0	163%
Methylene Chloride	44.4	50.0	88.8%
Acetone	233.	250	93.2%
Carbon Disulfide	43.8	50.0	87.6%
1,1-Dichloroethene	42.7	50.0	85.4%
1,1-Dichloroethane	44.9	50.0	89.8%
trans-1,2-Dichloroethene	44.4	50.0	88.8%
cis-1,2-Dichloroethene	46.1	50.0	92.2%
Chloroform	45.2	50.0	90.4%
1,2-Dichloroethane	40.2	50.0	80.4%
2-Butanone	236.	250	94.4%
1,1,1-Trichloroethane	44.6	50.0	89.2%
Carbon Tetrachloride	40.8	50.0	81.6%
Vinyl Acetate	40.8	50.0	81.6%
Bromodichloromethane	41.8	50.0	83.6%
1,2-Dichloropropane	42.9	50.0	85.8%
cis-1,3-Dichloropropene	40.4	50.0	80.8%
Trichloroethene	41.1	50.0	82.2%
Dibromochloromethane	40.8	50.0	81.6%
1,1,2-Trichloroethane	41.9	50.0	83.8%
Benzene	45.3	50.0	90.6%
trans-1,3-Dichloropropene	38.8	50.0	77.6%
2-Chloroethylvinylether	46.5	50.0	93.0%
Bromoform	39.5	50.0	79.0%
4-Methyl-2-Pentanone (MIBK)	228.	250	91.2%
2-Hexanone	222.	250	88.8%
Tetrachloroethene	44.0	50.0	88.0%
1,1,2,2-Tetrachloroethane	39.6	50.0	79.2%
Toluene	45.1	50.0	90.2%
Chlorobenzene	44.5	50.0	89.0%
Ethylbenzene	42.9	50.0	85.8%
Styrene	44.4	50.0	88.8%
Trichlorofluoromethane	39.4	50.0	78.8%
1,1,2-Trichlorotrifluoroethane	40.8	50.0	81.6%
m,p-Xylene	93.2	100	93.2%
O-Xylene	44.0	50.0	88.0%

Reported in ug/kg-dry-Wt

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CI62SB
LIMS ID: 00-19876
Matrix: Soil
Data Release Authorized:
Reported: 11/03/00
Date Analyzed: 10/26/00
Instrument: FINN5

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: NA

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
1,2-Dichlorobenzene	40.6	50.0	81.2%
1,3-Dichlorobenzene	42.3	50.0	84.6%
1,4-Dichlorobenzene	43.1	50.0	86.2%
Acrolein	331.	250	132%
Methyl Iodide	43.0	50.0	86.0%
Bromoethane	44.3	50.0	88.6%
Acrylonitrile	51.7	50.0	103%
1,1-Dichloropropene	44.6	50.0	89.2%
Dibromomethane	39.8	50.0	79.6%
1,1,1,2-Tetrachloroethane	43.7	50.0	87.4%
1,2-Dibromo-3-chloropropane	38.9	50.0	77.8%
1,2,3-Trichloropropane	43.4	50.0	86.8%
trans-1,4-Dichloro-2-butene	50.0	50.0	100%
1,3,5-Trimethylbenzene	42.5	50.0	85.0%
1,2,4-Trimethylbenzene	42.6	50.0	85.2%
Hexachlorobutadiene	33.8	50.0	67.6%
Ethylene Dibromide	40.6	50.0	81.2%
Bromochloromethane	44.4	50.0	88.8%
2,2-Dichloropropane	45.2	50.0	90.4%
1,3-Dichloropropane	42.8	50.0	85.6%
Isopropylbenzene	43.2	50.0	86.4%
n-Propylbenzene	42.5	50.0	85.0%
Bromobenzene	43.0	50.0	86.0%
2-Chlorotoluene	44.5	50.0	89.0%
4-Chlorotoluene	41.3	50.0	82.6%
tert-Butylbenzene	39.8	50.0	79.6%
sec-Butylbenzene	43.7	50.0	87.4%
4-Isopropyltoluene	41.8	50.0	83.6%
n-Butylbenzene	38.1	50.0	76.2%
1,2,4-Trichlorobenzene	39.5	50.0	79.0%
Naphthalene	43.0	50.0	86.0%
1,2,3-Trichlorobenzene	40.9	50.0	81.8%

Spike Blank Surrogate Recovery	
d4-1,2-Dichloroethane	97.4%
d8-Toluene	97.8%
Bromofluorobenzene	100%
d4-1,2-Dichlorobenzene	96.6%

Reported in ug/kg-dry-Wt

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 102700MB
LIMS ID: 00-19877
Matrix: Soil
Data Release Authorized
Reported: 11/03/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN5
Date Analyzed: 10/27/00 14:08

Sample Amount: 5.00 g dry Wt Equiv
Percent Moisture: NA

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	**Methylene Chloride**	**4.5**
67-64-1	**Acetone**	**3.2 J**
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	trans-1,2-Dichloroethene	1.0 U
156-59-2	cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
108-05-4	Vinyl Acetate	5.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-02-6	trans-1,3-Dichloropropene	1.0 U
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.0 U
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	1.0 U
1330-20-7	m,p-Xylene	1.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 102700MB
LIMS ID: 00-19877
Matrix: Soil
Data Release Authorized:
Reported: 11/03/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN5
Date Analyzed: 10/27/00 14:08

Sample Amount: 5.00 g dry Wt Equiv
Percent Moisture: NA

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	1.0 U
95-50-1	1,2-Dichlorobenzene	1.0 U
541-73-1	1,3-Dichlorobenzene	1.0 U
106-46-7	1,4-Dichlorobenzene	1.0 U
107-02-8	Acrolein	50 U
74-88-4	Methyl Iodide	1.0 U
74-96-4	Bromoethane	2.0 U
107-13-1	Acrylonitrile	5.0 U
563-58-6	1,1-Dichloropropene	1.0 U
74-95-3	Dibromomethane	1.0 U
630-20-6	1,1,1,2-Tetrachloroethane	1.0 U
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U
96-18-4	1,2,3-Trichloropropane	2.0 U
110-57-6	trans-1,4-Dichloro-2-butene	5.0 U
108-67-8	1,3,5-Trimethylbenzene	1.0 U
95-63-6	1,2,4-Trimethylbenzene	1.0 U
87-68-3	Hexachlorobutadiene	5.0 U
106-93-4	Ethylene Dibromide	1.0 U
74-97-5	Bromochloromethane	1.0 U
594-20-7	2,2-Dichloropropane	1.0 U
142-28-9	1,3-Dichloropropane	1.0 U
98-82-8	Isopropylbenzene	1.0 U
103-65-1	n-Propylbenzene	1.0 U
108-86-1	Bromobenzene	1.0 U
95-49-8	2-Chlorotoluene	1.0 U
106-43-4	4-Chlorotoluene	1.0 U
98-06-6	tert-Butylbenzene	1.0 U
135-98-8	sec-Butylbenzene	1.0 U
99-87-6	4-Isopropyltoluene	1.0 U
104-51-8	n-Butylbenzene	2.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0 U
91-20-3	Naphthalene	5.0 U
87-61-6	1,2,3-Trichlorobenzene	5.0 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	98.4%
d8-Toluene	99.5%
Bromofluorobenzene	97.8%
d4-1,2-Dichlorobenzene	97.6%

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CI62SB
LIMS ID: 00-19877
Matrix: Soil
Data Release Authorized
Reported: 11/03/00
Date Analyzed: 10/27/00
Instrument: FINN5

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: NA

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
Chloromethane	46.9	50.0	93.8%
Bromomethane	48.3	50.0	96.6%
Vinyl Chloride	46.7	50.0	93.4%
Chloroethane	51.9	50.0	104%
Methylene Chloride	49.8	50.0	99.6%
Acetone	245.	250	98.0%
Carbon Disulfide	38.6	50.0	77.2%
1,1-Dichloroethene	50.3	50.0	101%
1,1-Dichloroethane	52.8	50.0	106%
trans-1,2-Dichloroethene	49.2	50.0	98.4%
cis-1,2-Dichloroethene	54.8	50.0	110%
Chloroform	53.9	50.0	108%
1,2-Dichloroethane	52.4	50.0	105%
2-Butanone	248.	250	99.2%
1,1,1-Trichloroethane	52.0	50.0	104%
Carbon Tetrachloride	52.5	50.0	105%
Vinyl Acetate	42.9	50.0	85.8%
Bromodichloromethane	51.6	50.0	103%
1,2-Dichloropropane	54.9	50.0	110%
cis-1,3-Dichloropropene	49.9	50.0	99.8%
Trichloroethene	51.2	50.0	102%
Dibromochloromethane	52.9	50.0	106%
1,1,2-Trichloroethane	53.8	50.0	108%
Benzene	52.4	50.0	105%
trans-1,3-Dichloropropene	49.7	50.0	99.4%
2-Chloroethylvinylether	50.5	50.0	101%
Bromoform	52.6	50.0	105%
4-Methyl-2-Pentanone (MIBK)	248.	250	99.2%
2-Hexanone	244.	250	97.6%
Tetrachloroethene	51.0	50.0	102%
1,1,2,2-Tetrachloroethane	51.1	50.0	102%
Toluene	52.8	50.0	106%
Chlorobenzene	51.6	50.0	103%
Ethylbenzene	51.5	50.0	103%
Styrene	52.4	50.0	105%
Trichlorofluoromethane	47.0	50.0	94.0%
1,1,2-Trichlorotrifluoroethane	38.8	50.0	77.6%
m,p-Xylene	105.	100	105%
O-Xylene	52.8	50.0	106%

Reported in ug/kg-dry-Wt

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CI62SB
LIMS ID: 00-19877
Matrix: Soil
Data Release Authorized:
Reported: 11/03/00
Date Analyzed: 10/27/00
Instrument: FINN5

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: NA

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
1,2-Dichlorobenzene	50.8	50.0	102%
1,3-Dichlorobenzene	51.2	50.0	102%
1,4-Dichlorobenzene	52.0	50.0	104%
Acrolein	293.	250	117%
Methyl Iodide	40.4	50.0	80.8%
Bromoethane	42.6	50.0	85.2%
Acrylonitrile	50.4	50.0	101%
1,1-Dichloropropene	52.6	50.0	105%
Dibromomethane	53.0	50.0	106%
1,1,1,2-Tetrachloroethane	51.9	50.0	104%
1,2-Dibromo-3-chloropropane	51.4	50.0	103%
1,2,3-Trichloropropane	50.6	50.0	101%
trans-1,4-Dichloro-2-butene	51.2	50.0	102%
1,3,5-Trimethylbenzene	51.0	50.0	102%
1,2,4-Trimethylbenzene	52.7	50.0	105%
Hexachlorobutadiene	51.7	50.0	103%
Ethylene Dibromide	51.8	50.0	104%
Bromochloromethane	53.5	50.0	107%
2,2-Dichloropropane	53.3	50.0	107%
1,3-Dichloropropane	52.2	50.0	104%
Isopropylbenzene	51.2	50.0	102%
n-Propylbenzene	50.7	50.0	101%
Bromobenzene	52.2	50.0	104%
2-Chlorotoluene	52.6	50.0	105%
4-Chlorotoluene	49.4	50.0	98.8%
tert-Butylbenzene	51.4	50.0	103%
sec-Butylbenzene	53.5	50.0	107%
4-Isopropyltoluene	51.7	50.0	103%
n-Butylbenzene	49.9	50.0	99.8%
1,2,4-Trichlorobenzene	51.4	50.0	103%
Naphthalene	53.1	50.0	106%
1,2,3-Trichlorobenzene	52.9	50.0	106%

Spike Blank Surrogate Recovery

d4-1,2-Dichloroethane	99.4%
d8-Toluene	100%
Bromofluorobenzene	100%
d4-1,2-Dichlorobenzene	98.8%

Reported in ug/kg-dry-Wt

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 103000MB
LIMS ID: 00-19875
Matrix: Soil
Data Release Authorized:
Reported: 11/03/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN5
Date Analyzed: 10/30/00 12:37

Sample Amount: 40 mg dry Wt Equiv
Percent Moisture: NA

CAS Number	Analyte	ug/kg
74-87-3	Chloromethane	120 U
74-83-9	Bromomethane	120 U
75-01-4	Vinyl Chloride	120 U
75-00-3	Chloroethane	120 U
75-09-2	Methylene Chloride	380 U
67-64-1	Acetone	620 U
75-15-0	Carbon Disulfide	120 U
75-35-4	1,1-Dichloroethene	120 U
75-34-3	1,1-Dichloroethane	120 U
156-60-5	trans-1,2-Dichloroethene	120 U
156-59-2	cis-1,2-Dichloroethene	120 U
67-66-3	Chloroform	120 U
107-06-2	1,2-Dichloroethane	120 U
78-93-3	2-Butanone	620 U
71-55-6	1,1,1-Trichloroethane	120 U
56-23-5	Carbon Tetrachloride	120 U
108-05-4	Vinyl Acetate	620 U
75-27-4	Bromodichloromethane	120 U
78-87-5	1,2-Dichloropropane	120 U
10061-01-5	cis-1,3-Dichloropropene	120 U
79-01-6	Trichloroethene	120 U
124-48-1	Dibromochloromethane	120 U
79-00-5	1,1,2-Trichloroethane	120 U
71-43-2	Benzene	120 U
10061-02-6	trans-1,3-Dichloropropene	120 U
110-75-8	2-Chloroethylvinylether	620 U
75-25-2	Bromoform	120 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	620 U
591-78-6	2-Hexanone	620 U
127-18-4	Tetrachloroethene	120 U
79-34-5	1,1,2,2-Tetrachloroethane	120 U
108-88-3	Toluene	120 U
108-90-7	Chlorobenzene	120 U
100-41-4	Ethylbenzene	120 U
100-42-5	Styrene	120 U
75-69-4	Trichlorofluoromethane	120 U
76-13-1	1,1,2-Trichlorotrifluoroethane	120 U
1330-20-7	m,p-Xylene	120 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 103000MB
LIMS ID: 00-19875
Matrix: Soil
Data Release Authorized:
Reported: 11/03/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN5
Date Analyzed: 10/30/00 12:37

Sample Amount: 40 mg dry Wt Equiv
Percent Moisture: NA

CAS Number	Analyte	ug/kg
95-47-6	o-Xylene	120 U
95-50-1	1,2-Dichlorobenzene	120 U
541-73-1	1,3-Dichlorobenzene	120 U
106-46-7	1,4-Dichlorobenzene	120 U
107-02-8	Acrolein	6,200 U
74-88-4	Methyl Iodide	120 U
74-96-4	Bromoethane	250 U
107-13-1	Acrylonitrile	620 U
563-58-6	1,1-Dichloropropene	120 U
74-95-3	Dibromomethane	120 U
630-20-6	1,1,1,2-Tetrachloroethane	120 U
96-12-8	1,2-Dibromo-3-chloropropane	620 U
96-18-4	1,2,3-Trichloropropane	250 U
110-57-6	trans-1,4-Dichloro-2-butene	620 U
108-67-8	1,3,5-Trimethylbenzene	120 U
95-63-6	1,2,4-Trimethylbenzene	120 U
87-68-3	Hexachlorobutadiene	620 U
106-93-4	Ethylene Dibromide	120 U
74-97-5	Bromochloromethane	120 U
594-20-7	2,2-Dichloropropane	120 U
142-28-9	1,3-Dichloropropane	120 U
98-82-8	Isopropylbenzene	120 U
103-65-1	n-Propylbenzene	120 U
108-86-1	Bromobenzene	120 U
95-49-8	2-Chlorotoluene	120 U
106-43-4	4-Chlorotoluene	120 U
98-06-6	tert-Butylbenzene	120 U
135-98-8	sec-Butylbenzene	120 U
99-87-6	4-Isopropyltoluene	120 U
104-51-8	n-Butylbenzene	250 U
120-82-1	1,2,4-Trichlorobenzene	620 U
91-20-3	Naphthalene	620 U
87-61-6	1,2,3-Trichlorobenzene	620 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	131%
d8-Toluene	112%
Bromofluorobenzene	112%
d4-1,2-Dichlorobenzene	101%

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CI62SB
LIMS ID: 00-19875
Matrix: Soil
Data Release Authorized:
Reported: 11/03/00
Date Analyzed: 10/30/00
Instrument: FINN5

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: NA

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
Chloromethane	7980	6250	128%
Bromomethane	8250	6250	132%
Vinyl Chloride	8800	6250	141%
Chloroethane	8580	6250	137%
Methylene Chloride	6240	6250	99.8%
Acetone	31200	31200	99.8%
Carbon Disulfide	4660	6250	74.6%
1,1-Dichloroethene	5940	6250	95.0%
1,1-Dichloroethane	6720	6250	108%
trans-1,2-Dichloroethene	5950	6250	95.2%
cis-1,2-Dichloroethene	6480	6250	104%
Chloroform	6940	6250	111%
1,2-Dichloroethane	6950	6250	111%
2-Butanone	33400	31200	107%
1,1,1-Trichloroethane	6950	6250	111%
Carbon Tetrachloride	6480	6250	104%
Vinyl Acetate	5410	6250	86.6%
Bromodichloromethane	6680	6250	107%
1,2-Dichloropropane	7150	6250	114%
cis-1,3-Dichloropropene	6700	6250	107%
Trichloroethene	6510	6250	104%
Dibromochloromethane	6180	6250	98.9%
1,1,2-Trichloroethane	6820	6250	109%
Benzene	6500	6250	104%
trans-1,3-Dichloropropene	6460	6250	103%
2-Chloroethylvinylether	6590	6250	105%
Bromoform	5950	6250	95.2%
4-Methyl-2-Pentanone (MIBK)	33900	31200	108%
2-Hexanone	31900	31200	102%
Tetrachloroethene	6080	6250	97.3%
1,1,2,2-Tetrachloroethane	6050	6250	96.8%
Toluene	6810	6250	109%
Chlorobenzene	6100	6250	97.6%
Ethylbenzene	6240	6250	99.8%
Styrene	6150	6250	98.4%
Trichlorofluoromethane	5780	6250	92.5%
1,1,2-Trichlorotrifluoroethane	4810	6250	77.0%
m,p-Xylene	12600	12500	101%
O-Xylene	6150	6250	98.4%

Reported in ug/kg-dry-Wt

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CI62SB
LIMS ID: 00-19875
Matrix: Soil
Data Release Authorized:
Reported: 11/03/00
Date Analyzed: 10/30/00
Instrument: FINN5

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: NA

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
1,2-Dichlorobenzene	6160	6250	98.6%
1,3-Dichlorobenzene	6060	6250	97.0%
1,4-Dichlorobenzene	6160	6250	98.6%
Acrolein	37800	31200	121%
Methyl Iodide	4700	6250	75.2%
Bromoethane	4840	6250	77.4%
Acrylonitrile	6190	6250	99.0%
1,1-Dichloropropene	6610	6250	106%
Dibromomethane	6910	6250	111%
1,1,1,2-Tetrachloroethane	5990	6250	95.8%
1,2-Dibromo-3-chloropropane	6060	6250	97.0%
1,2,3-Trichloropropane	5900	6250	94.4%
trans-1,4-Dichloro-2-butene	6590	6250	105%
1,3,5-Trimethylbenzene	6460	6250	103%
1,2,4-Trimethylbenzene	6510	6250	104%
Hexachlorobutadiene	6940	6250	111%
Ethylene Dibromide	6790	6250	109%
Bromochloromethane	6310	6250	101%
2,2-Dichloropropane	6900	6250	110%
1,3-Dichloropropane	6250	6250	100%
Isopropylbenzene	6140	6250	98.2%
n-Propylbenzene	6340	6250	101%
Bromobenzene	6210	6250	99.4%
2-Chlorotoluene	5850	6250	93.6%
4-Chlorotoluene	7000	6250	112%
tert-Butylbenzene	6320	6250	101%
sec-Butylbenzene	6700	6250	107%
4-Isopropyltoluene	6280	6250	100%
n-Butylbenzene	6580	6250	105%
1,2,4-Trichlorobenzene	6900	6250	110%
Naphthalene	7040	6250	113%
1,2,3-Trichlorobenzene	6990	6250	112%

Spike Blank Surrogate Recovery	
d4-1,2-Dichloroethane	117%
d8-Toluene	109%
Bromofluorobenzene	104%
d4-1,2-Dichlorobenzene	101%

Reported in ug/kg-dry-Wt

ANALYTICAL RESOURCES INCORPORATED

SOIL AROCLOR SURROGATE SUMMARY

Matrix: Soil

QC Report No: CI62
Project: Tacoma Metals
996098.00

LIMS ID	Lab ID	Client ID	TCMX	#	DCBP	#	TOT OUT
00-19862MB	102500MB	Method Blank	82.8%		84.0%		0
00-19862SB	102500SB	Lab Control	85.5%		86.5%		0
00-19862	CI62A	TP-41-0-1	85.0%		75.5%		0
00-19863MB	102400MB	Method Blank	127%	*	123%		1
00-19863SB	102400SB	Lab Control	131%	*	126%		1
00-19863	CI62B	TP-43-0-1	104%		130%	*	1
00-19864	CI62C	TP-43-2-3	104%		NR	*	1
00-19865	CI62D	TP-45-0-1	114%	*	117%		1
00-19866	CI62E	TP-430-0-1	114%	*	126%		1
00-19867	CI62F	TP-47-0-1	85.8%		81.0%		0
00-19868	CI62G	TP-49-0-1	71.5%		67.2%		0
00-19879MB	103000MB	Method Blank	89.5%		81.5%		0
00-19879SB	103000SB	Lab Control	92.2%		86.8%		0
00-19879	CI62R	TP-49-6-10	44.5%	*	54.2%		1

	QC LIMITS
(TCMX) = Tetrachloro-m-xylene	(53-109)
(DCBP) = Decachlorobiphenyl	(54-127)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D Surrogate Compound diluted out

FORM-II PCB

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-41-0-1

Lab Sample ID: CI62A
LIMS ID: 00-19862
Matrix: Soil

Data Release Authorized:
Reported: 11/02/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/16/00
Date Received: 10/18/00

Date extracted: 10/25/00
Date analyzed: 10/27/00 08:27
Instrument ID: ECD1
Sample Amount: 11.4 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.6

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 4.8 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	35 U
53469-21-9	Aroclor 1242	35 U
12672-29-6	Aroclor 1248	35 U
11097-69-1	**Aroclor 1254**	**49**
11096-82-5	**Aroclor 1260**	**21 J**
11104-28-2	Aroclor 1221	70 U
11141-16-5	Aroclor 1232	35 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	75.5%
Tetrachlorometaxylene	85.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-43-0-1

Lab Sample ID: CI62B
LIMS ID: 00-19863
Matrix: Soil

Data Release Authorized: CP
Reported: 11/02/00 11/2/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/16/00
Date Received: 10/18/00

Date extracted: 10/24/00
Date analyzed: 11/02/00 04:02
Instrument ID: ECD1
Sample Amount: 4.20 g-dry-wt
Final Ext Vol: 20 mL
pH: 7.0

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 16.9%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	480 U
53469-21-9	Aroclor 1242	480 U
12672-29-6	Aroclor 1248	2,600 Y
11097-69-1	**Aroclor 1254**	**14,000**
11096-82-5	**Aroclor 1260**	**6,800**
11104-28-2	Aroclor 1221	950 U
11141-16-5	Aroclor 1232	480 U
11100-14-4	Aroclor 1268	480 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	130%
Tetrachlorometaxylene	104%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-43-2-3

Lab Sample ID: CI62C
LIMS ID: 00-19864
Matrix: Soil

Data Release Authorized: CK
Reported: 11/02/00 11/14

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/16/00
Date Received: 10/18/00

Date extracted: 10/24/00
Date analyzed: 11/02/00 04:31
Instrument ID: ECD1
Sample Amount: 4.29 g-dry-wt
Final Ext Vol: 20 mL
pH: 7.2

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 14.7%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	470 U
53469-21-9	Aroclor 1242	470 U
12672-29-6	Aroclor 1248	1,900 Y
11097-69-1	**Aroclor 1254**	**8,100**
11096-82-5	**Aroclor 1260**	**8,600**
11104-28-2	Aroclor 1221	930 U
11141-16-5	Aroclor 1232	470 U
11100-14-4	**Aroclor 1268**	**10,000**

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	NR
Tetrachlorometaxylene	104%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-45-0-1

Lab Sample ID: CI62D
LIMS ID: 00-19865
Matrix: Soil

Data Release Authorized:
Reported: 11/02/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/16/00
Date Received: 10/18/00

Date extracted: 10/24/00
Date analyzed: 11/02/00 04:59
Instrument ID: ECD1
Sample Amount: 4.34 g-dry-wt
Final Ext Vol: 20 mL
pH: 7.6

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 13.1%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	460 U
53469-21-9	Aroclor 1242	460 U
12672-29-6	Aroclor 1248	1,900 Y
11097-69-1	**Aroclor 1254**	**12,000**
11096-82-5	**Aroclor 1260**	**9,500**
11104-28-2	Aroclor 1221	920 U
11141-16-5	Aroclor 1232	460 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	117%
Tetrachlorometaxylene	114%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-430-0-1

Lab Sample ID: CI62E
LIMS ID: 00-19866
Matrix: Soil

Data Release Authorized: CH
Reported: 11/02/00 u/H/n

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/16/00
Date Received: 10/18/00

Date extracted: 10/24/00
Date analyzed: 11/02/00 05:27
Instrument ID: ECD1
Sample Amount: 4.34 g-dry-wt
Final Ext Vol: 20 mL
pH: 7.3

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 14.1%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	460 U
53469-21-9	Aroclor 1242	460 U
12672-29-6	Aroclor 1248	2,200 Y
11097-69-1	**Aroclor 1254**	**11,000**
11096-82-5	**Aroclor 1260**	**5,800**
11104-28-2	Aroclor 1221	920 U
11141-16-5	Aroclor 1232	460 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	126%
Tetrachlorometaxylene	114%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-47-0-1

Lab Sample ID: CI62F
LIMS ID: 00-19867
Matrix: Soil

Data Release Authorized:
Reported: 11/02/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/16/00
Date Received: 10/18/00

Date extracted: 10/25/00
Date analyzed: 10/27/00 08:55
Instrument ID: ECD1
Sample Amount: 10.7 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.5

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 10.7%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	37 U
53469-21-9	Aroclor 1242	37 U
12672-29-6	Aroclor 1248	37 U
11097-69-1	Aroclor 1254	37 U
11096-82-5	Aroclor 1260	37 U
11104-28-2	Aroclor 1221	75 U
11141-16-5	Aroclor 1232	37 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	81.0%
Tetrachlorometaxylene	85.8%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-49-0-1

Lab Sample ID: CI62G
LIMS ID: 00-19868
Matrix: Soil

Data Release Authorized:
Reported: 11/02/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/16/00
Date Received: 10/18/00

Date extracted: 10/25/00
Date analyzed: 10/27/00 09:23
Instrument ID: ECD1
Sample Amount: 11.3 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.3

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 5.7 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	35 U
53469-21-9	Aroclor 1242	35 U
12672-29-6	Aroclor 1248	35 U
11097-69-1	**Aroclor 1254**	**190**
11096-82-5	**Aroclor 1260**	**130**
11104-28-2	Aroclor 1221	70 U
11141-16-5	Aroclor 1232	35 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	67.2%
Tetrachlorometaxylene	71.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-49-6-10

Lab Sample ID: CI62R
LIMS ID: 00-19879
Matrix: Soil

Data Release Authorized:
Reported: 11/02/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Date extracted: 10/30/00
Date analyzed: 11/02/00 09:12
Instrument ID: ECD1
Sample Amount: 5.69 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 6.7

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 52.6%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	70 U
53469-21-9	Aroclor 1242	70 U
12672-29-6	Aroclor 1248	70 U
11097-69-1	Aroclor 1254	100 Y
11096-82-5	Aroclor 1260	70 U
11104-28-2	Aroclor 1221	140 U
11141-16-5	Aroclor 1232	70 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	54.2%
Tetrachlorometaxylene	44.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: Method Blank

Lab Sample ID: CI62MB
LIMS ID: 00-19862
Matrix: Soil

Data Release Authorized: CK 11/2/00
Reported: 11/02/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Date extracted: 10/25/00
Date analyzed: 10/26/00 18:49
Instrument ID: ECD1
Sample Amount: 12.0 g-dry-wt
Final Ext Vol: 4.0 mL
pH: NA

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: NA

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	33 U
53469-21-9	Aroclor 1242	33 U
12672-29-6	Aroclor 1248	33 U
11097-69-1	Aroclor 1254	33 U
11096-82-5	Aroclor 1260	33 U
11104-28-2	Aroclor 1221	67 U
11141-16-5	Aroclor 1232	33 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	84.0%
Tetrachlorometaxylene	82.8%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Lab Sample ID: CI62
LIMS ID: 00-19862
Matrix: Soil

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized: clr
Reported: 11/02/00 clr

LABORATORY CONTROL SAMPLE SPIKE RECOVERY
Date extracted: 10/25/00

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	309	333	92.7%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	86.5%
Tetrachlorometaxylene	85.5%

Values Reported in Total ug/kg Dry Weight

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: Method Blank

Lab Sample ID: CI62MB
LIMS ID: 00-19863
Matrix: Soil

Data Release Authorized: (/f
Reported: 11/02/00 4/2/

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Date extracted: 10/24/00
Date analyzed: 11/02/00 02:38
Instrument ID: ECD1
Sample Amount: 5.00 g-dry-wt
Final Ext Vol: 20 mL
pH: NA

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: NA

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	400 U
53469-21-9	Aroclor 1242	400 U
12672-29-6	Aroclor 1248	400 U
11097-69-1	Aroclor 1254	400 U
11096-82-5	Aroclor 1260	400 U
11104-28-2	Aroclor 1221	800 U
11141-16-5	Aroclor 1232	400 U
11100-14-4	Aroclor 1268	400 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	123%
Tetrachlorometaxylene	127%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Lab Sample ID: CI62
LIMS ID: 00-19863
Matrix: Soil

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized: CM
Reported: 11/02/00 [illegible]

LABORATORY CONTROL SAMPLE SPIKE RECOVERY
Date extracted: 10/24/00

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	4240	4000	106%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	126%
Tetrachlorometaxylene	131%

Values Reported in Total ug/kg Dry Weight

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: Method Blank

Lab Sample ID: CI62MB
LIMS ID: 00-19879
Matrix: Soil

Data Release Authorized:
Reported: 11/02/00

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Date extracted: 10/30/00
Date analyzed: 11/01/00 20:59
Instrument ID: ECD1
Sample Amount: 12.0 g-dry-wt
Final Ext Vol: 4.0 mL
pH: NA

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: NA

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	33 U
53469-21-9	Aroclor 1242	33 U
12672-29-6	Aroclor 1248	33 U
11097-69-1	Aroclor 1254	33 U
11096-82-5	Aroclor 1260	33 U
11104-28-2	Aroclor 1221	67 U
11141-16-5	Aroclor 1232	33 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	81.5%
Tetrachlorometaxylene	89.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Lab Sample ID: CI62
LIMS ID: 00-19879
Matrix: Soil

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized: CLF
Reported: 11/02/00 [illegible]

LABORATORY CONTROL SAMPLE SPIKE RECOVERY
Date extracted: 10/30/00

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	295	333	88.5%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	86.8%
Tetrachlorometaxylene	92.2%

Values Reported in Total ug/kg Dry Weight

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL HYDROCARBONS COMPOUND SUMMARY

Matrix: Soil

QC Report No: CI62

LIMS ID	Lab ID	Extracted	Client ID	MeArach	TOT OUT
00-19862MB	103000MB	10/26/00	Method Blank	103%	0
00-19862LC	103000LC	10/26/00	Lab Control	85%	0
00-19862	CI62A	10/26/00	TP-41-0-1	84%	0
00-19863	CI62B	10/26/00	TP-43-0-1	D	0
00-19864	CI62C	10/26/00	TP-43-2-3	D	0
00-19864	CI62C-DP	10/26/00	TP-43-2-3-DP	D	0
00-19865	CI62D	10/26/00	TP-45-0-1	D	0
00-19865	CI62D-MS	10/26/00	TP-45-0-1	D	0
00-19865	CI62D-MSD	10/26/00	TP-45-0-1	D	0
00-19866	CI62E	10/26/00	TP-430-0-1	D	0
00-19867	CI62F	10/26/00	TP-47-0-1	64%	0
00-19868	CI62G	10/26/00	TP-49-0-1	D	0
00-19869	CI62H	10/26/00	TP-42-0-1	57%	0
00-19870	CI62I	10/26/00	TP-46-0-1	48%	0
00-19871	CI62J	10/26/00	TP-46-4-6	80%	0
00-19872	CI62K	10/26/00	TP-48-0-1	66%	0
00-19873	CI62L	10/26/00	TP-48-6-8.5	71%	0
00-19874	CI62M	10/26/00	TP-49-2-3	53%	0
00-19875	CI62N	10/26/00	TP-49-4-6	D	0
00-19876	CI62O	10/26/00	TP-50-0-1	48%	0
00-19877	CI62P	10/26/00	TP-50-2-3	48%	0
00-19878	CI62Q	10/26/00	TP-500-0-1	44%	0
00-19879	CI62R	10/26/00	TP-49-6-10	D	0

	Control QC LIMITS	Sample QC LIMITS
(MeArach) = Methylarachidate	(56-114)	(42-113)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D System Monitoring Compound diluted out

FORM-II TPHD

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID
and Motor Oil

LIMS ID: 00-19862
Matrix: Soil

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized: CR 11/1/00
Reported: 11/01/00

Date Received: 10/18/00

Lab ID	Sample ID	Date Extracted	Date Analyzed	Dilution Factor	Diesel Range	*HC ID	Motor Oil Range	Surrogate Recovery
CI62MB	Method Blank	10/26/00	10/30/00	1:1	5.0 U	---	10 U	103%
CI62A	**TP-41-0-1**	10/26/00	10/30/00	1:1	5.2 U	NO	**16**	84.0%
CI62B	**TP-43-0-1**	10/26/00	10/30/00	1:20	**1,000**	NO	**2,500**	D
CI62C	**TP-43-2-3**	10/26/00	10/30/00	1:20	**1,500**	NO	**3,400**	D
CI62CD	**TP-43-2-3-DUPL**	10/26/00	10/30/00	1:20	**1,500**	NO	**3,400**	D
CI62D	**TP-45-0-1**	10/26/00	10/30/00	1:20	**450**	NO	**1,100**	D
CI62E	**TP-430-0-1**	10/26/00	10/30/00	1:20	**1,000**	NO	**2,800**	D
CI62F	**TP-47-0-1**	10/26/00	10/30/00	1:1	**6.2**	NO	11 U	64.0%
CI62G	**TP-49-0-1**	10/26/00	10/30/00	1:20	**220**	NO	**1,500**	D
CI62H	**TP-42-0-1**	10/26/00	10/30/00	1:1	**42**	NO	**130**	57.0%
CI62I	**TP-46-0-1**	10/26/00	10/30/00	1:4	**140**	NO	**450**	48.0%
CI62J	**TP-46-4-6**	10/26/00	10/31/00	1:10	**1,000**	NO	**2,700**	80.0%

Values reported in ppm (mg/kg) on a dry weight basis.

Surrogate is Methyl-Arachidate.

* ID indicates, in the opinion of the analyst, the petroleum product with the best pattern match. 'NO' indicates that there was not a good match for any of the requested products.
Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.

Data Qualifiers

U	Compound not detected at the given detection limit.
J	Indicates an estimated value below the calculated detection limit.
S	No value reported due to saturation of the detector. Dilution required
D	Indicates the surrogate was not detected because of dilution of the extract.
E	Indicates a value above the linear range of the detector. Dilution required.
NR	Indicates no recovery due to matrix interference.
B	Indicates compound also detected in the method blank.

FORM-1 TPHD

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID
and Motor Oil

LIMS ID: 00-19872
Matrix: Soil

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 11/01/00

Date Received: 10/18/00

Lab ID	Sample ID	Date Extracted	Date Analyzed	Dilution Factor	Diesel Range	*HC ID	Motor Oil Range	Surrogate Recovery
CI62K	**TP-48-0-1**	10/26/00	10/30/00	1:2	**130**	NO	**290**	66.0%
CI62L	**TP-48-6-8.5**	10/26/00	10/30/00	1:1	**630**	NO	**870**	71.0%
CI62M	**TP-49-2-3**	10/26/00	10/30/00	1:1	**29**	NO	**50**	53.0%
CI62N	**TP-49-4-6**	10/26/00	10/31/00	1:50	**11,000**	NO	**4,000**	D
CI62O	**TP-50-0-1**	10/26/00	10/30/00	1:4	**90**	NO	**190**	48.0%
CI62P	**TP-50-2-3**	10/26/00	10/30/00	1:1	**39**	NO	**54**	48.0%
CI62Q	**TP-500-0-1**	10/26/00	10/30/00	1:4	**110**	NO	**230**	44.0%
CI62R	**TP-49-6-10**	10/26/00	10/31/00	1:20	**14,000**	NO	**2,900**	D

Values reported in ppm (mg/kg) on a dry weight basis.

Surrogate is Methyl-Arachidate.

* ID indicates, in the opinion of the analyst, the petroleum product with the best pattern match. 'NO' indicates that there was not a good match for any of the requested products.
Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.

Data Qualifiers

U Compound not detected at the given detection limit.
J Indicates an estimated value below the calculated detection limit.
S No value reported due to saturation of the detector. Dilution required.
D Indicates the surrogate was not detected because of dilution of the extract.
E Indicates a value above the linear range of the detector. Dilution required.
NR Indicates no recovery due to matrix interference.
B Indicates compound also detected in the method blank.

FORM-1 TPHD

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CI62SB
LIMS ID: 00-19862
Matrix: Soil

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 11/01/00 CR 11/1/00

LABORATORY CONTROL SAMPLE RECOVERY REPORT
Date extracted: 10/26/00
Date analyzed: 10/30/00

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
Diesel Range Hydrocarbons	91.2	100	91.2%

TPHd Surrogate Recovery

Methylarachidate 85.0%

Values reported in ppm (mg/kg) on a dry weight basis.

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-45-0-1
Lab Sample ID: CI62D
QC Report No: CI62-Kennedy Jenks Consultants
LIMS ID: 00-19865
Project: Tacoma Metals
Matrix: Soil
996098.00
Date Received: 10/18/00

Data Release Authorized:
Reported: 11/01/00 CR 11/1/00

MATRIX SPIKE/SPIKE DUPLICATE RECOVERY

Date extracted: 10/26/00
Date analyzed: 10/30/00

CONSTITUENT	SAMPLE VALUE	SPIKE VALUE	SPIKE ADDED	% RECOVERY	RPD
MATRIX SPIKE					
Diesel Range Hydrocarbons	446	585	115	121%	
MATRIX SPIKE DUPLICATE					
Diesel Range Hydrocarbons	446	660	115	186%	42.4%

TPHd Surrogate Recovery

Matrix Spike	Methylarachidate	D
Matrix Spike Dup	Methylarachidate	D

Values reported in ppm (mg/kg) on a dry weight basis

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-41-0-1**
TOTAL METALS

Lab Sample ID: CI62A
LIMS ID: 00-19862
Matrix: Soil

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/16/00
Date Received: 10/18/00

Data Release Authorized:
Reported: 11/22/00

Percent Total Solids: 81.7%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/31/00	6010	11/17/00	7440-38-2	Arsenic	30	30 U
3050	10/31/00	6010	11/17/00	7440-39-3	Barium	2	38
3050	10/31/00	6010	11/17/00	7440-43-9	Cadmium	1	1 U
3050	10/31/00	6010	11/17/00	7440-47-3	Chromium	3	39
3050	10/31/00	6010	11/17/00	7440-50-8	Copper	1	20
3050	10/31/00	6010	11/17/00	7439-92-1	Lead	10	20
CLP	10/30/00	7471	10/31/00	7439-97-6	Mercury	0.5	5.5
3050	10/31/00	6010	11/17/00	7782-49-2	Selenium	30	30 U
3050	10/31/00	6010	11/17/00	7440-22-4	Silver	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET
TOTAL METALS

Sample No: TP-41-0-1
QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 10/18/00

Lab Sample ID: CI62A
LIMS ID: 00-19862
Matrix: Soil

Data Release Authorized:
Reported: 11/22/00

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample mg/kg-dry	Duplicate mg/kg-dry	RPD	Control Limit	Q
Arsenic	6010	30 U	30 U	0.0%	+/- 30	L
Barium	6010	38	44	14.6%	+/- 20 %	
Cadmium	6010	1 U	1 U	0.0%	+/- 1	L
Chromium	6010	39	34	13.7%	+/- 20 %	
Copper	6010	20	24	18.2%	+/- 20 %	
Lead	6010	20	20	0.0%	+/- 10	L
Mercury	7471	5.5	9.2	50.3%	+/- 20 %	*
Selenium	6010	30 U	30 U	0.0%	+/- 30	L
Silver	6010	2 U	2 U	0.0%	+/- 2	L

'Q' codes: * = control limit not met
L = RPD not valid, alternate limit = detection limit

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-41-0-1
QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 10/18/00

Lab Sample ID: CI62A
LIMS ID: 00-19862
Matrix: Soil

Data Release Authorized:
Reported: 11/22/00

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample mg/kg-dry	Spike mg/kg-dry	Spike Added	% Recovery	Q
Arsenic	6010	30 U	250	240	104%	
Barium	6010	38	274	242	97.5%	
Cadmium	6010	1 U	63	60	105%	
Chromium	6010	39	89	60	83.3%	
Copper	6010	20	75	60	91.7%	
Lead	6010	20	260	240	100%	
Mercury	7471	5.5	8.2	5.3	50.9%	N
Selenium	6010	30 U	250	240	104%	
Silver	6010	2 U	58	60	96.7%	

'Q' codes:
N = control limit not met
H = %R not applicable, sample concentration too high
* = RPD control limit not met
NA = Not applicable - analyte not spiked

Control Limits: Percent Recovery: 75-125%
RPD: +/-20%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-43-0-1**
TOTAL METALS

Lab Sample ID: CI62B
LIMS ID: 00-19863
Matrix: Soil

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/16/00
Date Received: 10/18/00

Data Release Authorized:
Reported: 11/22/00

Percent Total Solids: 82.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/31/00	6010	11/17/00	7440-38-2	Arsenic	30	90
3050	10/31/00	6010	11/17/00	7440-39-3	Barium	2	1,620
3050	10/31/00	6010	11/17/00	7440-43-9	Cadmium	1	53
3050	10/31/00	6010	11/17/00	7440-47-3	Chromium	3	564
3050	10/31/00	6010	11/17/00	7440-50-8	Copper	1	5,620
3050	10/31/00	6010	11/17/00	7439-92-1	Lead	10	5,840
CLP	10/30/00	7471	10/31/00	7439-97-6	Mercury	6	47
3050	10/31/00	6010	11/17/00	7782-49-2	Selenium	30	30 U
3050	10/31/00	6010	11/17/00	7440-22-4	Silver	2	5

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-43-2-3**
TOTAL METALS

Lab Sample ID: CI62C
LIMS ID: 00-19864
Matrix: Soil

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/16/00
Date Received: 10/18/00

Data Release Authorized
Reported: 11/22/00

Percent Total Solids: 83.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/31/00	6010	11/17/00	7440-38-2	Arsenic	30	80
3050	10/31/00	6010	11/17/00	7440-39-3	Barium	2	1,280
3050	10/31/00	6010	11/17/00	7440-43-9	Cadmium	1	46
3050	10/31/00	6010	11/17/00	7440-47-3	Chromium	3	259
3050	10/31/00	6010	11/17/00	7440-50-8	Copper	1	2,520
3050	10/31/00	6010	11/17/00	7439-92-1	Lead	10	12,300
CLP	10/30/00	7471	10/31/00	7439-97-6	Mercury	3	21
3050	10/31/00	6010	11/17/00	7782-49-2	Selenium	30	30 U
3050	10/31/00	6010	11/17/00	7440-22-4	Silver	2	5

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-45-0-1**
TOTAL METALS

Lab Sample ID: CI62D
LIMS ID: 00-19865
Matrix: Soil

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/16/00
Date Received: 10/18/00

Data Release Authorized:
Reported: 11/22/00

Percent Total Solids: 85.7%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/31/00	6010	11/17/00	7440-38-2	Arsenic	30	100
3050	10/31/00	6010	11/17/00	7440-39-3	Barium	2	774
3050	10/31/00	6010	11/17/00	7440-43-9	Cadmium	1	30
3050	10/31/00	6010	11/17/00	7440-47-3	Chromium	3	368
3050	10/31/00	6010	11/17/00	7440-50-8	Copper	1	3,560
3050	10/31/00	6010	11/17/00	7439-92-1	Lead	10	4,060
CLP	10/30/00	7471	10/31/00	7439-97-6	Mercury	2	47
3050	10/31/00	6010	11/17/00	7782-49-2	Selenium	30	30
3050	10/31/00	6010	11/17/00	7440-22-4	Silver	2	7

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-430-0-1**
TOTAL METALS

Lab Sample ID: CI62E
LIMS ID: 00-19866
Matrix: Soil

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/16/00
Date Received: 10/18/00

Data Release Authorized:
Reported: 11/22/00

Percent Total Solids: 81.1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/31/00	6010	11/17/00	7440-38-2	Arsenic	30	80
3050	10/31/00	6010	11/17/00	7440-39-3	Barium	2	1,400
3050	10/31/00	6010	11/17/00	7440-43-9	Cadmium	1	54
3050	10/31/00	6010	11/17/00	7440-47-3	Chromium	3	566
3050	10/31/00	6010	11/17/00	7440-50-8	Copper	1	5,000
3050	10/31/00	6010	11/17/00	7439-92-1	Lead	10	9,370
CLP	10/30/00	7471	10/31/00	7439-97-6	Mercury	3	41
3050	10/31/00	6010	11/17/00	7782-49-2	Selenium	30	30 U
3050	10/31/00	6010	11/17/00	7440-22-4	Silver	2	6

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-47-0-1**
TOTAL METALS

Lab Sample ID: CI62F
LIMS ID: 00-19867
Matrix: Soil

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/16/00
Date Received: 10/18/00

Data Release Authorized by
Reported: 11/22/00

Percent Total Solids: 89.1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/31/00	6010	11/20/00	7440-38-2	Arsenic	30	30 U
3050	10/31/00	6010	11/20/00	**7440-39-3**	**Barium**	2	**33**
3050	10/31/00	6010	11/20/00	7440-43-9	Cadmium	1	1 U
3050	10/31/00	6010	11/20/00	**7440-47-3**	**Chromium**	3	**25**
3050	10/31/00	6010	11/20/00	**7440-50-8**	**Copper**	1	**13**
3050	10/31/00	6010	11/20/00	7439-92 1	Lead	10	10 U
CLP	10/30/00	7471	10/31/00	7439-97-6	Mercury	0.05	0.05 U
3050	10/31/00	6010	11/20/00	7782-49-2	Selenium	30	30 U
3050	10/31/00	6010	11/20/00	7440-22-4	Silver	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: TP-49-0-1

Lab Sample ID: CI62G
LIMS ID: 00-19868
Matrix: Soil

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/16/00
Date Received: 10/18/00

Data Release Authorized
Reported: 11/22/00

Percent Total Solids: 93.5%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/31/00	6010	11/17/00	7440-38-2	Arsenic	30	30 U
3050	10/31/00	6010	11/17/00	7440-39-3	Barium	2	71
3050	10/31/00	6010	11/17/00	7440-43-9	Cadmium	1	1
3050	10/31/00	6010	11/17/00	7440-47-3	Chromium	3	33
3050	10/31/00	6010	11/17/00	7440-50-8	Copper	1	78
3050	10/31/00	6010	11/17/00	7439-92-1	Lead	10	150
CLP	10/30/00	7471	10/31/00	7439-97-6	Mercury	0.05	0.13
3050	10/31/00	6010	11/17/00	7782-49-2	Selenium	30	30 U
3050	10/31/00	6010	11/17/00	7440-22-4	Silver	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-42-0-1**
TOTAL METALS

Lab Sample ID: CI62H
LIMS ID: 00-19869
Matrix: Soil

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/16/00
Date Received: 10/18/00

Data Release Authorized:
Reported: 11/22/00

Percent Total Solids: 93.1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/31/00	6010	11/17/00	7440-38-2	Arsenic	30	30 U
3050	10/31/00	6010	11/17/00	7440-39-3	Barium	2	78
3050	10/31/00	6010	11/17/00	7440-43-9	Cadmium	1	2
3050	10/31/00	6010	11/17/00	7440-47-3	Chromium	3	31
3050	10/31/00	6010	11/17/00	7440-50-8	Copper	1	98
3050	10/31/00	6010	11/17/00	7439-92-1	Lead	10	130
CLP	10/30/00	7471	10/31/00	7439-97-6	Mercury	0.05	4.33
3050	10/31/00	6010	11/17/00	7782-49-2	Selenium	30	30 U
3050	10/31/00	6010	11/17/00	7440-22-4	Silver	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: TP-46-0-1

Lab Sample ID: CI62I
LIMS ID: 00-19870
Matrix: Soil

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996096.00
Date Sampled: 10/16/00
Date Received: 10/18/00

Data Release Authorized
Reported: 11/22/00

Percent Total Solids: 89.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/31/00	6010	11/17/00	7440-38-2	Arsenic	30	40
3050	10/31/00	6010	11/17/00	7440-39-3	Barium	2	302
3050	10/31/00	6010	11/17/00	7440-43-9	Cadmium	1	15
3050	10/31/00	6010	11/17/00	7440-47-3	Chromium	3	721
3050	10/31/00	6010	11/17/00	7440-50-8	Copper	1	1,820
3050	10/31/00	6010	11/17/00	7439-92-1	Lead	10	2,100
CLP	10/30/00	7471	10/31/00	7439-97-6	Mercury	0.5	10.6
3050	10/31/00	6010	11/17/00	7782-49-2	Selenium	30	30 U
3050	10/31/00	6010	11/17/00	7440-22-4	Silver	2	69

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-46-4-6**
TOTAL METALS

Lab Sample ID: CI62J
LIMS ID: 00-19871
Matrix: Soil

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/16/00
Date Received: 10/18/00

Data Release Authorized:
Reported: 11/22/00

Percent Total Solids: 83.5%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/31/00	6010	11/17/00	7440-38-2	Arsenic	30	50
3050	10/31/00	6010	11/17/00	7440-39-3	Barium	2	1,910
3050	10/31/00	6010	11/17/00	7440-43-9	Cadmium	1	93
3050	10/31/00	6010	11/17/00	7440-47-3	Chromium	3	93
3050	10/31/00	6010	11/17/00	7440-50-8	Copper	1	1,180
3050	10/31/00	6010	11/17/00	7439-92-1	Lead	10	4,320
CLP	10/30/00	7471	10/31/00	7439-97-6	Mercury	0.06	0.83
3050	10/31/00	6010	11/17/00	7782-49-2	Selenium	30	30 U
3050	10/31/00	6010	11/17/00	7440-22-4	Silver	2	2

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-48-0-1**
TOTAL METALS

Lab Sample ID: CI62K
LIMS ID: 00-19872
Matrix: Soil

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Data Release Authorized:
Reported: 11/22/00

Percent Total Solids: 91.7%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/31/00	6010	11/17/00	7440-38-2	Arsenic	30	40
3050	10/31/00	6010	11/17/00	7440-39-3	Barium	2	232
3050	10/31/00	6010	11/17/00	7440-43-9	Cadmium	1	8
3050	10/31/00	6010	11/17/00	7440-47-3	Chromium	3	52
3050	10/31/00	6010	11/17/00	7440-50-8	Copper	1	588
3050	10/31/00	6010	11/17/00	7439-92-1	Lead	10	630
CLP	10/30/00	7471	10/31/00	7439-97-6	Mercury	0.04	0.45
3050	10/31/00	6010	11/17/00	7782-49-2	Selenium	30	30 U
3050	10/31/00	6010	11/17/00	7440-22-4	Silver	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-48-6-8.5**
TOTAL METALS

Lab Sample ID: CI62L
LIMS ID: 00-19873
Matrix: Soil

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Data Release Authorized:
Reported: 11/22/00

Percent Total Solids: 33.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/31/00	6010	11/20/00	7440-38-2	Arsenic	70	70 U
3050	10/31/00	6010	11/20/00	7440-39-3	Barium	4	67
3050	10/31/00	6010	11/20/00	7440-43-9	Cadmium	3	3 U
3050	10/31/00	6010	11/20/00	7440-47-3	Chromium	7	18
3050	10/31/00	6010	11/20/00	7440-50-8	Copper	3	45
3050	10/31/00	6010	11/20/00	7439-92-1	Lead	30	40
CLP	10/30/00	7471	10/31/00	7439-97-6	Mercury	0.1	0.1 U
3050	10/31/00	6010	11/20/00	7782-49-2	Selenium	70	70 U
3050	10/31/00	6010	11/20/00	7440-22-4	Silver	4	4 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-49-2-3**
TOTAL METALS

Lab Sample ID: CI62M
LIMS ID: 00-19874
Matrix: Soil

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Data Release Authorized:
Reported: 11/22/00

Percent Total Solids: 90.7%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/31/00	6010	11/20/00	7440-38-2	Arsenic	30	30 U
3050	10/31/00	6010	11/20/00	**7440-39-3**	**Barium**	2	**64**
3050	10/31/00	6010	11/20/00	7440-43-9	Cadmium	1	1 U
3050	10/31/00	6010	11/20/00	**7440-47-3**	**Chromium**	3	**20**
3050	10/31/00	6010	11/20/00	**7440-50-8**	**Copper**	1	**20**
3050	10/31/00	6010	11/20/00	**7439-92-1**	**Lead**	10	**10**
CLP	10/30/00	7471	10/31/00	7439-97-6	Mercury	0.05	0.05 U
3050	10/31/00	6010	11/20/00	7782-49-2	Selenium	30	30 U
3050	10/31/00	6010	11/20/00	7440-22-4	Silver	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-49-4-6**
TOTAL METALS

Lab Sample ID: CI62N
LIMS ID: 00-19875
Matrix: Soil

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Data Release Authorized:
Reported: 11/22/00

Percent Total Solids: 84.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/31/00	6010	11/20/00	7440-38-2	Arsenic	30	30 U
3050	10/31/00	6010	11/20/00	7440-39-3	Barium	2	78
3050	10/31/00	6010	11/20/00	7440-43-9	Cadmium	1	1 U
3050	10/31/00	6010	11/20/00	7440-47-3	Chromium	3	15
3050	10/31/00	6010	11/20/00	7440-50-8	Copper	1	20
3050	10/31/00	6010	11/20/00	7439-92-1	Lead	10	150
CLP	10/30/00	7471	10/31/00	7439-97-6	Mercury	0.05	0.44
3050	10/31/00	6010	11/20/00	7782-49-2	Selenium	30	30 U
3050	10/31/00	6010	11/20/00	7440-22-4	Silver	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-50-0-1**
TOTAL METALS

Lab Sample ID: CI620
LIMS ID: 00-19876
Matrix: Soil

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Data Release Authorized:
Reported: 11/22/00

Percent Total Solids: 91.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/31/00	6010	11/20/00	7440-38-2	Arsenic	30	30 U
3050	10/31/00	6010	11/20/00	7440-39-3	Barium	2	208
3050	10/31/00	6010	11/20/00	7440-43-9	Cadmium	1	8
3050	10/31/00	6010	11/20/00	7440-47-3	Chromium	3	37
3050	10/31/00	6010	11/20/00	7440-50-8	Copper	1	1,100
3050	10/31/00	6010	11/20/00	7439-92-1	Lead	10	380
CLP	10/30/00	7471	10/31/00	7439-97-6	Mercury	0.04	0.49
3050	10/31/00	6010	11/20/00	7782-49-2	Selenium	30	30 U
3050	10/31/00	6010	11/20/00	7440-22-4	Silver	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-50-2-3**
TOTAL METALS

Lab Sample ID: CI62P
LIMS ID: 00-19877
Matrix: Soil

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Data Release Authorized:
Reported: 11/22/00

Percent Total Solids: 90.1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/31/00	6010	11/20/00	7440-38-2	Arsenic	30	30 U
3050	10/31/00	6010	11/20/00	**7440-39-3**	**Barium**	2	**69**
3050	10/31/00	6010	11/20/00	7440-43-9	Cadmium	1	1 U
3050	10/31/00	6010	11/20/00	**7440-47-3**	**Chromium**	3	**44**
3050	10/31/00	6010	11/20/00	**7440-50-8**	**Copper**	1	**29**
3050	10/31/00	6010	11/20/00	**7439-92-1**	**Lead**	10	**150**
CLP	10/30/00	7471	10/31/00	7439-97-6	Mercury	0.05	0.05 U
3050	10/31/00	6010	11/20/00	7782-49-2	Selenium	30	30 U
3050	10/31/00	6010	11/20/00	7440-22-4	Silver	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-500-0-1**
TOTAL METALS

Lab Sample ID: CI62Q
LIMS ID: 00-19878
Matrix: Soil

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Data Release Authorized
Reported: 11/22/00

Percent Total Solids: 91.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/31/00	6010	11/20/00	7440-38-2	Arsenic	30	30 U
3050	10/31/00	6010	11/20/00	**7440-39-3**	**Barium**	2	**293**
3050	10/31/00	6010	11/20/00	**7440-43-9**	**Cadmium**	1	**18**
3050	10/31/00	6010	11/20/00	**7440-47-3**	**Chromium**	3	**55**
3050	10/31/00	6010	11/20/00	**7440-50-8**	**Copper**	1	**530**
3050	10/31/00	6010	11/20/00	**7439-92-1**	**Lead**	10	**570**
CLP	10/30/00	7471	10/31/00	**7439-97-6**	**Mercury**	0.04	**0.61**
3050	10/31/00	6010	11/20/00	7782-49-2	Selenium	30	30 U
3050	10/31/00	6010	11/20/00	7440-22-4	Silver	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-49-6-10**
TOTAL METALS

Lab Sample ID: CI62R
LIMS ID: 00-19879
Matrix: Soil

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Data Release Authorized:
Reported: 11/22/00

Percent Total Solids: 48.5%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/31/00	6010	11/20/00	7440-38-2	Arsenic	50	50 U
3050	10/31/00	6010	11/20/00	**7440-39-3**	**Barium**	3	**51**
3050	10/31/00	6010	11/20/00	7440-43-9	Cadmium	2	2 U
3050	10/31/00	6010	11/20/00	**7440-47-3**	**Chromium**	5	23
3050	10/31/00	6010	11/20/00	**7440-50-8**	**Copper**	2	**942**
3050	10/31/00	6010	11/20/00	**7439-92-1**	**Lead**	20	**430**
CLP	10/30/00	7471	10/31/00	**7439-97-6**	**Mercury**	0.07	**0.12**
3050	10/31/00	6010	11/20/00	7782-49-2	Selenium	50	50 U
3050	10/31/00	6010	11/20/00	7440-22-4	Silver	3	3 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: Method Blank**
TOTAL METALS

Lab Sample ID: CI62MB
LIMS ID: 00-19863
Matrix: Soil

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized
Reported: 11/22/00

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	10/31/00	6010	11/20/00	7440-38-2	Arsenic	5	5 U
3050	10/31/00	6010	11/20/00	7440-39-3	Barium	0.3	0.3 U
3050	10/31/00	6010	11/20/00	7440-43-9	Cadmium	0.2	0.2 U
3050	10/31/00	6010	11/20/00	7440-47-3	Chromium	0.5	0.5 U
3050	10/31/00	6010	11/20/00	7440-50-8	Copper	0.2	0.2 U
3050	10/31/00	6010	11/20/00	7439-92-1	Lead	2	2 U
CLP	10/30/00	7471	10/31/00	7439-97-6	Mercury	0.05	0.05 U
3050	10/31/00	6010	11/20/00	7782-49-2	Selenium	5	5 U
3050	10/31/00	6010	11/20/00	7440-22-4	Silver	0.3	0.3 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CI62LCS
LIMS ID: 00-19863
Matrix: Soil

QC Report No: CI62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized
Reported: 11/22/00

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike mg/kg-dry	Spike Added	% Recovery	Q
Arsenic	6010	209	200	104%	
Barium	6010	196	200	98.0%	
Cadmium	6010	52.5	50.0	105%	
Chromium	6010	50.3	50.0	101%	
Copper	6010	47.2	50.0	94.4%	
Lead	6010	204	200	102%	
Mercury	7471	1.00	1.00	100%	
Selenium	6010	208	200	104%	
Silver	6010	49.1	50.0	98.2%	

'Q' codes: N = control limit not met

Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

Analytical Chemists & Consultants

333 Ninth Ave. North
Seattle, Wa 98109-5187
(206)621-6490

December 6, 2000

Ty Schreiner
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: Project: Tacoma Metals
ARI Job: CM30

Dear Ty:

Please find enclosed sample custody records and final analytical results for the above referenced project. Nine soil samples were re-logged from archives on November 17, 2000.

Selected samples were analyzed for PCB's referencing EPA method 8082.

The samples were extracted on November 27, 2000 and analyzed on November 30, 2000.

The surrogate Tetrachlorometaxylene for samples TP-4-0-1 & TP-7-2-3 exceeded QC limits due to matrix interference.

No other analytical complications were noted. Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Susan Snyder
Project Manager
susan@arilabs.com

SS/ss
Enclosures

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K/J Federal Way
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ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Lab Sample ID: CM30
LIMS ID: 00-22450
Matrix: Soil

QC Report No: CM30-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 12/04/00 CR 12/4/00

LABORATORY CONTROL SAMPLE SPIKE RECOVERY
Date extracted: 11/27/00

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	313	333	93.9%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	107%
Tetrachlorometaxylene	111%

Values Reported in Total ug/kg Dry Weight

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-50-2-3

Lab Sample ID: CM30I
LIMS ID: 00-22458
Matrix: Soil

QC Report No: CM30-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Data Release Authorized: CR 12/14/00
Reported: 12/04/00

Date extracted: 11/27/00
Date analyzed: 11/30/00 14:16
Instrument ID: ECD1
Sample Amount: 10.9 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.0

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 9.1 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	37 U
53469-21-9	Aroclor 1242	37 U
12672-29-6	Aroclor 1248	37 U
11097-69-1	**Aroclor 1254**	**36 J**
11096-82-5	Aroclor 1260	37 U
11104-28-2	Aroclor 1221	73 U
11141-16-5	Aroclor 1232	37 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	79.2%
Tetrachlorometaxylene	87.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-50-0-1
DILUTION

Lab Sample ID: CM30HDL
LIMS ID: 00-22457
Matrix: Soil

QC Report No: CM30-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Data Release Authorized: 12-14-00
Reported: 12/04/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 13:13
Instrument ID: ECD1
Sample Amount: 11.2 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 6.8

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:10
Percent Moisture: 6.7 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	360 U
53469-21-9	Aroclor 1242	360 U
12672-29-6	**Aroclor 1248**	**1,400**
11097-69-1	**Aroclor 1254**	**5,300**
11096-82-5	**Aroclor 1260**	**1,700**
11104-28-2	Aroclor 1221	710 U
11141-16-5	Aroclor 1232	360 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	87.5%
Tetrachlorometaxylene	62.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-50-0-1

Lab Sample ID: CM30H
LIMS ID: 00-22457
Matrix: Soil

QC Report No: CM30-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Data Release Authorized: CR 12/14/00
Reported: 12/04/00

Date extracted: 11/27/00
Date analyzed: 11/30/00 10:57
Instrument ID: ECD1
Sample Amount: 11.2 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 6.8

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 6.7 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	36 U
53469-21-9	Aroclor 1242	36 U
12672-29-6	Aroclor 1248	870
11097-69-1	Aroclor 1254	3,800 E
11096-82-5	Aroclor 1260	1,300
11104-28-2	Aroclor 1221	71 U
11141-16-5	Aroclor 1232	36 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	81.0%
Tetrachlorometaxylene	65.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-12-2-3

Lab Sample ID: CM30G
LIMS ID: 00-22456
Matrix: Soil

QC Report No: CM30-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/05/00
Date Received: 10/09/00

Data Release Authorized: CR 12/14/00
Reported: 12/04/00

Date extracted: 11/27/00
Date analyzed: 11/30/00 10:24
Instrument ID: ECD1
Sample Amount: 11.7 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.3

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 1.8 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	34 U
53469-21-9	Aroclor 1242	34 U
12672-29-6	**Aroclor 1248**	**150**
11097-69-1	**Aroclor 1254**	**430**
11096-82-5	**Aroclor 1260**	**170**
11104-28-2	Aroclor 1221	68 U
11141-16-5	Aroclor 1232	34 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	62.0%
Tetrachlorometaxylene	61.8%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-7-2-3
DILUTION

Lab Sample ID: CM30FDL
LIMS ID: 00-22455
Matrix: Soil

Data Release Authorized:
Reported: 12/04/00 CR 12/14/00

QC Report No: CM30-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/04/00
Date Received: 10/09/00

Date extracted: 11/27/00
Date analyzed: 11/30/00 09:51
Instrument ID: ECD1
Sample Amount: 11.2 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 6.9

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:10
Percent Moisture: 6.5 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	360 U
53469-21-9	Aroclor 1242	360 U
12672-29-6	**Aroclor 1248**	**2,100**
11097-69-1	**Aroclor 1254**	**5,200**
11096-82-5	**Aroclor 1260**	**1,900**
11104-28-2	Aroclor 1221	710 U
11141-16-5	Aroclor 1232	360 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	NR
Tetrachlorometaxylene	90.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-7-2-3

Lab Sample ID: CM30F
LIMS ID: 00-22455
Matrix: Soil

QC Report No: CM30-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/04/00
Date Received: 10/09/00

Data Release Authorized: CR 12/4/00
Reported: 12/04/00

Date extracted: 11/27/00
Date analyzed: 11/30/00 09:17
Instrument ID: ECD1
Sample Amount: 11.2 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 6.9

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 6.5 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	36 U
53469-21-9	Aroclor 1242	36 U
12672-29-6	**Aroclor 1248**	**1,700 E**
11097-69-1	**Aroclor 1254**	**4,000 E**
11096-82-5	**Aroclor 1260**	**1,500 E**
11104-28-2	Aroclor 1221	71 U
11141-16-5	Aroclor 1232	36 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	NR
Tetrachlorometaxylene	87.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-6-2-3

Lab Sample ID: CM30E
LIMS ID: 00-22454
Matrix: Soil

Data Release Authorized: 12/4/00
Reported: 12/04/00

QC Report No: CM30-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/04/00
Date Received: 10/09/00

Date extracted: 11/27/00
Date analyzed: 11/30/00 08:44
Instrument ID: ECD1
Sample Amount: 11.5 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 6.9

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 3.8 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	35 U
53469-21-9	Aroclor 1242	35 U
12672-29-6	Aroclor 1248	18 J
11097-69-1	Aroclor 1254	50
11096-82-5	Aroclor 1260	28 J
11104-28-2	Aroclor 1221	69 U
11141-16-5	Aroclor 1232	35 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	63.8%
Tetrachlorometaxylene	66.8%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-12-0-1

Lab Sample ID: CM30D
LIMS ID: 00-22453
Matrix: Soil

Data Release Authorized:
Reported: 12/04/00 CR 12/4/00

QC Report No: CM30-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/05/00
Date Received: 10/09/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 12:40
Instrument ID: ECD1
Sample Amount: 11.5 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.1

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 3.8 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	35 U
53469-21-9	Aroclor 1242	35 U
12672-29-6	**Aroclor 1248**	**31 J**
11097-69-1	**Aroclor 1254**	**63**
11096-82-5	**Aroclor 1260**	**30 J**
11104-28-2	Aroclor 1221	69 U
11141-16-5	Aroclor 1232	35 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	74.0%
Tetrachlorometaxylene	72.2%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-6-0-1

Lab Sample ID: CM30C
LIMS ID: 00-22452
Matrix: Soil

Data Release Authorized: CR 12/14/00
Reported: 12/04/00

QC Report No: CM30-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/04/00
Date Received: 10/09/00

Date extracted: 11/27/00
Date analyzed: 11/30/00 04:19
Instrument ID: ECD1
Sample Amount: 11.0 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 6.8

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 8.3 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	36 U
53469-21-9	Aroclor 1242	36 U
12672-29-6	**Aroclor 1248**	**110**
11097-69-1	**Aroclor 1254**	**360**
11096-82-5	**Aroclor 1260**	**300**
11104-28-2	Aroclor 1221	73 U
11141-16-5	Aroclor 1232	36 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	95.0%
Tetrachlorometaxylene	93.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-4-2-3

Lab Sample ID: CM30B
LIMS ID: 00-22451
Matrix: Soil

QC Report No: CM30-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Data Release Authorized:
Reported: 12/04/00 VR 12/4/00

Date extracted: 11/27/00
Date analyzed: 11/30/00 03:13
Instrument ID: ECD1
Sample Amount: 11.2 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.1

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 5.9 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	35 U
53469-21-9	Aroclor 1242	35 U
12672-29-6	**Aroclor 1248**	**390**
11097-69-1	**Aroclor 1254**	**1,400**
11096-82-5	**Aroclor 1260**	**970**
11104-28-2	Aroclor 1221	71 U
11141-16-5	Aroclor 1232	35 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	90.2%
Tetrachlorometaxylene	66.8%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-4-0-1
DILUTION

Lab Sample ID: CM30ADL
LIMS ID: 00-22450
Matrix: Soil

Data Release Authorized: CR 12/4/00
Reported: 12/04/00

QC Report No: CM30-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Date extracted: 11/27/00
Date analyzed: 11/30/00 02:06
Instrument ID: ECD1
Sample Amount: 10.9 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.2

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:5
Percent Moisture: 8.8 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	180 U
53469-21-9	Aroclor 1242	180 U
12672-29-6	Aroclor 1248	1,200
11097-69-1	Aroclor 1254	4,700
11096-82-5	Aroclor 1260	2,400
11104-28-2	Aroclor 1221	370 U
11141-16-5	Aroclor 1232	180 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	NR
Tetrachlorometaxylene	71.2%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-4-0-1

Lab Sample ID: CM30A
LIMS ID: 00-22450
Matrix: Soil

Data Release Authorized: 12/14/00
Reported: 12/04/00

QC Report No: CM30-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Date extracted: 11/27/00
Date analyzed: 11/30/00 02:40
Instrument ID: ECD1
Sample Amount: 10.9 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.2

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 8.8 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	37 U
53469-21-9	Aroclor 1242	37 U
12672-29-6	**Aroclor 1248**	**1,100**
11097-69-1	**Aroclor 1254**	**4,000 E**
11096-82-5	**Aroclor 1260**	**2,100 E**
11104-28-2	Aroclor 1221	73 U
11141-16-5	Aroclor 1232	37 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	NR
Tetrachlorometaxylene	75.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: Method Blank

Lab Sample ID: CM30MB
LIMS ID: 00-22450
Matrix: Soil

QC Report No: CM30-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized:
Reported: 12/04/00 LR 12/4/00

Date extracted: 11/27/00
Date analyzed: 11/30/00 01:00
Instrument ID: ECD1
Sample Amount: 12.0 g-dry-wt
Final Ext Vol: 4.0 mL
pH: NA

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: NA

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	33 U
53469-21-9	Aroclor 1242	33 U
12672-29-6	Aroclor 1248	33 U
11097-69-1	Aroclor 1254	33 U
11096-82-5	Aroclor 1260	33 U
11104-28-2	Aroclor 1221	67 U
11141-16-5	Aroclor 1232	33 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	116%
Tetrachlorometaxylene	124%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

CHANGE ORDER

2 week TAT

Client: Kennedy Jenks	ARI Job No: CI24 + CI25 + CI62
Project No: Tacoma Metals 996098-00	VTSR:
	Change order Date: 11/17/00
Change made by: Jodie Brundage	
Submitted by: Steph	

Change Acknowledged

Project Coordinator:
Extractions:
Volatiles:
GC/MS Extractions Lab:
GC Lab:
Metals:
Conventionals:
Data Section:

yf.
(CI24 fl-663
CI25-fl-660)

```
00-19692 Tacoma_Metals TP-27-2-3 CI24 K
00-19693 Tacoma_Metals TP-270-0-1 CI24 L EPH | SIM PAH
00-19694 Tacoma_Metals TP-29-0-1 CI24 M
00-19695 Tacoma_Metals TP-30-0-1 CI24 N
00-19696 Tacoma_Metals TP-30-2-3 CI24 O EPH | SIM PAH
00-19697 Tacoma_Metals TP-31-0-1 CI24 P
00-19698 Tacoma_Metals TP-31-2-3 CI24 Q
00-19699 Tacoma_Metals TP-32-0-1 CI24 R
00-19700 Tacoma_Metals TP-33-0-1 CI24 S EPH | SIM PAH
00-19607 Tacoma_Metals TP-39-6-10 CI22 C
00-19608 Tacoma_Metals TP-34-2-3 CI25 A EPH | SIM PAH
00-19875 Tacoma_Metals TP-49-4-6 CI62 N
00-19876 Tacoma_Metals TP-50-0-1 CI62 O - PCB
00-19877 Tacoma_Metals TP-50-2-3 CI62 P - PCB
00-19878 Tacoma_Metals TP-500-0-1 CI62 Q
```

(CI62 fl-667)

*

*Please pull the Highlighted samples + re log as a new job for the requested analysis.

Thanks

(*3 ARI Jobs)

*Sub EPH to Aliphatics + Aromatics

Northcreek

Rev. 2
02/01/94

ANALYTICAL RESOURCES INCORPORATED

2 week TAT

CHANGE ORDER

Client: Kennedy Jenks

Change by Project No: Jodie Brundage

996098.00

~~Change made by:~~ Tacoma Metals

Submitted by: Steph

ARI Job No: CH50

VTSR:

Change order Date: 11/17/00

Change Acknowledged

Project Coordinator:	
Extractions:	
Volatiles:	
GC/MS Extractions Lab:	
GC Lab:	
Metals:	
Conventionals:	
Data Section:	

```
00-19110 Tacoma_Metals TP-5-2-3 CH50 A  -TPHD
00-19111 Tacoma_Metals TP-6-2-3 CH50 B  -PCB, Lead
00-19112 Tacoma_Metals TP-6-4-6 CH50 C  -Lead
00-19113 Tacoma_Metals TP-6-6-10 CH50 D  -Lead
00-19114 Tacoma_Metals TP-7-2-3 CH50 E  -PCB
00-19115 Tacoma_Metals TP-7-4-6 CH50 F
00-19116 Tacoma_Metals TP-7-6-10 CH50 G
00-19117 Tacoma_Metals TP-8-2-3 CH50 H
00-19118 Tacoma_Metals TP-8-6-10 CH50 I
00-19119 Tacoma_Metals TP-9-2-3 CH50 J  -Lead TPHD
00-19120 Tacoma_Metals TP-9-6-10 CH50 K
00-19121 Tacoma_Metals TP-10-2-3 CH50 L TPHD
00-19122 Tacoma_Metals TP-11-2-3 CH50 M TPHD
00-19123 Tacoma_Metals TP-11-4-6 CH50 N TPHD
00-19124 Tacoma_Metals TP-12-2-3 CH50 O  -PCB
00-19130 Tacoma_Metals TP-14-2-3 CH50 U  } Lead
00-19131 Tacoma_Metals TP-14-4-6 CH50 V  }
00-19132 Tacoma_Metals TP-15-2-3 CH50 W
00-19135 Tacoma_Metals TP-16-2-3 CH50 Z  -Lead + TPHD
00-19136 Tacoma_Metals TP-17-2-3 CH50 AA  -Lead
00-19137 Tacoma_Metals TP-17-4-6 CH50 AB  -Lead
00-19138 Tacoma_Metals TP-17-6-10 CH50 AC  -Lead
```

61-65

*Please pull Highlighted samples & re-log as new job for requested analyses Thanks

Some have multiple analyses

0004F

Rev. 2
02/21/94

ANALYTICAL RESOURCES INCORPORATED

CHANGE ORDER

2 week TAT

Client: Kennedy Jenks	ARI Job No: CH43
Project No: Tacoma Metals 996098.00	VTSR: / Change order Date: 11/17/00
Change made by: Jodie Brundage	
Submitted by: Steph	

Change Acknowledged

Project Coordinator:	
Extractions:	
Volatiles:	
GC/MS Extractions Lab:	
GC Lab:	
Metals:	
Conventionals:	
Data Section:	

FI-659

LIMS	Project	Client Sample	Analysis
00-19069	Tacoma_Metals	TP-5-01 CH43 A	
00-19070	Tacoma_Metals	TP-5-4-6 CH43 B	
00-19071	Tacoma_Metals	TP-5-6-10 CH43 C	EPH / SIM PAH
00-19072	Tacoma_Metals	TP-6-0-1 CH43 D	PCB
00-19073	Tacoma_Metals	TP-600-0-1 CH43 E	
00-19074	Tacoma_Metals	TP-7-0-1 CH43 F	
00-19075	Tacoma_Metals	TP-8-0-1 CH43 G	
00-19076	Tacoma_Metals	TP-8-4-6 CH43 H	
00-19077	Tacoma_Metals	TP-9-0-1 CH43 I	EPH / SIM PAH
00-19078	Tacoma_Metals	TP-800-4-6 CH43 J	
00-19079	Tacoma_Metals	TP-9-4-6 CH43 K	
00-19080	Tacoma_Metals	TP-10-0-1 CH43 L	
00-19081	Tacoma_Metals	TP-10-4-6 CH43 M	
00-19082	Tacoma_Metals	TP-10-6-10 CH43 N	EPH / SIM PAH
00-19083	Tacoma_Metals	TP-11-0-1 CH43 O	
00-19084	Tacoma_Metals	TP-11-6-10 CH43 P	EPH / SIM PAH
00-19085	Tacoma_Metals	TP-12-0-1 CH43 Q	PCB
00-19086	Tacoma_Metals	TP-13-0-1 CH43 R	
00-19087	Tacoma_Metals	TP-14-0-1 CH43 S	
00-19088	Tacoma_Metals	TP-14-6-10 CH43 T	

FI-659

Please pull Highlighted samples & relog as new job for requested analyses. Thanks

Rev. 2
'21/94

00-22450 to 00-22458
CM30

2week TAT

ANALYTICAL RESOURCES INCORPORATED

CHANGE ORDER

Client: Kennedy Jenks	ARI Job No: CF88
Project No: Tacoma Metals 996098.00	VTSR: / Change order Date: 11/17/00
Change made by: Jodie Brundage	
Submitted by: Stephanie	

Change Acknowledged

Project Coordinator:	
Extractions:	
Volatiles:	
GC/MS Extractions Lab:	
GC Lab:	
Metals:	
Conventionals:	
Data Section:	

00-18314 Tacoma_Metals TP-1-0-1 CF88 A
00-18315 Tacoma_Metals TP-2-0-1 CF88 B
00-18316 Tacoma_Metals TP-2-2-3 CF88 C
00-18317 Tacoma_Metals TP-2-4-6 CF88 D
[redacted]18 Tacoma_Metals TP-2-6-10 CF88 E EPH/SIM PAHs
00-18319 Tacoma_Metals TP-3-0-1 CF88 F
00-18320 Tacoma_Metals TP-3-4-6 CF88 G
00-18321 Tacoma_Metals TP-3-6-10 CF88 H
00-18322 Tacoma_Metals TP-4-0-1 CF88 I - PCB: F1-651
00-18323 Tacoma_Metals TP-4-6-10 CF88 J
00-18324 Tacoma_Metals TP-1-2-3 CF88 K
00-18325 Tacoma_Metals TP-1-4-6 CF88 L } Lead
00-18326 Tacoma_Metals TP-1-6-10 CF88 M
00-18327 Tacoma_Metals TP-3-2-3 CF88 N
00-18328 Tacoma_Metals TP-4-2-3 CF88 O - PCB Lead
00-18329 Tacoma_Metals TP-4-4-6 CF88 P - Lead

(Highlighted only)

*Please pull these samples + relog as new jobs for listed analyses

*Sub EPH to Northcreek - Aliphatics + Aromatics

*SIM PAHs in house

0004F

Rev. 2
02/21/94

ANALYTICAL RESOURCES INCORPORATED

SOIL AROCLOR SURROGATE SUMMARY

Matrix: Soil

QC Report No: CM30
Project: Tacoma Metals
996098.00

LIMS ID	Lab ID	Client ID	TCMX	#	DCBP	#	TOT OUT
00-22450MB	112700MB	Method Blank	124%		116%		0
00-22450SB	112700SB	Lab Control	111%		107%		0
00-22450	CM30A	TP-4-0-1	75.5%		NR	*	1
00-22450DL	CM30A	TP-4-0-1-DL	71.2%		NR	*	1
00-22451	CM30B	TP-4-2-3	66.8%		90.2%		0
00-22452	CM30C	TP-6-0-1	93.0%		95.0%		0
00-22453	CM30D	TP-12-0-1	72.2%		74.0%		0
00-22454	CM30E	TP-6-2-3	66.8%		63.8%		0
00-22455	CM30F	TP-7-2-3	87.0%		NR	*	1
00-22455DL	CM30F	TP-7-2-3-DL	90.0%		NR	*	1
00-22456	CM30G	TP-12-2-3	61.8%		62.0%		0
00-22457	CM30H	TP-50-0-1	65.5%		81.0%		0
00-22457DL	CM30H	TP-50-0-1-DL	62.5%		87.5%		0
00-22458	CM30I	TP-50-2-3	87.5%		79.2%		0

	QC LIMITS
(TCMX) = Tetrachloro-m-xylene	(34-128)
(DCBP) = Decachlorobiphenyl	(39-132)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D Surrogate Compound diluted out

FORM-II PCB

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, Wa 98109-5187
(206)621-6490

December 6, 2000

Ty Schreiner
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: Project: Tacoma Metals
ARI Job: CM31

Dear Ty:

Please find enclosed sample custody records and final analytical results for the above referenced project. Ten soil samples were re-logged from archives on November 17, 2000.

Selected samples were analyzed for NWTPH-D. The samples were extracted on November 27, 2000 and analyzed on November 29, 2000.

The following samples A, B, F @5x, G, H, I & K showed a pattern in the diesel and motor oil range that does not resemble typical diesel or motor oil patterns. Patterns could be of a weathered diesel or lube oil. Sample C has a pattern that resembles a motor oil pattern. Sample D @ 5x shows a pattern on the diesel and motor oil range that does not resemble either of the diesel or motor oil patterns. Sample E @10x has an over lapping pattern on the diesel and motor oil that does not resemble the typical diesel or motor oil standard pattern. Sample J @5x shows a pattern in the motor oil range that does not resemble the motor oil standard pattern.

No other analytical complications were noted. Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Susan Snyder
Project Manager
susan@arilabs.com

SS/ss
Enclosures

RECEIVED

DEC 1 1 2000

K/J Federal Way
K/J No/File
Route
Return To/By

00-22459 to 00-22469

CMB1

2 week TAT

AN. TICAL RESOURCES INCORPORATED

CHANGE ORDER

Client: Kennedy Jenks	ARI Job No: CH50
Change by Project No: Jodie Brundage	VTSR:
↕ 996098.00	Change order Date: 11/17/00
~~Change made by:~~ Tacoma Metals	
Submitted by: Steph	

Change Acknowledged

Project Coordinator:	
Extractions:	
Volatiles:	
GC/MS Extractions Lab:	
GC Lab:	
Metals:	
Conventionals:	
Data Section:	

[redacted] - TPHD
00-19111 Tacoma_Metals TP-6-2-3 CH50 B - PCB, Lead - 1-PCB
00-19112 Tacoma_Metals TP-6-4-6 CH50 C - Lead
00-19113 Tacoma_Metals TP-6-6-10 CH50 D - Lead
00-19114 Tacoma_Metals TP-7-2-3 CH50 E - PCB
00-19115 Tacoma_Metals TP-7-4-6 CH50 F
00-19116 Tacoma_Metals TP-7-6-10 CH50 G
00-19117 Tacoma_Metals TP-8-2-3 CH50 H
00-19118 Tacoma_Metals TP-8-6-10 CH50 I
00-19119 Tacoma_Metals TP-9-2-3 CH50 J - Lead [redacted]
00-19120 Tacoma_Metals TP-9-6-10 CH50 K
00-19121 Tacoma_Metals TP-10-2-3 CH50 [redacted] TPHD
[redacted] TPHD
[redacted] TPHD
00-19124 Tacoma_Metals TP-12-2-3 CH50 O - PCB
00-19130 Tacoma_Metals TP-14-2-3 CH50 U - Lead
00-19131 Tacoma_Metals TP-14-4-6 CH50 V
00-19132 Tacoma_Metals TP-15-2-3 CH50 W
00-19135 Tacoma_Metals TP-16-2-3 CH50 Z - Lead + [redacted]
00-19136 Tacoma_Metals TP-17-2-3 CH50 AA - Lead
00-19137 Tacoma_Metals TP-17-4-6 CH50 AB - Lead
00-19138 Tacoma_Metals TP-17-6-10 CH50 AC - Lead

P1-653

*Please pull Highlighted samples & re-log as new job for requested analyses Thanks

Some have multiple analyses

0004F

Rev. 2
02/21/94

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID
and Motor Oil

LIMS ID: 00-22459
Matrix: Soil

QC Report No: CM31-Kennedy Jenks Consultants
Project: Tacoma Metals
966098.00

Data Release Authorized: CR 12/1/00
Reported: 12/01/00

Date Received: 10/09/00

Lab ID	Sample ID	Date Extracted	Date Analyzed	Dilution Factor	Diesel Range	*HC ID	Motor Oil Range	Surrogate Recovery
CM31MB	Method Blank	11/27/00	11/29/00	1:1	5.0 U	---	10 U	111%
CM31A	TP-5-2-3	11/27/00	11/29/00	1:1	81	NO	75	104%
CM31B	TP-9-2-3	11/27/00	11/29/00	1:1	54	NO	72	98.0%
CM31C	TP-10-2-3	11/27/00	11/29/00	1:1	43	M OIL	280	93.0%
CM31D	TP-11-2-3	11/27/00	11/29/00	1:5	440	NO	540	95.0%
CM31E	TP-11-4-6	11/27/00	11/30/00	1:10	870	NO	610	60.0%
CM31F	TP-16-2-3	11/27/00	11/29/00	1:5	940	NO	1,400	85.0%
CM31G	TP-37-4-6	11/27/00	11/29/00	1:1	60	NO	84	93.0%
CM31H	TP-38-2-3	11/27/00	11/29/00	1:1	68	NO	88	97.0%
CM31I	TP-30-4-6	11/27/00	11/29/00	1:1	8.5	NO	15	97.0%
CM31ID	TP-30-4-6-DUPL	11/27/00	11/29/00	1:1	7.2	NO	14	92.0%
CM31J	TP-33-2-3	11/27/00	11/29/00	1:5	420	NO	1,000	105%

Values reported in ppm (mg/kg) on a dry weight basis.

Surrogate is Methyl-Arachidate.

* ID indicates, in the opinion of the analyst, the petroleum product with the best pattern match. 'NO' indicates that there was not a good match for any of the requested products.
Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.

Data Qualifiers

U	Compound not detected at the given detection limit.
J	Indicates an estimated value below the calculated detection limit.
S	No value reported due to saturation of the detector. Dilution required.
D	Indicates the surrogate was not detected because of dilution of the extract.
E	Indicates a value above the linear range of the detector. Dilution required.
NR	Indicates no recovery due to matrix interference.
B	Indicates compound also detected in the method blank.

FORM-1 TPHD

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID
and Motor Oil

LIMS ID: 00-22469
Matrix: Soil

QC Report No: CM31-Kennedy Jenks Consultants
Project: Tacoma Metals
966098.00

Data Release Authorized:
Reported: 12/01/00 CR 12/1/00

Date Received: 10/13/00

Lab ID	Sample ID	Date Extracted	Date Analyzed	Dilution Factor	Diesel Range	*HC ID	Motor Oil Range	Surrogate Recovery
CM31K	TP-34-4-6	11/27/00	11/29/00	1:1	59	NO	160	78.0%

Values reported in ppm (mg/kg) on a dry weight basis.

Surrogate is Methyl-Arachidate.

* ID indicates, in the opinion of the analyst, the petroleum product with the best pattern match. 'NO' indicates that there was not a good match for any of the requested products.
Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.

Data Qualifiers

U Compound not detected at the given detection limit.
J Indicates an estimated value below the calculated detection limit.
S No value reported due to saturation of the detector. Dilution required.
D Indicates the surrogate was not detected because of dilution of the extract.
E Indicates a value above the linear range of the detector. Dilution required.
NR Indicates no recovery due to matrix interference.
B Indicates compound also detected in the method blank.

FORM-1 TPHD

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-5-2-3
Lab Sample ID: CM31A
QC Report No: CM31-Kennedy Jenks Consultants
LIMS ID: 00-22459
Project: Tacoma Metals
Matrix: Soil
966098.00
Date Received: 10/09/00

Data Release Authorized:
Reported: 12/01/00 CR 12/1/00

MATRIX SPIKE/SPIKE DUPLICATE RECOVERY

Date extracted: 11/27/00
Date analyzed: 11/29/00

CONSTITUENT	SAMPLE VALUE	SPIKE VALUE	SPIKE ADDED	% RECOVERY	RPD
MATRIX SPIKE					
Diesel Range Hydrocarbons	81.4	198	110	106%	
MATRIX SPIKE DUPLICATE					
Diesel Range Hydrocarbons	81.4	187	110	96.0%	9.9%

TPHd Surrogate Recovery

Matrix Spike	Methylarachidate	107%
Matrix Spike Dup	Methylarachidate	103%

Values reported in ppm (mg/kg) on a dry weight basis.

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CM31SB
LIMS ID: 00-22459
Matrix: Soil

QC Report No: CM31-Kennedy Jenks Consultants
Project: Tacoma Metals
966098.00

Data Release Authorized:
Reported: 12/01/00

LR 12/1/00

LABORATORY CONTROL SAMPLE RECOVERY REPORT
Date extracted: 11/27/00
Date analyzed: 11/29/00

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
Diesel Range Hydrocarbons	111	100	111%

TPHd Surrogate Recovery

Methylarachidate 102%

Values reported in ppm (mg/kg) on a dry weight basis.

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL HYDROCARBONS COMPOUND SUMMARY

Matrix: Soil

QC Report No: CM31

LIMS ID	Lab ID	Extracted	Client ID	MeArach	TOT OUT
00-22459MB	112900MB	11/27/00	Method Blank	111%	0
00-22459LC	112900LC	11/27/00	Lab Control	102%	0
00-22459	CM31A	11/27/00	TP-5-2-3	104%	0
00-22459	CM31A-MS	11/27/00	TP-5-2-3-MS	107%	0
00-22459	CM31A-MSD	11/27/00	TP-5-2-3-MSD	103%	0
00-22460	CM31B	11/27/00	TP-9-2-3	98%	0
00-22461	CM31C	11/27/00	TP-10-2-3	93%	0
00-22462	CM31D	11/27/00	TP-11-2-3	95%	0
00-22463	CM31E	11/27/00	TP-11-4-6	60%	0
00-22464	CM31F	11/27/00	TP-16-2-3	85%	0
00-22465	CM31G	11/27/00	TP-37-4-6	93%	0
00-22466	CM31H	11/27/00	TP-38-2-3	97%	0
00-22467	CM31I	11/27/00	TP-30-4-6	97%	0
00-22467	CM31I-DP	11/27/00	TP-30-4-6-DP	92%	0
00-22468	CM31J	11/27/00	TP-33-2-3	105%	0
00-22469	CM31K	11/27/00	TP-34-4-6	78%	0

	Control QC LIMITS	Sample QC LIMITS
(MeArach) = Methylarachidate	(56-114)	(21-130)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D System Monitoring Compound diluted out

FORM-II TPHD

Analytical Resources Inc.
NWTPH-D Quantitation Report

Data file: /chem2/fid3b.i/28NOV00.B/1128b045.d
Method: /chem2/fid3b.i/28NOV00.B/tphfid3b.m
Instrument: fid3b.i
Operator: GSA
Report Date: 11/30/2000
Macro: FID:3B112100
Calibration Dates: Gas:10/31/00 Diesel:11/10/00 M.Oil:11/06/00

ARI ID: CM31 MBS 11/27
Client ID:
Injection: 29-NOV-2000 00:07

Dilution Factor: 1

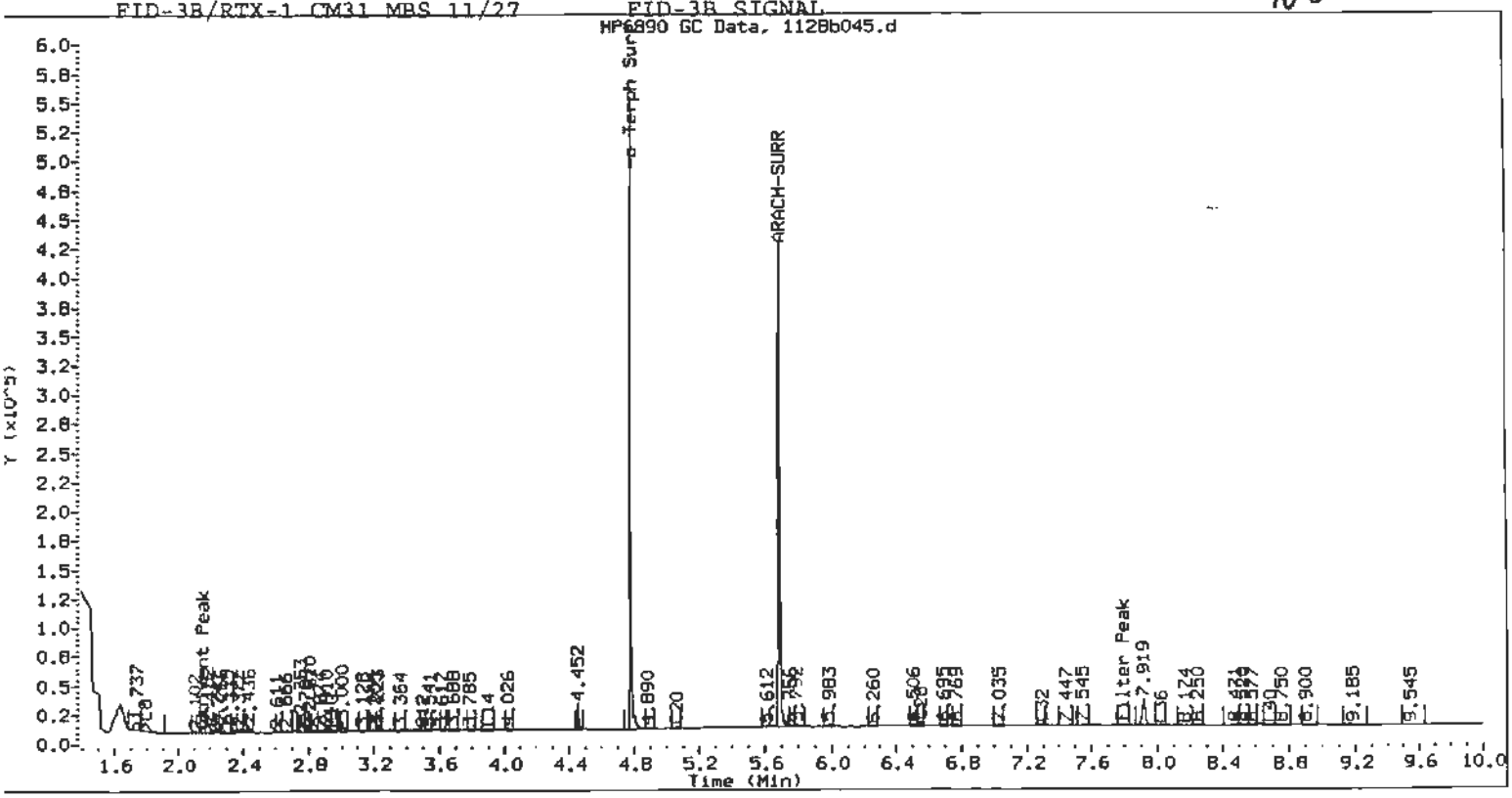
Tazz-1B RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	----				GAS (Tol-C12)	7957556	22
C8	1.791	-0.022	6460	685215	DIESEL (C12-C24)	2426181	3
Solvent Peak	2.151	0.009	6120	401316	M.OIL (C24-C38)	3522905	5
C10	2.944	0.003	2239	146340			
C12	3.500	0.036	1374	100037			
C14	3.899	0.001	1687	216102			
C16	----						
C18	----						
o-Terph Surr	4.783	-0.002	545861	14750126			
C20	5.065	-0.037	2219	135037			
C22	----						
ARACH-SURR	5.691	-0.002	417875	15264812			
C24	----						
C26	----						
C28	6.551	-0.005	3975	233408			
C30	----						
Filter Peak	7.790	-0.009	930	115480			
C32	7.294	0.012	1157	102607			
C34	----						
C36	8.024	0.033	829	105965			
C38	----						
C40	8.684	0.015	977	175498			

Me-Arach Surrogate Rec = 111% (15264812)
o-Terphenyl Surrogate Rec = 110%

NO

FID-3B/RTX-1 CM31 MBS 11/27 FID-3B SIGNAL
HP6890 GC Data, 1128b045.d



Analytical Resources Inc.
NWTPH-D Quantitation Report

Data file: /chem2/fid3b.i/28NOV00.B/1128b046.d
Method: /chem2/fid3b.i/28NOV00.B/tphfid3b.m
Instrument: fid3b.i
Operator: GSA
Report Date: 11/30/2000
Macro: FID:3B112100
Calibration Dates: Gas:10/31/00 Diesel:11/10/00 M.Oil:11/06/00

ARI ID: CM31 SBS 11/27
Client ID:
Injection: 29-NOV-2000 00:26

Dilution Factor: 1

Tazz-1B RESULTS

Compound	RT	Shift	Height	Area
Toluene	----			
C8	1.802	-0.012	10762	1280932
Solvent Peak	2.153	0.011	13320	1463197
C10	2.945	0.003	211600	7314235
C12	3.464	0.001	406370	10157092
C14	3.899	0.000	425310	21027536
C16	4.299	-0.001	389742	24212491
C18	4.701	-0.002	263713	14703733
o-Terph Surr	4.785	-0.001	498624	12591922
C20	5.099	-0.003	151615	9967065
C22	5.482	-0.003	65075	4948283
ARACH-SURR	5.693	0.000	399653	13929353
C24	5.849	-0.004	21351	1884783
C26	6.204	-0.003	6392	577790
C28	6.552	-0.004	2792	249617
C30	----			
Filter Peak	----			

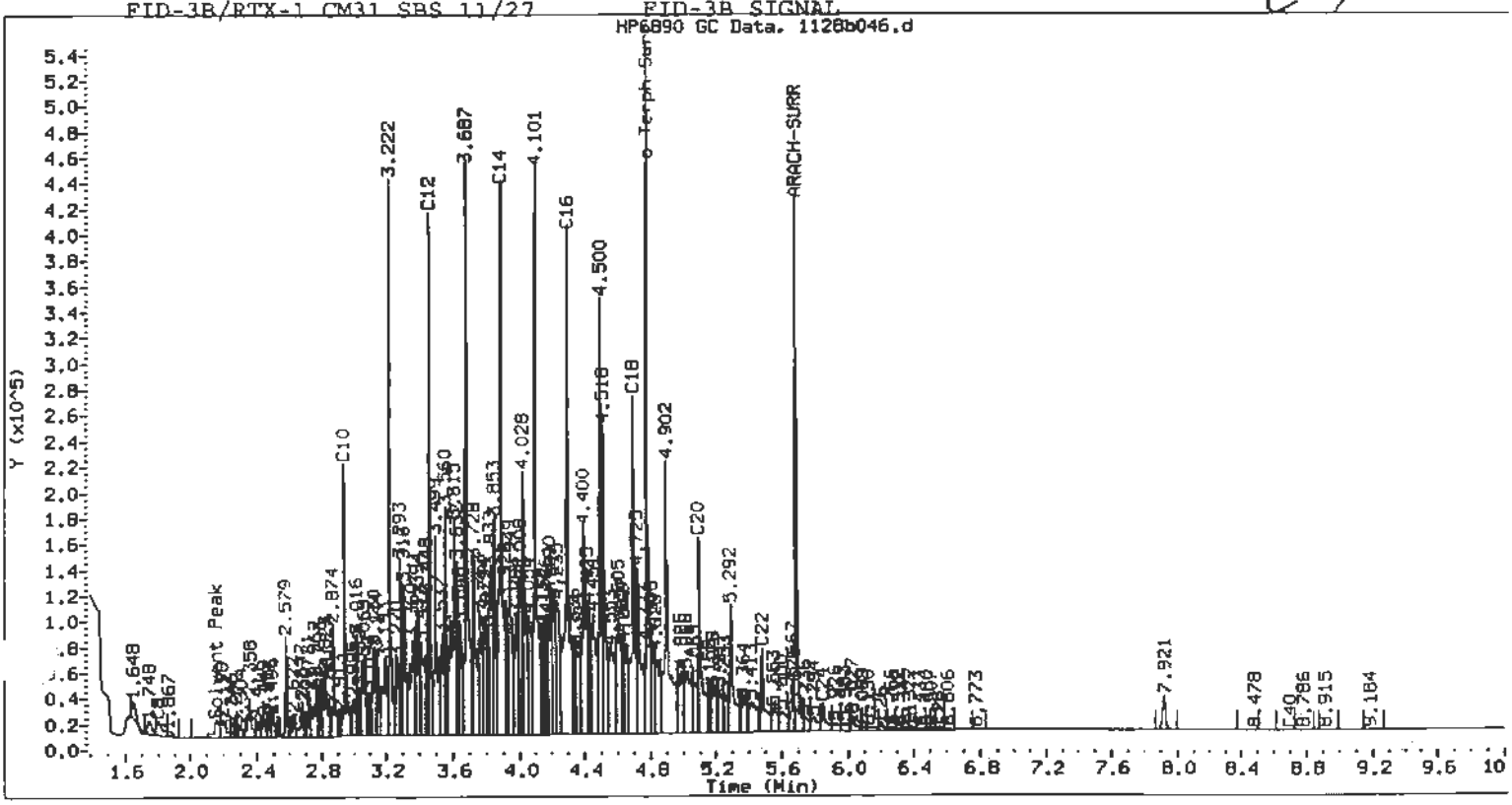
C36	----			
C38	----			
C40	8.695	0.025	725	183347

Range	Total Area	Conc
GAS (Tol-C12)	131179947	361
DIESEL (C12-C24)	446025405	553
M.OIL (C24-C38)	8478141	11

Me-Arach Surrogate Rec = 102%
o-Terphenyl Surrogate Rec = 94%

LCS

FID-3B/RTX-1 CM31 SBS 11/27 FID-3B SIGNAL



Analytical Resources Inc.
NWTPH-D Quantitation Report

Data file: /chem2/fid3b.i/28NOV00.B/1128b056.d
Method: /chem2/fid3b.i/28NOV00.B/tphfid3b.m
Instrument: fid3b.i
Operator: GSA
Report Date: 11/30/2000
Macro: FID:3B112100
Calibration Dates: Gas:10/31/00 Diesel:11/10/00 M.Oil:11/06/00

ARI ID: CM31 A
Client ID:
Injection: 29-NOV-2000 03:45

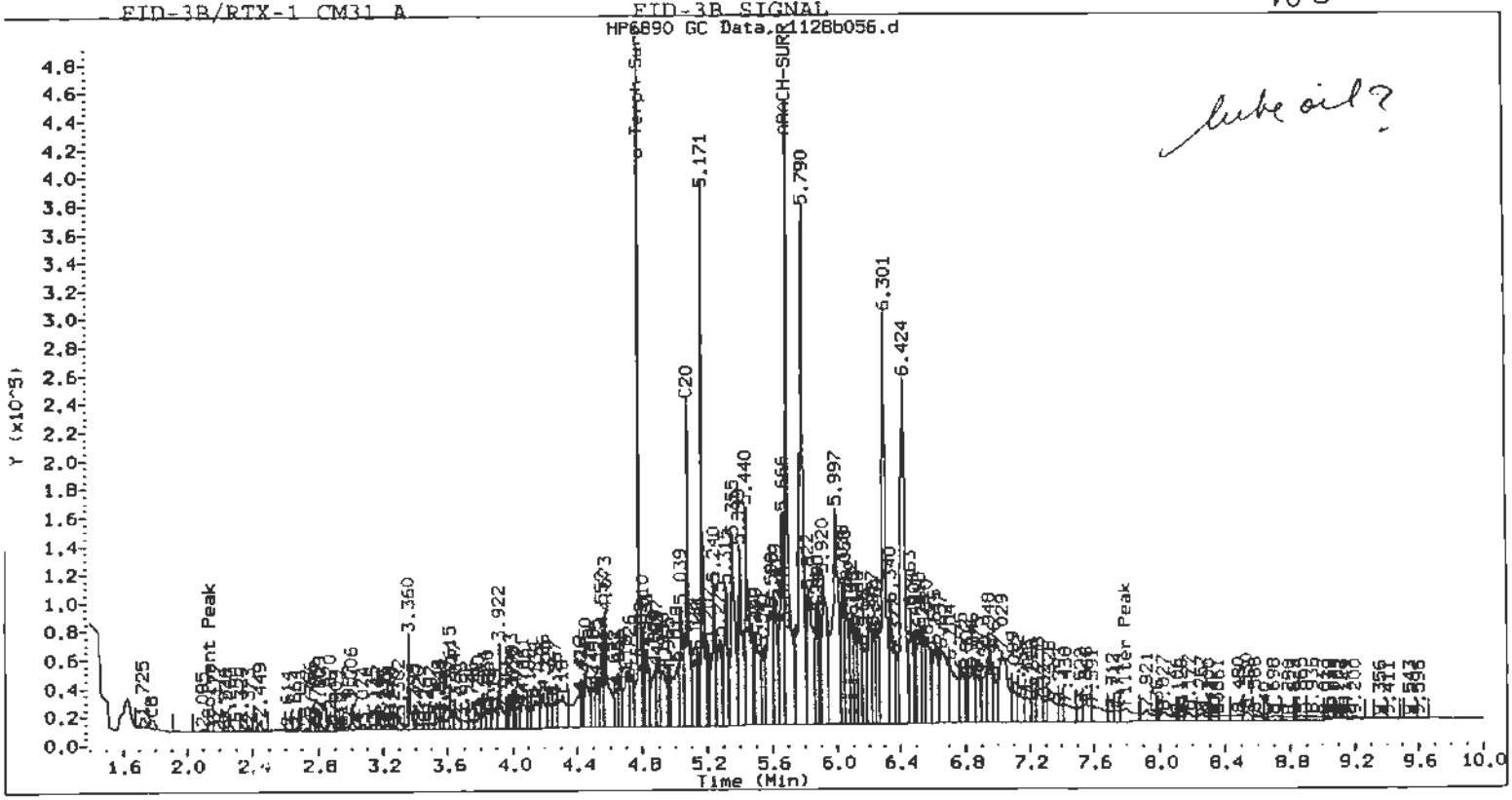
Dilution Factor: 1

Tazz-1B RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	----				GAS (Tol-C12)	15019322	41
C8	1.780	-0.034	6609	611332	DIESEL (C12-C24)	299314824	371
Solvent Peak	2.138	-0.004	7570	509473	M.OIL (C24-C38)	251124266	340
C10	2.943	0.001	2203	125619			
C12	3.462	-0.001	4913	484658			
C14	3.878	-0.021	17765	1451611			
C16	4.307	0.008	23214	3663578			
C18	4.699	-0.003	39924	4223331			
o-Terph Surr	4.783	-0.002	448192	11818502			
C20	5.082	-0.020	230173	11768300			
C22	5.482	-0.003	61936	3275976			
ARACH-SURR	5.696	0.003	373002	14243029			
C24	5.877	0.025	82343	4535384			
C26	6.205	-0.002	71779	6110655			
C28	6.543	-0.013	66084	4291860			
C30	6.923	0.005	35571	3696957			
Filter Peak	7.793	-0.006	9195	2463572			
C32	7.293	0.010	15624	1090233			
C34	----						
C36	7.985	-0.006	4829	285028	Me-Arach Surrogate Rec = 104%	(14243029)	
C38	8.347	0.012	3597	478098	o-Terphenyl Surrogate Rec = 88%	(11818502)	
C40	8.647	-0.023	2846	144977			

ND

FID-3B/RTX-1 CM31 A FID-3B SIGNAL
HP6890 GC Data.d\1128b056.d



Analytical Resources Inc.
NWTPH-D Quantitation Report

Data file: /chem2/fid3b.i/28NOV00.B/1128b048.d
Method: /chem2/fid3b.i/28NOV00.B/tphfid3b.m
Instrument: fid3b.i
Operator: GSA
Report Date: 11/30/2000
Macro: FID:3B112100
Calibration Dates: Gas:10/31/00 Diesel:11/10/00 M.Oil:11/06/00

ARI ID: CM31 C
Client ID:
Injection: 29-NOV-2000 01:06

Dilution Factor: 1

Tazz-1B RESULTS

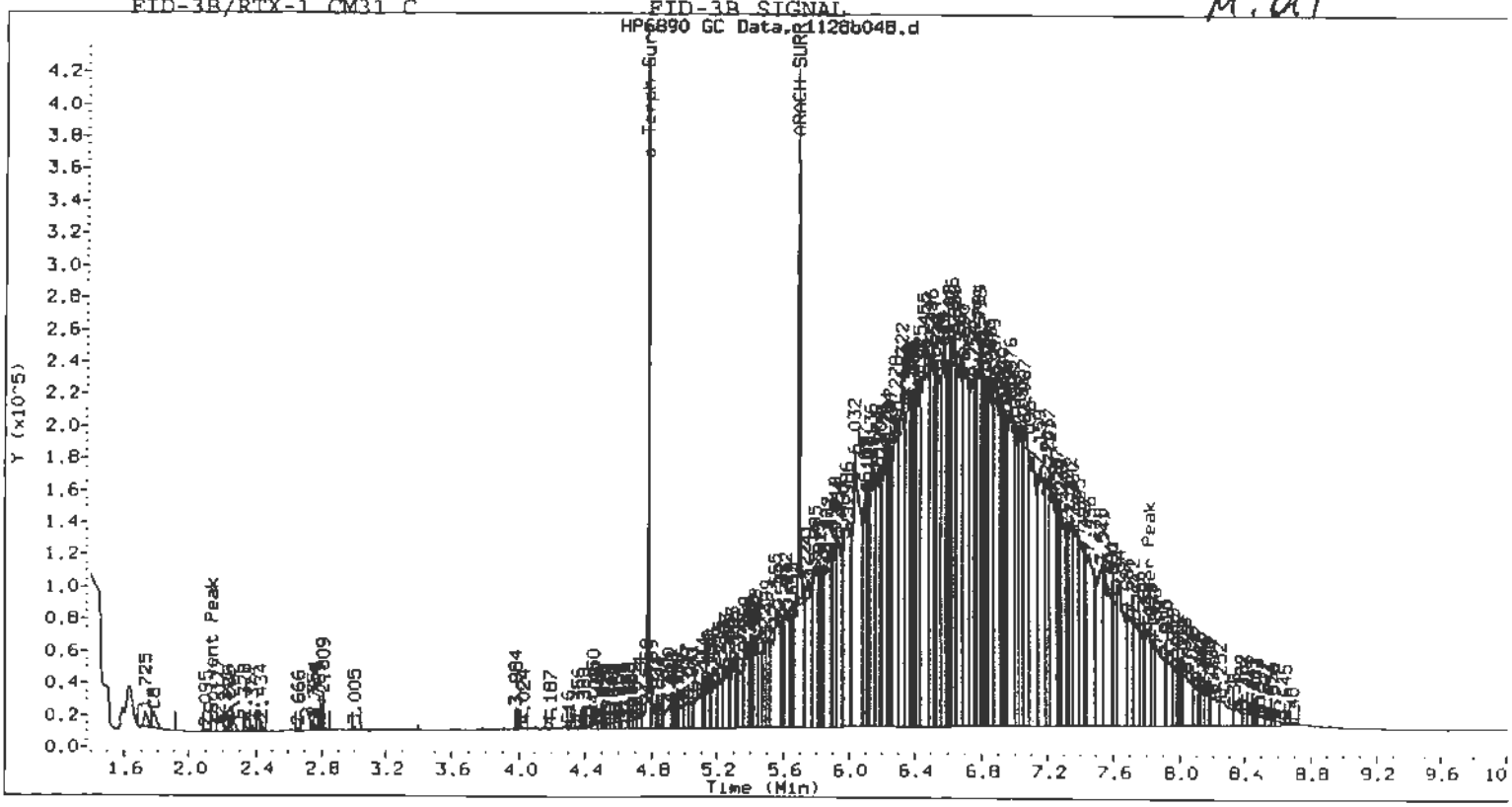
Compound	RT	Shift	Height	Area
Toluene	----			
C8	1.779	-0.035	9814	816782
Solvent Peak	2.131	-0.011	9914	795316
C10	----			
C12	----			
C14	----			
C16	4.297	-0.002	2277	103327
C18	4.698	-0.005	7383	415595
o-Terph Surr	4.782	-0.004	399076	10297486
C20	5.098	-0.004	25153	3231332
C22	5.484	-0.001	53810	3777956
ARACH-SURR	5.694	0.001	331375	12701171
C24	5.836	-0.016	92872	3178450
C26	6.221	0.014	180425	16257863
C28	6.571	0.015	236567	21617272
C30	6.915	-0.003	198141	7425041
Filter Peak	7.816	0.017	61519	6778957
C32	7.284	0.002	132317	11839234
C34	7.638	-0.004	87818	13542086
C36	7.993	0.002	34225	1610814
C38	8.331	-0.003	10541	1556515
C40	8.693	0.024	1828	214278

	Range	Total Area	Conc
GAS	(Tol-C12)	6393343	18
DIESEL	(C12-C24)	156227752	194
M.OIL	(C24-C38)	942236224	1276

Me-Arach Surrogate Rec = 93% (12701171)
o-Terphenyl Surrogate Rec = 77% (10297486)

M.oil

FID-3B/RTX-1 CM31 C FID-3B SIGNAL
HP6890 GC Data.n1128b048.d



Analytical Resources Inc.
NWTPH-D Quantitation Report

:a file: /chem2/fid3b.i/28NOV00.B/1128b047.d
chod: /chem2/fid3b.i/28NOV00.B/tphfid3b.m
Instrument: fid3b.i
Operator: GSA
Report Date: 11/30/2000
Macro: FID:3B112100
Calibration Dates: Gas:10/31/00 Diesel:11/10/00 M.Oil:11/06/00

ARI ID: CM31 B
Client ID:
Injection: 29-NOV-2000 00:46

Dilution Factor: 1

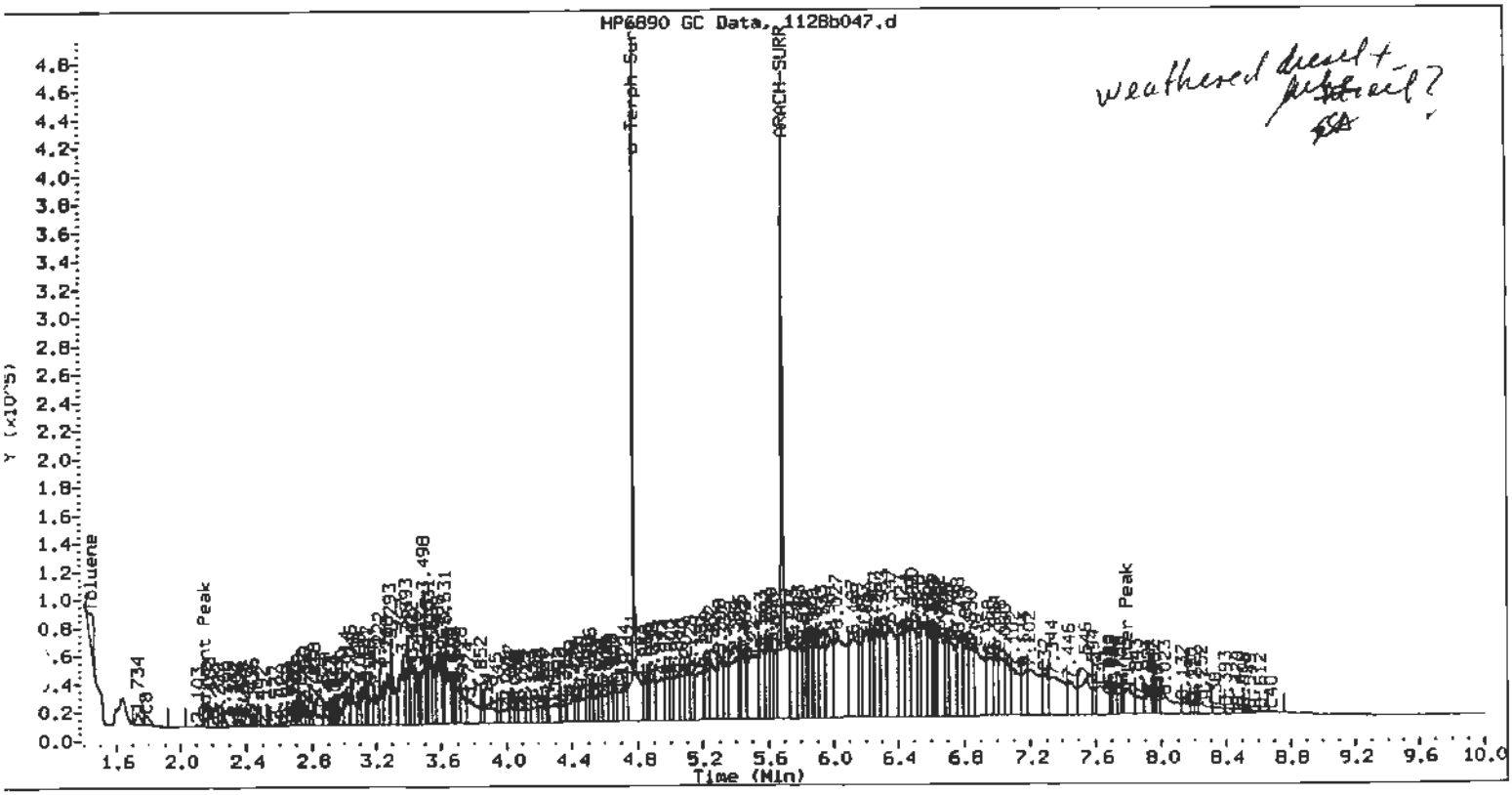
Tazz-1B RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	1.450	0.029	29271	2305211	GAS (Tol-C12)	58028972	160
C8	1.790	-0.024	6761	685123	DIESEL (C12-C24)	200027454	248
Solvent Peak	2.151	0.009	6052	381421	M.OIL (C24-C38)	247586803	335
C10	2.944	0.002	6615	324664			
C12	3.467	0.003	34127	1483696			
C14	3.880	-0.019	10927	2137248			
C16	4.298	-0.001	13424	2169953			
C18	4.700	-0.003	22781	2501257			
o-Terph Surr	4.784	-0.002	450628	11457272			
C20	5.099	-0.003	35488	2720749			
C22	5.507	0.023	45261	9034523			
ARACH-SURR	5.691	-0.002	362133	13481178			
C24	5.862	0.010	51272	3657508			
C26	6.206	-0.001	64265	6822623			
C28	6.553	-0.003	64288	7249009			
C30	6.880	-0.038	48299	8568567			
Filter Peak	7.789	-0.009	17849	3326662			
C32	7.295	0.012	29160	3160604			
C34	7.623	-0.018	20253	3943239			
	7.980	-0.011	10219	600149	Me-Arach Surrogate Rec = 98% (13481178)		
C38	8.338	0.004	4337	874552	o-Terphenyl Surrogate Rec = 85% (11457272)		
C40	8.686	0.016	1421	200859			

FID-3B/RTX-1 CM31 B

FID-3B SIGNAL

NO



weathered diesel + ~~fuel~~ oil?
GSA

Analytical Resources Inc.
NWTPH-D Quantitation Report

...ta file: /chem2/fid3b.i/28NOV00.B/1128b060.d
Method: /chem2/fid3b.i/28NOV00.B/tphfid3b.m
Instrument: fid3b.i
Operator: GSA
Report Date: 11/30/2000
Macro: FID:3B112100
Calibration Dates: Gas:10/31/00 Diesel:11/10/00 M.Oil:11/06/00

ARI ID: CM31 D 5x
Client ID:
Injection: 29-NOV-2000 05:04

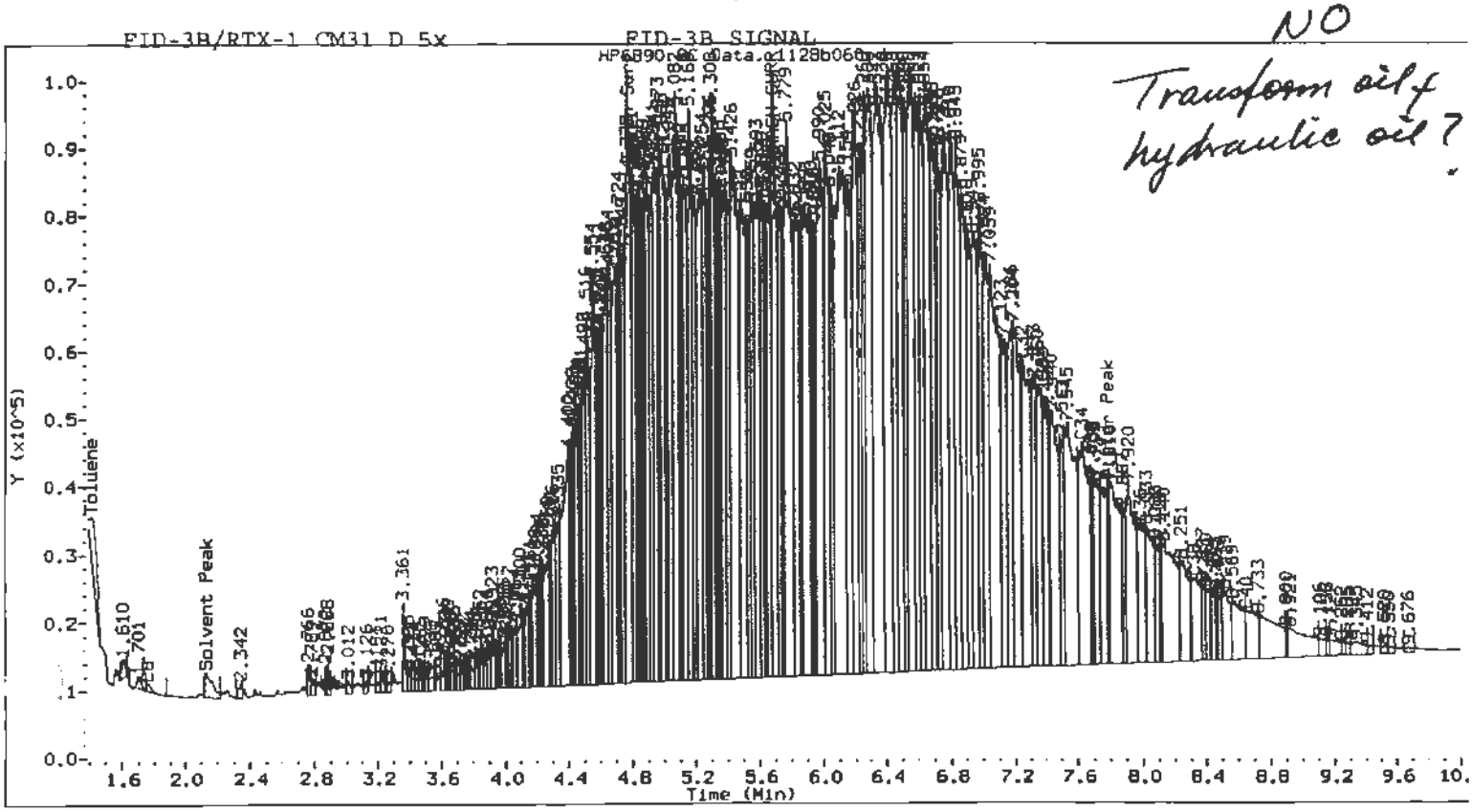
Dilution Factor: 1

Tazz-1B RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	1.418	-0.003	6541	1244462	GAS (Tol-C12)	4928511	14
C8	1.766	-0.048	1153	102509	DIESEL (C12-C24)	325839807	404
Solvent Peak	2.127	-0.015	3742	560342	M.OIL (C24-C38)	368208979	499
C10	----						
C12	3.463	0.000	2913	125391			
C14	3.897	-0.002	7276	309373			
C16	4.297	-0.002	24686	1539584			
C18	4.697	-0.006	61391	6069684			
o-Terph Surr	4.782	-0.003	83108	1864602			
C20	5.101	-0.002	77367	4782342			
C22	5.488	0.003	70089	9138120			
ARACH-SURR	5.690	-0.003	77384	2612532			
C24	5.865	0.013	66801	2692280			
C26	6.208	0.001	83930	8850988			
C28	6.561	0.005	91987	11788000			
C30	6.911	-0.007	64719	5958530			
Filter Peak	7.792	-0.007	26866	1581234			
[illegible]	7.258	-0.025	45369	8011918			
	7.634	-0.008	33079	6747690			
C36	7.993	0.002	20689	3517626	Me-Arach Surrogate Rec =	19%	(2612532)
C38	8.330	-0.004	12339	2255699	o-Terphenyl Surrogate Rec =	14%	(1864602)
C40	8.653	-0.016	7134	1625274			

NO
Transform oil of hydraulic oil?

FID-3B/RTX-1 CM31 D 5x FID-3B SIGNAL



Analytical Resources Inc.
NWTPH-D Quantitation Report

Data file: /chem2/fid4a.i/30nov00.b/1130a015.d
Method: /chem2/fid4a.i/22nov00.b/tphfid4a.m
Instrument: fid4a.i
Operator: GSA
Report Date: 11/30/2000
Macro: FID:4A112100
Calibration Dates: Gas:11/17/00 Diesel:11/17/00 M.Oil:11/21/00

ARI ID: CM31 E 10x
Client ID:
Injection: 30-NOV-2000 14:13

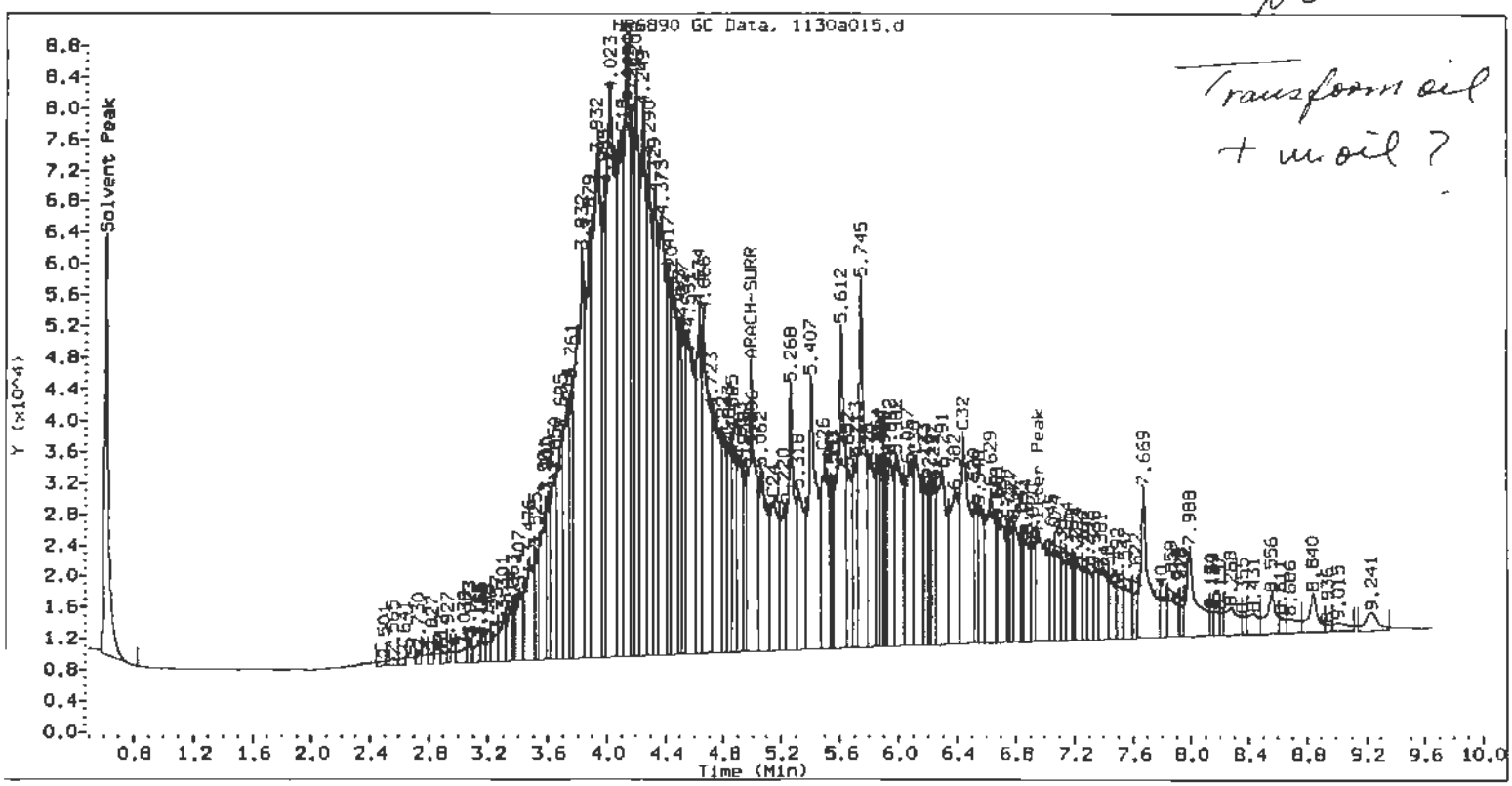
Dilution Factor: 1

FID:4A RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	----				GAS (Tol-C12)	5891168	27
C8	----				DIESEL (C12-C24)	208439742	358
Solvent Peak	0.608	0.001	53653	4893841	M.OIL (C24-C38)	123477620	251
C10	----						
C12	2.890	0.008	1659	160159			
C14	3.348	0.003	7154	669962			
C16	3.740	0.005	33032	4076799			
C18	4.109	0.016	66741	9676012			
o-terph	4.133	-0.001	24784	673183			
C20	4.449	0.006	47807	6311268			
C22	4.800	0.002	28438	2809000			
ARACH-SURR	4.993	-0.001	12988	517398			
C24	5.151	0.006	19611	3986281			
C26	5.494	0.006	25100	4358111			
C28	5.793	-0.024	24220	3528674			
C30	6.116	-0.017	24342	4825565			
C32	6.443	-0.021	26967	5975772			
C34	6.792	-0.006	15444	2223619			
Filter Peak	6.957	-0.026	13815	3548150	Me-Arach Surrogate Rec =	6%	(517398)
C36	7.110	-0.021	10997	1094324	o-Terph Surrogate Rec =	7%	(673183)
C38	7.435	-0.018	7660	1172555			
C40	7.790	0.025	4769	708269			

FID:4A-2C/RTX-1 CM31 E 10x FID:4A SIGNAL

NO Transformer oil + m oil ?



Analytical Resources Inc.
NWTPH-D Quantitation Report

Data file: /chem2/fid3b.i/28NOV00.B/1128b061.d
Method: /chem2/fid3b.i/28NOV00.B/tphfid3b.m
Instrument: fid3b.i
Operator: GSA
Report Date: 11/30/2000
Macro: FID:3B112100
Calibration Dates: Gas:10/31/00 Diesel:11/10/00 M.Oil:11/06/00

ARI ID: CM31 F 5x
Client ID:
Injection: 29-NOV-2000 05:24

Dilution Factor: 1

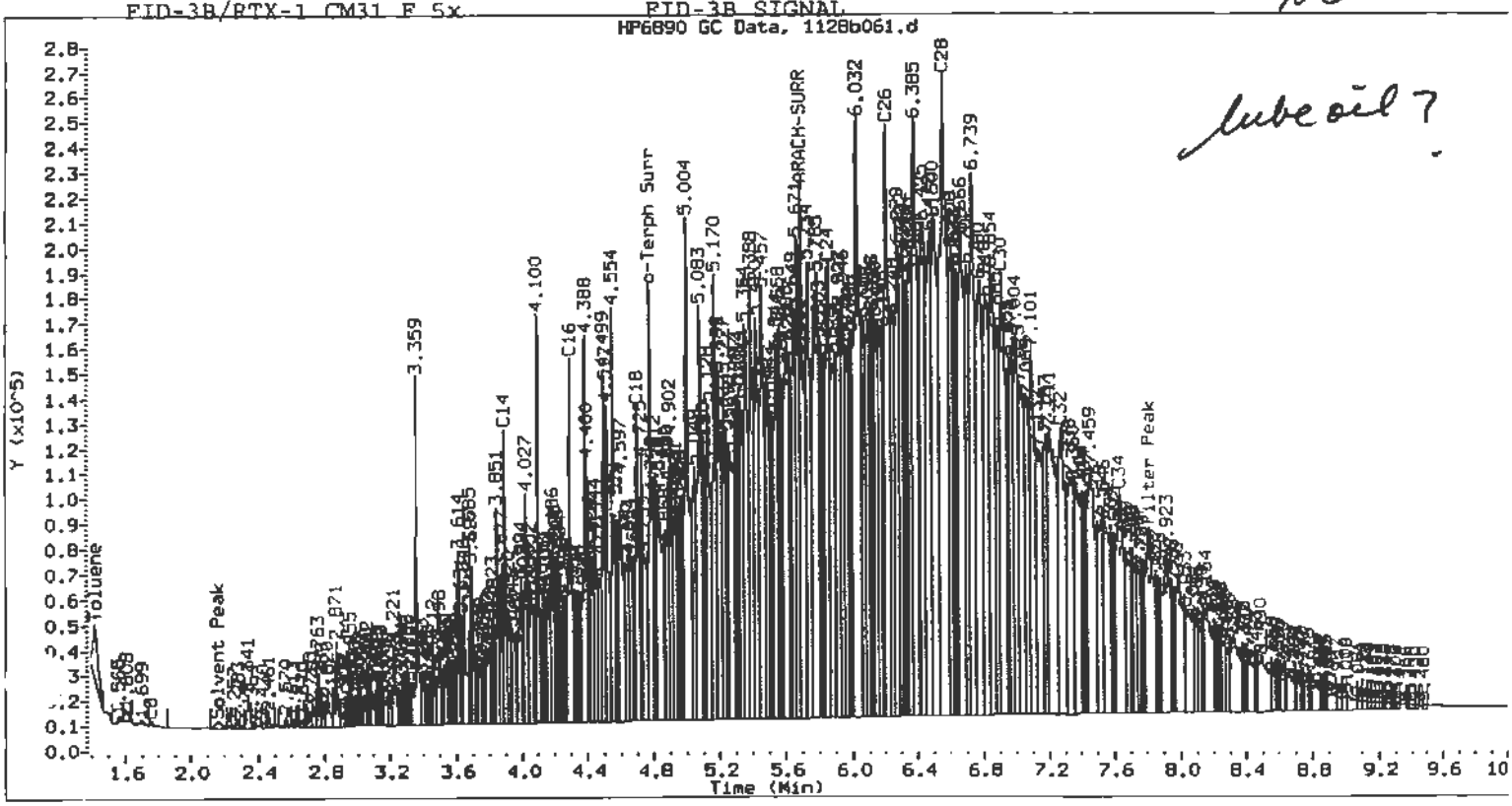
Tazz-1B RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	1.422	0.001	22510	2320500	GAS (Tol-C12)	35322209	97
C8	1.757	-0.056	2065	223667	DIESEL (C12-C24)	594410171	737
Solvent Peak	2.163	0.021	2749	388196	M.OIL (C24-C38)	833633082	1129
C10	2.942	0.000	12129	364528			
C12	3.463	-0.001	35871	1139176			
C14	3.896	-0.003	118052	3755632			
C16	4.297	-0.003	144831	7910516			
C18	4.700	-0.003	125846	7539966			
o-Terph Surr	4.781	-0.004	87212	1995041			
C20	5.100	-0.003	113247	4693647			
C22	5.485	0.000	134487	7663916			
ARACH-SURR	5.694	0.001	74885	2382046			
C24	5.853	0.001	180676	15674385			
C26	6.209	0.002	236001	22640288			
C28	6.560	0.004	255338	38907966			
C30	6.919	0.001	176847	20628895			
Filter Peak	7.815	0.016	73707	11948481			
C32	7.283	0.000	114044	14485657			
	7.638	-0.003	88676	14282271			
C36	7.989	-0.002	53216	7612033			
C38	8.326	-0.008	30778	5146942			
C40	8.658	-0.012	15188	2120205			

Me-Arach Surrogate Rec = 17% (2382046)
o-Terphenyl Surrogate Rec = 15% (1995041)

NO

FID-3B/RTX-1 CM31 F 5x FID-3B SIGNAL
HP6890 GC Data, 1128b061.d



lube oil ?

Analytical Resources Inc.
NWTPH-D Quantitation Report

Data file: /chem2/fid3b.i/28NOV00.B/1128b049.d
Method: /chem2/fid3b.i/28NOV00.B/tphfid3b.m
Instrument: fid3b.i
Operator: GSA
Report Date: 11/30/2000
Macro: FID:3B112100
Calibration Dates: Gas:10/31/00 Diesel:11/10/00 M.Oil:11/06/00

ARI ID: CM31 G
Client ID:
Injection: 29-NOV-2000 01:26

Dilution Factor: 1

Tazz-1B RESULTS

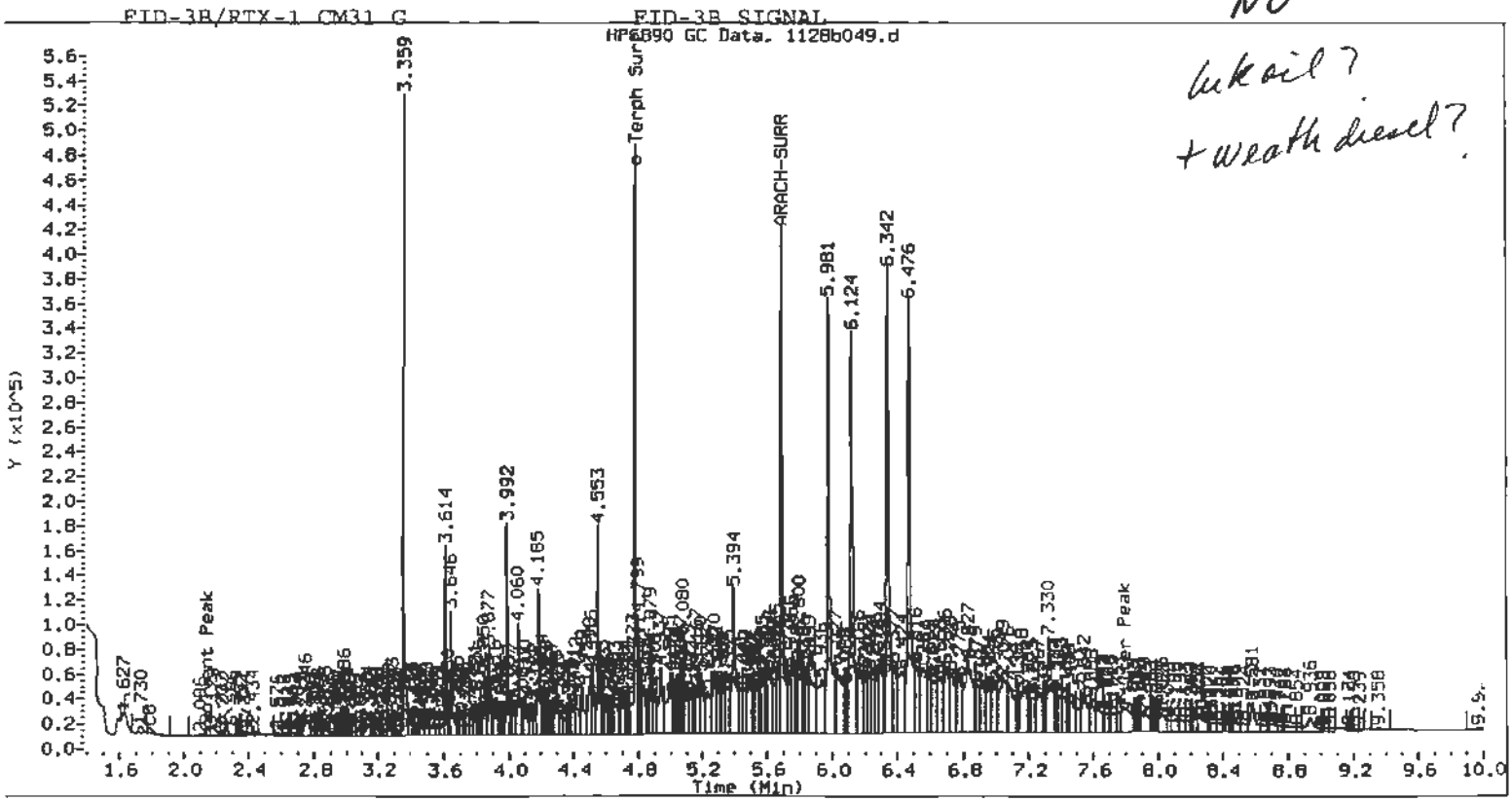
Compound	RT	Shift	Height	Area
Toluene	----			
C8	1.787	-0.026	4815	451518
Solvent Peak	2.140	-0.002	7805	503944
C10	2.943	0.002	6584	238420
C12	3.462	-0.001	13665	523051
C14	3.895	-0.003	21083	678560
C16	4.293	-0.006	40241	1853144
C18	4.699	-0.004	32485	2077700
o-Terph Surr	4.783	-0.002	426547	10446467
C20	5.096	-0.006	38425	1661788
C22	5.483	-0.002	44650	3908161
ARACH-SURR	5.691	-0.001	365156	12799594
C24	5.849	-0.003	48583	2394484
C26	6.206	-0.001	51329	3728346
C28	6.559	0.003	52737	6595415
C30	6.911	-0.007	38526	3560773
Filter Peak	7.791	-0.008	19279	3810582
C32	7.298	0.015	29123	1914814
C34	7.631	-0.011	18116	2119843
C36	7.995	0.005	11356	397062
C38	8.328	-0.007	7411	857621
C40	8.680	0.010	5647	226234

Range	Total Area	Conc
GAS (Tol-C12)	30275839	83
DIESEL (C12-C24)	218364314	271
M.OIL (C24-C38)	278971663	378

Me-Arach Surrogate Rec = 93% (12799594)
o-Terphenyl Surrogate Rec = 78% (10446467)

NO
lubeoil?
+weath diesel?

FID-3B/RTX-1 CM31 G FID-3B SIGNAL
HP6890 GC Data. 1128b049.d



Analytical Resources Inc.
NWTPH-D Quantitation Report

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Method: /chem2/fid3b.i/28NOV00.B/tphfid3b.m
Instrument: fid3b.i
Operator: GSA
Report Date: 11/30/2000
Macro: FID:3B112100
Calibration Dates: Gas:10/31/00 Diesel:11/10/00 M.Oil:11/06/00

ARI ID: CM31 H
Client ID:
Injection: 29-NOV-2000 03:05

Dilution Factor: 1

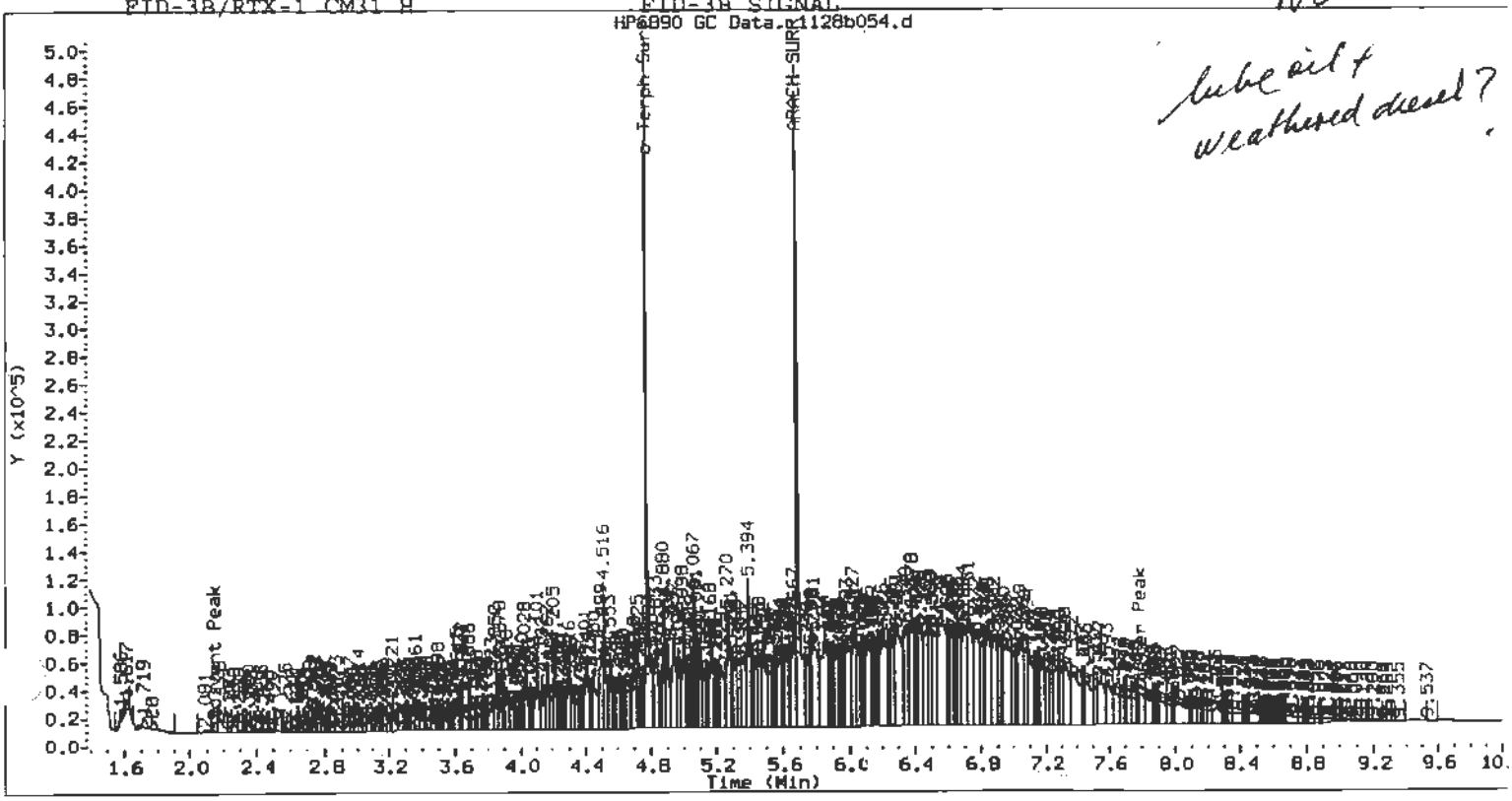
Tazz-1B RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	----				GAS (Tol-C12)	24143747	66
C8	1.776	-0.038	6813	612391	DIESEL (C12-C24)	253172730	314
Solvent Peak	2.143	0.001	7511	516200	M.OIL (C24-C38)	300936987	408
C10	2.943	0.002	14859	576031			
C12	3.463	0.000	28413	758457			
C14	3.897	-0.002	41014	1281161			
C16	4.297	-0.003	53725	2645210			
C18	4.700	-0.003	55434	2927207			
o-Terph Surr	4.784	-0.002	460762	11768711			
C20	5.097	-0.005	59260	2550978			
C22	5.482	-0.003	65745	5355816			
ARACH-SURR	5.694	0.001	403075	13307084			
C24	5.848	-0.004	69350	8973378			
C26	6.203	-0.004	76887	9780335			
C28	6.558	0.002	82669	13224291			
C30	6.909	-0.009	60169	5231491			
Filter Peak	7.794	-0.005	22401	2342810			
C32	7.285	0.002	39719	1225313			
4	7.631	-0.011	23531	2741176			
36	7.991	0.000	13492	692725	Me-Arach Surrogate Rec = 97%	(13307084)	
C38	8.329	-0.005	8074	576873	o-Terphenyl Surrogate Rec = 88%	(11768711)	
C40	8.670	0.001	4854	119772			

NO

lube oil + weathered diesel?

FID-3B/RTX-1 CM31 H FID-3B SIGNAL
HP6890 GC Data.m1128b054.d



Analytical Resources Inc.
NWTPH-D Quantitation Report

Data file: /chem2/fid3b.i/28NOV00.B/1128b050.d
Method: /chem2/fid3b.i/28NOV00.B/tphfid3b.m
Instrument: fid3b.i
Operator: GSA
Report Date: 11/30/2000
Macro: FID:3B112100
Calibration Dates: Gas:10/31/00 Diesel:11/10/00 M.Oil:11/06/00

ARI ID: CM31 I
Client ID:
Injection: 29-NOV-2000 01:46

Dilution Factor: 1

Tazz-1B RESULTS

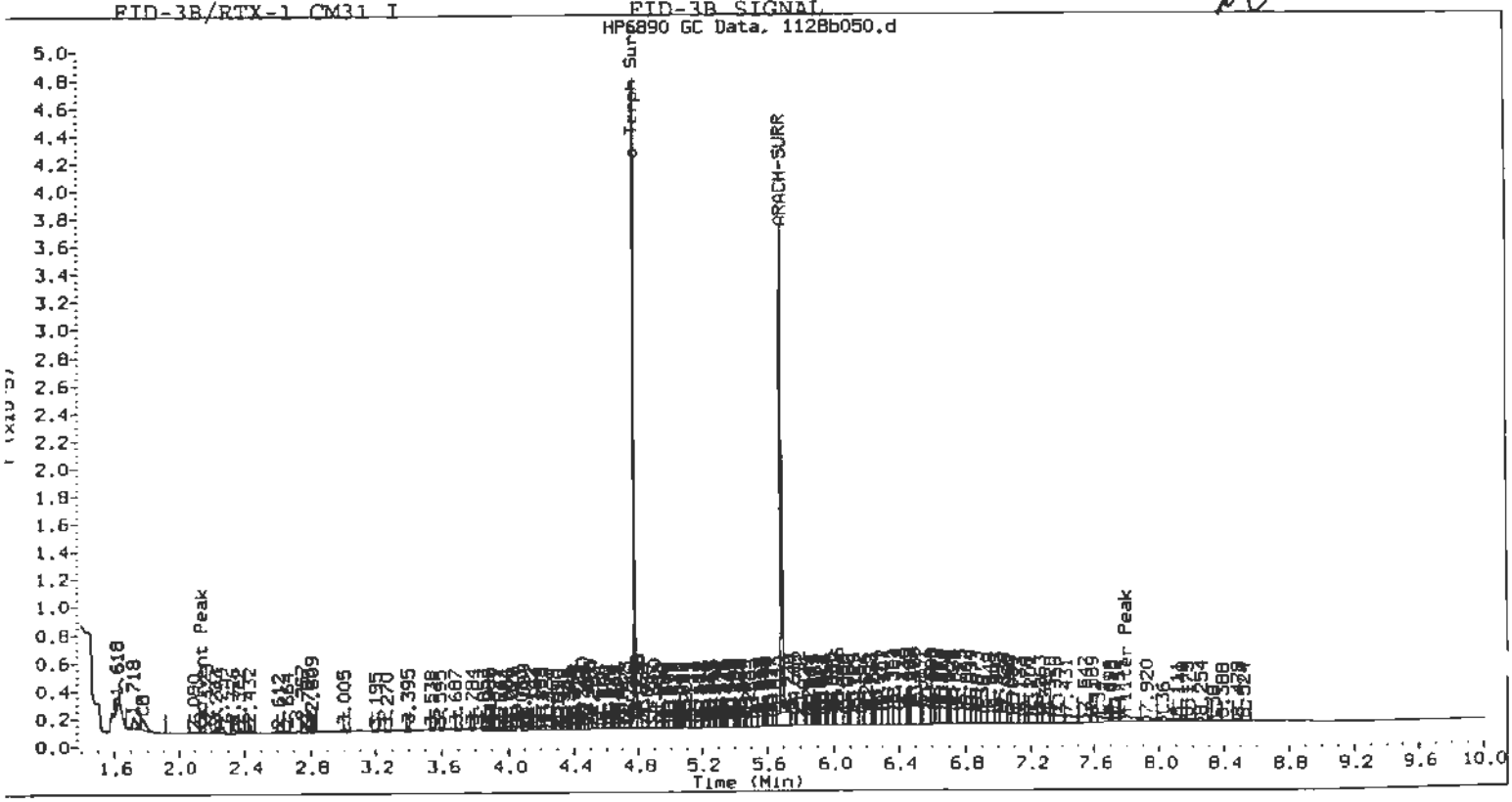
Compound	RT	Shift	Height	Area
Toluene	----			
C8	1.772	-0.042	8236	676490
Solvent Peak	2.138	-0.004	5801	363143
C10	----			
C12	----			
C14	3.897	-0.002	4563	145182
C16	4.296	-0.003	7114	316656
C18	4.699	-0.004	8647	451490
o-Terph Surr	4.782	-0.003	459012	11528210
C20	5.097	-0.005	8039	479008
C22	5.480	-0.005	7569	515517
ARACH-SURR	5.691	-0.002	350288	13318118
C24	5.851	-0.001	9337	761153
C26	6.204	-0.003	11833	1325365
C28	6.559	0.003	14507	1851127
C30	6.903	-0.015	9262	1020959
Filter Peak	7.793	-0.006	4634	1172472
C32	7.295	0.012	7899	846944
C34	7.628	-0.014	4465	880055
C36	8.025	0.034	3556	686117
C38	8.330	-0.004	886	136286
C40	0.000	-8.670	0	0

	Range	Total Area	Conc
GAS	(Tol-C12)	6360152	17
DIESEL	(C12-C24)	32598126	40
M.OIL	(C24-C38)	52652217	71

Me-Arach Surrogate Rec = 97% (13318118)
o-Terphenyl Surrogate Rec = 86% (11528210)

NO

FID-3B/RTX-1 CM31 I FID-3B SIGNAL
HP6890 GC Data, 1128b050.d



Analytical Resources Inc.
NWTPH-D Quantitation Report

ata file: /chem2/fid3b.i/28NOV00.B/1128b062.d
Method: /chem2/fid3b.i/28NOV00.B/tphfid3b.m
Instrument: fid3b.i
Operator: GSA
Report Date: 11/30/2000
Macro: FID:3B112100
Calibration Dates: Gas:10/31/00 Diesel:11/10/00 M.Oil:11/06/00

ARI ID: CM31 J 5x
Client ID:
Injection: 29-NOV-2000 05:44

Dilution Factor: 1

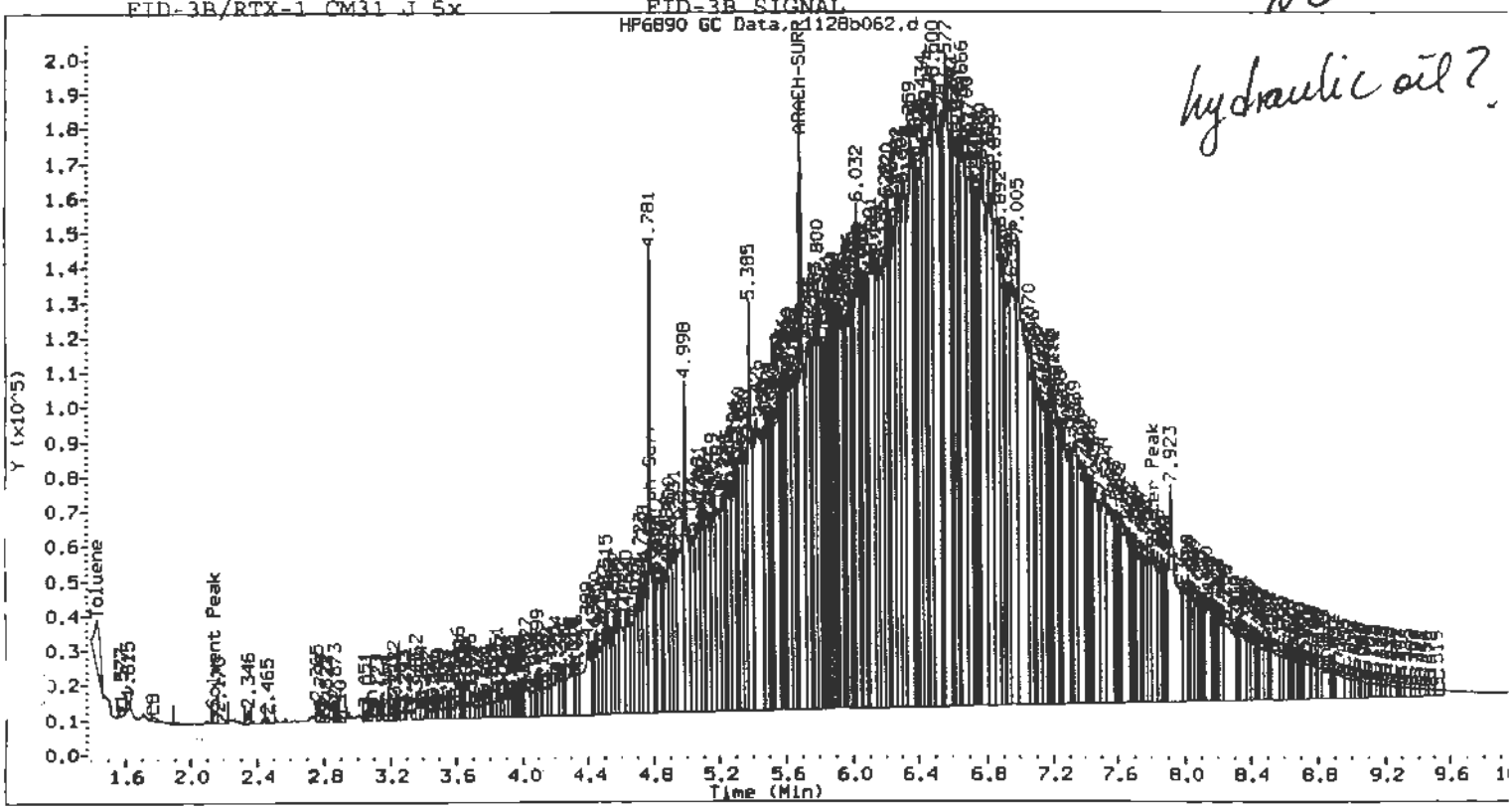
Tazz-1B RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	1.434	0.013	13719	1684574	GAS (Tol-C12)	6750362	19
C8	1.774	-0.040	1289	124463	DIESEL (C12-C24)	294210062	365
Solvent Peak	2.140	-0.002	3649	250844	M.OIL (C24-C38)	677001008	917
C10	2.904	-0.037	1925	130897			
C12	3.463	0.000	5342	183733			
C14	3.896	-0.002	11421	467212			
C16	4.296	-0.003	17873	1858725			
C18	4.699	-0.004	34705	2479357			
o-Terph Surr	4.789	0.004	42998	4303078			
C20	5.099	-0.003	60592	3365984			
C22	5.486	0.001	84789	5777227			
ARACH-SURR	5.692	-0.001	80801	2885946			
C24	5.853	0.001	108409	5887956			
C26	6.212	0.005	146136	9858916			
C28	6.542	-0.014	169175	7370786			
C30	6.911	-0.007	126917	6280634			
Filter Peak	7.817	0.019	43852	4588647			
C32	7.264	-0.019	79218	9827649			
4	7.631	-0.011	52510	6986683			
36	7.993	0.003	33133	3477541	Me-Arach Surrogate Rec =	21%	(2885946)
C38	8.330	-0.004	19941	691972	o-Terphenyl Surrogate Rec =	32%	(4303078)
C40	8.665	-0.005	11666	763150			

NO

hydraulic oil?

FID-3B/RTX-1 CM31 J 5x FID-3B SIGNAL
HP6890 GC Data 1128b062.d



Analytical Resources Inc.
NWTPH-D Quantitation Report

Data file: /chem2/fid3b.i/28NOV00.B/1128b055.d
Method: /chem2/fid3b.i/28NOV00.B/tphfid3b.m
Instrument: fid3b.i
Operator: GSA
Report Date: 11/30/2000
Macro: FID:3B112100
Calibration Dates: Gas:10/31/00 Diesel:11/10/00 M.Oil:11/06/00

ARI ID: CM31 K
Client ID:
Injection: 29-NOV-2000 03:25

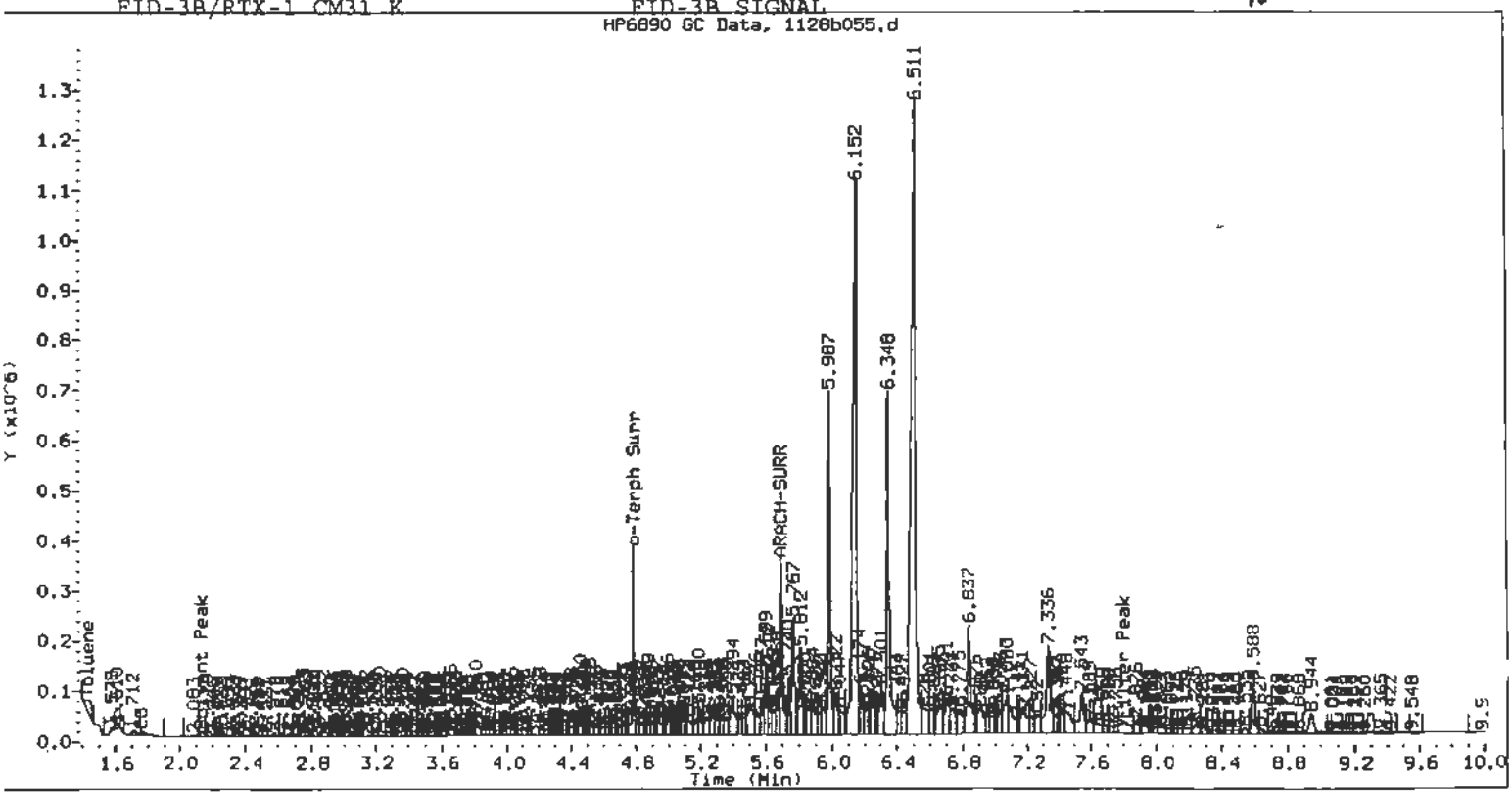
Dilution Factor: 1

Tazz-1B RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	1.434	0.013	22291	3142662	GAS (Tol-C12)	33395347	~~92~~
C8	1.768	-0.046	7640	713563	DIESEL (C12-C24)	203328196	252
Solvent Peak	2.126	-0.016	10139	712458	M.OIL (C24-C38)	515632995	698
C10	2.942	0.001	16059	541409			
C12	3.462	-0.001	16251	606108			
C14	3.895	-0.003	16273	675750			
C16	4.295	-0.004	18431	753326			
C18	4.699	-0.004	22459	1349079			
o-Terph Surr	4.783	-0.003	344049	8925464			
C20	5.098	-0.005	33507	1557561			
C22	5.499	0.014	68418	7877127			
ARACH-SURR	5.692	-0.001	299982	10675412			
C24	5.862	0.010	61288	5401448			
C26	6.216	0.009	52965	3555324			
C28	6.558	0.002	52169	6227191			
C30	6.908	-0.010	52430	6752391			
Filter Peak	7.797	-0.002	25136	5235201			
C32	7.266	-0.017	39070	4283713			
C34	7.630	-0.012	22376	3259503			
C36	7.990	-0.001	12671	742425	Me-Arach Surrogate Rec =	78%	(10675412)
C38	8.340	0.005	7268	553145	o-Terphenyl Surrogate Rec =	66%	(8925464)
C40	8.701	0.032	6459	987304			

NO

FID-3B/RTX-1 CM31 K FID-3B SIGNAL
HP6890 GC Data, 1128b055.d



Analytical Resources Inc.
NWTPH-D Quantitation Report

ata file: /chem2/fid3b.i/28NOV00.B/1128b057.d
Method: /chem2/fid3b.i/28NOV00.B/tphfid3b.m
Instrument: fid3b.i
Operator: GSA
Report Date: 11/30/2000
Macro: FID:3B112100
Calibration Dates: Gas:10/31/00 Diesel:11/10/00 M.Oil:11/06/00

ARI ID: CM31 Ams
Client ID:
Injection: 29-NOV-2000 04:05

Dilution Factor: 1

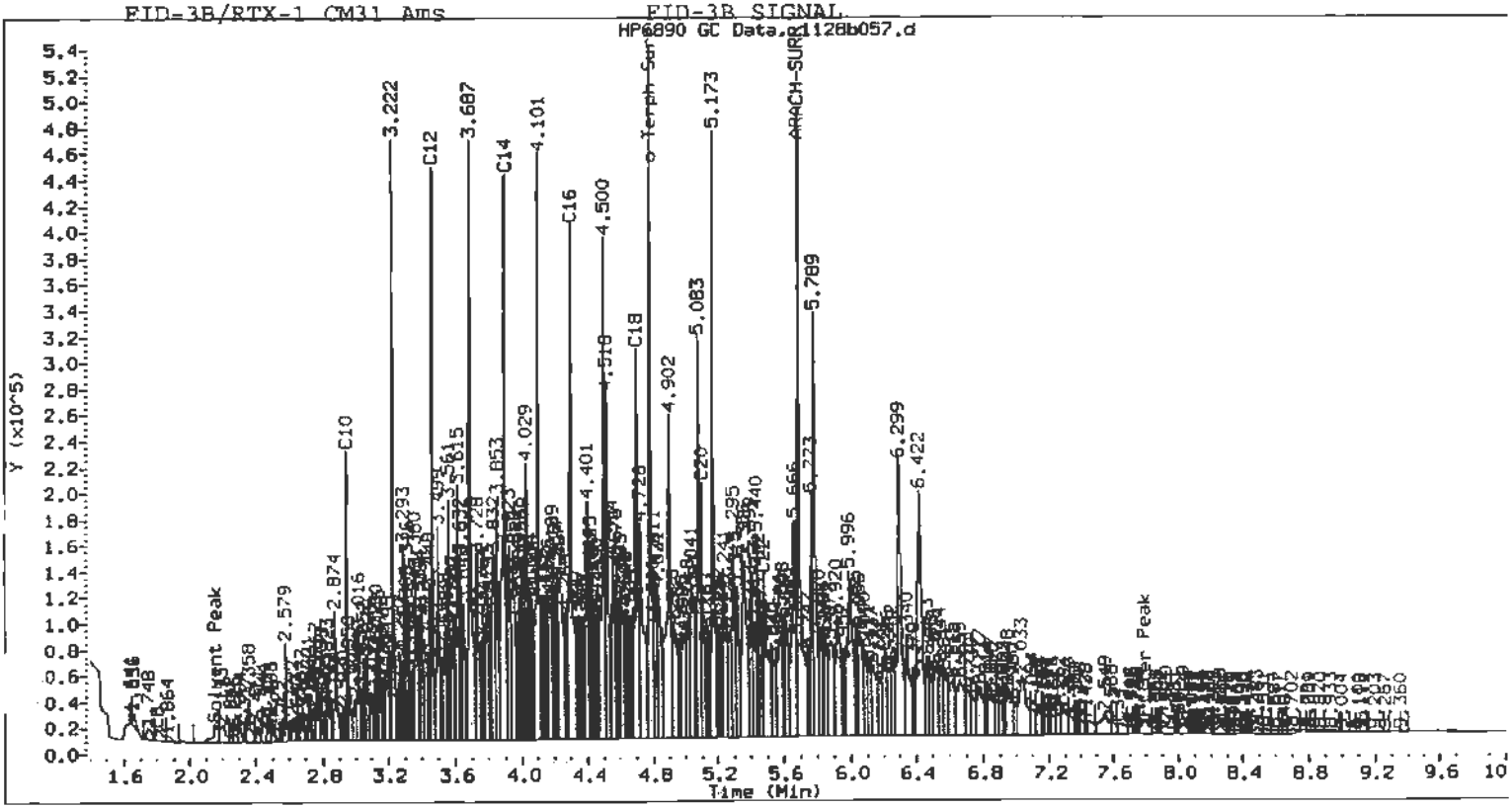
Tazz-1B RESULTS

Compound	RT	Shift	Height	Area
Toluene	----			
C8	1.803	-0.010	7900	1093554
Solvent Peak	2.150	0.008	13426	1498519
C10	2.945	0.003	222571	4619074
C12	3.465	0.001	441622	10509111
C14	3.899	0.000	436175	22710342
C16	4.299	-0.001	394041	22514293
C18	4.702	-0.001	299670	15686691
o-Terph Surr	4.785	-0.001	492798	13262430
C20	5.100	-0.002	195169	10037256
C22	5.482	-0.003	124289	11067813
ARACH-SURR	5.695	0.002	410549	14673483
C24	5.849	-0.003	79730	4515147
C26	6.205	-0.002	64635	5693119
C28	6.568	0.012	47969	4031838
C30	6.916	-0.002	27261	1802491
Filter Peak	7.794	-0.005	11164	1827203
C32	7.297	0.014	19830	2109582
4	7.631	-0.011	8275	1387448
C36	7.997	0.006	4420	110377
C38	8.330	-0.005	3017	166930
C40	8.648	-0.021	2330	171120

		Total Area	Conc
GAS	(Tol-C12)	141577468	389
DIESEL	(C12-C24)	726853542	902
M.OIL	(C24-C38)	208688177	283

Me-Arach Surrogate Rec = 107% (14673483)
o-Terphenyl Surrogate Rec = 99% (13262430)

FID=3B/RTX-1 CM31 Ams FID-3B SIGNAL
HP6890 GC Data.R1128b057.d



Analytical Resources Inc.
NWTPH-D Quantitation Report

Data file: /chem2/fid3b.i/28NOV00.B/1128b058.d
Method: /chem2/fid3b.i/28NOV00.B/tphfid3b.m
Instrument: fid3b.i
Operator: GSA
Report Date: 11/30/2000
Macro: FID:3B112100
Calibration Dates: Gas:10/31/00 Diesel:11/10/00 M.Oil:11/06/00

ARI ID: CM31 Amsd
Client ID:
Injection: 29-NOV-2000 04:25

Dilution Factor: 1

Tazz-1B RESULTS

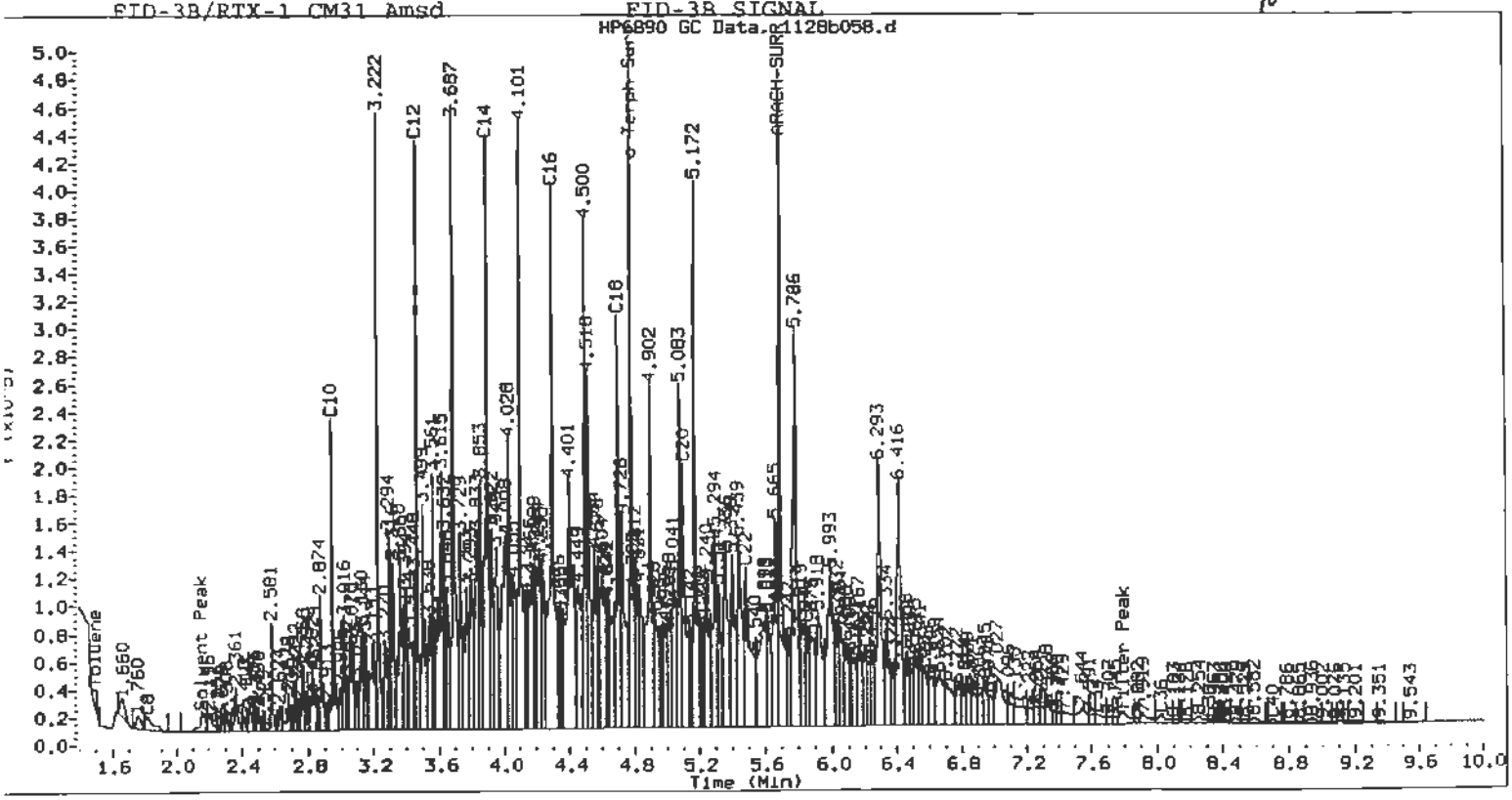
Compound	RT	Shift	Height	Area
Toluene	1.491	0.070	10132	1140792
C8	1.815	0.001	8939	1552772
Solvent Peak	2.155	0.013	13844	1600335
C10	2.945	0.003	223752	7585152
C12	3.464	0.001	425276	10460307
C14	3.898	0.000	421843	22103588
C16	4.299	-0.001	388749	27726538
C18	4.702	-0.001	298697	15285816
o-Terph Surr	4.785	-0.001	458890	11978460
C20	5.101	-0.002	190958	11815244
C22	5.482	-0.003	114694	12889365
ARACH-SURR	5.695	0.002	393683	14099954
C24	5.847	-0.005	74225	4626795
C26	6.201	-0.007	55643	4433765
C28	6.564	0.008	40734	3753410
C30	6.917	-0.001	23240	2637118
Filter Peak	7.792	-0.006	8565	1682305
C32	7.295	0.012	13402	1197644
C34	7.629	-0.013	6485	1183399
C36	8.027	0.036	6353	1274928
C38	8.319	-0.015	2442	213438
C40	8.697	0.028	2964	569666

Range	Total Area	Conc
GAS (Tol-C12)	139553846	384
DIESEL (C12-C24)	684746684	850
M.OIL (C24-C38)	183702601	249

Me-Arach Surrogate Rec = 103% (14099954)
o-Terphenyl Surrogate Rec = 89% (11978460)

NO

FID-3B/RTX-1 CM31 Amsd FID-3B SIGNAL
HP6890 GC Data.1128b058.d



Analytical Resources Inc.
NWTPH-D Quantitation Report

Data file: /chem2/fid3b.i/28NOV00.B/1128b051.d
Method: /chem2/fid3b.i/28NOV00.B/tphfid3b.m
Instrument: fid3b.i
Operator: GSA
Report Date: 11/30/2000
Macro: FID:3B112100
Calibration Dates: Gas:10/31/00 Diesel:11/10/00 M.Oil:11/06/00

ARI ID: CM31 Idup
Client ID:
Injection: 29-NOV-2000 02:06

Dilution Factor: 1

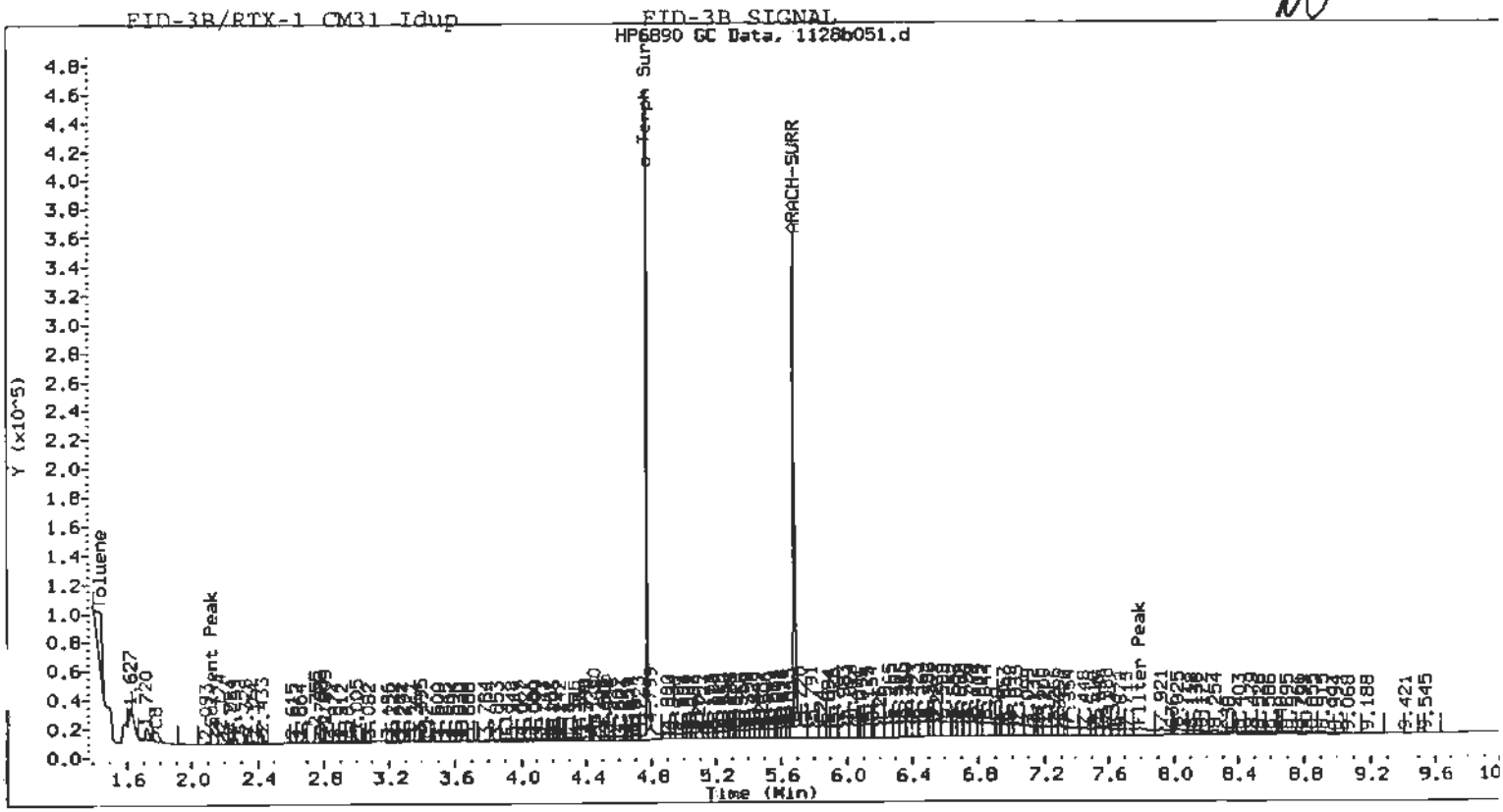
Tazz-1B RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	1.443	0.022	34431	3475627	GAS (Tol-C12)	11571827	32
C8	1.776	-0.037	7662	653008	DIESEL (C12-C24)	27295636	34
Solvent Peak	2.122	-0.020	10622	1002333	M.OIL (C24-C38)	49467008	67
C10	2.955	0.013	1140	109844			
C12	3.430	-0.034	1216	121191			
C14	3.910	0.011	2624	348454			
C16	4.297	-0.002	2666	259438			
C18	4.698	-0.005	3727	251555			
o-Terph Surr	4.782	-0.004	443514	11345556			
C20	5.097	-0.005	5411	642194			
C22	5.481	-0.004	6988	490702			
ARACH-SURR	5.690	-0.003	341474	12669359			
C24	5.847	-0.005	8685	1130931			
C26	6.202	-0.005	10834	1628983			
C28	6.553	-0.003	12246	1590735			
C30	6.910	-0.008	8579	749723			
Filter Peak	7.791	-0.008	5056	1513236			
C32	7.293	0.010	8284	869542			
C34	7.629	-0.013	4599	605959			
C36	7.992	0.001	3046	132977			
C38	8.339	0.005	2019	239159			
C40	8.658	-0.012	1516	101546			

Me-Arach Surrogate Rec = 92% (12669359)
o-Terphenyl Surrogate Rec = 85% (11345556)

NO

FID-3B/RTX-1 CM31 Idup FID-3B SIGNAL



10 X

Analytical Resources Inc.
NWTPH-D Quantitation Report

Data file: /chem2/fid3b.i/28NOV00.B/1128b059.d
Method: /chem2/fid3b.i/28NOV00.B/tphfid3b.m
Instrument: fid3b.i
Operator: GSA
Report Date: 11/30/2000
Macro: FID:3B112100
Calibration Dates: Gas:10/31/00 Diesel:11/10/00 M.Oil:11/06/00

ARI ID: CM31 E
Client ID:
Injection: 29-NOV-2000 04:44

Dilution Factor: 1

Tazz-1B RESULTS

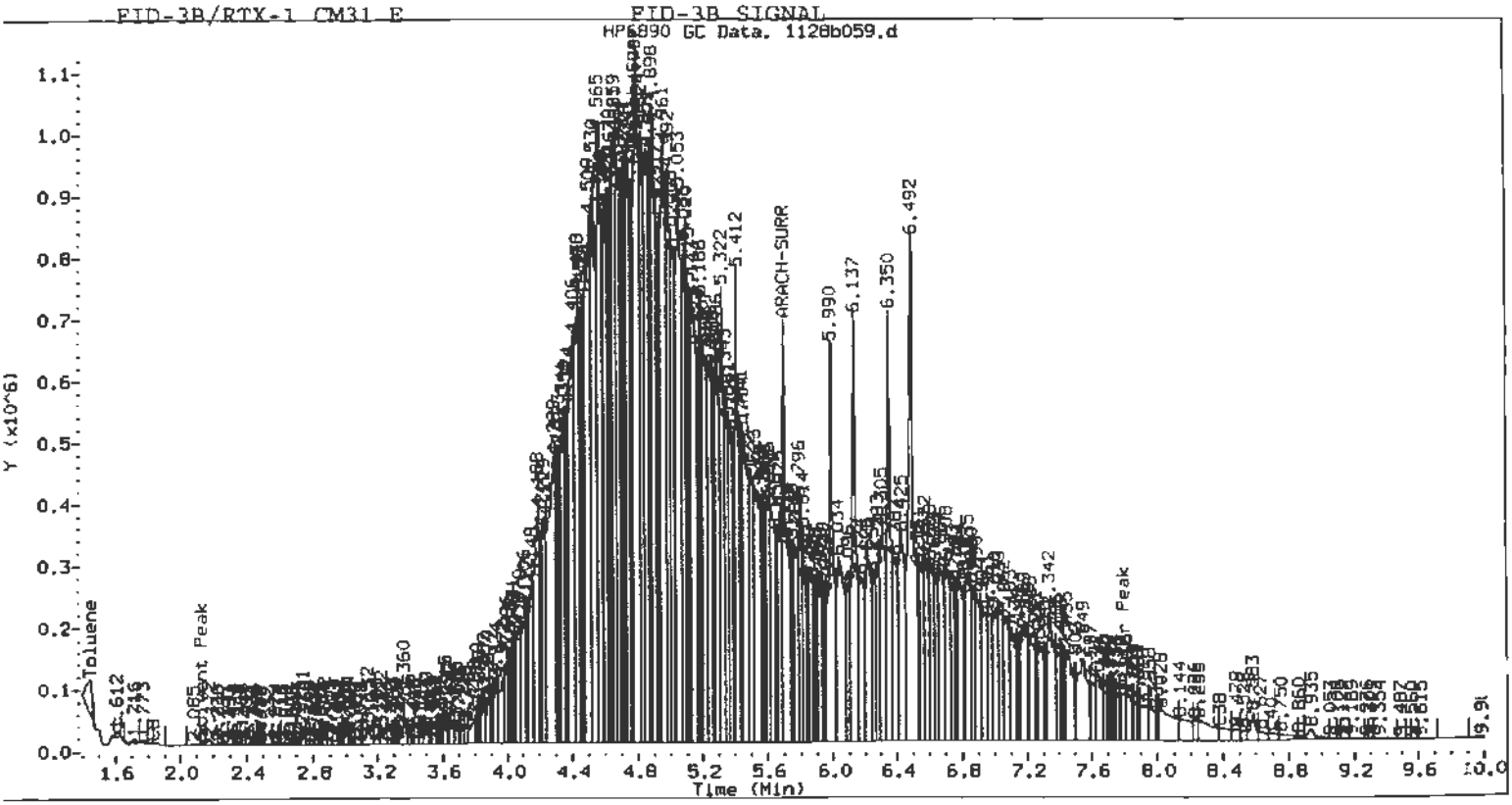
Compound	RT	Shift	Height	Area
Toluene	1.445	0.024	54928	6578458
C8	1.835	0.021	1860	226940
Solvent Peak	2.131	-0.011	8938	644007
C10	2.943	0.002	13060	696125
C12	3.464	0.000	28120	1045105
C14	3.899	0.000	75583	3287517
C16	4.306	0.007	468269	22913963
C18	4.698	-0.005	926463	43261817
o-Terph Surr	4.787	0.001	1000145	119906712
C20	5.100	-0.002	848860	41226947
C22	5.493	0.008	443706	38714653
ARACH-SURR	5.701	0.008	359946	12347334
C24	5.856	0.004	273931	20402685
C26	6.214	0.007	307402	38687934
C28	6.559	0.003	297628	23813261
C30	6.924	0.006	221757	22368755
Filter Peak	7.797	-0.001	77637	6852606
C32	7.277	-0.006	160276	17429959
C34	7.636	-0.006	109210	14418971
C36	8.000	0.010	48358	2181162
C38	8.382	0.047	18930	4226703
C40	8.699	0.030	10581	1740172

GAS (Tol-C12)	42179530	116
DIESEL (C12-C24)	3249271094	4031
M.OIL (C24-C38)	1348188924	1826

Me-Arach Surrogate Rec = 90% (12347334)
o-Terphenyl Surrogate Rec = 893% (119906712)

Needs dilution.

FID-3B/RTX-1 CM31 E FID-3B SIGNAL
HP6890 GC Data. 1128b059.d



Analytical Resources, Incorporated
Analytical Chemists and Consultants

December 11, 2000

Ty Schreiner
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: Project: Tacoma Metals
ARI Job: CM33

Dear Ty:

Please find enclosed sample custody records and final analytical results for the above referenced project. Fifteen soil samples were re-logged from archives on November 17, 2000.

Selected samples were analyzed for Lead referencing EPA method 6010. The samples were prepped on December 1, 2000 and analyzed on December 6 & 7, 2000.

No analytical complications were noted. Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Susan Snyder
Project Manager
susan@arilabs.com

SS/ss
Enclosures

RECEIVED

DEC 13 2000

K/J Federal Way
K/J No/File
Route
Return To/By

333 Ninth Avenue North • Seattle WA 98109-5187 • **206-621-6490** • **206-621-7523** fax

00-22486 to 00-22500
CH33

CHANGE ORDER

2 week TAT

ANA CAL RESOURCES INCORPORATED

Client: Kennedy Jenks

Project No: Jodie Brundage

Change by

996098.00

Change made by: Tacoma Metals

Submitted by: Steph

ARI Job No: CH50

VTSR:

Change order Date: 11/17/00

Change Acknowledged

Project Coordinator:

Extractions:

Volatiles:

GC/MS Extractions Lab:

GC Lab:

Metals:

Conventionals:

Data Section:

00-19110 Tacoma_Metals TP-5-2-3 CH50 A - TPHD
00-19111 Tacoma_Metals TP-6-2-3 CH50 B - PCB, lead
00-19112 Tacoma_Metals TP-6-4-6 CH50 C - lead
00-19113 Tacoma_Metals TP-6-6-10 CH50 D - lead
00-19114 Tacoma_Metals TP-7-2-3 CH50 E - PCB
00-19115 Tacoma_Metals TP-7-4-6 CH50 F
00-19116 Tacoma_Metals TP-7-6-10 CH50 G
00-19117 Tacoma_Metals TP-8-2-3 CH50 H
00-19118 Tacoma_Metals TP-8-6-10 CH50 I
00-19119 Tacoma_Metals TP-9-2-3 CH50 J - lead TPH
00-19120 Tacoma_Metals TP-9-6-10 CH50 K
00-19121 Tacoma_Metals TP-10-2-3 CH50 L TPHD
00-19122 Tacoma_Metals TP-11-2-3 CH50 M TPHD
00-19123 Tacoma_Metals TP-11-4-6 CH50 N TPHD
00-19124 Tacoma_Metals TP-12-2-3 CH50 O - PCB
00-19130 Tacoma_Metals TP-14-2-3 CH50 U lead
00-19131 Tacoma_Metals TP-14-4-6 CH50 V
~~00-19132 Tacoma_Metals TP-15-2-3 CH50 W~~
00-19135 Tacoma_Metals TP-16-2-3 CH50 Z - lead TPHD
00-19136 Tacoma_Metals TP-17-2-3 CH50 AA - lead
00-19137 Tacoma_Metals TP-17-4-6 CH50 AB - lead
00-19138 Tacoma_Metals TP-17-6-10 CH50 AC - lead

*Please pull Highlighted samples & re-log as new JOB for requested analyses
Thanks

Some have multiple analyses

0004F

Rev. 2
02/21/94

AN. ICAL RESOURCES INCORPORATED

CHANGE ORDER

2 week TAT

Client: Kennedy Jenks	ARI Job No: CF88
Project No: Tacoma Metals 996098.00	VTSR: / Change order Date: 11/17/00
Change made by: Jodie Brundage	
Submitted by: Stephanie	

Change Acknowledged

Project Coordinator:	
Extractions:	
Volatiles:	
GC/MS Extractions Lab:	
GC Lab:	
Metals:	
Conventionals:	
Data Section:	

00-18314 Tacoma_Metals TP-1-0-1 CF88 A
00-18315 Tacoma_Metals TP-2-0-1 CF88 B
00-18316 Tacoma_Metals TP-2-2-3 CF88 C
00-18317 Tacoma_Metals TP-2-4-6 CF88 D
00-18318 Tacoma_Metals TP-2-6-10 CF88 E EPH/SIM PAHs
00-18319 Tacoma_Metals TP-3-0-1 CF88 F
00-18320 Tacoma_Metals TP-3-4-6 CF88 G
00-18321 Tacoma_Metals TP-3-6-10 CF88 H
00-18322 Tacoma_Metals TP-4-0-1 CF88 I - PCB.
00-18323 Tacoma_Metals TP-4-6-10 CF88 J
00-18324 Tacoma_Metals TP-1-2-3 CF88 K
00-18325 Tacoma_Metals TP-1-4-6 CF88 L } Lead
00-18326 Tacoma_Metals TP-1-6-10 CF88 M
00-18327 Tacoma_Metals TP-3-2-3 CF88 N
00-18328 Tacoma_Metals TP-4-2-3 CF88 O - PCB Lead.
00-18329 Tacoma_Metals TP-4-4-6 CF88 P - Lead.

(Highlighted only)

*Please pull these samples + ~~to~~ relog as new jobs for listed analyses

*Sub EPH to Northwest - Aliphatics + Aromatics

*SIM PAHs in house

0004F

Rev. 2
02/21/94

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: Method Blank**
TOTAL METALS

Lab Sample ID: CM33MB
LIMS ID: 00-22486
Matrix: Soil

QC Report No: CM33-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized
Reported: 12/08/00

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/01/00	6010	12/07/00	7439-92-1	Lead	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-6-2-3**
TOTAL METALS

Lab Sample ID: CM33A
LIMS ID: 00-22486
Matrix: Soil

QC Report No: CM33-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/04/00
Date Received: 10/09/00

Data Release Authorized:
Reported: 12/08/00

Percent Total Solids: 96.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/01/00	6010	12/07/00	7439-92-1	Lead	10	54

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-6-4-6**
TOTAL METALS

Lab Sample ID: CM33B
LIMS ID: 00-22487
Matrix: Soil

QC Report No: CM33-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/04/00
Date Received: 10/09/00

Data Release Authorized:
Reported: 12/08/00

Percent Total Solids: 74.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/01/00	6010	12/07/00	7439-92-1	Lead	10	40

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-6-6-10**
TOTAL METALS

Lab Sample ID: CM33C
LIMS ID: 00-22488
Matrix: Soil

QC Report No: CM33-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/04/00
Date Received: 10/09/00

Data Release Authorized
Reported: 12/08/00

Percent Total Solids: 64.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/01/00	6010	12/06/00	7439-92-1	Lead	20	60

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-9-2-3**
TOTAL METALS

Lab Sample ID: CM33D
LIMS ID: 00-22489
Matrix: Soil

QC Report No: CM33-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/04/00
Date Received: 10/09/00

Data Release Authorized:
Reported: 12/08/00

Percent Total Solids: 91.7%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/01/00	6010	12/06/00	**7439-92-1**	**Lead**	10	20

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-14-2-3**
TOTAL METALS

Lab Sample ID: CM33E
LIMS ID: 00-22490
Matrix: Soil

QC Report No: CM33-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/06/00
Date Received: 10/09/00

Data Release Authorized:
Reported: 12/08/00

Percent Total Solids: 91.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/01/00	6010	12/06/00	7439-92-1	Lead	10	560

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-14-4-6**
TOTAL METALS

Lab Sample ID: CM33F
LIMS ID: 00-22491
Matrix: Soil

QC Report No: CM33-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/06/00
Date Received: 10/09/00

Data Release Authorized
Reported: 12/08/00

Percent Total Solids: 93.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/01/00	6010	12/06/00	7439-92-1	Lead	10	20

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-16-2-3**
TOTAL METALS

Lab Sample ID: CM33G
LIMS ID: 00-22492
Matrix: Soil

QC Report No: CM33-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/06/00
Date Received: 10/09/00

Data Release Authorized:
Reported: 12/08/00

Percent Total Solids: 72.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/01/00	6010	12/06/00	**7439-92-1**	**Lead**	10	**8,240**

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-17-2-3**
TOTAL METALS

Lab Sample ID: CM33H
LIMS ID: 00-22493
Matrix: Soil

QC Report No: CM33-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/06/00
Date Received: 10/09/00

Data Release Authorized:
Reported: 12/08/00

Percent Total Solids: 92.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/01/00	6010	12/06/00	7439-92-1	Lead	10	30

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-17-4-6**
TOTAL METALS

Lab Sample ID: CM33I
LIMS ID: 00-22494
Matrix: Soil

QC Report No: CM33-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/06/00
Date Received: 10/09/00

Data Release Authorized:
Reported: 12/08/00

Percent Total Solids: 83.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/01/00	6010	12/06/00	7439-92-1	Lead	10	30

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-17-6-10**
TOTAL METALS

Lab Sample ID: CM33J
LIMS ID: 00-22495
Matrix: Soil

QC Report No: CM33-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/06/00
Date Received: 10/09/00

Data Release Authorized
Reported: 12/08/00

Percent Total Solids: 69.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/01/00	6010	12/06/00	**7439-92-1**	**Lead**	10	20

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-1-2-3**
TOTAL METALS

Lab Sample ID: CM33K
LIMS ID: 00-22496
Matrix: Soil

QC Report No: CM33-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Data Release Authorized:
Reported: 12/08/00

Percent Total Solids: 83.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/01/00	6010	12/06/00	**7439-92-1**	**Lead**	10	**120**

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-1-4-6**
TOTAL METALS

Lab Sample ID: CM33L
LIMS ID: 00-22497
Matrix: Soil

QC Report No: CM33-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Data Release Authorized:
Reported: 12/08/00

Percent Total Solids: 74.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/01/00	6010	12/06/00	7439-92-1	Lead	10	90

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-1-6-10**
TOTAL METALS

Lab Sample ID: CM33M
LIMS ID: 00-22498
Matrix: Soil

QC Report No: CM33-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Data Release Authorized:
Reported: 12/08/00

Percent Total Solids: 53.7%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/01/00	6010	12/06/00	7439-92-1	Lead	20	30

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-4-2-3**
TOTAL METALS

Lab Sample ID: CM33N
LIMS ID: 00-22499
Matrix: Soil

QC Report No: CM33-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Data Release Authorized:
Reported: 12/08/00

Percent Total Solids: 93.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/01/00	6010	12/06/00	**7439-92-1**	**Lead**	10	**443**

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-4-4-6**
TOTAL METALS

Lab Sample ID: CM330
LIMS ID: 00-22500
Matrix: Soil

QC Report No: CM33-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Data Release Authorized:
Reported: 12/08/00

Percent Total Solids: 94.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/01/00	6010	12/06/00	7439-92-1	Lead	10	160

U Analyte undetected at given RL

RL Reporting Limit

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CM33LCS
LIMS ID: 00-22486
Matrix: Soil

QC Report No: CM33-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 12/08/00

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike mg/kg-dry	Spike Added	% Recovery	Q
Lead	6010	188	200	94.0%	

'Q' codes: N = control limit not met

Control Limits: 80-120%

Analytical Resources, Incorporated
Analytical Chemists and Consultants

December 11, 2000

Ty Schreiner
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: Project: Tacoma Metals
ARI Job: CL62

Dear Ty:

Please find enclosed sample custody records and final analytical results for the above referenced project. Twenty-one soil samples were received on November 16, 2000. The samples were received in good condition and frozen once sample preps or extractions were completed.

Selected samples were analyzed for metals by EPA 6010/7000, PCB's by method 8082 and NWTPH-D.

For samples TP-55-0-1 & TP-61-0-1, the PCB surrogate DCBP was outside specified QC criteria due to matrix interference. Sample TP-65-0-1 was used for matrix spike and matrix spike duplicate. The percent recovery for Aroclor 1242 was outside specified QC limits low. The MS/MSD was re-extracted and found to be within criteria. The LCS's in both extraction batches were within QC criteria.

Sample TP-51-0-1 was used as the QC sample for metals analysis. The duplicate analysis for all metals except chromium and lead exceeded the QC criteria due to matrix effects. The sample consisted of sand and rocks, which made the creation of duplicate samples difficult. The matrix spike for copper exceeded QC limits high also due to matrix effects. The LCS was within specified QC limits.

No analytical complications were noted. Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,
ANALYTICAL RESOURCES, INC.

Susan Snyder
Project Manager
susan@arilabs.com

SS/ss
Enclosures

RECEIVED
DEC 13 2000
K/J Federal Way
K/J No/File
Route
Return To/By

333 Ninth Avenue North • Seattle WA 98109-5187 • **206-621-6490** • **206-621-7523** fax

00-21967 to 00-21988

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
400 Ninth Avenue North
Seattle, WA 98109-4708
206-621-6490 206-621-7523 (fax)

Page 1 of 3 Cold, cold, cold Turn Around Requested: Std.

Report to: TY SCHREWER	Proj Name: TACOMA METALS
Company: KENNEDY/JENKS	Proj Number: 996098.00
Address: 530 S. 336th ST	Sampler: PM, JB
FEDERAL WAY WA 98003	
Phone: 253 874-0555	Shipping Method: COURIER
Fax:	AirBill:

Sample ID	Sample Date	Sample Time	Sample Matrix	No Containers	NWTPH-DX	RCRA METALS	CU	VOCs	PCBs		HOLD				Notes/Comments
TP-51-0-1	11/14/00	8:35	SOIL	2	X	X	X		X						
TP-51-2-3		8:44									X				FREEZE
TP-51-4-6		8:55									X				ALL
TP-51-6-8		9:10									X				HOLDS
TP-52-0-1		10:25			X	X	X				X				
TP-52-2-3		10:35									X				
TP-52-4-6		10:50			X						X				
TP-52-6-10		11:10			X						X				
TP-53-0-1		11:25			X	X	X		X						
TP-53-2-3		11:35									X				
TP-53-4-6		11:45									X				
TP-53-6-7		11:50									X				
TP-54-0-1		12:45			X	X	X				X				
TP-54-2-3		12:50									X				
TP-54-4-6		1:00									X				
TP-54-6-10		1:10									X				
TP-55-0-1		1:20			X	X	X		X						
TP-55-2-3		1:30			X						X				
TP-55-4-6		1:40			X						X				
TP-55-6-10		1:50			X						X				

Relinquished: (Signature) [signature]	Relinquished: (Signature)	Relinquished: (Signature)	Special Instructions/Notes
Printed name: JODIE Balage	Printed name:	Printed name:	
Company: Kennedy/Jenks	Company:	Company:	
Date: 11/16/00 Time: 9:00 am	Date: Time:	Date: Time:	
Received by: [signature]	Received by:	Received by:	
Printed name: Mike McDougal	Printed name:	Printed name:	
Company: ARI	Company:	Company:	Number of Coolers:
			Cooler Temp(s):
Date: 11/16/00 Time: 1100	Date: Time:	Date: Time:	COC Seals Intact?
			Bottles Intact?

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
400 Ninth Avenue North
Seattle, WA 98109-4708
206-621-6490 206-621-7523 (fax)

Page 2 of 3

Turn Around Requested: Std

Report to: TY SCHREINER	Proj Name: TACOMA METALS
Company: KENNEDY / JENKS	Proj Number: 996098.00
Address: 530 S. 336th St	Sampler: DM, JB
FEDERAL WAY WA 98003	
Phone: 253 874-0555	Shipping Method: COURIER
Fax:	AirBill:

Analyses Requested

Sample ID	Sample Date	Sample Time	Sample Matrix	No Containers	NWTPH-DX	RCRA METALS	CU	VOC'S	PCB'S		HOLD				Notes/Comments
TP-56-0-1	11/14/00	2:10	SOIL	2	X	X	X				X				FREEZE ALL HOLDS
TP-56-2-3		2:15									X				
TP-56-4-6		2:25									X				
TP-56-6-10		2:40									X				
TP-57-0-1		2:55			X	X	X		X						
TP-57-2-3		3:00			X						X				
TP-57-4-6		3:15			X						X				
TP-57-6-10		3:25			X						X				
TP-58-0-1	11/15/00	8:15			X	X	X				X				
TP-58-2-3		8:25				X	X				X				
TP-58-4-6		8:35									X				
58-6-10		8:50									X				
TP-59-0-1		9:05			X	X	X		X						
TP-59-2-3		9:15				X	X				X				
TP-59-4-6		9:25									X				
TP-59-6-10		9:40									X				
TP-60-0-1		9:50			X	X	X				X				
TP-60-2-3		10:00				X	X				X				
TP-60-4-6		10:10									X				
TP-60-6-10		10:20									X				

Relinquished: (Signature) [signature]	Relinquished: (Signature)	Relinquished: (Signature)	Special Instructions/Notes
Printed name: Jodie Brulere	Printed name:	Printed name:	
Company: Kennedy / Jenks	Company:	Company:	
Date: 11/14/00 Time: 9:00 am	Date: Time:	Date: Time:	
Received by: [signature]	Received by:	Received by:	
Printed name: Marrie McDougal	Printed name:	Printed name:	
Company: ARI	Company:	Company:	Number of Coolers:
			Cooler Temp(s):
Date: 11/16/00 Time: 1100	Date: Time:	Date: Time:	COC Seals Intact?
			Bottles Intact?

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
400 Ninth Avenue North
Seattle, WA 98109-4708
206-621-6490 206-621-7523 (fax)

Turn Around Requested: Std

Report to: TY SCHREINER	Proj Name: TACOMA METALS
Company: KENNEDY/JENKS	Proj Number: 996098 00
Address: 530 S. 336th ST	Sampler: PM, JB
FEDERAL WAY WA 98003	
Phone: 253 874-0555	Shipping Method: COURIER
Fax:	AirBill:

Analyses Requested

Sample ID	Sample Date	Sample Time	Sample Matrix	No Containers	NWTPH-DX	RCRA METALS	CU	VOCs	PCB		HOLD				Notes/Comments
TP-61-0-1	11/15/00	10:35	SOIL	2	X	X	X		X						FREEZE ALL HOLDS
TP-61-2-3		10:45			X	X	X				X				
TP-61-4-6		11:00			X						X				
TP-61-6-10		11:15									X				
TP-62-0-1		11:20			X	X	X				X				
TP-62-2-3		11:30				X	X				X				
TP-62-4-6		11:40									X				
TP-62-6-10		11:50									X				
TP-63-0-1		12:40			X	X	X		X						SCRATCH
TP-63-2-3		12:45			X	[illegible]	[illegible]				X				
TP-63-4-6		1:00			X	[illegible]	[illegible]				X				
TP-63-6-10		1:10									X				
TP-64-0-1		1:45			X	X	X				X				DO Metals & CU on TP-63 2-3
TP-64-2-3		1:55									X				
TP-64-4-6		2:10									X				
TP-64-6-8		2:17									X				
TP-65-0-1		2:40			X	X	X		X						
TP-65-2-3		2:45									X				
TP-65-4-6		2:55									X				
TP-65-6-9		3:05									X				

Relinquished: (Signature)	Relinquished: (Signature)	Relinquished: (Signature)	Special Instructions/Notes
Printed name: J Brundage	Printed name:	Printed name:	
Company: Kennedy/Jenks	Company:	Company:	
Date: 11/16/00 Time: 9:00 am	Date: Time:	Date: Time:	
Received by: [signature]	Received by:	Received by:	
Printed name: Carrie McDougal	Printed name:	Printed name:	
Company: ARI	Company:	Company:	Number of Coolers:
			Cooler Temp(s):
Date: 11/16/00 Time: 1100	Date: Time:	Date: Time:	COC Seals Intact?
			Bottles Intact?

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-55-0-1
DILUTION

Lab Sample ID: CL62EDL
LIMS ID: 00-21971
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/14/00
Date Received: 11/16/00

Data Release Authorized: CH
Reported: 12/07/00 12/7/00

Date extracted: 11/22/00
Date analyzed: 11/29/00 23:17
Instrument ID: ECD3
Sample Amount: 11.0 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.4

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:4
Percent Moisture: 8.4 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	140 U
53469-21-9	Aroclor 1242	140 U
12672-29-6	**Aroclor 1248**	**990**
11097-69-1	**Aroclor 1254**	**3,000**
11096-82-5	**Aroclor 1260**	**1,500**
11104-28-2	Aroclor 1221	290 U
11141-16-5	Aroclor 1232	140 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	156%
Tetrachlorometaxylene	87.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-55-0-1

Lab Sample ID: CL62E
LIMS ID: 00-21971
Matrix: Soil

Data Release Authorized: clk
Reported: 12/07/00 12/7/0

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/14/00
Date Received: 11/16/00

Date extracted: 11/22/00
Date analyzed: 11/29/00 14:56
Instrument ID: ECD3
Sample Amount: 11.0 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.4

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 8.4 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	36 U
53469-21-9	Aroclor 1242	36 U
12672-29-6	**Aroclor 1248**	**830**
11097-69-1	**Aroclor 1254**	**2,300 E**
11096-82-5	**Aroclor 1260**	**1,800 E**
11104-28-2	Aroclor 1221	73 U
11141-16-5	Aroclor 1232	36 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	140%
Tetrachlorometaxylene	79.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-53-0-1

Lab Sample ID: CL62C
LIMS ID: 00-21969
Matrix: Soil

Data Release Authorized: CH
Reported: 12/07/00 1/1/11

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/14/00
Date Received: 11/16/00

Date extracted: 11/22/00
Date analyzed: 11/29/00 14:21
Instrument ID: ECD3
Sample Amount: 11.4 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.8

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 4.8 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	35 U
53469-21-9	Aroclor 1242	35 U
12672-29-6	Aroclor 1248	35 U
11097-69-1	**Aroclor 1254**	**54**
11096-82-5	**Aroclor 1260**	**46**
11104-28-2	Aroclor 1221	70 U
11141-16-5	Aroclor 1232	35 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	70.0%
Tetrachlorometaxylene	59.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-51-0-1

Lab Sample ID: CL62A
LIMS ID: 00-21967
Matrix: Soil

Data Release Authorized: [illegible]
Reported: 12/07/00 [illegible]

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/14/00
Date Received: 11/16/00

Date extracted: 11/22/00
Date analyzed: 11/29/00 13:46
Instrument ID: ECD3
Sample Amount: 11.0 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.1

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 7.9 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	36 U
53469-21-9	Aroclor 1242	36 U
12672-29-6	Aroclor 1248	43
11097-69-1	Aroclor 1254	140
11096-82-5	Aroclor 1260	140
11104-28-2	Aroclor 1221	72 U
11141-16-5	Aroclor 1232	36 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	89.0%
Tetrachlorometaxylene	90.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: Method Blank

Lab Sample ID: CL62MB
LIMS ID: 00-23245
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098-10
Date Sampled: NA
Date Received: NA

Data Release Authorized: LH
Reported: 12/07/00 12/11/00

Date extracted: 12/06/00
Date analyzed: 12/06/00 18:27
Instrument ID: ECD3
Sample Amount: 12.0 g-dry-wt
Final Ext Vol: 4.0 mL
pH: NA

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: NA

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	33 U
53469-21-9	Aroclor 1242	33 U
12672-29-6	Aroclor 1248	33 U
11097-69-1	Aroclor 1254	33 U
11096-82-5	Aroclor 1260	33 U
11104-28-2	Aroclor 1221	67 U
11141-16-5	Aroclor 1232	33 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	68.5%
Tetrachlorometaxylene	78.8%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: Method Blank

Lab Sample ID: CL62MB
LIMS ID: 00-21967
Matrix: Soil

Data Release Authorized: CH
Reported: 12/07/00 CH/n

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: NA
Date Received: NA

Date extracted: 11/22/00
Date analyzed: 11/29/00 12:36
Instrument ID: ECD3
Sample Amount: 12.0 g-dry-wt
Final Ext Vol: 4.0 mL
pH: NA

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: NA

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	33 U
53469-21-9	Aroclor 1242	33 U
12672-29-6	Aroclor 1248	33 U
11097-69-1	Aroclor 1254	33 U
11096-82-5	Aroclor 1260	33 U
11104-28-2	Aroclor 1221	67 U
11141-16-5	Aroclor 1232	33 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	114%
Tetrachlorometaxylene	110%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-57-0-1

Lab Sample ID: CL62G
LIMS ID: 00-21973
Matrix: Soil

Data Release Authorized: CH 12/7/00
Reported: 12/07/00

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/14/00
Date Received: 11/16/00

Date extracted: 11/22/00
Date analyzed: 11/29/00 15:31
Instrument ID: ECD3
Sample Amount: 9.78 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.3

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 18.7%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	710 Y
53469-21-9	Aroclor 1242	41 U
12672-29-6	**Aroclor 1248**	**1,400**
11097-69-1	**Aroclor 1254**	**1,200**
11096-82-5	**Aroclor 1260**	**290**
11104-28-2	Aroclor 1221	82 U
11141-16-5	Aroclor 1232	41 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	119%
Tetrachlorometaxylene	76.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-59-0-1

Lab Sample ID: CL62J
LIMS ID: 00-21976
Matrix: Soil

Data Release Authorized: CH
Reported: 12/07/00 12/7/00

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Date extracted: 11/22/00
Date analyzed: 11/29/00 16:06
Instrument ID: ECD3
Sample Amount: 10.4 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.0

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 12.8%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	38 U
53469-21-9	Aroclor 1242	38 U
12672-29-6	**Aroclor 1248**	**S**
11097-69-1	**Aroclor 1254**	**S**
11096-82-5	**Aroclor 1260**	**1,600 E**
11104-28-2	Aroclor 1221	76 U
11141-16-5	Aroclor 1232	38 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	123%
Tetrachlorometaxylene	81.8%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-59-0-1
DILUTION

Lab Sample ID: CL62JDL
LIMS ID: 00-21976
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized: [illegible]
Reported: 12/07/00 [illegible]

Date extracted: 11/22/00
Date analyzed: 11/30/00 02:48
Instrument ID: ECD3
Sample Amount: 10.4 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.0

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:20
Percent Moisture: 12.8%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	760 U
53469-21-9	Aroclor 1242	760 U
12672-29-6	**Aroclor 1248**	**13,000**
11097-69-1	**Aroclor 1254**	**9,800**
11096-82-5	**Aroclor 1260**	**2,100**
11104-28-2	Aroclor 1221	1,500 U
11141-16-5	Aroclor 1232	760 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	D
Tetrachlorometaxylene	D

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
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NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-61-0-1

Lab Sample ID: CL62N
LIMS ID: 00-21980
Matrix: Soil

Data Release Authorized: clk
Reported: 12/07/00 12/11/00

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Date extracted: 11/22/00
Date analyzed: 11/29/00 16:42
Instrument ID: ECD3
Sample Amount: 11.1 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.3

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 7.0 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	36 U
53469-21-9	Aroclor 1242	36 U
12672-29-6	**Aroclor 1248**	**710**
11097-69-1	**Aroclor 1254**	**1,700 E**
11096-82-5	**Aroclor 1260**	**830**
11104-28-2	Aroclor 1221	72 U
11141-16-5	Aroclor 1232	36 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	124%
Tetrachlorometaxylene	61.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-61-0-1
DILUTION

Lab Sample ID: CL62NDL
LIMS ID: 00-21980
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized: ck
Reported: 12/07/00 12/9/00

Date extracted: 11/22/00
Date analyzed: 11/29/00 23:52
Instrument ID: ECD3
Sample Amount: 11.1 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.3

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:2
Percent Moisture: 7.0 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	72 U
53469-21-9	Aroclor 1242	72 U
12672-29-6	**Aroclor 1248**	**770**
11097-69-1	**Aroclor 1254**	**1,900**
11096-82-5	**Aroclor 1260**	**910**
11104-28-2	Aroclor 1221	140 U
11141-16-5	Aroclor 1232	72 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	139%
Tetrachlorometaxylene	60.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-63-0-1

Lab Sample ID: CL62R
LIMS ID: 00-21984
Matrix: Soil

Data Release Authorized: CLP
Reported: 12/07/00 12/11/00

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Date extracted: 11/22/00
Date analyzed: 11/29/00 20:57
Instrument ID: ECD3
Sample Amount: 11.1 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.3

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 7.2 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	36 U
53469-21-9	Aroclor 1242	36 U
12672-29-6	Aroclor 1248	330 Y
11097-69-1	**Aroclor 1254**	**2,400 E**
11096-82-5	**Aroclor 1260**	**350**
11104-28-2	Aroclor 1221	72 U
11141-16-5	Aroclor 1232	36 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	126%
Tetrachlorometaxylene	68.2%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-63-0-1
DILUTION

Lab Sample ID: CL62RDL
LIMS ID: 00-21984
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized: LH
Reported: 12/07/00 12/11/00

Date extracted: 11/22/00
Date analyzed: 11/30/00 03:23
Instrument ID: ECD3
Sample Amount: 11.1 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.3

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:2
Percent Moisture: 7.2 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	72 U
53469-21-9	Aroclor 1242	72 U
12672-29-6	Aroclor 1248	340 Y
11097-69-1	**Aroclor 1254**	**2,600**
11096-82-5	**Aroclor 1260**	**350**
11104-28-2	Aroclor 1221	140 U
11141-16-5	Aroclor 1232	72 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	130%
Tetrachlorometaxylene	70.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-65-0-1

Lab Sample ID: CL62U
LIMS ID: 00-21988
Matrix: Soil

Data Release Authorized: CLP
Reported: 12/07/00 12/7/00

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Date extracted: 11/22/00
Date analyzed: 11/29/00 21:32
Instrument ID: ECD3
Sample Amount: 11.2 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.6

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 6.4 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	36 U
53469-21-9	Aroclor 1242	36 U
12672-29-6	Aroclor 1248	36 U
11097-69-1	**Aroclor 1254**	**20 J**
11096-82-5	Aroclor 1260	36 U
11104-28-2	Aroclor 1221	71 U
11141-16-5	Aroclor 1232	36 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	81.5%
Tetrachlorometaxylene	91.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-65-0-1
MATRIX SPIKE

Lab Sample ID: CL62UMS
LIMS ID: 00-21988
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized:
Reported: 12/07/00

Date extracted: 11/22/00
Date analyzed: 11/29/00 22:07
Instrument ID: ECD3
Sample Amount: 11.2 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.6

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 6.4 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	36 U
53469-21-9	Aroclor 1242	---
12672-29-6	Aroclor 1248	36 U
11097-69-1	Aroclor 1254	36 U
11096-82-5	Aroclor 1260	36 U
11104-28-2	Aroclor 1221	71 U
11141-16-5	Aroclor 1232	36 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	98.0%
Tetrachlorometaxylene	99.8%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-65-0-1
SPIKE DUPLICATE

Lab Sample ID: CL62UMSD
LIMS ID: 00-21988
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized: clf
Reported: 12/07/00 12/14/00

Date extracted: 11/22/00
Date analyzed: 11/29/00 22:42
Instrument ID: ECD3
Sample Amount: 11.2 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.6

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 6.4 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	36 U
53469-21-9	Aroclor 1242	---
12672-29-6	Aroclor 1248	36 U
11097-69-1	Aroclor 1254	36 U
11096-82-5	Aroclor 1260	36 U
11104-28-2	Aroclor 1221	71 U
11141-16-5	Aroclor 1232	36 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	84.0%
Tetrachlorometaxylene	94.8%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-65-0-1-RE

Lab Sample ID: CL62URE
LIMS ID: 00-23245
Matrix: Soil

Data Release Authorized: 12/19/00
Reported: 12/07/00

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098-10
Date Sampled: 11/15/00
Date Received: 11/16/00

Date extracted: 12/06/00
Date analyzed: 12/06/00 19:38
Instrument ID: ECD3
Sample Amount: 11.2 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.6

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 6.4 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	36 U
53469-21-9	Aroclor 1242	36 U
12672-29-6	Aroclor 1248	36 U
11097-69-1	Aroclor 1254	36 U
11096-82-5	Aroclor 1260	36 U
11104-28-2	Aroclor 1221	71 U
11141-16-5	Aroclor 1232	36 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	69.5%
Tetrachlorometaxylene	83.2%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-65-0-1-RE
MATRIX SPIKE

Lab Sample ID: CL62UMSRE
LIMS ID: 00-23245
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098-10
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized:
Reported: 12/07/00

Date extracted: 12/06/00
Date analyzed: 12/06/00 20:13
Instrument ID: ECD3
Sample Amount: 11.2 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.6

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 6.4 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	36 U
53469-21-9	Aroclor 1242	---
12672-29-6	Aroclor 1248	36 U
11097-69-1	Aroclor 1254	36 U
11096-82-5	Aroclor 1260	36 U
11104-28-2	Aroclor 1221	71 U
11141-16-5	Aroclor 1232	36 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	68.0%
Tetrachlorometaxylene	80.8%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-65-0-1-RE
SPIKE DUPLICATE

Lab Sample ID: CL62UMSDRE
LIMS ID: 00-23245
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098-10
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized: clr
Reported: 12/07/00 12/9/00

Date extracted: 12/06/00
Date analyzed: 12/06/00 20:48
Instrument ID: ECD3
Sample Amount: 11.2 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.6

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 6.4 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	36 U
53469-21-9	Aroclor 1242	---
12672-29-6	Aroclor 1248	36 U
11097-69-1	Aroclor 1254	36 U
11096-82-5	Aroclor 1260	36 U
11104-28-2	Aroclor 1221	71 U
11141-16-5	Aroclor 1232	36 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	66.2%
Tetrachlorometaxylene	83.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-65-0-1
Lab Sample ID: CL62U
QC Report No: CL62-Kennedy Jenks Consultants
LIMS ID: 00-21988
Project: Tacoma Metals
Matrix: Soil
996098.10
Date Received: 11/16/00

Data Release Authorized: CH
Reported: 12/07/00 12/7/00

MATRIX SPIKE/SPIKE DUPLICATE RECOVERY
Date extracted: 11/22/00

CONSTITUENT	SAMPLE VALUE	SPIKE FOUND	SPIKE ADDED	% RECOVERY	RPD
MATRIX SPIKE					
Aroclor 1242	< 36	104	356	29.2%	
MATRIX SPIKE DUPLICATE					
Aroclor 1242	< 36	39.2	356	11.0%	91%

Values Reported in Total ug/kg Dry Weight

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-65-0-1-RE
Lab Sample ID: CL62URE
QC Report No: CL62-Kennedy Jenks Consultants
LIMS ID: 00-23245
Project: Tacoma Metals
Matrix: Soil
996098-10
Date Received: 11/16/00

Data Release Authorized:
Reported: 12/07/00

MATRIX SPIKE/SPIKE DUPLICATE RECOVERY
Date extracted: 12/06/00

CONSTITUENT	SAMPLE VALUE	SPIKE FOUND	SPIKE ADDED	% RECOVERY	RPD
MATRIX SPIKE					
Aroclor 1242	< 35	298	355	84.0%	
MATRIX SPIKE DUPLICATE					
Aroclor 1242	< 35	300	356	84.4%	0.4%

Values Reported in Total ug/kg Dry Weight

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Lab Sample ID: CL62
LIMS ID: 00-21967
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10

Data Release Authorized: clr
Reported: 12/07/00 12/11/00

LABORATORY CONTROL SAMPLE SPIKE RECOVERY
Date extracted: 11/22/00

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	314	333	94.2%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	107%
Tetrachlorometaxylene	97.2%

Values Reported in Total ug/kg Dry Weight

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-57-0-1**
TOTAL METALS

Lab Sample ID: CL62G
LIMS ID: 00-21973
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/14/00
Date Received: 11/16/00

Data Release Authorized:
Reported: 12/08/00

Percent Total Solids: 77.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	11/28/00	6010	12/05/00	7440-38-2	Arsenic	30	60
3050	11/28/00	6010	12/05/00	7440-39-3	Barium	2	2,740
3050	11/28/00	6010	12/05/00	7440-43-9	Cadmium	1	70
3050	11/28/00	6010	12/05/00	7440-47-3	Chromium	3	145
3050	11/28/00	6010	12/05/00	7440-50-8	Copper	1	7,410
3050	11/28/00	6010	12/05/00	7439-92-1	Lead	10	2,710
CLP	11/28/00	7471	12/06/00	7439-97-6	Mercury	0.06	0.60
3050	11/28/00	6010	12/05/00	7782-49-2	Selenium	30	40
3050	11/28/00	6010	12/05/00	7440-22-4	Silver	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-56-0-1**
TOTAL METALS

Lab Sample ID: CL62F
LIMS ID: 00-21972
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/14/00
Date Received: 11/16/00

Data Release Authorized:
Reported: 12/08/00

Percent Total Solids: 91.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	11/28/00	6010	12/05/00	7440-38-2	Arsenic	30	30 U
3050	11/28/00	6010	12/05/00	7440-39-3	Barium	2	63
3050	11/28/00	6010	12/05/00	7440-43-9	Cadmium	1	2
3050	11/28/00	6010	12/05/00	7440-47-3	Chromium	3	31
3050	11/28/00	6010	12/05/00	7440-50-8	Copper	1	88
3050	11/28/00	6010	12/05/00	7439-92-1	Lead	10	70
CLP	11/28/00	7471	12/06/00	7439-97-6	Mercury	0.04	0.12
3050	11/28/00	6010	12/05/00	7782-49-2	Selenium	30	30 U
3050	11/28/00	6010	12/05/00	7440-22-4	Silver	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-55-0-1**
TOTAL METALS

Lab Sample ID: CL62E
LIMS ID: 00-21971
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/14/00
Date Received: 11/16/00

Data Release Authorized
Reported: 12/08/00

Percent Total Solids: 89.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	11/28/00	6010	12/05/00	7440-38-2	Arsenic	30	30 U
3050	11/28/00	6010	12/05/00	**7440-39-3**	**Barium**	2	**1,080**
3050	11/28/00	6010	12/05/00	**7440-43-9**	**Cadmium**	1	**29**
3050	11/28/00	6010	12/05/00	**7440-47-3**	**Chromium**	3	**117**
3050	11/28/00	6010	12/05/00	**7440-50-8**	**Copper**	1	**465**
3050	11/28/00	6010	12/05/00	**7439-92-1**	**Lead**	10	**1,750**
CLP	11/28/00	7471	12/06/00	**7439-97-6**	**Mercury**	0.05	**0.83**
3050	11/28/00	6010	12/05/00	7782-49-2	Selenium	30	30 U
3050	11/28/00	6010	12/05/00	7440-22-4	Silver	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-54-0-1**
TOTAL METALS

Lab Sample ID: CL62D
LIMS ID: 00-21970
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/14/00
Date Received: 11/16/00

Data Release Authorized:
Reported: 12/08/00

Percent Total Solids: 90.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	11/28/00	6010	12/05/00	7440-38-2	Arsenic	30	30 U
3050	11/28/00	6010	12/05/00	7440-39-3	Barium	2	242
3050	11/28/00	6010	12/05/00	7440-43-9	Cadmium	1	8
3050	11/28/00	6010	12/05/00	7440-47-3	Chromium	3	48
3050	11/28/00	6010	12/05/00	7440-50-8	Copper	1	273
3050	11/28/00	6010	12/05/00	7439-92-1	Lead	10	410
CLP	11/28/00	7471	12/06/00	7439-97-6	Mercury	0.04	0.98
3050	11/28/00	6010	12/05/00	7782-49-2	Selenium	30	30 U
3050	11/28/00	6010	12/05/00	7440-22-4	Silver	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-53-0-1**
TOTAL METALS

Lab Sample ID: CL62C
LIMS ID: 00-21969
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/14/00
Date Received: 11/16/00

Data Release Authorized
Reported: 12/08/00

Percent Total Solids: 94.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	11/28/00	6010	12/05/00	7440-38-2	Arsenic	30	30 U
3050	11/28/00	6010	12/05/00	7440-39-3	Barium	2	63
3050	11/28/00	6010	12/05/00	7440-43-9	Cadmium	1	1 U
3050	11/28/00	6010	12/05/00	7440-47-3	Chromium	3	31
3050	11/28/00	6010	12/05/00	7440-50-8	Copper	1	40
3050	11/28/00	6010	12/05/00	7439-92-1	Lead	10	20
CLP	11/28/00	7471	12/06/00	7439-97-6	Mercury	0 04	0.05
3050	11/28/00	6010	12/05/00	7782-49-2	Selenium	30	30 U
3050	11/28/00	6010	12/05/00	7440-22-4	Silver	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-52-0-1**
TOTAL METALS

Lab Sample ID: CL62B
LIMS ID: 00-21968
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/14/00
Date Received: 11/16/00

Data Release Authorized:
Reported: 12/08/00

Percent Total Solids: 94.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	11/28/00	6010	12/05/00	7440-38-2	Arsenic	20	20 U
3050	11/28/00	6010	12/05/00	7440-39-3	Barium	1	50
3050	11/28/00	6010	12/05/00	7440-43-9	Cadmium	1.0	1.0 U
3050	11/28/00	6010	12/05/00	7440-47-3	Chromium	2	27
3050	11/28/00	6010	12/05/00	7440-50-8	Copper	1.0	38.2
3050	11/28/00	6010	12/05/00	7439-92-1	Lead	10	38
CLP	11/28/00	7471	12/06/00	7439-97-6	Mercury	0.05	0.06
3050	11/28/00	6010	12/05/00	7782-49-2	Selenium	20	20 U
3050	11/28/00	6010	12/05/00	7440-22-4	Silver	1	1 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-51-0-1
Lab Sample ID: CL62A
QC Report No: CL62-Kennedy Jenks Consultants
LIMS ID: 00-21967
Project: Tacoma Metals
Matrix: Soil
996098.10
Date Received: 11/16/00

Data Release Authorized
Reported: 12/08/00

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample mg/kg-dry	Spike mg/kg-dry	Spike Added	% Recovery	Q
Arsenic	6010	30 U	190	210	90.5%	
Barium	6010	73	257	209	88.0%	
Cadmium	6010	1 U	49	52	94.2%	
Chromium	6010	34	74	52	76.9%	
Copper	6010	61	131	52	135%	N
Lead	6010	100	300	210	95.2%	
Mercury	7471	0.05	0.50	0.44	102%	
Selenium	6010	30 U	200	210	95.2%	
Silver	6010	2 U	48	52	92.3%	

'Q' codes:
N = control limit not met
H = %R not applicable, sample concentration too high
* = RPD control limit not met
NA = Not applicable - analyte not spiked

Control Limits: Percent Recovery: 75-125%
RPD: +/-20%

FORM-V

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET
TOTAL METALS

Sample No: TP-51-0-1
QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Received: 11/16/00

Lab Sample ID: CL62A
LIMS ID: 00-21967
Matrix: Soil

Data Release Authorized
Reported: 12/08/00

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample mg/kg-dry	Duplicate mg/kg-dry	RPD	Control Limit	Q
Arsenic	6010	30 U	30 U	0.0%	+/- 30	L
Barium	6010	73	90	20.9%	+/- 20 %	*
Cadmium	6010	1 U	1	0.0%	+/- 1	L
Chromium	6010	34	28	19.4%	+/- 20 %	
Copper	6010	61	83	30.6%	+/- 20 %	*
Lead	6010	100	110	9.5%	+/- 20 %	
Mercury	7471	0.05	0.07	33.3%	+/- 0.04	L
Selenium	6010	30 U	30 U	0.0%	+/- 30	L
Silver	6010	2 U	2 U	0.0%	+/- 2	L

'Q' codes: * = control limit not met
L = RPD not valid, alternate limit = detection limit

FORM-VI

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-51-0-1**
TOTAL METALS

Lab Sample ID: CL62A
LIMS ID: 00-21967
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/14/00
Date Received: 11/16/00

Data Release Authorized:
Reported: 12/08/00

Percent Total Solids: 92.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	11/28/00	6010	12/05/00	7440-38-2	Arsenic	30	30 U
3050	11/28/00	6010	12/05/00	7440-39-3	Barium	2	73
3050	11/28/00	6010	12/05/00	7440-43-9	Cadmium	1	1 U
3050	11/28/00	6010	12/05/00	7440-47-3	Chromium	3	34
3050	11/28/00	6010	12/05/00	7440-50-8	Copper	1	61
3050	11/28/00	6010	12/05/00	7439-92-1	Lead	10	100
CLP	11/28/00	7471	12/06/00	7439-97-6	Mercury	0.04	0.05
3050	11/28/00	6010	12/05/00	7782-49-2	Selenium	30	30 U
3050	11/28/00	6010	12/05/00	7440-22-4	Silver	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL HYDROCARBONS COMPOUND SUMMARY

Matrix: Soil

QC Report No: CL62

LIMS ID	Lab ID	Extracted	Client ID	MeArach	TOT OUT
00-21967MB	112300MB	11/20/00	Method Blank	104%	0
00-21967LC	112300LC	11/20/00	Lab Control	84%	0
00-21967	CL62A	11/20/00	TP-51-0-1	96%	0
00-21968	CL62B	11/20/00	TP-52-0-1	105%	0
00-21968	CL62B-MS	11/20/00	TP-52-0-1-MS	100%	0
00-21968	CL62B-MSD	11/20/00	TP-52-0-1-MSD	65%	0
00-21969	CL62C	11/20/00	TP-53-0-1	60%	0
00-21969	CL62C-DP	11/20/00	TP-53-0-1-DP	90%	0
00-21970	CL62D	11/20/00	TP-54-0-1	98%	0
00-21971	CL62E	11/20/00	TP-55-0-1	D	0
00-21972	CL62F	11/20/00	TP-56-0-1	80%	0
00-21973	CL62G	11/20/00	TP-57-0-1	D	0
00-21974	CL62H	11/20/00	TP-58-0-1	78%	0
00-21976	CL62J	11/20/00	TP-59-0-1	100%	0
00-21978	CL62L	11/20/00	TP-60-0-1	110%	0
00-21980	CL62N	11/20/00	TP-61-0-1	110%	0
00-21981	CL62O	11/20/00	TP-61-2-3	D	0
00-21982	CL62P	11/20/00	TP-62-0-1	90%	0
00-21984	CL62R	11/20/00	TP-63-0-1	90%	0
00-21985	CL62S	11/20/00	TP-63-2-3	70%	0
00-21986	CL62T	11/20/00	TP-64-0-1	87%	0
00-21988	CL62U	11/20/00	TP-65-0-1	72%	0

	Control QC LIMITS	Sample QC LIMITS
(MeArach) = Methylarachidate	(56-114)	(21-130)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D System Monitoring Compound diluted out

FORM-II TPHD

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-52-0-1
Lab Sample ID: CL62B
QC Report No: CL62-Kennedy Jenks Consultants
LIMS ID: 00-21968
Project: Tacoma Metals
Matrix: Soil
996098.10
Date Received: 11/16/00

Data Release Authorized:
Reported: 11/30/00 CR 11/30/00

MATRIX SPIKE/SPIKE DUPLICATE RECOVERY

Date extracted: 11/20/00
Date analyzed: 11/25/00

CONSTITUENT	SAMPLE VALUE	SPIKE VALUE	SPIKE ADDED	% RECOVERY	RPD
MATRIX SPIKE					
Diesel Range Hydrocarbons	85.8 B	172	105	82.1%	
MATRIX SPIKE DUPLICATE					
Diesel Range Hydrocarbons	85.8 B	299	105	203%	84.8%

TPHd Surrogate Recovery

Matrix Spike	Methylarachidate	100%
Matrix Spike Dup	Methylarachidate	65.0%

Values reported in ppm (mg/kg) on a dry weight basis.

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CL62SB
LIMS ID: 00-21967
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10

Data Release Authorized:
Reported: 11/30/00 CR 11/30/00

LABORATORY CONTROL SAMPLE RECOVERY REPORT
Date extracted: 11/20/00
Date analyzed: 11/23/00

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
Diesel Range Hydrocarbons	113	100	113%

TPHd Surrogate Recovery

Methylarachidate 84.0%

Values reported in ppm (mg/kg) on a dry weight basis.

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID
and Motor Oil

LIMS ID: 00-21980
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10

Data Release Authorized: CR 11/30/00
Reported: 11/30/00

Date Received: 11/16/00

Lab ID	Sample ID	Date Extracted	Date Analyzed	Dilution Factor	Diesel Range	*HC ID	Motor Oil Range	Surrogate Recovery
CL62N	**TP-61-0-1**	11/20/00	11/25/00	1:10	**3,700 B**	NO	**1,900**	110%
CL62O	**TP-61-2-3**	11/20/00	11/28/00	1:20	**8,500 B**	NO	**2,300**	D
CL62P	**TP-62-0-1**	11/20/00	11/28/00	1:5	**320 B**	NO	**910**	90.0%
CL62R	**TP-63-0-1**	11/20/00	11/25/00	1:10	**340 B**	NO	**1,100**	90.0%
CL62S	**TP-63-2-3**	11/20/00	11/25/00	1:10	**860 B**	NO	**2,100**	70.0%
CL62T	**TP-64-0-1**	11/20/00	11/25/00	1:1	**150 B**	NO	**330**	87.0%
CL62U	TP-65-0-1	11/20/00	11/25/00	1:1	5.3 U	---	11 U	72.0%

Values reported in ppm (mg/kg) on a dry weight basis.

Surrogate is Methyl-Arachidate.

* ID indicates, in the opinion of the analyst, the petroleum product with the best pattern match. 'NO' indicates that there was not a good match for any of the requested products.
Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.

Data Qualifiers

U	Compound not detected at the given detection limit.
J	Indicates an estimated value below the calculated detection limit.
S	No value reported due to saturation of the detector. Dilution required.
D	Indicates the surrogate was not detected because of dilution of the extract.
E	Indicates a value above the linear range of the detector. Dilution required.
NR	Indicates no recovery due to matrix interference.
B	Indicates compound also detected in the method blank.

FORM-1 TPHD

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID
and Motor Oil

LIMS ID: 00-21967
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10

Data Release Authorized: CR 11/30/00
Reported: 11/30/00

Date Received: 11/16/00

Lab ID	Sample ID	Date Extracted	Date Analyzed	Dilution Factor	Diesel Range	*HC ID	Motor Oil Range	Surrogate Recovery
CL62MB	**Method Blank**	11/20/00	11/23/00	1:1	**7.6**	NO	10 U	104%
CL62A	**TP-51-0-1**	11/20/00	11/25/00	1:1	**35 B**	NO	**100**	96.0%
CL62B	**TP-52-0-1**	11/20/00	11/25/00	1:5	**86 B**	M OIL	**440**	105%
CL62C	**TP-53-0-1**	11/20/00	11/28/00	1:10	**690 B**	NO	**700**	60.0%
CL62CD	**TP-53-0-1-DUPL**	11/20/00	11/28/00	1:10	**930 B**	NO	**970**	90.0%
CL62D	**TP-54-0-1**	11/20/00	11/25/00	1:1	**160 B**	NO	**310**	98.0%
CL62E	**TP-55-0-1**	11/20/00	11/28/00	1:50	**1,700 B**	NO	**6,300**	D
CL62F	**TP-56-0-1**	11/20/00	11/25/00	1:1	**16 B**	NO	**54**	80.0%
CL62G	**TP-57-0-1**	11/20/00	11/25/00	1:20	**2,200 B**	NO	**4,700**	D
CL62H	**TP-58-0-1**	11/20/00	11/25/00	1:1	**11 B**	NO	10 U	78.0%
CL62J	**TP-59-0-1**	11/20/00	11/28/00	1:10	**520 B**	NO	**1,200**	100%
CL62L	**TP-60-0-1**	11/20/00	11/28/00	1:10	**980 B**	NO	**1,700**	110%

Values reported in ppm (mg/kg) on a dry weight basis.

Surrogate is Methyl-Arachidate.

* ID indicates, in the opinion of the analyst, the petroleum product with the best pattern match. 'NO' indicates that there was not a good match for any of the requested products.
Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.

Data Qualifiers

U Compound not detected at the given detection limit.
J Indicates an estimated value below the calculated detection limit.
S No value reported due to saturation of the detector. Dilution required.
D Indicates the surrogate was not detected because of dilution of the extract.
E Indicates a value above the linear range of the detector. Dilution required.
NR Indicates no recovery due to matrix interference.
B Indicates compound also detected in the method blank.

FORM-1 TPHD

ANALYTICAL RESOURCES INCORPORATED

SOIL AROCLOR SURROGATE SUMMARY

Matrix: Soil

QC Report No: CL62
Project: Tacoma Metals
996098.10

LIMS ID	Lab ID	Client ID	TCMX	#	DCBP	#	TOT OUT
00-21967MB	112200MB	Method Blank	110%		114%		0
00-21967SB	112200SB	Lab Control	97.2%		107%		0
00-21967	CL62A	TP-51-0-1	90.5%		89.0%		0
00-21969	CL62C	TP-53-0-1	59.0%		70.0%		0
00-21971	CL62E	TP-55-0-1	79.0%		140%	*	1
00-21971DL	CL62E	TP-55-0-1-DL	87.0%		156%	*	1
00-21973	CL62G	TP-57-0-1	76.0%		119%		0
00-21976	CL62J	TP-59-0-1	81.8%		123%		0
00-21976DL	CL62J	TP-59-0-1-DL	D		D		0
00-21980	CL62N	TP-61-0-1	61.0%		124%		0
00-21980DL	CL62N	TP-61-0-1-DL	60.0%		139%	*	1
00-21984	CL62R	TP-63-0-1	68.2%		126%		0
00-21984DL	CL62R	TP-63-0-1-DL	70.5%		130%		0
00-21988	CL62U	TP-65-0-1	91.0%		81.5%		0
00-21988MS	CL62U	TP-65-0-1-MS	99.8%		98.0%		0
00-21988MSD	CL62U	TP-65-0-1-MSD	94.8%		84.0%		0
00-23245MB	120600MB	Method Blank	78.8%		68.5%		0
00-23245SB	120600SB	Lab Control	73.0%		64.0%		0
00-23245	CL62URE	TP-65-0-1RE	83.2%		69.5%		0
00-23245MS	CL62URE	TP-65-0-1RE-MS	80.8%		68.0%		0
00-23245MSD	CL62URE	TP-65-0-1RE-MSD	83.0%		66.2%		0

	QC LIMITS
(TCMX) = Tetrachloro-m-xylene	(34-128)
(DCBP) = Decachlorobiphenyl	(39-132)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D Surrogate Compound diluted out

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Lab Sample ID: CL62
LIMS ID: 00-23245
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098-10

Data Release Authorized:
Reported: 12/07/00

LABORATORY CONTROL SAMPLE SPIKE RECOVERY
Date extracted: 12/06/00

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	255	333	76.5%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	64.0%
Tetrachlorometaxylene	73.0%

Values Reported in Total ug/kg Dry Weight

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-58-0-1**
TOTAL METALS

Lab Sample ID: CL62H
LIMS ID: 00-21974
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized:
Reported: 12/08/00

Percent Total Solids: 95.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	11/28/00	6010	12/05/00	7440-38-2	Arsenic	30	30 U
3050	11/28/00	6010	12/05/00	**7440-39-3**	**Barium**	2	**45**
3050	11/28/00	6010	12/05/00	7440-43-9	Cadmium	1	1 U
3050	11/28/00	6010	12/05/00	**7440-47-3**	**Chromium**	3	**29**
3050	11/28/00	6010	12/05/00	**7440-50-8**	**Copper**	1	**21**
3050	11/28/00	6010	12/05/00	7439-92-1	Lead	10	10 U
CLP	11/28/00	7471	12/06/00	**7439-97-6**	**Mercury**	0.05	**0.06**
3050	11/28/00	6010	12/05/00	7782-49-2	Selenium	30	30 U
3050	11/28/00	6010	12/05/00	7440-22-4	Silver	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-58-2-3**
TOTAL METALS

Lab Sample ID: CL62I
LIMS ID: 00-21975
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized:
Reported: 12/08/00

Percent Total Solids: 87.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	11/28/00	6010	12/05/00	7440-38-2	Arsenic	30	30 U
3050	11/28/00	6010	12/05/00	7440-39-3	Barium	2	602
3050	11/28/00	6010	12/05/00	7440-43-9	Cadmium	1	17
3050	11/28/00	6010	12/05/00	7440-47-3	Chromium	3	105
3050	11/28/00	6010	12/05/00	7440-50-8	Copper	1	2,070
3050	11/28/00	6010	12/05/00	7439-92-1	Lead	10	2,340
CLP	11/28/00	7471	12/06/00	7439-97-6	Mercury	2	62
3050	11/28/00	6010	12/05/00	7782-49-2	Selenium	30	30 U
3050	11/28/00	6010	12/05/00	7440-22-4	Silver	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-59-0-1**
TOTAL METALS

Lab Sample ID: CL62J
LIMS ID: 00-21976
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized:
Reported: 12/08/00

Percent Total Solids: 85.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	11/28/00	6010	12/05/00	7440-38-2	Arsenic	30	40
3050	11/28/00	6010	12/05/00	7440-39-3	Barium	2	871
3050	11/28/00	6010	12/05/00	7440-43-9	Cadmium	1	34
3050	11/28/00	6010	12/05/00	7440-47-3	Chromium	3	173
3050	11/28/00	6010	12/05/00	7440-50-8	Copper	1	3,010
3050	11/28/00	6010	12/05/00	7439-92-1	Lead	10	2,250
CLP	11/28/00	7471	12/06/00	7439-97-6	Mercury	0.06	1.55
3050	11/28/00	6010	12/05/00	7782-49-2	Selenium	30	30 U
3050	11/28/00	6010	12/05/00	7440-22-4	Silver	2	2

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-59-2-3**
TOTAL METALS

Lab Sample ID: CL62K
LIMS ID: 00-21977
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized:
Reported: 12/08/00

Percent Total Solids: 91.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	11/28/00	6010	12/05/00	7440-38-2	Arsenic	30	30 U
3050	11/28/00	6010	12/05/00	7440-39-3	Barium	2	194
3050	11/28/00	6010	12/05/00	7440-43-9	Cadmium	1	9
3050	11/28/00	6010	12/05/00	7440-47-3	Chromium	3	35
3050	11/28/00	6010	12/05/00	7440-50-8	Copper	1	388
3050	11/28/00	6010	12/05/00	7439-92-1	Lead	10	350
CLP	11/28/00	7471	12/06/00	7439-97-6	Mercury	0 04	0.22
3050	11/28/00	6010	12/05/00	7782-49-2	Selenium	30	30 U
3050	11/28/00	6010	12/05/00	7440-22-4	Silver	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-60-0-1**
TOTAL METALS

Lab Sample ID: CL62L
LIMS ID: 00-21978
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized:
Reported: 12/08/00

Percent Total Solids: 85.1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	11/28/00	6010	12/06/00	7440-38-2	Arsenic	30	50
3050	11/28/00	6010	12/06/00	7440-39-3	Barium	2	1,050
3050	11/28/00	6010	12/06/00	7440-43-9	Cadmium	1	30
3050	11/28/00	6010	12/06/00	7440-47-3	Chromium	3	225
3050	11/28/00	6010	12/06/00	7440-50-8	Copper	1	2,330
3050	11/28/00	6010	12/06/00	7439-92-1	Lead	10	10,800
CLP	11/28/00	7471	12/06/00	7439-97-6	Mercury	2	77
3050	11/28/00	6010	12/06/00	7782-49-2	Selenium	30	40
3050	11/28/00	6010	12/06/00	7440-22-4	Silver	2	2

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-60-2-3**
TOTAL METALS

Lab Sample ID: CL62M
LIMS ID: 00-21979
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized:
Reported: 12/08/00

Percent Total Solids: 73.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	11/28/00	6010	12/06/00	7440-38-2	Arsenic	30	30 U
3050	11/28/00	6010	12/06/00	**7440-39-3**	**Barium**	2	**1,410**
3050	11/28/00	6010	12/06/00	**7440-43-9**	**Cadmium**	1	**20**
3050	11/28/00	6010	12/06/00	**7440-47-3**	**Chromium**	3	**99**
3050	11/28/00	6010	12/06/00	**7440-50-8**	**Copper**	1	**773**
3050	11/28/00	6010	12/06/00	**7439-92-1**	**Lead**	10	**3,260**
CLP	11/28/00	7471	12/06/00	**7439-97-6**	**Mercury**	0.05	**1.41**
3050	11/28/00	6010	12/06/00	7782-49-2	Selenium	30	30 U
3050	11/20/00	6010	12/06/00	7440-22-4	Silver	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-61-0-1**
TOTAL METALS

Lab Sample ID: CL62N
LIMS ID: 00-21980
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized:
Reported: 12/08/00

Percent Total Solids: 93.1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	11/28/00	6010	12/06/00	7440-38-2	Arsenic	30	30 U
3050	11/28/00	6010	12/06/00	7440-39-3	Barium	2	377
3050	11/28/00	6010	12/06/00	7440-43-9	Cadmium	1	10
3050	11/28/00	6010	12/06/00	7440-47-3	Chromium	3	53
3050	11/28/00	6010	12/06/00	7440-50-8	Copper	1	356
3050	11/28/00	6010	12/06/00	7439-92-1	Lead	10	4,810
CLP	11/28/00	7471	12/06/00	7439-97-6	Mercury	0.04	0.76
3050	11/28/00	6010	12/06/00	7782-49-2	Selenium	30	30 U
3050	11/28/00	6010	12/06/00	7440-22-4	Silver	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-61-2-3**
TOTAL METALS

Lab Sample ID: CL620
LIMS ID: 00-21981
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized:
Reported: 12/08/00

Percent Total Solids: 89.5%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	11/28/00	6010	12/06/00	7440-38-2	Arsenic	30	30 U
3050	11/28/00	6010	12/06/00	7440-39-3	Barium	2	352
3050	11/28/00	6010	12/06/00	7440-43-9	Cadmium	1	1
3050	11/28/00	6010	12/06/00	7440-47-3	Chromium	3	25
3050	11/28/00	6010	12/06/00	7440-50-8	Copper	1	40
3050	11/28/00	6010	12/06/00	7439-92-1	Lead	10	80
CLP	11/28/00	7471	12/06/00	7439-97-6	Mercury	0.05	0.23
3050	11/28/00	6010	12/06/00	7782-49-2	Selenium	30	30 U
3050	11/28/00	6010	12/06/00	7440-22-4	Silver	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-62-0-1**
TOTAL METALS

Lab Sample ID: CL62P
LIMS ID: 00-21982
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized:
Reported: 12/08/00

Percent Total Solids: 89.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	11/28/00	6010	12/06/00	7440-38-2	Arsenic	30	30 U
3050	11/28/00	6010	12/06/00	7440-39-3	Barium	2	201
3050	11/28/00	6010	12/06/00	7440-43-9	Cadmium	1	5
3050	11/28/00	6010	12/06/00	7440-47-3	Chromium	3	72
3050	11/28/00	6010	12/06/00	7440-50-8	Copper	1	208
3050	11/28/00	6010	12/06/00	7439-92-1	Lead	10	420
CLP	11/28/00	7471	12/06/00	7439-97-6	Mercury	0.04	0.92
3050	11/28/00	6010	12/06/00	7782-49-2	Selenium	30	30 U
3050	11/28/00	6010	12/06/00	7440-22-4	Silver	2	2

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-62-2-3**
TOTAL METALS

Lab Sample ID: CL62Q
LIMS ID: 00-21983
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized:
Reported: 12/08/00

Percent Total Solids: 83.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	11/28/00	6010	12/06/00	7440-38-2	Arsenic	30	30 U
3050	11/28/00	6010	12/06/00	7440-39-3	**Barium**	2	**265**
3050	11/28/00	6010	12/06/00	7440-43-9	**Cadmium**	1	**11**
3050	11/28/00	6010	12/06/00	7440-47-3	**Chromium**	3	**283**
3050	11/28/00	6010	12/06/00	7440-50-8	**Copper**	1	**407**
3050	11/28/00	6010	12/06/00	7439-92-1	**Lead**	10	**800**
CLP	11/28/00	7471	12/06/00	7439-97-6	**Mercury**	0.05	**2.05**
3050	11/28/00	6010	12/06/00	7782-49-2	Selenium	30	30 U
3050	11/28/00	6010	12/06/00	7440-22-4	Silver	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-63-0-1**
TOTAL METALS

Lab Sample ID: CL62R
LIMS ID: 00-21984
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized:
Reported: 12/08/00

Percent Total Solids: 92.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	11/28/00	6010	12/06/00	7440-38-2	Arsenic	30	30 U
3050	11/28/00	6010	12/06/00	7440-39-3	Barium	2	584
3050	11/28/00	6010	12/06/00	7440-43-9	Cadmium	1	38
3050	11/28/00	6010	12/06/00	7440-47-3	Chromium	3	61
3050	11/28/00	6010	12/06/00	7440-50-8	Copper	1	304
3050	11/28/00	6010	12/06/00	7439-92-1	Lead	10	700
CLP	11/28/00	7471	12/06/00	7439-97-6	Mercury	0.04	0.37
3050	11/28/00	6010	12/06/00	7782-49-2	Selenium	30	30 U
3050	11/28/00	6010	12/06/00	7440-22-4	Silver	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-63-2-3**
TOTAL METALS

Lab Sample ID: CL62S
LIMS ID: 00-21985
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized:
Reported: 12/08/00

Percent Total Solids: 87.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	11/28/00	6010	12/07/00	7440-38-2	Arsenic	30	30 U
3050	11/28/00	6010	12/07/00	7440-39-3	Barium	2	637
3050	11/28/00	6010	12/07/00	7440-43-9	Cadmium	1	50
3050	11/28/00	6010	12/07/00	7440-47-3	Chromium	3	64
3050	11/28/00	6010	12/07/00	7440-50-8	Copper	1	299
3050	11/28/00	6010	12/07/00	7439-92-1	Lead	10	1,800
CLP	11/28/00	7471	12/06/00	7439-97-6	Mercury	0.04	0.24
3050	11/28/00	6010	12/07/00	7782-49-2	Selenium	30	30
3050	11/28/00	6010	12/07/00	7440-22-4	Silver	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-64-0-1**
TOTAL METALS

Lab Sample ID: CL62T
LIMS ID: 00-21986
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized
Reported: 12/08/00

Percent Total Solids: 92.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	11/28/00	6010	12/07/00	7440-38-2	Arsenic	30	30 U
3050	11/28/00	6010	12/07/00	7440-39-3	Barium	2	163
3050	11/28/00	6010	12/07/00	7440-43-9	Cadmium	1	5
3050	11/28/00	6010	12/07/00	7440-47-3	Chromium	3	31
3050	11/28/00	6010	12/07/00	7440-50-8	Copper	1	459
3050	11/28/00	6010	12/07/00	7439-92-1	Lead	10	450
CLP	11/28/00	7471	12/06/00	7439-97-6	Mercury	0.04	0.98
3050	11/28/00	6010	12/07/00	7782-49-2	Selenium	30	30 U
3050	11/28/00	6010	12/07/00	7440-22-4	Silver	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-65-0-1**
TOTAL METALS

Lab Sample ID: CL62U
LIMS ID: 00-21988
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized:
Reported: 12/08/00

Percent Total Solids: 92.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	11/28/00	6010	12/07/00	7440-38-2	Arsenic	30	30 U
3050	11/28/00	6010	12/07/00	**7440-39-3**	**Barium**	2	**58**
3050	11/28/00	6010	12/07/00	7440-43-9	Cadmium	1	1 U
3050	11/28/00	6010	12/07/00	**7440-47-3**	**Chromium**	3	**28**
3050	11/28/00	6010	12/07/00	**7440-50-8**	**Copper**	1	**19**
3050	11/28/00	6010	12/07/00	7439-92-1	Lead	10	10 U
CLP	11/28/00	7471	12/06/00	**7439-97-6**	**Mercury**	0.05	**0.05**
3050	11/28/00	6010	12/07/00	7782-49-2	Selenium	30	30 U
3050	11/28/00	6010	12/07/00	7440-22-4	Silver	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: Method Blank**
TOTAL METALS

Lab Sample ID: CL62MB
LIMS ID: 00-21968
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: NA
Date Received: NA

Data Release Authorized
Reported: 12/08/00

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	11/28/00	6010	12/05/00	7440-38-2	Arsenic	2	2 U
3050	11/28/00	6010	12/05/00	7440-39-3	Barium	0.2	0.2 U
3050	11/28/00	6010	12/05/00	7440-43-9	Cadmium	0.1	0.1 U
3050	11/28/00	6010	12/05/00	7440-47-3	Chromium	0.2	0.2 U
3050	11/28/00	6010	12/05/00	7440-50-8	Copper	0.1	0.1 U
3050	11/28/00	6010	12/05/00	7439-92-1	Lead	1	1 U
CLP	11/28/00	7471	12/06/00	7439-97-6	Mercury	0.05	0.05 U
3050	11/28/00	6010	12/05/00	7782-49-2	Selenium	2	2 U
3050	11/28/00	6010	12/05/00	7440-22-4	Silver	0.2	0.2 U

U Analyte undetected at given RL

RL Reporting Limit

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CL62LCS
LIMS ID: 00-21968
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10

Data Release Authorized:
Reported: 12/08/00

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike mg/kg-dry	Spike Added	% Recovery	Q
Arsenic	6010	194	200	97.0%	
Barium	6010	174	200	87.0%	
Cadmium	6010	45.2	50.0	90.4%	
Chromium	6010	45.7	50.0	91.4%	
Copper	6010	43.1	50.0	86.2%	
Lead	6010	189	200	94.5%	
Mercury	7471	0.98	1.00	98.0%	
Selenium	6010	197	200	98.5%	
Silver	6010	44.0	50.0	88.0%	

'Q' codes: N = control limit not met

Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: Method Blank**
TOTAL METALS

Lab Sample ID: CL62MB
LIMS ID: 00-21988
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: NA
Date Received: NA

Data Release Authorized:
Reported: 12/08/00

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	11/28/00	6010	12/05/00	7440-38-2	Arsenic	2	2 U
3050	11/28/00	6010	12/05/00	7440-39-3	Barium	0.2	0.2 U
3050	11/28/00	6010	12/05/00	7440-43-9	Cadmium	0.1	0.1 U
3050	11/28/00	6010	12/05/00	7440-47-3	Chromium	0.2	0.2 U
3050	11/28/00	6010	12/05/00	7440-50-8	Copper	0.1	0.1 U
3050	11/28/00	6010	12/05/00	7439-92-1	Lead	1	1 U
CLP	11/28/00	7471	12/06/00	7439-97-6	Mercury	0.05	0.05 U
3050	11/28/00	6010	12/05/00	7782-49-2	Selenium	2	2 U
3050	11/28/00	6010	12/05/00	7440-22-4	Silver	0.2	0.2 U

U Analyte undetected at given RL

RL Reporting Limit

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CL62LCS
LIMS ID: 00-21988
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10

Data Release Authorized
Reported: 12/08/00

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike mg/kg-dry	Spike Added	% Recovery	Q
Arsenic	6010	195	200	97.5%	
Barium	6010	201	200	100%	
Cadmium	6010	50.4	50.0	101%	
Chromium	6010	50.0	50.0	100%	
Copper	6010	49.4	50.0	98.8%	
Lead	6010	195	200	97.5%	
Mercury	7471	0.98	1.00	98.0%	
Selenium	6010	197	200	98.5%	
Silver	6010	48.2	50.0	96.4%	

'Q' codes: N = control limit not met

Control Limits: 80-120%

Analytical Resources, Incorporated
Analytical Chemists and Consultants

December 13, 2000

Ty Schreiner
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: Project: Tacoma Metals
ARI Job: CL64

Dear Ty:

Please find enclosed sample custody records and final analytical results for the above referenced project. Ten soil samples were received in good condition on November 16, 2000. Selected samples were placed on hold at –18 degrees celcius pending further instruction.

Selected samples were analyzed for diesel and motor oil range hydrocarbons and were determined referencing WDOE method NWTPH-Dx.

The surrogate methyl-arachidate was diluted out on sample TP-55-2-3. No other analytical complications were noted. Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Susan Snyder
Project Manager
susan@arilabs.com

SS/ss
Enclosures

RECEIVED
DEC 14 2000
K/J Federal Way
K/J No/File
Route
Return To/By

333 Ninth Avenue North • Seattle WA 98109-5187 • **206-621-6490** • **206-621-7523** fax

00-21989 to 00-21998 CL64

Chain of Custody Record & Laboratory Analysis Request

Page 1 of 3 cold, cold, cold Turn Around Requested: Std.

Analytical Resources, Incorporated
Analytical Chemists and Consultants
400 Ninth Avenue North
Seattle, WA 98109-4708
206-621-6490 206-621-7523 (fax)

Report to: TY SCHREIDER	Proj Name: TACOMA METALS
Company: KENNEDY/JENKS	Proj Number: 996098.00
Address: 530 S. 336th ST	Sampler: DM JB
FEDERAL WAY WA 98003	
Phone: 253 874-0555	Shipping Method: COURIER
Fax:	AirBill:

Analyses Requested

Sample ID	Sample Date	Sample Time	Sample Matrix	No Containers	NWTPH-DX	RCRA METALS	CU	VOC'S	PCB'S		HOLD				Notes/Comments
TP-51-0-1	11/14/00	8:35	SOIL	2	X	X	X		X						
TP-51-2-3		8:44									X				FREEZE
TP-51-4-6		8:55									X				ALL
TP-51-6-8		9:10									X				HOLDS
TP-52-0-1		10:25			X	X	X				X				
TP-52-2-3		10:35									X				
TP-52-4-6		10:50			X						X				
TP-52-6-10		11:10			X						X				
TP-53-0-1		11:25			X	X	X		X						
TP-53-2-3		11:35									X				
TP-53-4-6		11:45									X				
53-6-7		11:50									X				
TP-54-0-1		12:45			X	X	X				X				
TP-54-2-3		12:50									X				
TP-54-4-6		1:00									X				
TP-54-6-10		1:10									X				
TP-55-0-1		1:20			X	X	X		X						
TP-55-2-3		1:30			X						X				
TP-55-4-6		1:40			X						X				
TP-55-6-10		1:50			X						X				

Relinquished: (Signature) [signature]	Relinquished: (Signature)	Relinquished: (Signature)	Special Instructions/Notes
Printed name: JODIE BALAGE	Printed name:	Printed name:	
Company: Kennedy/Jenks	Company:	Company:	
Date: 11/16/00 Time: 9:00 am	Date: Time:	Date: Time:	
Received by: [signature]	Received by:	Received by:	
Printed name: [illegible]	Printed name:	Printed name:	
Company: ARI	Company:	Company:	Number of Coolers:
			Cooler Temp(s):
Date: 11/16/00 Time: 1100	Date: Time:	Date: Time:	COC Seals Intact?
			Bottles Intact?

Chain of Custody Record & Laboratory Analysis Request

Page 2 of 3

Turn Around Requested: Std

Analytical Resources, Incorporated
Analytical Chemists and Consultants
400 Ninth Avenue North
Seattle, WA 98109-4708
206-621-6490 206-621-7523 (fax)

Report to: TY SCHIRPNER	Proj Name: TACOMA METALS
Company: KENNEDY / JENKS	Proj Number: 996098.00
Address: 520 S. 336th St	Sampler: DM, JB
FEDERAL WAY WA 98003	
Phone: 253 874-0555	Shipping Method: COURIER
Fax:	AirBill:

Sample ID	Sample Date	Sample Time	Sample Matrix	No Containers	2WRH-DV	PCBA METALS	CU	VOC'S	PCB'S		HOLD				Notes/Comments
TP-56-0-1	11/14/00	2:10	SOIL	2	X	X	X				X				FREEZE ALL HOLDS
TP-56-2-3		2:15									X				
TP-56-4-6		2:25									X				
TP-56-6-10		2:40									X				
TP-57-0-1		2:55			X	X	X		X						
TP-57-2-3		3:00			X						X				
TP-57-4-6		3:15			X						X				
TP-57-6-10		3:25			X						X				
TP-58-0-1	11/15/00	8:15			X	X	X				X				
TP-58-2-3		8:25				X	X				X				
TP-58-4-6		8:35									X				
TP-58-6-10		8:50									X				
TP-59-0-1		9:05			X	X	X		X						
TP-59-2-3		9:15				X	X				X				
TP-59-4-6		9:25									X				
TP-59-6-10		9:40									X				
TP-60-0-1		9:50			X	X	X				X				
TP-60-2-3		10:00				X	X				X				
TP-60-4-6		10:10									X				
TP-60-6-10		10:20									X				

Relinquished: (Signature)	Relinquished: (Signature)	Relinquished: (Signature)	Special Instructions/Notes
Printed name: Jodie Bordelon	Printed name:	Printed name:	
Company: Kennedy / Jenks	Company:	Company:	
Date: 11/14/00 Time: 9:00 am	Date: Time:	Date: Time:	
Received by:	Received by:	Received by:	
Printed name: Mark McDonald	Printed name:	Printed name:	
Company: ARI	Company:	Company:	Number of Coolers:
			Cooler Temp(s):
Date: 11/16/00 Time: 1100	Date: Time:	Date: Time:	COC Seals Intact?
			Bottles Intact?

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
400 Ninth Avenue North
Seattle, WA 98109-4708
206-621-6490 206-621-7523 (fax)

Page 3 of 3

Turn Around Requested: Std

Report to: TY SCHREINER	Proj Name: TACOMA METALS
Company: KENNEDY/JENKS	Proj Number: 996098 00
Address: 530 S. 336th ST	Sampler: DM, JB
FEDERAL WAY WA 98003	
Phone: 253 874-0555	Shipping Method: COURIER
Fax:	AirBill:

Analyses Requested

Sample ID	Sample Date	Sample Time	Sample Matrix	No Containers	NWTPH-DX	RCRA METALS	CU	VOCs	PCB		HOLD				Notes/Comments
TP-61-0-1	1/15/00	10:35	SOIL	2	X	X	X		X						FREEZE ALL HOLDS
TP-61-2-3		10:45			X	X	X				X				
TP-61-4-6		11:00			X						X				
TP-61-6-10		11:15									X				
TP-62-0-1		11:20			X	X	X				X				
TP-62-2-3		11:30				X	X				X				
TP-62-4-6		11:40									X				
TP-62-6-10		11:50									X				
TP-63-0-1		12:40			X	X	X		X						
TP-63-2-3		12:45			X						X				
TP-63-4-6		1:00			X						X				
TP-63-6-10		1:10									X				
TP-64-0-1		1:45			X	X	X				X				
TP-64-2-3		1:55									X				
TP-64-4-6		2:10									X				
TP-64-6-8		2:17									X				
TP-65-0-1		2:40			X	X	X		X						
TP-65-2-3		2:45									X				
TP-65-4-6		2:55									X				
TP-65-6-9		3:05									X				

SCRATCH

DO Metals & CU on TP-63 2-3

Relinquished: (Signature) [signature]	Relinquished: (Signature)	Relinquished: (Signature)	Special Instructions/Notes
Printed name: J Brundage	Printed name:	Printed name:	
Company: Kennedy/Jenks	Company:	Company:	
Date: 1/16/00 Time: 9:00am	Date: Time:	Date: Time:	
Received by: [signature]	Received by:	Received by:	
Printed name: [illegible] McDougal	Printed name:	Printed name:	
Company: ARI	Company:	Company:	Number of Coolers:
			Cooler Temp(s):
Date: 11/16/00 Time: 1100	Date: Time:	Date: Time:	COC Seals Intact?
			Bottles Intact?

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID
and Motor Oil

LIMS ID: 00-21989 QC Report No: CL64-Kennedy Jenks Consultants
Matrix: Soil Project: Tacoma Metals
996098.10

Data Release Authorized: 12/14/00 Date Received: 11/16/00
Reported: 12/04/00

Lab ID	Sample ID	Date Extracted	Date Analyzed	Dilution Factor	Diesel Range	*HC ID	Motor Oil Range	Surrogate Recovery
CL64MB	Method Blank	11/22/00	11/28/00	1:1	5.0 U	---	10 U	102%
CL64A	TP-52-4-6	11/22/00	11/28/00	1:1	240	NO	140	48.0%
CL64B	TP-52-6-10	11/22/00	11/28/00	1:4	730	NO	870	56.0%
CL64C	TP-55-2-3	11/22/00	11/30/00	1:20	2,000	NO	8,000	D
CL64D	TP-55-4-6	11/22/00	11/30/00	1:10	1,700	NO	6,500	50.0%
CL64E	TP-55-6-10	11/22/00	11/30/00	1:10	2,400	NO	12,000	90.0%
CL64F	TP-57-2-3	11/22/00	11/28/00	1:1	66	NO	98	77.0%
CL64G	TP-57-4-6	11/22/00	11/28/00	1:1	170	NO	200	69.0%
CL64MB	Method Blank	11/30/00	12/01/00	1:1	5.0 U	---	10 U	100%
CL64H	TP-57-6-10	11/22/00	11/28/00	1:1	88	NO	350	33.0%
CL64HR	TP-57-6-10	11/30/00	12/01/00	1:1	98	NO	680	52.0%
CL64I	TP-61-4-6	11/22/00	11/28/00	1:1	120	NO	87	95.0%

Values reported in ppm (mg/kg) on a dry weight basis.

Surrogate is Methyl-Arachidate.

* ID indicates, in the opinion of the analyst, the petroleum product with the best pattern match. 'NO' indicates that there was not a good match for any of the requested products.
Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.

Data Qualifiers

U	Compound not detected at the given detection limit.
J	Indicates an estimated value below the calculated detection limit.
S	No value reported due to saturation of the detector. Dilution required.
D	Indicates the surrogate was not detected because of dilution of the extract.
E	Indicates a value above the linear range of the detector. Dilution required.
NR	Indicates no recovery due to matrix interference.
B	Indicates compound also detected in the method blank.

FORM-1 TPHD

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID
and Motor Oil

LIMS ID: 00-21997
Matrix: Soil

QC Report No: CL64-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10

Data Release Authorized: CR 12/14/00
Reported: 12/04/00

Date Received: 11/16/00

Lab ID	Sample ID	Date Extracted	Date Analyzed	Dilution Factor	Diesel Range	*HC ID	Motor Oil Range	Surrogate Recovery
CL64ID	**TP-61-4-6-DUPL**	11/22/00	11/28/00	1:1	**120**	NO	**87**	92.0%
CL64J	**TP-63-4-6**	11/22/00	11/28/00	1:1	**240**	NO	**640**	71.0%

Values reported in ppm (mg/kg) on a dry weight basis.

Surrogate is Methyl-Arachidate.

* ID indicates, in the opinion of the analyst, the petroleum product with the best pattern match. 'NO' indicates that there was not a good match for any of the requested products.
Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.

Data Qualifiers

U	Compound not detected at the given detection limit.
J	Indicates an estimated value below the calculated detection limit.
S	No value reported due to saturation of the detector. Dilution required.
D	Indicates the surrogate was not detected because of dilution of the extract.
E	Indicates a value above the linear range of the detector. Dilution required.
NR	Indicates no recovery due to matrix interference.
B	Indicates compound also detected in the method blank.

FORM-1 TPHD

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CL64SB
LIMS ID: 00-21989
Matrix: Soil

QC Report No: CL64-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10

Data Release Authorized:
Reported: 12/04/00 CR 12/4/00

LABORATORY CONTROL SAMPLE RECOVERY REPORT
Date extracted: 11/22/00
Date analyzed: 11/28/00

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
Diesel Range Hydrocarbons	109	100	109%

TPHd Surrogate Recovery

Methylarachidate 96.0%

Values reported in ppm (mg/kg) on a dry weight basis.

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CL64SB
LIMS ID: 00-21996
Matrix: Soil

QC Report No: CL64-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10

Data Release Authorized:
Reported: 12/04/00 CR 12/4/00

LABORATORY CONTROL SAMPLE RECOVERY REPORT
Date extracted: 11/30/00
Date analyzed: 12/01/00

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
Diesel Range Hydrocarbons	110	100	110%

TPHd Surrogate Recovery

Methylarachidate 93.0%

Values reported in ppm (mg/kg) on a dry weight basis.

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL HYDROCARBONS COMPOUND SUMMARY

Matrix: Soil

QC Report No: CL64

LIMS ID	Lab ID	Extracted	Client ID	MeArach	TOT OUT
00-21989MB	112800MB	11/22/00	Method Blank	102%	0
00-21989LC	112800LC	11/22/00	Lab Control	96%	0
00-21989	CL64A	11/22/00	TP-52-4-6	48%	0
00-21990	CL64B	11/22/00	TP-52-6-10	56%	0
00-21991	CL64C	11/22/00	TP-55-2-3	D	0
00-21992	CL64D	11/22/00	TP-55-4-6	50%	0
00-21993	CL64E	11/22/00	TP-55-6-10	90%	0
00-21994	CL64F	11/22/00	TP-57-2-3	77%	0
00-21995	CL64G	11/22/00	TP-57-4-6	69%	0
00-21996MB	120100MB	11/30/00	Method Blank	100%	0
00-21996LC	120100LC	11/30/00	Lab Control	93%	0
00-21996	CL64H	11/22/00	TP-57-6-10	33%	0
00-21996	CL64H-RE	11/30/00	TP-57-6-10-RE	52%	0
00-21997	CL64I	11/22/00	TP-61-4-6	95%	0
00-21997	CL64I-DP	11/22/00	TP-61-4-6-DP	92%	0
00-21998	CL64J	11/22/00	TP-63-4-6	71%	0

	Control QC LIMITS	Sample QC LIMITS
(MeArach) = Methylarachidate	(56-114)	(21-130)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D System Monitoring Compound diluted out

FORM-II TPHD

Analytical Resources Inc.
NWTPH-D Quantitation Report

Data file: /chem2/fid3b.i/28NOV00.B/1128b030.d
Method: /chem2/fid3b.i/28NOV00.B/tphfid3b.m
Instrument: fid3b.i
Operator: GSA
Report Date: 11/30/2000
Macro: FID:3B112100
Calibration Dates: Gas:10/31/00 Diesel:11/10/00 M.Oil:11/06/00

ARI ID: CL64 MBS 11/22 method Blank
Client ID:
Injection: 28-NOV-2000 19:03

Dilution Factor: 1

Tazz-1B RESULTS

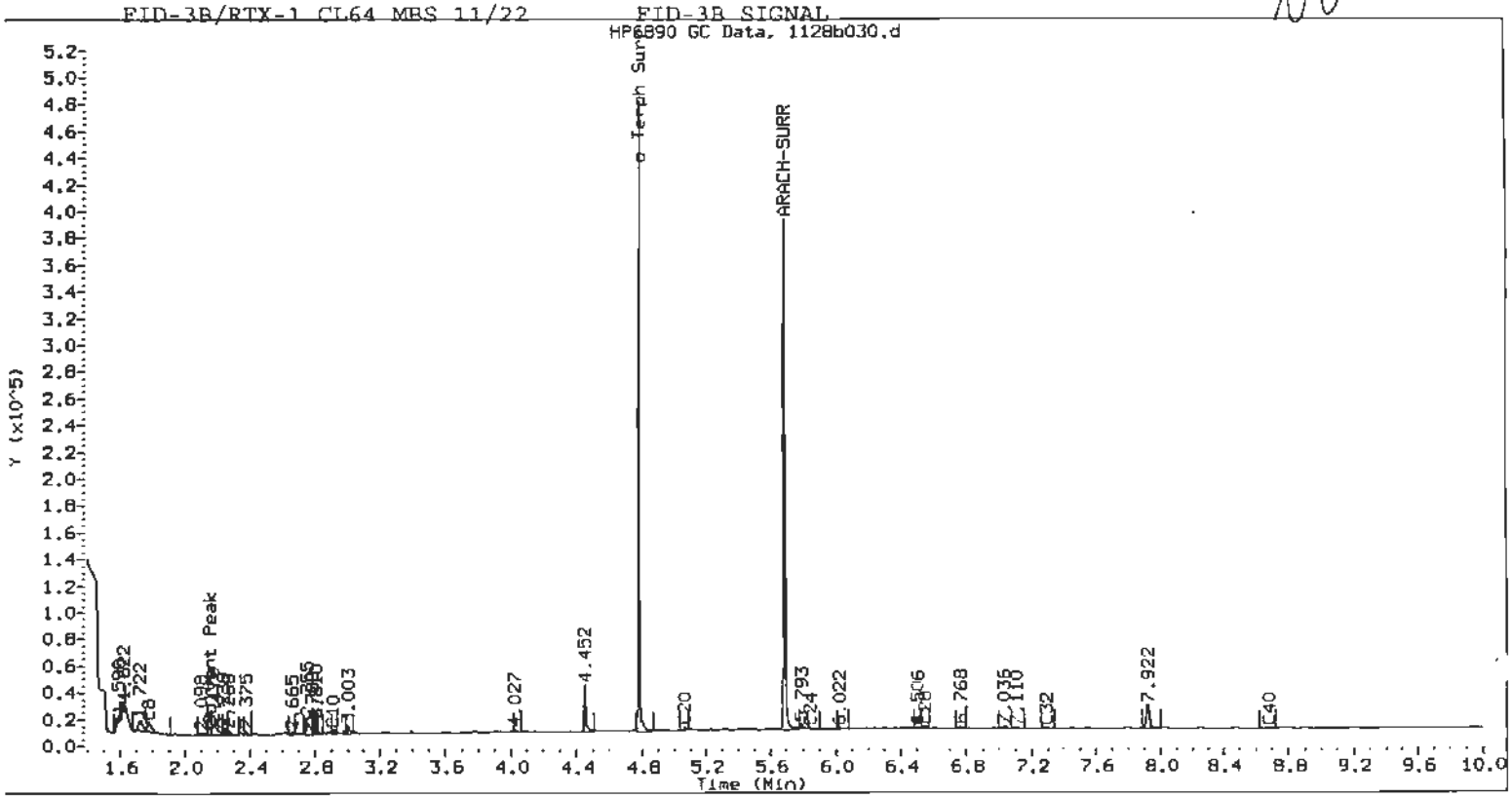
Compound	RT	Shift	Height	Area
Toluene	----			
C8	1.779	-0.035	7270	627976
Solvent Peak	2.150	0.008	5727	383407
C10	2.912	-0.029	3511	176849
C12	----			
C14	----			
C16	----			
C18	----			
o-Terph Surr	4.784	-0.001	474071	13075076
C20	5.065	-0.038	3248	205390
C22	----			
ARACH-SURR	5.692	-0.001	382391	13955733
C24	5.848	-0.004	999	132242
C26	----			
C28	6.550	-0.006	2181	143719
C30	----			
Filter Peak	----			
C32	7.297	0.014	1286	118445
C34	----			
C36	----			
C38	----			
C40	8.685	0.015	579	115730

Range	Total Area	Conc
GAS (Tol-C12)	5709668	16
DIESEL (C12-C24)	2086426	3
M.OIL (C24-C38)	2249561	3

Me-Arach Surrogate Rec = 102%
o-Terphenyl Surrogate Rec = 97%

NO

FID-3B/RTX-1 CL64 MBS 11/22 FID-3B SIGNAL



Analytical Resources Inc.
NWTPH-D Quantitation Report

ata file: /chem2/fid3b.i/01dec00.b/1201b009.d
Method: /chem2/fid3b.i/01dec00.b/tphfid3b.m
Instrument: fid3b.i
Operator: GSA
Report Date: 12/04/2000
Macro: FID:3B112100
Calibration Dates: Gas:10/31/00 Diesel:11/10/00 M.Oil:11/06/00

ARI ID: CL64 MBS 11/30 method Blank
Client ID:
Injection: 01-DEC-2000 16:54

Dilution Factor: 1

Tazz-1B RESULTS

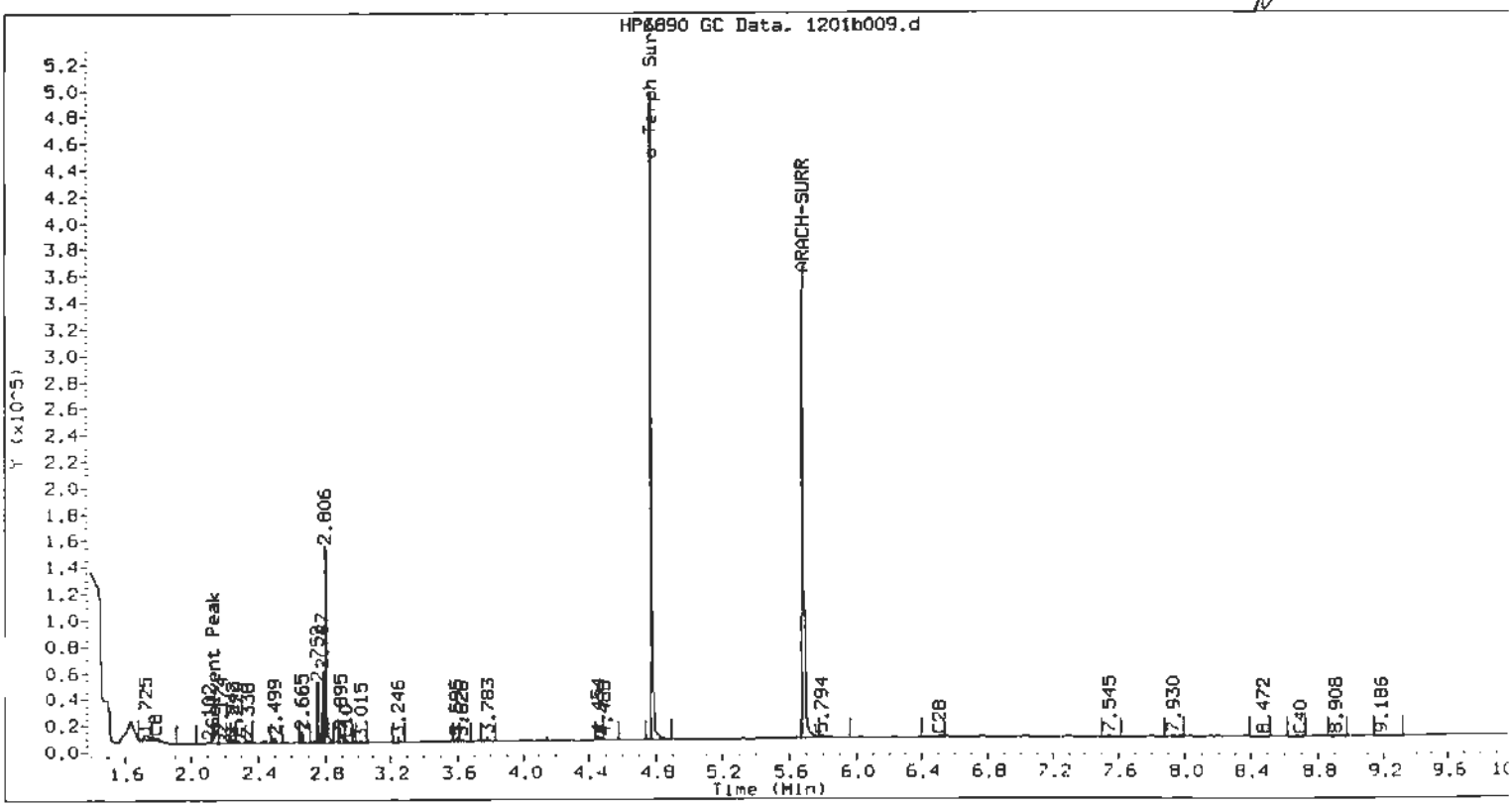
Compound	RT	Shift	Height	Area
Toluene	----			
C8	1.789	-0.035	2921	294804
Solvent Peak	2.129	-0.013	10287	1039810
C10	2.929	-0.011	2819	124497
C12	----			
C14	----			
C16	----			
C18	----			
o-Terph Surr	4.782	-0.001	487382	13787177
C20	----			
C22	----			
ARACH-SURR	5.689	0.001	350062	13723575
C24	----			
C26	----			
C28	6.504	-0.043	972	102040
C30	----			
Filter Peak	----			
C32	----			
34	----			
36	----			
C38	----			
C40	8.687	0.041	861	130502

Range	Total Area	Conc
GAS (Tol-C12)	10896929	30
DIESEL (C12-C24)	1111159	1
M.OIL (C24-C38)	375616	1

Me-Arach Surrogate Rec = 100%
o-Terphenyl Surrogate Rec = 103%

NO

FID-3B/RTX-1 CL64 MBS 11/30 FID-3B SIGNAL



Analytical Resources Inc.
NWTPH-D Quantitation Report

Data file: /chem2/fid3b.i/28NOV00.B/1128b031.d
Method: /chem2/fid3b.i/28NOV00.B/tphfid3b.m
Instrument: fid3b.i
Operator: GSA
Report Date: 11/30/2000
Macro: FID:3B112100
Calibration Dates: Gas:10/31/00 Diesel:11/10/00 M.Oil:11/06/00

ARI ID: CL64 SBS 11/22 LCS
Client ID:
Injection: 28-NOV-2000 19:23

Dilution Factor: 1

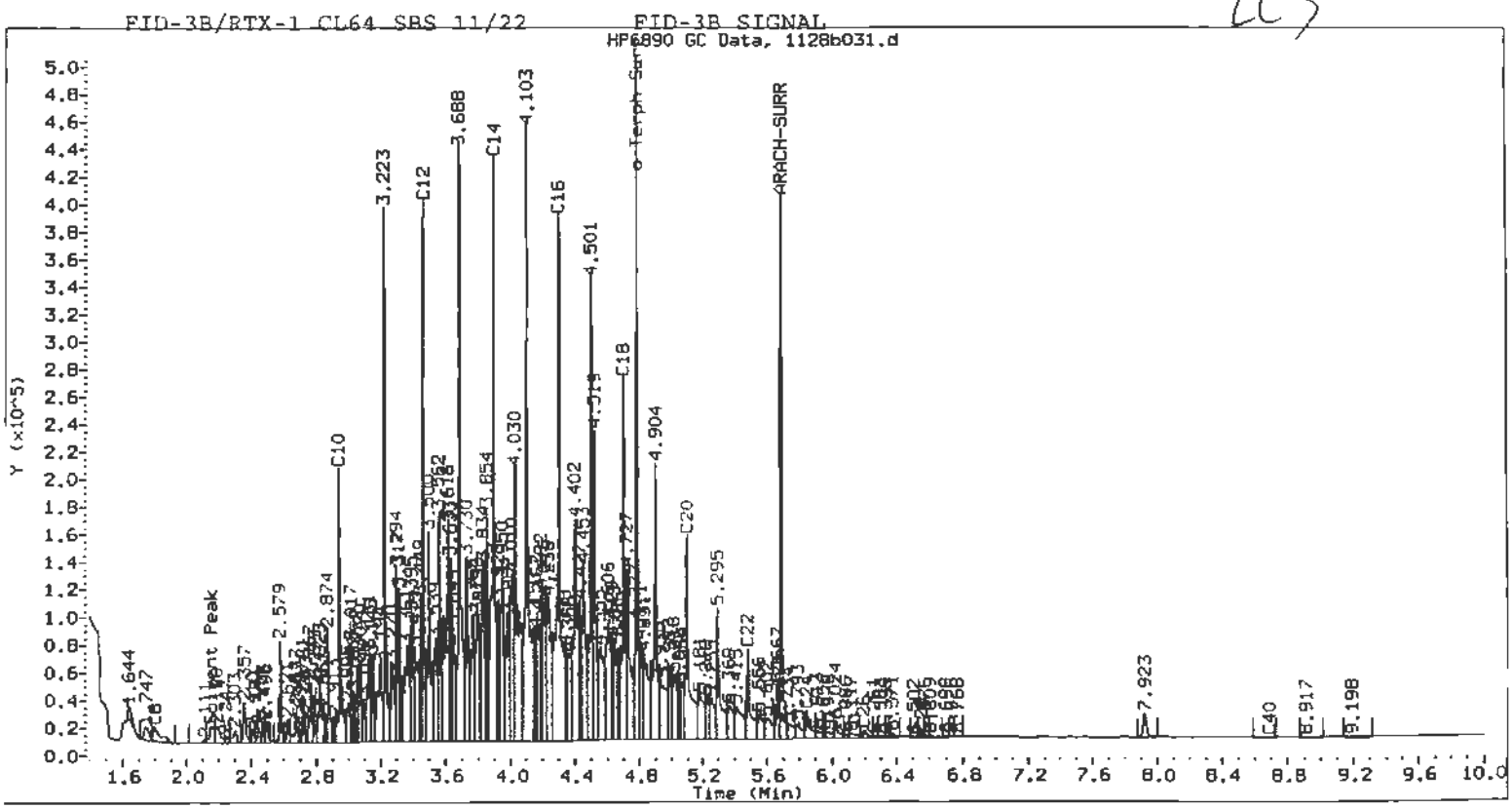
Tazz-1B RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	----				GAS (Tol-C12)	125768767	346
C8	1.801	-0.013	9995	1566472	DIESEL (C12-C24)	439307215	545
Solvent Peak	2.153	0.011	12426	1136890	M.OIL (C24-C38)	7626625	10
C10	2.945	0.003	197788	7121752			
C12	3.465	0.002	389018	9801723			
C14	3.900	0.001	432690	20631720			
C16	4.300	0.001	392269	23028129			
C18	4.703	0.000	264924	12009043			
o-Terph Surr	4.787	0.001	461522	11663140			
C20	5.101	-0.001	147262	11037672			
C22	5.483	-0.002	65279	4978906			
ARACH-SURR	5.692	-0.001	379453	13208921			
C24	5.847	-0.005	20239	1772701			
C26	6.197	-0.010	5906	667272			
C28	6.551	-0.006	3970	261459			
C30	----						
Filter Peak	----						
C32	----						
C34	----						
C36	----						
C38	----						
C40	8.692	0.022	513	145294			

Me-Arach Surrogate Rec = 96%
o-Terphenyl Surrogate Rec = 87%

LCS

FID-3B/RTX-1 CL64 SBS 11/22 FID-3B SIGNAL



Analytical Resources Inc.
NWTPH-D Quantitation Report

ata file: /chem2/fid3b.i/01dec00.b/1201b010.d
ethod: /chem2/fid3b.i/01dec00.b/tphfid3b.m
Instrument: fid3b.i
Operator: GSA
Report Date: 12/04/2000
Macro: FID:3B112100
Calibration Dates: Gas:10/31/00 Diesel:11/10/00 M.Oil:11/06/00

ARI ID: CL64 SBS 11/30 LCS
Client ID:
Injection: 01-DEC-2000 17:14

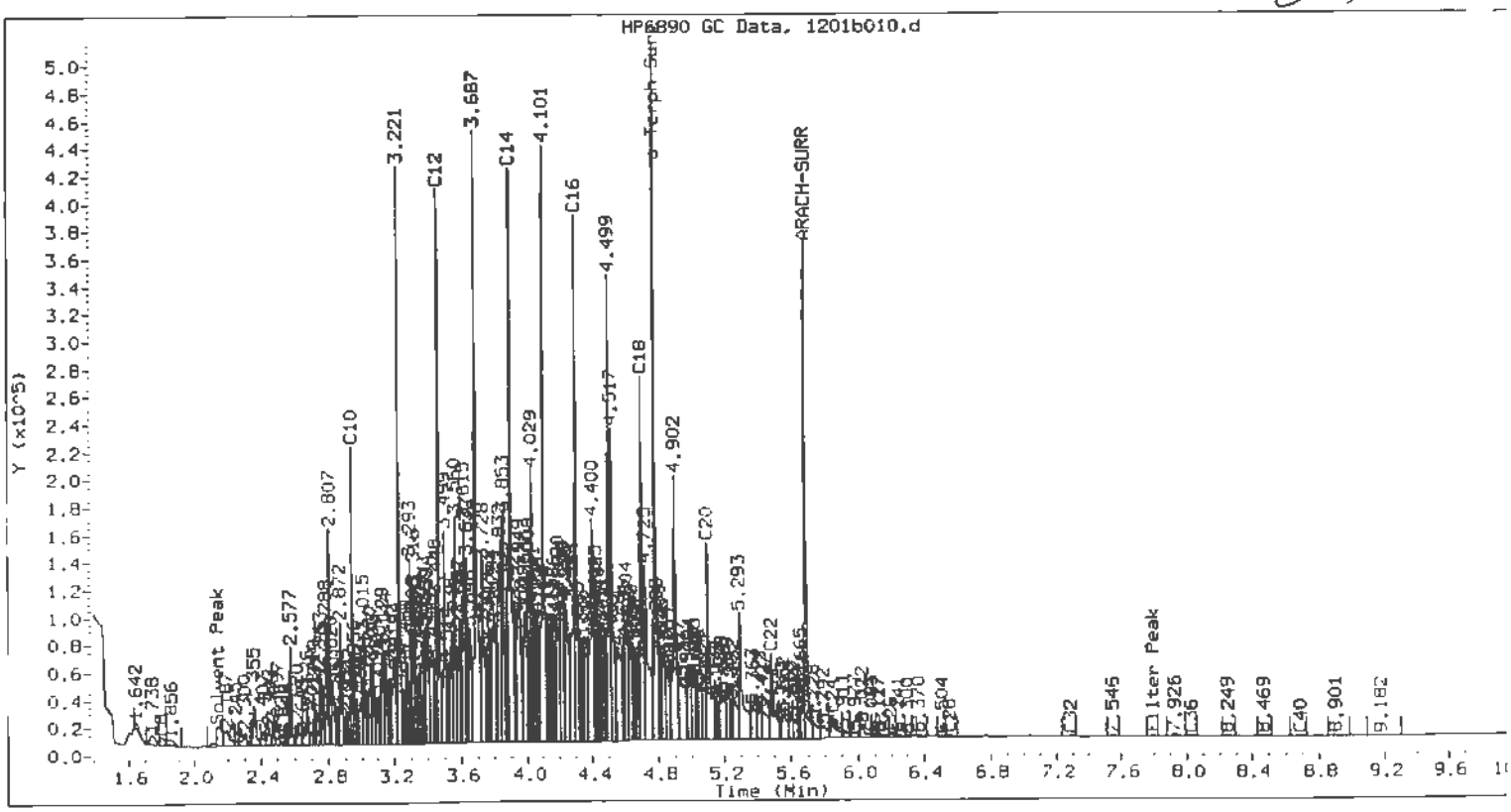
Dilution Factor: 1

Tazz-1B RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	----				GAS (Tol-C12)	135375522	372
C8	1.798	-0.025	5793	638919	DIESEL (C12-C24)	443781504	551
Solvent Peak	2.139	-0.003	14377	1767076	M.OIL (C24-C38)	4909267	7
C10	2.943	0.003	215878	4466773			
C12	3.464	0.001	402558	9971108			
C14	3.898	0.000	415311	16872003			
C16	4.299	0.000	383656	12366593			
C18	4.702	0.001	266394	10351622			
o-Terph Surr	4.784	0.001	468251	11914725			
C20	5.099	-0.001	144116	8249525			
C22	5.481	-0.002	62217	4209938			
ARACH-SURR	5.690	0.002	345708	12791395			
C24	5.845	0.000	17113	1710882			
C26	6.196	0.001	4247	358224			
C28	6.550	0.003	1334	116175			
C30	----						
Filter Peak	7.790	-0.009	1306	109387			
C32	7.292	0.016	1400	101563			
C34	----						
36	8.024	0.040	1278	119824	Me-Arach Surrogate Rec =	93%	(12791395)
38	----				o-Terphenyl Surrogate Rec =	89%	
C40	8.682	0.036	1046	143670			

FID-3B/RTX-1 CL64 SBS 11/30 FID-3B SIGNAL

LCS



Analytical Resources Inc.
NWTPH-D Quantitation Report

Data file: /chem2/fid3b.i/28NOV00.B/1128b037.d
Method: /chem2/fid3b.i/28NOV00.B/tphfid3b.m
Instrument: fid3b.i
Operator: GSA
Report Date: 11/30/2000
Macro: FID:3B112100
Calibration Dates: Gas:10/31/00 Diesel:11/10/00 M.Oil:11/06/00

ARI ID: CL64 A
Client ID:
Injection: 28-NOV-2000 21:25

Dilution Factor: 1

Tazz-1B RESULTS

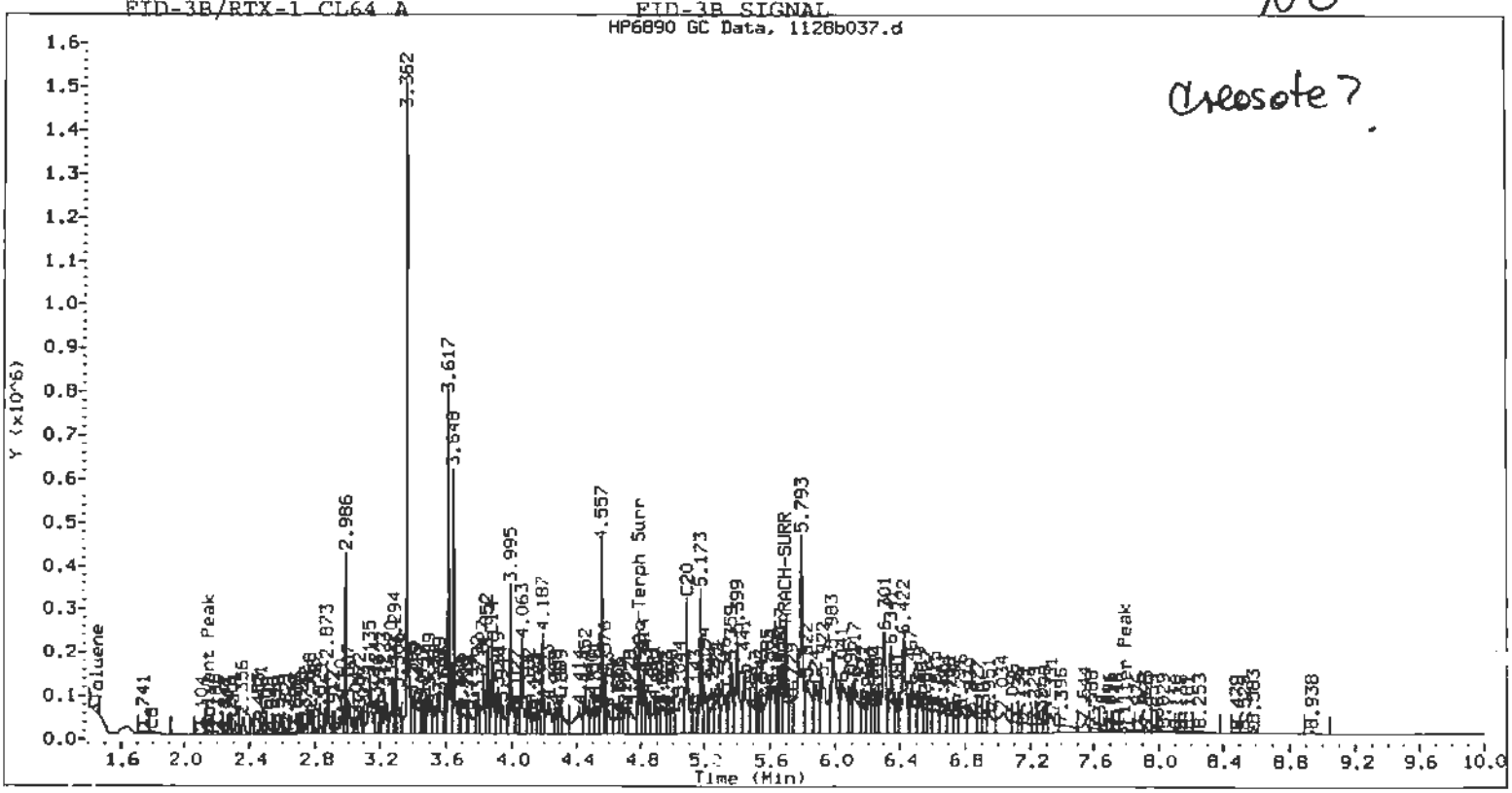
Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	1.455	0.033	22732	1523316	GAS (Tol-C12)	151119635	416
C8	1.795	-0.018	6487	738713	DIESEL (C12-C24)	521986275	648
Solvent Peak	2.141	-0.001	9811	840602	M.OIL (C24-C38)	277347900	376
C10	2.958	0.016	92720	3934185			
C12	3.466	0.003	61409	2780043			
C14	3.880	-0.019	223107	10783095			
C16	4.295	-0.005	80407	3594381			
C18	4.701	-0.001	61663	4904820			
o-Terph Surr	4.785	-0.001	156227	3543971			
C20	5.085	-0.017	317785	17630063			
C22	5.484	-0.001	70527	6454301			
ARACH-SURR	5.695	0.002	174544	6624708			
C24	5.878	0.026	110714	10560738			
C26	6.206	-0.002	78118	6980204			
C28	6.550	-0.007	58668	3625542			
C30	6.915	-0.003	35262	3186112			
Filter Peak	7.793	-0.005	12188	2162807			
C32	7.270	-0.013	21167	2356204			
C34	7.639	-0.002	9680	1266094			
C36	7.992	0.001	3792	154633	Me-Arach Surrogate Rec = 48%	(6624708)	
C38	----				o-Terphenyl Surrogate Rec = 26%		
C40	0.000	-8.670	0	0			

NO

FID-3B/RTX-1 CL64 A

FID-3B SIGNAL
HP6890 GC Data, 1128b037.d

Creosote?



Analytical Resources Inc.
NWTPH-D Quantitation Report

ata file: /chem2/fid3b.i/28NOV00.B/1128b043.d
ethod: /chem2/fid3b.i/28NOV00.B/tphfid3b.m
Instrument: fid3b.i
Operator: GSA
Report Date: 11/30/2000
Macro: FID:3B112100
Calibration Dates: Gas:10/31/00 Diesel:11/10/00 M.Oil:11/06/00

ARI ID: CL64 B 4x
Client ID:
Injection: 28-NOV-2000 23:27

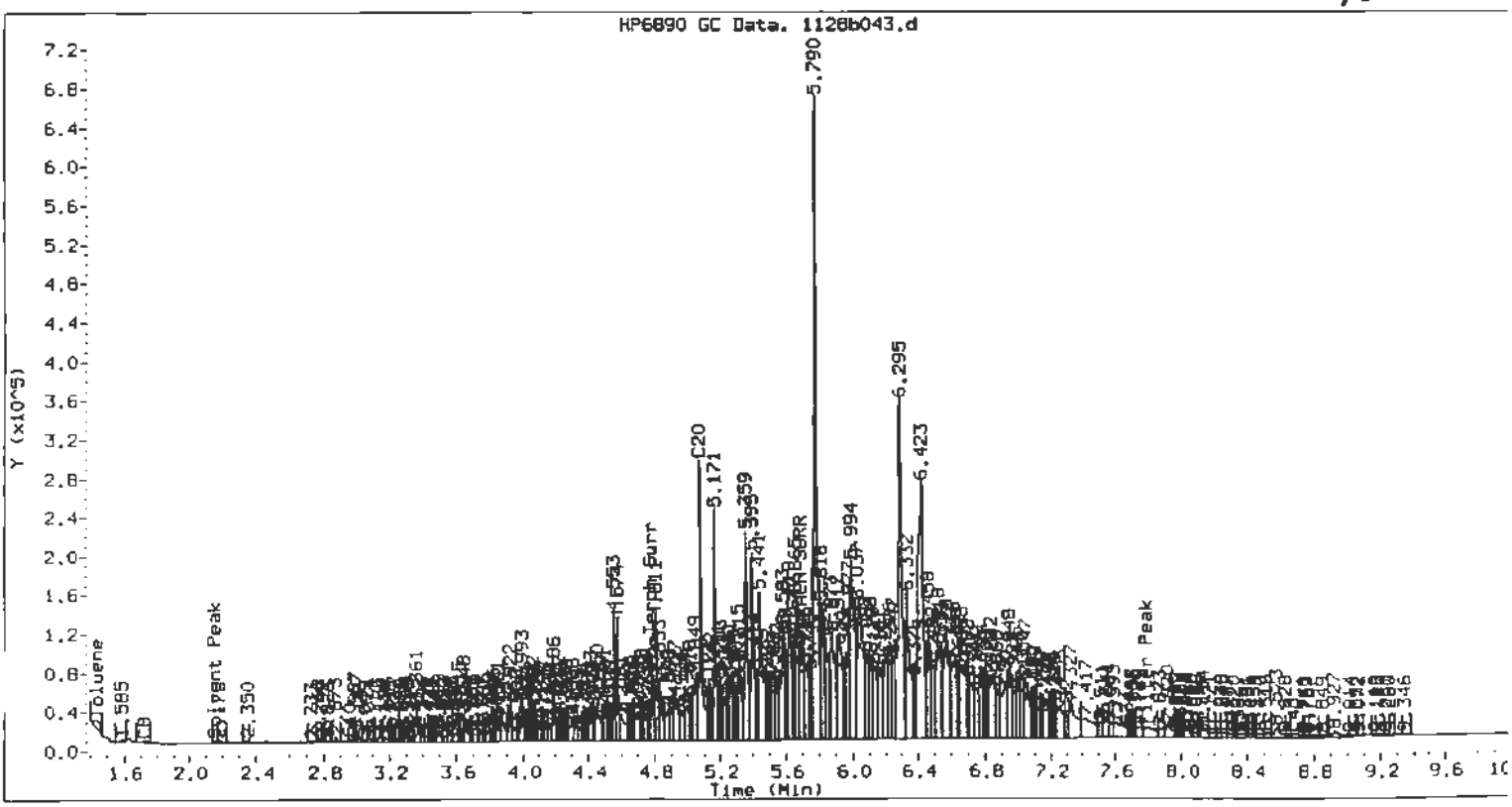
Dilution Factor: 1

Tazz-1B RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	1.436	0.015	8091	1143625	GAS (Tol-C12)	11012159	30
C8	1.724	-0.090	1837	178887	DIESEL (C12-C24)	313207804	389
Solvent Peak	2.153	0.011	3010	170328	M.OIL (C24-C38)	341160995	462
C10	2.958	0.017	3477	123621			
C12	3.466	0.003	6021	266666			
C14	3.878	-0.021	25162	1689662			
C16	4.294	-0.006	24989	1307418			
C18	4.700	-0.003	29792	1980585			
o-Terph Surr	4.782	-0.004	59532	2253751			
C20	5.083	-0.019	288902	14230028			
C22	5.482	-0.003	59552	2424861			
ARACH-SURR	5.693	0.000	41008	1854025			
C24	5.835	-0.017	104713	8161516			
C26	6.196	-0.011	87505	7495716			
C28	6.564	0.008	107454	11523244			
C30	6.921	0.003	53396	6435725			
Filter Peak	7.786	-0.013	10734	2496012			
C32	7.302	0.019	22769	1134331			
C34	7.672	0.030	10458	452385			
6	7.993	0.002	6999	320320	Me-Arach Surrogate Rec = 14%	(1854025)	
38	8.339	0.005	4170	656380	o-Terphenyl Surrogate Rec = 17%	(2253751)	
C40	8.685	0.015	3160	585304			

FID-3B/RTX-1 CL64 B 4x FID-3B SIGNAL

NO



Analytical Resources Inc.
NWTPH-D Quantitation Report

Data file: /chem2/fid4a.i/30nov00.b/1130a034.d
Method: /chem2/fid4a.i/30nov00.b/tphfid4a.m
Instrument: fid4a.i
Operator: GSA
Report Date: 12/04/2000
Macro: FID:4A112100
Calibration Dates: Gas:11/17/00 Diesel:11/17/00 M.Oil:11/21/00

ARI ID: CL64 C 20x
Client ID:
Injection: 30-NOV-2000 20:51

Dilution Factor: 1

FID:4A RESULTS

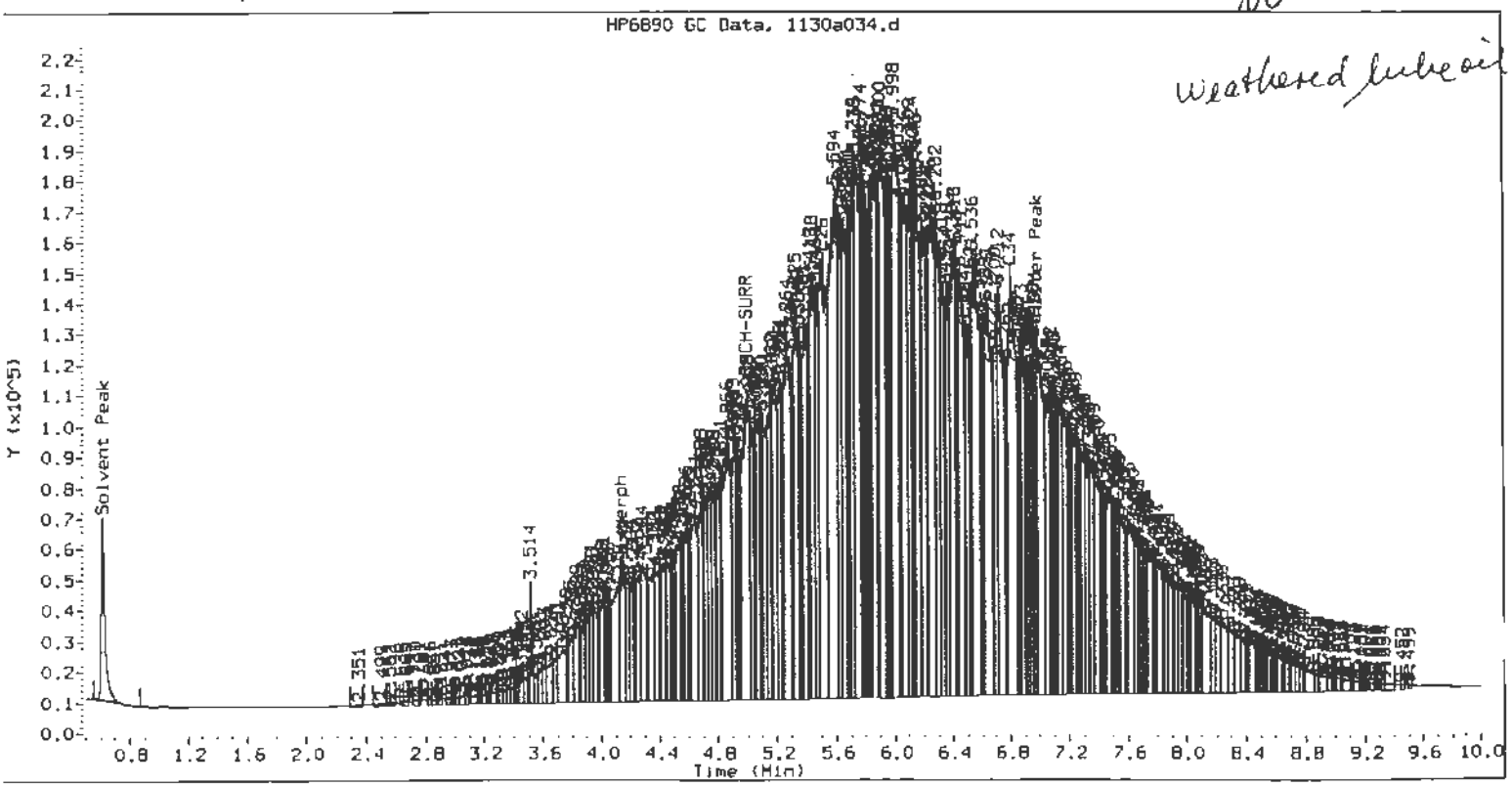
Compound	RT	Shift	Height	Area
Toluene	----			
C8	----			
Solvent Peak	0.609	0.002	59713	5418610
C10	----			
C12	2.900	0.017	2341	176381
C14	3.335	-0.010	4953	314316
C16	3.734	-0.001	17313	2490617
C18	4.114	0.022	38096	5812910
o-terph	4.135	0.001	9458	271696
C20	4.446	0.004	46158	901899
C22	4.805	0.007	71988	4426204
ARACH-SURR	4.996	0.002	9997	269061
C24	5.152	0.009	101222	8168722
C26	5.504	0.018	144531	23479220
C28	5.821	0.004	166815	7469801
C30	6.131	-0.002	175423	5008265
C32	6.476	0.013	122799	3347539
C34	6.800	0.000	140111	23620680
Filter Peak	6.979	-0.005	122208	17594843
C36	7.131	0.000	97725	7526383
C38	7.464	0.010	66271	6290896
C40	7.773	0.008	45773	1910360

Range	Total Area	Conc
GAS (Tol-C12)	7008997	33
DIESEL (C12-C24)	248427544	427
M.OIL (C24-C38)	863381298	1752

Me-Arach Surrogate Rec = 3% (269061)
o-Terph Surrogate Rec = 3% (271696)

FID:4A-2C/RTX-1 CL64 C 20x FID:4A SIGNAL

NO



Analytical Resources Inc.
NWTPH-D Quantitation Report

ata file: /chem2/fid4a.i/30nov00.b/1130a033.d
ethod: /chem2/fid4a.i/30nov00.b/tphfid4a.m
Instrument: fid4a.i
Operator: GSA
Report Date: 12/04/2000
Macro: FID:4A112100
Calibration Dates: Gas:11/17/00 Diesel:11/17/00 M.Oil:11/21/00

ARI ID: CL64 D 10x
Client ID:
Injection: 30-NOV-2000 20:30

Dilution Factor: 1

FID:4A RESULTS

Compound	RT	Shift	Height	Area
Toluene	----			
C8	----			
Solvent Peak	0.608	0.002	59820	5513091
C10	----			
C12	2.899	0.015	2774	238618
C14	3.337	-0.008	8823	758327
C16	3.741	0.006	26816	2272157
C18	4.087	-0.005	53513	3819265
o-terph	4.139	0.005	79651	15807695
C20	4.446	0.003	117497	10058088
C22	4.797	-0.002	84192	5752199
ARACH-SURR	5.012	0.019	17517	470037
C24	5.149	0.005	122326	16435714
C26	5.501	0.015	191344	31930970
C28	5.831	0.014	206661	19754194
C30	6.133	0.000	224381	34052334
C32	6.447	-0.016	178250	31374030
C34	6.807	0.007	179026	38525452
Filter Peak	6.970	-0.014	155663	41081038
36	7.133	0.002	131660	12739922
C38	7.463	0.009	88260	11612992
C40	7.773	0.007	57524	7307205

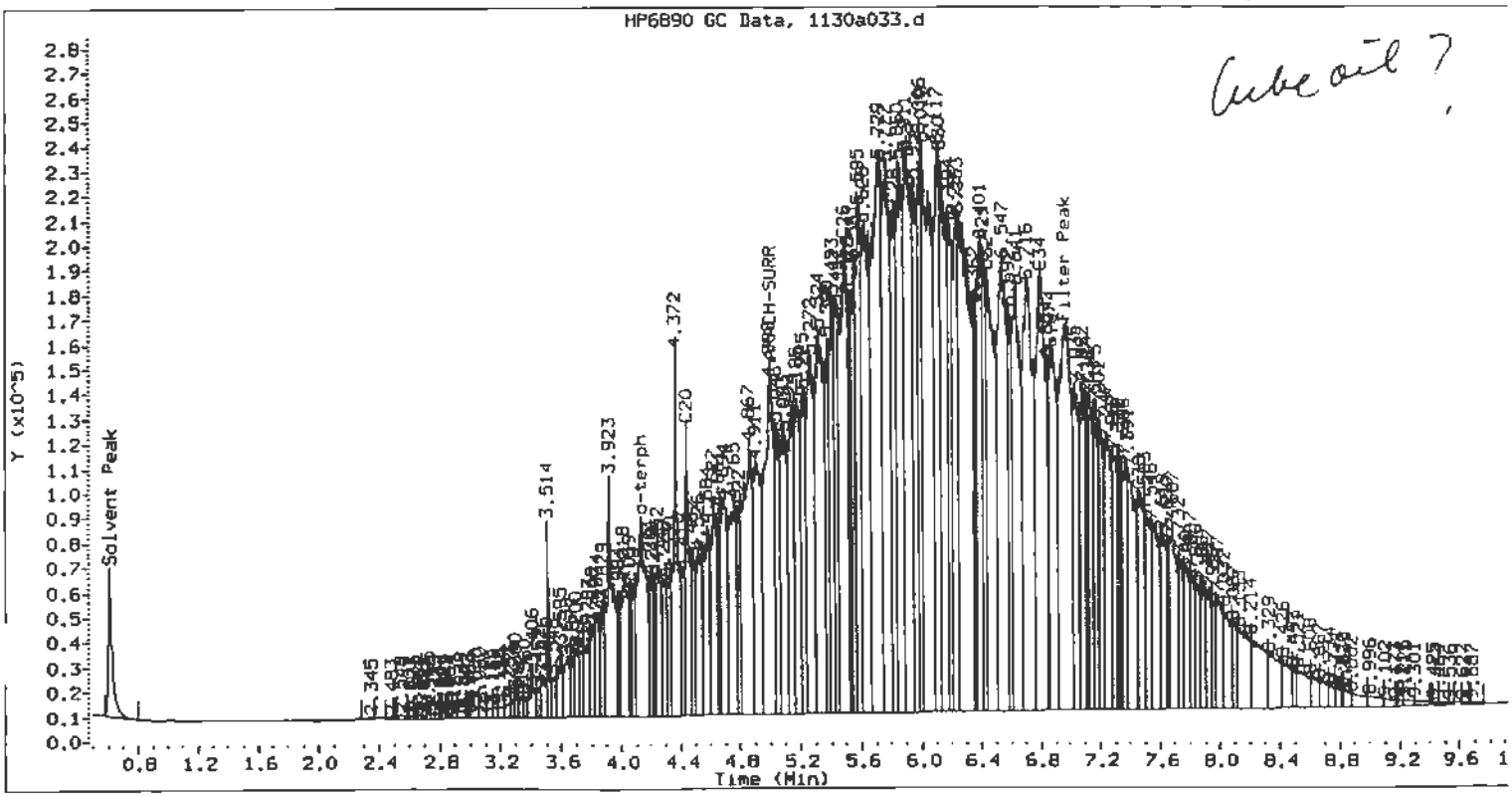
Range	Total Area	Conc
GAS (Tol-C12)	8054848	~~37~~
DIESEL (C12-C24)	328458105	564
M.OIL (C24-C38)	1087457966	2207

Me-Arach Surrogate Rec = 5% (470037)
o-Terph Surrogate Rec = 154% (15807695)

FID:4A-2C/RTX-1 CL64 D 10x FID:4A SIGNAL

NO

Lube oil ?



Analytical Resources Inc.
NWTPH-D Quantitation Report

Data file: /chem2/fid4a.i/30nov00.b/1130a032.d
Method: /chem2/fid4a.i/30nov00.b/tphfid4a.m
Instrument: fid4a.i
Operator: GSA
Report Date: 12/04/2000
Macro: FID:4A112100
Calibration Dates: Gas:11/17/00 Diesel:11/17/00 M.Oil:11/21/00

ARI ID: CL64 E 10x
Client ID:
Injection: 30-NOV-2000 20:09

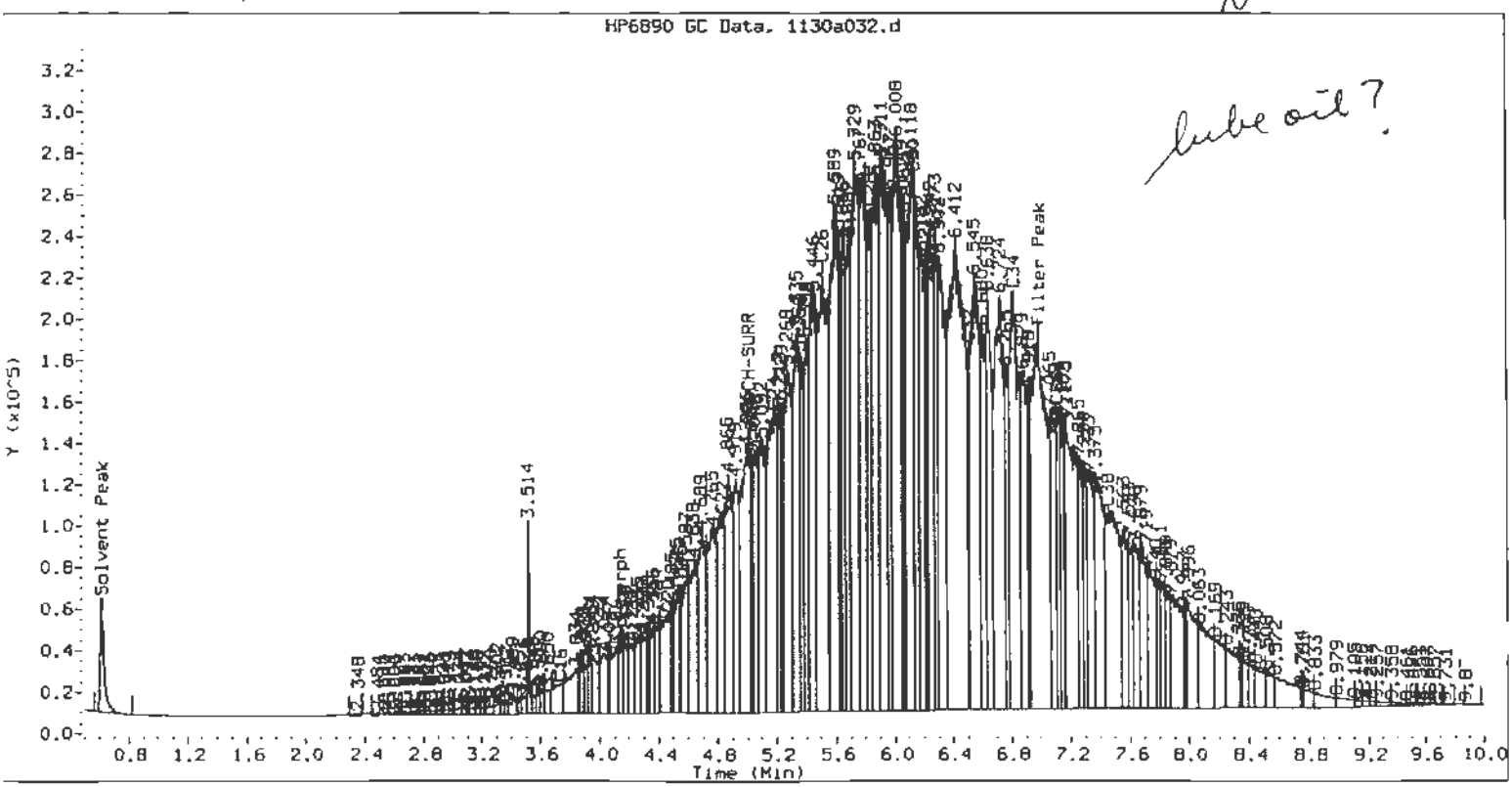
Dilution Factor: 1

FID:4A RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	----				GAS (Tol-C12)	7270331	34
C8	----				DIESEL (C12-C24)	289245649	497
Solvent Peak	0.607	0.001	54485	4932438	M.OIL (C24-C38)	1276093877	2589
C10	----						
C12	2.900	0.017	2389	234464			
C14	3.338	-0.007	4910	469609			
C16	3.731	-0.003	14408	3344343			
C18	4.111	0.019	32675	4935195			
o-terph	4.135	0.001	11322	426044			
C20	4.459	0.016	48034	9946899			
C22	4.831	0.032	95413	14404779			
ARACH-SURR	5.007	0.013	20655	867398			
C24	5.178	0.034	144446	31154008			
C26	5.507	0.020	215982	46235300			
C28	5.830	0.013	242265	22512406			
C30	6.135	0.002	258457	27461483			
C32	6.506	0.044	176688	6407242			
C34	6.813	0.013	203448	41420136			
Filter Peak	6.983	0.000	184366	62784902	Me-Arach Surrogate Rec =	9%	(867398)
C36	7.120	-0.011	144256	11992356	o-Terph Surrogate Rec =	4%	(426044)
C38	7.458	0.004	96370	28831869			
C40	7.778	0.012	64717	3957995			

FID:4A-2C/RTX-1 CL64 E 10x FID:4A SIGNAL

NO



Analytical Resources Inc.
NWTPH-D Quantitation Report

ata file: /chem2/fid3b.i/28NOV00.B/1128b033.d
Method: /chem2/fid3b.i/28NOV00.B/tphfid3b.m
Instrument: fid3b.i
Operator: GSA
Report Date: 11/30/2000
Macro: FID:3B112100
Calibration Dates: Gas:10/31/00 Diesel:11/10/00 M.Oil:11/06/00

ARI ID: CL64 F
Client ID:
Injection: 28-NOV-2000 20:04

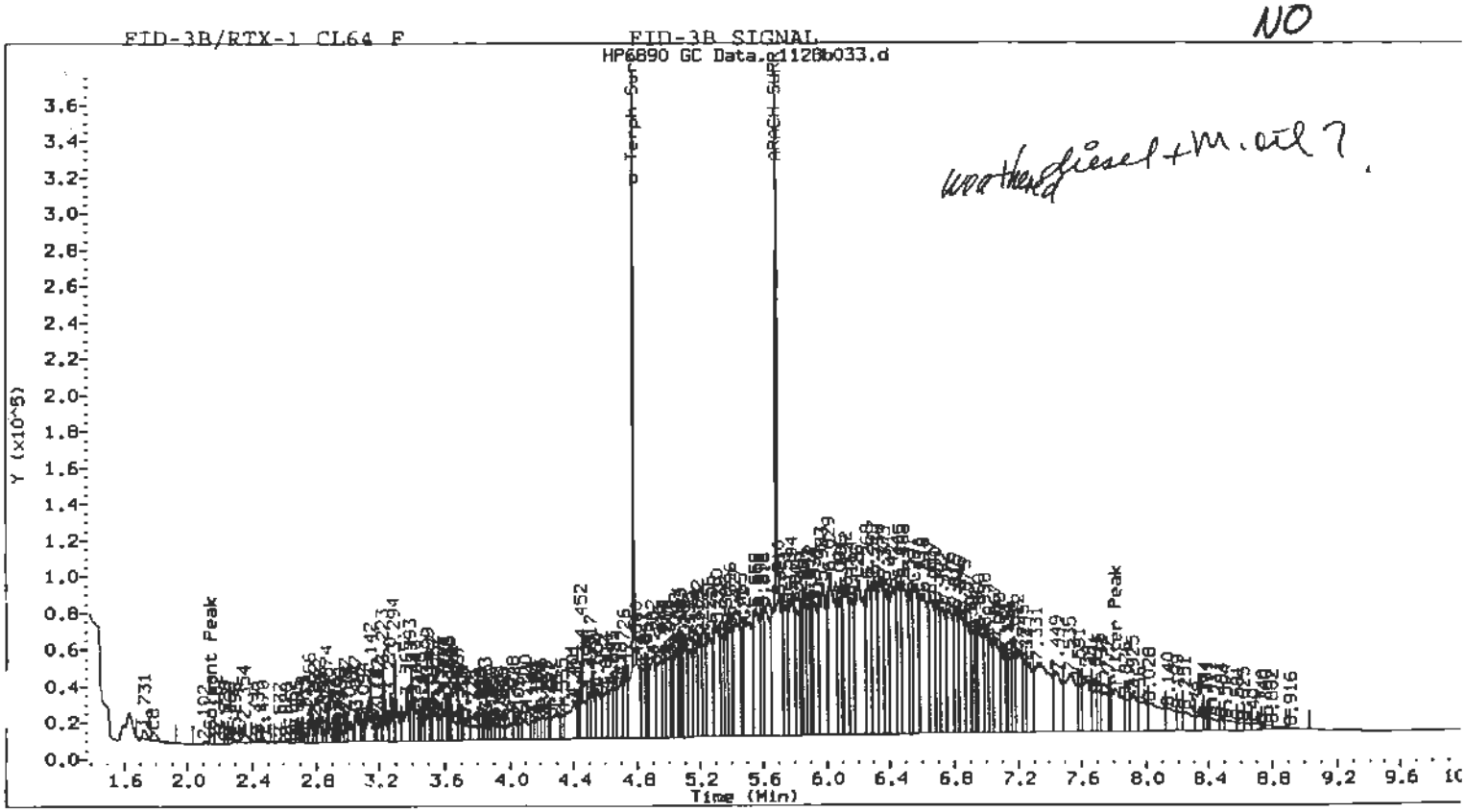
Dilution Factor: 1

Tazz-1B RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	----				GAS (Tol-C12)	32221706	89
C8	1.787	-0.026	5030	445988	DIESEL (C12-C24)	246308581	306
Solvent Peak	2.146	0.004	6323	420647	M.OIL (C24-C38)	339554708	460
C10	2.944	0.003	8181	223791			
C12	3.465	0.001	24235	845188			
C14	3.898	-0.001	11613	610951			
C16	4.298	-0.002	16969	2357820			
C18	4.701	-0.002	34164	3650506			
o-Terph Surr	4.784	-0.001	343909	8720857			
C20	5.101	-0.001	54834	3883371			
C22	5.486	0.001	63534	11926045			
ARACH-SURR	5.693	0.000	309229	10590709			
C24	5.851	-0.001	71570	4421429			
C26	6.206	-0.001	85720	16436243			
C28	6.558	0.002	82152	9594416			
C30	6.916	-0.002	55943	3974685			
Filter Peak	7.812	0.013	23675	5185314			
C32	7.262	-0.021	38325	5297784			
34	7.634	-0.007	28797	4968103			
36	7.959	-0.032	16680	3138955	Me-Arach Surrogate Rec =	77%	(10590709)
C38	8.330	-0.004	8122	1246445	o-Terphenyl Surrogate Rec =	65%	(8720857)
C40	8.680	0.011	3499	576565			

NO

FID-3B/RTX-1 CL64 F FID-3B SIGNAL
HP6890 GC Data.n1128b033.d



weathered diesel + M. oil ?

Analytical Resources Inc.
NWTPH-D Quantitation Report

Data file: /chem2/fid3b.i/28NOV00.B/1128b039.d
Method: /chem2/fid3b.i/28NOV00.B/tphfid3b.m
Instrument: fid3b.i
Operator: GSA
Report Date: 11/30/2000
Macro: FID:3B112100
Calibration Dates: Gas:10/31/00 Diesel:11/10/00 M.Oil:11/06/00

ARI ID: CL64 G
Client ID:
Injection: 28-NOV-2000 22:06

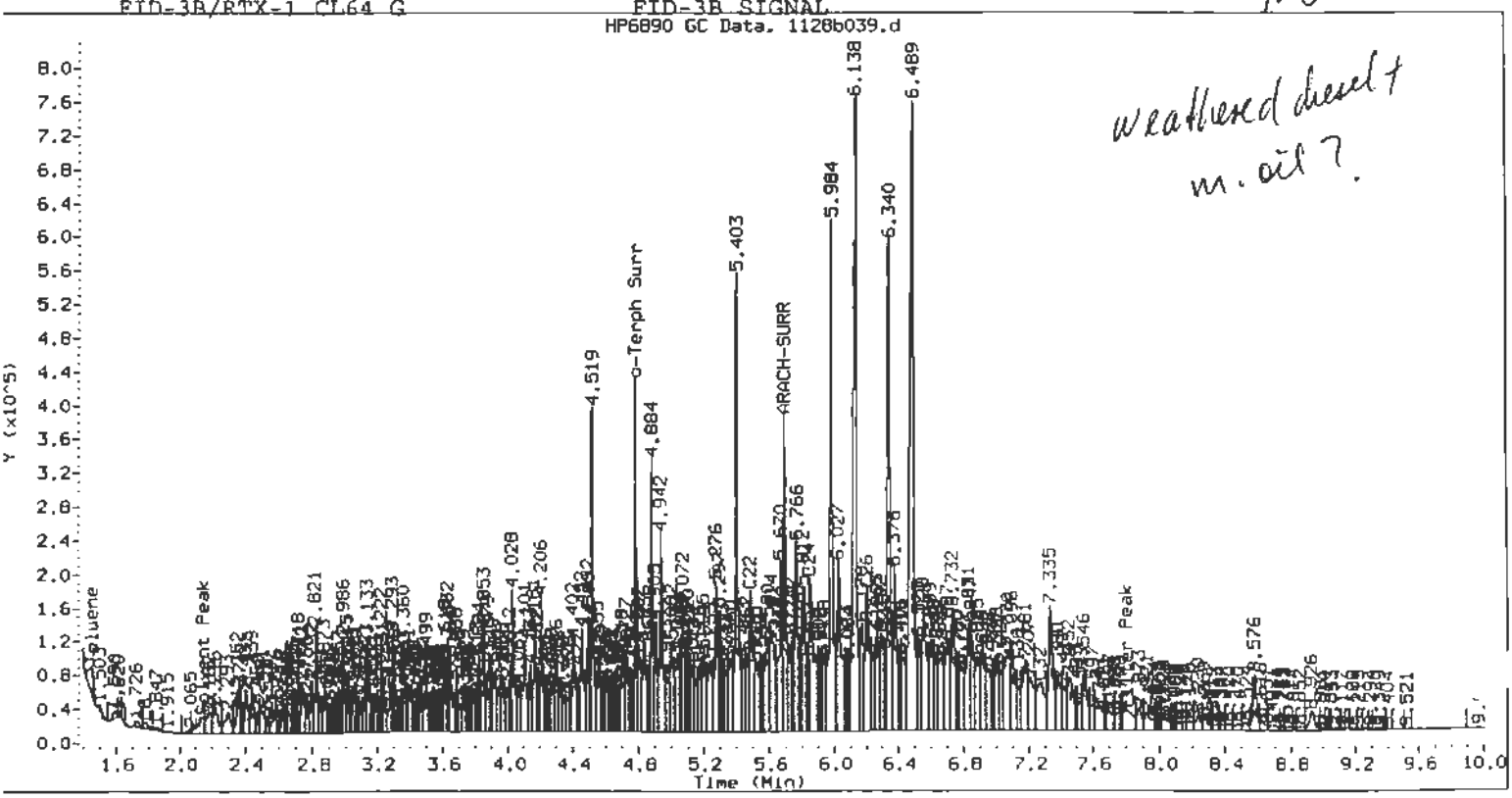
Dilution Factor: 1

Tazz-1B RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	1.451	0.030	32195	2896033	GAS (Tol-C12)	133967370	368
C8	1.782	-0.031	7406	775845	DIESEL (C12-C24)	541652284	672
Solvent Peak	2.141	-0.001	18514	2904432	M.OIL (C24-C38)	563027267	763
C10	2.944	0.003	37381	1502191			
C12	3.463	0.000	67475	2174848			
C14	3.897	-0.001	80393	2500475			
C16	4.297	-0.002	91258	4824900			
C18	4.701	-0.001	103949	5504138			
o-Terph Surr	4.786	0.000	345171	9006656			
C20	5.102	0.000	129164	5676461			
C22	5.485	0.000	166161	11748384			
ARACH-SURR	5.694	0.001	278335	9472108			
C24	5.849	-0.003	181334	18816549			
C26	6.202	-0.005	167235	14892591			
C28	6.555	-0.001	140653	15023503			
C30	6.913	-0.005	100667	8999070			
Filter Peak	7.799	0.000	23853	4725653			
C32	7.276	-0.007	57549	9665053			
C34	7.636	-0.005	30346	4734753			
C36	7.983	-0.007	13162	739454	Me-Arach Surrogate Rec = 69%	(9472108)	
C38	8.326	-0.008	7200	752262	o-Terphenyl Surrogate Rec = 67%	(9006656)	
C40	8.685	0.015	5333	947213			

NO

FID-3B/RTX-1 CL64 G FID-3B SIGNAL



Analytical Resources Inc.
NWTPH-D Quantitation Report

Data file: /chem2/fid3b.i/28NOV00.B/1128b034.d
Method: /chem2/fid3b.i/28NOV00.B/tphfid3b.m
Instrument: fid3b.i
Operator: GSA
Report Date: 11/30/2000
Macro: FID:3B112100
Calibration Dates: Gas:10/31/00 Diesel:11/10/00 M.Oil:11/06/00

ARI ID: CL64 H
Client ID:
Injection: 28-NOV-2000 20:24

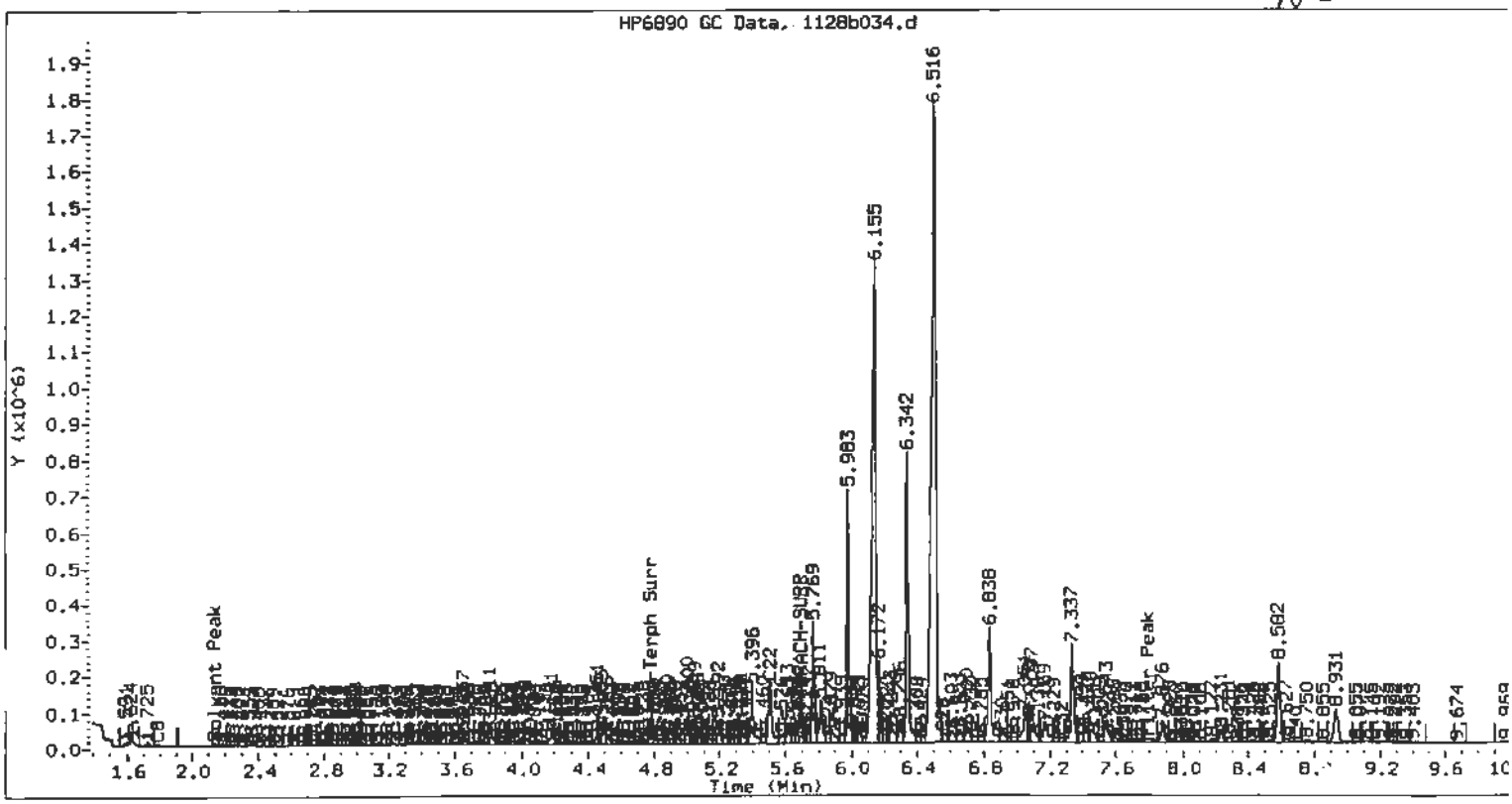
Dilution Factor: 1

Tazz-1B RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	----				GAS (Tol-C12)	17199986	47
C8	1.784	-0.029	5831	484247	DIESEL (C12-C24)	141263044	175
Solvent Peak	2.133	-0.009	8974	738821	M.OIL (C24-C38)	512095613	694
C10	2.944	0.002	4443	215256			
C12	3.464	0.000	7483	322347			
C14	3.897	-0.001	10446	441275			
C16	4.298	-0.002	11397	635387			
C18	4.700	-0.003	11416	597244			
o-Terph Surr	4.782	-0.004	122566	3016276			
C20	5.099	-0.003	16382	659516			
C22	5.505	0.020	169246	11889925			
ARACH-SURR	5.690	-0.003	132052	4584295			
C24	5.861	0.009	35299	2494863			
C26	6.200	-0.007	23984	1363651			
C28	6.556	0.000	27612	2645525			
C30	6.910	-0.008	25004	3019854			
Filter Peak	7.793	-0.005	12825	2408882			
C32	7.270	-0.013	16758	1824254			
C34	7.644	0.002	9253	747993			
C36	7.986	-0.005	5290	144542	Me-Arach Surrogate Rec = 33%	(4584295)	
C38	8.335	0.000	4003	162356	o-Terphenyl Surrogate Rec = 22%	(3016276)	
C40	8.686	0.017	4245	504491			

FID-3B/RTX-1 CL64 H FID-3B SIGNAL

NO



Analytical Resources Inc.
NWTPH-D Quantitation Report

Data file: /chem2/fid3b.i/28NOV00.B/1128b035.d
Method: /chem2/fid3b.i/28NOV00.B/tphfid3b.m
Instrument: fid3b.i
Operator: GSA
Report Date: 11/30/2000
Macro: FID:3B112100
Calibration Dates: Gas:10/31/00 Diesel:11/10/00 M.Oil:11/06/00

ARI ID: CL64 I
Client ID:
Injection: 28-NOV-2000 20:44

Dilution Factor: 1

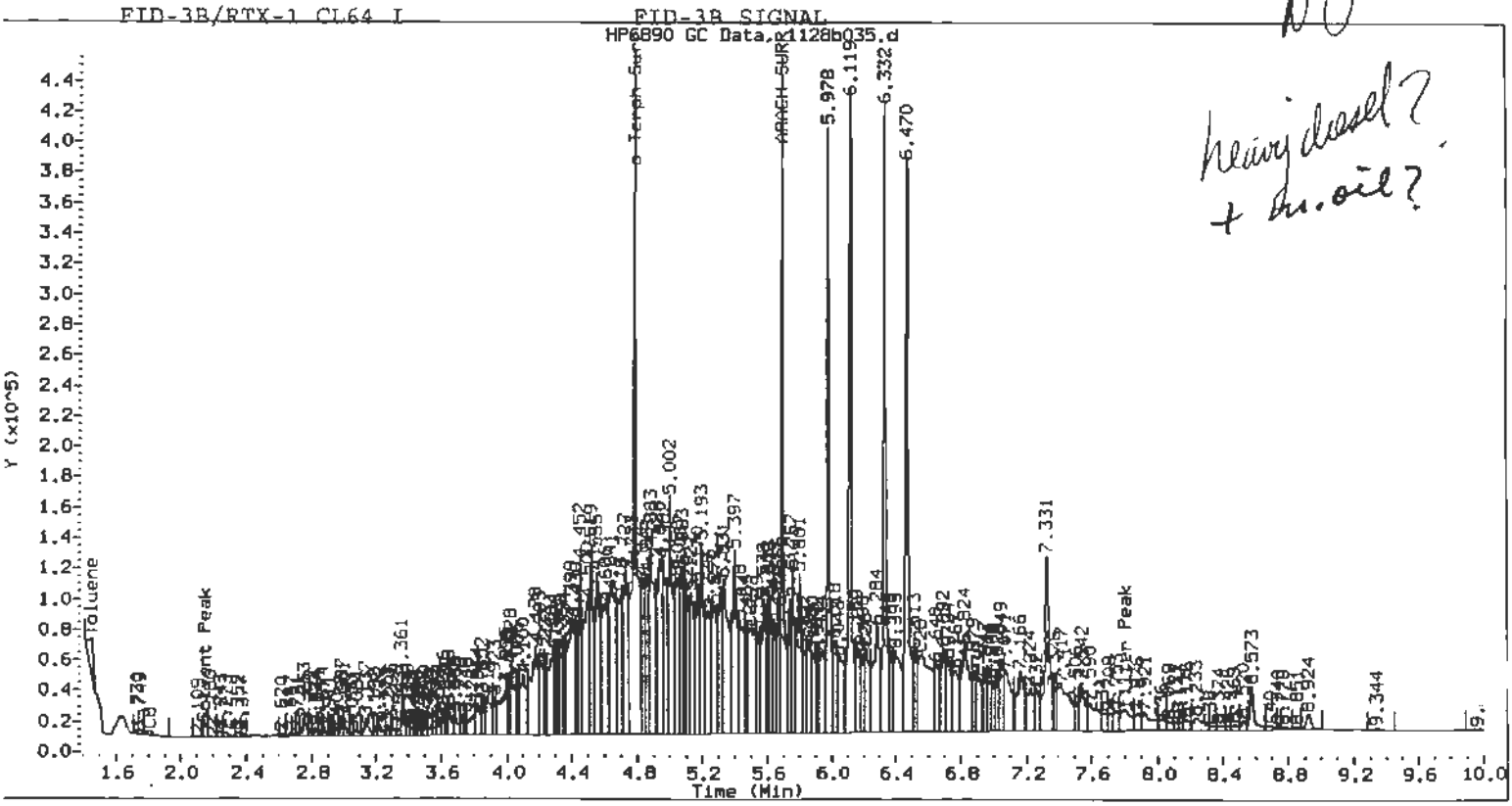
Tazz-1B RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	1.450	0.029	24507	2038165	GAS (Tol-C12)	16995758	47
C8	1.808	-0.005	2952	407118	DIESEL (C12-C24)	443005014	550
Solvent Peak	2.143	0.001	8270	636988	M.OIL (C24-C38)	283477014	384
C10	2.956	0.015	6468	390321			
C12	3.465	0.001	8525	293955			
C14	3.884	-0.014	26852	2621768			
C16	4.298	-0.001	56027	2475018			
C18	4.702	-0.001	92985	10203885			
o-Terph Surr	4.786	0.000	384759	10202504			
C20	5.101	-0.002	94745	6003206			
C22	5.490	0.005	69326	10308130			
ARACH-SURR	5.693	0.000	381218	13044689			
C24	5.859	0.007	61651	6009994			
C26	6.213	0.006	55558	5695129			
C28	6.554	-0.002	51280	13737828			
C30	6.908	-0.010	35166	3674503			
Filter Peak	7.797	-0.002	13704	2894268			
C32	7.264	-0.019	27837	2880254			
C34	7.667	0.025	11575	1361127			
C36	8.027	0.036	7662	1119177	Me-Arach Surrogate Rec =	95%	(13044689)
C38	8.319	-0.015	3629	473187	o-Terphenyl Surrogate Rec =	76%	(10202504)
C40	8.687	0.018	2854	470419			

NG

heavy diesel? + m.oil?

FID-3B/RTX-1 CL64 I FID-3B SIGNAL
HP6890 GC Data,R1128b035.d



Analytical Resources Inc.
NWTPH-D Quantitation Report

ata file: /chem2/fid3b.i/28NOV00.B/1128b042.d
Method: /chem2/fid3b.i/28NOV00.B/tphfid3b.m
Instrument: fid3b.i
Operator: GSA
Report Date: 11/30/2000
Macro: FID:3B112100
Calibration Dates: Gas:10/31/00 Diesel:11/10/00 M.Oil:11/06/00

ARI ID: CL64 J
Client ID:
Injection: 28-NOV-2000 23:07

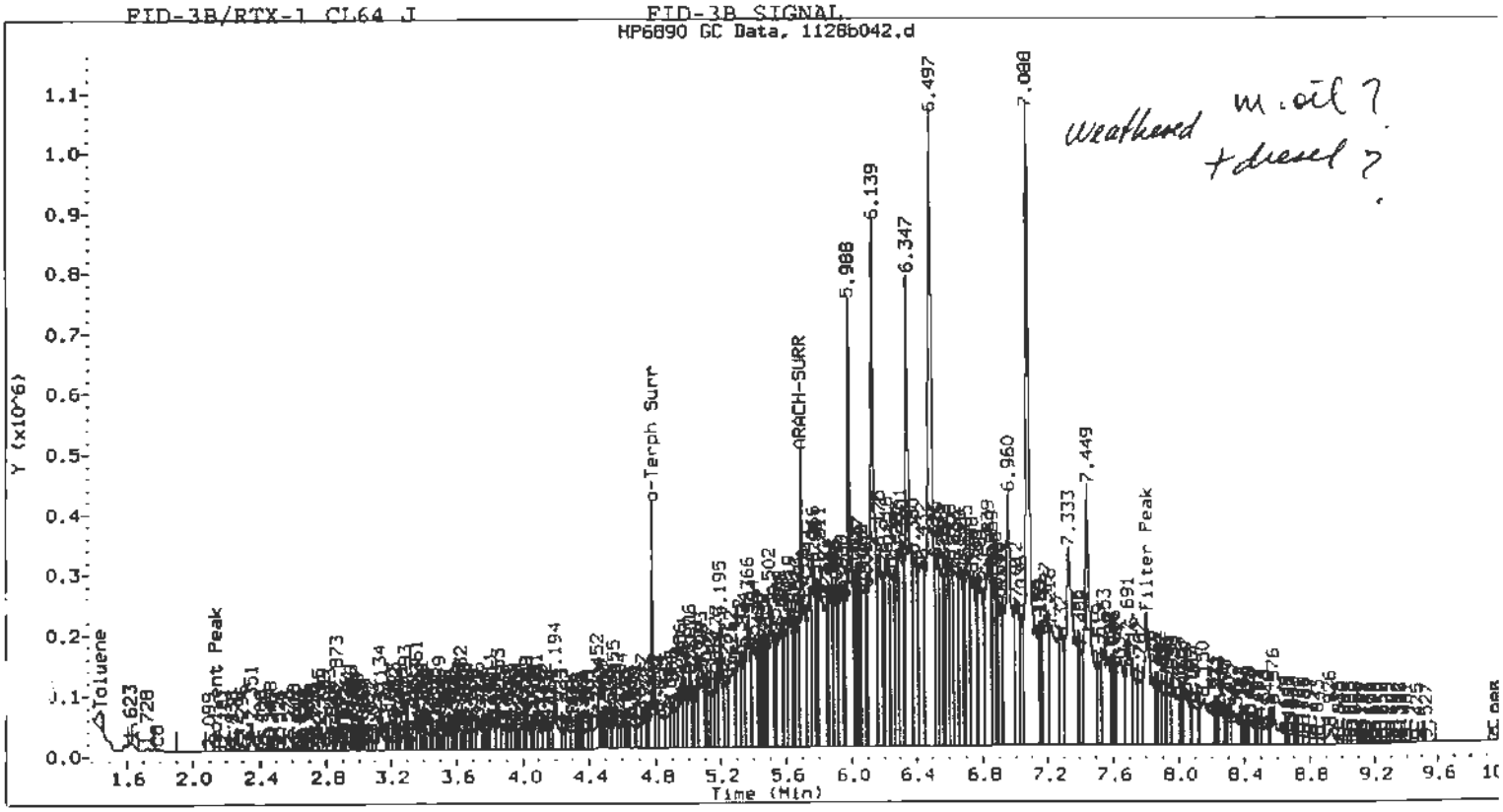
Dilution Factor: 1

Tazz-1B RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	1.450	0.029	30119	2940207	GAS (Tol-C12)	67370600	185
C8	1.785	-0.028	3285	293583	DIESEL (C12-C24)	644479384	800
Solvent Peak	2.135	-0.007	10034	902149	M.OIL (C24-C38)	1610396975	2181
C10	2.944	0.003	9684	277470			
C12	3.467	0.003	33168	1710525			
C14	3.897	-0.002	29577	805629			
C16	4.299	0.000	31426	1824324			
C18	4.702	0.000	41877	2578070			
o-Terph Surr	4.785	-0.001	350874	8774165			
C20	5.102	0.000	100386	5012736			
C22	5.471	-0.014	155323	6578822			
ARACH-SURR	5.696	0.003	272568	9777001			
C24	5.850	-0.002	240932	8182220			
C26	6.200	-0.007	278526	10346450			
C28	6.570	0.014	308982	16940248			
C30	6.917	-0.001	226350	9361263			
Filter Peak	7.805	0.006	217447	31850414			
C32	7.285	0.002	189036	15975999			
4	7.636	-0.006	139772	21053061			
6	8.003	0.012	74743	3016596	Me-Arach Surrogate Rec =	71%	(9777001)
C38	8.346	0.012	39316	5732275	o-Terphenyl Surrogate Rec =	65%	(8774165)
C40	8.664	-0.006	16805	747093			

FID-3B/RTX-1 CL64 J

FID-3B SIGNAL
HP6890 GC Data, 1128b042.d



Analytical Resources Inc.
NWTPH-D Quantitation Report

Data file: /chem2/fid3b.i/28NOV00.B/1128b036.d
Method: /chem2/fid3b.i/28NOV00.B/tphfid3b.m
Instrument: fid3b.i
Operator: GSA
Report Date: 11/30/2000
Macro: FID:3B112100
Calibration Dates: Gas:10/31/00 Diesel:11/10/00 M.Oil:11/06/00

ARI ID: CL64 Idup
Client ID:
Injection: 28-NOV-2000 21:05

Dilution Factor: 1

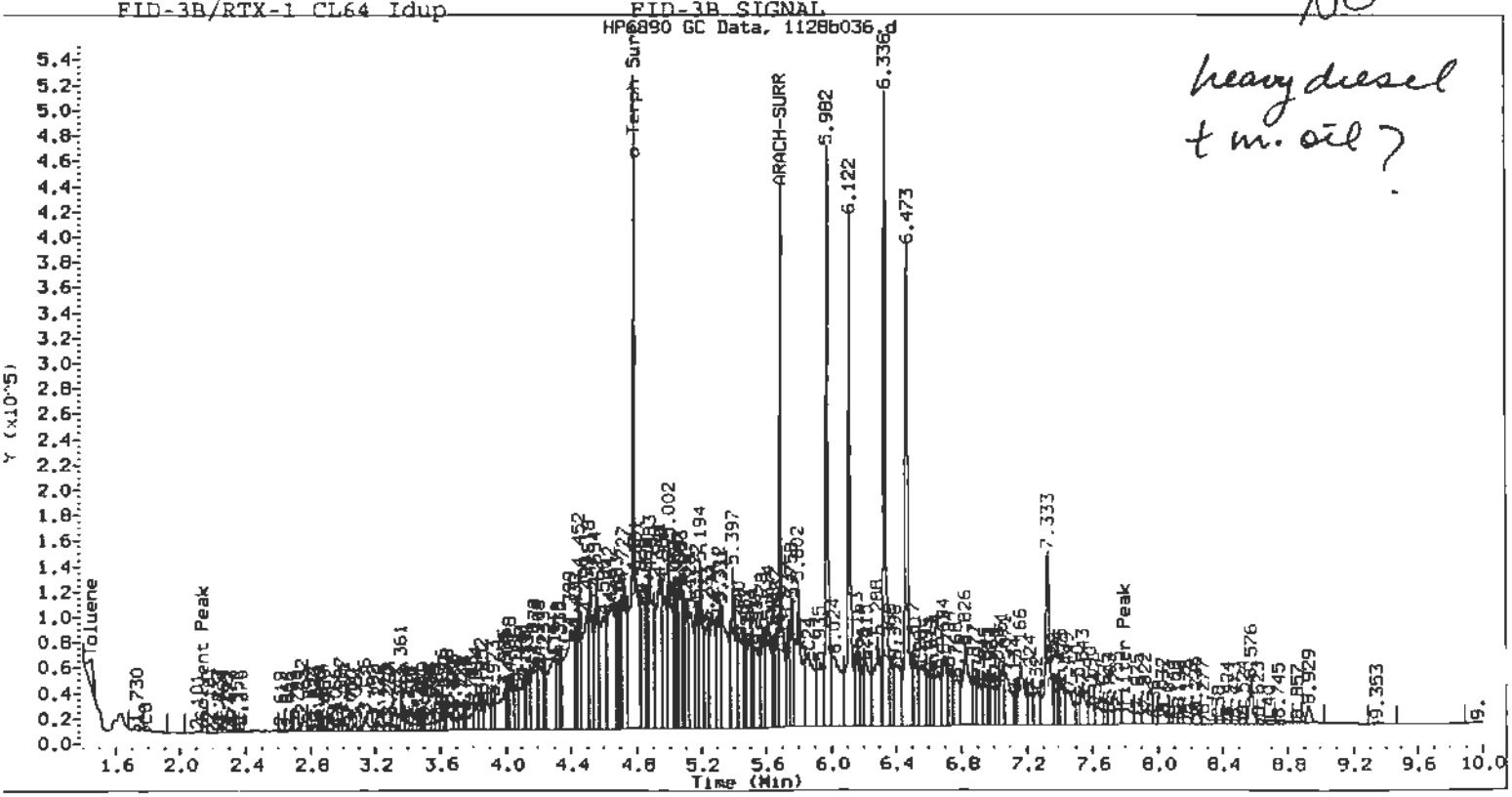
Tazz-1B RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	1.448	0.027	22156	2167698	GAS (Tol-C12)	17181685	47
C8	1.788	-0.026	3499	367853	DIESEL (C12-C24)	446854132	554
Solvent Peak	2.138	-0.004	7438	584056	M.OIL (C24-C38)	283095695	383
C10	2.956	0.014	6441	432941			
C12	3.464	0.001	8185	282780			
C14	3.885	-0.014	25674	2698218			
C16	4.297	-0.002	56906	10030988			
C18	4.700	-0.002	94892	5074173			
o-Terph Surr	4.786	0.001	410393	10662500			
C20	5.101	-0.001	100009	5999575			
C22	5.487	0.002	69528	6343746			
ARACH-SURR	5.694	0.002	366423	12559023			
C24	5.860	0.008	58356	10739479			
C26	6.200	-0.007	50057	3061229			
C28	6.556	0.000	47742	6697021			
C30	6.907	-0.011	34506	3498865			
Filter Peak	7.793	-0.006	12176	2672390			
C32	7.267	-0.016	26895	3159837			
C34	7.620	-0.022	13837	2002397			
C36	7.976	-0.015	6840	551536	Me-Arach Surrogate Rec = 92%	(12559023)	
C38	8.372	0.038	3234	460434	o-Terphenyl Surrogate Rec = 79%	(10662500)	
C40	8.692	0.022	2518	444096			

FID-3B/RTX-1 CL64 Idup

FID-3B SIGNAL
HP6890 GC Data, 1128b036.d

NO heavy diesel + m. oil?



Analytical Resources Inc.
NWTPH-D Quantitation Report

Data file: /chem2/fid3b.i/01dec00.b/1201b011.d
Method: /chem2/fid3b.i/01dec00.b/tphfid3b.m
Instrument: fid3b.i
Operator: GSA
Report Date: 12/04/2000
Macro: FID:3B112100
Calibration Dates: Gas:10/31/00 Diesel:11/10/00 M.Oil:11/06/00

ARI ID: CL64 H2
Client ID:
Injection: 01-DEC-2000 17:35

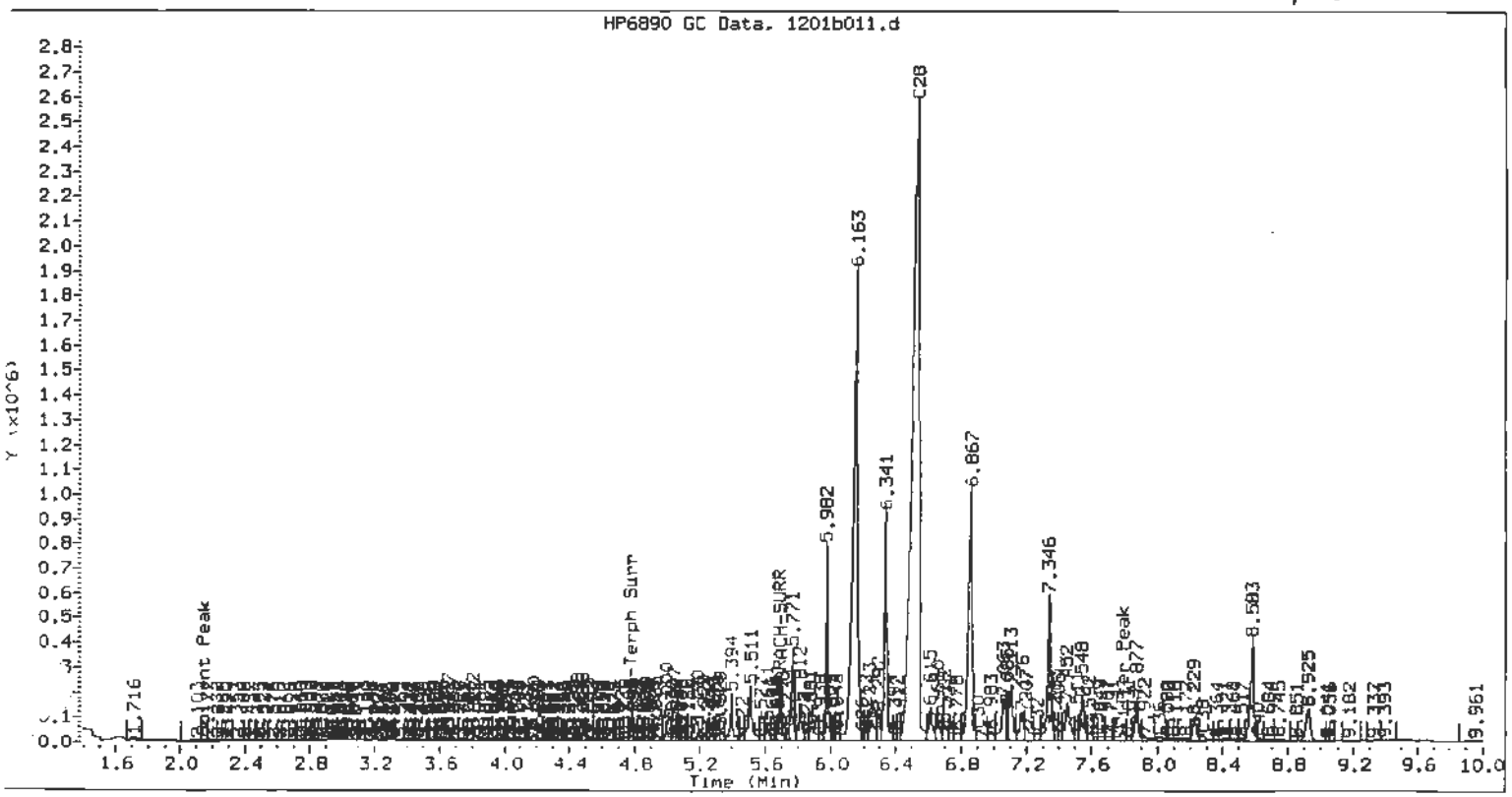
Dilution Factor: 1

Tazz-1B RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	----				GAS (Tol-C12)	14389840	40
C8	----				DIESEL (C12-C24)	155820544	193
Solvent Peak	2.147	0.005	5765	402787	M.OIL (C24-C38)	996087541	1349
C10	2.942	0.002	3761	133953			
C12	3.463	0.000	5650	285934			
C14	3.896	-0.002	9043	266328			
C16	4.295	-0.003	10014	474290			
C18	4.699	-0.002	11007	643519			
o-Terph Surr	4.782	-0.001	182846	4614952			
C20	5.097	-0.003	15674	733761			
C22	5.461	-0.022	37145	2548666			
ARACH-SURR	5.689	0.001	204459	7191368			
C24	5.857	0.012	49389	2743020			
C26	6.197	0.002	31755	1483774			
C28	6.544	-0.004	2573991	385099418			
C30	6.911	0.002	37757	5923868			
Filter Peak	7.792	-0.007	34915	4475154			
C32	7.274	-0.002	28469	2900456			
C34	7.633	-0.003	15665	960196			
[illegible]	8.014	0.030	15100	2303526	Me-Arach Surrogate Rec =	52%	(7191368)
	8.280	-0.040	24763	2725126	o-Terphenyl Surrogate Rec =	34%	(4614952)
C40	8.619	-0.027	12053	1081213			

FID-3B/RTX-1 CL64 H2 FID-3B SIGNAL

NO



Analytical Resources, Incorporated
Analytical Chemists and Consultants

December 14, 2000

Ty Schreiner
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: Project: Tacoma Metals
ARI Job: CN 69

Dear Ty:

Please find enclosed sample your request for additional analysis and final analytical results for the above referenced project. Twelve soil samples were re-logged from archives on December 8, 2000.

Selected samples were analyzed for PCB's referencing EPA method 8082. The samples were extracted on December 11, 2000 and analyzed on December 12 & 13, 2000.

The surrogate DCBP exceeded QC limits in samples D & E due to matrix interference. The surrogate peak co-cluded with pattern peaks in the sample. Samples E & F were re-analyzed at 1:20 dilutions whereby both surrogates were diluted out. Sample K was re-analyzed at a 1:10 dilution due to matrix interference (co-eluding peaks) the surrogate DCBP exceeded QC limits high.

Activity in tbe Aroclor 1248 area quantitation was good in sample A. The remaining samples with this same activity did not quantitate as well and were qualified with the "Y" flag. Indicating a raised reporting limit due to matrix interference. The lowest peaks were chosen for the "Y" flag.

No other analytical complications were noted. Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Susan Snyder
Project Manager
susan@arilabs.com

SS/ss
Enclosures

333 Ninth Avenue North • Seattle WA 98109-5187 • **206-621-6490** • **206-621-7523** fax

NWTPH-DX

C163 TP-43-4-6 00-19886
C162 TP-46-2-3/6-10 00-19891

✓ EPH / PAH (SIM) D

C162 TP-43-2-3 00-19864
C162 TP-46-4-6 00-19871
C162 TP-49-6-10 00-19879

✓ PCB

CH43 TP-10-0-1/2-3 00-19080
CH43 TP-14-0-1/2-3 00-19087
CI19 TP-20-0-1/2-3 00-19615
CI19 TP-22-0-1/2-3 00-19620
CI18 TP-40-0-1/2-3 00-19601
CI62 TP-46-0-1/2-3 00-19870

✓ LEAD

C120 TP-20-4-6/6-10 00-19628 ✓
C120 TP-21-4-6/6-10 00-19630 ✓
C120 TP-22-4-6/6-10 00-19632
C126 TP-23-4-6/6-10 00-19702
C126 TP-28-4-6/6-10 00-19711
C126 TP-30-4-6/6-10 00-19717
C126 TP-33-2-3/4-6/6-10 00-19721
C126 TP-34-4-6/6-10 00-19724
C121 TP-35-2-3/4-6/6-10 00-19634
C121 TP-37-4-6/6-10 00-19639
C121 TP-38-2-3/4-6/6-10 00-19641
C163 TP-43-4-6/6-10 00-19886
C163 TP-45-2-3/4-6/6-10 00-19888
[redacted]

CADMIUM D

TP-4-2-3 18328/CF88
TP-7-2-3 19114 CH50
TP-16-2-3 19135 CH50
TP-20-4-6 19628 (C120)
TP-21-4-6 19630 (C120)
TP-23-2-3 19702 (C126)
TP-28-4-6-19711 (C126)
TP-30-4-6 19717 (C126)
TP-37-4-6 19639/C121
TP-39-2-3 19605 C122
TP-43-4-6 00-19886/C163
TP-45-2-3 00-19888/C163
[redacted] C162

CHROMIUM D

[redacted]
TP-22-4-6 C120 00-19632
[redacted]

MERCURY D

TP-1-2-3 00-18324 CF88
TP-23-4-6 19702/C126
TP-27-4-6 19712/C126
TP-28-4-6 19717/C126
TP-33-2-3 00-19721 C
TP-34-4-6 00-19724
TP-37-4-6 00-19639/C12
TP-38-2-3 19641/C12
TP-43-4-6 00-19886 C163
TP-45-2-3 19888 C
[redacted]

Analytical Resources, Incorporated
Analytical Chemists and Consultants

December 15, 2000

Ty Schreiner
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: Project: Tacoma Metals
ARI Job: CN62

Dear Ty:

Please find enclosed sample your request for additional analysis and final analytical results for the above referenced project. Three soil samples were re-logged from archives on December 1, 2000.

Selected samples were analyzed for Diesel and motor oil referencing WDOE method NWTPH-Dx. One sample was analyzed for lead and cadmium by EPA method 6010. The samples for NWTPH-DX were extracted on December 8, 2000 and analyzed on December 11, 2000.

No analytical complications were noted. Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Susan Snyder
Project Manager
susan@arilabs.com

SS/ss
Enclosures

333 Ninth Avenue North • Seattle WA 98109-5187 • **206-621-6490** • **206-621-7523** fax

ANALYTICAL RESOURCES INCORPORATED

Client: Kennedy/Jenks Cons.	
Project NO.: 9960098.00	

Change Order

ARI Job No.: C163 & C162	
VTSR: 10/18/00 &	

Change made by: Jodie Bruadage	
Taken by: Sue Snyder	

Change Order Date: 12-1-00

Please Make the Following Changes:

add the following Samples for NW TPH-DX

TP-43-4-6 (00-19886) C163 G

TP-46-2-3/6-10 (00-19891) C162 I

10/16/00 1300 VTSR 10/18/00

00-23518 to 00-23519 CN62

Change Order Acknowledged

Project Coordinator:	
Extractions:	
Volatiles:	
GC/MS Lab:	
GC Lab:	
Metals:	
Conventionals:	
Data Section:	

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL HYDROCARBONS COMPOUND SUMMARY

Matrix: Soil

QC Report No: CN62

LIMS ID	Lab ID	Extracted	Client ID	MeArach	TOT OUT
00-23518	CN62G	12/08/00	TP-43-4-6	109%	0
00-23519	CN62J	12/08/00	TP-46-2-3	75%	0
00-23725MB	121100MB	12/08/00	Method Blank	83%	0
00-23725LC	121100LC	12/08/00	Lab Control	79%	0
00-23725	CN62C	12/08/00	TP-46-6-10	85%	0

	Control QC LIMITS	Sample QC LIMITS
(MeArach) = Methylarachidate	(56-114)	(21-130)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D System Monitoring Compound diluted out

FORM-II TPHD

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID
and Motor Oil

LIMS ID: 00-23518 QC Report No: CN62-Kennedy Jenks Consultants
Matrix: Soil Project: Tacoma Metals
996098.00

Data Release Authorized: Date Received: 10/18/00
Reported: 12/12/00 CR 12/12/00

Lab ID	Sample ID	Date Extracted	Date Analyzed	Dilution Factor	Diesel Range	*HC ID	Motor Oil Range	Surrogate Recovery
CN62G	TP-43-4-6	12/08/00	12/11/00	1:1	5.3 U	---	11 U	109%
CN62J	**TP-46-2-3**	12/08/00	12/11/00	1:5	**170**	NO	**510**	75.0%
CN62MB	Method Blank	12/08/00	12/11/00	1:1	5.0 U	---	10 U	83.0%
CN62C	**TP-46-6-10**	12/08/00	12/11/00	1:1	**45**	NO	**150**	85.0%

Values reported in ppm (mg/kg) on a dry weight basis.

Surrogate is Methyl-Arachidate.

* ID indicates, in the opinion of the analyst, the petroleum product with the best pattern match. 'NO' indicates that there was not a good match for any of the requested products.
Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.

Data Qualifiers

U Compound not detected at the given detection limit.
J Indicates an estimated value below the calculated detection limit.
S No value reported due to saturation of the detector. Dilution required.
D Indicates the surrogate was not detected because of dilution of the extract.
E Indicates a value above the linear range of the detector. Dilution required.
NR Indicates no recovery due to matrix interference.
B Indicates compound also detected in the method blank.

FORM-1 TPHD

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CN62SB
LIMS ID: 00-23725
Matrix: Soil

QC Report No: CN62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 12/12/00 CR 12/12/00

LABORATORY CONTROL SAMPLE RECOVERY REPORT
Date extracted: 12/08/00
Date analyzed: 12/11/00

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
Diesel Range Hydrocarbons	87.0	100	87.0%

TPHd Surrogate Recovery

Methylarachidate 79.0%

Values reported in ppm (mg/kg) on a dry weight basis.

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: Method Blank

Lab Sample ID: CN62MB
LIMS ID: 00-23725
Matrix: Soil

QC Report No: CN62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized:
Reported: 12/15/00

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/11/00	6010	12/13/00	7440-43-9	Cadmium	0.2	0.2 U
3050	12/11/00	6010	12/13/00	7439-92-1	Lead	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-46-6-10**
TOTAL METALS

Lab Sample ID: CN62C
LIMS ID: 00-23725
Matrix: Soil

QC Report No: CN62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/16/00
Date Received: 10/18/00

Data Release Authorized
Reported: 12/15/00

Percent Total Solids: 73.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/11/00	6010	12/13/00	**7440-43-9**	**Cadmium**	0.6	**0.9**
3050	12/11/00	6010	12/13/00	**7439-92-1**	**Lead**	6	**217**

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CN62LCS
LIMS ID: 00-23725
Matrix: Soil

QC Report No: CN62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 12/15/00

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike mg/kg-dry	Spike Added	% Recovery	Q
Cadmium	6010	48.3	50.0	96.6%	
Lead	6010	192	200	96.0%	

'Q' codes: N = control limit not met

Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

SOIL AROCLOR SURROGATE SUMMARY

Matrix: Soil

QC Report No: CN69
Project: Tacoma Metals
966098.00

LIMS ID	Lab ID	Client ID	TCMX #	DCBP #	TOT OUT
00-23555MB	121100MB	Method Blank	84.0%	67.0%	0
00-23555SB	121100SB	Lab Control	88.2%	67.2%	0
00-23555	CN69A	TP-10-0-1	74.0%	72.5%	0
00-23556	CN69B	TP-14-0-1	68.0%	51.0%	0
00-23557	CN69C	TP-20-0-1	75.8%	63.8%	0
00-23558	CN69D	TP-22-0-1	74.5%	NR *	1
00-23559	CN69E	TP-40-0-1	48.2%	NR *	1
00-23559DL	CN69E	TP-40-0-1-DL	D	D	0
00-23560	CN69F	TP-46-0-1	72.2%	110%	0
00-23560DL	CN69F	TP-46-0-1-DL	D	D	0
00-23719	CN69G	TP-10-2-3	73.5%	46.0%	0
00-23720	CN69H	TP-14-2-3	62.8%	65.8%	0
00-23721	CN69I	TP-20-2-3	62.8%	95.8%	0
00-23722	CN69J	TP-22-2-3	80.0%	78.8%	0
00-23723	CN69K	TP-40-2-3	56.2%	111%	0
00-23723DL	CN69K	TP-40-2-3-DL	60.0%	138% *	1
00-23724	CN69L	TP-46-2-3	78.8%	43.2%	0

	QC LIMITS
(TCMX) = Tetrachloro-m-xylene	(34-128)
(DCBP) = Decachlorobiphenyl	(39-132)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D Surrogate Compound diluted out

FORM-II PCB

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: Method Blank

Lab Sample ID: CN69MB
LIMS ID: 00-23555
Matrix: Soil

QC Report No: CN69-Kennedy Jenks Consultants
Project: Tacoma Metals
966098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized:
Reported: 12/14/00 CR 12/14/00

Date extracted: 12/11/00
Date analyzed: 12/12/00 20:52
Instrument ID: ECD3
Sample Amount: 12.0 g-dry-wt
Final Ext Vol: 4.0 mL
pH: NA

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: NA

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	33 U
53469-21-9	Aroclor 1242	33 U
12672-29-6	Aroclor 1248	33 U
11097-69-1	Aroclor 1254	33 U
11096-82-5	Aroclor 1260	33 U
11104-28-2	Aroclor 1221	67 U
11141-16-5	Aroclor 1232	33 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	67.0%
Tetrachlorometaxylene	84.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-10-0-1

Lab Sample ID: CN69A
LIMS ID: 00-23555
Matrix: Soil

QC Report No: CN69-Kennedy Jenks Consultants
Project: Tacoma Metals
966098.00
Date Sampled: 10/04/00
Date Received: 10/09/00

Data Release Authorized:
Reported: 12/14/00 CR 12/14/00

Date extracted: 12/11/00
Date analyzed: 12/13/00 01:32
Instrument ID: ECD3
Sample Amount: 10.9 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 8.6

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 9.0 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	37 U
53469-21-9	Aroclor 1242	37 U
12672-29-6	**Aroclor 1248**	**560**
11097-69-1	**Aroclor 1254**	**650**
11096-82-5	**Aroclor 1260**	**290**
11104-28-2	Aroclor 1221	73 U
11141-16-5	Aroclor 1232	37 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	72.5%
Tetrachlorometaxylene	74.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-14-0-1

Lab Sample ID: CN69B
LIMS ID: 00-23556
Matrix: Soil

QC Report No: CN69-Kennedy Jenks Consultants
Project: Tacoma Metals
966098.00
Date Sampled: 10/06/00
Date Received: 10/09/00

Data Release Authorized: CR 12/14/00
Reported: 12/14/00

Date extracted: 12/11/00
Date analyzed: 12/13/00 02:07
Instrument ID: ECD3
Sample Amount: 11.5 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 8.9

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 3.5 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	34 U
53469-21-9	Aroclor 1242	34 U
12672-29-6	Aroclor 1248	34 U
11097-69-1	Aroclor 1254	34 U
11096-82-5	Aroclor 1260	34 U
11104-28-2	Aroclor 1221	69 U
11141-16-5	Aroclor 1232	34 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	51.0%
Tetrachlorometaxylene	68.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-20-0-1

Lab Sample ID: CN69C
LIMS ID: 00-23557
Matrix: Soil

QC Report No: CN69-Kennedy Jenks Consultants
Project: Tacoma Metals
966098.00
Date Sampled: 10/10/00
Date Received: 10/13/00

Data Release Authorized: CR 12/14/00
Reported: 12/14/00

Date extracted: 12/11/00
Date analyzed: 12/13/00 02:42
Instrument ID: ECD3
Sample Amount: 11.4 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 8.9

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 4.8 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	35 U
53469-21-9	Aroclor 1242	35 U
12672-29-6	Aroclor 1248	35 U
11097-69-1	**Aroclor 1254**	**20 J**
11096-82-5	**Aroclor 1260**	**23 J**
11104-28-2	Aroclor 1221	70 U
11141-16-5	Aroclor 1232	35 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	63.8%
Tetrachlorometaxylene	75.8%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-22-0-1

Lab Sample ID: CN69D
LIMS ID: 00-23558
Matrix: Soil

Data Release Authorized: CR 12/14/00
Reported: 12/14/00

QC Report No: CN69-Kennedy Jenks Consultants
Project: Tacoma Metals
966098.00
Date Sampled: 10/10/00
Date Received: 10/13/00

Date extracted: 12/11/00
Date analyzed: 12/13/00 03:17
Instrument ID: ECD3
Sample Amount: 9.59 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 8.5

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 20.1%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	42 U
53469-21-9	Aroclor 1242	42 U
12672-29-6	Aroclor 1248	430 Y
11097-69-1	**Aroclor 1254**	**1,400**
11096-82-5	**Aroclor 1260**	**660**
11104-28-2	Aroclor 1221	83 U
11141-16-5	Aroclor 1232	42 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	NR
Tetrachlorometaxylene	74.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-40-0-1

Lab Sample ID: CN69E
LIMS ID: 00-23559
Matrix: Soil

QC Report No: CN69-Kennedy Jenks Consultants
Project: Tacoma Metals
966098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Data Release Authorized: CR 12/14/00
Reported: 12/14/00

Date extracted: 12/11/00
Date analyzed: 12/13/00 03:52
Instrument ID: ECD3
Sample Amount: 10.4 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 8.6

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 13.0%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	38 U
53469-21-9	Aroclor 1242	38 U
12672-29-6	Aroclor 1248	3,700 Y
11097-69-1	**Aroclor 1254**	**S**
11096-82-5	**Aroclor 1260**	**S**
11104-28-2	Aroclor 1221	77 U
11141-16-5	Aroclor 1232	38 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	NR
Tetrachlorometaxylene	48.2%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-40-0-1
DILUTION

Lab Sample ID: CN69EDL
LIMS ID: 00-23559
Matrix: Soil

QC Report No: CN69-Kennedy Jenks Consultants
Project: Tacoma Metals
966098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Data Release Authorized:
Reported: 12/14/00 CR 12/14/00

Date extracted: 12/11/00
Date analyzed: 12/13/00 18:53
Instrument ID: ECD3
Sample Amount: 10.4 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 8.6

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:20
Percent Moisture: 13.0%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	770 U
53469-21-9	Aroclor 1242	770 U
12672-29-6	Aroclor 1248	5,800 Y
11097-69-1	Aroclor 1254	18,000
11096-82-5	Aroclor 1260	6,000
11104-28-2	Aroclor 1221	1,500 U
11141-16-5	Aroclor 1232	770 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	D
Tetrachlorometaxylene	D

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-46-0-1

Lab Sample ID: CN69F
LIMS ID: 00-23560
Matrix: Soil

QC Report No: CN69-Kennedy Jenks Consultants
Project: Tacoma Metals
966098.00
Date Sampled: 10/16/00
Date Received: 10/18/00

Data Release Authorized:
Reported: 12/14/00 CR 12/14/00

Date extracted: 12/11/00
Date analyzed: 12/13/00 04:27
Instrument ID: ECD3
Sample Amount: 10.9 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 8.2

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 8.8 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	36 U
53469-21-9	Aroclor 1242	36 U
12672-29-6	Aroclor 1248	900 Y
11097-69-1	Aroclor 1254	S
11096-82-5	Aroclor 1260	S
11104-28-2	Aroclor 1221	73 U
11141-16-5	Aroclor 1232	36 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	110%
Tetrachlorometaxylene	72.2%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-46-0-1
DILUTION

Lab Sample ID: CN69FDL
LIMS ID: 00-23560
Matrix: Soil

QC Report No: CN69-Kennedy Jenks Consultants
Project: Tacoma Metals
966098.00
Date Sampled: 10/16/00
Date Received: 10/18/00

Data Release Authorized: CR 12/14/00
Reported: 12/14/00

Date extracted: 12/11/00
Date analyzed: 12/13/00 19:28
Instrument ID: ECD3
Sample Amount: 10.9 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 8.2

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:20
Percent Moisture: 8.8 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	730 U
53469-21-9	Aroclor 1242	730 U
12672-29-6	Aroclor 1248	1,300 Y
11097-69-1	**Aroclor 1254**	**8,300**
11096-82-5	**Aroclor 1260**	**4,300**
11104-28-2	Aroclor 1221	1,500 U
11141-16-5	Aroclor 1232	730 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	D
Tetrachlorometaxylene	D

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
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NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-10-2-3

Lab Sample ID: CN69G
LIMS ID: 00-23719
Matrix: Soil

QC Report No: CN69-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/05/00
Date Received: 10/09/00

Data Release Authorized:
Reported: 12/14/00 CR 12/14/00

Date extracted: 12/11/00
Date analyzed: 12/13/00 05:02
Instrument ID: ECD3
Sample Amount: 10.8 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 8.5

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 9.6 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	37 U
53469-21-9	Aroclor 1242	37 U
12672-29-6	Aroclor 1248	37 U
11097-69-1	**Aroclor 1254**	**45**
11096-82-5	Aroclor 1260	37 U
11104-28-2	Aroclor 1221	74 U
11141-16-5	Aroclor 1232	37 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	46.0%
Tetrachlorometaxylene	73.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-14-2-3

Lab Sample ID: CN69H
LIMS ID: 00-23720
Matrix: Soil

QC Report No: CN69-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/06/00
Date Received: 10/09/00

Data Release Authorized: CR 12/14/00
Reported: 12/14/00

Date extracted: 12/11/00
Date analyzed: 12/13/00 05:38
Instrument ID: ECD3
Sample Amount: 10.9 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 8.2

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 9.1 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	37 U
53469-21-9	Aroclor 1242	37 U
12672-29-6	Aroclor 1248	98 Y
11097-69-1	**Aroclor 1254**	**600**
11096-82-5	**Aroclor 1260**	**260**
11104-28-2	Aroclor 1221	73 U
11141-16-5	Aroclor 1232	37 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	65.8%
Tetrachlorometaxylene	62.8%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-20-2-3

Lab Sample ID: CN69I
LIMS ID: 00-23721
Matrix: Soil

QC Report No: CN69-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/10/00
Date Received: 10/13/00

Data Release Authorized: CR 12/14/00
Reported: 12/14/00

Date extracted: 12/11/00
Date analyzed: 12/13/00 08:33
Instrument ID: ECD3
Sample Amount: 11.0 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 8.1

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 8.2 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	36 U
53469-21-9	Aroclor 1242	36 U
12672-29-6	Aroclor 1248	180 Y
11097-69-1	**Aroclor 1254**	**970**
11096-82-5	**Aroclor 1260**	**320**
11104-28-2	Aroclor 1221	72 U
11141-16-5	Aroclor 1232	36 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	95.8%
Tetrachlorometaxylene	62.8%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-22-2-3

Lab Sample ID: CN69J
LIMS ID: 00-23722
Matrix: Soil

Data Release Authorized:
Reported: 12/14/00 CR 12/14/00

QC Report No: CN69-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/10/00
Date Received: 10/13/00

Date extracted: 12/11/00
Date analyzed: 12/13/00 09:08
Instrument ID: ECD3
Sample Amount: 9.69 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 8.2

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 19.3%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	41 U
53469-21-9	Aroclor 1242	41 U
12672-29-6	Aroclor 1248	520 Y
11097-69-1	**Aroclor 1254**	**1,300**
11096-82-5	**Aroclor 1260**	**990**
11104-28-2	Aroclor 1221	83 U
11141-16-5	Aroclor 1232	41 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	78.8%
Tetrachlorometaxylene	80.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
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U Indicates compound was analyzed for, but not detected at the given detection limit.
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NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-40-2-3

Lab Sample ID: CN69K
LIMS ID: 00-23723
Matrix: Soil

QC Report No: CN69-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Data Release Authorized:
Reported: 12/14/00 CR 12/14/00

Date extracted: 12/11/00
Date analyzed: 12/13/00 09:43
Instrument ID: ECD3
Sample Amount: 10.5 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 8.1

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 12.1%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	38 U
53469-21-9	Aroclor 1242	38 U
12672-29-6	Aroclor 1248	600 Y
11097-69-1	**Aroclor 1254**	**S**
11096-82-5	**Aroclor 1260**	**1,700 E**
11104-28-2	Aroclor 1221	76 U
11141-16-5	Aroclor 1232	38 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	111%
Tetrachlorometaxylene	56.2%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
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B Found in associated method blank
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NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
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ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-40-2-3
DILUTION

Lab Sample ID: CN69KDL
LIMS ID: 00-23723
Matrix: Soil

QC Report No: CN69-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Data Release Authorized: CR 12/14/00
Reported: 12/14/00

Date extracted: 12/11/00
Date analyzed: 12/13/00 20:03
Instrument ID: ECD3
Sample Amount: 10.5 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 8.1

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:10
Percent Moisture: 12.1%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	380 U
53469-21-9	Aroclor 1242	380 U
12672-29-6	Aroclor 1248	810 Y
11097-69-1	Aroclor 1254	3,200
11096-82-5	Aroclor 1260	1,700
11104-28-2	Aroclor 1221	760 U
11141-16-5	Aroclor 1232	380 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	138%
Tetrachlorometaxylene	60.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
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NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
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ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-46-2-3

Lab Sample ID: CN69L
LIMS ID: 00-23724
Matrix: Soil

QC Report No: CN69-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/16/00
Date Received: 10/18/00

Data Release Authorized:
Reported: 12/14/00 CR 12/14/00

Date extracted: 12/11/00
Date analyzed: 12/13/00 10:19
Instrument ID: ECD3
Sample Amount: 10.5 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 8.3

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 12.3%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	38 U
53469-21-9	Aroclor 1242	38 U
12672-29-6	Aroclor 1248	38 U
11097-69-1	**Aroclor 1254**	**51**
11096-82-5	Aroclor 1260	38 U
11104-28-2	Aroclor 1221	76 U
11141-16-5	Aroclor 1232	38 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	43.2%
Tetrachlorometaxylene	78.8%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Lab Sample ID: CN69
LIMS ID: 00-23555
Matrix: Soil

QC Report No: CN69-Kennedy Jenks Consultants
Project: Tacoma Metals
966098.00

Data Release Authorized:
Reported: 12/14/00 CR 12/14/00

LABORATORY CONTROL SAMPLE SPIKE RECOVERY
Date extracted: 12/11/00

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	330	333	99.0%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	67.2%
Tetrachlorometaxylene	88.2%

Values Reported in Total ug/kg Dry Weight

Analytical Resources, Incorporated
Analytical Chemists and Consultants

December 18, 2000

Ty Schreiner
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: Project: Tacoma Metals
ARI Job: CN70

Dear Ty:

Please find enclosed a copy of the request for additional analysis and final analytical results for the above referenced project. Twenty soil samples were re-logged from archives on December 1, 2000.

Selected samples were analyzed for total metals (lead, cadmium, chromium & mercury) referencing EPA methods 6010/7471.

No analytical complications were noted. Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Susan Snyder
Project Manager
susan@arilabs.com

SS/ss
Enclosures

RECEIVED

DEC 19 2000

K/J Federal Way
K/J No/File
Route
Return To/By

333 Ninth Avenue North • Seattle WA 98109-5187 • **206-621-6490** • **206-621-7523** fax

ANALYTICAL RESOURCES INCORPORATED

Client: Kennedy / Jenks Consultants	
Project NO.: 9916098.00	

Change Order
Pb (lead)

ARI Job No.: C120, C126, C121, C163, C162	
VTSR:	

Change made by: Jodie Brundage	
Taken by: Sue Snyder	

Change Order Date: 12-1-00

Please Make the Following Changes: Add lead analysis on the following samples:

TP-20-4-6	(C120)	00-19628	G	✓	
TP-21-4-6		00-19630	T	✓	
TP-22-46		00-19632	K	✓	
TP-23-46	(C126)	00-19702	A	✓	✓
TP-28-46		00-19711	J	✓	
TP-~~28~~ 30-4-6		00-19717	P	✓	
TP-33-2-3		00-19721	T	✓	
TP-34-4-6		00-19724	W	✓	
TP-35-2-3	(C121)	00-19634	A	✓	
TP-37-4-6		00-19639	F	✓	
TP-38-2-3		00-19641	H	✓	
TP-43-4-6	(C163)	00-19886	G	✓	
TP-45-2-3	(C163)	00-19888	I	✓	
TP-46-2-3	(C163)	00-19891		✓	
TP-21-6-12				✓ Shane	
TP-21-6-12				✓	

Change Order Acknowledged

Project Coordinator:	
Extractions:	
Volatiles:	
GC/MS Lab:	
GC Lab:	
Metals:	
Conventionals:	
Data Section:	

00-23561 to 00-23574 CN 70

ANALYTICAL RESOURCES INCORPORATED

Client: Kennedy/Jenks Cons.	
Project NO.: 996098.00	

Change Order
Cadmium

ARI Job No.: CF88/CH50, C120, C126, C121, C123, C162	
VTSR:	

Change made by: Jodie Brundage	
Taken by: Sue Snyder	

Change Order Date: 12-1-00

Please Make the Following Changes: Cadmium added to:

TP-4-2-3	(CF88)	00-18328	P CN70
TP-7-2-3	(CH50)	00-19114	Q ↓
TP-16-2-3	↓	00-19135	B CN91
TP-20-4-6	(C120)	00-19628	A CN70
TP-21-4-6	↓	00-19630	B ↓
* TP-23-2-3	(C126)	00-19702	
TP-28-4-6		00-19711	E CN70
TP-30-4-6	↓	00-19717	F
TP-37-4-6	(C121)	00-19639	J ↓
* TP-39-2-3	(C122)	00-19605	
TP-43-4-6	(C163)	00-19886	L CN70/CN62
TP-45-2-3	↓	00-19888	M ↓
TP-46-2-3	(C162)	00-19871	CN70/CN62 N

Change Order Acknowledged

Project Coordinator:	
Extractions:	
Volatiles:	
GC/MS Lab:	
GC Lab:	
Metals:	
Conventionals:	
Data Section:	

* [illegible]

ANALYTICAL RESOURCES INCORPORATED

Client: Kennedy/Jenks Cons	
Project NO.: 996098.00	

Change Order

Chromium

ARI Job No.: C120, C162	
VTSR:	

Change made by: Jodie Brundage	
Taken by: Sue Snyder	

Change Order Date: 12-1-00

Please Make the Following Changes:

Add chromium to the following samples:

TP-21-4-6 (C120) 00-19630 /

TP-22-4-6 (C120) 00-19632 /

TP-46-2-3 (C162) 00-19864 /

Change Order Acknowledged

Project Coordinator:	
Extractions:	
Volatiles:	
GC/MS Lab:	
GC Lab:	
Metals:	
Conventionals:	
Data Section:	

ANALYTICAL RESOURCES INCORPORATED

Client: Kennedy/Jenks Cons	
Project NO.: 996098.00	

Change Order

mercury

ARI Job No.: CF88, C126, C121, C163, C162	
VTSR:	

Change made by: Jodie Brundage	
Taken by: Sue Snyder	

Change Order Date: 12-1-00

Please Make the Following Changes: Add mercury to:

TP-1-2-3	(CF88)	00-18324	K	✓
TP-23-4-6	(C126)	00-19702	A	✓
TP-27-4-6	↓	00-19712	K	
TP-28-4-6	↓	00-19717	19711	C126J ✓
TP-33-2-3	↓	00-19721	J	✓
TP-34-4-6	↓	00-19724	W	✓
TP-37-4-6	(C121)	00-19639	F	✓
TP-38-2-3	↓	00-19641	H	✓
TP-43-4-6	(C163)	00-19886	G	✓
TP-45-2-3	↓	00-19888	I	✓
TP-46-2-3	(C162)	00-198864	CT63	✓ 00-19891

Change Order Acknowledged

Project Coordinator:	
Extractions:	
Volatiles:	
GC/MS Lab:	
GC Lab:	
Metals:	
Conventionals:	
Data Section:	

00-23751 to 00-23768 CN91

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-20-4-6**
TOTAL METALS

Lab Sample ID: CN70A
LIMS ID: 00-23561
Matrix: Soil

QC Report No: CN70-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/10/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 12/15/00

Percent Total Solids: 87.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/11/00	6010	12/13/00	**7440-43-9**	**Cadmium**	1	1
3050	12/11/00	6010	12/13/00	**7439-92-1**	**Lead**	10	540

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-21-4-6**
TOTAL METALS

Lab Sample ID: CN70B
LIMS ID: 00-23562
Matrix: Soil

QC Report No: CN70-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/10/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 12/15/00

Percent Total Solids: 94.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/11/00	6010	12/13/00	7440-43-9	Cadmium	1	1 U
3050	12/11/00	6010	12/13/00	7440-47-3	Chromium	3	42
3050	12/11/00	6010	12/13/00	7439-92-1	Lead	10	20

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-22-4-6**
TOTAL METALS

Lab Sample ID: CN70C
LIMS ID: 00-23563
Matrix: Soil

QC Report No: CN70-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/10/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 12/15/00

Percent Total Solids: 94.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/11/00	6010	12/13/00	**7440-47-3**	**Chromium**	3	47
3050	12/11/00	6010	12/13/00	**7439-92-1**	**Lead**	10	360

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-23-4-6**
TOTAL METALS

Lab Sample ID: CN70D
LIMS ID: 00-23564
Matrix: Soil

QC Report No: CN70-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/11/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 12/15/00

Percent Total Solids: 87.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/11/00	6010	12/13/00	7439-92-1	Lead	10	140
CLP	12/11/00	7471	12/14/00	7439-97-6	Mercury	0.04	0.19

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: TP-28-4-6

Lab Sample ID: CN70E
LIMS ID: 00-23565
Matrix: Soil

QC Report No: CN70-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/11/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 12/15/00

Percent Total Solids: 94.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/11/00	6010	12/13/00	7440-43-9	Cadmium	1	1 U
3050	12/11/00	6010	12/13/00	7439-92-1	Lead	10	10 U
CLP	12/11/00	7471	12/14/00	7439-97-6	Mercury	0.05	0.05 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-30-4-6**
TOTAL METALS

Lab Sample ID: CN70F
LIMS ID: 00-23566
Matrix: Soil

QC Report No: CN70-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Data Release Authorized
Reported: 12/15/00

Percent Total Solids: 92.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/11/00	6010	12/13/00	7440-43-9	Cadmium	1	1 U
3050	12/11/00	6010	12/13/00	7439-92-1	Lead	10	10 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-33-2-3**
TOTAL METALS

Lab Sample ID: CN70G
LIMS ID: 00-23567
Matrix: Soil

QC Report No: CN70-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 12/15/00

Percent Total Solids: 85.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/11/00	6010	12/13/00	7439-92-1	Lead	10	4,560
CLP	12/11/00	7471	12/14/00	7439-97-6	Mercury	0.05	1.69

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-34-4-6**
TOTAL METALS

Lab Sample ID: CN70H
LIMS ID: 00-23568
Matrix: Soil

QC Report No: CN70-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Data Release Authorized
Reported: 12/15/00

Percent Total Solids: 84.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/11/00	6010	12/13/00	**7439-92-1**	**Lead**	10	**1,110**
CLP	12/11/00	7471	12/14/00	7439-97-6	Mercury	0.05	0.05 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-35-2-3**
TOTAL METALS

Lab Sample ID: CN70I
LIMS ID: 00-23569
Matrix: Soil

QC Report No: CN70-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Data Release Authorized:
Reported: 12/15/00

Percent Total Solids: 92.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/11/00	6010	12/13/00	**7439-92-1**	**Lead**	10	**240**

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-37-4-6**
TOTAL METALS

Lab Sample ID: CN70J
LIMS ID: 00-23570
Matrix: Soil

QC Report No: CN70-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Data Release Authorized
Reported: 12/15/00

Percent Total Solids: 89.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/11/00	6010	12/13/00	7440-43-9	Cadmium	1	1 U
3050	12/11/00	6010	12/13/00	7439-92-1	Lead	10	20
CLP	12/11/00	7471	12/14/00	7439-97-6	Mercury	0.05	0.05 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-38-2-3**
TOTAL METALS

Lab Sample ID: CN70K
LIMS ID: 00-23571
Matrix: Soil

QC Report No: CN70-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Data Release Authorized:
Reported: 12/15/00

Percent Total Solids: 91.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/11/00	6010	12/13/00	**7439-92-1**	**Lead**	10	**70**
CLP	12/11/00	7471	12/14/00	**7439-97-6**	**Mercury**	0.05	**0.12**

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-43-4-6**
TOTAL METALS

Lab Sample ID: CN70L
LIMS ID: 00-23572
Matrix: Soil

QC Report No: CN70-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/16/00
Date Received: 10/18/00

Data Release Authorized:
Reported: 12/15/00

Percent Total Solids: 92.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/11/00	6010	12/13/00	7440-43-9	Cadmium	1	1 U
3050	12/11/00	6010	12/13/00	7439-92-1	Lead	10	10
CLP	12/11/00	7471	12/14/00	7439-97-6	Mercury	0.04	0.04 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: TP-45-2-3

Lab Sample ID: CN70M
LIMS ID: 00-23573
Matrix: Soil

QC Report No: CN70-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/16/00
Date Received: 10/18/00

Data Release Authorized:
Reported: 12/15/00

Percent Total Solids: 90.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/11/00	6010	12/13/00	**7440-43-9**	**Cadmium**	1	15
3050	12/11/00	6010	12/13/00	**7439-92-1**	**Lead**	10	950
CLP	12/11/00	7471	12/14/00	**7439-97-6**	**Mercury**	2	16

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-46-2-3**
TOTAL METALS

Lab Sample ID: CN70N
LIMS ID: 00-23574
Matrix: Soil

QC Report No: CN70-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/16/00
Date Received: 10/18/00

Data Release Authorized
Reported: 12/15/00

Percent Total Solids: 85.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/11/00	6010	12/13/00	7440-43-9	Cadmium	1	9
3050	12/11/00	6010	12/13/00	7440-47-3	Chromium	3	104
3050	12/11/00	6010	12/13/00	7439-92-1	Lead	10	970
CLP	12/11/00	7471	12/14/00	7439-97-6	Mercury	0.05	2.88

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-1-2-3**
TOTAL METALS

Lab Sample ID: CN70O
LIMS ID: 00-23726
Matrix: Soil

QC Report No: CN70-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Data Release Authorized:
Reported: 12/15/00

Percent Total Solids: 84.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
CLP	12/11/00	7471	12/14/00	7439-97-6	Mercury	0.05	0.11

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: TP-4-2-3

Lab Sample ID: CN70P
LIMS ID: 00-23727
Matrix: Soil

QC Report No: CN70-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Data Release Authorized:
Reported: 12/15/00

Percent Total Solids: 92.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/11/00	6010	12/13/00	**7440-43-9**	**Cadmium**	1	8

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-7-2-3**
TOTAL METALS

Lab Sample ID: CN70Q
LIMS ID: 00-23728
Matrix: Soil

QC Report No: CN70-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/04/00
Date Received: 10/09/00

Data Release Authorized:
Reported: 12/15/00

Percent Total Solids: 90.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/11/00	6010	12/13/00	**7440-43-9**	**Cadmium**	1	9

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-16-2-3**
TOTAL METALS

Lab Sample ID: CN70R
LIMS ID: 00-23729
Matrix: Soil

QC Report No: CN70-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/06/00
Date Received: 10/09/00

Data Release Authorized:
Reported: 12/15/00

Percent Total Solids: 74.1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/11/00	6010	12/13/00	7440-43-9	Cadmium	1	68

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-21-6-10**
TOTAL METALS

Lab Sample ID: CN70T
LIMS ID: 00-23731
Matrix: Soil

QC Report No: CN70-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/10/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 12/15/00

Percent Total Solids: 71.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/11/00	6010	12/13/00	7439-92-1	Lead	10	50

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-20-6-10**
TOTAL METALS

Lab Sample ID: CN70S
LIMS ID: 00-23730
Matrix: Soil

QC Report No: CN70-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/10/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 12/15/00

Percent Total Solids: 88.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/11/00	6010	12/13/00	7439-92-1	Lead	10	230

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: Method Blank**
TOTAL METALS

Lab Sample ID: CN70MB
LIMS ID: 00-23574
Matrix: Soil

QC Report No: CN70-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized:
Reported: 12/15/00

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/11/00	6010	12/13/00	7440-43-9	Cadmium	0.2	0.2 U
3050	12/11/00	6010	12/13/00	7440-47-3	Chromium	0.5	0.5 U
3050	12/11/00	6010	12/13/00	7439-92-1	Lead	2	2 U
CLP	12/11/00	7471	12/14/00	7439-97-6	Mercury	0.05	0.05 U

U Analyte undetected at given RL

RL Reporting Limit

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CN70LCS
LIMS ID: 00-23574
Matrix: Soil

QC Report No: CN70-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 12/15/00

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike mg/kg-dry	Spike Added	% Recovery	Q
Cadmium	6010	49.9	50.0	99.8%	
Chromium	6010	49.3	50.0	98.6%	
Lead	6010	196	200	98.0%	
Mercury	7471	1.02	1.00	102%	

'Q' codes: N = control limit not met

Control Limits: 80-120%

Analytical Resources, Incorporated
Analytical Chemists and Consultants

December 18, 2000

Ty Schreiner
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: Project: Tacoma Metals
ARI Job: CM28

Dear Ty:

Please find enclosed sample custody records and final analytical results for the above referenced project. Thirteen soil samples were re-logged from archives on November 17, 2000.

Selected samples were analyzed for PNA's referencing EPA method 8270 or GC/MS-SIM, ARI SOP. Samples submitted for EPH were subcontracted to North Creek Analytical and are attached.

The samples were extracted on November 27th and December 4th, 2000 and analyzed on November 27, 28, 29 and December 1 & 2, 2000.

Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Susan Snyder
Project Manager
susan@arilabs.com

SS/ss
Enclosures

RECEIVED
DEC 20 2000
K/J Federal Way
K/J No/File
Route
Return To/By

333 Ninth Avenue North • Seattle WA 98109-5187 • 206-621-6490 • 206-621-7523 fax

Simpna CH 28
00-22437 to 00-22449

CHANGE ORDER

2 week TAT

ANALYTICAL RESOURCES INCORPORATED

Client: Kennedy Jenks	ARI Job No: CH49 + CI 18
Project No: Tacoma Metals	VTSR:
	Change order Date: 11/17/00

996098.00

Change made by: Jodie Brundage	
Submitted by: Steph	

Change Acknowledged

Project Coordinator:	
Extractions:	
Volatiles:	
GC/MS Extractions Lab:	
GC Lab:	
Metals:	
Conventionals:	
Data Section:	

LIMS	Project	Client ID	JOB	Analysis
00-19101	Tacoma_Metals	TP-15-0-1	CH49 A	
* 00-19102	Tacoma_Metals	TP-16-0-1	CH49 B	EPH / SIM PAH 10/9
00-19103	Tacoma_Metals	TP-160-0-1	CH49 C	
00-19104	Tacoma_Metals	TP-17-0-1	CH49 D	
00-19596	Tacoma_Metals	TP-37-0-1	CI18 D	
00-19597	Tacoma_Metals	TP-37-2-3	CI18 E	EPH / SIM PAH FI-659
00-19598	Tacoma_Metals	TP-38-0-1	CI18 F	EPH / SIM PAH
00-19599	Tacoma_Metals	TP-39-0-1	CI18 G	
00-19600	Tacoma_Metals	TP-390-0-1	CI18 H	
00-19601	Tacoma_Metals	TP-40-0-1	CI18 I	EPH / SIM PAH
00-19602	Tacoma_Metals	TP-40-2-3	CI18 J	

* Please pull Highlighted Samples + relog as new job. for requested analysis

* There are TWO ARI Jobs

*Sub EPH to Aliphatics + ~~Aliphat~~ Aromatics

0004F

Rev. 2
02/21/94

ANALYTICAL RESOURCES INCORPORATED

2 week TAT

CHANGE ORDER

Client: Kennedy Jenks	ARI Job No: CH43
Project No: Tacoma Metals 996098.00	VTSR: / Change order Date: 11/17/00
Change made by: Jodie Brundage	
Submitted by: Steph	

Change Acknowledged

Project Coordinator:	
Extractions:	
Volatiles:	
GC/MS Extractions Lab:	
GC Lab:	
Metals:	
Conventionals:	
Data Section:	

LIMS	Project	Client Sample	Analysis
00-19069	Tacoma_Metals	TP-5-01 CH43 A	
00-19070	Tacoma_Metals	TP-5-4-6 CH43 B	
~~00-19071~~	~~Tacoma_Metals~~	~~TP-5-6-10 CH43 C~~	EPH / SIM PAH
00-19072	Tacoma_Metals	TP-6-0-1 CH43 D	PCB
00-19073	Tacoma_Metals	TP-600-0-1 CH43 E	
00-19074	Tacoma_Metals	TP-7-0-1 CH43 F	
00-19075	Tacoma_Metals	TP-8-0-1 CH43 G	
00-19076	Tacoma_Metals	TP-8-4-6 CH43 H	
~~00-19077~~	~~Tacoma_Metals~~	~~TP-9-0-1 CH43 I~~	EPH / SIM PAH
00-19078	Tacoma_Metals	TP-800-4-6 CH43 J	
00-19079	Tacoma_Metals	TP-9-4-6 CH43 K	
00-19080	Tacoma_Metals	TP-10-0-1 CH43 L	
00-19081	Tacoma_Metals	TP-10-4-6 CH43 M	
~~00-19082~~	~~Tacoma_Metals~~	~~TP-10-6-10 CH43 N~~	EPH / SIM PAH
00-19083	Tacoma_Metals	TP-11-0-1 CH43 O	
~~00-19084~~	~~Tacoma_Metals~~	~~TP-11-6-10 CH43 P~~	EPH / SIM PAH
00-19085	Tacoma_Metals	TP-12-0-1 CH43 Q	PCB
00-19086	Tacoma_Metals	TP-13-0-1 CH43 R	
00-19087	Tacoma_Metals	TP-14-0-1 CH43 S	
00-19088	Tacoma_Metals	TP-14-6-10 CH43 T	

FI-651

Please pull Highlighted samples + relog as new job for requested analyses. Thanks

0004F

Rev. 2
02/21/94

EPH
Northcreek

ANALYTICAL RESOURCES INCORPORATED

CHANGE ORDER

2 week TAT

Aromatics + Aliphatics

North Creek - How much sample

ARI Job No: CI24 + CI25 + CI62	
VTSR:	Change order Date: 11/17/00

S

b

98-00

ndage

Change Acknowledged

Project Coordinator:
Extractions:
Volatiles:
GC/MS Extractions Lab:
GC Lab:
Metals:
Conventionals:
Data Section:

gf. (CI24 f1-663 CI25-f1660)

-3 CI24 K

[redacted]-0-1 CI24 [redacted] EPH / SIM PAH

00-19694 Tacoma_Metals TP-29-0-1 CI24 M

00-19695 Tacoma_Metals TP-30-0-1 CI24 N

[redacted] EPH / SIM PAH

00-19697 Tacoma_Metals TP-31-0-1 CI24 P

00-19698 Tacoma_Metals TP-31-2-3 CI24 Q

00-19699 Tacoma_Metals TP-32-0-1 CI24 R

(CI62 f1-66[illegible])

[redacted] EPH / SIM PAH

00-19607 Tacoma_Metals TP-39-6-10 CI22 C

[redacted] EPA / SIM PAH

00-19875 Tacoma_Metals TP-49-4-6 CI62 N

00-19876 Tacoma_Metals TP-50-0-1 CI62 O - PCB

00-19877 Tacoma_Metals TP-50-2-3 CI62 P - PCB

00-19878 Tacoma_Metals TP-500-0-1 CI62 Q

*

*Please pull the Highlighted samples + re log as a new job for the requested analysis.

Thanks

*Sub EPH to Aliphatics + Aromatics North Creek

(*3 ARI Jobs)

0004F

Rev. 2
02/21/94

ANALYTICAL RESOURCES INCORPORATED

2 week TAT

CHANGE ORDER

Client: Kennedy Jenks

Project No: Tacoma Metals

996098.00

Change made by: Jodie Brundage

Submitted by: Stephanie

ARI Job No: CF88

VTSR:

Change order Date: 11/17/00

Change Acknowledged

Projec

Extra

Vol

GC

GC

M

C

(50) 30 gms - soil

(1 ltr) - water

EPH

00-18314 Tacoma_Metals TP-1-0-1 CF88 A
00-18315 Tacoma_Metals TP-2-0-1 CF88 B
00-18316 Tacoma_Metals TP-2-2-3 CF88 C
00-18317 Tacoma_Metals TP-2-4-6 CF88 D
00-18318 Tacoma_Metals TP-2-6-10 CF88 E EPH/SIM PAH
00-18319 Tacoma_Metals TP-3-0-1 CF88 F
00-18320 Tacoma_Metals TP-3-4-6 CF88 G
00-18321 Tacoma_Metals TP-3-6-10 CF88 H
00-18322 Tacoma_Metals TP-4-0-1 CF88 I - PCB
00-18323 Tacoma_Metals TP-4-6-10 CF88 J
00-18324 Tacoma_Metals TP-1-2-3 CF88 K
00-18325 Tacoma_Metals TP-1-4-6 CF88 L } Lead
00-18326 Tacoma_Metals TP-1-6-10 CF88 M
00-18327 Tacoma_Metals TP-3-2-3 CF88 N
00-18328 Tacoma_Metals TP-4-2-3 CF88 O - PCB Lead
00-18329 Tacoma_Metals TP-4-4-6 CF88 P - Lead

F1-657

(Highlighted only)

*Please pull these samples + relog as new jobs for listed analyses

*Sub EPH to Northcreek - aliphatics + mastics

*SIM PAHs in house

Rev. 2
02/21/94

mm4F

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Case Narrative

Client Project ID: 21090
ARI Job# CM28
Date: December 8, 2000

Semivolatile Organics – PNA GC/MS_SIM

The samples were extracted on November 27, & December 4th, 2000 and analyzed on November 27, 28, 29 and December 1 & 2, 2000. Most of the SIM PNA extracts had significant background matrix interference that resulted in internal standard failures. The extracts were analyzed with as little dilution as possible, most analytes were detected, although some analytes were "J" flagged.

Sample's "E" and "M" we re-extracted and analyzed by 8270 PNA due to the level of target analytes in the samples.

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

ORGANIC COMPOUND DATA REPORTING QUALIFIERS

U	Indicates the compound was undetected at the reported concentration. (Same as ND).
J	Indicates an estimated concentration when the value is less than the calculated reporting limit.
D	Indicates the surrogate/spike(s) was not detected, due to dilution of extract.
NR	Indicates the surrogate recovery cannot be reported due to matrix interference.
E	Indicates a value above the linear range of the detector. Sample dilution required.
S	Indicates no value reported due to saturation of the detector. Sample dilution required.
NA	Indicates compound not analyzed for.
M	Indicates an estimated value of analyte found and confirmed by analyst but with low spectral match.
B	Indicates possible/probable blank contamination. Flagged when the analyte is detected in the blank as well as the sample.
Y	Indicates raised reporting limit due to background interference or to activity on the instrument. Compound is still not detected at or above the raised level.

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ANALYTICAL RESOURCES INCORPORATED

SOIL 8270 PNA SURROGATE RECOVERY SUMMARY

Matrix: Soil

QC Report No: CM28-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

LIMS ID	Client ID	TPH	DPH	TOT OUT
00-22441	Method Blank	82%	78%	0
00-22441	Lab Control	79%	78%	0
00-22441	TP-5-6-10	95%	87%	0
00-22441	TP-5-6-10-DL	81%	73%	0
00-22449	TP-2-6-10	106%	94%	0
00-22449	TP-2-6-10-DL	88%	84%	0

	LCS/MB LIMITS	QC LIMITS
(TPH) = d14-p-Terphenyl	(30-160)	(30-160)
(DPH) = d10-Diphenyl	(30-160)	(30-160)

D Surrogate Compound diluted out

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: Method Blank**
PNAs by GC/MS

Lab Sample ID: 112800MB
LIMS ID: 00-22441
Matrix: Soil
Data Release Authorized:
Reported: 11/29/00

QC Report No: CM28-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Date extracted: 11/27/00
Date analyzed: 11/28/00 16:13
Instrument: NT1
GPC Cleanup: NO

Sample Amount: 4.00 g-as-rec
Final Extract Volume: 10. mL
Conc/Dilution Factor: 1:1
Moisture: NA
pH: NA

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	2,500 U
91-57-6	2-Methylnaphthalene	2,500 U
208-96-8	Acenaphthylene	2,500 U
83-32-9	Acenaphthene	2,500 U
86-73-7	Fluorene	2,500 U
85-01-8	Phenanthrene	2,500 U
120-12-7	Anthracene	2,500 U
206-44-0	Fluoranthene	2,500 U
129-00-0	Pyrene	2,500 U
56-55-3	Benzo(a)anthracene	2,500 U
218-01-9	Chrysene	2,500 U
205-99-2	Benzo(b)fluoranthene	2,500 U
207-08-9	Benzo(k)fluoranthene	2,500 U
50-32-8	Benzo(a)pyrene	2,500 U
193-39-5	Indeno(1,2,3-cd)pyrene	2,500 U
53-70-3	Dibenz(a,h)anthracene	2,500 U
191-24-2	Benzo(g,h,i)perylene	2,500 U
132-64-9	Dibenzofuran	2,500 U

Base/Neutral Surrogate Recovery	
d14-p-Terphenyl	81.6%
d10-Diphenyl	78.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: TP-5-6-10**
PNAs by GC/MS

Lab Sample ID: CM28E
LIMS ID: 00-22441
Matrix: Soil
Data Release Authorized:
Reported: 11/29/00

QC Report No: CM28-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/04/00
Date Received: 10/09/00

Date extracted: 11/27/00
Date analyzed: 11/28/00 17:22
Instrument: NT1
GPC Cleanup: NO

Sample Amount: 1.00 g-as-rec
Final Extract Volume: 10. mL
Conc/Dilution Factor: 1:1
Moisture: NA
pH: Not Entered

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	41,000
91-57-6	2-Methylnaphthalene	34,000
208-96-8	Acenaphthylene	19,000
83-32-9	Acenaphthene	260,000
86-73-7	Fluorene	360,000
85-01-8	Phenanthrene	840,000 E
120-12-7	Anthracene	850,000 E
206-44-0	Fluoranthene	470,000
129-00-0	Pyrene	400,000
56-55-3	Benzo(a)anthracene	130,000
218-01-9	Chrysene	190,000
205-99-2	Benzo(b)fluoranthene	93,000
207-08-9	Benzo(k)fluoranthene	80,000
50-32-8	Benzo(a)pyrene	95,000
193-39-5	Indeno(1,2,3-cd)pyrene	35,000
53-70-3	Dibenz(a,h)anthracene	16,000
191-24-2	Benzo(g,h,i)perylene	39,000
132-64-9	Dibenzofuran	150,000

Base/Neutral Surrogate Recovery	
d14-p-Terphenyl	94.8%
d10-Diphenyl	86.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: TP-5-6-10**
PNAs by GC/MS **DILUTION**

Lab Sample ID: CM28E-DL
LIMS ID: 00-22441
Matrix: Soil
Data Release Authorized:
Reported: 11/29/00

QC Report No: CM28-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/04/00
Date Received: 10/09/00

Date extracted: 11/27/00
Date analyzed: 11/28/00 18:30
Instrument: NT1
GPC Cleanup: NO

Sample Amount: 1.00 g-as-rec
Final Extract Volume: 10. mL
Conc/Dilution Factor: 1:3
Moisture: NA
pH: Not Entered

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	36,000
91-57-6	2-Methylnaphthalene	30,000 U
208-96-8	Acenaphthylene	30,000 U
83-32-9	Acenaphthene	220,000
86-73-7	Fluorene	300,000
85-01-8	Phenanthrene	750,000
120-12-7	Anthracene	750,000
206-44-0	Fluoranthene	400,000
129-00-0	Pyrene	340,000
56-55-3	Benzo(a)anthracene	110,000
218-01-9	Chrysene	160,000
205-99-2	Benzo(b)fluoranthene	89,000
207-08-9	Benzo(k)fluoranthene	62,000
50-32-8	Benzo(a)pyrene	80,000
193-39-5	Indeno(1,2,3-cd)pyrene	30,000 U
53-70-3	Dibenz(a,h)anthracene	30,000 U
191-24-2	Benzo(g,h,i)perylene	32,000
132-64-9	Dibenzofuran	130,000

Base/Neutral Surrogate Recovery	
d14-p-Terphenyl	81.2%
d10-Diphenyl	73.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: TP-2-6-10**
PNAs by GC/MS

Lab Sample ID: CM28M
LIMS ID: 00-22449
Matrix: Soil
Data Release Authorized: MN
Reported: 11/29/00

QC Report No: CM28-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Date extracted: 11/27/00
Date analyzed: 11/28/00 17:56
Instrument: NT1
GPC Cleanup: NO

Sample Amount: 3.02 g-dry-wt
Final Extract Volume: 10. mL
Conc/Dilution Factor: 1:1
Moisture: 24.6%
pH: 7.3

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	470,000 E
91-57-6	2-Methylnaphthalene	270,000 E
208-96-8	Acenaphthylene	7,100
83-32-9	Acenaphthene	270,000 E
86-73-7	Fluorene	200,000
85-01-8	Phenanthrene	460,000 E
120-12-7	Anthracene	400,000 E
206-44-0	Fluoranthene	390,000 E
129-00-0	Pyrene	470,000 E
56-55-3	Benzo(a)anthracene	140,000
218-01-9	Chrysene	230,000
205-99-2	Benzo(b)fluoranthene	90,000
207-08-9	Benzo(k)fluoranthene	110,000
50-32-8	Benzo(a)pyrene	110,000
193-39-5	Indeno(1,2,3-cd)pyrene	33,000
53-70-3	Dibenz(a,h)anthracene	17,000
191-24-2	Benzo(g,h,i)perylene	34,000
132-64-9	Dibenzofuran	120,000

Base/Neutral Surrogate Recovery	
d14-p-Terphenyl	106%
d10-Diphenyl	93.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by GC/MS

Sample No: TP-2-6-10
DILUTION

Lab Sample ID: CM28M-DL
LIMS ID: 00-22449
Matrix: Soil
Data Release Authorized: MW
Reported: 12/05/00

QC Report No: CM28-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Date extracted: 11/27/00
Date analyzed: 11/28/00 19:05
Instrument: NT1
GPC Cleanup: NO

Sample Amount: 3.02 g-dry-wt
Final Extract Volume: 10. mL
Conc/Dilution Factor: 1:3
Moisture: 24.6%
pH: 7.3

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	440,000
91-57-6	2-Methylnaphthalene	240,000
208-96-8	Acenaphthylene	9,900 U
83-32-9	Acenaphthene	240,000
86-73-7	Fluorene	180,000
85-01-8	Phenanthrene	460,000
120-12-7	Anthracene	380,000
206-44-0	Fluoranthene	370,000
129-00-0	Pyrene	430,000
56-55-3	Benzo(a)anthracene	120,000
218-01-9	Chrysene	210,000
205-99-2	Benzo(b)fluoranthene	96,000
207-08-9	Benzo(k)fluoranthene	97,000
50-32-8	Benzo(a)pyrene	100,000
193-39-5	Indeno(1,2,3-cd)pyrene	33,000
53-70-3	Dibenz(a,h)anthracene	19,000
191-24-2	Benzo(g,h,i)perylene	33,000
132-64-9	Dibenzofuran	110,000

Base/Neutral Surrogate Recovery	
d14-p-Terphenyl	87.8%
d10-Diphenyl	84.0%

ORGANICS ANALYSIS DATA SHEET
PNAs by GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CM28SB
LIMS ID: 00-22441
Matrix: Soil

QC Report No: CM28-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 11/29/00

Date extracted: 11/27/00
Date analyzed: 11/27/00

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE ADDED	% RECOVERY
Naphthalene	53800	62500	86.1%
Acenaphthene	51800	62500	82.9%
Fluoranthene	51500	62500	82.4%
Benzo(a)anthracene	50000	62500	80.0%

Spike Blank Surrogate Recovery

d14-p-Terphenyl	79.2%
d10-Diphenyl	77.6%

Values reported in ppb (ug/kg) dry weight

ANALYTICAL RESOURCES INCORPORATED

SIM SURROGATE RECOVERY SUMMARY

Matrix: Soil

QC Report No: CM28-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Client ID	MNP	DBA	TOT OUT
Method Blank	74%	74%	0
Lab Control	66%	72%	0
TP-16-0-1	82%	84%	0
TP-16-0-1-DL	87%	67%	0
TP-37-2-3	73%	90%	0
TP-37-2-3-MS	80%	70%	0
TP-37-2-3-MSD	87%	83%	0
TP-38-0-1	63%	63%	0
TP-40-0-1	71%	84%	0
TP-40-0-1-DL	D	D	0
TP-9-0-1	81%	63%	0
TP-10-6-10	68%	80%	0
TP-10-6-10-DL	67%	67%	0
TP-11-6-10	63%	62%	0
TP-270-0-1	92%	70%	0
TP-30-2-3	67%	57%	0
TP-33-0-1	83%	70%	0
TP-34-2-3	67%	63%	0

	LCS/MB LIMITS	QC LIMITS
(MNP) = d10-2-Methylnaphthalene	(30-160)	(30-160)
(DBA) = d14-Dibenz(a,h)anthracene	(30-160)	(30-160)

(Present limits for LCS/MB are advisory only)

D Surrogate Compound diluted out

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: Method Blank

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CM28MB
LIMS ID: 00-22437
Matrix: Soil
Data Release Authorized:
Reported: 12/05/00

QC Report No: CM28-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Date extracted: 11/27/00
Date analyzed: 11/29/00 02:49
Instrument: FINN4
GPC Cleanup: NO
Alumina: 1:1

Sample Amount: 7.50 g-dry-wt Equiv.
Final Extract Volume: 0.5 mL
Conc/Dilution Factor: 1:1
Moisture: NA
pH: NA

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	6.7 U
91-57-6	2-Methylnaphthalene	6.7 U
208-96-8	Acenaphthylene	6.7 U
83-32-9	Acenaphthene	6.7 U
86-73-7	Fluorene	6.7 U
85-01-8	Phenanthrene	6.7 U
120-12-7	Anthracene	6.7 U
206-44-0	Fluoranthene	6.7 U
129-00-0	Pyrene	6.7 U
56-55-3	Benzo(a)anthracene	6.7 U
218-01-9	Chrysene	6.7 U
205-99-2	Benzo(b)fluoranthene	6.7 U
207-08-9	Benzo(k)fluoranthene	6.7 U
50-32-8	Benzo(a)pyrene	6.7 U
193-39-5	Indeno(1,2,3-cd)pyrene	6.7 U
53-70-3	Dibenzo(a,h)anthracene	6.7 U
191-24-2	Benzo(g,h,i)perylene	6.7 U
132-64-9	Dibenzofuran	6.7 U

SIM Surrogate Recovery

d10-2-Methylnaphthalene	74.0%
d14-Dibenzo(a,h)anthracene	74.0%

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: TP-16-0-1

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CM28A
LIMS ID: 00-22437
Matrix: Soil
Data Release Authorized:
Reported: 12/05/00

QC Report No: CM28-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/06/00
Date Received: 10/09/00

Date extracted: 11/27/00
Date analyzed: 11/29/00 03:51
Instrument: FINN4

Sample Amount: 0.89 g-dry-wt
Final Extract Volume: 1.0 mL
Conc/Dilution Factor: 1:1
Moisture: 11.9%
pH: 6.8

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	990
91-57-6	2-Methylnaphthalene	540
208-96-8	Acenaphthylene	15,000 E
83-32-9	Acenaphthene	1,800
86-73-7	Fluorene	1,000
85-01-8	Phenanthrene	2,200
120-12-7	Anthracene	1,800
206-44-0	Fluoranthene	6,900
129-00-0	Pyrene	6,200
56-55-3	Benzo(a)anthracene	3,800
218-01-9	Chrysene	4,300
205-99-2	Benzo(b)fluoranthene	4,500
207-08-9	Benzo(k)fluoranthene	5,600
50-32-8	Benzo(a)pyrene	7,000
193-39-5	Indeno(1,2,3-cd)pyrene	3,800
53-70-3	Dibenzo(a,h)anthracene	1,400
191-24-2	Benzo(g,h,i)perylene	3,500
132-64-9	Dibenzofuran	680

SIM Surrogate Recovery

d10-2-Methylnaphthalene	81.7%
d14-Dibenzo(a,h)anthracene	83.7%

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: TP-16-0-1
DILUTION

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CM28A-DL
LIMS ID: 00-22437
Matrix: Soil
Data Release Authorized:
Reported: 12/05/00

QC Report No: CM28-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/06/00
Date Received: 10/09/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 04:01
Instrument: FINN4

Sample Amount: 0.89 g-dry-wt
Final Extract Volume: 1.0 mL
Conc/Dilution Factor: 1:10
Moisture: 11.9%
pH: 6.8

CAS Number	Analyte	ug/kg
91-20-3	Naphtbalene	1,100
91-57-6	2-Methylnaphthalene	1,200
208-96-8	Acenaphthylene	18,000
83-32-9	Acenaphthene	1,400
86-73-7	Fluorene	1,100
85-01-8	Phenanthrene	2,400
120-12-7	Anthracene	1,800
206-44-0	Fluoranthene	7,000
129-00-0	Pyrene	6,600
56-55-3	Benzo(a)anthracene	3,600
218-01-9	Chrysene	4,200
205-99-2	Benzo(b)fluoranthene	5,300
207-08-9	Benzo(k)fluoranthene	4,600
50-32-8	Benzo(a)pyrene	6,300
193-39-5	Indeno(1,2,3-cd)pyrene	4,200
53-70-3	Dibenzo(a,h)anthracene	1,200
191-24-2	Benzo(g,h,i)perylene	3,600
132-64-9	Dibenzofuran	790 J

SIM Surrogate Recovery

d10-2-Methylnaphthalene	86.7%
d14-Dibenzo(a,h)anthracene	66.7%

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: TP-37-2-3

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CM28B
LIMS ID: 00-22438
Matrix: Soil
Data Release Authorized: MW
Reported: 12/05/00

QC Report No: CM28-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 04:30
Instrument: FINN4

Alumina: 1:1

Sample Amount: 6.42 g-dry-wt
Final Extract Volume: 0.5 mL
Conc/Dilution Factor: 1:10
Moisture: 14.6%
pH: 7.0

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	300
91-57-6	2-Methylnaphthalene	490
208-96-8	Acenaphthylene	94
83-32-9	Acenaphthene	78
86-73-7	Fluorene	200
85-01-8	Phenanthrene	1,100
120-12-7	Anthracene	340
206-44-0	Fluoranthene	1,900
129-00-0	Pyrene	2,000
56-55-3	Benzo(a)anthracene	810
218-01-9	Chrysene	1,200
205-99-2	Benzo(b)fluoranthene	1,100
207-08-9	Benzo(k)fluoranthene	750
50-32-8	Benzo(a)pyrene	1,000
193-39-5	Indeno(1,2,3-cd)pyrene	870
53-70-3	Dibenzo(a,h)anthracene	270
191-24-2	Benzo(g,h,i)perylene	1,200
132-64-9	Dibenzofuran	170

SIM Surrogate Recovery

d10-2-Methylnaphthalene	73.3%
d14-Dibenzo(a,h)anthracene	90.0%

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: TP-38-0-1

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CM28C
LIMS ID: 00-22439
Matrix: Soil
Data Release Authorized:
Reported: 12/05/00

QC Report No: CM28-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 07:15
Instrument: FINN4

Sample Amount: 0.86 g-dry-wt
Final Extract Volume: 0.5 mL
Conc/Dilution Factor: 1:3
Moisture: 16.2%
pH: 7.3

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	300
91-57-6	2-Methylnaphthalene	300
208-96-8	Acenaphthylene	240
83-32-9	Acenaphthene	590
86-73-7	Fluorene	510
85-01-8	Phenanthrene	4,200
120-12-7	Anthracene	1,000
206-44-0	Fluoranthene	5,100
129-00-0	Pyrene	4,900
56-55-3	Benzo(a)anthracene	2,500
218-01-9	Chrysene	3,200
205-99-2	Benzo(b)fluoranthene	2,000
207-08-9	Benzo(k)fluoranthene	2,100
50-32-8	Benzo(a)pyrene	2,400
193-39-5	Indeno(1,2,3-cd)pyrene	2,000
53-70-3	Dibenzo(a,h)anthracene	590
191-24-2	Benzo(g,h,i)perylene	2,000
132-64-9	Dibenzofuran	230

SIM Surrogate Recovery

d10-2-Methylnaphthalene	63.0%
d14-Dibenzo(a,h)anthracene	63.0%

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: TP-40-0-1

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CM28D
LIMS ID: 00-22440
Matrix: Soil
Data Release Authorized:
Reported: 12/05/00

QC Report No: CM28-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 07:48
Instrument: FINN4

Sample Amount: 0.89 g-dry-wt
Final Extract Volume: 1.0 mL
Conc/Dilution Factor: 1:3
Moisture: 12.8%
pH: 7.0

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	980
91-57-6	2-Methylnaphthalene	1,300
208-96-8	Acenaphthylene	3,800
83-32-9	Acenaphthene	740
86-73-7	Fluorene	1,400
85-01-8	Phenanthrene	17,000
120-12-7	Anthracene	4,700
206-44-0	Fluoranthene	44,000 E
129-00-0	Pyrene	50,000 E
56-55-3	Benzo(a)anthracene	37,000 E
218-01-9	Chrysene	48,000 E
205-99-2	Benzo(b)fluoranthene	24,000
207-08-9	Benzo(k)fluoranthene	23,000
50-32-8	Benzo(a)pyrene	28,000
193-39-5	Indeno(1,2,3-cd)pyrene	14,000
53-70-3	Dibenzo(a,h)anthracene	4,800
191-24-2	Benzo(g,h,i)perylene	13,000
132-64-9	Dibenzofuran	370

SIM Surrogate Recovery	
d10-2-Methylnaphthalene	71.0%
d14-Dibenzo(a,h)anthracene	84.0%

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: TP-40-0-1
DILUTION

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CM28D-DL
LIMS ID: 00-22440
Matrix: Soil
Data Release Authorized:
Reported: 12/05/00

QC Report No: CM28-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 06:09
Instrument: FINN4

Sample Amount: 0.89 g-dry-wt
Final Extract Volume: 1.0 mL
Conc/Dilution Factor: 1:50
Moisture: 12.8%
pH: 7.0

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	5,600 U
91-57-6	2-Methylnaphthalene	5,600 U
208-96-8	**Acenaphthylene**	**3,900 J**
83-32-9	Acenaphthene	5,600 U
86-73-7	Fluorene	5,600 U
85-01-8	**Phenanthrene**	**17,000**
120-12-7	**Anthracene**	**4,500 J**
206-44-0	**Fluoranthene**	**43,000**
129-00-0	**Pyrene**	**51,000**
56-55-3	**Benzo(a)anthracene**	**33,000**
218-01-9	**Chrysene**	**41,000**
205-99-2	**Benzo(b)fluoranthene**	**21,000**
207-08-9	**Benzo(k)fluoranthene**	**22,000**
50-32-8	**Benzo(a)pyrene**	**26,000**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**14,000**
53-70-3	**Dibenzo(a,h)anthracene**	**5,100 J**
191-24-2	**Benzo(g,h,i)perylene**	**14,000**
132-64-9	Dibenzofuran	5,600 U

SIM Surrogate Recovery

d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracene	D

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: TP-9-0-1

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CM28F
LIMS ID: 00-22442
Matrix: Soil
Data Release Authorized:
Reported: 12/05/00

QC Report No: CM28-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/04/00
Date Received: 10/09/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 08:21
Instrument: FINN4

Alumina: 1:1

Sample Amount: 6.51 g-dry-wt
Final Extract Volume: 0.5 mL
Conc/Dilution Factor: 1:3
Moisture: 13.6%
pH: 7.0

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	350
91-57-6	2-Methylnaphthalene	950
208-96-8	Acenaphthylene	14 J
83-32-9	Acenaphthene	28
86-73-7	Fluorene	28
85-01-8	Phenanthrene	160
120-12-7	Anthracene	67
206-44-0	Fluoranthene	270
129-00-0	Pyrene	240
56-55-3	Benzo(a)anthracene	150
218-01-9	Chrysene	280
205-99-2	Benzo(b)fluoranthene	170
207-08-9	Benzo(k)fluoranthene	120
50-32-8	Benzo(a)pyrene	140
193-39-5	Indeno(1,2,3-cd)pyrene	94
53-70-3	Dibenzo(a,h)anthracene	35
191-24-2	Benzo(g,h,i)perylene	170
132-64-9	Dibenzofuran	18 J

SIM Surrogate Recovery	
d10-2-Methylnaphthalene	81.0%
d14-Dibenzo(a,h)anthracene	63.0%

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: TP-10-6-10

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CM28G
LIMS ID: 00-22443
Matrix: Soil
Data Release Authorized:
Reported: 12/05/00

QC Report No: CM28-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/05/00
Date Received: 10/09/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 00:14
Instrument: FINN4

Sample Amount: 6.62 g-dry-wt
Final Extract Volume: 0.5 mL
Conc/Dilution Factor: 1:3
Moisture: 12.2%
pH: 7.0

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	11 J
91-57-6	2-Methylnaphthalene	11 J
208-96-8	Acenaphthylene	6.8 J
83-32-9	Acenaphthene	23
86-73-7	Fluorene	14 J
85-01-8	Phenanthrene	23
120-12-7	Anthracene	14 J
206-44-0	Fluoranthene	32 M
129-00-0	Pyrene	18 J
56-55-3	Benzo(a)anthracene	20 MJ
218-01-9	Chrysene	38
205-99-2	Benzo(b)fluoranthene	36 M
207-08-9	Benzo(k)fluoranthene	23 MJ
50-32-8	Benzo(a)pyrene	25
193-39-5	Indeno(1,2,3-cd)pyrene	18 MJ
53-70-3	Dibenzo(a,h)anthracene	9.1 MJ
191-24-2	Benzo(g,h,i)perylene	41 M
132-64-9	Dibenzofuran	6.8 J

SIM Surrogate Recovery

d10-2-Methylnaphthalene	68.0%
d14-Dibenzo(a,h)anthracene	80.0%

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: TP-10-6-10
DILUTION

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CM28G-DL
LIMS ID: 00-22443
Matrix: Soil
Data Release Authorized:
Reported: 12/05/00

QC Report No: CM28-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/05/00
Date Received: 10/09/00

Date extracted: 11/27/00
Date analyzed: 12/04/00 20:34
Instrument: FINN4

Sample Amount: 6.62 g-dry-wt
Final Extract Volume: 0.5 mL
Conc/Dilution Factor: 1:5
Moisture: 12.2%
pH: 7.0

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	11 J
91-57-6	2-Methylnaphthalene	7.6 J
208-96-8	Acenaphthylene	3.8 J
83-32-9	Acenaphthene	23 J
86-73-7	Fluorene	11 J
85-01-8	Phenanthrene	23 J
120-12-7	Anthracene	11 MJ
206-44-0	Fluoranthene	30 J
129-00-0	Pyrene	30 J
56-55-3	Benzo(a)anthracene	19 MJ
218-01-9	Chrysene	38 U
205-99-2	Benzo(b)fluoranthene	30 MJ
207-08-9	Benzo(k)fluoranthene	23 MJ
50-32-8	Benzo(a)pyrene	30 MJ
193-39-5	Indeno(1,2,3-cd)pyrene	11 MJ
53-70-3	Dibenzo(a,h)anthracene	38 U
191-24-2	Benzo(g,h,i)perylene	7.6 MJ
132-64-9	Dibenzofuran	3.8 J

SIM Surrogate Recovery

d10-2-Methylnaphthalene	66.7%
d14-Dibenzo(a,h)anthracene	66.7%

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: TP-11-6-10

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CM28H
LIMS ID: 00-22444
Matrix: Soil
Data Release Authorized:
Reported: 12/05/00

QC Report No: CM28-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/05/00
Date Received: 10/09/00

Date extracted: 11/27/00
Date analyzed: 12/04/00 21:03
Instrument: FINN4

Sample Amount: 0.64 g-dry-wt
Final Extract Volume: 1.0 mL
Conc/Dilution Factor: 1:5
Moisture: 38.0%
pH: 6.5

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	700 J
91-57-6	2-Methylnaphthalene	390 J
208-96-8	Acenaphthylene	160 J
83-32-9	Acenaphthene	1,600
86-73-7	Fluorene	1,400
85-01-8	Phenanthrene	2,700
120-12-7	Anthracene	860 M
206-44-0	Fluoranthene	4,600
129-00-0	Pyrene	2,800
56-55-3	Benzo(a)anthracene	1,200
218-01-9	Chrysene	1,800
205-99-2	Benzo(b)fluoranthene	1,000
207-08-9	Benzo(k)fluoranthene	780 J
50-32-8	Benzo(a)pyrene	940
193-39-5	Indeno(1,2,3-cd)pyrene	550 J
53-70-3	Dibenzo(a,h)anthracene	160 MJ
191-24-2	Benzo(g,h,i)perylene	550 J
132-64-9	Dibenzofuran	470 J

SIM Surrogate Recovery

d10-2-Methylnaphthalene	63.3%
d14-Dibenzo(a,h)anthracene	61.7%

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: TP-270-0-1

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CM28I
LIMS ID: 00-22445
Matrix: Soil
Data Release Authorized:
Reported: 12/05/00

QC Report No: CM28-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/11/00
Date Received: 10/13/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 08:54
Instrument: FINN4

Alumina: 1:1

Sample Amount: 6.56 g-dry-wt
Final Extract Volume: 0.5 mL
Conc/Dilution Factor: 1:3
Moisture: 12.8%
pH: 6.8

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	80
91-57-6	2-Methylnaphthalene	140
208-96-8	Acenaphthylene	25
83-32-9	Acenaphthene	11 MJ
86-73-7	Fluorene	11 J
85-01-8	Phenanthrene	130
120-12-7	Anthracene	34
206-44-0	Fluoranthene	150
129-00-0	Pyrene	190
56-55-3	Benzo(a)anthracene	110
218-01-9	Chrysene	270
205-99-2	Benzo(b)fluoranthene	190
207-08-9	Benzo(k)fluoranthene	120
50-32-8	Benzo(a)pyrene	140
193-39-5	Indeno(1,2,3-cd)pyrene	160
53-70-3	Dibenzo(a,h)anthracene	48
191-24-2	Benzo(g,h,i)perylene	220
132-64-9	Dibenzofuran	16 J

SIM Surrogate Recovery	
d10-2-Methylnaphthalene	92.0%
d14-Dibenzo(a,h)anthracene	70.0%

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: TP-30-2-3

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CM28J
LIMS ID: 00-22446
Matrix: Soil
Data Release Authorized:
Reported: 12/05/00

QC Report No: CM28-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Date extracted: 11/27/00
Date analyzed: 12/02/00 01:04
Instrument: FINN4

Sample Amount: 6.61 g-dry-wt
Final Extract Volume: 0.5 mL
Conc/Dilution Factor: 1:10
Moisture: 12.1%
pH: 6.9

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	140
91-57-6	2-Methylnaphthalene	170
208-96-8	Acenaphthylene	110
83-32-9	Acenaphthene	53 J
86-73-7	Fluorene	91
85-01-8	Phenanthrene	500
120-12-7	Anthracene	200
206-44-0	Fluoranthene	840
129-00-0	Pyrene	950
56-55-3	Benzo(a)anthracene	500
218-01-9	Chrysene	1,900
205-99-2	Benzo(b)fluoranthene	820
207-08-9	Benzo(k)fluoranthene	440
50-32-8	Benzo(a)pyrene	520
193-39-5	Indeno(1,2,3-cd)pyrene	380
53-70-3	Dibenzo(a,h)anthracene	120
191-24-2	Benzo(g,h,i)perylene	490
132-64-9	Dibenzofuran	38 J

SIM Surrogate Recovery

d10-2-Methylnaphthalene	66.7%
d14-Dibenzo(a,h)anthracene	56.7%

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: TP-33-0-1

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CM28K
LIMS ID: 00-22447
Matrix: Soil
Data Release Authorized:
Reported: 12/05/00

QC Report No: CM28-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Date extracted: 11/27/00
Date analyzed: 12/02/00 01:38
Instrument: FINN4

Alumina: 1:1

Sample Amount: 6.69 g-dry-wt
Final Extract Volume: 0.5 mL
Conc/Dilution Factor: 1:10
Moisture: 11.2%
pH: 6.9

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	310
91-57-6	2-Methylnaphthalene	320
208-96-8	Acenaphthylene	67 J
83-32-9	Acenaphthene	75
86-73-7	Fluorene	97
85-01-8	Phenanthrene	510
120-12-7	Anthracene	170
206-44-0	Fluoranthene	600
129-00-0	Pyrene	940
56-55-3	Benzo(a)anthracene	360
218-01-9	Chrysene	650
205-99-2	Benzo(b)fluoranthene	460
207-08-9	Benzo(k)fluoranthene	390
50-32-8	Benzo(a)pyrene	490
193-39-5	Indeno(1,2,3-cd)pyrene	340
53-70-3	Dibenzo(a,h)anthracene	120
191-24-2	Benzo(g,h,i)perylene	490
132-64-9	Dibenzofuran	60 J

SIM Surrogate Recovery

d10-2-Methylnaphthalene	83.3%
d14-Dibenzo(a,h)anthracene	70.0%

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: TP-34-2-3

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CM28L
LIMS ID: 00-22448
Matrix: Soil
Data Release Authorized:
Reported: 12/05/00

QC Report No: CM28-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Date extracted: 11/27/00
Date analyzed: 12/02/00 02:11
Instrument: FINN4

Alumina: 1:1

Sample Amount: 6.36 g-dry-wt
Final Extract Volume: 0.5 mL
Conc/Dilution Factor: 1:10
Moisture: 15.4%
pH: 6.9

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	950
91-57-6	2-Methylnaphthalene	570
208-96-8	Acenaphthylene	100
83-32-9	Acenaphthene	1,900
86-73-7	Fluorene	910
85-01-8	Phenanthrene	4,300
120-12-7	Anthracene	1,300
206-44-0	Fluoranthene	4,700
129-00-0	Pyrene	4,000
56-55-3	Benzo(a)anthracene	1,900
218-01-9	Chrysene	4,200
205-99-2	Benzo(b)fluoranthene	2,000
207-08-9	Benzo(k)fluoranthene	1,100
50-32-8	Benzo(a)pyrene	1,300
193-39-5	Indeno(1,2,3-cd)pyrene	790
53-70-3	Dibenzo(a,h)anthracene	240
191-24-2	Benzo(g,h,i)perylene	930
132-64-9	Dibenzofuran	540

SIM Surrogate Recovery

d10-2-Methylnaphthalene	66.7%
d14-Dibenzo(a,h)anthracene	63.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNA's by Selected Ion Monitoring GC/MS

Lab Sample ID: CM28LC
LIMS ID: 00-22437
Matrix: Soil

QC Report No: CM28-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized: MW
Reported: 12/05/00

Date extracted: 11/27/00
Date analyzed: 11/29/00
Instrument: FINN4

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
Phenanthrene	148	200	74.0%
Chrysene	145	200	72.5%
Benzo(k)fluoranthene	147	200	73.5%

Spike Blank Surrogate Recovery

d10-2-Methylnaphthalene	66.3%
d14-Dibenzo(a,h)anthracene	72.0%

Values reported in ug/kg

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: TP-37-2-3
MATRIX SPIKE

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CM28BMS
LIMS ID: 00-22438
Matrix: Soil
Data Release Authorized: MW
Reported: 12/05/00

QC Report No: CM28-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 05:03
Instrument: FINN4

Alumina: 1:1

Sample Amount: 6.41 g-dry-wt
Final Extract Volume: 0.5 mL
Conc/Dilution Factor: 1:10
Moisture: 14.6%
pH: 7.0

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	250
91-57-6	2-Methylnaphthalene	420
208-96-8	Acenaphthylene	78 J
83-32-9	Acenaphthene	70 J
86-73-7	Fluorene	150
85-01-8	Phenanthrene	---
120-12-7	Anthracene	280
206-44-0	Fluoranthene	1,600
129-00-0	Pyrene	1,400
56-55-3	Benzo(a)anthracene	570
218-01-9	Chrysene	---
205-99-2	Benzo(b)fluoranthene	750
207-08-9	Benzo(k)fluoranthene	---
50-32-8	Benzo(a)pyrene	660
193-39-5	Indeno(1,2,3-cd)pyrene	580
53-70-3	Dibenzo(a,h)anthracene	150
191-24-2	Benzo(g,h,i)perylene	690
132-64-9	Dibenzofuran	150

SIM Surrogate Recovery

d10-2-Methylnaphthalene	80.0%
d14-Dibenzo(a,h)anthracene	70.0%

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: TP-37-2-3
MSDUPLICATE

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CM28BMSD
LIMS ID: 00-22438
Matrix: Soil
Data Release Authorized: Mw
Reported: 12/05/00

QC Report No: CM28-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 05:36
Instrument: FINN4

Alumina: 1:1

Sample Amount: 6.41 g-dry-wt
Final Extract Volume: 0.5 mL
Conc/Dilution Factor: 1:10
Moisture: 14.6%
pH: 7.0

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	290
91-57-6	2-Methylnaphthalene	480
208-96-8	Acenaphthylene	120
83-32-9	Acenaphthene	86
86-73-7	Fluorene	200
85-01-8	Phenanthrene	---
120-12-7	Anthracene	350
206-44-0	Fluoranthene	1,900
129-00-0	Pyrene	1,800
56-55-3	Benzo(a)anthracene	840
218-01-9	Chrysene	---
205-99-2	Benzo(b)fluoranthene	990
207-08-9	Benzo(k)fluoranthene	---
50-32-8	Benzo(a)pyrene	990
193-39-5	Indeno(1,2,3-cd)pyrene	890
53-70-3	Dibenzo(a,h)anthracene	320
191-24-2	Benzo(g,h,i)perylene	990
132-64-9	Dibenzofuran	180

SIM Surrogate Recovery

d10-2-Methylnaphthalene	86.7%
d14-Dibenzo(a,h)anthracene	83.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNA's by Selected Ion Monitoring GC/MS

Sample No: TP-37-2-3
Lab Sample ID: CM28B
QC Report No: CM28-Kennedy Jenks Consultants
LIMS ID: 00-22438
Project: Tacoma Metals
Matrix: Soil
996098.00
Date Received: 10/16/00

Data Release Authorized:
Reported: 12/05/00

MATRIX SPIKE/SPIKE DUPLICATE RECOVERY

CONSTITUENT	SAMPLE VALUE	SPIKE VALUE	SPIKE AMT	% RECOVERY	RPD
MATRIX SPIKE					
Phenanthrene	1080	983	234	NA*	
Chrysene	1250	1100	234	NA*	
Benzo(k)fluoranthene	748	749	234	0.4%	
MATRIX SPIKE DUPLICATE					
Phenanthrene	748	1260	234	219%	NA*
Chrysene	748	1480	234	313%	NA*
Benzo(k)fluoranthene	748	1010	234	112%	200%

* Recovery unavailable due to high concentration of analyte in original sample.

Values reported in ug/kg-dry

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ARI 333 Ninth Ave. N. Seattle WA, 98109-5187	Project: CM28 Project Number: none provided Project Manager: Jeff Reitan	**Reported:** 12/07/00 18:05

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
00-22437-CM28A	B0K0607-01	Soil	10/06/00 12:00	11/22/00 15:00
00-22438-CM28B	B0K0607-02	Soil	10/13/00 12:00	11/22/00 15:00
00-22439-CM28C	B0K0607-03	Soil	10/13/00 12:00	11/22/00 15:00
00-22440-CM28D	B0K0607-04	Soil	10/13/00 12:00	11/22/00 15:00
00-22441-CM28E	B0K0607-05	Soil	10/04/00 12:00	11/22/00 15:00
00-22442-CM28F	B0K0607-06	Soil	10/04/00 12:00	11/22/00 15:00
00-22443-CM28G	B0K0607-07	Soil	10/05/00 12:00	11/22/00 15:00
00-22444-CM28H	B0K0607-08	Soil	10/05/00 12:00	11/22/00 15:00
00-22445-CM28I	B0K0607-09	Soil	10/11/00 12:00	11/22/00 15:00
00-22446-CM28J	B0K0607-10	Soil	10/12/00 12:00	11/22/00 15:00
00-22447-CM28K	B0K0607-11	Soil	10/12/00 12:00	11/22/00 15:00
00-22448-CM28L	B0K0607-12	Soil	10/12/00 12:00	11/22/00 15:00
00-22449-CM28M	B0K0607-13	Soil	09/27/00 12:00	11/22/00 15:00

The results in this report apply to the samples analyzed in accordance with the chain custody document. This analytical report must be reproduced in its entire

Amar Gill, Project Manager

Analytical Resources, Incorporated
Analytical Chemists and Consultants

December 26, 2000

Ty Schreiner
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: Project: Tacoma Metals
ARI Job: CN91revised

Dear Ty:

Please find enclosed additional analysis requests and final analytical results for the above referenced project. Eighteen selected samples were retrieved from sample archive per your request on December 1, 2000.

Selected samples were analyzed for total metals referencing EPA methods 6010 and 7000 series.

No analytical complications were noted. Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Susan Snyder
Project Manager
susan@arilabs.com

SS/ss
Enclosures

RECEIVED

JAN 08 2001

K/J Federal Way
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Route
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333 Ninth Avenue North • Seattle WA 98109-5187 • **206-621-6490** • **206-621-7523** fax

Analytical Resources, Incorporated
Analytical Chemists and Consultants

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Kennedy Jenks Consultants
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Sincerely,

ANALYTICAL RESOURCES, INC.

Susan Snyder
Project Manager
susan@arilabs.com

SS/ss
Enclosures

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NWTPH-DX

C163 TP-43-4-6 00-19886
C162 TP-46-2-3/6-10 00-19891

✓ EPH / PAH (SIM) D

C162 TP-43-2-3 00-19864
C162 TP-46-4-6 00-19871
C162 TP-49-6-10 00-19879

✓ PCB

CH43 TP-10-0-1/2-3 00-19080
CH43 TP-14-0-1/2-3 00-19087
CI19 TP-20-0-1/2-3 00-19615
CI19 TP-22-0-1/2-3 00-19620
CI18 TP-40-0-1/2-3 00-19601
CI62 TP-46-0-1/2-3 00-19870

✓ LEAD

C120 TP-20-4-6/6-10 00-19628 ✓
C120 TP-21-4-6/6-10 00-19630 ✓
C120 TP-22-4-6/6-10 00-19632
C126 TP-23-4-6/6-10 00-19702
C126 TP-28-4-6/6-10 00-19711
C126 TP-30-4-6/6-10 00-19717
C126 TP-33-2-3/4-6/6-10 00-19721
C126 TP-34-4-6/6-10 00-19724
C121 TP-35-2-3/4-6/6-10 00-19634
C121 TP-37-4-6/6-10 00-19639
C121 TP-38-2-3/4-6/6-10 00-19641
C163 TP-43-4-6/6-10 00-19886
C163 TP-45-2-3/4-6/6-10 00-19888
C163 TP-46-2-3/6-10 00-19891 ✓

CADMIUM D

TP-4-2-3 18328/CF88
TP-7-2-3 19114 CH50
TP-16-2-3 19135 CH50
TP-20-4-6 19628 (C120)
TP-21-4-6 19630 (C120)
TP-23-2-3 19702 (C126)
TP-28-4-6-19711 (C126)
TP-30-4-6 19717 (C126)
TP-37-4-6 19639/C121
TP-34-2-3 19605 C122
TP-43-4-6 00-19886/C163
TP-45-2-3 00-19888/C163
TP-46-2-3/6-10 00-1987 C162

CHROMIUM D

TP-21-4-6 C120-00-19630
TP-22-4-6 C120-00-19632
TP-46-2-3 00-19864/C162

MERCURY D

TP-1-2-3 00-18324 CF
TP-23-4-6 19702/C12
TP-27-4-6 19712/C12
TP-28-4-6-19717/C1
TP-33-2-3 00-19721 C
TP-34-4-6 00-1972
TP-37-4-6 00-19639/C
TP-38-2-3 19641/C
TP-43-4-6 00-198 C163
TP-45-2-3 19888-
TP-46-2-3 00-19864/C162

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: Method Blank**
TOTAL METALS

Lab Sample ID: CN91MB
LIMS ID: 00-23751
Matrix: Soil

QC Report No: CN91-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized:
Reported: 12/21/00

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/13/00	6010	12/18/00	7440-43-9	Cadmium	0.2	0.2 U
3050	12/13/00	6010	12/18/00	7439-92-1	Lead	2	2 U
CLP	12/13/00	7471	12/14/00	7439-97-6	Mercury	0.05	0.05 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-22-6-10**
TOTAL METALS

Lab Sample ID: CN91A
LIMS ID: 00-23751
Matrix: Soil

QC Report No: CN91-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/10/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 12/21/00

Percent Total Solids: 54.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/13/00	6010	12/18/00	**7439-92-1**	**Lead**	20	**80**

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-23-2-3**
TOTAL METALS

Lab Sample ID: CN91B
LIMS ID: 00-23752
Matrix: Soil

QC Report No: CN91-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/11/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 12/21/00

Percent Total Solids: 92.1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/13/00	6010	12/18/00	7440-43-9	Cadmium	1	13

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-23-6-10**
TOTAL METALS

Lab Sample ID: CN91C
LIMS ID: 00-23753
Matrix: Soil

QC Report No: CN91-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/11/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 12/21/00

Percent Total Solids: 73.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/13/00	6010	12/18/00	7439-92-1	Lead	10	130

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-27-4-6**
TOTAL METALS

Lab Sample ID: CN91D
LIMS ID: 00-23754
Matrix: Soil

QC Report No: CN91-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/11/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 12/21/00

Percent Total Solids: 82.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
CLP	12/13/00	7471	12/14/00	7439-97-6	Mercury	0.06	0.06 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-28-6-10**
TOTAL METALS

Lab Sample ID: CN91E
LIMS ID: 00-23755
Matrix: Soil

QC Report No: CN91-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Data Release Authorized
Reported: 12/21/00

Percent Total Solids: 75.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/13/00	6010	12/18/00	7439-92-1	Lead	6	7

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-30-6-10**
TOTAL METALS

Lab Sample ID: CN91F
LIMS ID: 00-23756
Matrix: Soil

QC Report No: CN91-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 12/21/00

Percent Total Solids: 69.7%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/13/00	6010	12/18/00	7439-92-1	Lead	10	50

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-33-4-6**
TOTAL METALS

Lab Sample ID: CN91G
LIMS ID: 00-23757
Matrix: Soil

QC Report No: CN91-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 12/21/00

Percent Total Solids: 88.1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/13/00	6010	12/18/00	7439-92-1	Lead	10	10

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-33-6-10**
TOTAL METALS

Lab Sample ID: CN91H
LIMS ID: 00-23758
Matrix: Soil

QC Report No: CN91-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 12/21/00

Percent Total Solids: 59.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/13/00	6010	12/18/00	7439-92-1	Lead	20	70

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-34-6-10**
TOTAL METALS

Lab Sample ID: CN91I
LIMS ID: 00-23759
Matrix: Soil

QC Report No: CN91-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Data Release Authorized
Reported: 12/21/00

Percent Total Solids: 68.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/13/00	6010	12/18/00	7439-92-1	Lead	10	40

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-35-4-6**
TOTAL METALS

Lab Sample ID: CN91J
LIMS ID: 00-23760
Matrix: Soil

QC Report No: CN91-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Data Release Authorized:
Reported: 12/21/00

Percent Total Solids: 87.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/13/00	6010	12/18/00	**7439-92-1**	**Lead**	10	30

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-35-6-10**
TOTAL METALS

Lab Sample ID: CN91K
LIMS ID: 00-23761
Matrix: Soil

QC Report No: CN91-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Data Release Authorized:
Reported: 12/21/00

Percent Total Solids: 68.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/13/00	6010	12/18/00	7439-92-1	Lead	10	20

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-37-6-10**
TOTAL METALS

Lab Sample ID: CN91L
LIMS ID: 00-23762
Matrix: Soil

QC Report No: CN91-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Data Release Authorized:
Reported: 12/21/00

Percent Total Solids: 65.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/13/00	6010	12/18/00	7439-92-1	Lead	20	30

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-38-4-6**
TOTAL METALS

Lab Sample ID: CN91M
LIMS ID: 00-23763
Matrix: Soil

QC Report No: CN91-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Data Release Authorized:
Reported: 12/21/00

Percent Total Solids: 76.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/13/00	6010	12/18/00	7439-92-1	Lead	10	50

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: TP-38-6-10

Lab Sample ID: CN91N
LIMS ID: 00-23764
Matrix: Soil

QC Report No: CN91-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Data Release Authorized
Reported: 12/21/00

Percent Total Solids: 72.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/13/00	6010	12/19/00	7439-92-1	Lead	7	11

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-39-2-3**
TOTAL METALS

Lab Sample ID: CN910
LIMS ID: 00-23765
Matrix: Soil

QC Report No: CN91-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Data Release Authorized:
Reported: 12/21/00

Percent Total Solids: 92.5%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/13/00	6010	12/18/00	7440-43-9	Cadmium	1.0	10.4

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-43-6-10**
TOTAL METALS

Lab Sample ID: CN91P
LIMS ID: 00-23766
Matrix: Soil

QC Report No: CN91-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/16/00
Date Received: 10/18/00

Data Release Authorized:
Reported: 12/21/00

Percent Total Solids: 67.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/13/00	6010	12/18/00	7439-92-1	Lead	10	70

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-45-4-6**
TOTAL METALS

Lab Sample ID: CN91Q
LIMS ID: 00-23767
Matrix: Soil

QC Report No: CN91-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/16/00
Date Received: 10/18/00

Data Release Authorized
Reported: 12/21/00

Percent Total Solids: 88.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/13/00	6010	12/18/00	7439-92-1	Lead	10	180

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-45-6-10**
TOTAL METALS

Lab Sample ID: CN91R
LIMS ID: 00-23768
Matrix: Soil

QC Report No: CN91-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/16/00
Date Received: 12/07/00

Data Release Authorized:
Reported: 12/21/00

Percent Total Solids: 71.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/13/00	6010	12/18/00	7439-92-1	Lead	10	80

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CN91LCS
LIMS ID: 00-23751
Matrix: Soil

QC Report No: CN91-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 12/21/00

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike mg/kg-dry	Spike Added	% Recovery	Q
Cadmium	6010	46.1	50.0	92.2%	
Lead	6010	184	200	92.0%	
Mercury	7471	1.04	1.00	104%	

'Q' codes: N = control limit not met

Control Limits: 80-120%

Analytical Resources, Incorporated
Analytical Chemists and Consultants

December 29, 2000

Ty Schreiner
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: Project: Tacoma Metals / ARI Job: CN64

Dear Ty:

Please find enclosed sample change order custody records and final analytical results for the above referenced project. Three soil samples were removed from archive at –18 degrees celcius in good condition on December 1, 2000. The samples were analyzed for PAH referencing GC/MS-SIM or EPA 8270. The EPH samples were subcontracted to North Creek Analytical and are contained in Appendix A.

All samples were originally screened for PAH's, it was determined that sample TP-49-6-10 contained analytes above the linear range for SIM analysis. This sample was analyzed for PAH's by EPA 8270 methodology. Several analytes were above the linear range in the straight run, the sample was diluted (1:25) and reanalyzed. Both sets of data are reported. In the SIM analysis, sample "C" contained elevated levels of target analyte resulting in poor isomer resolution. The sample was diluted (1:10) and reanalyzed. Both sets of data have been reported. For sample "J" the diluted analysis and the original analysis had an internal standard that exceeded QC criteria, indicating matrix interference. The sample was reanalyzed again at a (1:10) and confirmed the matrix effects. Both sets of data for the diluted analysis have been reported.

No other analytical complications were noted. Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,
Analytical Resources, Inc.

Susan Snyder
Project Manager

SS/ss
Enclosures
CC: Jodi Brundage, Kennedy Jenks Consultants, Federal Way, WA

333 Ninth Avenue North • Seattle WA 98109-5187 • **206-621-6490** • **206-621-7523** fax

ANALYTICAL RESOURCES INCORPORATED

Client: Kennedy/Jenks Cons.	
Project NO.: 996098.00	

Change Order

ARI Job No.: C162	
VTSR:	

Change made by: Jodie Bruddage	
Taken by: Sue Snyder	

Change Order Date: 12-1-00

Please Make the Following Changes:

Please add the following samples in for EPH/PAH (SIM)

TP-43-2-3 00-19864 CJ
TP-46-4-6 00-19871 J
TP-49-6-10 00-19879 CJ62R

Thanks!

00-23482 to 00-23484 CN04

Change Order Acknowledged

Project Coordinator:	
Extractions:	
Volatiles:	
GC/MS Lab:	
GC Lab:	
Metals:	
Conventionals:	
Data Section:	

ANALYTICAL RESOURCES INCORPORATED

Client: Kennedy Jenks Cons.
Project NO.: 99C.098.02 Tacoma metals

Change Order

ARI Job No.: CW64
VTSR: 10/18/02

Change made by: Jodie B.
Taken by: Sue Snyder

Change Order Date: 12/18/02

Please Make the Following Changes:

Change CW64R from SIM PNA to just PNA by 8270 no Sim due to high target analytes.
SS

Change Order Acknowledged

Project Coordinator	SS
Extractions:	
Volatiles:	
GC/MS Lab:	
GC Lab:	
Metals:	
Conventionals:	
Data Section:	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ORGANIC COMPOUND DATA REPORTING QUALIFIERS

U	Indicates the compound was undetected at the reported concentration. (Same as ND).
J	Indicates an estimated concentration when the value is less than the calculated reporting limit.
D	Indicates the surrogate/spike(s) was not detected, due to dilution of extract.
NR	Indicates the surrogate recovery cannot be reported due to matrix interference.
E	Indicates a value above the linear range of the detector. Sample dilution required.
S	Indicates no value reported due to saturation of the detector. Sample dilution required.
NA	Indicates compound not analyzed for.
M	Indicates an estimated value of analyte found and confirmed by analyst but with low spectral match.
B	Indicates possible/probable blank contamination. Flagged when the analyte is detected in the blank as well as the sample.
Y	Indicates raised reporting limit due to background interference or to activity on the instrument. Compound is still not detected at or above the raised level.

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ANALYTICAL RESOURCES INCORPORATED

SOIL 8270 PNA SURROGATE RECOVERY SUMMARY

Matrix: Soil

QC Report No: CN64-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

LIMS ID	Client ID	TPH	DPH	TOT OUT
00-23484	Method Blank	80%	71%	0
00-23484	Lab Control	93%	70%	0
00-23484	TP-49-6-10	98%	76%	0
00-23484	TP-49-6-10-DL	90%	91%	0

	LCS/MB LIMITS	QC LIMITS
(TPH) = d14-p-Terphenyl	(30-160)	(30-160)
(DPH) = d10-Diphenyl	(30-160)	(30-160)

D Surrogate Compound diluted out

FORM-II 8270 PNA

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: TP-49-6-10**
PNAs by GC/MS

Lab Sample ID: CN64R
LIMS ID: 00-23484
Matrix: Soil
Data Release Authorized:
Reported: 12/14/00

QC Report No: CN64-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Date extracted: 12/11/00
Date analyzed: 12/12/00 22:26
Instrument: NT1
GPC Cleanup: NO
Alumina: 1:1

Sample Amount: 0.46 g-dry-wt
Final Extract Volume: 0.5 mL
Conc/Dilution Factor: 1:1
Moisture: 53.9%
pH: NA

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	8,400
91-57-6	2-Methylnaphthalene	48,000
208-96-8	Acenaphthylene	16,000
83-32-9	Acenaphthene	330,000 E
86-73-7	Fluorene	310,000 E
85-01-8	Phenanthrene	900,000 E
120-12-7	Anthracene	260,000 E
206-44-0	Fluoranthene	620,000 E
129-00-0	Pyrene	520,000 E
56-55-3	Benzo(a)anthracene	150,000 E
218-01-9	Chrysene	180,000 E
205-99-2	Benzo(b)fluoranthene	100,000 E
207-08-9	Benzo(k)fluoranthene	54,000
50-32-8	Benzo(a)pyrene	82,000
193-39-5	Indeno(1,2,3-cd)pyrene	31,000
53-70-3	Dibenz(a,h)anthracene	14,000 M
191-24-2	Benzo(g,h,i)perylene	38,000
132-64-9	Dibenzofuran	180,000 E

Base/Neutral Surrogate Recovery	
d14-p-Terphenyl	98.0%
d10-Diphenyl	76.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by GC/MS

Sample No: TP-49-6-10
DILUTION

Lab Sample ID: CN64RDL
LIMS ID: 00-23484
Matrix: Soil
Data Release Authorized:
Reported: 12/14/00

QC Report No: CN64-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Date extracted: 12/11/00
Date analyzed: 12/13/00 12:43
Instrument: NT1
GPC Cleanup: NO
Alumina: 1:1

Sample Amount: 0.46 g-dry-wt
Final Extract Volume: 0.5 mL
Conc/Dilution Factor: 1:25
Moisture: 53.9%
pH: NA

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	27,000 U
91-57-6	**2-Methylnaphthalene**	**46,000**
208-96-8	Acenaphthylene	27,000 U
83-32-9	**Acenaphthene**	**440,000**
86-73-7	**Fluorene**	**390,000**
85-01-8	**Phenanthrene**	**1,300,000**
120-12-7	**Anthracene**	**250,000**
206-44-0	**Fluoranthene**	**810,000**
129-00-0	**Pyrene**	**620,000**
56-55-3	**Benzo(a)anthracene**	**150,000**
218-01-9	**Chrysene**	**230,000**
205-99-2	**Benzo(b)fluoranthene**	**73,000**
207-08-9	**Benzo(k)fluoranthene**	**73,000**
50-32-8	**Benzo(a)pyrene**	**83,000**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**28,000**
53-70-3	Dibenz(a,h)anthracene	27,000 U
191-24-2	**Benzo(g,h,i)perylene**	**37,000**
132-64-9	**Dibenzofuran**	**200,000**

Base/Neutral Surrogate Recovery	
d14-p-Terphenyl	90.0%
d10-Diphenyl	91.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: Method Blank**
PNAs by GC/MS

Lab Sample ID: CN64MB
LIMS ID: 00-23484
Matrix: Soil
Data Release Authorized: PS
Reported: 12/14/00

QC Report No: CN64-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Date extracted: 12/11/00
Date analyzed: 12/13/00 12:06
Instrument: NT1
GPC Cleanup: NO
Alumina: 1:1

Sample Amount: 7.50 g-dry-wt
Final Extract Volume: 0.5 mL
Conc/Dilution Factor: 1:1
Moisture: NA
pH: NA

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	67 U
91-57-6	2-Methylnaphthalene	67 U
208-96-8	Acenaphthylene	67 U
83-32-9	Acenaphthene	67 U
86-73-7	Fluorene	67 U
85-01-8	Phenanthrene	67 U
120-12-7	Anthracene	67 U
206-44-0	Fluoranthene	67 U
129-00-0	Pyrene	67 U
56-55-3	Benzo(a)anthracene	67 U
218-01-9	Chrysene	67 U
205-99-2	Benzo(b)fluoranthene	67 U
207-08-9	Benzo(k)fluoranthene	67 U
50-32-8	Benzo(a)pyrene	67 U
193-39-5	Indeno(1,2,3-cd)pyrene	67 U
53-70-3	Dibenz(a,h)anthracene	67 U
191-24-2	Benzo(g,h,i)perylene	67 U
132-64-9	Dibenzofuran	67 U

Base/Neutral Surrogate Recovery	
d14-p-Terphenyl	79.6%
d10-Diphenyl	71.2%

ORGANICS ANALYSIS DATA SHEET
PNAs by GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CN64SB
LIMS ID: 00-23484
Matrix: Soil

QC Report No: CN64-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 12/14/00

Date extracted: 12/11/00
Date analyzed: 12/11/00

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE ADDED	% RECOVERY
Naphthalene	1310	1670	78.4%
Acenaphthene	1200	1670	71.9%
Fluoranthene	1350	1670	80.8%
Benzo(a)anthracene	1390	1670	83.2%

Spike Blank Surrogate Recovery

d14-p-Terphenyl	93.2%
d10-Diphenyl	69.6%

Values reported in ppb (ug/kg) dry weight

ANALYTICAL RESOURCES INCORPORATED

SIM SURROGATE RECOVERY SUMMARY

Matrix: Soil

QC Report No: CN64-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Client ID	MNP	DBA	TOT OUT
Method Blank	85%	100%	0
Lab Control	91%	113%	0
TP-43-2-3	93%	93%	0
TP-43-2-3-DL	97%	83%	0
TP-46-4-6	100%	90%	0
TP-46-4-6-DL	93%	90%	0

	LCS/MB LIMITS	QC LIMITS
(MNP) = d10-2-Methylnaphthalene	(30-160)	(30-160)
(DBA) = d14-Dibenz(a,h)anthracene	(30-160)	(30-160)

(Present limits for LCS/MB are advisory only)

D Surrogate Compound diluted out

FORM-II 8270-SIM

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: TP-43-2-3

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CN64C
LIMS ID: 00-23482
Matrix: Soil
Data Release Authorized:
Reported: 12/19/00

QC Report No: CN64-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/16/00
Date Received: 10/18/00

Date extracted: 12/11/00
Date analyzed: 12/18/00 20:35
Instrument: NT2

Alumina: 1:1

Sample Amount: 6.38 g-dry-wt
Final Extract Volume: 0.5 mL
Conc/Dilution Factor: 1:10
Moisture: 15.1%

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	290
91-57-6	2-Methylnaphthalene	240
208-96-8	Acenaphthylene	340
83-32-9	Acenaphthene	310
86-73-7	Fluorene	250
85-01-8	Phenanthrene	2,300
120-12-7	Anthracene	830
206-44-0	Fluoranthene	3,600
129-00-0	Pyrene	2,600
56-55-3	Benzo(a)anthracene	1,600
218-01-9	Chrysene	2,200
205-99-2	Benzo(b)fluoranthene	1,500 M
207-08-9	Benzo(k)fluoranthene	1,400
50-32-8	Benzo(a)pyrene	1,700
193-39-5	Indeno(1,2,3-cd)pyrene	1,100
53-70-3	Dibenzo(a,h)anthracene	440
191-24-2	Benzo(g,h,i)perylene	1,300
132-64-9	Dibenzofuran	130

SIM Surrogate Recovery

d10-2-Methylnaphthalene	93.3%
d14-Dibenzo(a,h)anthracene	93.3%

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: TP-43-2-3
REANALYSIS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CN64C-DL
LIMS ID: 00-23482
Matrix: Soil
Data Release Authorized:
Reported: 12/19/00

QC Report No: CN64-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/16/00
Date Received: 10/18/00

Date extracted: 12/11/00
Date analyzed: 12/18/00 21:23
Instrument: NT2

Alumina: 1:1

Sample Amount: 6.38 g-dry-wt
Final Extract Volume: 0.5 mL
Conc/Dilution Factor: 1:10
Moisture: 15.1%

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	290
91-57-6	2-Methylnaphthalene	240
208-96-8	Acenaphthylene	320
83-32-9	Acenaphthene	300
86-73-7	Fluorene	260
85-01-8	Phenanthrene	2,300
120-12-7	Anthracene	810
206-44-0	Fluoranthene	3,600
129-00-0	Pyrene	2,600
56-55-3	Benzo(a)anthracene	1,600
218-01-9	Chrysene	2,200
205-99-2	Benzo(b)fluoranthene	1,400 M
207-08-9	Benzo(k)fluoranthene	1,500
50-32-8	Benzo(a)pyrene	1,700
193-39-5	Indeno(1,2,3-cd)pyrene	1,000
53-70-3	Dibenzo(a,h)anthracene	420
191-24-2	Benzo(g,h,i)perylene	1,200
132-64-9	Dibenzofuran	130

SIM Surrogate Recovery

d10-2-Methylnaphthalene	96.7%
d14-Dibenzo(a,h)anthracene	83.3%

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: TP-46-4-6

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CN64J
LIMS ID: 00-23483
Matrix: Soil
Data Release Authorized:
Reported: 12/19/00

QC Report No: CN64-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/16/00
Date Received: 10/18/00

Date extracted: 12/11/00
Date analyzed: 12/18/00 20:11
Instrument: NT2

Alumina: 1:1

Sample Amount: 6.39 g-dry-wt
Final Extract Volume: 0.5 mL
Conc/Dilution Factor: 1:10
Moisture: 14.9%

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	210
91-57-6	2-Methylnaphthalene	340
208-96-8	Acenaphthylene	55 J
83-32-9	Acenaphthene	55 J
86-73-7	Fluorene	63 J
85-01-8	Phenanthrene	350
120-12-7	Anthracene	110
206-44-0	Fluoranthene	620
129-00-0	Pyrene	430
56-55-3	Benzo(a)anthracene	250
218-01-9	Chrysene	450
205-99-2	Benzo(b)fluoranthene	300 M
207-08-9	Benzo(k)fluoranthene	300 M
50-32-8	Benzo(a)pyrene	310 M
193-39-5	Indeno(1,2,3-cd)pyrene	200
53-70-3	Dibenzo(a,h)anthracene	94
191-24-2	Benzo(g,h,i)perylene	350
132-64-9	Dibenzofuran	39 J

SIM Surrogate Recovery

d10-2-Methylnaphthalene	100%
d14-Dibenzo(a,h)anthracene	90.0%

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: TP-46-4-6
REANALYSIS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CN64J-DL
LIMS ID: 00-23483
Matrix: Soil
Data Release Authorized:
Reported: 12/19/00

QC Report No: CN64-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/16/00
Date Received: 10/18/00

Date extracted: 12/11/00
Date analyzed: 12/18/00 20:59
Instrument: NT2

Alumina: 1:1

Sample Amount: 6.39 g-dry-wt
Final Extract Volume: 0.5 mL
Conc/Dilution Factor: 1:10
Moisture: 14.9%

CAS Number	Analyte	ug/kg	
91-20-3	Naphthalene	240	
91-57-6	2-Methylnaphthalene	330	
208-96-8	Acenaphthylene	55	J
83-32-9	Acenaphthene	55	J
86-73-7	Fluorene	70	J
85-01-8	Phenanthrene	370	
120-12-7	Anthracene	120	
206-44-0	Fluoranthene	610	
129-00-0	Pyrene	450	
56-55-3	Benzo(a)anthracene	240	
218-01-9	Chrysene	470	
205-99-2	Benzo(b)fluoranthene	330	M
207-08-9	Benzo(k)fluoranthene	300	M
50-32-8	Benzo(a)pyrene	330	M
193-39-5	Indeno(1,2,3-cd)pyrene	200	
53-70-3	Dibenzo(a,h)anthracene	86	
191-24-2	Benzo(g,h,i)perylene	340	
132-64-9	Dibenzofuran	39	J

SIM Surrogate Recovery

d10-2-Methylnaphthalene	93.3%
d14-Dibenzo(a,h)anthracene	90.0%

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: Method Blank

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CN64MB
LIMS ID: 00-23482
Matrix: Soil
Data Release Authorized:
Reported: 12/19/00

QC Report No: CN64-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Date extracted: 12/11/00
Date analyzed: 12/18/00 18:58
Instrument: NT2
GPC Cleanup: NO
Alumina: 1:1

Sample Amount: 7.50 g-dry-wt Equiv.
Final Extract Volume: 0.5 mL
Conc/Dilution Factor: 1:1
Moisture: NA

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	6.7 U
91-57-6	2-Methylnaphthalene	6.7 U
208-96-8	Acenaphthylene	6.7 U
83-32-9	Acenaphthene	6.7 U
86-73-7	Fluorene	6.7 U
85-01-8	Phenanthrene	6.7 U
120-12-7	Anthracene	6.7 U
206-44-0	Fluoranthene	6.7 U
129-00-0	Pyrene	6.7 U
56-55-3	Benzo(a)anthracene	6.7 U
218-01-9	Chrysene	6.7 U
205-99-2	Benzo(b)fluoranthene	6.7 U
207-08-9	Benzo(k)fluoranthene	6.7 U
50-32-8	Benzo(a)pyrene	6.7 U
193-39-5	Indeno(1,2,3-cd)pyrene	6.7 U
53-70-3	Dibenzo(a,h)anthracene	6.7 U
191-24-2	Benzo(g,h,i)perylene	6.7 U
132-64-9	Dibenzofuran	6.7 U

SIM Surrogate Recovery

d10-2-Methylnaphthalene	85.0%
d14-Dibenzo(a,h)anthracene	100%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNA's by Selected Ion Monitoring GC/MS

Lab Sample ID: CN64LC
LIMS ID: 00-23482
Matrix: Soil

QC Report No: CN64-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 12/19/00

Date extracted: 12/11/00
Date analyzed: 12/18/00
Instrument: NT2

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
Phenanthrene	187	200	93.5%
Chrysene	192	200	96.0%
Benzo(k)fluoranthene	192	200	96.0%

Spike Blank Surrogate Recovery

d10-2-Methylnaphthalene	90.7%
d14-Dibenzo(a,h)anthracene	113%

Values reported in ug/kg

APPENDIX A

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509.924.9200 fax 509.924.9290
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
503.906.9200 fax 503.906.9210
Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
541.383.9310 fax 541.382.7588

ARI 333 Ninth Ave. N. Seattle WA, 98109-5187	Project: CN64 Project Number: 996098.00 Project Manager: Susan Snyder	**Reported:** 12/21/00 13:46

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
00-23482-CN64C	B0L0195-01	Soil	10/16/00 12:00	12/08/00 09:20
00-23483-CN64J	B0L0195-02	Soil	10/16/00 12:00	12/08/00 09:20
00-23484-CN64R	B0L0195-03	Soil	10/17/00 12:00	12/08/00 09:20

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Amar Gill, Project Manager

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ARI 333 Ninth Ave. N. Seattle WA, 98109-5187	Project: CN64 Project Number: 996098.00 Project Manager: Susan Snyder	**Reported:** 12/21/00 13:46

Extractable Petroleum Hydrocarbons by modified WDOE Interim TPH Policy Method

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
00-23482-CN64C (B0L0195-01) Soil	**Sampled: 10/16/00 12:00**		**Received: 12/08/00 09:20**						**I-05**
C8-C10 Aliphatics	ND	50.0	mg/kg dry	10	0L11017	12/11/00	12/15/00	WA MTCA-EPH	
C10-C12 Aliphatics	ND	50.0	"	"	"	"	"	"	
C12-C16 Aliphatics	ND	50.0	"	"	"	"	"	"	
C16-C21 Aliphatics	**339**	50.0	"	"	"	"	"	"	
C21-C34 Aliphatics	**1520**	50.0	"	"	"	"	"	"	
C10-C12 Aromatics	ND	50.0	"	"	"	"	12/18/00	"	
C12-C16 Aromatics	**55.7**	50.0	"	"	"	"	"	"	
C16-C21 Aromatics	**267**	50.0	"	"	"	"	"	"	
C21-C34 Aromatics	**670**	50.0	"	"	"	"	"	"	
Extractable Petroleum Hydrocarbons	**2850**		"	"	"	"	12/15/00	"	
Surrogate: 2-FBP	*69.6 %*	*50-150*			"	"	*12/18/00*	"	
Surrogate: Octacosane	*97.9 %*	*50-150*			"	"	*12/15/00*	"	
Surrogate: Undecane	*60.0 %*	*30-150*			"	"	"	"	
00-23483-CN64J (B0L0195-02) Soil	**Sampled: 10/16/00 12:00**		**Received: 12/08/00 09:20**						
C8-C10 Aliphatics	ND	50.0	mg/kg dry	10	0L11017	12/11/00	12/15/00	WA MTCA-EPH	
C10-C12 Aliphatics	ND	50.0	"	"	"	"	"	"	
C12-C16 Aliphatics	ND	50.0	"	"	"	"	"	"	
C16-C21 Aliphatics	**304**	50.0	"	"	"	"	"	"	
C21-C34 Aliphatics	**2120**	50.0	"	"	"	"	"	"	
C10-C12 Aromatics	ND	50.0	"	"	"	"	12/18/00	"	
C12-C16 Aromatics	ND	50.0	"	"	"	"	"	"	
C16-C21 Aromatics	**74.6**	50.0	"	"	"	"	"	"	
C21-C34 Aromatics	**521**	50.0	"	"	"	"	"	"	
Extractable Petroleum Hydrocarbons	**3020**		"	"	"	"	12/15/00	"	
Surrogate: 2-FBP	*83.8 %*	*50-150*			"	"	*12/18/00*	"	
Surrogate: Octacosane	*117 %*	*50-150*			"	"	*12/15/00*	"	
Surrogate: Undecane	*76.8 %*	*30-150*			"	"	"	"	

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ARI	Project: CN64	
333 Ninth Ave. N.	Project Number: 996098.00	**Reported:**
Seattle WA, 98109-5187	Project Manager: Susan Snyder	12/21/00 13:46

Extractable Petroleum Hydrocarbons by modified WDOE Interim TPH Policy Method
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
00-23484-CN64R (B0L0195-03) Soil	**Sampled: 10/17/00 12:00**		**Received: 12/08/00 09:20**						**I-0**
C8-C10 Aliphatics	ND	119	mg/kg dry	10	0L11017	12/11/00	12/15/00	WA MTCA-EPH	
C10-C12 Aliphatics	ND	119	"	"	"	"	"	"	
C12-C16 Aliphatics	**319**	119	"	"	"	"	"	"	
C16-C21 Aliphatics	**243**	119	"	"	"	"	"	"	
C21-C34 Aliphatics	**172**	119	"	"	"	"	"	"	
C10-C12 Aromatics	ND	119	"	"	"	"	12/18/00	"	
C12-C16 Aromatics	**1960**	119	"	"	"	"	"	"	
C16-C21 Aromatics	**4270**	119	"	"	"	"	"	"	
C21-C34 Aromatics	**3260**	119	"	"	"	"	"	"	
Extractable Petroleum Hydrocarbons	**10200**		"	"	"	"	12/15/00	"	
Surrogate: 2-FBP	*%*	*50-150*			"	"	*12/18/00*	"	*S-0*
Surrogate: Octacosane	*51.2 %*	*50-150*			"	"	*12/15/00*	"	
Surrogate: Undecane	*47.0 %*	*30-150*			"	"	"	"	

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Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
541.383.9310 fax 541.382.7588

ARI 333 Ninth Ave. N. Seattle WA, 98109-5187	Project: CN64 Project Number: 996098.00 Project Manager: Susan Snyder	**Reported:** 12/21/00 13:46

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
00-23482-CN64C (B0L0195-01) Soil	**Sampled: 10/16/00 12:00**		**Received: 12/08/00 09:20**						
Dry Weight	**86.6**	1.00	%	1	0L13045	12/13/00	12/14/00	BSOPSPL003R07	
00-23483-CN64J (B0L0195-02) Soil	**Sampled: 10/16/00 12:00**		**Received: 12/08/00 09:20**						
Dry Weight	**85.3**	1.00	%	1	0L13045	12/13/00	12/14/00	BSOPSPL003R07	
00-23484-CN64R (B0L0195-03) Soil	**Sampled: 10/17/00 12:00**		**Received: 12/08/00 09:20**						
Dry Weight	**41.9**	1.00	%	1	0L13045	12/13/00	12/14/00	BSOPSPL003R07	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Ahlan Gill, Project Manager

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Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8223
425.420.9200 fax 425.420.9210
Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
509.924.9200 fax 509.924.9290
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
503.906.9200 fax 503.906.9210
Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
541.383.9310 fax 541.382.7588

ARI 333 Ninth Ave. N. Seattle WA, 98109-5187	Project: CN64 Project Number: 996098.00 Project Manager: Susan Snyder	**Reported:** 12/21/00 13:46

Extractable Petroleum Hydrocarbons by modified WDOE Interim TPH Policy Method - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0L11017: Prepared 12/11/00 Using EPA 3550B										
Blank (0L11017-BLK1)										
C8-C10 Aliphatics	ND	5.00	mg/kg wet							
C10-C12 Aliphatics	ND	5.00	"							
C12-C16 Aliphatics	ND	5.00	"							
C16-C21 Aliphatics	ND	5.00	"							
C21-C34 Aliphatics	ND	5.00	"							
C10-C12 Aromatics	ND	5.00	"							
C12-C16 Aromatics	ND	5.00	"							
C16-C21 Aromatics	ND	5.00	"							
C21-C34 Aromatics	ND	5.00	"							
Surrogate: 2-FBP	*10.4*		"	*12.1*		*86.0*	*50-150*			
Surrogate: Octacosane	*10.5*		"	*12.3*		*85.4*	*50-150*			
Surrogate: Undecane	*10.2*		"	*13.2*		*77.3*	*30-150*			
LCS (0L11017-BS1)										
Extractable Petroleum Hydrocarbons	168		mg/kg wet	167		101	30-120			
Surrogate: 2-FBP	*10.1*		"	*12.1*		*83.5*	*50-150*			
Surrogate: Octacosane	*11.2*		"	*12.3*		*91.1*	*50-150*			
Surrogate: Undecane	*10.8*		"	*13.2*		*81.8*	*30-150*			
LCS Dup (0L11017-BSD1)										
Extractable Petroleum Hydrocarbons	158		mg/kg wet	167		94.6	30-120	6.13	40	
Surrogate: 2-FBP	*11.1*		"	*12.1*		*91.7*	*50-150*			
Surrogate: Octacosane	*11.2*		"	*12.3*		*91.1*	*50-150*			
Surrogate: Undecane	*11.3*		"	*13.2*		*85.6*	*30-150*			

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ARI 333 Ninth Ave. N. Seattle WA, 98109-5187	Project: CN64 Project Number: 996098.00 Project Manager: Susan Snyder	**Reported:** 12/21/00 13:46

Physical Parameters by APHA/ASTM/EPA Methods - Quality Control

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0L13045: Prepared 12/13/00 Using Dry Weight										
Blank (0L13045-BLK1)										
Dry Weight	100	1.00	%							

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Amar Gill, Project Manager

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541.383.9310 fax 541.382.7588

ARI	Project: CN64	
333 Ninth Ave. N.	Project Number: 996098.00	**Reported:**
Seattle WA, 98109-5187	Project Manager: Susan Snyder	12/21/00 13:46

Notes and Definitions

I-05	Since the sample was out of hold at the time of receipt, the preparation of the sample could not be initiated within the method-specified hold time.
S-02	The surrogate recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

B0L0195

SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 12\07\00 **ARI Project: CN64**

Laboratory: North Creek Analytical
Lab Contact: David Vandel
Lab Address: 11720 North Creek Pkwy North
Bothell, WA 98011
Phone: 425-420-9200
Fax: 425-420-9210

ARI Client: Kennedy Jenks Consultant
Project ID: 996098.00
ARI PMgr: Susan Snyder.
Phone: (206) 340-2866 Ext 118
Fax: (206) 621-7523

Analytical Protocol: In-house

Requested Turn Around: **12/14/00**
Fax Results (Y/N): **Yes**

ARI Sample ID	Client Sample ID	Sampled	Matrix	Bottles	Analyses
00-23482-CN64C	TP-43-2-3	10/16/00	Soil	1	EPH EPH-Aliphatics/Aromatics
00-23483-CN64J	TP-46-4-6	10/16/00	Soil	1	EPH EPH-Aliphatics/Aromatics
00-23484-CN64R	TP-49-6-10	10/17/00	Soil	1	EPH EPH-Aliphatics/Aromatics

Limits of Liability. *Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or sucessors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Subcontractor.*

Carrier	Airbill		Date
Relinquished by	Company	Date	Time
[illegible]	ARI	12/7/00	
Received by	Company	Date	Time
Tony	NCA	12/8/00	09 20
Carrier	Airbill		Date
Relinquished by	Company	Date	Time
Received by	Company	Date	Time

12.1 00/0

Analytical Resources, Incorporated
Analytical Chemists and Consultants

4, January 2001

Ty Schreiner
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: Project: Tacoma Metals
ARI Job: CP33

Dear Ty:

Please find enclosed additional analysis requests and final analytical results for the above referenced project. Fourteen selected samples were retrieved from sample archive per your request on December 14, 2000.

Selected samples were analyzed for total metals referencing EPA methods 6010 and 7000 series.

No analytical complications were noted. Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Susan Snyder
Project Manager
susan@arilabs.com

SS/ss
Enclosures
CC: Jodi Brundage, Kennedy Jenks Consultants, Federal Way, WA

RECEIVED

JAN 08 2001

K/J Federal Way
K/J No/File
Route
Return To/By

333 Ninth Avenue North • Seattle WA 98109-5187 • **206-621-6490** • **206-621-7523** fax

ABI # CL62 ?

LEAD

TP-55-2-3 / 4-6 / 6-10
TP-57-2-3 / 4-6 / 6-10
TP-58-4-6 / 6-10
TP-60-4-6 / 6-10
TP-63-4-6 / 6-10

CADMIUM

TP-55-2-3
TP-57-2-3
TP-58-2-3
TP-58-4-6
TP-60-4-6
TP-62-4-6
TP-63-4-6

MERCURY

TP-60-4-6
TP-62-4-6

EDI-1/SIM

TP-55-6-10
TP-57-0-1
TP-61-2-3
TP-49-6-10

} CP31

ANALYTICAL RESOURCES INCORPORATED

Client: Kennedy Jenks Cons.
Project NO.: Tacoma metals

Change Order

ARI Job No.: CL64, CL62, CL66
VTSR:

Change made by:
Taken by:

Change Order Date: 12/14/00

Please Make the Following Changes: cadmium

TP-SS-2-3 (00-21991) CL64 C
TP-S7-2-3 (00-21994) CL64 F
TP-S8-2-3 (00-21979) CL62 I
TP-S8-4-6 (00-22020) CL66 M
TP-60-4-6 (00-22024) CL66 R
TP-62-4-6 (00-22027) CL66 T
TP-63-4-6 (00-21998) CL64 J

Change Order Acknowledged

Project Coordinator:
Extractions:
Volatiles:
GC/MS Lab:
GC Lab:
Metals:
Conventionals:
Data Section:

ANALYTICAL RESOURCES INCORPORATED

Client: Kennedy Jenks Const	
Project NO.: Tacoma metals	

Change Order

ARI Job No.: CL66	
VTSR:	

Change made by:	
Taken by:	

Change Order Date: 12/14/00

Please Make the Following Changes: mercury

TP-60-4-6 (00-22024) CL66 Q
TP-62-4-6 (00-22027) CL66 T

Change Order Acknowledged

Project Coordinator:	
Extractions:	
Volatiles:	
GC/MS Lab:	
GC Lab:	
Metals:	
Conventionals:	
Data Section:	

CL62 — FI-665
CL64 — FI-665
CL66 — FI-664

Already pulled 12/7/00 gf.

ANALYTICAL RESOURCES INCORPORATED

Change Order

Client: Kennedy Jenks Cons.	ARI Job No.:
Project NO.: Tacoma Metals	VTSR:

Change made by:

Taken by:

Change Order Date: 12/14/00

Please Make the Following Changes: Lead

TP-SS-2-3	(00-21991)	CL64	C - cd
4-6	(00-21992)	CL64	D
6-10	(00-21993)	CL64	E
TP-S7-2-3	(00-21994)	CL64	F - cd
4-6	(00-21995)	CL64	G
6-10	(00-21996)	CL64	H
TP-58-4-6	(00-22020)	CL66	M - cd
6-10	(00-22021)	CL66	N
TP-60-4-6	(00-22024)	CL66	Q - cd, Hg
6-10	(00-22025)	CL66	R Hg
TP-63-4-6	(00-21998)	CL64	J - cd
6-10	(00-22029)	CL66	V
			I (cd)
			T (cd), Hg

(00-24608 to 00-24621)
CD33

Change Order Acknowledged

Project Coordinator:	
Extractions:	
Volatiles:	
GC/MS Lab:	
GC Lab:	
Metals:	
Conventionals:	
Data Section:	

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: TP-55-2-3

Lab Sample ID: CP33A
LIMS ID: 00-24608
Matrix: Soil

QC Report No: CP33-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/14/00
Date Received: 11/16/00

Data Release Authorized:
Reported: 01/04/01

Percent Total Solids: 89.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/26/00	6010	01/02/01	7440-43-9	Cadmium	0.6	21.1
3050	12/26/00	6010	01/02/01	7439-92-1	Lead	6	772

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-55-4-6**
TOTAL METALS

Lab Sample ID: CP33B
LIMS ID: 00-24609
Matrix: Soil

QC Report No: CP33-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/14/00
Date Received: 11/16/00

Data Release Authorized:
Reported: 01/04/01

Percent Total Solids: 71.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/26/00	6010	01/02/01	**7439-92-1**	**Lead**	7	**106**

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-55-6-10**
TOTAL METALS

Lab Sample ID: CP33C
LIMS ID: 00-24610
Matrix: Soil

QC Report No: CP33-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/14/00
Date Received: 11/16/00

Data Release Authorized:
Reported: 01/04/01

Percent Total Solids: 38.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/26/00	6010	01/02/01	7439-92-1	Lead	10	70

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-57-2-3**
TOTAL METALS

Lab Sample ID: CP33D
LIMS ID: 00-24611
Matrix: Soil

QC Report No: CP33-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/14/00
Date Received: 11/16/00

Data Release Authorized
Reported: 01/04/01

Percent Total Solids: 92.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/26/00	6010	01/02/01	7440-43-9	Cadmium	0.5	1.7
3050	12/26/00	6010	01/02/01	7439-92-1	Lead	5	28

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-57-4-6**
TOTAL METALS

Lab Sample ID: CP33E
LIMS ID: 00-24612
Matrix: Soil

QC Report No: CP33-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/14/00
Date Received: 11/16/00

Data Release Authorized:
Reported: 01/04/01

Percent Total Solids: 76.1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/26/00	6010	01/02/01	7439-92-1	**Lead**	10	80

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-57-6-10**
TOTAL METALS

Lab Sample ID: CP33F
LIMS ID: 00-24613
Matrix: Soil

QC Report No: CP33-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/14/00
Date Received: 11/16/00

Data Release Authorized:
Reported: 01/04/01

Percent Total Solids: 50.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/26/00	6010	01/02/01	**7439-92-1**	**Lead**	9	23

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-58-4-6**
TOTAL METALS

Lab Sample ID: CP33G
LIMS ID: 00-24614
Matrix: Soil

QC Report No: CP33-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized:
Reported: 01/04/01

Percent Total Solids: 94.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/26/00	6010	01/02/01	7440-43-9	Cadmium	0.5	0.5 U
3050	12/26/00	6010	01/02/01	7439-92-1	Lead	5	9

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-58-6-10**
TOTAL METALS

Lab Sample ID: CP33H
LIMS ID: 00-24615
Matrix: Soil

QC Report No: CP33-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized
Reported: 01/04/01

Percent Total Solids: 83.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/26/00	6010	01/02/01	7439-92-1	Lead	6	70

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-60-4-6**
TOTAL METALS

Lab Sample ID: CP33I
LIMS ID: 00-24616
Matrix: Soil

QC Report No: CP33-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized by
Reported: 01/04/01

Percent Total Solids: 88.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/26/00	6010	01/02/01	**7440-43-9**	**Cadmium**	0.5	**0.9**
3050	12/26/00	6010	01/02/01	**7439-92-1**	**Lead**	5	**116**
CLP	12/26/00	7471	12/27/00	**7439-97-6**	**Mercury**	0.04	**0.08**

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-60-6-10**
TOTAL METALS

Lab Sample ID: CP33J
LIMS ID: 00-24617
Matrix: Soil

QC Report No: CP33-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized:
Reported: 01/04/01

Percent Total Solids: 72.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/26/00	6010	01/02/01	7439-92-1	Lead	7	49

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-63-4-6**
TOTAL METALS

Lab Sample ID: CP33K
LIMS ID: 00-24618
Matrix: Soil

QC Report No: CP33-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized:
Reported: 01/04/01

Percent Total Solids: 75.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/26/00	6010	01/02/01	7440-43-9	Cadmium	0.6	0.7
3050	12/26/00	6010	01/02/01	7439-92-1	Lead	6	123

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-63-6-10**
TOTAL METALS

Lab Sample ID: CP33L
LIMS ID: 00-24619
Matrix: Soil

QC Report No: CP33-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized:
Reported: 01/04/01

Percent Total Solids: 69.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/26/00	6010	01/02/01	7439-92-1	Lead	7	102

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-58-2-3**
TOTAL METALS

Lab Sample ID: CP33M
LIMS ID: 00-24620
Matrix: Soil

QC Report No: CP33-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized by
Reported: 01/04/01

Percent Total Solids: 87.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/26/00	6010	01/02/01	**7440-43-9**	**Cadmium**	0.6	**13.2**

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-62-4-6**
TOTAL METALS

Lab Sample ID: CP33N
LIMS ID: 00-24621
Matrix: Soil

QC Report No: CP33-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized
Reported: 01/04/01

Percent Total Solids: 90.5%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/26/00	6010	01/02/01	7440-43-9	Cadmium	0.5	0.5 U
CLP	12/26/00	7471	12/27/00	7439-97-6	Mercury	0.04	0.04 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: **Method Blank**

Lab Sample ID: CP33MB
LIMS ID: 00-24616
Matrix: Soil

QC Report No: CP33-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: NA
Date Received: NA

Data Release Authorized:
Reported: 01/04/01

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	12/26/00	6010	01/02/01	7440-43-9	Cadmium	0.2	0.2 U
3050	12/26/00	6010	01/02/01	7439-92-1	Lead	2	2 U
CLP	12/26/00	7471	12/27/00	7439-97-6	Mercury	0.05	0.05 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CP33LCS
LIMS ID: 00-24616
Matrix: Soil

QC Report No: CP33-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10

Data Release Authorized by:
Reported: 01/04/01

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike mg/kg-dry	Spike Added	% Recovery	Q
Cadmium	6010	44.7	50.0	89.4%	
Lead	6010	182	200	91.0%	
Mercury	7471	1.06	1.00	106%	

'Q' codes: N = control limit not met

Control Limits: 80-120%

FORM-VII

Analytical Resources, Incorporated
Analytical Chemists and Consultants

January 19, 2001

Ty Schreiner
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: Project: Tacoma Metals
ARI Job: CQ36

Dear Ty:

Please find enclosed additional analysis request and final analytical results for the above referenced project. One sample was retrieved from sample archive per your request on January 5, 2001.

The sample was analyzed for cadmium and lead referencing EPA methods 6010.

No analytical complications were noted. Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Susan Snyder
Project Manager
susan@arilabs.com

SS/ss
Enclosures

RECEIVED
JAN 2 2 2001
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ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-46-6-10**
TOTAL METALS

Lab Sample ID: CQ36M
LIMS ID: 01-196
Matrix: Soil

QC Report No: CQ36-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/16/00
Date Received: 10/18/00

Data Release Authorized:
Reported: 01/18/01

Percent Total Solids: 72.1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	01/09/01	6010	01/16/01	7440-43-9	Cadmium	0.7	0.9
3050	01/09/01	6010	01/16/01	7439-92-1	Lead	7	82

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: Method Blank**
TOTAL METALS

Lab Sample ID: CQ36MB
LIMS ID: 01-196
Matrix: Soil

QC Report No: CQ36-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized:
Reported: 01/18/01

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	01/09/01	6010	01/16/01	7440-43-9	Cadmium	0.2	0.2 U
3050	01/09/01	6010	01/16/01	7439-92-1	Lead	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CQ36LCS
LIMS ID: 01-196
Matrix: Soil

QC Report No: CQ36-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized
Reported: 01/18/01

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike mg/kg-dry	Spike Added	% Recovery	Q
Cadmium	6010	48.5	50.0	97.0%	
Lead	6010	194	200	97.0%	

'Q' codes: N = control limit not met

Control Limits: 80-120%

NWTPH-DX

C163 TP-43-4-6 00-19886
C162 TP-46-2-3/6-10 00-19891

✓ EPH/PAH (SIM) D

C162 TP-43-2-3 00-19864
C162 TP-46-4-6 00-19871
C162 TP-49-6-10 00-19879

✓ PCB

CH43 TP-10-0-1/2-3 00-19080
CH43 TP-14-0-1/2-3 00-19087
CI19 TP-20-0-1/2-3 00-19615
CI19 TP-22-0-1/2-3 00-19620
CI18 TP-40-0-1/2-3 00-19601
CI62 TP-46-0-1/2-3 00-19870

✓ LEAD

C120 TP-20-4-6/6-10 00-19628 ✓
C120 TP-21-4-6/6-10 00-19630 ✓
C120 TP-22-4-6/6-10 00-19632
C126 TP-23-4-6/6-10 00-19702
C126 TP-28-4-6/6-10 00-19711
C126 TP-30-4-6/6-10 00-19717
C126 TP-33-2-3/4-6/6-10 00-19721
C126 TP-34-4-6/6-10 00-19724
C121 TP-35-2-3/4-6/6-10 00-19634
C121 TP-37-4-6/6-10 00-19639
C121 TP-38-2-3/4-6/6-10 00-19641
C163 TP-43-4-6/6-10 00-19886
C163 TP-45-2-3/4-6/6-10 00-19888
C163 TP-46-2-3/6-10 00-19891 ✓

CADMIUM D

TP-4-2-3 18328/CF88
TP-7-2-3 19114 CH50
TP-16-2-3 19135 CH50
TP-20-4-6 19628 (C120)
TP-21-4-6 19630 (C120)
TP-23-2-3 19702 (C126)
TP-28-4-6-19711 (C126)
TP-30-4-6 19717 (C126)
TP-37-4-6 19639/C121
TP-34-2-3 19605 C122
TP-43-4-6 00-19886/C163
TP-45-2-3 00-19888/C163
~~TP-46-2-3/6-10 00-19871~~ C162

CHROMIUM D

~~TP-21-4-6 C120 00-19630~~
TP-22-4-6 C120 00-19632
~~TP-46-2-3 00-19864/C162~~

MERCURY D

TP-1-2-3 00-18324 CF88
TP-23-4-6 19702/C126
TP-27-4-6 19712/C126
TP-28-4-6 19717/C126
TP-33-2-3 00-19721 C126
TP-34-4-6 00-19724
TP-37-4-6 00-19639/C121
TP-38-2-3 19641/C121
TP-43-4-6 00-19886 C163
TP-45-2-3 19888 C163
TP-46-2-3 00-19864/C162

ANALYTICAL RESOURCES INCORPORATED

Client: Kennedy Jenks Constituents	
Project NO.:	

Change Order

ARI Job No.: CN91 or CI62	
VTSR:	

Change made by: Jodie B.	
Taken by: Sue Snyder	

Change Order Date: 1/5/00

Please Make the Following Changes:

TP 46-6-10 for cadmium & lead

00-19892 CI63 previous job
Taken off hold 1/8/01 cm
F1-660

New job 01-196 CQ36

Change Order Acknowledged

Project Coordinator:	
Extractions:	
Volatiles:	
GC/MS Lab:	
GC Lab:	
Metals:	
Conventionals:	
Data Section:	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

31, January, 2001

Ty Schreiner
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: Project: Tacoma Metals / ARI Job: CP31

Dear Ty:

Please find enclosed sample change order custody records and final analytical results for the above referenced project. Four soil samples were removed from archive at –18 degrees celcius in good condition on December 21, 2000. The samples were analyzed for PAH referencing GC/MS-SIM or EPA 8270. The EPH samples were subcontracted to North Creek Analytical and are contained in Appendix A.

All samples were originally screened for PAH's, it was determined that the samples contain analytes above the linear range for SIM analysis. The samples were analyzed for PAH's by EPA 8270 methodology.

Sample TP-61-2-3 required a 2x dilution as the internal standard was low in the initial analysis and was attributed to matrix interference. Sample TP-49-6-10 was initially analyzed at a 10X dilution, as Phenanthrene exceeded the linear range of the calibration, the sample was diluted and reanalyzed at a 40x dilution.

No other analytical complications were noted. Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,
Analytical Resources, Inc.

Susan Snyder
Project Manager

SS/ss
Enclosures
CC: Jodi Brundage, Kennedy Jenks Consultants, Federal Way, WA

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FEB - 6 2001
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ANALYTICAL RESOURCES INCORPORATED

Client: Kennedy Jenks Const	
Project NO.: Tacoma metals	

Change Order

ARI Job No.: CI 62, CL 62, CL 64	
VTSR:	

Change made by: [illegible]	
Taken by: [illegible]	

Change Order Date: 12/14/00

Please Make the Following Changes: PAH SIM

TP-55-6-10 (21993) CL64 E
TP-57-0-1 (00-21973) CL62 G
TP-61-2-3 (00-21981) CL62 O
TP-49-6-10 (00-19879) CI 62 R

00-24604 to 00-24607 CD31

Change Order Acknowledged

Project Coordinator:	[illegible]
Extractions:	
Volatiles:	
GC/MS Lab:	
GC Lab:	
Metals:	
Conventionals:	
Data Section:	

ANALYTICAL RESOURCES INCORPORATED

Client: Kennedy Jenks Cons.	
Project NO.: 99C098.10	

Change Order

ARI Job No.: CP31	
VTSR:	

Change made by: Vickie R.	
Taken by: Sue Thyden	

Change Order Date: 12/21

Please Make the Following Changes:

Change Test from Sim PAH to PAH 8270 w/out Sim. Samples were to high for Sim

Change Order Acknowledged

Project Coordinator:	
Extractions:	
Volatiles:	
GC/MS Lab:	
GC Lab:	
Metals:	
Conventionals:	
Data Section:	

ANALYTICAL RESOURCES INCORPORATED

Client: Kennedy Jenks Const.	
Project NO.: Tacoma metals	

Change Order

ARI Job No.: CL62, CL62, CL64	
VTSR:	

Change made by: [illegible]	
Taken by: [illegible]	

Change Order Date: 12/14/00

Please Make the Following Changes: Sub to North Creek for EPH

TP-55-6-10 CL64 E 00-21993
TP-57-0-1 CL62 G 00-21973
TP-61-2-3 CL62 C 00-21981
TP-49-6-10 CL62 R 00-19879

Change Order Acknowledged

Project Coordinator: [illegible]	
Extractions:	
Volatiles:	
GC/MS Lab:	
GC Lab:	
Metals:	
Conventionals:	
Data Section:	

~~00-24608 to 00-24611 EPSD~~

ANALYTICAL RESOURCES INCORPORATED

SOIL 8270 PNA SURROGATE RECOVERY SUMMARY

Matrix: Soil

QC Report No: CP31-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

LIMS ID	Client ID	TPH	DPH	TOT OUT
00-24604	Method Blank	77%	71%	0
00-24604	Lab Control	79%	61%	0
00-24604	TP-55-6-10	83%	71%	0
00-24605	TP-57-0-1	68%	70%	0
00-24605	TP-57-0-1-MS	71%	70%	0
00-24605	TP-57-0-1-MSD	66%	65%	0
00-24606	TP-61-2-3	83%	70%	0
00-24607	TP-49-6-10	70%	64%	0
00-24607	TP-49-6-10-DL	D	D	0

	LCS/MB LIMITS	QC LIMITS
(TPH) = d14-p-Terphenyl	(30-160)	(30-160)
(DPH) = d10-Diphenyl	(30-160)	(30-160)

D Surrogate Compound diluted out

FORM-II 8270 PNA

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by GC/MS

Sample No: Method Blank

Lab Sample ID: CP31MB
LIMS ID: 00-24604
Matrix: Soil
Data Release Authorized:
Reported: 02/02/01

QC Report No: CP31-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Date extracted: 12/21/00
Date analyzed: 12/22/00 18:35
Instrument: FINN2
GPC Cleanup: NO

Sample Amount: 7.50 g-dry-wt
Final Extract Volume: 0.5 mL
Conc/Dilution Factor: 1:1
Moisture: NA
pH: NA

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	67 U
91-57-6	2-Methylnaphthalene	67 U
208-96-8	Acenaphthylene	67 U
83-32-9	Acenaphthene	67 U
86-73-7	Fluorene	67 U
85-01-8	Phenanthrene	67 U
120-12-7	Anthracene	67 U
206-44-0	Fluoranthene	67 U
129-00-0	Pyrene	67 U
56-55-3	Benzo(a)anthracene	67 U
218-01-9	Chrysene	67 U
205-99-2	Benzo(b)fluoranthene	67 U
207-08-9	Benzo(k)fluoranthene	67 U
50-32-8	Benzo(a)pyrene	67 U
193-39-5	Indeno(1,2,3-cd)pyrene	67 U
53-70-3	Dibenz(a,h)anthracene	67 U
191-24-2	Benzo(g,h,i)perylene	67 U
132-64-9	Dibenzofuran	67 U

Base/Neutral Surrogate Recovery	
d14-p-Terphenyl	77.2%
d10-Diphenyl	70.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: TP-55-6-10**
PNAs by GC/MS

Lab Sample ID: CP31A
LIMS ID: 00-24604
Matrix: Soil
Data Release Authorized:
Reported: 02/02/01

QC Report No: CP31-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/14/00
Date Received: 11/16/00

Date extracted: 12/21/00
Date analyzed: 12/22/00
Instrument: FINN2
GPC Cleanup: NO

Sample Amount: 0.39 g-dry-wt
Final Extract Volume: 0.5 mL
Conc/Dilution Factor: 1:1
Moisture: 61.7%
pH: 6.4

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	1,300 U
91-57-6	**2-Methylnaphthalene**	**2,100**
208-96-8	Acenaphthylene	1,300 U
83-32-9	**Acenaphthene**	**3,900**
86-73-7	**Fluorene**	**3,600**
85-01-8	**Phenanthrene**	**7,000**
120-12-7	**Anthracene**	**1,400**
206-44-0	**Fluoranthene**	**4,600**
129-00-0	**Pyrene**	**3,100**
56-55-3	Benzo(a)anthracene	1,300 U
218-01-9	**Chrysene**	**1,700 M**
205-99-2	Benzo(b)fluoranthene	1,300 U
207-08-9	Benzo(k)fluoranthene	1,300 U
50-32-8	Benzo(a)pyrene	1,300 U
193-39-5	Indeno(1,2,3-cd)pyrene	1,300 U
53-70-3	Dibenz(a,h)anthracene	1,300 U
191-24-2	Benzo(g,h,i)perylene	1,300 U
132-64-9	Dibenzofuran	2,000 Y

Base/Neutral Surrogate Recovery	
d14-p-Terphenyl	83.2%
d10-Diphenyl	71.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by GC/MS

Sample No: TP-57-0-1

Lab Sample ID: CP31B
LIMS ID: 00-24605
Matrix: Soil
Data Release Authorized:
Reported: 02/02/01

QC Report No: CP31-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/14/00
Date Received: 11/16/00

Date extracted: 12/21/00
Date analyzed: 12/22/00
Instrument: FINN2
GPC Cleanup: NO

Sample Amount: 6.21 g-dry-wt
Final Extract Volume: 0.5 mL
Conc/Dilution Factor: 1:1
Moisture: 17.2%
pH: 6.7

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	680
91-57-6	2-Methylnaphthalene	1,100
208-96-8	Acenaphthylene	81 U
83-32-9	Acenaphthene	81 U
86-73-7	Fluorene	81 U
85-01-8	Phenanthrene	260
120-12-7	Anthracene	81 U
206-44-0	Fluoranthene	530
129-00-0	Pyrene	630
56-55-3	Benzo(a)anthracene	220
218-01-9	Chrysene	320 M
205-99-2	Benzo(b)fluoranthene	310 M
207-08-9	Benzo(k)fluoranthene	220
50-32-8	Benzo(a)pyrene	250
193-39-5	Indeno(1,2,3-cd)pyrene	190
53-70-3	Dibenz(a,h)anthracene	81 U
191-24-2	Benzo(g,h,i)perylene	310 M
132-64-9	Dibenzofuran	81 U

Base/Neutral Surrogate Recovery	
d14-p-Terphenyl	68.0%
d10-Diphenyl	69.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: TP-61-2-3**
PNAs by GC/MS

Lab Sample ID: CP31C
LIMS ID: 00-24606
Matrix: Soil
Data Release Authorized:
Reported: 02/02/01

QC Report No: CP31-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/15/00
Date Received: 11/16/00

Date extracted: 12/21/00
Date analyzed: 12/23/00 0:39
Instrument: FINN2
GPC Cleanup: NO

Sample Amount: 2.72 g-dry-wt
Final Extract Volume: 0.5 mL
Conc/Dilution Factor: 1:2
Moisture: 9.7%
pH: 6.7

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	2,800
91-57-6	2-Methylnaphthalene	5,000
208-96-8	Acenaphthylene	670
83-32-9	Acenaphthene	680 M
86-73-7	Fluorene	1,700
85-01-8	Phenanthrene	7,200
120-12-7	Anthracene	2,500 M
206-44-0	Fluoranthene	9,300
129-00-0	Pyrene	7,800
56-55-3	Benzo(a)anthracene	4,100
218-01-9	Chrysene	4,900
205-99-2	Benzo(b)fluoranthene	2,900
207-08-9	Benzo(k)fluoranthene	2,700
50-32-8	Benzo(a)pyrene	2,900
193-39-5	Indeno(1,2,3-cd)pyrene	1,600
53-70-3	Dibenz(a,h)anthracene	610 M
191-24-2	Benzo(g,h,i)perylene	1,100
132-64-9	Dibenzofuran	1,900

Base/Neutral Surrogate Recovery	
d14-p-Terphenyl	83.2%
d10-Diphenyl	69.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by GC/MS

Sample No: TP-49-6-10

Lab Sample ID: CP31D
LIMS ID: 00-24607
Matrix: Soil
Data Release Authorized:
Reported: 02/02/01

QC Report No: CP31-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Date extracted: 12/21/00
Date analyzed: 12/22/00
Instrument: FINN2
GPC Cleanup: NO

Sample Amount: 0.49 g-dry-wt
Final Extract Volume: 0.5 mL
Conc/Dilution Factor: 1:10
Moisture: 52.6%
pH: 6.7

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	15,000
91-57-6	2-Methylnaphthalene	50,000
208-96-8	Acenaphthylene	10,000
83-32-9	Acenaphthene	440,000
86-73-7	Fluorene	390,000
85-01-8	Phenanthrene	960,000 E
120-12-7	Anthracene	210,000
206-44-0	Fluoranthene	640,000
129-00-0	Pyrene	550,000
56-55-3	Benzo(a)anthracene	150,000
218-01-9	Chrysene	160,000
205-99-2	Benzo(b)fluoranthene	91,000
207-08-9	Benzo(k)fluoranthene	43,000
50-32-8	Benzo(a)pyrene	61,000
193-39-5	Indeno(1,2,3-cd)pyrene	27,000
53-70-3	Dibenz(a,h)anthracene	10,000 U
191-24-2	Benzo(g,h,i)perylene	28,000
132-64-9	Dibenzofuran	220,000

Base/Neutral Surrogate Recovery	
d14-p-Terphenyl	70.0%
d10-Diphenyl	64.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by GC/MS

Sample No: TP-49-6-10
DILUTION

Lab Sample ID: CP31DDL
LIMS ID: 00-24607
Matrix: Soil
Data Release Authorized:
Reported: 02/02/01

QC Report No: CP31-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Date extracted: 12/21/00
Date analyzed: 12/22/00 21:48
Instrument: FINN2
GPC Cleanup: NO

Sample Amount: 0.49 g-dry-wt
Final Extract Volume: 0.5 mL
Conc/Dilution Factor: 1:40
Moisture: 52.6%
pH: 6.7

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	41,000 U
91-57-6	2-Methylnaphthalene	41,000 U
208-96-8	Acenaphthylene	41,000 U
83-32-9	Acenaphthene	420,000
86-73-7	Fluorene	370,000
85-01-8	Phenanthrene	1,100,000
120-12-7	Anthracene	190,000
206-44-0	Fluoranthene	680,000
129-00-0	Pyrene	650,000
56-55-3	Benzo(a)anthracene	140,000
218-01-9	Chrysene	150,000
205-99-2	Benzo(b)fluoranthene	61,000
207-08-9	Benzo(k)fluoranthene	51,000
50-32-8	Benzo(a)pyrene	56,000
193-39-5	Indeno(1,2,3-cd)pyrene	41,000 U
53-70-3	Dibenz(a,h)anthracene	41,000 U
191-24-2	Benzo(g,h,i)perylene	41,000 U
132-64-9	Dibenzofuran	210,000

Base/Neutral Surrogate Recovery	
d14-p-Terphenyl	D
d10-Diphenyl	D

ORGANICS ANALYSIS DATA SHEET
PNAs by GC/MS

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-57-0-1
QC Report No: CP31-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 11/16/00

Lab Sample ID: CP31B
LIMS ID: 00-24605
Matrix: Soil

Data Release Authorized:
Reported: 02/02/01

MATRIX SPIKE/SPIKE DUPLICATE RECOVERY

CONSTITUENT	SAMPLE VALUE	SPIKE VALUE	SPIKE ADDED	% RECOVERY	RPD
MATRIX SPIKE					
Naphthalene	680.	2060	2010	68.6%	
Acenaphthene	< 80.5	1310	2010	65.1%	
Fluoranthene	532.	1580	2010	52.1%	
Benzo(a)anthracene	224.	1310	2010	54.0%	
MATRIX SPIKE DUPLICATE					
Naphthalene	680.	1980	2010	64.8%	5.6%
Acenaphthene	< 80.5	1200	2010	59.8%	8.5%
Fluoranthene	532.	1710	2010	58.7%	12%
Benzo(a)anthracene	224.	1330	2010	55.1%	2.1%

Values reported in ppb (ug/kg) dry weight

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by GC/MS

Sample No: TP-57-0-1
MATRIX SPIKE

Lab Sample ID: CP31BMS
LIMS ID: 00-24605
Matrix: Soil
Data Release Authorized:
Reported: 02/02/01

QC Report No: CP31-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/14/00
Date Received: 11/16/00

Date extracted: 12/21/00
Date analyzed: 12/23/00 1:12
Instrument: FINN2
GPC Cleanup: NO

Sample Amount: 6.21 g-dry-wt
Final Extract Volume: 0.5 mL
Conc/Dilution Factor: 1:1
Moisture: 17.2%
pH: 6.7

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	---
91-57-6	**2-Methylnaphthalene**	**1,300**
208-96-8	Acenaphthylene	81 U
83-32-9	Acenaphthene	---
86-73-7	Fluorene	81 U
85-01-8	**Phenanthrene**	**310**
120-12-7	Anthracene	81 U
206-44-0	Fluoranthene	---
129-00-0	**Pyrene**	**380**
56-55-3	Benzo(a)anthracene	---
218-01-9	**Chrysene**	**180 M**
205-99-2	**Benzo(b)fluoranthene**	**130 M**
207-08-9	**Benzo(k)fluoranthene**	**84**
50-32-8	**Benzo(a)pyrene**	**93**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**83**
53-70-3	Dibenz(a,h)anthracene	81 U
191-24-2	**Benzo(g,h,i)perylene**	**130 M**
132-64-9	Dibenzofuran	81 U

Base/Neutral Surrogate Recovery	
d14-p-Terphenyl	70.8%
d10-Diphenyl	69.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by GC/MS

Sample No: TP-57-0-1
SPIKE DUPLICATE

Lab Sample ID: CP31BMSD
LIMS ID: 00-24605
Matrix: Soil
Data Release Authorized:
Reported: 02/02/01

QC Report No: CP31-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/14/00
Date Received: 11/16/00

Date extracted: 12/21/00
Date analyzed: 12/23/00 1:46
Instrument: FINN2
GPC Cleanup: NO

Sample Amount: 6.23 g-dry-wt
Final Extract Volume: 0.5 mL
Conc/Dilution Factor: 1:1
Moisture: 17.2%
pH: 6.7

CAS Number	Analyte	ug/kg
91-20-3	Naphthalene	---
91-57-6	**2-Methylnaphthalene**	**1,200**
208-96-8	Acenaphthylene	80 U
83-32-9	Acenaphthene	---
86-73-7	Fluorene	80 U
85-01-8	**Phenanthrene**	**270**
120-12-7	Anthracene	80 U
206-44-0	Fluoranthene	---
129-00-0	**Pyrene**	**490**
56-55-3	Benzo(a)anthracene	---
218-01-9	**Chrysene**	**220 M**
205-99-2	**Benzo(b)fluoranthene**	**190 M**
207-08-9	**Benzo(k)fluoranthene**	**100**
50-32-8	**Benzo(a)pyrene**	**96**
193-39-5	Indeno(1,2,3-cd)pyrene	80 U
53-70-3	Dibenz(a,h)anthracene	80 U
191-24-2	**Benzo(g,h,i)perylene**	**120 M**
132-64-9	Dibenzofuran	80 U

Base/Neutral Surrogate Recovery	
d14-p-Terphenyl	65.6%
d10-Diphenyl	65.2%

ORGANICS ANALYSIS DATA SHEET
PNAs by GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CP31SB
LIMS ID: 00-24604
Matrix: Soil

QC Report No: CP31-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 02/02/01

Date extracted: 12/21/00
Date analyzed: 12/22/00

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE ADDED	% RECOVERY
Naphthalene	1090	1670	65.3%
Acenaphthene	1040	1670	62.3%
Fluoranthene	1170	1670	70.1%
Benzo(a)anthracene	1230	1670	73.7%

Spike Blank Surrogate Recovery

d14-p-Terphenyl	79.2%
d10-Diphenyl	61.2%

Values reported in ppb (ug/kg) dry weight

FORM-III

APPENDIX A

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503.906.9200 fax 503.906.9210
Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
541.383.9310 fax 541.382.7588

30 January, 2001

Susan Snyder
ARI
333 Ninth Ave. N.
Seattle, WA 98109-5187

RE: CP31

Enclosed are **amended** results of analyses for samples received by the laboratory on 12/20/00 17:20. If you have any questions concerning this report, please feel free to contact me. These results supercede all previous results reported by the laboratory.

Sincerely,

Amar Gill
Project Manager

Work Orders included in this report:

B0L0518

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541.383.9310 fax 541.382.7588

CASE NARRATIVE for B0L0518

Client: ARI
Project Manager: Susan Snyder
Project Name: CP31
Project Number: 996098.00

1.0 DESCRIPTION OF CASE

One water sample was received for the analysis of:

- MTCA-EPH

2.0 COMMENTS ON SAMPLE RECEIPT

The samples were received outside method established hold times and logged in on 8th January 2001 at a temperature of 7.6C.

Preparation and Analysis

MTCA-EPH

The Octocosane recovery Blank Spike for Batch 0L23004 was outside the method established range; the Blank Spike sample was re-shot confirming the result. The Blank Spike was then re-separated and re-analyzed and again the recovery was lower than the acceptable method value. Since the recoveries for the samples and all other quality control samples was within method established levels this low recovery does not represent a problem.

"I certify that this data package is in compliance with the Contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Director or his designee, as verified by the following signature."

Amar Gill
Project Manager
North Creek Analytical

www.ncalabs.com

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ARI 333 Ninth Ave. N. Seattle, WA 98109-5187	Project: CP31 Project Number: 996098.00 Project Manager: Susan Snyder	**Amended Report** Issued: 01/30/01 10:39

ANALYTICAL REPORT FOR SAMPLES - Amended

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
TP-55-6-10	B0L0518-01	Soil	11/14/00 12:00	12/20/00 17:20
TP-57-0-1	B0L0518-02	Soil	11/14/00 12:00	12/20/00 17:20
TP-61-2-3	B0L0518-03	Soil	11/14/00 12:00	12/20/00 17:20
TP-49-6-10	B0L0518-04	Soil	11/14/00 12:00	12/20/00 17:20

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ARI	Project: CP31	
333 Ninth Ave. N.	Project Number: 996098.00	**Amended Report**
Seattle, WA 98109-5187	Project Manager: Susan Snyder	Issued: 01/30/01 10:39

Extractable Petroleum Hydrocarbons by modified WDOE Interim TPH Policy Method

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
TP-55-6-10 (B0L0518-01) Soil					Sampled: 11/14/00	Received: 12/20/00			
C8-C10 Aliphatics	ND	28.0	mg/kg dry	2	WA	12/23/00	01/06/01	0L23004	
C10-C12 Aliphatics	ND	28.0	"	"	MTCA-EPH	"	"	"	
C12-C16 Aliphatics	**151**	28.0	"	"	"	"	"	"	
C16-C21 Aliphatics	**1540**	28.0	"	"	"	"	"	"	
C21-C34 Aliphatics	**10100**	28.0	"	"	"	"	"	"	
C10-C12 Aromatics	ND	28.0	"	"	"	"	"	"	
C12-C16 Aromatics	**93.4**	28.0	"	"	"	"	"	"	
C16-C21 Aromatics	**308**	28.0	"	"	"	"	"	"	
C21-C34 Aromatics	**3360**	28.0	"	"	"	"	"	"	
Extractable Petroleum Hydrocarbons	**15600**		"	"	"	"	"	"	
Surr: 2-FBP	*85.5 %*	*50-150*							
Surr: Octacosane	*130 %*	*50-150*							
Surr: Undecane	*79.7 %*	*30-150*							
TP-57-0-1 (B0L0518-02) Soil					Sampled: 11/14/00	Received: 12/20/00			
C8-C10 Aliphatics	ND	50.0	mg/kg dry	10	WA	12/23/00	01/06/01	0L23004	
C10-C12 Aliphatics	ND	50.0	"	"	MTCA-EPH	"	"	"	
C12-C16 Aliphatics	ND	50.0	"	"	"	"	"	"	
C16-C21 Aliphatics	**386**	50.0	"	"	"	"	"	"	
C21-C34 Aliphatics	**2430**	50.0	"	"	"	"	"	"	
C10-C12 Aromatics	ND	50.0	"	"	"	"	"	"	
C12-C16 Aromatics	ND	50.0	"	"	"	"	"	"	
C16-C21 Aromatics	**93.5**	50.0	"	"	"	"	"	"	
C21-C34 Aromatics	**676**	50.0	"	"	"	"	"	"	
Extractable Petroleum Hydrocarbons	**3590**		"	"	"	"	"	"	
Surr: 2-FBP	*NR*	*50-150*							*S-0*
Surr: Octacosane	*NR*	*50-150*							*S-0*
Surr: Undecane	*82.3 %*	*30-150*							

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Amar Gill, Project Manager

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ARI 333 Ninth Ave. N. Seattle, WA 98109-5187	Project: CP31 Project Number: 996098.00 Project Manager: Susan Snyder	**Amended Report** Issued: 01/30/01 10:39

Extractable Petroleum Hydrocarbons by modified WDOE Interim TPH Policy Method

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
TP-61-2-3 (B0L0518-03) Soil					Sampled: 11/14/00	Received: 12/20/00			
C8-C10 Aliphatics	ND	10.0	mg/kg dry	2	WA	12/23/00	01/06/01	0L23004	
C10-C12 Aliphatics	**11.6**	10.0	"	"	MTCA-EPH	"	"	"	
C12-C16 Aliphatics	**695**	10.0	"	"	"	"	"	"	
C16-C21 Aliphatics	**3160**	10.0	"	"	"	"	"	"	
C21-C34 Aliphatics	**1190**	10.0	"	"	"	"	"	"	
C10-C12 Aromatics	ND	10.0	"	"	"	"	"	"	
C12-C16 Aromatics	**64.6**	10.0	"	"	"	"	"	"	
C16-C21 Aromatics	**521**	10.0	"	"	"	"	"	"	
C21-C34 Aromatics	**495**	10.0	"	"	"	"	"	"	
Extractable Petroleum Hydrocarbons	**6140**		"	"	"	"	"	"	
Surr: 2-FBP	*88.7 %*	*50-150*							
Surr: Octacosane	*77.2 %*	*50-150*							
Surr: Undecane	*79.3 %*	*30-150*							
TP-49-6-10 (B0L0518-04) Soil					Sampled: 11/14/00	Received: 12/20/00			
C8-C10 Aliphatics	ND	14.2	mg/kg dry	2	WA	12/23/00	01/06/01	0L23004	
C10-C12 Aliphatics	**34.9**	14.2	"	"	MTCA-EPH	"	"	"	
C12-C16 Aliphatics	**332**	14.2	"	"	"	"	"	"	
C16-C21 Aliphatics	**316**	14.2	"	"	"	"	"	"	
C21-C34 Aliphatics	**197**	14.2	"	"	"	"	"	"	
C10-C12 Aromatics	**53.9**	14.2	"	"	"	"	"	"	
C12-C16 Aromatics	**2130**	14.2	"	"	"	"	"	"	
C16-C21 Aromatics	**4060**	14.2	"	"	"	"	"	"	
C21-C34 Aromatics	**3310**	14.2	"	"	"	"	"	"	
Extractable Petroleum Hydrocarbons	**10400**		"	"	"	"	"	"	
Surr: 2-FBP	*111 %*	*50-150*							
Surr: Octacosane	*74.1 %*	*50-150*							
Surr: Undecane	*82.1 %*	*30-150*							

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ARI 333 Ninth Ave. N. Seattle, WA 98109-5187	Project: CP31 Project Number: 996098.00 Project Manager: Susan Snyder	**Amended Report** Issued: 01/30/01 10:39

Physical Parameters by APHA/ASTM/EPA Methods

North Creek Analytical - Botbell

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
TP-55-6-10 (B0L0518-01) Soil					Sampled: 11/14/00	Received: 12/20/00			
Dry Weight	**42.5**	1.00	%	1	BSOPSPL003R 07	12/21/00	12/22/00	0L21037	
TP-57-0-1 (B0L0518-02) Soil					Sampled: 11/14/00	Received: 12/20/00			
Dry Weight	**80.0**	1.00	%	1	BSOPSPL003R 07	12/21/00	12/22/00	0L21037	
TP-61-2-3 (B0L0518-03) Soil					Sampled: 11/14/00	Received: 12/20/00			
Dry Weight	**90.7**	1.00	%	1	BSOPSPL003R 07	12/21/00	12/22/00	0L21037	
TP-49-6-10 (B0L0518-04) Soil					Sampled: 11/14/00	Received: 12/20/00			
Dry Weight	**50.7**	1.00	%	1	BSOPSPL003R 07	12/21/00	12/22/00	0L21037	

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ARI 333 Ninth Ave. N. Seattle, WA 98109-5187	Project: CP31 Project Number: 996098.00 Project Manager: Susan Snyder	**Amended Report** Issued: 01/30/01 10:39

Extractable Petroleum Hydrocarbons by modified WDOE Interim TPH Policy Method - Quality Control

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0L23004 - EPA 3550B										
Blank (0L23004-BLK1)				Prepared: 12/23/00 Analyzed: 01/04/01						
C8-C10 Aliphatics	ND	5.00	mg/kg wet							
C10-C12 Aliphatics	ND	5.00	"							
C12-C16 Aliphatics	ND	5.00	"							
C16-C21 Aliphatics	ND	5.00	"							
C21-C34 Aliphatics	ND	5.00	"							
C10-C12 Aromatics	ND	5.00	"							
C12-C16 Aromatics	ND	5.00	"							
C16-C21 Aromatics	ND	5.00	"							
C21-C34 Aromatics	ND	5.00	"							
Surr: 2-FBP	*9.15*		"	*12.1*		*75.6*	*50-150*			
Surr: Octacosane	*7.68*		"	*12.3*		*62.4*	*50-150*			
Surr: Undecane	*10.1*		"	*13.2*		*76.5*	*30-150*			
LCS (0L23004-BS1)				Prepared: 12/23/00 Analyzed: 01/10/01						
Extractable Petroleum Hydrocarbons	104		mg/kg wet	167		62.3	30-120			
Surr: 2-FBP	*7.10*		"	*12.1*		*58.7*	*50-150*			
Surr: Octacosane	*4.79*		"	*12.3*		*38.9*	*50-150*			*X*
Surr: Undecane	*7.95*		"	*13.2*		*60.2*	*30-150*			
LCS Dup (0L23004-BSD1)				Prepared: 12/23/00 Analyzed: 01/06/01						
Extractable Petroleum Hydrocarbons	136		mg/kg wet	167		81.4	30-120	26.7	40	
Surr: 2-FBP	*9.33*		"	*12.1*		*77.1*	*50-150*			
Surr: Octacosane	*7.74*		"	*12.3*		*62.9*	*50-150*			
Surr: Undecane	*10.1*		"	*13.2*		*76.5*	*30-150*			
Matrix Spike (0L23004-MS1)		**Source: B0L0576-01**		Prepared: 12/23/00 Analyzed: 01/06/01						
Extractable Petroleum Hydrocarbons	2340		mg/kg dry	184	717	NR	30-120			Q-03
Surr: 2-FBP	*11.1*		"	*13.4*		*82.8*	*50-150*			
Surr: Octacosane	*6.88*		"	*13.6*		*50.6*	*50-150*			
Surr: Undecane	*NR*		"	*14.6*			*30-150*			*S-02*

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ARI
333 Ninth Ave. N.
Seattle, WA 98109-5187

Project: CP31
Project Number: 996098.00
Project Manager: Susan Snyder

Amended Report
Issued: 01/30/01 10:39

Physical Parameters by APHA/ASTM/EPA Methods - Quality Control

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0L21037 - Dry Weight										
Blank (0L21037-BLK1)				Prepared: 12/21/00 Analyzed: 12/22/00						
Dry Weight	100	1.00	%							

The results in this report apply to the samples analyzed in accordance with the chain c custody document. This analytical report must be reproduced in its entiret

Amar Gill, Project Manager

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ARI 333 Ninth Ave. N. Seattle, WA 98109-5187	Project: CP31 Project Number: 996098.00 Project Manager: Susan Snyder	**Amended Report** Issued: 01/30/01 10:39

Notes and Definitions

Q-03	The percent recovery for this QC spike sample cannot be accurately calculated due to the high concentration of analyte already present in the sample.
S-01	The surrogate recovery for this sample is not available due to sample dilution required from high analyte concentration and/or matrix interferences.
S-02	The surrogate recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample.
X	See case narrative.
DET	***Analyte DETECTED***
ND	***Analyte NOT DETECTED at or above the reporting limit***
NR	Not Reported
dry	***Sample results reported on a dry weight basis***
wet	***Sample results reported on a wet weight basis***
RPD	***Relative Percent Difference***

SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 12\19\00 **ARI Project: CP31**

Laboratory: North Creek Analytical
Lab Contact: Sample Receiving
Lab Address: 11720 North Creek Pkwy North
Bothell, WA 98011-8244
Phone: 425-420-9200
Fax: 425-420-9210

ARI Client: Kennedy Jenks Consultant
Project ID: 996098.10
ARI PMgr: Susan Snyder
Phone: (206) 340-2866 Ext 118
Fax: (206) 621-7523

Analytical Protocol: In-house

Requested Turn Around: **12/27/00**
Fax Results (Y/N): **Yes**

ARI Sample ID	Client Sample ID	Sampled	Matrix	Bottles	Analyses
00-24604-CP31A	TP-55-6-10	11/14/00	Soil	3040518 1	EPH .01
Arimatics/Aliphatics					
00-24605-CP31B	TP-57-0-1	11/14/00	Soil	1	EPH 02
Arimatics/Aliphatics					
00-24606-CP31C	TP-61-2-3	11/15/00	Soil	1	EPH 03
Arimatics/Aliphatics					
00-24607-CP31D	TP-49-6-10	10/17/00	Soil	1	EPH 04
Arimatics/Aliphatics					

Limits of Liability. Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or sucessors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Subcontractor.

Carrier	Airbill		Date
Relinquished by	Company ARI	Date 12/20/00	Time
Received by	Company NCA	Date 12/20	Time 17:20

7.6° W/O

Carrier	Airbill		Date
Relinquished by	Company	Date	Time
Received by	Company	Date	Time

SAMPLES WERE NOT @ 2-6C UPON RECEIPT

Analytical Resources, Incorporated
Analytical Chemists and Consultants

April 11, 2001

Jodie Brundage
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: Project: Tacoma Metals / ARI Job: CX26

Dear Ms Brundage:

Please find enclosed the re-analysis of samples TP-20-2-3 and TP-2000-2-3. The samples were analyzed for arsenic and lead. The samples were re-analyzed due to suspected sample homogeneity problems.

No analytical complications were noted. Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

Susan Snyder
Project manger
(206)389-6167
susan@arilabs.com

SS/ss
Enclosures

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INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CX26LCS
LIMS ID: 01-4360
Matrix: Soil

QC Report No: CX26-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 04/04/01

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike mg/kg-dry	Spike Added	% Recovery	Q
Arsenic	6010B	192	200	96.0%	
Lead	6010B	192	200	96.0%	

'Q' codes: N = control limit not met

Control Limits: 80-120%

FORM-VII

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: Method Blank**
TOTAL METALS

Lab Sample ID: CX26MB
LIMS ID: 01-4360
Matrix: Soil

QC Report No: CX26-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized:
Reported: 04/04/01

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050B	03/29/01	6010B	04/03/01	7440-38-2	Arsenic	5	5 U
3050B	03/29/01	6010B	04/03/01	7439-92-1	Lead	2	2 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-2000-2-3**
TOTAL METALS

Lab Sample ID: CX26B
LIMS ID: 01-4361
Matrix: Soil

QC Report No: CX26-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/10/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 04/04/01

Percent Total Solids: 92.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050B	03/29/01	6010B	04/03/01	7440-38-2	Arsenic	10	10 U
3050B	03/29/01	6010B	04/03/01	7439-92-1	Lead	5	10,200

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-20-2-3**
TOTAL METALS

Lab Sample ID: CX26A
LIMS ID: 01-4360
Matrix: Soil

QC Report No: CX26-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/10/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 04/04/01

Percent Total Solids: 92.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050B	03/29/01	6010B	04/03/01	7440-38-2	Arsenic	10	20
3050B	03/29/01	6010B	04/03/01	7439-92-1	Lead	5	6,790

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

Analytical Resources, Incorporated
Analytical Chemists and Consultants

April 17, 2001

Ty Schreiner
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: Project: Tacoma Metals / ARI Job: CY20

Dear Mr. Schreiner:

Please find enclosed sample custody records and final analytical results for the above referenced project. Six soil samples were retrieved from archives on April 4, 2001 per your request. The samples had been archived at –18°C and were in good condition. The samples were analyzed for PCB referencing EPA method 8082.

Samples were extracted on 4/10 & 4/12/01. Samples were analyzed on 4/12/01. There were no analytical complications noted.

Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,
Analytical Resources, Inc.

Susan Snyder
Project manger

SS/ss
Enclosures

CC: Jodi Brundage, Kennedy Jenks Consultants, Federal Way, WA

RECEIVED
APR 18 2001
K/J Federal Way
K/J No/File
Route
Return To/By

333 Ninth Avenue North • Seattle WA 98109-5187 • **206-621-6490** • **206-621-7523** fax

ANALYTICAL RESOURCES INCORPORATED

SOIL AROCLOR SURROGATE SUMMARY

Matrix: Soil

QC Report No: CY20
Project: Tacoma Metals
996098.10

LIMS ID	Lab ID	Client ID	TCMX #	DCBP #	TOT OUT
01-4991MB	041201MB	Method Blank	102%	89.2%	0
01-4991SB	041201SB	Lab Control	107%	93.0%	0
01-4991	CY20A	TP-60-0-1	92.5%	77.5%	0
01-4992MB	041001MB	Method Blank	69.5%	74.2%	0
01-4992SB	041001SB	Lab Control	77.2%	82.8%	0
01-4992	CY20B	TP-59-2-3	64.5%	55.5%	0
01-4993	CY20C	TP-45-2-3	86.2%	67.8%	0
01-4993MS	CY20C	TP-45-2-3-MS	93.2%	74.0%	0
01-4993MSD	CY20C	TP-45-2-3-MSD	92.2%	73.2%	0
01-4994	CY20D	TP-43-4-6	62.8%	58.8%	0
01-4995	CY20E	TP-36-0-1	74.5%	63.0%	0
01-4995MS	CY20E	TP-36-0-1-MS	82.8%	66.0%	0
01-4995MSD	CY20E	TP-36-0-1-MSD	82.0%	64.2%	0
01-4996	CY20F	TP-50-0-1	96.2%	80.0%	0

	LCS/MB LIMITS	QC LIMITS
(TCMX) = Tetrachloro-m-xylene	(46-132)	(34-128)
(DCBP) = Decachlorobiphenyl	(61-122)	(39-132)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D Surrogate Compound diluted out

FORM-II PCB

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: Method Blank

Lab Sample ID: CY20MB
LIMS ID: 01-4991
Matrix: Soil

Data Release Authorized: CH
Reported: 04/17/01 4/17/01

QC Report No: CY20-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: NA
Date Received: NA

Date extracted: 04/12/01
Date analyzed: 04/12/01 17:53
Instrument ID: ECD3
Sample Amount: 5.00 g-dry-wt
Final Ext Vol: 40 mL
pH: NA

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: NA

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	800 U
53469-21-9	Aroclor 1242	800 U
12672-29-6	Aroclor 1248	800 U
11097-69-1	Aroclor 1254	800 U
11096-82-5	Aroclor 1260	800 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	89.2%
Tetrachlorometaxylene	102%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: Method Blank

Lab Sample ID: CY20MB
LIMS ID: 01-4992
Matrix: Soil

Data Release Authorized: CH
Reported: 04/17/01 4/17/01

QC Report No: CY20-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: NA
Date Received: NA

Date extracted: 04/10/01
Date analyzed: 04/12/01 04:11
Instrument ID: ECD3
Sample Amount: 12.0 g-dry-wt
Final Ext Vol: 4.0 mL
pH: NA

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: NA

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	33 U
53469-21-9	Aroclor 1242	33 U
12672-29-6	Aroclor 1248	33 U
11097-69-1	Aroclor 1254	33 U
11096-82-5	Aroclor 1260	33 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	74.2%
Tetrachlorometaxylene	69.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-60-0-1

Lab Sample ID: CY20A
LIMS ID: 01-4991
Matrix: Soil

QC Report No: CY20-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized: CH
Reported: 04/17/01 4/17/01

Date extracted: 04/12/01
Date analyzed: 04/12/01 19:03
Instrument ID: ECD3
Sample Amount: 4.30 g-dry-wt
Final Ext Vol: 40 mL
pH: 8.5

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 14.8%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	930 U
53469-21-9	Aroclor 1242	930 U
12672-29-6	Aroclor 1248	930 U
11097-69-1	**Aroclor 1254**	**29,000**
11096-82-5	**Aroclor 1260**	**8,300**

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	77.5%
Tetrachlorometaxylene	92.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-59-2-3

Lab Sample ID: CY20B
LIMS ID: 01-4992
Matrix: Soil

QC Report No: CY20-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized: CH
Reported: 04/17/01 4/17/01

Date extracted: 04/10/01
Date analyzed: 04/12/01 05:21
Instrument ID: ECD3
Sample Amount: 11.0 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 8.0

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 7.9 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	36 U
53469-21-9	Aroclor 1242	36 U
12672-29-6	**Aroclor 1248**	**380**
11097-69-1	**Aroclor 1254**	**550**
11096-82-5	**Aroclor 1260**	**200**

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	55.5%
Tetrachlorometaxylene	64.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-45-2-3

Lab Sample ID: CY20C
LIMS ID: 01-4993
Matrix: Soil

QC Report No: CY20-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 10/16/00
Date Received: 11/16/00

Data Release Authorized: CH
Reported: 04/17/01 4/17/01

Date extracted: 04/12/01
Date analyzed: 04/12/01 19:38
Instrument ID: ECD3
Sample Amount: 4.57 g-dry-wt
Final Ext Vol: 40 mL
pH: 8.1

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 9.0 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	880 U
53469-21-9	Aroclor 1242	880 U
12672-29-6	Aroclor 1248	880 U
11097-69-1	**Aroclor 1254**	**7,000**
11096-82-5	**Aroclor 1260**	**4,600**

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	67.8%
Tetrachlorometaxylene	86.2%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-45-2-3
MATRIX SPIKE

Lab Sample ID: CY20CMS
LIMS ID: 01-4993
Matrix: Soil

QC Report No: CY20-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 10/16/00
Date Received: 11/16/00

Data Release Authorized: CH
Reported: 04/17/01 4/19/01

Date extracted: 04/12/01
Date analyzed: 04/12/01 20:13
Instrument ID: ECD3
Sample Amount: 4.60 g-dry-wt
Final Ext Vol: 40 mL
pH: 8.1

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 9.0 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	870 U
53469-21-9	Aroclor 1242	---
12672-29-6	Aroclor 1248	870 U
11097-69-1	**Aroclor 1254**	**9,300**
11096-82-5	**Aroclor 1260**	**4,000**

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	74.0%
Tetrachlorometaxylene	93.2%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-45-2-3
SPIKE DUPLICATE

Lab Sample ID: CY20CMSD
LIMS ID: 01-4993
Matrix: Soil

QC Report No: CY20-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 10/16/00
Date Received: 11/16/00

Data Release Authorized: c/r
Reported: 04/17/01 4/17/01

Date extracted: 04/12/01
Date analyzed: 04/12/01 20:49
Instrument ID: ECD3
Sample Amount: 4.59 g-dry-wt
Final Ext Vol: 40 mL
pH: 8.1

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 9.0 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	870 U
53469-21-9	Aroclor 1242	---
12672-29-6	Aroclor 1248	870 U
11097-69-1	**Aroclor 1254**	**9,400**
11096-82-5	**Aroclor 1260**	**5,500**

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	73.2%
Tetrachlorometaxylene	92.2%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-43-4-6

Lab Sample ID: CY20D
LIMS ID: 01-4994
Matrix: Soil

Data Release Authorized: CH
Reported: 04/17/01 4/19/01

QC Report No: CY20-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 10/16/00
Date Received: 11/16/00

Date extracted: 04/10/01
Date analyzed: 04/12/01 05:56
Instrument ID: ECD3
Sample Amount: 11.1 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 8.4

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 7.2 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	36 U
53469-21-9	Aroclor 1242	36 U
12672-29-6	Aroclor 1248	36 U
11097-69-1	**Aroclor 1254**	**36 J**
11096-82-5	Aroclor 1260	36 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	58.8%
Tetrachlorometaxylene	62.8%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-36-0-1

Lab Sample ID: CY20E
LIMS ID: 01-4995
Matrix: Soil

QC Report No: CY20-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 10/13/00
Date Received: 11/16/00

Data Release Authorized: CH
Reported: 04/17/01 4/17/01

Date extracted: 04/10/01
Date analyzed: 04/12/01 06:31
Instrument ID: ECD3
Sample Amount: 10.8 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 8.2

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 9.4 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	37 U
53469-21-9	Aroclor 1242	37 U
12672-29-6	Aroclor 1248	31 J
11097-69-1	Aroclor 1254	56
11096-82-5	Aroclor 1260	60

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	63.0%
Tetrachlorometaxylene	74.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-36-0-1
MATRIX SPIKE

Lab Sample ID: CY20EMS
LIMS ID: 01-4995
Matrix: Soil

QC Report No: CY20-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 10/13/00
Date Received: 11/16/00

Data Release Authorized: CLK
Reported: 04/17/01 4/17/01

Date extracted: 04/10/01
Date analyzed: 04/12/01 07:06
Instrument ID: ECD3
Sample Amount: 10.8 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 8.2

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 9.4 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	37 U
53469-21-9	Aroclor 1242	---
12672-29-6	Aroclor 1248	37 U
11097-69-1	**Aroclor 1254**	69
11096-82-5	**Aroclor 1260**	63

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	66.0%
Tetrachlorometaxylene	82.8%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-36-0-1
SPIKE DUPLICATE

Lab Sample ID: CY20EMSD
LIMS ID: 01-4995
Matrix: Soil

QC Report No: CY20-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 10/13/00
Date Received: 11/16/00

Data Release Authorized: CP
Reported: 04/17/01 4/17/01

Date extracted: 04/10/01
Date analyzed: 04/12/01 07:41
Instrument ID: ECD3
Sample Amount: 10.8 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 8.2

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 9.4 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	37 U
53469-21-9	Aroclor 1242	---
12672-29-6	Aroclor 1248	37 U
11097-69-1	**Aroclor 1254**	**67**
11096-82-5	**Aroclor 1260**	**61**

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	64.2%
Tetrachlorometaxylene	82.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-50-0-1

Lab Sample ID: CY20F
LIMS ID: 01-4996
Matrix: Soil

Data Release Authorized: CH
Reported: 04/17/01 4/19/01

QC Report No: CY20-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 10/17/00
Date Received: 11/16/00

Date extracted: 04/12/01
Date analyzed: 04/12/01 21:24
Instrument ID: ECD3
Sample Amount: 4.71 g-dry-wt
Final Ext Vol: 40 mL
pH: 8.2

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 6.6 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	850 U
53469-21-9	Aroclor 1242	850 U
12672-29-6	Aroclor 1248	850 U
11097-69-1	**Aroclor 1254**	**5,800**
11096-82-5	**Aroclor 1260**	**1,500**

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	80.0%
Tetrachlorometaxylene	96.2%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Lab Sample ID: CY20
LIMS ID: 01-4991
Matrix: Soil

QC Report No: CY20-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10

Data Release Authorized: CH
Reported: 04/17/01 4/19/01

LABORATORY CONTROL SAMPLE SPIKE RECOVERY
Date extracted: 04/12/01

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	8400	8000	105%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	93.0%
Tetrachlorometaxylene	107%

Values Reported in Total ug/kg Dry Weight

FORM-III

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Lab Sample ID: CY20
LIMS ID: 01-4992
Matrix: Soil

QC Report No: CY20-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10

Data Release Authorized: CH
Reported: 04/17/01 4/17/01

LABORATORY CONTROL SAMPLE SPIKE RECOVERY
Date extracted: 04/10/01

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	275	333	82.5%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	82.8%
Tetrachlorometaxylene	77.2%

Values Reported in Total ug/kg Dry Weight

FORM-III

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-45-2-3
Lab Sample ID: CY20C
QC Report No: CY20-Kennedy Jenks Consultants
LIMS ID: 01-4993
Project: Tacoma Metals
Matrix: Soil
996098.10
Date Received: 11/16/00

Data Release Authorized: CH
Reported: 04/17/01 4/17/01

MATRIX SPIKE/SPIKE DUPLICATE RECOVERY
Date extracted: 04/12/01

CONSTITUENT	SAMPLE VALUE	SPIKE FOUND	SPIKE ADDED	% RECOVERY	RPD
MATRIX SPIKE					
Aroclor 1242	< 880	8260	8700	95.0%	
MATRIX SPIKE DUPLICATE					
Aroclor 1242	< 880	8490	8710	97.4%	2.5%

Values Reported in Total ug/kg Dry Weight

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-36-0-1
Lab Sample ID: CY20E
QC Report No: CY20-Kennedy Jenks Consultants
LIMS ID: 01-4995
Project: Tacoma Metals
Matrix: Soil
996098.10
Date Received: 11/16/00

Data Release Authorized: CH
Reported: 04/17/01 4/17/01

MATRIX SPIKE/SPIKE DUPLICATE RECOVERY
Date extracted: 04/10/01

CONSTITUENT	SAMPLE VALUE	SPIKE FOUND	SPIKE ADDED	% RECOVERY	RPD
MATRIX SPIKE					
Aroclor 1242	< 37	119	367	32.4%	
MATRIX SPIKE DUPLICATE					
Aroclor 1242	< 37	107	367	29.1%	11%

Values Reported in Total ug/kg Dry Weight

Susan Snyder

From: "Jodie Brundage" <JodieBrundage@KennedyJenks.com>
To: "'Susan Snyder'" <susan@arilabs.com>
Sent: Wednesday, April 04, 2001 3:50 PM
Subject: RE: Tacoma Metals

Hello Susan!
I have a request. There are a few Samples that I need run for PCBs. (From
Tacoma Metals)
TP-60, 36, 50 - 0-1'
TP-45 2-3, TP-43 4-6, and TP-59 2-3

I believe TP-60-0-1 and TP-59-2-3 is CL62
TP-45-2-3 and TP-43-4-6 is CI62
I'm not sure about TP-36-0-1 and TP-50-0-1.
I will be out of the office thursday and friday so if you have any questions
you can leave a voicemail and I'll try to answer it if not I will hopefully
get a hold of you on Monday. Thanks, Jodie (253) 942-3415

Analytical Resources, Incorporated
Analytical Chemists and Consultants

April 23, 2001

Jodie Brundage
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: Project: Tacoma Metals / ARI Job: CY20

Dear Ms Brundage:

Please find enclosed revised data sheets for PCB analysis. The sheets have been revised to include Aroclor 1221 & Aroclor 1232.

Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,
Analytical Resources, Inc.

Susan Snyder
Project manger

SS/ss
Enclosures

RECEIVED
APR 25 2001
K/J Federal Way
K/J No/File
Route
Return To/By

333 Ninth Avenue North • Seattle WA 98109-5187 • **206-621-6490** • **206-621-7523** fax

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: Method Blank

Lab Sample ID: CY20MB
LIMS ID: 01-4991
Matrix: Soil

Data Release Authorized: CJP 4/23/01
Reported: 04/23/01

QC Report No: CY20-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: NA
Date Received: NA

Date extracted: 04/12/01
Date analyzed: 04/12/01 17:53
Instrument ID: ECD3
Sample Amount: 5.00 g-dry-wt
Final Ext Vol: 40 mL
pH: NA

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: NA

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	800 U
53469-21-9	Aroclor 1242	800 U
12672-29-6	Aroclor 1248	800 U
11097-69-1	Aroclor 1254	800 U
11096-82-5	Aroclor 1260	800 U
11104-28-2	Aroclor 1221	1,600 U
11141-16-5	Aroclor 1232	800 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	89.2%
Tetrachlorometaxylene	102%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
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NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: Method Blank

Lab Sample ID: CY20MB
LIMS ID: 01-4992
Matrix: Soil

QC Report No: CY20-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: NA
Date Received: NA

Data Release Authorized: CP 4/23/01
Reported: 04/23/01

Date extracted: 04/10/01
Date analyzed: 04/12/01 04:11
Instrument ID: ECD3
Sample Amount: 12.0 g-dry-wt
Final Ext Vol: 4.0 mL
pH: NA

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: NA

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	33 U
53469-21-9	Aroclor 1242	33 U
12672-29-6	Aroclor 1248	33 U
11097-69-1	Aroclor 1254	33 U
11096-82-5	Aroclor 1260	33 U
11104-28-2	Aroclor 1221	67 U
11141-16-5	Aroclor 1232	33 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	74.2%
Tetrachlorometaxylene	69.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
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ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-60-0-1

Lab Sample ID: CY20A
LIMS ID: 01-4991
Matrix: Soil

Data Release Authorized: CH
Reported: 04/23/01 4/23/01

QC Report No: CY20-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Date extracted: 04/12/01
Date analyzed: 04/12/01 19:03
Instrument ID: ECD3
Sample Amount: 4.30 g-dry-wt
Final Ext Vol: 40 mL
pH: 8.5

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 14.8%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	930 U
53469-21-9	Aroclor 1242	930 U
12672-29-6	Aroclor 1248	930 U
11097-69-1	**Aroclor 1254**	**29,000**
11096-82-5	**Aroclor 1260**	**8,300**
11104-28-2	Aroclor 1221	1,900 U
11141-16-5	Aroclor 1232	930 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	77.5%
Tetrachlorometaxylene	92.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
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NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-59-2-3

Lab Sample ID: CY20B
LIMS ID: 01-4992
Matrix: Soil

QC Report No: CY20-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized: CH 4/23/01
Reported: 04/23/01

Date extracted: 04/10/01
Date analyzed: 04/12/01 05:21
Instrument ID: ECD3
Sample Amount: 11.0 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 8.0

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 7.9 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	36 U
53469-21-9	Aroclor 1242	36 U
12672-29-6	**Aroclor 1248**	**380**
11097-69-1	**Aroclor 1254**	**550**
11096-82-5	**Aroclor 1260**	**200**
11104-28-2	Aroclor 1221	72 U
11141-16-5	Aroclor 1232	36 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	55.5%
Tetrachlorometaxylene	64.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
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U Indicates compound was analyzed for, but not detected at the given detection limit.
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NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-45-2-3

Lab Sample ID: CY20C
LIMS ID: 01-4993
Matrix: Soil

Data Release Authorized: CLF 4/23/01
Reported: 04/23/01

QC Report No: CY20-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 10/16/00
Date Received: 11/16/00

Date extracted: 04/12/01
Date analyzed: 04/12/01 19:38
Instrument ID: ECD3
Sample Amount: 4.57 g-dry-wt
Final Ext Vol: 40 mL
pH: 8.1

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 9.0 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	880 U
53469-21-9	Aroclor 1242	880 U
12672-29-6	Aroclor 1248	880 U
11097-69-1	**Aroclor 1254**	**7,000**
11096-82-5	**Aroclor 1260**	**4,600**
11104-28-2	Aroclor 1221	1,800 U
11141-16-5	Aroclor 1232	880 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	67.8%
Tetrachlorometaxylene	86.2%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
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NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-45-2-3
MATRIX SPIKE

Lab Sample ID: CY20CMS
LIMS ID: 01-4993
Matrix: Soil

QC Report No: CY20-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 10/16/00
Date Received: 11/16/00

Data Release Authorized: CLH 4/23/01
Reported: 04/23/01

Date extracted: 04/12/01
Date analyzed: 04/12/01 20:13
Instrument ID: ECD3
Sample Amount: 4.60 g-dry-wt
Final Ext Vol: 40 mL
pH: 8.1

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 9.0 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	870 U
53469-21-9	Aroclor 1242	---
12672-29-6	Aroclor 1248	870 U
11097-69-1	**Aroclor 1254**	**9,300**
11096-82-5	**Aroclor 1260**	**4,000**
11104-28-2	Aroclor 1221	1,700 U
11141-16-5	Aroclor 1232	870 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	74.0%
Tetrachlorometaxylene	93.2%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-45-2-3
SPIKE DUPLICATE

Lab Sample ID: CY20CMSD
LIMS ID: 01-4993
Matrix: Soil

Data Release Authorized: 4/23/01
Reported: 04/23/01

QC Report No: CY20-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 10/16/00
Date Received: 11/16/00

Date extracted: 04/12/01
Date analyzed: 04/12/01 20:49
Instrument ID: ECD3
Sample Amount: 4.59 g-dry-wt
Final Ext Vol: 40 mL
pH: 8.1

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 9.0 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	870 U
53469-21-9	Aroclor 1242	---
12672-29-6	Aroclor 1248	870 U
11097-69-1	**Aroclor 1254**	**9,400**
11096-82-5	**Aroclor 1260**	**5,500**
11104-28-2	Aroclor 1221	1,700 U
11141-16-5	Aroclor 1232	870 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	73.2%
Tetrachlorometaxylene	92.2%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-43-4-6

Lab Sample ID: CY20D
LIMS ID: 01-4994
Matrix: Soil

Data Release Authorized: CLK 4/23/01
Reported: 04/23/01

QC Report No: CY20-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 10/16/00
Date Received: 11/16/00

Date extracted: 04/10/01
Date analyzed: 04/12/01 05:56
Instrument ID: ECD3
Sample Amount: 11.1 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 8.4

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 7.2 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	36 U
53469-21-9	Aroclor 1242	36 U
12672-29-6	Aroclor 1248	36 U
11097-69-1	**Aroclor 1254**	**36 J**
11096-82-5	Aroclor 1260	36 U
11104-28-2	Aroclor 1221	72 U
11141-16-5	Aroclor 1232	36 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	58.8%
Tetrachlorometaxylene	62.8%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-36-0-1

Lab Sample ID: CY20E
LIMS ID: 01-4995
Matrix: Soil

Data Release Authorized: CH 4/23/01
Reported: 04/23/01

QC Report No: CY20-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 10/13/00
Date Received: 11/16/00

Date extracted: 04/10/01
Date analyzed: 04/12/01 06:31
Instrument ID: ECD3
Sample Amount: 10.8 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 8.2

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 9.4 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	37 U
53469-21-9	Aroclor 1242	37 U
12672-29-6	**Aroclor 1248**	**31 J**
11097-69-1	**Aroclor 1254**	**56**
11096-82-5	**Aroclor 1260**	**60**
11104-28-2	Aroclor 1221	74 U
11141-16-5	Aroclor 1232	37 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	63.0%
Tetrachlorometaxylene	74.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
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B Found in associated method blank
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NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-36-0-1
MATRIX SPIKE

Lab Sample ID: CY20EMS
LIMS ID: 01-4995
Matrix: Soil

Data Release Authorized: CLK 4/23/01
Reported: 04/23/01

QC Report No: CY20-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 10/13/00
Date Received: 11/16/00

Date extracted: 04/10/01
Date analyzed: 04/12/01 07:06
Instrument ID: ECD3
Sample Amount: 10.8 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 8.2

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 9.4 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	37 U
53469-21-9	Aroclor 1242	---
12672-29-6	Aroclor 1248	37 U
11097-69-1	**Aroclor 1254**	**69**
11096-82-5	**Aroclor 1260**	**63**
11104-28-2	Aroclor 1221	74 U
11141-16-5	Aroclor 1232	37 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	66.0%
Tetrachlorometaxylene	82.8%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-36-0-1
SPIKE DUPLICATE

Lab Sample ID: CY20EMSD
LIMS ID: 01-4995
Matrix: Soil

Data Release Authorized:
Reported: 04/23/01

QC Report No: CY20-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 10/13/00
Date Received: 11/16/00

Date extracted: 04/10/01
Date analyzed: 04/12/01 07:41
Instrument ID: ECD3
Sample Amount: 10.8 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 8.2

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 9.4 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	37 U
53469-21-9	Aroclor 1242	---
12672-29-6	Aroclor 1248	37 U
11097-69-1	**Aroclor 1254**	**67**
11096-82-5	**Aroclor 1260**	**61**
11104-28-2	Aroclor 1221	74 U
11141-16-5	Aroclor 1232	37 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	64.2%
Tetrachlorometaxylene	82.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-50-0-1

Lab Sample ID: CY20F
LIMS ID: 01-4996
Matrix: Soil

Data Release Authorized:
Reported: 04/23/01

QC Report No: CY20-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 10/17/00
Date Received: 11/16/00

Date extracted: 04/12/01
Date analyzed: 04/12/01 21:24
Instrument ID: ECD3
Sample Amount: 4.71 g-dry-wt
Final Ext Vol: 40 mL
pH: 8.2

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 6.6 %

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	850 U
53469-21-9	Aroclor 1242	850 U
12672-29-6	Aroclor 1248	850 U
11097-69-1	**Aroclor 1254**	**5,800**
11096-82-5	**Aroclor 1260**	**1,500**
11104-28-2	Aroclor 1221	1,700 U
11141-16-5	Aroclor 1232	850 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	80.0%
Tetrachlorometaxylene	96.2%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

May 8, 2001

Jodie Brundage
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: Project: Tacoma Metals / ARI Job: CL62 additional work

Dear Ms Brundage:

Please find enclosed your request and final analytical results for the above referenced project. One soil sample was retrieved from archives on April 30, 2001 per your request. The sample had been archived at –18°C and was in good condition. The sample was analyzed for PCB's referencing EPA methods 8082.

The sample was extracted on 5/3/01 and analyzed on 5/4/01. There were no analytical complications noted during these analyses.

Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,
Analytical Resources, Inc.

Susan Snyder
Project manger

SS/ss
Enclosures

RECEIVED
MAY - 2001
K/J Federal Way
K/J No/File
Route
Return To/By

333 Ninth Avenue North • Seattle WA 98109-5187 • **206-621-6490** • **206-621-7523** fax

Susan Snyder

From: "Jodie Brundage"
To: "'Susan Snyder'" <susan@arilabs.com>
Sent: Monday, April 30, 2001 9:52 AM
Subject: RE: Tacoma Metals

Morning Susan!
I was wondering if I could get another sample run for PCBs (with 7 Aroclors). The sample ID is TP-60-2-3, the ARI# is CY20. Thanks, Jodie

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: TP-60-2-3

Lab Sample ID: CL62M
LIMS ID: 00-21979
Matrix: Soil

Data Release Authorized: 5/1/01
Reported: 05/07/01

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: 11/15/00
Date Received: 11/16/00

Date extracted: 05/03/01
Date analyzed: 05/04/01 17:26
Instrument ID: ECD1
Sample Amount: 8.89 g-dry-wt
Final Ext Vol: 4.0 mL
pH: 7.2

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 25.9%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	45 U
53469-21-9	Aroclor 1242	45 U
12672-29-6	Aroclor 1248	120 Y
11097-69-1	**Aroclor 1254**	**1,100**
11096-82-5	**Aroclor 1260**	**580**
11104-28-2	Aroclor 1221	90 U
11141-16-5	Aroclor 1232	45 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	79.0%
Tetrachlorometaxylene	60.2%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Lab Sample ID: CL62
LIMS ID: 00-21979
Matrix: Soil

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10

Data Release Authorized:
Reported: 05/07/01

LABORATORY CONTROL SAMPLE SPIKE RECOVERY
Date extracted: 05/03/01

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	279	333	83.7%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	89.8%
Tetrachlorometaxylene	87.8%

Values Reported in Total ug/kg Dry Weight

ANALYTICAL RESOURCES INCORPORATED

SOIL AROCLOR SURROGATE SUMMARY

Matrix: Soil

QC Report No: CL62
Project: Tacoma Metals
996098.10

LIMS ID	Lab ID	Client ID	TCMX #	DCBP #	TOT OUT
00-21979MB	050301MB	Method Blank	82.8%	81.0%	0
00-21979SB	050301SB	Lab Control	87.8%	89.8%	0
00-21979	CL62M	TP-60-2-3	60.2%	79.0%	0

	LCS/MB LIMITS	QC LIMITS
(TCMX) = Tetrachloro-m-xylene	(46-132)	(34-128)
(DCBP) = Decachlorobiphenyl	(61-122)	(39-132)

olumn to be used to flag recovery values

es outside of required QC limits

ate Compound diluted out

FORM-II PCB

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: Method Blank

Lab Sample ID: CL62MB
LIMS ID: 00-21979
Matrix: Soil

Data Release Authorized: CH
Reported: 05/07/01 5/7/01

QC Report No: CL62-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.10
Date Sampled: NA
Date Received: NA

Date extracted: 05/03/01
Date analyzed: 05/04/01 15:46
Instrument ID: ECD1
Sample Amount: 12.0 g-dry-wt
Final Ext Vol: 4.0 mL
pH: NA

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: NA

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	33 U
53469-21-9	Aroclor 1242	33 U
12672-29-6	Aroclor 1248	33 U
11097-69-1	Aroclor 1254	33 U
11096-82-5	Aroclor 1260	33 U
11104-28-2	Aroclor 1221	67 U
11141-16-5	Aroclor 1232	33 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	81.0%
Tetrachlorometaxylene	82.8%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
NV Indicates no value reportable - see additional analyses.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

Appendix I

Interim Policy Calculation Worksheets

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cannot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												1	
EC >6 - 8												1	
EC >8 -10												1	
EC >10 -12	12									0.00	0.0001	1	0.00010
EC >12 -16	695									0.17	0.00010	1	0.00010
EC >16 - 21	3160									0.57	0.0000006	1	0.000001
Total aliphatic	3867	0.06		0.81		0.20		0.02					
Aromatics													
EC >8 - 10												1	
EC >10 - 12												1	
EC >12 - 16	65									0.02	0.12	1	0.123
EC >16 - 21	521									0.13	0.068	1	0.0682
EC >21 - 35	495									0.10	0.00066	1	0.0007
Total aromatic	1081	0.03											
Benzene			0.029		0.00E+00		0.00E+00		0.00E+00			1	
c-PAHs	19.71		7.3		1.44E-04		3.60E-05		1.10E-05				
Ethylbenzene		0.10											
Toluene		0.20										1	
Xylenes		2.00											
Total aromatic:+B-E-X	1081	0.03		0.45		0.11		0.01					
Total				1.26	1.44E-04	0.31	3.60E-05	0.03	1.10E-05	1.00000			0.2

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cannot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												20	
EC >6 - 8												20	
EC >8 -10												20	
EC >10 -12	12									0.00	0.0001	20	0.00000
EC >12 -16	695									0.17	0.00010	20	0.00001
EC >16 - 21	3160									0.57	0.0000006	20	0.000000
Total aliphatic	3867	0.06		0.81		0.20		0.02					
Aromatics													
EC >8 - 10												20	
EC >10 - 12												20	
EC >12 - 16	65									0.02	0.12	20	0.006
EC >16 - 21	521									0.13	0.068	20	0.0034
EC >21 - 35	495									0.10	0.00066	20	0.0000
Total aromatic	1081	0.03											
Benzene			0.029		0.00E+00		0.00E+00		0.00E+00			20	
c-PAHs	19.71		7.3		1.44E-04		3.60E-05		1.10E-05				
Ethylbenzene		0.10											
Toluene		0.20										20	
Xylenes		2.00											
Total aromatic:+B-E-X	1081	0.03		0.45		0.11		0.01					
Total				1.26	1.44E-04	0.31	3.60E-05	0.03	1.10E-05	1.00000			0.0

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cannot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for rasidential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												1	
EC >6 - 8												1	
EC >8 -10												1	
EC >10 -12												1	
EC >12 -16												1	
EC >16 - 21	386									0.30	0.0000003	1	0.000000
Total aliphatic	386	0.06		0.08		0.02		0.00					
Aromatics													
EC >8 - 10												1	
EC >10 - 12												1	
EC >12 - 16												1	
EC >16 - 21	94									0.10	0.053	1	0.0532
EC >21 - 35	676									0.59	0.00392	1	0.0039
Total aromatic	770	0.03											
Benzene			0.029		0.00E+00		0.00E+00		0.00E+00			1	
c-PAHs	1.55		7.3		1.13E-05		2.83E-06		8.62E-07				
Ethylbenzene		0.10											
Toluene		0.20										1	
Xylenes		2.00											
Total aromatic:+B-E-X	770	0.03		0.32		0.08		0.01					
Total				0.40	1.13E-05	0.10	2.83E-06	0.01	8.62E-07	1.00000			0.1

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cannot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												20	
EC >6 - 8												20	
EC >8 -10												20	
EC >10 -12												20	
EC >12 -16												20	
EC >16 - 21	386									0.30	0.0000003	20	0.000000
Total aliphatic	386	0.06		0.08		0.02		0.00					
Aromatics													
EC >8 - 10												20	
EC >10 - 12												20	
EC >12 - 16												20	
EC >16 - 21	94									0.10	0.053	20	0.0027
EC >21 - 35	676									0.59	0.00392	20	0.0002
Total aromatic	770	0.03											
Benzene			0.029		0.00E+00		0.00E+00		0.00E+00			20	
c-PAHs	1.55		7.3		1.13E-05		2.83E-06		8.62E-07				
Ethylbenzene		0.10											
Toluene		0.20										20	
Xylenes		2.00											
Total aromatic:+B-E-X	770	0.03		0.32		0.08		0.01					
Total				0.40	1.13E-05	0.10	2.83E-06	0.01	8.62E-07	1.00000			0.0

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cannot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												1	
EC >6 - 8												1	
EC >8 -10												1	
EC >10 -12												1	
EC >12 -16	151									0.03	0.00002	1	0.00002
EC >16 - 21	1540									0.25	0.0000003	1	0.000000
Total aliphatic	1691	0.06		0.35		0.09		0.01					
Aromatics													
EC >8 - 10												1	
EC >10 - 12												1	
EC >12 - 16	93									0.03	0.16	1	0.159
EC >16 - 21	308									0.07	0.036	1	0.0364
EC >21 - 35	3360									0.62	0.00407	1	0.0041
Total aromatic	3761	0.03											
Benzene			0.029		0.00E+00		0.00E+00		0.00E+00			1	
c-PAHs	5.6		7.3		4.09E-05		1.02E-05		3.12E-06				
Ethylbenzene		0.10											
Toluene		0.20										1	
Xylenes		2.00											
Total aromatic:+B-E-X	3761	0.03		1.57		0.39		0.04					
Total				1.92	4.09E-05	0.48	1.02E-05	0.04	3.12E-06	1.00000			0.2

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cannot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot excaed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot excaed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												20	
EC >6 - 8												20	
EC >8 -10												20	
EC >10 -12												20	
EC >12 -16	151									0.03	0.00002	20	0.00000
EC >16 - 21	1540									0.25	0.0000003	20	0.000000
Total aliphatic	1691	0.06		0.35		0.09		0.01					
Aromatics													
EC >8 - 10												20	
EC >10 - 12												20	
EC >12 - 16	93									0.03	0.16	20	0.008
EC >16 - 21	308									0.07	0.036	20	0.0018
EC >21 - 35	3360									0.62	0.00407	20	0.0002
Total aromatic	3761	0.03											
Benzene			0.029		0.00E+00		0.00E+00		0.00E+00			20	
c-PAHs	5.6		7.3		4.09E-05		1.02E-05		3.12E-06				
Ethylbenzene		0.10											
Toluene		0.20										20	
Xylenes		2.00											
Total aromatic:+B-E-X	3761	0.03		1.57		0.39		0.04					
Total				1.92	4.09E-05	0.48	1.02E-05	0.04	3.12E-06	1.00000			0.0

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cannot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												1	
EC >6 - 8												1	
EC >8 -10												1	
EC >10 -12												1	
EC >12 -16	319									0.03	0.00002	1	0.00002
EC >16 - 21	243									0.02	0.0000000	1	0.000000
Total aliphatic	562	0.06		0.12		0.03		0.00					
Aromatics													
EC >8 - 10												1	
EC >10 - 12												1	
EC >12 - 16	1960									0.25	1.47	1	1.468
EC >16 - 21	4270									0.44	0.222	1	0.2220
EC >21 - 35	3260									0.26	0.00174	1	0.0017
Total aromatic	9490	0.03											
Benzene	0.011		0.029		3.19E-10		7.98E-11		2.43E-11	0.00	0.0	1	0.00
c-PAHs	634		7.3		4.63E-03		1.16E-03		3.53E-04				
Ethylbenzene	0.024	0.10		0.00		0.00		0.00					
Toluene	0.27	0.20		0.00		0.00		0.00		0.00	0.0	1	0.030
Xylenes	0.142	2.00		0.00		0.00		0.00					
Total aromatic:+B-E-X	9490	0.03		3.95		0.99		0.09					
Total				4.07	4.63E-03	1.02	1.16E-03	0.09	3.53E-04	1.00000			1.7

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cannot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												20	
EC >6 - 8												20	
EC >8 -10												20	
EC >10 -12												20	
EC >12 -16	319									0.03	0.00002	20	0.00000
EC >16 - 21	243									0.02	0.0000000	20	0.000000
Total aliphatic	562	0.06		0.12		0.03		0.00					
Aromatics													
EC >8 - 10												20	
EC >10 - 12												20	
EC >12 - 16	1960									0.25	1.47	20	0.073
EC >16 - 21	4270									0.44	0.222	20	0.0111
EC >21 - 35	3260									0.26	0.00174	20	0.0001
Total aromatic	9490	0.03											
Benzene	0.011		0.029		3.19E-10		7.98E-11		2.43E-11	0.00	0.0	20	0.00
c-PAHs	634		7.3		4.63E-03		1.16E-03		3.53E-04				
Ethylbenzene	0.024	0.10		0.00		0.00		0.00					
Toluene	0.27	0.20		0.00		0.00		0.00		0.00	0.0	20	0.001
Xylenes	0.142	2.00		0.00		0.00		0.00					
Total aromatic +BTEX	9490	0.03		3.95		0.99		0.09					
Total				4.07	4.64E-03	1.02	1.16E-03	0.09	3.53E-04	100.000			0.1

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cannot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												1	
EC >6 - 8												1	
EC >8 -10												1	
EC >10 -12												1	
EC >12 -16												1	
EC >16 - 21	304									0.31	0.0000003	1	0.000000
Total aliphatic	304	0.06		0.06		0.02		0.00					
Aromatics													
EC >8 - 10												1	
EC >10 - 12												1	
EC >12 - 16												1	
EC >16 - 21	75									0.11	0.054	1	0.0543
EC >21 - 35	521									0.59	0.00388	1	0.0039
Total aromatic	596	0.03											
Benzene			0.029		0.00E+00		0.00E+00		0.00E+00			1	
c-PAHs	1.904		7.3		1.39E-05		3.47E-06		1.06E-06				
Ethylbenzene		0.10											
Toluene		0.20										1	
Xylenes		2.00											
Total aromatic:+B-E-X	596	0.03		0.25		0.06		0.01					
Total				0.31	1.39E-05	0.08	3.47E-06	0.01	1.06E-06	1.00000			0.1

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemicel or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cennot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												20	
EC >6 - 8												20	
EC >8 -10												20	
EC >10 -12												20	
EC >12 -16												20	
EC >16 - 21	304									0.31	0.0000003	20	0.000000
Total aliphatic	304	0.06		0.06		0.02		0.00					
Aromatics													
EC >8 - 10												20	
EC >10 - 12												20	
EC >12 - 16												20	
EC >16 - 21	75									0.11	0.054	20	0.0027
EC >21 - 35	521									0.59	0.00388	20	0.0002
Total aromatic	596	0.03											
Benzene			0.029		0.00E+00		0.00E+00		0.00E+00			20	
c-PAHs	1.904		7.3		1.39E-05		3.47E-06		1.06E-06				
Ethylbenzene		0.10											
Toluene		0.20										20	
Xylenes		2.00											
Total aromatic+B-E-X	596	0.03		0.25		0.06		0.01					
Total				0.31	1.39E-05	0.08	3.47E-06	0.01	1.06E-06	1.00000			0.0

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cannot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												1	
EC >6 - 8												1	
EC >8 -10												1	
EC >10 -12												1	
EC >12 -16												1	
EC >16 - 21	339									0.22	0.0000002	1	0.000000
Total aliphatic	339	0.06		0.07		0.02		0.00					
Aromatics													
EC >8 - 10												1	
EC >10 - 12												1	
EC >12 - 16	56									0.06	0.37	1	0.370
EC >16 - 21	267									0.24	0.123	1	0.1231
EC >21 - 35	670									0.48	0.00316	1	0.0032
Total aromatic	993	0.03											
Benzene			0.029		0.00E+00		0.00E+00		0.00E+00			1	
c-PAHs	9.94		7.3		7.26E-05		1.81E-05		5.53E-06				
Ethylbenzene		0.10											
Toluene		0.20										1	
Xylenes		2.00											
Total aromatic:+B-E-X	993	0.03		0.41		0.10		0.01					
Total				0.48	7.26E-05	0.12	1.81E-05	0.01	5.53E-06	1.00000			0.5

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cannot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												20	
EC >6 - 8												20	
EC >8 -10												20	
EC >10 -12												20	
EC >12 -16												20	
EC >16 - 21	339									0.22	0.0000002	20	0.000000
Total aliphatic	339	0.06		0.07		0.02		0.00					
Aromatics													
EC >8 - 10												20	
EC >10 - 12												20	
EC >12 - 16	56									0.06	0.37	20	0.018
EC >16 - 21	267									0.24	0.123	20	0.0062
EC >21 - 35	670									0.48	0.00316	20	0.0002
Total aromatic	993	0.03											
Benzene			0.029		0.00E+00		0.00E+00		0.00E+00			20	
c-PAHs	9.94		7.3		7.26E-05		1.81E-05		5.53E-06				
Ethylbenzene		0.10											
Toluene		0.20										20	
Xylenes		2.00											
Total aromatic:+B-E-X	993	0.03		0.41		0.10		0.01					
Total				0.48	7.26E-05	0.12	1.81E-05	0.01	5.53E-06	1.00000			0.0

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cannot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												1	
EC >6 - 8												1	
EC >8 -10												1	
EC >10 -12												1	
EC >12 -16												1	
EC >16 - 21	151									0.11	0.0000001	1	0.000000
Total aliphatic	151	0.06		0.03		0.01		0.00					
Aromatics													
EC >8 - 10												1	
EC >10 - 12												1	
EC >12 - 16	42									0.06	0.33	1	0.332
EC >16 - 21	265									0.29	0.146	1	0.1462
EC >21 - 35	632									0.54	0.00357	1	0.0036
Total aromatic	939	0.03											
Benzene			0.029		0.00E+00		0.00E+00		0.00E+00			1	
c-PAHs	167.8		7.3		1.22E-03		3.06E-04		9.33E-05				
Ethylbenzene		0.10											
Toluene		0.20										1	
Xylenes		2.00											
Total aromatic+B-E-X	939	0.03		0.39		0.10		0.01					
Total				0.42	1.22E-03	0.11	3.06E-04	0.01	9.33E-05	1.00000			0.5

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cennot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												20	
EC >6 - 8												20	
EC >8 -10												20	
EC >10 -12												20	
EC >12 -16												20	
EC >16 - 21	151									0.11	0.0000001	20	0.000000
Total aliphatic	151	0.06		0.03		0.01		0.00					
Aromatics													
EC >8 - 10												20	
EC >10 - 12												20	
EC >12 - 16	42									0.06	0.33	20	0.017
EC >16 - 21	265									0.29	0.146	20	0.0073
EC >21 - 35	632									0.54	0.00357	20	0.0002
Total aromatic	939	0.03											
Benzene			0.029		0.00E+00		0.00E+00		0.00E+00			20	
c-PAHs	167.8		7.3		1.22E-03		3.06E-04		9.33E-05				
Ethylbenzene		0.10											
Toluene		0.20										20	
Xylenes		2.00											
Total aromatic:+B-E-X	939	0.03		0.39		0.10		0.01					
Total				0.42	1.22E-03	0.11	3.06E-04	0.01	9.33E-05	1.00000			0.0

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cannot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												1	
EC >6 - 8												1	
EC >8 -10												1	
EC >10 -12												1	
EC >12 -16												1	
EC >16 - 21	106									0.17	0.0000002	1	0.000000
Total aliphatic	106	0.06		0.02		0.01		0.00					
Aromatics													
EC >8 - 10												1	
EC >10 - 12												1	
EC >12 - 16												1	
EC >16 - 21	71									0.17	0.084	1	0.0843
EC >21 - 35	360									0.66	0.00437	1	0.0044
Total aromatic	431	0.03											
Benzene			0.029		0.00E+00		0.00E+00		0.00E+00			1	
c-PAHs	14.79		7.3		1.08E-04		2.70E-05		8.23E-06				
Ethylbenzene		0.10											
Toluene		0.20										1	
Xylenes		2.00											
Total aromatic:+B-E-X	431	0.03		0.18		0.04		0.00					
Total				0.20	1.08E-04	0.05	2.70E-05	0.00	8.23E-06	1.00000			0.1

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cannot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												20	
EC >6 - 8												20	
EC >8 -10												20	
EC >10 -12												20	
EC >12 -16												20	
EC >16 - 21	106									0.17	0.0000002	20	0.000000
Total aliphatic	106	0.06		0.02		0.01		0.00					
Aromatics													
EC >8 - 10												20	
EC >10 - 12												20	
EC >12 - 16												20	
EC >16 - 21	71									0.17	0.084	20	0.0042
EC >21 - 35	360									0.66	0.00437	20	0.0002
Total aromatic	431	0.03											
Benzene			0.029		0.00E+00		0.00E+00		0.00E+00			20	
c-PAHs	14.79		7.3		1.08E-04		2.70E-05		8.23E-06				
Ethylbenzene		0.10											
Toluene		0.20										20	
Xylenes		2.00											
Total aromatic:+B-E-X	431	0.03		0.18		0.04		0.00					
Total				0.20	1.08E-04	0.05	2.70E-05	0.00	8.23E-06	1.00000			0.0

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cannot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												1	
EC >6 - 8												1	
EC >8 -10												1	
EC >10 -12												1	
EC >12 -16	20									0.03	0.00002	1	0.00002
EC >16 - 21	163									0.16	0.0000002	1	0.000000
Total aliphatic	183	0.06		0.04		0.01		0.00					
Aromatics													
EC >8 - 10												1	
EC >10 - 12												1	
EC >12 - 16	19									0.03	0.20	1	0.201
EC >16 - 21	95									0.14	0.070	1	0.0697
EC >21 - 35	559									0.64	0.00420	1	0.0042
Total aromatic	673	0.03											
Benzene			0.029		0.00E+00		0.00E+00		0.00E+00			1	
c-PAHs	6		7.3		4.38E-05		1.10E-05		3.34E-06				
Ethylbenzene		0.10											
Toluene		0.20										1	
Xylenes		2.00											
Total aromatic+B-E-X	673	0.03		0.28		0.07		0.01					
Total				0.32	4.38E-05	0.08	1.10E-05	0.01	3.34E-06	1.00000			0.3

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cannot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												20	
EC >6 - 8												20	
EC >8 -10												20	
EC >10 -12												20	
EC >12 -16	20									0.03	0.00002	20	0.00000
EC >16 - 21	163									0.16	0.0000002	20	0.000000
Total aliphatic	183	0.06		0.04		0.01		0.00					
Aromatics													
EC >8 - 10												20	
EC >10 - 12												20	
EC >12 - 16	19									0.03	0.20	20	0.010
EC >16 - 21	95									0.14	0.070	20	0.0035
EC >21 - 35	559									0.64	0.00420	20	0.0002
Total aromatic	673	0.03											
Benzene			0.029		0.00E+00		0.00E+00		0.00E+00			20	
c-PAHs	6		7.3		4.38E-05		1.10E-05		3.34E-06				
Ethylbenzene		0.10											
Toluene		0.20										20	
Xylenes		2.00											
Total aromatic+B-E-X	673	0.03		0.28		0.07		0.01					
Total				0.32	4.38E-05	0.08	1.10E-05	0.01	3.34E-06	1.00000			0.0

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cannot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												1	
EC >6 - 8												1	
EC >8 -10												1	
EC >10 -12												1	
EC >12 -16												1	
EC >16 - 21	94									0.30	0.0000003	1	0.000000
Total aliphatic	94	0.06		0.02		0.00		0.00					
Aromatics													
EC >8 - 10												1	
EC >10 - 12												1	
EC >12 - 16												1	
EC >16 - 21												1	
EC >21 - 35	199									0.70	0.00465	1	0.0046
Total aromatic	199	0.03											
Benzene			0.029		0.00E+00		0.00E+00		0.00E+00			1	
c-PAHs	11.53		7.3		8.42E-05		2.10E-05		6.41E-06				
Ethylbenzene		0.10											
Toluene		0.20										1	
Xylenes		2.00											
Total aromatic:+B-E-X	199	0.03		0.08		0.02		0.00					
Total				0.10	8.42E-05	0.03	2.10E-05	0.00	6.41E-06	1.00000			0.0

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cannot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												20	
EC >6 - 8												20	
EC >8 -10												20	
EC >10 -12												20	
EC >12 -16												20	
EC >16 - 21	94									0.30	0.0000003	20	0.000000
Total aliphatic	94	0.06		0.02		0.00		0.00					
Aromatics													
EC >8 - 10												20	
EC >10 - 12												20	
EC >12 - 16												20	
EC >16 - 21												20	
EC >21 - 35	199									0.70	0.00465	20	0.0002
Total aromatic	199	0.03											
Benzene			0.029		0.00E+00		0.00E+00		0.00E+00			20	
c-PAHs	11.53		7.3		8.42E-05		2.10E-05		6.41E-06				
Ethylbenzene		0.10											
Toluene		0.20										20	
Xylenes		2.00											
Total aromatic:+B-E-X	199	0.03		0.08		0.02		0.00					
Total				0.10	8.42E-05	0.03	2.10E-05	0.00	6.41E-06	1.00000			0.0

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cannot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												1	
EC >6 - 8												1	
EC >8 -10												1	
EC >10 -12												1	
EC >12 -16	86									0.12	0.00007	1	0.00007
EC >16 - 21	366									0.39	0.0000004	1	0.000000
Total aliphatic	452	0.06		0.09		0.02		0.00					
Aromatics													
EC >8 - 10												1	
EC >10 - 12												1	
EC >12 - 16												1	
EC >16 - 21	76									0.11	0.059	1	0.0585
EC >21 - 35	309									0.37	0.00245	1	0.0024
Total aromatic	385	0.03											
Benzene			0.029		0.00E+00		0.00E+00		0.00E+00			1	
c-PAHs	2.81		7.3		2.05E-05		5.13E-06		1.56E-06				
Ethylbenzene		0.10											
Toluene		0.20										1	
Xylenes		2.00											
Total aromatic:+B-E-X	385	0.03		0.16		0.04		0.00					
Total				0.25	2.05E-05	0.06	5.13E-06	0.01	1.56E-06	1.00000			0.1

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cannot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												20	
EC >6 - 8												20	
EC >8 -10												20	
EC >10 -12												20	
EC >12 -16	86									0.12	0.00007	20	0.00000
EC >16 - 21	366									0.39	0.0000004	20	0.000000
Total aliphatic	452	0.06		0.09		0.02		0.00					
Aromatics													
EC >8 - 10												20	
EC >10 - 12												20	
EC >12 - 16												20	
EC >16 - 21	76									0.11	0.059	20	0.0029
EC >21 - 35	309									0.37	0.00245	20	0.0001
Total aromatic	385	0.03											
Benzene			0.029		0.00E+00		0.00E+00		0.00E+00			20	
c-PAHs	2.81		7.3		2.05E-05		5.13E-06		1.56E-06				
Ethylbenzene		0.10											
Toluene		0.20										20	
Xylenes		2.00											
Total aromatic+B-E-X	385	0.03		0.16		0.04		0.00					
Total				0.25	2.05E-05	0.06	5.13E-06	0.01	1.56E-06	1.00000			0.0

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Intarim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cannot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												1	
EC >6 - 8												1	
EC >8 -10												1	
EC >10 -12												1	
EC >12 -16												1	
EC >16 - 21	202									0.33	0.0000003	1	0.000000
Total aliphatic	202	0.06		0.04		0.01		0.00					
Aromatics													
EC >8 - 10												1	
EC >10 - 12												1	
EC >12 - 16												1	
EC >16 - 21	53									0.12	0.063	1	0.0629
EC >21 - 35	295									0.54	0.00358	1	0.0036
Total aromatic	348	0.03											
Benzene	0.002		0.029		5.80E-11		1.45E-11		4.42E-12	0.00	0.0	1	0.02
c-PAHs	4.68		7.3		3.42E-05		8.54E-06		2.60E-06				
Ethylbenzene	0.002	0.10		0.00		0.00		0.00					
Toluene	0.64	0.20		0.00		0.00		0.00		0.00	1.6	1	1.598
Xylenes	0.0164	2.00		0.00		0.00		0.00					
Total aromatic:+B-E-X	348	0.03		0.14		0.04		0.00					
Total				0.19	3.42E-05	0.05	8.64E-06	0.00	2.60E-06	1.00000			1.7

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cannot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												20	
EC >6 - 8												20	
EC >8 -10												20	
EC >10 -12												20	
EC >12 -16												20	
EC >16 - 21	202									0.33	0.0000003	20	0.000000
Total aliphatic	202	0.06		0.04		0.01		0.00					
Aromatics													
EC >8 - 10												20	
EC >10 - 12												20	
EC >12 - 16												20	
EC >16 - 21	53									0.12	0.063	20	0.0031
EC >21 - 35	295									0.54	0.00358	20	0.0002
Total aromatic	[illegible]	0.03											
Benzene	0.002		0.029		5.80E-11		1.45E-11		4.42E-12	0.00	0.0	20	0.00
c-PAHs	4.68		7.3		3.42E-05		8.54E-06		2.60E-06				
Ethylbenzene	0.002	0.10		0.00		0.00		0.00					
Toluene	0.64	0.20		0.00		0.00		0.00		0.00	1.6	20	0.080
Xylenes	0.0164	2.00		0.00		0.00		0.00					
Total aromatic (B-E-X)	[illegible]	0.03		0.14		0.04		0.00					
Total				[illegible]	[illegible]	[illegible]	[illegible]	0.00	[illegible]	[illegible]			0.1

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cannot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												1	
EC >6 - 8												1	
EC >8 -10												1	
EC >10 -12												1	
EC >12 -16	137									0.24	0.00014	1	0.00014
EC >16 - 21	133									0.18	0.0000002	1	0.000000
Total aliphatic	270	0.06		0.06		0.01		0.00					
Aromatics													
EC >8 - 10												1	
EC >10 - 12												1	
EC >12 - 16												1	
EC >16 - 21												1	
EC >21 - 35	389									0.58	0.00382	1	0.0038
Total aromatic	389	0.03											
Benzene	0.003		0.029		8.70E-11		2.18E-11		6.63E-12	0.00	0.0	1	0.02
c-PAHs	1.038		7.3		7.58E-06		1.89E-06		5.77E-07				
Ethylbenzene	0.003	0.10		0.00		0.00		0.00					
Toluene	0.32	0.20		0.00		0.00		0.00		0.00	0.6	1	0.646
Xylenes	0.006	2.00		0.00		0.00		0.00					
Total aromatic:+B-E-X	389	0.03		0.16		0.04		0.00					
Total				0.22	7.58E-06	0.05	1.89E-06	0.00	5.77E-07	1.00000			0.7

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cannot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												20	
EC >6 - 8												20	
EC >8 -10												20	
EC >10 -12												20	
EC >12 -16	137									0.24	0.00014	20	0.00001
EC >16 - 21	133									0.18	0.0000002	20	0.000000
Total aliphatic	270	0.06		0.06		0.01		0.00					
Aromatics													
EC >8 - 10												20	
EC >10 - 12												20	
EC >12 - 16												20	
EC >16 - 21												20	
EC >21 - 35	389									0.58	0.00382	20	0.0002
Total aromatic	389	0.03											
Benzene	0.003		0.029		8.70E-11		2.18E-11		6.63E-12	0.00	0.0	20	0.00
c-PAHs	1.038		7.3		7.58E-06		1.89E-06		5.77E-07				
Ethylbenzene	0.003	0.10		0.00		0.00		0.00					
Toluene	0.32	0.20		0.00		0.00		0.00		0.00	0.6	20	0.032
Xylenes	0.006	2.00		0.00		0.00		0.00					
Total aromatic, B-E-X	389	0.03		0.16		0.04		0.00					
Total				0.22	7.58E-06	0.05	1.89E-06	0.00	5.77E-07	1.00000			0.0

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cannot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												1	
EC >6 - 8												1	
EC >8 -10												1	
EC >10 -12	96									0.09	0.0024	1	0.00242
EC >12 -16	280									0.22	0.00013	1	0.00013
EC >16 - 21	145									0.08	0.0000001	1	0.000000
Total aliphatic	521	0.06		0.11		0.03		0.00					
Aromatics													
EC >8 - 10												1	
EC >10 - 12	36									0.04	1.1	1	1.074
EC >12 - 16	106									0.11	0.64	1	0.636
EC >16 - 21	208									0.17	0.087	1	0.0866
EC >21 - 35	438									0.28	0.00187	1	0.0019
Total aromatic	788	0.03											
Benzene	0.003		0.029		8.70E-11		2.18E-11		6.63E-12	0.00	0.0	1	0.01
c-PAHs	30.4		7.3		2.22E-04		5.55E-05		1.69E-05				
Ethylbenzene	0.016	0.10		0.00		0.00		0.00					
Toluene	0.72	0.20		0.00		0.00		0.00		0.00	0.6	1	0.631
Xylenes	0.02	2.00		0.00		0.00		0.00					
Total aromatic:+B-E-X	788	0.03		0.33		0.08		0.01					
Total				0.44	2.22E-04	0.11	5.55E-05	0.01	1.69E-05	1.00000			2.4

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cannot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												20	
EC >6 - 8												20	
EC >8 -10												20	
EC >10 -12	96									0.09	0.0024	20	0.00012
EC >12 -16	280									0.22	0.00013	20	0.00001
EC >16 - 21	145									0.08	0.0000001	20	0.000000
Total aliphatic	521	0.06		0.11		0.03		0.00					
Aromatics													
EC >8 - 10												20	
EC >10 - 12	36									0.04	1.1	20	0.054
EC >12 - 16	106									0.11	0.64	20	0.032
EC >16 - 21	208									0.17	0.087	20	0.0043
EC >21 - 35	438									0.28	0.00187	20	0.0001
Total aromatic	788	0.03											
Benzene	0.003		0.029		8.70E-11		2.18E-11		6.63E-12	0.00	0.0	20	0.00
c-PAHs	30.4		7.3		2.22E-04		5.55E-05		1.69E-05				
Ethylbenzene	0.015	0.10		0.00		0.00		0.00					
Toluene	0.72	0.20		0.00		0.00		0.00		0.00	0.6	20	0.032
Xylenes	0.02	2.00		0.00		0.00		0.00					
Total aromatic:+B-E-X	786	0.03		0.33		0.08		0.01					
Total				0.44	2.22E-04	0.11	5.55E-05	0.01	1.69E-05	1.00000			0.1

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cannot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												1	
EC >6 - 8												1	
EC >8 -10												1	
EC >10 -12												1	
EC >12 -16	241									0.10	0.00006	1	0.00006
EC >16 - 21	1830									0.56	0.0000006	1	0.000001
Total aliphatic	2071	0.06		0.43		0.11		0.01					
Aromatics													
EC >8 - 10												1	
EC >10 - 12												1	
EC >12 - 16												1	
EC >16 - 21	178									0.08	0.040	1	0.0395
EC >21 - 35	761									0.26	0.00173	1	0.0017
Total aromatic	939	0.03											
Benzene			0.029		0.00E+00		0.00E+00		0.00E+00			1	
c-PAHs	6.085		7.3		4.44E-05		1.11E-05		3.38E-06				
Ethylbenzene		0.10											
Toluene		0.20										1	
Xylenes		2.00											
Total aromatic:+B-E-X	939	0.03		0.39		0.10		0.01					
Total				0.82	4.44E-05	0.21	1.11E-05	0.02	3.38E-06	1.00000			0.0

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cannot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												20	
EC >6 - 8												20	
EC >8 -10												20	
EC >10 -12												20	
EC >12 -16	241									0.10	0.00006	20	0.00000
EC >16 - 21	1830									0.56	0.0000006	20	0.000000
Total aliphatic	2071	0.06		0.43		0.11		0.01					
Aromatics													
EC >8 - 10												20	
EC >10 - 12												20	
EC >12 - 16												20	
EC >16 - 21	178									0.08	0.040	20	0.0020
EC >21 - 35	761									0.26	0.00173	20	0.0001
Total aromatic	939	0.03											
Benzene			0.029		0.00E+00		0.00E+00		0.00E+00			20	
c-PAHs	6.085		7.3		4.44E-05		1.11E-05		3.38E-06				
Ethylbenzene		0.10											
Toluene		0.20										20	
Xylenes		2.00											
Total aromatic:+B-E-X	939	0.03		0.39		0.10		0.01					
Total				0.82	4.44E-05	0.21	1.11E-05	0.02	3.38E-06	1.00000			0.0

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cannot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												1	
EC >6 - 8												1	
EC >8 -10												1	
EC >10 -12												1	
EC >12 -16												1	
EC >16 - 21	231									0.30	0.0000003	1	0.000000
Total aliphatic	231	0.06		0.05		0.01		0.00					
Aromatics													
EC >8 - 10												1	
EC >10 - 12												1	
EC >12 - 16												1	
EC >16 - 21												1	
EC >21 - 35	468									0.69	0.00455	1	0.0046
Total aromatic	468	0.03											
Benzene	0.075		0.029		2.18E-09		5.44E-10		1.66E-10	0.00	0.6	1	0.61
c-PAHs	0.134		7.3		9.78E-07		2.45E-07		7.45E-08				
Ethylbenzene	0.075	0.10		0.00		0.00		0.00					
Toluene	1.8	0.20		0.00		0.00		0.00		0.01	3.6	1	3.600
Xylenes	0.075	2.00		0.00		0.00		0.00					
Total aromatic:+B-E-X	468	0.03		0.19		0.05		0.00					
Total				0.24	9.80E-07	0.06	2.45E-07	0.01	7.47E-08	1.00000	[illegible]	[illegible]	4.2

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundweter." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cannot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												20	
EC >6 - 8												20	
EC >8 -10												20	
EC >10 -12												20	
EC >12 -16												20	
EC >16 - 21	231									0.30	0.0000003	20	0.000000
Total aliphatic	231	0.06		0.05		0.01		0.00					
Aromatics													
EC >8 - 10												20	
EC >10 - 12												20	
EC >12 - 16												20	
EC >16 - 21												20	
EC >21 - 35	468									0.69	0.00455	20	0.0002
Total aromatic	468	0.03											
Benzene	0.075		0.029		2.18E-09		5.44E-10		1.66E-10	0.00	0.6	20	0.03
c-PAHs	0.134		7.3		9.78E-07		2.45E-07		7.45E-08				
Ethylbenzene	0.075	0.10		0.00		0.00		0.00					
Toluene	1.8	0.20		0.00		0.00		0.00		0.01	3.6	20	0.180
Xylenes	0.075	2.00		0.00		0.00		0.00					
Total aromatic BETX	1.88	0.03		0.19		0.05		0.00					
Total				0.24	9.80E-07	0.06	2.45E-07	0.01	7.47E-08	1.00000			0.2

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cannot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												1	
EC >6 - 8												1	
EC >8 -10												1	
EC >10 -12	137									0.16	0.0041	1	0.00411
EC >12 -16	145									0.13	0.00008	1	0.00008
EC >16 - 21	463									0.32	0.0000003	1	0.000000
Total aliphatic	745	0.06		0.16		0.04		0.00					
Aromatics													
EC >8 - 10												1	
EC >10 - 12	0									0.00	0.0	1	0.000
EC >12 - 16	0									0.00	0.00	1	0.000
EC >16 - 21	89									0.09	0.044	1	0.0440
EC >21 - 35	396									0.30	0.00201	1	0.0020
Total aromatic	[illegible]	0.03											
Benzene	0.07		0.029		2.03E-09		5.08E-10		1.55E-10	0.00	0.3	1	0.29
c-PAHs	0.989		7.3		7.22E-06		1.80E-06		5.50E-07				
Ethylbenzene	0.07	0.10		0.00		0.00		0.00					
Toluene	0.098	0.20		0.00		0.00		0.00		0.00	0.1	1	0.102
Xylenes	0.07	2.00		0.00		0.00		0.00					
Total aromatic:+B-E-X	485	0.03		0.20		0.05		0.00					
Total				0.36	7.22E-06	0.09	1.81E-06	0.01	5.50E-07	1.00000			0.4

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cannot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												20	
EC >6 - 8												20	
EC >8 -10												20	
EC >10 -12	137									0.16	0.0041	20	0.00021
EC >12 -16	145									0.13	0.00008	20	0.00000
EC >16 - 21	463									0.32	0.0000003	20	0.000000
Total aliphatic	745	0.06		0.16		0.04		0.00					
Aromatics													
EC >8 - 10												20	
EC >10 - 12	0									0.00	0.0	20	0.000
EC >12 - 16	0									0.00	0.00	20	0.000
EC >16 - 21	89									0.09	0.044	20	0.0022
EC >21 - 35	396									0.30	0.00201	20	0.0001
Total aromatic	485	0.03											
Benzene	0.07		0.029		2.03E-09		5.08E-10		1.55E-10	0.00	0.3	20	0.01
c-PAHs	0.989		7.3		7.22E-06		1.80E-06		5.50E-07				
Ethylbenzene	0.07	0.10		0.00		0.00		0.00					
Toluene	0.098	0.20		0.00		0.00		0.00		0.00	0.1	20	0.005
Xylenes	0.07	2.00		0.00		0.00		0.00					
Total aromatic +B-E-X	485	0.03		0.20		0.05		0.00					
Total				0.36	7.22E-06	0.09	1.81E-06	0.01	5.50E-07	1.00000			0.01

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cennot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cennot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												1	
EC >6 - 8												1	
EC >8 -10												1	
EC >10 -12												1	
EC >12 -16	419									0.03	0.00002	1	0.00002
EC >16 - 21	442									0.02	0.0000000	1	0.000000
Total aliphatic	861	0.06		0.18		0.04		0.00					
Aromatics													
EC >8 - 10												1	
EC >10 - 12	73									0.01	0.2	1	0.202
EC >12 - 16	2300									0.22	1.28	1	1.276
EC >16 - 21	5590									0.42	0.215	1	0.2153
EC >21 - 35	4950									0.30	0.00195	1	0.0020
Total aromatic	12913	0.03											
Benzene	0.115		0.029		3.34E-09		8.34E-10		2.54E-10	0.00	0.0	1	0.04
c-PAHs	639		7.3		4.66E-03		1.17E-03		3.55E-04				
Ethylbenzene	0.115	0.10		0.00		0.00		0.00					
Toluene	1.2	0.20		0.00		0.00		0.00		0.00	0.1	1	0.097
Xylenes	0.115	2.00		0.00		0.00		0.00					
Total aromatic:+B-E-X	12913	0.03		5.38		1.35		0.12					
Total				5.56	4.66E-03	1.39	1.17E-03	0.13	3.55E-04	1.00000			1.8

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cannot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												20	
EC >6 - 8												20	
EC >8 -10												20	
EC >10 -12												20	
EC >12 -16	419									0.03	0.00002	20	0.00000
EC >16 - 21	442									0.02	0.0000000	20	0.000000
Total Aliphatic	861	0.06		0.18		0.04		0.00					
Aromatics													
EC >8 - 10												20	
EC >10 - 12	73									0.01	0.2	20	0.010
EC >12 - 16	2300									0.22	1.28	20	0.064
EC >16 - 21	5590									0.42	0.215	20	0.0108
EC >21 - 35	4950									0.30	0.00195	20	0.0001
Total Aromatic	12913	0.03											
Benzene	0.115		0.029		3.34E-09		8.34E-10		2.54E-10	0.00	0.0	20	0.00
c-PAHs	639		7.3		4.66E-03		1.17E-03		3.55E-04				
Ethylbenzene	0.115	0.10		0.00		0.00		0.00					
Toluene	1.2	0.20		0.00		0.00		0.00		0.00	0.1	20	0.005
Xylenes	0.115	2.00		0.00		0.00		0.00					
Total Aromatic+BETX	13913	0.03		5.38		1.35		0.12					
Total				5.56	4.66E-03	1.39	1.17E-03	0.12	3.55E-04	1.00000			0.1

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cannot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												1	
EC >6 - 8												1	
EC >8 -10												1	
EC >10 -12												1	
EC >12 -16	150									0.02	0.00001	1	0.00001
EC >16 - 21	122									0.01	0.0000000	1	0.000000
Total aliphatic	272	0.06		0.06		0.01		0.00					
Aromatics													
EC >8 - 10												1	
EC >10 - 12	376									0.07	1.7	1	1.717
EC >12 - 16	1260									0.20	1.16	1	1.157
EC >16 - 21	3030									0.38	0.193	1	0.1931
EC >21 - 35	3280									0.32	0.00214	1	0.0021
Total aromatic	7946	0.03											
Benzene	0.073		0.029		2.12E-09		5.29E-10		1.61E-10	0.00	0.0	1	0.04
c-PAHs	730		7.3		5.33E-03		1.33E-03		4.06E-04				
Ethylbenzene	0.87	0.10		0.00		0.00		0.00					
Toluene	0.43	0.20		0.00		0.00		0.00		0.00	0.1	1	0.058
Xylenes	3.6	2.00		0.00		0.00		0.00					
Total aromatic:+B-E-X	7942	0.03		3.31		0.83		0.08					
Total				3.37	5.33E-03	0.84	1.33E-03	0.08	4.06E-04	1.00000			3.2

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Worksheet:

Calculations for Using the TPH Interim Policy (Two Pathways: Human Health and Soil-to-Groundwater)*

1. As in "Calculations for Using the TPH Interim Policy" example put the soil concentrations in the "Soil Conc" column.
2. Examine the hazard index and risk for each land use you wish to use, for each chemical or fraction, and the "Conc. at the well."
3. Hazard quotients for individual substances or fractions cannot exceed 1.0
4. The hazard index (sum of the hazard quotients) cannot exceed 1.0
5. The risk for individual substance or fractions cannot exceed 1x10E-06 for residential land use or 1x10E-05 for commercial or industrial.
6. The risk for the total cannot exceed 1x10E-05 for any land use.
7. The "concentration at the well" cannot exceed 1.0 mg/L total TPH.
8. If any exceedence occurs in 3-7 above, then the cleanup level for TPH has not been met.

1	2	3	4	5	6	7	8	9	10	11	12		13
	Soil Conc.	RfD	OCPF	Residential		Commercial		Industrial		Mol. Frac.	Effect. Sol.	DF	Conc.@ well
Compound	(mg/kg)	(mg/kg*day)	(kg*day/mg)	HQ	Risk	HQ	Risk	HQ	Risk	(percent)	(mg/l)		(mg/l)
Aliphatics													
EC 5 - 6												20	
EC >6 - 8												20	
EC >8 -10												20	
EC >10 -12												20	
EC >12 -16	150									0.02	0.00001	20	0.00000
EC >16 - 21	122									0.01	0.0000000	20	0.000000
Total aliphatic	272	0.06		0.06		0.01		0.00					
Aromatics													
EC >8 - 10												20	
EC >10 - 12	376									0.07	1.7	20	0.086
EC >12 - 16	1260									0.20	1.16	20	0.058
EC >16 - 21	3030									0.38	0.193	20	0.0097
EC >21 - 35	3280									0.32	0.00214	20	0.0001
Total aromatic	7946	0.03											
Benzene	0.073		0.029		2.12E-09		5.29E-10		1.61E-10	0.00	0.0	20	0.00
c-PAHs	730		7.3		5.33E-03		1.33E-03		4.06E-04				
Ethylbenzene	0.87	0.10		0.00		0.00		0.00					
Toluene	0.43	0.20		0.00		0.00		0.00		0.00	0.1	20	0.003
Xylenes	3.6	2.00		0.00		0.00		0.00					
Total aromatic BETX	9942	0.03		3.31		0.83		0.08					
Total				3.37	5.33E-03	0.84	1.33E-03	0.08	4.06E-04	100000			0.2

*Note: This worksheet calculates Methods B and C soil cleanup levels for TPH for two pathways: "direct contact human health" and "soil-to-groundwater." Other possible pathways, such as vapor and surface water must be considered (see "Interim Policy"). In Addition to not exceeding a TPH level in the groundwater of 1.0 mg/L, there cannot be exceedance in the groundwater for individual substances such as the "BETX" compounds.

Appendix J

TCLP and SPLP Analytical Reports

ANALYTICAL RESOURCES INCORPORATED

SPLP SEMIVOLATILE SURROGATE RECOVERY SUMMARY

Matrix: Soil

QC Report No: CY88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Client ID	NBZ	FBP	TPH	PHL	2FP	TBP	2CP	DCB	TOT OUT
Method Blank	73.4%	69.6%	80.2%	71.0%	85.6%	59.1%	79.3%	64.2%	0
Lab Control	81.5%	77.2%	85.7%	70.4%	87.2%	73.3%	81.1%	67.5%	0
TP-40-0-1	74.0%	74.4%	84.2%	68.3%	82.9%	62.9%	80.2%	66.8%	0
TP-49-6-10	74.1%	73.4%	96.0%	68.9%	86.6%	77.2%	81.4%	67.0%	0
TP-61-2-3	76.2%	77.5%	80.4%	70.2%	87.6%	63.6%	82.7%	67.8%	0
TP-61-2-3-MS	74.4%	77.4%	85.8%	65.5%	81.6%	64.5%	77.4%	63.2%	0

		LCS/MB LIMITS	QC LIMITS
(NBZ)	= Nitrobenzene-d5	(50-101)	(30-113)
(FBP)	= 2-Fluorobiphenyl	(44-104)	(20-129)
(TPH)	= p-Terphenyl-d14	(59-116)	(30-134)
(PHL)	= Phenol-d5	(25-100)	(10-101)
(2FP)	= 2-Fluorophenol	(32-100)	(10-111)
(TBP)	= 2,4,6-Tribromophenol	(27-120)	(10-134)
(2CP)	= 2-Chlorophenol-d4	(47-103)	(10-129)
(DCB)	= 1,2-Dichlorobenzene-d4	(34-104)	(35-100)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D Surrogate Compound diluted out

FORM-II SVOA-1

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
SPLP Semivolatiles by GC/MS **Sample No: Method Blank**

Lab Sample ID: CY88-MB
LIMS ID: 01-5489
Matrix: Soil
Data Release Authorized:
Reported: 04/25/01

QC Report No: CY88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Date extracted: 04/18/01
Date analyzed: 04/19/01
Instrument: FINN8

Sample Amount: 100 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	10 U
91-57-6	2-Methylnaphthalene	10 U
208-96-8	Acenaphthylene	10 U
83-32-9	Acenaphthene	10 U
132-64-9	Dibenzofuran	10 U
86-73-7	Fluorene	10 U
87-86-5	Pentachlorophenol	50 U
85-01-8	Phenanthrene	10 U
120-12-7	Anthracene	10 U
206-44-0	Fluoranthene	10 U
129-00-0	Pyrene	10 U
56-55-3	Benzo(a)anthracene	10 U
218-01-9	Chrysene	10 U
205-99-2	Benzo(b)fluoranthene	10 U
207-08-9	Benzo(k)fluoranthene	10 U
50-32-8	Benzo(a)pyrene	10 U
193-39-5	Indeno(1,2,3-cd)pyrene	10 U
53-70-3	Dibenzo(a,h)anthracene	10 U
191-24-2	Benzo(g,h,i)perylene	10 U

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	73.4%	d5-Phenol	71.0%
2-Fluorobiphenyl	69.6%	2-Fluorophenol	85.6%
d14-p-Terphenyl	80.2%	2,4,6-Tribromophenol	59.1%
d4-1,2-Dichlorobenzene	64.2%	d4-2-Chlorophenol	79.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
SPLP Semivolatiles by GC/MS **Sample No: TP-40-0-1**

Lab Sample ID: CY88A
LIMS ID: 01-5489
Matrix: Soil
Data Release Authorized:
Reported: 04/25/01

QC Report No: CY88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Date extracted: 04/18/01
Date analyzed: 04/19/01
Instrument: FINN8

Sample Amount: 100 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	10 U
91-57-6	2-Methylnaphthalene	10 U
208-96-8	Acenaphthylene	10 U
83-32-9	Acenaphthene	10 U
132-64-9	Dibenzofuran	10 U
86-73-7	Fluorene	10 U
87-86-5	Pentachlorophenol	50 U
85-01-8	Phenanthrene	10 U
120-12-7	Anthracene	10 U
206-44-0	Fluoranthene	10 U
129-00-0	Pyrene	10 U
56-55-3	Benzo(a)anthracene	10 U
218-01-9	Chrysene	10 U
205-99-2	Benzo(b)fluoranthene	10 U
207-08-9	Benzo(k)fluoranthene	10 U
50-32-8	Benzo(a)pyrene	10 U
193-39-5	Indeno(1,2,3-cd)pyrene	10 U
53-70-3	Dibenzo(a,h)anthracene	10 U
191-24-2	Benzo(g,h,i)perylene	10 U

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	74.0%	d5-Phenol	68.3%
2-Fluorobiphenyl	74.4%	2-Fluorophenol	82.9%
d14-p-Terphenyl	84.2%	2,4,6-Tribromophenol	62.9%
d4-1,2-Dichlorobenzene	66.8%	d4-2-Chlorophenol	80.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
SPLP Semivolatiles by GC/MS **Sample No: TP-49-6-10**
Page 1 of 1

Lab Sample ID: CY88B
LIMS ID: 01-5490
Matrix: Soil
Data Release Authorized:
Reported: 04/25/01

QC Report No: CY88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Date extracted: 04/18/01
Date analyzed: 04/19/01
Instrument: FINN8

Sample Amount: 100 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	10 U
91-57-6	2-Methylnaphthalene	10 U
208-96-8	Acenaphthylene	10 U
83-32-9	**Acenaphthene**	**230**
132-64-9	**Dibenzofuran**	**71**
86-73-7	**Fluorene**	**140**
87-86-5	Pentachlorophenol	50 U
85-01-8	**Phenanthrene**	**150**
120-12-7	**Anthracene**	**15**
206-44-0	**Fluoranthene**	**23**
129-00-0	**Pyrene**	**18**
56-55-3	Benzo(a)anthracene	10 U
218-01-9	Chrysene	10 U
205-99-2	Benzo(b)fluoranthene	10 U
207-08-9	Benzo(k)fluoranthene	10 U
50-32-8	Benzo(a)pyrene	10 U
193-39-5	Indeno(1,2,3-cd)pyrene	10 U
53-70-3	Dibenzo(a,h)anthracene	10 U
191-24-2	Benzo(g,h,i)perylene	10 U

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	74.1%	d5-Phenol	68.9%
2-Fluorobiphenyl	73.4%	2-Fluorophenol	86.6%
d14-p-Terphenyl	96.0%	2,4,6-Tribromophenol	77.2%
d4-1,2-Dichlorobenzene	67.0%	d4-2-Chlorophenol	81.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
SPLP Semivolatiles by GC/MS **Sample No: TP-61-2-3**

Lab Sample ID: CY88C
LIMS ID: 01-5491
Matrix: Soil
Data Release Authorized:
Reported: 04/25/01

QC Report No: CY88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/15/00
Date Received: 11/16/00

Date extracted: 04/18/01
Date analyzed: 04/19/01
Instrument: FINN8

Sample Amount: 100 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	10 U
91-57-6	2-Methylnaphthalene	10 U
208-96-8	Acenaphthylene	10 U
83-32-9	Acenaphthene	10 U
132-64-9	Dibenzofuran	10 U
86-73-7	Fluorene	10 U
87-86-5	Pentachlorophenol	50 U
85-01-8	Phenanthrene	10 U
120-12-7	Anthracene	10 U
206-44-0	Fluoranthene	10 U
129-00-0	Pyrene	10 U
56-55-3	Benzo(a)anthracene	10 U
218-01-9	Chrysene	10 U
205-99-2	Benzo(b)fluoranthene	10 U
207-08-9	Benzo(k)fluoranthene	10 U
50-32-8	Benzo(a)pyrene	10 U
193-39-5	Indeno(1,2,3-cd)pyrene	10 U
53-70-3	Dibenzo(a,h)anthracene	10 U
191-24-2	Benzo(g,h,i)perylene	10 U

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	76.2%	d5-Phenol	70.2%
2-Fluorobiphenyl	77.5%	2-Fluorophenol	87.6%
d14-p-Terphenyl	80.4%	2,4,6-Tribromophenol	63.6%
d4-1,2-Dichlorobenzene	67.8%	d4-2-Chlorophenol	82.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
SPLP Semivolatiles by GC/MS **Sample No: TP-61-2-3**
Page 1 of 1 **MATRIX SPIKE**

Lab Sample ID: CY88C-MS QC Report No: CY88-Kennedy Jenks Consultants
LIMS ID: 01-5491 Project: Tacoma Metals
Matrix: Soil 996098.00
Data Release Authorized: Date Sampled: 11/15/00
Reported: 04/25/01 Date Received: 11/16/00

Date extracted: 04/18/01 Sample Amount: 100 mL
Date analyzed: 04/19/01 Final Extract Volume: 1.0 mL
Instrument: FINN8 Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	10 U
91-57-6	2-Methylnaphthalene	10 U
208-96-8	Acenaphthylene	10 U
83-32-9	Acenaphthene	10 U
132-64-9	Dibenzofuran	10 U
86-73-7	Fluorene	10 U
87-86-5	Pentachlorophenol	---
85-01-8	Phenanthrene	10 U
120-12-7	Anthracene	10 U
206-44-0	Fluoranthene	10 U
129-00-0	Pyrene	10 U
56-55-3	Benzo(a)anthracene	10 U
218-01-9	Chrysene	10 U
205-99-2	Benzo(b)fluoranthene	10 U
207-08-9	Benzo(k)fluoranthene	10 U
50-32-8	Benzo(a)pyrene	10 U
193-39-5	Indeno(1,2,3-cd)pyrene	10 U
53-70-3	Dibenzo(a,h)anthracene	10 U
191-24-2	Benzo(g,h,i)perylene	10 U

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	74.4%	d5-Phenol	65.5%
2-Fluorobiphenyl	77.4%	2-Fluorophenol	81.6%
d14-p-Terphenyl	85.8%	2,4,6-Tribromophenol	64.5%
d4-1,2-Dichlorobenzene	63.2%	d4-2-Chlorophenol	77.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
SPLP Semivolatiles by GC/MS

Sample No: TP-61-2-3

Lab Sample ID: CY88C
LIMS ID: 01-5491
Matrix: TCLP Extract

QC Report No: CY88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 11/16/00

Data Release Authorized:
Reported: 04/24/01

MATRIX SPIKE RECOVERY
Date extracted: 04/18/01 Date Analyzed: 04/19/01

CONSTITUENT	SAMPLE VALUE	SPIKE VALUE	SPIKE ADDED	% RECOVERY
MATRIX SPIKE				
Pentachlorophenol	< 50.0	501	562	89.1%

Values reported in ug/L

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
SPLP Semivolatiles by GC/MS

Lab Sample ID: CY88LCS
LIMS ID: 01-5489
Matrix: SPLP Extract

QC Report No: CY88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 04/23/01

Date extracted: 04/18/01 Date Analyzed: 04/19/01

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
Pentachlorophenol	486	562	86.4%

Spike Blank Surrogate Recovery

d5-Nitrobenzene	81.5%	d5-Phenol	70.4%
2-Fluorobiphenyl	77.2%	2-Fluorophenol	87.2%
d14-p-Terphenyl	85.7%	2,4,6-Tribromophenol	73.3%
d4-1,2-Dichlorobenzene	67.5%	d4-2-Chlorophenol	81.1%

Values reported in ug/L

ANALYTICAL RESOURCES INCORPORATED

SOIL 8270 TCLP PNA SURROGATE RECOVERY SUMMARY

Matrix: Soil

QC Report No: CY88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

LIMS ID	Client ID	TPH	DPH	TOT OUT
01-5492	Method Blank	102%	87%	0
01-5492	Lab Control	90%	84%	0
01-5492	TP-40-0-1	95%	82%	0
01-5493	TP-49-6-10	98%	83%	0
01-5494	TP-61-2-3	89%	81%	0
01-5494	TP-61-2-3-MS	85%	81%	0

	LCS/MB LIMITS	QC LIMITS
(TPH) = d14-p-Terphenyl	(30-160)	(30-160)
(DPH) = d10-Diphenyl	(30-160)	(30-160)

D Surrogate Compound diluted out

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TCLP Semivolatiles by GC/MS **Sample No: Method Blank**

Lab Sample ID: CY88-MB
LIMS ID: 01-5492
Matrix: Soil
Data Release Authorized:
Reported: 04/20/01

QC Report No: CY88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Date extracted: 04/18/01
Date analyzed: 04/19/01
Instrument: FINN2

Sample Amount: 100 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	10 U
91-57-6	2-Methylnaphthalene	10 U
208-96-8	Acenaphthylene	10 U
83-32-9	Acenaphthene	10 U
132-64-9	Dibenzofuran	10 U
86-73-7	Fluorene	10 U
85-01-8	Phenanthrene	10 U
120-12-7	Anthracene	10 U
206-44-0	Fluoranthene	10 U
129-00-0	Pyrene	10 U
56-55-3	Benzo(a)anthracene	10 U
218-01-9	Chrysene	10 U
205-99-2	Benzo(b)fluoranthene	10 U
207-08-9	Benzo(k)fluoranthene	10 U
50-32-8	Benzo(a)pyrene	10 U
193-39-5	Indeno(1,2,3-cd)pyrene	10 U
53-70-3	Dibenzo(a,h)anthracene	10 U
191-24-2	Benzo(g,h,i)perylene	10 U

Semivolatiles Surrogate Recovery

d14-p-Terphenyl	102%
d10-Diphenyl	87.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TCLP Semivolatiles by GC/MS **Sample No: TP-40-0-1**

Lab Sample ID: CY88D
LIMS ID: 01-5492
Matrix: Soil
Data Release Authorized:
Reported: 04/20/01

QC Report No: CY88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Date extracted: 04/18/01
Date analyzed: 04/19/01
Instrument: FINN2

Sample Amount: 100 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	10 U
91-57-6	2-Methylnaphthalene	10 U
208-96-8	Acenaphthylene	10 U
83-32-9	Acenaphthene	10 U
132-64-9	Dibenzofuran	10 U
86-73-7	Fluorene	10 U
85-01-8	Phenanthrene	10 U
120-12-7	Anthracene	10 U
206-44-0	Fluoranthene	10 U
129-00-0	Pyrene	10 U
56-55-3	Benzo(a)anthracene	10 U
218-01-9	Chrysene	10 U
205-99-2	Benzo(b)fluoranthene	10 U
207-08-9	Benzo(k)fluoranthene	10 U
50-32-8	Benzo(a)pyrene	10 U
193-39-5	Indeno(1,2,3-cd)pyrene	10 U
53-70-3	Dibenzo(a,h)anthracene	10 U
191-24-2	Benzo(g,h,i)perylene	10 U

Semivolatiles Surrogate Recovery

d14-p-Terphenyl	95.2%
d10-Diphenyl	81.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TCLP Semivolatiles by GC/MS **Sample No: TP-49-6-10**
Page 1 of 1

Lab Sample ID: CY88E
LIMS ID: 01-5493
Matrix: Soil
Data Release Authorized
Reported: 04/20/01

QC Report No: CY88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/17/00
Date Received: 10/18/00

Date extracted: 04/18/01
Date analyzed: 04/19/01
Instrument: FINN2

Sample Amount: 100 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	10 U
91-57-6	**2-Methylnaphthalene**	**15**
208-96-8	Acenaphthylene	10 U
83-32-9	**Acenaphthene**	**300**
132-64-9	**Dibenzofuran**	**110**
86-73-7	**Fluorene**	**180**
85-01-8	**Phenanthrene**	**190**
120-12-7	**Anthracene**	**20**
206-44-0	**Fluoranthene**	**28**
129-00-0	**Pyrene**	**18**
56-55-3	Benzo(a)anthracene	10 U
218-01-9	Chrysene	10 U
205-99-2	Benzo(b)fluoranthene	10 U
207-08-9	Benzo(k)fluoranthene	10 U
50-32-8	Benzo(a)pyrene	10 U
193-39-5	Indeno(1,2,3-cd)pyrene	10 U
53-70-3	Dibenzo(a,h)anthracene	10 U
191-24-2	Benzo(g,h,i)perylene	10 U

Semivolatiles Surrogate Recovery

d14-p-Terphenyl	97.6%
d10-Diphenyl	83.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TCLP Semivolatiles by GC/MS **Sample No: TP-61-2-3**

Lab Sample ID: CY88F
LIMS ID: 01-5494
Matrix: Soil
Data Release Authorized:
Reported: 04/20/01

QC Report No: CY88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/15/00
Date Received: 11/16/00

Date extracted: 04/18/01
Date analyzed: 04/19/01
Instrument: FINN2

Sample Amount: 100 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	10 U
91-57-6	2-Methylnaphthalene	10 U
208-96-8	Acenaphthylene	10 U
83-32-9	Acenaphthene	10 U
132-64-9	Dibenzofuran	10 U
86-73-7	Fluorene	10 U
85-01-8	Phenanthrene	10 U
120-12-7	Anthracene	10 U
206-44-0	Fluoranthene	10 U
129-00-0	Pyrene	10 U
56-55-3	Benzo(a)anthracene	10 U
218-01-9	Chrysene	10 U
205-99-2	Benzo(b)fluoranthene	10 U
207-08-9	Benzo(k)fluoranthene	10 U
50-32-8	Benzo(a)pyrene	10 U
193-39-5	Indeno(1,2,3-cd)pyrene	10 U
53-70-3	Dibenzo(a,h)anthracene	10 U
191-24-2	Benzo(g,h,i)perylene	10 U

Semivolatiles Surrogate Recovery

d14-p-Terphenyl	88.8%
d10-Diphenyl	80.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TCLP Semivolatiles by GC/MS

Sample No: TP-61-2-3

Lab Sample ID: CY88F
LIMS ID: 01-5494
Matrix: TCLP Extract

QC Report No: CY88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 11/16/00

Data Release Authorized:
Reported: 04/20/01

MATRIX SPIKE RECOVERY
Date extracted: 04/18/01 Date Analyzed: 04/19/01

CONSTITUENT	SAMPLE VALUE	SPIKE VALUE	SPIKE ADDED	% RECOVERY
MATRIX SPIKE				
Naphthalene	< 10.0	205	250	82.0%
Acenaphthene	< 10.0	205	250	82.0%
Fluoranthene	< 10.0	210	250	84.0%
Benzo(a)anthracene	< 10.0	209	250	83.6%

Values reported in ug/L

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TCLP Semivolatiles by GC/MS **Sample No: TP-61-2-3**
Page 1 of 1 **MATRIX SPIKE**

Lab Sample ID: CY88F-MS
LIMS ID: 01-5494
Matrix: Soil
Data Release Authorized
Reported: 04/20/01

QC Report No: CY88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/15/00
Date Received: 11/16/00

Date extracted: 04/18/01
Date analyzed: 04/19/01
Instrument: FINN2

Sample Amount: 100 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	---
91-57-6	2-Methylnaphthalene	10 U
208-96-8	Acenaphthylene	10 U
83-32-9	Acenaphthene	---
132-64-9	Dibenzofuran	10 U
86-73-7	Fluorene	10 U
85-01-8	Phenanthrene	10 U
120-12-7	Anthracene	10 U
206-44-0	Fluoranthene	---
129-00-0	Pyrene	10 U
56-55-3	Benzo(a)anthracene	---
218-01-9	Chrysene	10 U
205-99-2	Benzo(b)fluoranthene	10 U
207-08-9	Benzo(k)fluoranthene	10 U
50-32-8	Benzo(a)pyrene	10 U
193-39-5	Indeno(1,2,3-cd)pyrene	10 U
53-70-3	Dibenzo(a,h)anthracene	10 U
191-24-2	Benzo(g,h,i)perylene	10 U

Semivolatiles Surrogate Recovery

d14-p-Terphenyl	84.8%
d10-Diphenyl	80.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TCLP Semivolatiles by GC/MS

Lab Sample ID: CY88SB
LIMS ID: 01-5492
Matrix: TCLP Extract

QC Report No: CY88-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 04/20/01

Date extracted: 04/18/01 Date Analyzed: 04/19/01

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
Naphthalene	215	250	86.0%
Acenaphthene	216	250	86.4%
Fluoranthene	202	250	80.8%
Benzo(a)anthracene	219	250	87.6%

Spike Blank Surrogate Recovery

d14-p-Terphenyl	90.4%
d10-Diphenyl	84.0%

Values reported in ug/L

Susan Snyder

From: "Dean Malte" <DeanMalte@KennedyJenks.com>
To: <susan@arilabs.com>
Cc: "Amanda Aldersley" <AmandaAldersley@KennedyJenks.com>
Sent: Monday, April 09, 2001 3:15 PM
Subject: Tacoma Metals

Susan--

We need to perform the following analyses for the Tacoma Metals soil samples
listed below. I listed the previous ARI job number for each sample. We'd
like to get these going as soon as possible (but with a standard turn around).

SPLP and TCLP analysis for lead:

TP-16-2-3 CM33
TP-39-0-1 CI18
TP-40-2-3 CI18
TP-43-2-3 CI62
TP-61-0-1 CL62

SPLP and TCLP analysis for PAHs:

TP-40-0-1 CI18
TP-49-6-10 CI62
TP-61-2-3 CL62

I will be out of the office tomorrow and Wednesday, but you can contact
Amanda Aldersley with any questions. Thank you.

-Dean Malte

Analytical Resources, Incorporated
Analytical Chemists and Consultants

April 23, 2001

Ty Schreiner
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: Project: Tacoma Metals / ARI Job: CY63

Dear Mr. Schreiner:

Please find enclosed sample custody records and final analytical results for the above referenced project. Five soil samples were retrieved from archives on April 9, 2001 per your request. The samples had been archived at –18°C and were in good condition. The samples were analyzed for TCLP & SPLP lead referencing EPA methods 1311/1312/6010.

Samples were prepped on 4/16/0 and analyzed on 4/18/01. There were no analytical complications noted during these analyses.

Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,
Analytical Resources, Inc.

Susan Snyder
Project manger

SS/ss
Enclosures

CC: Dean Malte, Kennedy Jenks Consultants, Federal Way, WA

RECEIVED
APR 25 2001
K/J Federal Way
K/J No/File
Route
Return To/By

333 Ninth Avenue North • Seattle WA 98109-5187 • **206-621-6490** • **206-621-7523** fax

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET Sample No: Method Blank
SPLP METALS

Lab Sample ID: CY63MB
LIMS ID: 01-5355
Matrix: Soil

QC Report No: CY63-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized:
Reported: 04/19/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
1312	04/16/01	6010	04/18/01	7439-92-1	Lead	0.02	0.02 U

U Analyte undetected at given RL

RL Reporting Limits

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-16-2-3**
SPLP METALS

Lab Sample ID: CY63A
LIMS ID: 01-5355
Matrix: Soil

QC Report No: CY63-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/06/00
Date Received: 10/09/00

Data Release Authorized
Reported: 04/19/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
1312	04/16/01	6010	04/18/01	7439-92-1	Lead	0.02	0.02 U

U Analyte undetected at given RL

RL Reporting Limits

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
SPLP METALS

Sample No: TP-16-2-3
Lab Sample ID: CY63A
QC Report No: CY63-Kennedy Jenks Consultants
LIMS ID: 01-5355
Project: Tacoma Metals
Matrix: Soil
996098.00
Date Received: 10/09/00

Data Release Authorized:
Reported: 04/19/01

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Sample mg/L	Duplicate mg/L	RPD	Control Limit	Q
Lead	0.02 U	0.02 U	0.0%	+/- 0.02	L

'Q' codes: * = control limit not met
L = RPD not valid, alternate limit = detection limit

FORM-VI

INORGANICS ANALYSIS DATA SHEET
SPLP METALS

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-16-2-3
Lab Sample ID: CY63A
QC Report No: CY63-Kennedy Jenks Consultants
LIMS ID: 01-5355
Project: Tacoma Metals
Matrix: Soil
996098.00
Date Received: 10/09/00

Data Release Authorized:
Reported: 04/19/01

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Sample mg/L	Spike mg/L	Spike Added	% Recovery	Q
Lead	0.02 U	1.91	2.00	95.5%	

'Q' codes:
N = control limit not met
H = %R not applicable, sample concentration too high
* = RPD control limit not met
NA = Not applicable - analyte not spiked

Control Limits:
Percent Recovery: 75-125%
RPD: +/-20%

FORM-V

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET Sample No: TP-43-2-3
SPLP METALS

Lab Sample ID: CY63B
LIMS ID: 01-5356
Matrix: Soil

QC Report No: CY63-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/16/00
Date Received: 10/18/00

Data Release Authorized:
Reported: 04/19/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
1312	04/16/01	6010	04/18/01	**7439-92-1**	**Lead**	0.02	**0.03**

U Analyte undetected at given RL

RL Reporting Limits

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET Sample No: TP-61-0-1
SPLP METALS

Lab Sample ID: CY63C
LIMS ID: 01-5357
Matrix: Soil

QC Report No: CY63-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized:
Reported: 04/19/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
1312	04/16/01	6010	04/18/01	7439-92-1	Lead	0.02	0.07

U Analyte undetected at given RL

RL Reporting Limits

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET Sample No: TP-40-2-3
SPLP METALS

Lab Sample ID: CY63D
LIMS ID: 01-5358
Matrix: Soil

QC Report No: CY63-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Data Release Authorized:
Reported: 04/19/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
1312	04/16/01	6010	04/18/01	7439-92-1	Lead	0.02	0.02 U

U Analyte undetected at given RL

RL Reporting Limits

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: TP-39-0-1**
SPLP METALS

Lab Sample ID: CY63E
LIMS ID: 01-5359
Matrix: Soil

QC Report No: CY63-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Data Release Authorized:
Reported: 04/19/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
1312	04/16/01	6010	04/18/01	7439-92-1	Lead	0.02	0.03

U Analyte undetected at given RL

RL Reporting Limits

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET Sample No: Method Blank
TCLP METALS

Lab Sample ID: CY63MB
LIMS ID: 01-5360
Matrix: Soil

QC Report No: CY63-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized:
Reported: 04/19/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
1311	04/16/01	6010	04/18/01	7439-92-1	Lead	0.02	0.02 U

U Analyte undetected at given RL

RL Reporting Limits

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET Sample No: TP-16-2-3
TCLP METALS

Lab Sample ID: CY63F
LIMS ID: 01-5360
Matrix: Soil

QC Report No: CY63-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/06/00
Date Received: 10/09/00

Data Release Authorized
Reported: 04/19/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
1311	04/16/01	6010	04/18/01	7439-92-1	Lead	0.1	3.3

U Analyte undetected at given RL

RL Reporting Limits

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TCLP METALS

Sample No: TP-16-2-3
Lab Sample ID: CY63F
QC Report No: CY63-Kennedy Jenks Consultants
LIMS ID: 01-5360
Project: Tacoma Metals
Matrix: Soil
996098.00
Date Received: 10/09/00

Data Release Authorized:
Reported: 04/19/01

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Sample mg/L	Duplicate mg/L	RPD	Control Limit	Q
Lead	3.3	3.3	0.0%	+/- 20 %	

'Q' codes: * = control limit not met
L = RPD not valid, alternate limit = detection limit

FORM-VI

INORGANICS ANALYSIS DATA SHEET
TCLP METALS

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-16-2-3
Lab Sample ID: CY63F
QC Report No: CY63-Kennedy Jenks Consultants
LIMS ID: 01-5360
Project: Tacoma Metals
Matrix: Soil
996098.00
Date Received: 10/09/00

Data Release Authorized:
Reported: 04/19/01

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Sample mg/L	Spike mg/L	Spike Added	% Recovery	Q
Lead	3.3	12.8	10.0	95.0%	

'Q' codes:
N = control limit not met
H = %R not applicable, sample concentration too high
* = RPD control limit not met
NA = Not applicable - analyte not spiked

Control Limits: Percent Recovery: 75-125%
RPD: +/-20%

FORM-V

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET Sample No: TP-43-2-3
TCLP METALS

Lab Sample ID: CY63G
LIMS ID: 01-5361
Matrix: Soil

QC Report No: CY63-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/16/00
Date Received: 10/18/00

Data Release Authorized:
Reported: 04/19/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
1311	04/16/01	6010	04/18/01	7439-92-1	Lead	0.1	63.6

U Analyte undetected at given RL

RL Reporting Limits

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET Sample No: TP-61-0-1
TCLP METALS

Lab Sample ID: CY63H
LIMS ID: 01-5362
Matrix: Soil

QC Report No: CY63-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized:
Reported: 04/19/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
1311	04/16/01	6010	04/18/01	7439-92-1	Lead	0.02	12.2

U Analyte undetected at given RL

RL Reporting Limits

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET Sample No: TP-40-2-3
TCLP METALS

Lab Sample ID: CY63I
LIMS ID: 01-5363
Matrix: Soil

QC Report No: CY63-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Data Release Authorized:
Reported: 04/19/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
1311	04/16/01	6010	04/18/01	7439-92-1	Lead	0.1	6.9

U Analyte undetected at given RL

RL Reporting Limits

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET Sample No: TP-39-0-1
TCLP METALS

Lab Sample ID: CY63J
LIMS ID: 01-5364
Matrix: Soil

QC Report No: CY63-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Data Release Authorized
Reported: 04/19/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
1311	04/16/01	6010	04/18/01	7439-92-1	Lead	0.02	0.13

U Analyte undetected at given RL

RL Reporting Limits

FORM-I

Susan Snyder

From: "Dean Malte" <DeanMalte@KennedyJenks.com>
To: <susan@arilabs.com>
Cc: "Amanda Aldersley" <AmandaAldersley@KennedyJenks.com>
Sent: Monday, April 09, 2001 3:15 PM
Subject: Tacoma Metals

Susan--

We need to perform the following analyses for the Tacoma Metals soil samples
listed below. I listed the previous ARI job number for each sample. We'd
like to get these going as soon as possible (but with a standard turn around).

SPLP and TCLP analysis for lead:

TP-16-2-3 CM33
TP-39-0-1 CI18
TP-40-2-3 CI18
TP-43-2-3 CI62
TP-61-0-1 CL62

SPLP and TCLP analysis for PAHs:

TP-40-0-1 CI18
TP-49-6-10 CI62
TP-61-2-3 CL62

I will be out of the office tomorrow and Wednesday, but you can contact
Amanda Aldersley with any questions. Thank you.

-Dean Malte

Analytical Resources, Incorporated
Analytical Chemists and Consultants

10, May 2001

Dean Malte
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: **Project: Tacoma Metals**
ARI Job: DA70

Dear Dean:

Please find enclosed additional analysis requests and final analytical results for the above referenced project. Four selected samples were retrieved from sample archive per your request on April 25, 2001.

Selected samples were analyzed for TCLP metals referencing EPA methods 1311/6010 and 7000 series and SPLP metals referencing 1312/6010/7000 methods.

No analytical complications were noted. Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Susan Snyder
Project Manager
susan@arilabs.com

SS/ss
Enclosures

RECEIVED
MAY 1 1 2001
K/J Federal Way
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333 Ninth Avenue North • Seattle WA 98109-5187 • **206-621-6490** • **206-621-7523** fax

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET Sample No: Method Blank
SPLP METALS

Lab Sample ID: DA70MB
LIMS ID: 01-6640
Matrix: Soil

QC Report No: DA70-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized
Reported: 05/08/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
1312	04/30/01	6010B	05/04/01	7440-38-2	Arsenic	0.05	0.05 U
1312	04/30/01	6010B	05/04/01	7440-39-3	Barium	0.003	0.003 U
1312	04/30/01	6010B	05/04/01	7440-43-9	Cadmium	0.002	0.002 U
1312	04/30/01	6010B	05/04/01	7440-47-3	Chromium	0.005	0.005 U
1312	04/30/01	6010B	05/04/01	7440-50-8	Copper	0.002	0.002 U
1312	05/01/01	7470	05/02/01	7439-97-6	Mercury	0.0001	0.0001 U
1312	04/30/01	6010B	05/04/01	7782-49-2	Selenium	0.05	0.05 U
1312	04/30/01	6010B	05/04/01	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limits

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET Sample No: TP-21-2-3
SPLP METALS

Lab Sample ID: DA70A
LIMS ID: 01-6640
Matrix: Soil

QC Report No: DA70-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/10/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 05/08/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
1312	04/30/01	6010B	05/04/01	7440-39-3	Barium	0.003	0.672
1312	04/30/01	6010B	05/04/01	7440-43-9	Cadmium	0.002	0.002 U
1312	04/30/01	6010B	05/04/01	7440-47-3	Chromium	0.005	0.005 U

U Analyte undetected at given RL

RL Reporting Limits

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET Sample No: TP-22-2-3
SPLP METALS

Lab Sample ID: DA70B
LIMS ID: 01-6641
Matrix: Soil

QC Report No: DA70-Kennedy Jenks Consultants
Project: Tacoma Metals
99608.00
Date Sampled: 10/10/00
Date Received: 10/13/00

Data Release Authorized
Reported: 05/08/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
1312	04/30/01	6010B	05/04/01	7440-50-8	Copper	0.002	0.005
1312	04/30/01	6010B	05/04/01	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limits

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET Sample No: TP-45-0-1
SPLP METALS

Lab Sample ID: DA70C
LIMS ID: 01-6642
Matrix: Soil

QC Report No: DA70-Kennedy Jenks Consultants
Project: Tacoma Metals
99608.00
Date Sampled: 10/16/00
Date Received: 10/18/00

Data Release Authorized:
Reported: 05/08/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
1312	04/30/01	6010B	05/04/01	7440-38-2	Arsenic	0.05	0.05 U

U Analyte undetected at given RL

RL Reporting Limits

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET Sample No: TP-60-0-1
SPLP METALS

Lab Sample ID: DA70D
LIMS ID: 01-6643
Matrix: Soil

QC Report No: DA70-Kennedy Jenks Consultants
Project: Tacoma Metals
99608.00
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized
Reported: 05/08/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
1312	05/01/01	7470	05/02/01	**7439-97-6**	**Mercury**	0.0001	**0.0021**
1312	04/30/01	6010B	05/04/01	7782-49-2	Selenium	0.05	0.05 U

U Analyte undetected at given RL

RL Reporting Limits

FORM-I

INORGANICS ANALYSIS DATA SHEET
SPLP METALS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: DA70LCS
LIMS ID: 01-6640
Matrix: Soil

QC Report No: DA70-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 05/10/01

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Spike mg/L	Spike Added	% Recovery	Q
Arsenic	2.21	2.00	110%	
Barium	2.13	2.00	106%	
Cadmium	0.564	0.500	113%	
Chromium	0.535	0.500	107%	
Copper	0.528	0.500	106%	
Mercury	0.0020	0.0020	100%	
Selenium	2.24	2.00	112%	
Silver	0.530	0.500	106%	

'Q' codes: N = control limit not met

Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET Sample No: Method Blank
TCLP METALS

Lab Sample ID: DA70MB
LIMS ID: 01-6657
Matrix: Soil

QC Report No: DA70-Kennedy Jenks Consultants
Project: Tacoma Metals
99608.00
Date Sampled: NA
Date Received: NA

Data Release Authorized:
Reported: 05/08/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
1311	04/30/01	6010B	05/04/01	7440-38-2	Arsenic	0.05	0.05 U
1311	04/30/01	6010B	05/04/01	7440-39-3	Barium	0.003	0.003 U
1311	04/30/01	6010B	05/04/01	7440-43-9	Cadmium	0.002	0.002 U
1311	04/30/01	6010B	05/04/01	7440-47-3	Chromium	0.005	0.005 U
1311	04/30/01	6010B	05/04/01	7440-50-8	Copper	0.002	0.002 U
1311	05/01/01	7470	05/02/01	7439-97-6	Mercury	0.0001	0.0001 U
1311	04/30/01	6010B	05/04/01	7782-49-2	Selenium	0.05	0.05 U
1311	04/30/01	6010B	05/04/01	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limits

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET Sample No: TP-21-2-3
TCLP METALS

Lab Sample ID: DA70E
LIMS ID: 01-6657
Matrix: Soil

QC Report No: DA70-Kennedy Jenks Consultants
Project: Tacoma Metals
99608.00
Date Sampled: 10/10/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 05/08/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
1311	04/30/01	6010B	05/07/01	7440-39-3	Barium	0.03	6.99
1311	04/30/01	6010B	05/07/01	7440-43-9	Cadmium	0.02	0.94
1311	04/30/01	6010B	05/07/01	7440-47-3	Chromium	0.05	0.05 U

U Analyte undetected at given RL

RL Reporting Limits

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET Sample No: TP-22-2-3
TCLP METALS

Lab Sample ID: DA70F
LIMS ID: 01-6658
Matrix: Soil

QC Report No: DA70-Kennedy Jenks Consultants
Project: Tacoma Metals
99608.00
Date Sampled: 10/13/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 05/08/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
1311	04/30/01	6010B	05/07/01	7440-50-8	Copper	0.01	66.2
1311	04/30/01	6010B	05/07/01	7440-22-4	Silver	0.02	0.02 U

U Analyte undetected at given RL

RL Reporting Limits

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET Sample No: TP-45-0-1
TCLP METALS

Lab Sample ID: DA70G
LIMS ID: 01-6659
Matrix: Soil

QC Report No: DA70-Kennedy Jenks Consultants
Project: Tacoma Metals
99608.00
Date Sampled: 10/16/00
Date Received: 10/18/00

Data Release Authorized:
Reported: 05/08/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
1311	04/30/01	6010B	05/04/01	7440-38-2	Arsenic	0.05	0.05 U

U Analyte undetected at given RL

RL Reporting Limits

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET Sample No: TP-60-0-1
TCLP METALS

Lab Sample ID: DA70H
LIMS ID: 01-6660
Matrix: Soil

QC Report No: DA70-Kennedy Jenks Consultants
Project: Tacoma Metals
99608.00
Date Sampled: 11/15/00
Date Received: 11/16/00

Data Release Authorized:
Reported: 05/08/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
1311	05/01/01	7470	05/02/01	7439-97-6	Mercury	0.0001	0.0005
1311	04/30/01	6010B	05/07/01	7782-49-2	Selenium	0.2	0.2 U

U Analyte undetected at given RL

RL Reporting Limits

FORM-I

INORGANICS ANALYSIS DATA SHEET
TCLP METALS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: DA70LCS
LIMS ID: 01-6657
Matrix: Soil

QC Report No: DA70-Kennedy Jenks Consultants
Project: Tacoma Metals
99608.00

Data Release Authorized:
Reported: 05/10/01

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Spike mg/L	Spike Added	% Recovery	Q
Arsenic	1.82	2.00	91.0%	
Barium	2.04	2.00	102%	
Cadmium	0.516	0.500	103%	
Chromium	0.476	0.500	95.2%	
Copper	0.508	0.500	102%	
Mercury	0.0024	0.0020	120%	
Selenium	2.29	2.00	114%	
Silver	0.437	0.500	87.4%	

'Q' codes: N = control limit not met

Control Limits: 80-120%

Susan Snyder

From: "Dean Malte" <DeanMalte@KennedyJenks.com>
To: "'Susan Snyder'" <susan@arilabs.com>
Sent: Wednesday, April 25, 2001 9:35 AM
Subject: Tacoma Metals

Susan--

We need to run some more TCLP and SPLP analyses for Tacoma Metals soil
samples:

Ba, Cd, Cr TP-21-2-3 ARI CI19
Cu, Ag TP-22-2-3 ARI CI19
As TP-45-0-1 ARI CI62
Hg,Se TP-60-0-1 ARI CL62

Please call me with any questions or comments. Thank you.

Dean Malte
Senior Staff Geologist
Kennedy/Jenks Consultants

Analytical Resources, Incorporated
Analytical Chemists and Consultants

14, May 2001

Dean Malte
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: Project: Tacoma Metals
ARI Job: DB93

Dear Dean:

Please find enclosed additional analysis requests and final analytical results for the above referenced project. Six selected samples were retrieved from sample archive per your request on May 2, 2001.

Selected samples were analyzed for TCLP metals referencing EPA methods 1311/6010B methods.

No analytical complications were noted. Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Susan Snyder
Project Manager
susan@arilabs.com

SS/ss
Enclosures

RECEIVED
MAY 15 2001
K/J Federal Way
K/J No/File
Route
Return To/By

333 Ninth Avenue North • Seattle WA 98109-5187 • **206-621-6490** • **206-621-7523** fax

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET Sample No: Method Blank
TCLP METALS

Lab Sample ID: DB93MB
LIMS ID: 01-7377
Matrix: Soil

QC Report No: DB93-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized
Reported: 05/14/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
1311	05/08/01	6010B	05/09/01	7439-92-1	Lead	0.02	0.02 U

U Analyte undetected at given RL

RL Reporting Limits

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET Sample No: TP-1-0-1
TCLP METALS

Lab Sample ID: DB93A
LIMS ID: 01-7377
Matrix: Soil

QC Report No: DB93-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 09/27/00
Date Received: 09/28/00

Data Release Authorized:
Reported: 05/14/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
1311	05/08/01	6010B	05/09/01	7439-92-1	Lead	0.1	11.7

U Analyte undetected at given RL

RL Reporting Limits

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TCLP METALS

Sample No: TP-1-0-1
Lab Sample ID: DB93A
QC Report No: DB93-Kennedy Jenks Consultants
LIMS ID: 01-7377
Project: Tacoma Metals
Matrix: Soil
996098.00
Date Received: 09/28/00

Data Release Authorized:
Reported: 05/14/01

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Sample mg/L	Duplicate mg/L	RPD	Control Limit	Q
Lead	11.7	11.6	0.9%	+/- 20 %	

'Q' codes: * = control limit not met
L = RPD not valid, alternate limit = detection limit

FORM-VI

INORGANICS ANALYSIS DATA SHEET
TCLP METALS

ANALYTICAL RESOURCES INCORPORATED

Sample No: TP-1-0-1
Lab Sample ID: DB93A
QC Report No: DB93-Kennedy Jenks Consultants
LIMS ID: 01-7377
Project: Tacoma Metals
Matrix: Soil
996098.00
Date Received: 09/28/00

Data Release Authorized:
Reported: 05/14/01

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Sample mg/L	Spike mg/L	Spike Added	% Recovery	Q
Lead	11.7	21.3	10.0	96.0%	

'Q' codes:
N = control limit not met
H = %R not applicable, sample concentration too high
* = RPD control limit not met
NA = Not applicable - analyte not spiked

Control Limits:
Percent Recovery: 75-125%
RPD: +/-20%

FORM-V

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET Sample No: TP-14-6-10
TCLP METALS

Lab Sample ID: DB93B
LIMS ID: 01-7378
Matrix: Soil

QC Report No: DB93-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/06/00
Date Received: 10/09/00

Data Release Authorized:
Reported: 05/14/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
1311	05/08/01	6010B	05/09/01	7439-92-1	Lead	0.1	0.1 U

U Analyte undetected at given RL

RL Reporting Limits

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET Sample No: TP-21-2-3
TCLP METALS

Lab Sample ID: DB93C
LIMS ID: 01-7379
Matrix: Soil

QC Report No: DB93-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/10/00
Date Received: 10/13/00

Data Release Authorized
Reported: 05/14/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
1311	05/08/01	6010B	05/10/01	7439-92-1	Lead	0.4	74.7

U Analyte undetected at given RL

RL Reporting Limits

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET Sample No: TP-33-2-3
TCLP METALS

Lab Sample ID: DB93D
LIMS ID: 01-7380
Matrix: Soil

QC Report No: DB93-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/12/00
Date Received: 10/13/00

Data Release Authorized:
Reported: 05/14/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
1311	05/08/01	6010B	05/09/01	7439-92-1	Lead	0.1	22.4

U Analyte undetected at given RL

RL Reporting Limits

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET Sample No: TP-38-0-1
TCLP METALS

Lab Sample ID: DB93E
LIMS ID: 01-7381
Matrix: Soil

QC Report No: DB93-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 10/13/00
Date Received: 10/16/00

Data Release Authorized
Reported: 05/14/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
1311	05/08/01	6010B	05/10/01	7439-92-1	Lead	0.4	20.6

U Analyte undetected at given RL

RL Reporting Limits

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET Sample No: TP-55-0-1
TCLP METALS

Lab Sample ID: DB93F
LIMS ID: 01-7382
Matrix: Soil

QC Report No: DB93-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/14/00
Date Received: 11/16/00

Data Release Authorized
Reported: 05/14/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
1311	05/08/01	6010B	05/09/01	7439-92-1	Lead	0.1	26.5

U Analyte undetected at given RL

RL Reporting Limits

FORM-I

Susan Snyder

From: "Dean Malte"
To: "'Susan Snyder'" <susan@arilabs.com>
Sent: Wednesday, May 02, 2001 11:43 AM
Subject: TCLP Analyses

Susan--

We need to run yet more TCLP (no SPLP this time) lead analyses for Tacoma
Metals soil samples:

TP-1-0-1 ARI CF88
TP-14-6-10 ARI CH43
TP-21-2-3 ARI CI19
TP-33-2-3 ARI CI24
TP-38-0-1 ARI CI18
TP-55-0.1 ARI CL62

Please call me with any questions or comments. Thank you.

Dean Malte
Senior Staff Geologist
Kennedy/Jenks Consultants

Appendix K

Reconnaissance Groundwater Analytical Reports
and Chain-of-Custody Documents

CCI
ANALYTICAL
LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 1
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-1 5/25/00 7:51AM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	ND	UG/L		5/28/00	LAH
TPH-DIESEL RANGE	NWTPH-DX	ND	UG/L		5/31/00	GLW
TPH-OIL RANGE	NWTPH-DX	ND	UG/L		5/31/00	GLW
NAPHTHALENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
ACENAPHTHYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
ACENAPHATHENE	EPA-8270 SIM	0.24	UG/L		6/8/00	LRK
FLUORENE	EPA-8270 SIM	0.23	UG/L		6/8/00	LRK
PHENANTHRENE	EPA-8270 SIM	0.09	UG/L		6/8/00	LRK
ANTHRACENE	EPA-8270 SIM	0.07	UG/L		6/8/00	LRK
FLUORANTHENE	EPA-8270 SIM	0.22	UG/L		6/8/00	LRK
PYRENE	EPA-8270 SIM	0.14	UG/L		6/8/00	LRK
BENZO[A]ANTHRACENE	EPA-8270 SIM	0.03	UG/L		6/8/00	LRK
CHRYSENE	EPA-8270 SIM	0.02	UG/L		6/8/00	LRK
BENZO[B]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO[K]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO(A)PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
INDENO[1,2,3-CD]PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
DIBENZ[A,H]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO[G,H,I]PERYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
DICHLORODIFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
VINYL CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRICHLOROFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ACETONE	EPA-8260A	ND(<20)	UG/L		6/5/00	LRK
1,1-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
METHYLENE CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ACRYLONITRILE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
METHYL T-BUTYL ETHER	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRANS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2-BUTANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK

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CCI
ANALYTICAL
LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 1
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-1 5/25/00 7:51AM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
CIS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROFORM	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,1-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CARBON TETRACHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
DIBROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMODICHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRANS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
4-METHYL-2-PENTANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
TOLUENE	EPA-8260A	3	UG/L		6/5/00	LRK
CIS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,2-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2-HEXANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
1,3-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TETRACHLOROETHYLENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
DIBROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DIBROMOETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,1,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
M+P XYLENE	EPA-8260A	ND(<4)	UG/L		6/5/00	LRK
STYRENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
O-XYLENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOFORM	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ISOPROPYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,2,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,3-TRICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
N-PROPYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 1
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-1 5/25/00 7:51AM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
2-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,3,5-TRIMETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
4-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
T-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,4-TRIMETHYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
S-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
P-ISOPROPYLTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,3 DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,4-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
N-BUTYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DIBROMO 3-CHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
1,2,4-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
HEXACHLORO1,3-BUTADIENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
NAPHTHALENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,3-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
PCB-1016	EPA-8082 MOD	ND(<0.2)	UG/L		5/30/00	LAH
PCB-1221	EPA-8082 MOD	ND(<0.2)	UG/L		5/30/00	LAH
PCB-1232	EPA-8082 MOD	ND(<0.2)	UG/L		5/30/00	LAH
PCB-1242	EPA-8082 MOD	ND(<0.2)	UG/L		5/30/00	LAH
PCB-1248	EPA-8082 MOD	ND(<0.2)	UG/L		5/30/00	LAH
PCB-1254	EPA-8082 MOD	ND(<0.2)	UG/L		5/30/00	LAH
PCB-1260	EPA-8082 MOD	ND(<0.2)	UG/L		5/30/00	LAH
DISSOLVED ARSENIC	EPA-7060	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED BARIUM	EPA-6010	0.061	MG/L		6/7/00	CMH
DISSOLVED CADMIUM	EPA-6010	0.009	MG/L		6/7/00	CMH
DISSOLVED CHROMIUM	EPA-6010	ND(<0.01)	MG/L		6/7/00	CMH
DISSOLVED LEAD	EPA-7421	ND(<0.004)	MG/L		6/12/00	CMH
DISSOLVED MERCURY	EPA-7470	ND(<.0002)	MG/L		6/9/00	CMH
DISSOLVED SELENIUM	EPA-6010	ND(<0.05)	MG/L		6/7/00	CMH
DISSOLVED SILVER	EPA-6010	ND(<0.007)	MG/L		6/7/00	CMH

NOTE: PCB REPORTING LIMIT RAISED DUE TO MATRIX INTERFERENCE

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CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
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CCIL SAMPLE #: 1
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-1 5/25/00 7:51AM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 50 UG/L
DIESEL RANGE REPORTING LIMIT IS 250 UG/L
LUBE OIL RANGE REPORTING LIMIT IS 500 UG/L

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: _____

3229 Pine St. • Everett, WA 98201 • 425 252-2620 • FAX 425 259-6289 • Seattle 206 292-9059

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LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 2
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-2 5/25/00 8:30AM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	ND	MG/KG		5/28/00	LAH
TPH-DIESEL RANGE	NWTPH-DX	ND	UG/L		5/31/00	GLW
TPH-OIL RANGE	NWTPH-DX	ND	UG/L		5/31/00	GLW
NAPHTHALENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
ACENAPHTHYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
ACENAPHATHENE	EPA-8270 SIM	1100	UG/L		6/10/00	LRK
FLUORENE	EPA-8270 SIM	0.05	UG/L		6/8/00	LRK
PHENANTHRENE	EPA-8270 SIM	0.03	UG/L		6/8/00	LRK
ANTHRACENE	EPA-8270 SIM	0.03	UG/L		6/8/00	LRK
FLUORANTHENE	EPA-8270 SIM	0.08	UG/L		6/8/00	LRK
PYRENE	EPA-8270 SIM	0.06	UG/L		6/8/00	LRK
BENZO[A]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
CHRYSENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO[B]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO[K]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO(A)PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
INDENO[1,2,3-CD]PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
DIBENZ[A,H]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO[G,H,I]PERYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
DICHLORODIFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
VINYL CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRICHLOROFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ACETONE	EPA-8260A	ND(<20)	UG/L		6/5/00	LRK
1,1-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
METHYLENE CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ACRYLONITRILE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
METHYL T-BUTYL ETHER	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRANS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2-BUTANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK

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LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 2
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-2 5/25/00 8:30AM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
CIS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROFORM	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,1-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CARBON TETRACHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
DIBROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMODICHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRANS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
4-METHYL-2-PENTANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
TOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CIS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,2-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2-HEXANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
1,3-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TETRACHLOROETHYLENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
DIBROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DIBROMOETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,1,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
M+P XYLENE	EPA-8260A	ND(<4)	UG/L		6/5/00	LRK
STYRENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
O-XYLENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOFORM	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ISOPROPYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,2,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,3-TRICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
N-PROPYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK

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CCIL SAMPLE #: 2
DATE RECEIVED: 5/26/00
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CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-2 5/25/00 8:30AM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
2-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,3,5-TRIMETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
4-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
T-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,4-TRIMETHYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
S-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
P-ISOPROPYLTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,3 DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,4-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
N-BUTYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DIBROMO 3-CHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
1,2,4-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
HEXACHLORO1,3-BUTADIENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
NAPHTHALENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,3-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
PCB-1016	EPA-8082 MOD	ND(<1)	UG/L		6/12/00	LAH
PCB-1221	EPA-8082 MOD	ND(<1)	UG/L		6/12/00	LAH
PCB-1232	EPA-8082 MOD	ND(<1)	UG/L		6/12/00	LAH
PCB-1242	EPA-8082 MOD	ND(<1)	UG/L		6/12/00	LAH
PCB-1248	EPA-8082 MOD	ND(<1)	UG/L		6/12/00	LAH
PCB-1254	EPA-8082 MOD	ND(<1)	UG/L		6/12/00	LAH
PCB-1260	EPA-8082 MOD	ND(<1)	UG/L		6/12/00	LAH
DISSOLVED ARSENIC	EPA-7060	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED BARIUM	EPA-6010	0.049	MG/L		6/7/00	CMH
DISSOLVED CADMIUM	EPA-6010	0.006	MG/L		6/7/00	CMH
DISSOLVED CHROMIUM	EPA-6010	ND(<0.01)	MG/L		6/7/00	CMH
DISSOLVED LEAD	EPA-7421	ND(<0.004)	MG/L		6/12/00	CMH
DISSOLVED MERCURY	EPA-7470	ND(<.0002)	MG/L		6/9/00	CMH
DISSOLVED SELENIUM	EPA-6010	ND(<0.05)	MG/L		6/7/00	CMH
DISSOLVED SILVER	EPA-6010	ND(<0.007)	MG/L		6/7/00	CMH

NOTE: PCB REPORTING LIMIT RAISED DUE TO MATRIX INTERFERENCE

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530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

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CCIL SAMPLE #: 2
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-2 5/25/00 8:30AM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 50 UG/L
DIESEL RANGE REPORTING LIMIT IS 250 UG/L
LUBE OIL RANGE REPORTING LIMIT IS 500 UG/L

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: _____

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530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 3
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-3 5/25/00 9:15AM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	ND	UG/L		5/28/00	LAH
TPH-DIESEL RANGE	NWTPH-DX	ND	UG/L		5/31/00	GLW
TPH-OIL RANGE	NWTPH-DX	ND	UG/L		5/31/00	GLW
NAPHTHALENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
ACENAPHTHYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
ACENAPHATHENE	EPA-8270 SIM	0.17	UG/L		6/8/00	LRK
FLUORENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
PHENANTHRENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO[A]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
CHRYSENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO[B]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO[K]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO(A)PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
INDENO[1,2,3-CD]PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
DIBENZ[A,H]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO[G,H,I]PERYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
DICHLORODIFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
VINYL CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRICHLOROFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ACETONE	EPA-8260A	ND(<20)	UG/L		6/5/00	LRK
1,1-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
METHYLENE CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ACRYLONITRILE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
METHYL T-BUTYL ETHER	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRANS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2-BUTANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK

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530 SOUTH 336TH STREET
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WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-3 5/25/00 9:15AM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
CIS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROFORM	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,1-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CARBON TETRACHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
DIBROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMODICHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRANS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
4-METHYL-2-PENTANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
TOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CIS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,2-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2-HEXANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
1,3-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TETRACHLOROETHYLENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
DIBROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DIBROMOETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,1,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
M+P XYLENE	EPA-8260A	ND(<4)	UG/L		6/5/00	LRK
STYRENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
O-XYLENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOFORM	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ISOPROPYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,2,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,3-TRICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
N-PROPYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK

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DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
2-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,3,5-TRIMETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
4-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
T-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,4-TRIMETHYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
S-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
P-ISOPROPYLTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,3 DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,4-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
N-BUTYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DIBROMO 3-CHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
1,2,4-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
HEXACHLORO1,3-BUTADIENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
NAPHTHALENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,3-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
PCB-1016	EPA-8082 MOD	ND(<1)	UG/L		5/30/00	LAH
PCB-1221	EPA-8082 MOD	ND(<1)	UG/L		5/30/00	LAH
PCB-1232	EPA-8082 MOD	ND(<1)	UG/L		5/30/00	LAH
PCB-1242	EPA-8082 MOD	ND(<1)	UG/L		5/30/00	LAH
PCB-1248	EPA-8082 MOD	ND(<1)	UG/L		5/30/00	LAH
PCB-1254	EPA-8082 MOD	ND(<1)	UG/L		5/30/00	LAH
PCB-1260	EPA-8082 MOD	ND(<1)	UG/L		5/30/00	LAH
DISSOLVED ARSENIC	EPA-7060	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED BARIUM	EPA-6010	0.062	MG/L		6/7/00	CMH
DISSOLVED CADMIUM	EPA-6010	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED CHROMIUM	EPA-6010	ND(<0.01)	MG/L		6/7/00	CMH
DISSOLVED LEAD	EPA-7421	ND(<0.004)	MG/L		6/12/00	CMH
DISSOLVED MERCURY	EPA-7470	ND(<.0002)	MG/L		6/9/00	CMH
DISSOLVED SELENIUM	EPA-6010	ND(<0.05)	MG/L		6/7/00	CMH
DISSOLVED SILVER	EPA-6010	ND(<0.007)	MG/L		6/7/00	CMH

NOTE: PCB REPORTING LIMIT RAISED DUE TO MATRIX INTERFERENCE

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 3
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-3 5/25/00 9:15AM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 50 UG/L
DIESEL RANGE REPORTING LIMIT IS 250 UG/L
LUBE OIL RANGE REPORTING LIMIT IS 500 UG/L

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: _____

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 4
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-4 5/25/00 9:50AM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	ND	UG/L		5/28/00	LAH
TPH-DIESEL RANGE	NWTPH-DX	ND	UG/L		5/31/00	GLW
TPH-OIL RANGE	NWTPH-DX	ND	UG/L		5/31/00	GLW
NAPHTHALENE	EPA-8270 SIM	0.04	UG/L		6/8/00	LRK
ACENAPHTHYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
ACENAPHATHENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
FLUORENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
PHENANTHRENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO[A]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
CHRYSENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO[B]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO[K]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO(A)PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
INDENO[1,2,3-CD]PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
DIBENZ[A,H]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO[G,H,I]PERYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
DICHLORODIFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
VINYL CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRICHLOROFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ACETONE	EPA-8260A	ND(<20)	UG/L		6/5/00	LRK
1,1-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
METHYLENE CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ACRYLONITRILE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
METHYL T-BUTYL ETHER	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRANS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2-BUTANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 4
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-4 5/25/00 9:50AM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
CIS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROFORM	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,1-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CARBON TETRACHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
DIBROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMODICHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRANS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
4-METHYL-2-PENTANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
TOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CIS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,2-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2-HEXANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
1,3-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TETRACHLOROETHYLENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
DIBROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DIBROMOETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,1,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
M+P XYLENE	EPA-8260A	ND(<4)	UG/L		6/5/00	LRK
STYRENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
O-XYLENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOFORM	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ISOPROPYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,2,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,3-TRICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
N-PROPYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 4
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-4 5/25/00 9:50AM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
2-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,3,5-TRIMETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
4-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
T-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,4-TRIMETHYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
S-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
P-ISOPROPYLTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,3 DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,4-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
N-BUTYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DIBROMO 3-CHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
1,2,4-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
HEXACHLORO1,3-BUTADIENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
NAPHTHALENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,3-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
PCB-1016	EPA-8082 MOD	ND(<1)	UG/L		5/30/00	LAH
PCB-1221	EPA-8082 MOD	ND(<1)	UG/L		5/30/00	LAH
PCB-1232	EPA-8082 MOD	ND(<1)	UG/L		5/30/00	LAH
PCB-1242	EPA-8082 MOD	ND(<1)	UG/L		5/30/00	LAH
PCB-1248	EPA-8082 MOD	ND(<1)	UG/L		5/30/00	LAH
PCB-1254	EPA-8082 MOD	ND(<1)	UG/L		5/30/00	LAH
PCB-1260	EPA-8082 MOD	ND(<1)	UG/L		5/30/00	LAH
DISSOLVED ARSENIC	EPA-7060	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED BARIUM	EPA-6010	0.033	MG/L		6/7/00	CMH
DISSOLVED CADMIUM	EPA-6010	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED CHROMIUM	EPA-6010	ND(<0.01)	MG/L		6/7/00	CMH
DISSOLVED LEAD	EPA-7421	ND(<0.004)	MG/L		6/12/00	CMH
DISSOLVED MERCURY	EPA-7470	ND(<.0002)	MG/L		6/9/00	CMH
DISSOLVED SELENIUM	EPA-6010	ND(<0.05)	MG/L		6/7/00	CMH
DISSOLVED SILVER	EPA-6010	ND(<0.007)	MG/L		6/7/00	CMH

NOTE: PCB REPORTING LIMIT RAISED DUE TO MATRIX INTERFERENCE

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LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 4
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-4 5/25/00 9:50AM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 50 UG/L
DIESEL RANGE REPORTING LIMIT IS 250 UG/L
LUBE OIL RANGE REPORTING LIMIT IS 500 UG/L

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: _____

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 5
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-5 5/25/00 10:25AM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	ND	UG/L		5/28/00	LAH
TPH-DIESEL RANGE	NWTPH-DX	ND	UG/L		5/31/00	GLW
TPH-OIL RANGE	NWTPH-DX	ND	UG/L		5/31/00	GLW
NAPHTHALENE	EPA-8270 SIM	0.02	UG/L		6/8/00	LRK
ACENAPHTHYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
ACENAPHATHENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
FLUORENE	EPA-8270 SIM	0.04	UG/L		6/8/00	LRK
PHENANTHRENE	EPA-8270 SIM	0.06	UG/L		6/8/00	LRK
ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
FLUORANTHENE	EPA-8270 SIM	0.07	UG/L		6/8/00	LRK
PYRENE	EPA-8270 SIM	0.06	UG/L		6/8/00	LRK
BENZO[A]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
CHRYSENE	EPA-8270 SIM	0.02	UG/L		6/8/00	LRK
BENZO[B]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO[K]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO(A)PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
INDENO[1,2,3-CD]PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
DIBENZ[A,H]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO[G,H,I]PERYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
DICHLORODIFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
VINYL CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRICHLOROFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ACETONE	EPA-8260A	ND(<20)	UG/L		6/5/00	LRK
1,1-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
METHYLENE CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ACRYLONITRILE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
METHYL T-BUTYL ETHER	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRANS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2-BUTANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 5
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-5 5/25/00 10:25AM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
CIS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROFORM	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,1-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CARBON TETRACHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
DIBROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMODICHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRANS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
4-METHYL-2-PENTANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
TOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CIS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,2-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2-HEXANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
1,3-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TETRACHLOROETHYLENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
DIBROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DIBROMOETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,1,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
M+P XYLENE	EPA-8260A	ND(<4)	UG/L		6/5/00	LRK
STYRENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
O-XYLENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOFORM	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ISOPROPYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,2,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,3-TRICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
N-PROPYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK

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LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 5
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-5 5/25/00 10:25AM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
2-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,3,5-TRIMETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
4-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
T-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,4-TRIMETHYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
S-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
P-ISOPROPYLTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,3 DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,4-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
N-BUTYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DIBROMO 3-CHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
1,2,4-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
HEXACHLORO1,3-BUTADIENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
NAPHTHALENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,3-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
PCB-1016	EPA-8082 MOD	ND(<2)	UG/L		6/12/00	LAH
PCB-1221	EPA-8082 MOD	ND(<2)	UG/L		6/12/00	LAH
PCB-1232	EPA-8082 MOD	ND(<2)	UG/L		6/12/00	LAH
PCB-1242	EPA-8082 MOD	ND(<2)	UG/L		6/12/00	LAH
PCB-1248	EPA-8082 MOD	ND(<2)	UG/L		6/12/00	LAH
PCB-1254	EPA-8082 MOD	ND(<2)	UG/L		6/12/00	LAH
PCB-1260	EPA-8082 MOD	ND(<2)	UG/L		6/12/00	LAH
DISSOLVED ARSENIC	EPA-7060	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED BARIUM	EPA-6010	0.044	MG/L		6/7/00	CMH
DISSOLVED CADMIUM	EPA-6010	0.005	MG/L		6/7/00	CMH
DISSOLVED CHROMIUM	EPA-6010	ND(<0.01)	MG/L		6/7/00	CMH
DISSOLVED LEAD	EPA-7421	ND(<0.004)	MG/L		6/12/00	CMH
DISSOLVED MERCURY	EPA-7470	ND(<.0002)	MG/L		6/9/00	CMH
DISSOLVED SELENIUM	EPA-6010	ND(<0.05)	MG/L		6/7/00	CMH
DISSOLVED SILVER	EPA-6010	ND(<0.007)	MG/L		6/7/00	CMH

NOTE: PCB REPORTING LIMIT RAISED DUE TO MATRIX INTERFERENCE

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 5
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-5 5/25/00 10:25AM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 50 UG/L
DIESEL RANGE REPORTING LIMIT IS 250 UG/L
LUBE OIL RANGE REPORTING LIMIT IS 500 UG/L

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: _____

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LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 6
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-6 5/25/00 11:15AM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	ND	UG/L		5/28/00	LAH
TPH-DIESEL RANGE	NWTPH-DX	ND	UG/L		5/31/00	GLW
TPH-OIL RANGE	NWTPH-DX	ND	UG/L		5/31/00	GLW
NAPHTHALENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
ACENAPHTHYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
ACENAPHATHENE	EPA-8270 SIM	0.16	UG/L		6/8/00	LRK
FLUORENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
PHENANTHRENE	EPA-8270 SIM	0.04	UG/L		6/8/00	LRK
ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
FLUORANTHENE	EPA-8270 SIM	0.09	UG/L		6/8/00	LRK
PYRENE	EPA-8270 SIM	0.16	UG/L		6/8/00	LRK
BENZO[A]ANTHRACENE	EPA-8270 SIM	0.09	UG/L		6/8/00	LRK
CHRYSENE	EPA-8270 SIM	0.55	UG/L		6/8/00	LRK
BENZO[B]FLUORANTHENE	EPA-8270 SIM	0.21	UG/L		6/8/00	LRK
BENZO[K]FLUORANTHENE	EPA-8270 SIM	0.09	UG/L		6/8/00	LRK
BENZO(A)PYRENE	EPA-8270 SIM	0.04	UG/L		6/8/00	LRK
INDENO[1,2,3-CD]PYRENE	EPA-8270 SIM	0.04	UG/L		6/8/00	LRK
DIBENZ[A,H]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO[G,H,I]PERYLENE	EPA-8270 SIM	0.07	UG/L		6/8/00	LRK
DICHLORODIFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
VINYL CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRICHLOROFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ACETONE	EPA-8260A	ND(<20)	UG/L		6/5/00	LRK
1,1-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
METHYLENE CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ACRYLONITRILE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
METHYL T-BUTYL ETHER	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRANS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2-BUTANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK

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CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 6
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-6 5/25/00 11:15AM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
CIS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROFORM	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,1-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CARBON TETRACHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
DIBROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMODICHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRANS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
4-METHYL-2-PENTANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
TOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CIS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,2-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2-HEXANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
1,3-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TETRACHLOROETHYLENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
DIBROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DIBROMOETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,1,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
M+P XYLENE	EPA-8260A	ND(<4)	UG/L		6/5/00	LRK
STYRENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
O-XYLENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOFORM	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ISOPROPYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,2,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,3-TRICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
N-PROPYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK

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CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 6
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-6 5/25/00 11:15AM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
2-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,3,5-TRIMETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
4-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
T-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,4-TRIMETHYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
S-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
P-ISOPROPYLTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,3 DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,4-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
N-BUTYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DIBROMO 3-CHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
1,2,4-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
HEXACHLORO1,3-BUTADIENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
NAPHTHALENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,3-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
PCB-1016	EPA-8082 MOD	ND(<0.1)	UG/L		6/12/00	LAH
PCB-1221	EPA-8082 MOD	ND(<0.1)	UG/L		6/12/00	LAH
PCB-1232	EPA-8082 MOD	ND(<0.1)	UG/L		6/12/00	LAH
PCB-1242	EPA-8082 MOD	ND(<0.1)	UG/L		6/12/00	LAH
PCB-1248	EPA-8082 MOD	ND(<0.1)	UG/L		6/12/00	LAH
PCB-1254	EPA-8082 MOD	ND(<0.1)	UG/L		6/12/00	LAH
PCB-1260	EPA-8082 MOD	ND(<0.1)	UG/L		6/12/00	LAH
DISSOLVED ARSENIC	EPA-7060	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED BARIUM	EPA-6010	0.014	MG/L		6/7/00	CMH
DISSOLVED CADMIUM	EPA-6010	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED CHROMIUM	EPA-6010	ND(<0.01)	MG/L		6/7/00	CMH
DISSOLVED LEAD	EPA-7421	ND(<0.004)	MG/L		6/12/00	CMH
DISSOLVED MERCURY	EPA-7470	ND(<.0002)	MG/L		6/9/00	CMH
DISSOLVED SELENIUM	EPA-6010	ND(<0.05)	MG/L		6/7/00	CMH
DISSOLVED SILVER	EPA-6010	ND(<0.007)	MG/L		6/7/00	CMH

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530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 6
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-6 5/25/00 11:15AM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 50 UG/L
DIESEL RANGE REPORTING LIMIT IS 250 UG/L
LUBE OIL RANGE REPORTING LIMIT IS 500 UG/L

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: _____

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 7
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-7 5/25/00 12:00PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	ND	UG/L		5/28/00	LAH
TPH-DIESEL RANGE	NWTPH-DX	ND	UG/L		5/31/00	GLW
TPH-OIL RANGE	NWTPH-DX	ND	UG/L		5/31/00	GLW
NAPHTHALENE	EPA-8270 SIM	0.02	UG/L		6/8/00	LRK
ACENAPHTHYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
ACENAPHATHENE	EPA-8270 SIM	0.55	UG/L		6/8/00	LRK
FLUORENE	EPA-8270 SIM	0.40	UG/L		6/8/00	LRK
PHENANTHRENE	EPA-8270 SIM	1.2	UG/L		6/10/00	LRK
ANTHRACENE	EPA-8270 SIM	0.18	UG/L		6/8/00	LRK
FLUORANTHENE	EPA-8270 SIM	0.38	UG/L		6/8/00	LRK
PYRENE	EPA-8270 SIM	0.25	UG/L		6/8/00	LRK
BENZO[A]ANTHRACENE	EPA-8270 SIM	0.05	UG/L		6/8/00	LRK
CHRYSENE	EPA-8270 SIM	0.04	UG/L		6/8/00	LRK
BENZO[B]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO[K]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO(A)PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
INDENO[1,2,3-CD]PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
DIBENZ[A,H]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO[G,H,I]PERYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
DICHLORODIFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
VINYL CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRICHLOROFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ACETONE	EPA-8260A	ND(<20)	UG/L		6/5/00	LRK
1,1-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
METHYLENE CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ACRYLONITRILE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
METHYL T-BUTYL ETHER	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRANS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2-BUTANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK

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ANALYTICAL
LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 7
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-7 5/25/00 12:00PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
CIS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROFORM	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,1-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CARBON TETRACHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
DIBROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMODICHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRANS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
4-METHYL-2-PENTANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
TOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CIS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,2-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2-HEXANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
1,3-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TETRACHLOROETHYLENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
DIBROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DIBROMOETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,1,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
M+P XYLENE	EPA-8260A	ND(<4)	UG/L		6/5/00	LRK
STYRENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
O-XYLENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOFORM	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ISOPROPYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,2,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,3-TRICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
N-PROPYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK

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530 SOUTH 336TH STREET
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CCIL SAMPLE #: 7
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-7 5/25/00 12:00PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
2-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,3,5-TRIMETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
4-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
T-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,4-TRIMETHYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
S-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
P-ISOPROPYLTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,3 DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,4-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
N-BUTYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DIBROMO 3-CHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
1,2,4-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
HEXACHLORO1,3-BUTADIENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
NAPHTHALENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,3-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
PCB-1016	EPA-8082 MOD	ND(<0.1)	UG/L		6/12/00	LAH
PCB-1221	EPA-8082 MOD	ND(<0.1)	UG/L		6/12/00	LAH
PCB-1232	EPA-8082 MOD	ND(<0.1)	UG/L		6/12/00	LAH
PCB-1242	EPA-8082 MOD	ND(<0.1)	UG/L		6/12/00	LAH
PCB-1248	EPA-8082 MOD	ND(<0.1)	UG/L		6/12/00	LAH
PCB-1254	EPA-8082 MOD	ND(<0.1)	UG/L		6/12/00	LAH
PCB-1260	EPA-8082 MOD	ND(<0.1)	UG/L		6/12/00	LAH
DISSOLVED ARSENIC	EPA-7060	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED BARIUM	EPA-6010	0.023	MG/L		6/7/00	CMH
DISSOLVED CADMIUM	EPA-6010	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED CHROMIUM	EPA-6010	ND(<0.01)	MG/L		6/7/00	CMH
DISSOLVED LEAD	EPA-7421	ND(<0.004)	MG/L		6/12/00	CMH
DISSOLVED MERCURY	EPA-7470	ND(<.0002)	MG/L		6/9/00	CMH
DISSOLVED SELENIUM	EPA-6010	ND(<0.05)	MG/L		6/7/00	CMH
DISSOLVED SILVER	EPA-6010	ND(<0.007)	MG/L		6/7/00	CMH

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FEDERAL WAY, WA 98003

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WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-7 5/25/00 12:00PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 50 UG/L
DIESEL RANGE REPORTING LIMIT IS 250 UG/L
LUBE OIL RANGE REPORTING LIMIT IS 500 UG/L

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: _____

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CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 8
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-8 5/25/00 1:40PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	ND	UG/L		5/28/00	LAH
TPH-DIESEL RANGE	NWTPH-DX	ND	UG/L		5/31/00	GLW
TPH-OIL RANGE	NWTPH-DX	ND	UG/L		5/31/00	GLW
NAPHTHALENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
ACENAPHTHYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
ACENAPHATHENE	EPA-8270 SIM	0.02	UG/L		6/8/00	LRK
FLUORENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
PHENANTHRENE	EPA-8270 SIM	0.09	UG/L		6/8/00	LRK
ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
FLUORANTHENE	EPA-8270 SIM	0.05	UG/L		6/8/00	LRK
PYRENE	EPA-8270 SIM	0.06	UG/L		6/8/00	LRK
BENZO[A]ANTHRACENE	EPA-8270 SIM	0.02	UG/L		6/8/00	LRK
CHRYSENE	EPA-8270 SIM	0.03	UG/L		6/8/00	LRK
BENZO[B]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO[K]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO(A)PYRENE	EPA-8270 SIM	0.02	UG/L		6/8/00	LRK
INDENO[1,2,3-CD]PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
DIBENZ[A,H]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO[G,H,I]PERYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
DICHLORODIFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
VINYL CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRICHLOROFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ACETONE	EPA-8260A	ND(<20)	UG/L		6/5/00	LRK
1,1-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
METHYLENE CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ACRYLONITRILE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
METHYL T-BUTYL ETHER	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRANS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2-BUTANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK

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530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

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WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-8 5/25/00 1:40PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
CIS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROFORM	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,1-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CARBON TETRACHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
DIBROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMODICHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRANS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
4-METHYL-2-PENTANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
TOLUENE	EPA-8260A	2	UG/L		6/5/00	LRK
CIS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,2-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2-HEXANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
1,3-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TETRACHLOROETHYLENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
DIBROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DIBROMOETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,1,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
M+P XYLENE	EPA-8260A	ND(<4)	UG/L		6/5/00	LRK
STYRENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
O-XYLENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOFORM	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ISOPROPYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,2,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,3-TRICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
N-PROPYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK

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DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
2-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,3,5-TRIMETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
4-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
T-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,4-TRIMETHYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
S-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
P-ISOPROPYLTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,3 DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,4-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
N-BUTYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DIBROMO 3-CHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
1,2,4-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
HEXACHLORO1,3-BUTADIENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
NAPHTHALENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,3-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
PCB-1016	EPA-8082 MOD	ND(<0.1)	UG/L		6/12/00	LAH
PCB-1221	EPA-8082 MOD	ND(<0.1)	UG/L		6/12/00	LAH
PCB-1232	EPA-8082 MOD	ND(<0.1)	UG/L		6/12/00	LAH
PCB-1242	EPA-8082 MOD	ND(<0.1)	UG/L		6/12/00	LAH
PCB-1248	EPA-8082 MOD	ND(<0.1)	UG/L		6/12/00	LAH
PCB-1254	EPA-8082 MOD	ND(<0.1)	UG/L		6/12/00	LAH
PCB-1260	EPA-8082 MOD	ND(<0.1)	UG/L		6/12/00	LAH
DISSOLVED ARSENIC	EPA-7060	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED BARIUM	EPA-6010	0.12	MG/L		6/7/00	CMH
DISSOLVED CADMIUM	EPA-6010	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED CHROMIUM	EPA-6010	ND(<0.01)	MG/L		6/7/00	CMH
DISSOLVED LEAD	EPA-7421	ND(<0.004)	MG/L		6/12/00	CMH
DISSOLVED MERCURY	EPA-7470	ND(<.0002)	MG/L		6/9/00	CMH
DISSOLVED SELENIUM	EPA-6010	ND(<0.05)	MG/L		6/7/00	CMH
DISSOLVED SILVER	EPA-6010	ND(<0.007)	MG/L		6/7/00	CMH

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 8
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-8 5/25/00 1:40PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 50 UG/L
DIESEL RANGE REPORTING LIMIT IS 250 UG/L
LUBE OIL RANGE REPORTING LIMIT IS 500 UG/L

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: _____

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 9
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-9 5/25/00 3:00PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	ND	UG/L		5/28/00	LAH
TPH-DIESEL RANGE	NWTPH-DX	ND	UG/L		5/31/00	GLW
TPH-OIL RANGE	NWTPH-DX	ND	UG/L		5/31/00	GLW
NAPHTHALENE	EPA-8270 SIM	0.02	UG/L		6/8/00	LRK
ACENAPHTHYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
ACENAPHATHENE	EPA-8270 SIM	0.04B	UG/L		6/8/00	LRK
FLUORENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
PHENANTHRENE	EPA-8270 SIM	0.06B	UG/L		6/8/00	LRK
ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
FLUORANTHENE	EPA-8270 SIM	0.03	UG/L		6/8/00	LRK
PYRENE	EPA-8270 SIM	0.02	UG/L		6/8/00	LRK
BENZO[A]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
CHRYSENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO[B]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO[K]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO(A)PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
INDENO[1,2,3-CD]PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
DIBENZ[A,H]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO[G,H,I]PERYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
DICHLORODIFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
VINYL CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRICHLOROFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ACETONE	EPA-8260A	ND(<20)	UG/L		6/5/00	LRK
1,1-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
METHYLENE CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ACRYLONITRILE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
METHYL T-BUTYL ETHER	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRANS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2-BUTANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 9
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-9 5/25/00 3:00PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
CIS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROFORM	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,1-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CARBON TETRACHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
DIBROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMODICHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRAN5-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
4-METHYL-2-PENTANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
TOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CIS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,2-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2-HEXANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
1,3-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TETRACHLOROETHYLENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
DIBROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DIBROMOETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,1,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
M+P XYLENE	EPA-8260A	ND(<4)	UG/L		6/5/00	LRK
STYRENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
O-XYLENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOFORM	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ISOPROPYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,2,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,3-TRICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
N-PROPYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 9
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-9 5/25/00 3:00PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
2-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,3,5-TRIMETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
4-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
T-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,4-TRIMETHYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
S-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
P-ISOPROPYLTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,3 DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,4-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
N-BUTYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DIBROMO 3-CHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
1,2,4-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
HEXACHLORO1,3-BUTADIENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
NAPHTHALENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,3-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
PCB-1016	EPA-8082 MOD	ND(<0.2)	UG/L		5/30/00	LAH
PCB-1221	EPA-8082 MOD	ND(<0.2)	UG/L		5/30/00	LAH
PCB-1232	EPA-8082 MOD	ND(<0.2)	UG/L		5/30/00	LAH
PCB-1242	EPA-8082 MOD	ND(<0.2)	UG/L		5/30/00	LAH
PCB-1248	EPA-8082 MOD	ND(<0.2)	UG/L		5/30/00	LAH
PCB-1254	EPA-8082 MOD	ND(<0.2)	UG/L		5/30/00	LAH
PCB-1260	EPA-8082 MOD	ND(<0.2)	UG/L		5/30/00	LAH
DISSOLVED ARSENIC	EPA-7060	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED BARIUM	EPA-6010	0.030	MG/L		6/7/00	CMH
DISSOLVED CADMIUM	EPA-6010	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED CHROMIUM	EPA-6010	ND(<0.01)	MG/L		6/7/00	CMH
DISSOLVED LEAD	EPA-7421	ND(<0.004)	MG/L		6/12/00	CMH
DISSOLVED MERCURY	EPA-7470	ND(<.0002)	MG/L		6/9/00	CMH
DISSOLVED SELENIUM	EPA-6010	ND(<0.05)	MG/L		6/7/00	CMH
DISSOLVED SILVER	EPA-6010	ND(<0.007)	MG/L		6/7/00	CMH

NOTE: PCB REPORTING LIMIT RAISED DUE TO MATRIX INTERFERENCE

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LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 9
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-9 5/25/00 3:00PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 50 UG/L
DIESEL RANGE REPORTING LIMIT IS 250 UG/L
LUBE OIL RANGE REPORTING LIMIT IS 500 UG/L

B INDICATES ANALYTE ALSO OBSERVED IN BLANK

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: _____

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 10
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-10 5/25/00 4:10PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	ND	UG/L		5/28/00	LAH
TPH-DIESEL RANGE	NWTPH-DX	ND	UG/L		5/31/00	GLW
TPH-OIL RANGE	NWTPH-DX	ND	UG/L		5/31/00	GLW
NAPHTHALENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
ACENAPHTHYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
ACENAPHATHENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
FLUORENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
PHENANTHRENE	EPA-8270 SIM	0.02B	UG/L		6/8/00	LRK
ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO[A]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
CHRYSENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO[B]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO[K]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO(A)PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
INDENO[1,2,3-CD]PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
DIBENZ[A,H]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
BENZO[G,H,I]PERYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/8/00	LRK
DICHLORODIFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
CHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
VINYL CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
BROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
CHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
TRICHLOROFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
ACETONE	EPA-8260A	ND(<20)	UG/L		6/8/00	LRK
1,1-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
METHYLENE CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
ACRYLONITRILE	EPA-8260A	ND(<5)	UG/L		6/8/00	LRK
METHYL T-BUTYL ETHER	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
TRANS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
1,1-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
2-BUTANONE	EPA-8260A	ND(<5)	UG/L		6/8/00	LRK

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 10
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-10 5/25/00 4:10PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
CIS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
2,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
BROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
CHLOROFORM	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
1,1,1-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
1,1-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
CARBON TETRACHLORIDE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
1,2-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
BENZENE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
TRICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
1,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
DIBROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
BROMODICHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
TRANS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
4-METHYL-2-PENTANONE	EPA-8260A	ND(<5)	UG/L		6/8/00	LRK
TOLUENE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
CIS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
1,1,2-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
2-HEXANONE	EPA-8260A	ND(<5)	UG/L		6/8/00	LRK
1,3-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
TETRACHLOROETHYLENE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
DIBROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
1,2-DIBROMOETHANE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
CHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
1,1,1,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
ETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
M+P XYLENE	EPA-8260A	ND(<4)	UG/L		6/8/00	LRK
STYRENE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
O-XYLENE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
BROMOFORM	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
ISOPROPYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
1,1,2,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
1,2,3-TRICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
BROMOBENZENE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
N-PROPYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK

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LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 10
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-10 5/25/00 4:10PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
2-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
1,3,5-TRIMETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
4-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
T-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
1,2,4-TRIMETHYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
S-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
P-ISOPROPYLTOLUENE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
1,3 DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
1,4-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
N-BUTYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
1,2-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
1,2-DIBROMO 3-CHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		6/8/00	LRK
1,2,4-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
HEXACHLORO1,3-BUTADIENE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
NAPHTHALENE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
1,2,3-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/8/00	LRK
PCB-1016	EPA-8082 MOD	ND(<0.2)	UG/L		5/30/00	LAH
PCB-1221	EPA-8082 MOD	ND(<0.2)	UG/L		5/30/00	LAH
PCB-1232	EPA-8082 MOD	ND(<0.2)	UG/L		5/30/00	LAH
PCB-1242	EPA-8082 MOD	ND(<0.2)	UG/L		5/30/00	LAH
PCB-1248	EPA-8082 MOD	ND(<0.2)	UG/L		5/30/00	LAH
PCB-1254	EPA-8082 MOD	ND(<0.2)	UG/L		5/30/00	LAH
PCB-1260	EPA-8082 MOD	ND(<0.2)	UG/L		5/30/00	LAH
DISSOLVED ARSENIC	EPA-7060	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED BARIUM	EPA-6010	0.017	MG/L		6/7/00	CMH
DISSOLVED CADMIUM	EPA-6010	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED CHROMIUM	EPA-6010	ND(<0.01)	MG/L		6/7/00	CMH
DISSOLVED LEAD	EPA-7421	ND(<0.004)	MG/L		6/12/00	CMH
DISSOLVED MERCURY	EPA-7470	ND(<.0002)	MG/L		6/9/00	CMH
DISSOLVED SELENIUM	EPA-6010	ND(<0.05)	MG/L		6/7/00	CMH
DISSOLVED SILVER	EPA-6010	ND(<0.007)	MG/L		6/7/00	CMH

NOTE: PCB REPORTING LIMIT RAISED DUE TO MATRIX INTERFERENCE

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 10
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-10 5/25/00 4:10PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 50 UG/L
DIESEL RANGE REPORTING LIMIT IS 250 UG/L
LUBE OIL RANGE REPORTING LIMIT IS 500 UG/L

B INDICATES ANALYTE ALSO OBSERVED IN BLANK

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: _____

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DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-11 5/25/00 4:45PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	ND	UG/L		5/28/00	LAH
TPH-DIESEL RANGE	NWTPH-DX	ND	UG/L		6/1/00	GLW
TPH-OIL RANGE	NWTPH-DX	ND	UG/L		6/1/00	GLW
NAPHTHALENE	EPA-8270 SIM	0.13	UG/L		6/9/00	LRK
ACENAPHTHYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
ACENAPHATHENE	EPA-8270 SIM	1.4	UG/L		6/10/00	LRK
FLUORENE	EPA-8270 SIM	0.03	UG/L		6/9/00	LRK
PHENANTHRENE	EPA-8270 SIM	0.04	UG/L		6/9/00	LRK
ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
BENZO[A]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
CHRYSENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
BENZO[B]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
BENZO[K]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
BENZO(A)PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
INDENO[1,2,3-CD]PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
DIBENZ[A,H]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
BENZO[G,H,I]PERYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
DICHLORODIFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
VINYL CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRICHLOROFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ACETONE	EPA-8260A	ND(<20)	UG/L		6/5/00	LRK
1,1-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
METHYLENE CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ACRYLONITRILE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
METHYL T-BUTYL ETHER	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRANS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2-BUTANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK

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530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 11
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-11 5/25/00 4:45PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
CIS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROFORM	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,1-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CARBON TETRACHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
DIBROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMODICHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRANS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
4-METHYL-2-PENTANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
TOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CIS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,2-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2-HEXANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
1,3-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TETRACHLOROETHYLENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
DIBROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DIBROMOETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,1,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
M+P XYLENE	EPA-8260A	ND(<4)	UG/L		6/5/00	LRK
STYRENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
O-XYLENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOFORM	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ISOPROPYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,2,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,3-TRICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
N-PROPYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK

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CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 11
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-11 5/25/00 4:45PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
2-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,3,5-TRIMETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
4-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
T-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,4-TRIMETHYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
S-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
P-ISOPROPYLTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,3 DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,4-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
N-BUTYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DIBROMO 3-CHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
1,2,4-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
HEXACHLORO1,3-BUTADIENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
NAPHTHALENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,3-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
PCB-1016	EPA-8082 MOD	ND(<0.2)	UG/L		5/30/00	LAH
PCB-1221	EPA-8082 MOD	ND(<0.2)	UG/L		5/30/00	LAH
PCB-1232	EPA-8082 MOD	ND(<0.2)	UG/L		5/30/00	LAH
PCB-1242	EPA-8082 MOD	ND(<0.2)	UG/L		5/30/00	LAH
PCB-1248	EPA-8082 MOD	ND(<0.2)	UG/L		5/30/00	LAH
PCB-1254	EPA-8082 MOD	ND(<0.2)	UG/L		5/30/00	LAH
PCB-1260	EPA-8082 MOD	ND(<0.2)	UG/L		5/30/00	LAH
DISSOLVED ARSENIC	EPA-7060	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED BARIUM	EPA-6010	0.009	MG/L		6/7/00	CMH
DISSOLVED CADMIUM	EPA-6010	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED CHROMIUM	EPA-6010	ND(<0.01)	MG/L		6/7/00	CMH
DISSOLVED LEAD	EPA-7421	ND(<0.004)	MG/L		6/12/00	CMH
DISSOLVED MERCURY	EPA-7470	ND(<.0002)	MG/L		6/9/00	CMH
DISSOLVED SELENIUM	EPA-6010	ND(<0.05)	MG/L		6/7/00	CMH
DISSOLVED SILVER	EPA-6010	ND(<0.007)	MG/L		6/7/00	CMH

NOTE: PCB REPORTING LIMIT RAISED DUE TO MATRIX INTERFERENCE

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CCIL SAMPLE #: 11
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-11 5/25/00 4:45PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 50 UG/L
DIESEL RANGE REPORTING LIMIT IS 250 UG/L
LUBE OIL RANGE REPORTING LIMIT IS 500 UG/L

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: _____

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530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 12
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-12 5/25/00 5:30PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	ND	UG/L		5/28/00	LAH
TPH-DIESEL RANGE	NWTPH-DX	ND	UG/L		6/1/00	GLW
TPH-OIL RANGE	NWTPH-DX	ND	UG/L		6/1/00	GLW
NAPHTHALENE	EPA-8270 SIM	0.02	UG/L		6/9/00	LRK
ACENAPHTHYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
ACENAPHATHENE	EPA-8270 SIM	0.10B	UG/L		6/9/00	LRK
FLUORENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
PHENANTHRENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
BENZO[A]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
CHRYSENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
BENZO[B]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
BENZO[K]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
BENZO(A)PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
INDENO[1,2,3-CD]PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
DIBENZ[A,H]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
BENZO[G,H,I]PERYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
DICHLORODIFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
VINYL CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRICHLOROFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ACETONE	EPA-8260A	ND(<20)	UG/L		6/5/00	LRK
1,1-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
METHYLENE CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ACRYLONITRILE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
METHYL T-BUTYL ETHER	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRANS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2-BUTANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
CIS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 12
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-12 5/25/00 5:30PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
2,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROFORM	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,1-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CARBON TETRACHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
DIBROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMODICHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRANS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
4-METHYL-2-PENTANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
TOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CIS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,2-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2-HEXANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
1,3-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TETRACHLOROETHYLENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
DIBROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DIBROMOETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,1,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
M+P XYLENE	EPA-8260A	ND(<4)	UG/L		6/5/00	LRK
STYRENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
O-XYLENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOFORM	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ISOPROPYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,2,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,3-TRICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
N-PROPYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK

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CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-12 5/25/00 5:30PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
2-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,3,5-TRIMETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
4-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
T-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,4-TRIMETHYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
S-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
P-ISOPROPYLTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,3 DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,4-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
N-BUTYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DIBROMO 3-CHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
1,2,4-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
HEXACHLORO1,3-BUTADIENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
NAPHTHALENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,3-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
PCB-1016	EPA-8082 MOD	ND(<0.2)	UG/L		5/30/00	LAH
PCB-1221	EPA-8082 MOD	ND(<0.2)	UG/L		5/30/00	LAH
PCB-1232	EPA-8082 MOD	ND(<0.2)	UG/L		5/30/00	LAH
PCB-1242	EPA-8082 MOD	ND(<0.2)	UG/L		5/30/00	LAH
PCB-1248	EPA-8082 MOD	ND(<0.2)	UG/L		5/30/00	LAH
PCB-1254	EPA-8082 MOD	ND(<0.2)	UG/L		5/30/00	LAH
PCB-1260	EPA-8082 MOD	ND(<0.2)	UG/L		5/30/00	LAH
DISSOLVED ARSENIC	EPA-7060	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED BARIUM	EPA-6010	0.010	MG/L		6/7/00	CMH
DISSOLVED CADMIUM	EPA-6010	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED CHROMIUM	EPA-6010	ND(<0.01)	MG/L		6/7/00	CMH
DISSOLVED LEAD	EPA-7421	ND(<0.004)	MG/L		6/12/00	CMH
DISSOLVED MERCURY	EPA-7470	ND(<.0002)	MG/L		6/9/00	CMH
DISSOLVED SELENIUM	EPA-6010	ND(<0.05)	MG/L		6/7/00	CMH
DISSOLVED SILVER	EPA-6010	ND(<0.007)	MG/L		6/7/00	CMH

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS PRODUCT WHICH IS LIKELY DIESEL
PCB REPORTING LIMIT RAISED DUE TO MATRIX INTERFERENCE

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530 SOUTH 336TH STREET
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CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-12 5/25/00 5:30PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 50 UG/L
DIESEL RANGE REPORTING LIMIT IS 250 UG/L
LUBE OIL RANGE REPORTING LIMIT IS 500 UG/L

B INDICATES ANALYTE ALSO OBSERVED IN BLANK

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: _____

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CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-13 5/26/00 7:50PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	330	UG/L		5/29/00	LAH
TPH-DIESEL RANGE	NWTPH-DX	880	UG/L		6/1/00	GLW
TPH-OIL RANGE	NWTPH-DX	ND	UG/L		6/1/00	GLW
NAPHTHALENE	EPA-8270 SIM	34	UG/L		6/10/00	LRK
ACENAPHTHYLENE	EPA-8270 SIM	0.61	UG/L		6/9/00	LRK
ACENAPHATHENE	EPA-8270 SIM	140	UG/L		6/10/00	LRK
FLUORENE	EPA-8270 SIM	57	UG/L		6/10/00	LRK
PHENANTHRENE	EPA-8270 SIM	31	UG/L		6/10/00	LRK
ANTHRACENE	EPA-8270 SIM	2.4	UG/L		6/10/00	LRK
FLUORANTHENE	EPA-8270 SIM	4.4	UG/L		6/10/00	LRK
PYRENE	EPA-8270 SIM	3.1	UG/L		6/10/00	LRK
BENZO[A]ANTHRACENE	EPA-8270 SIM	0.43	UG/L		6/9/00	LRK
CHRYSENE	EPA-8270 SIM	0.47	UG/L		6/9/00	LRK
BENZO[B]FLUORANTHENE	EPA-8270 SIM	0.27	UG/L		6/9/00	LRK
BENZO[K]FLUORANTHENE	EPA-8270 SIM	0.23	UG/L		6/9/00	LRK
BENZO(A)PYRENE	EPA-8270 SIM	0.38	UG/L		6/9/00	LRK
INDENO[1,2,3-CD]PYRENE	EPA-8270 SIM	0.21	UG/L		6/9/00	LRK
DIBENZ[A,H]ANTHRACENE	EPA-8270 SIM	0.07	UG/L		6/9/00	LRK
BENZO[G,H,I]PERYLENE	EPA-8270 SIM	0.24	UG/L		6/9/00	LRK
DICHLORODIFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
VINYL CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRICHLOROFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ACETONE	EPA-8260A	ND(<20)	UG/L		6/5/00	LRK
1,1-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
METHYLENE CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ACRYLONITRILE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
METHYL T-BUTYL ETHER	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRANS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2-BUTANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK

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CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-13 5/26/00 7:50PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
CIS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROFORM	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,1-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CARBON TETRACHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
DIBROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMODICHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRANS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
4-METHYL-2-PENTANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
TOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CIS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,2-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2-HEXANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
1,3-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TETRACHLOROETHYLENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
DIBROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DIBROMOETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,1,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ETHYLBENZENE	EPA-8260A	2	UG/L		6/5/00	LRK
M+P XYLENE	EPA-8260A	ND(<4)	UG/L		6/5/00	LRK
STYRENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
O-XYLENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOFORM	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ISOPROPYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,2,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,3-TRICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
N-PROPYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK

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DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
4-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
T-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,4-TRIMETHYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
S-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
P-ISOPROPYLTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,3 DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,4-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
N-BUTYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DIBROMO 3-CHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
1,2,4-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
HEXACHLORO1,3-BUTADIENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
NAPHTHALENE	EPA-8260A	33	UG/L		6/5/00	LRK
1,2,3-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
PCB-1016	EPA-8082 MOD	ND(<0.1)	UG/L		6/12/00	LAH
PCB-1221	EPA-8082 MOD	ND(<0.1)	UG/L		6/12/00	LAH
PCB-1232	EPA-8082 MOD	ND(<0.1)	UG/L		6/12/00	LAH
PCB-1242	EPA-8082 MOD	ND(<0.1)	UG/L		6/12/00	LAH
PCB-1248	EPA-8082 MOD	ND(<0.1)	UG/L		6/12/00	LAH
PCB-1254	EPA-8082 MOD	ND(<0.1)	UG/L		6/12/00	LAH
PCB-1260	EPA-8082 MOD	ND(<0.1)	UG/L		6/12/00	LAH
DISSOLVED ARSENIC	EPA-7060	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED BARIUM	EPA-6010	0.011	MG/L		6/7/00	CMH
DISSOLVED CADMIUM	EPA-6010	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED CHROMIUM	EPA-6010	ND(<0.01)	MG/L		6/7/00	CMH
DISSOLVED LEAD	EPA-7421	ND(<0.004)	MG/L		6/12/00	CMH
DISSOLVED MERCURY	EPA-7470	ND(<.0002)	MG/L		6/9/00	CMH
DISSOLVED SELENIUM	EPA-6010	ND(<0.05)	MG/L		6/7/00	CMH
DISSOLVED SILVER	EPA-6010	ND(<0.007)	MG/L		6/7/00	CMH

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS TWO PRODUCTS WHICH ARE LIKELY WEATHERED GASOLINE AND UNIDENTIFIED DIESEL RANGE PRODUCT

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LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 13
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-13 5/26/00 7:50PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 50 UG/L
DIESEL RANGE REPORTING LIMIT IS 250 UG/L
LUBE OIL RANGE REPORTING LIMIT IS 500 UG/L

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: _____

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 14
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-14 5/26/00 8:10PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	ND	UG/L		5/29/00	LAH
TPH-DIESEL RANGE	NWTPH-DX	ND	UG/L		6/1/00	GLW
TPH-OIL RANGE	NWTPH-DX	ND	UG/L		6/1/00	GLW
NAPHTHALENE	EPA-8270 SIM	8.6	UG/L		6/10/00	LRK
ACENAPHTHYLENE	EPA-8270 SIM	0.05	UG/L		6/9/00	LRK
ACENAPHATHENE	EPA-8270 SIM	3.6	UG/L		6/10/00	LRK
FLUORENE	EPA-8270 SIM	2.2	UG/L		6/10/00	LRK
PHENANTHRENE	EPA-8270 SIM	2.2	UG/L		6/10/00	LRK
ANTHRACENE	EPA-8270 SIM	0.64	UG/L		6/9/00	LRK
FLUORANTHENE	EPA-8270 SIM	2.7	UG/L		6/10/00	LRK
PYRENE	EPA-8270 SIM	1.6	UG/L		6/10/00	LRK
BENZO[A]ANTHRACENE	EPA-8270 SIM	0.28	UG/L		6/9/00	LRK
CHRYSENE	EPA-8270 SIM	0.22	UG/L		6/9/00	LRK
BENZO[B]FLUORANTHENE	EPA-8270 SIM	0.07	UG/L		6/9/00	LRK
BENZO[K]FLUORANTHENE	EPA-8270 SIM	0.07	UG/L		6/9/00	LRK
BENZO(A)PYRENE	EPA-8270 SIM	0.06	UG/L		6/9/00	LRK
INDENO[1,2,3-CD]PYRENE	EPA-8270 SIM	0.03	UG/L		6/9/00	LRK
DIBENZ[A,H]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
BENZO[G,H,I]PERYLENE	EPA-8270 SIM	0.03	UG/L		6/9/00	LRK
DICHLORODIFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
VINYL CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRICHLOROFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ACETONE	EPA-8260A	ND(<20)	UG/L		6/5/00	LRK
1,1-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
METHYLENE CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ACRYLONITRILE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
METHYL T-BUTYL ETHER	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRANS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2-BUTANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 14
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-14 5/26/00 8:10PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
CIS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROFORM	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,1-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CARBON TETRACHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
DIBROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMODICHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRANS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
4-METHYL-2-PENTANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
TOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CIS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,2-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2-HEXANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
1,3-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TETRACHLOROETHYLENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
DIBROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DIBROMOETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,1,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
M+P XYLENE	EPA-8260A	ND(<4)	UG/L		6/5/00	LRK
STYRENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
O-XYLENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOFORM	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ISOPROPYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,2,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,3-TRICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
N-PROPYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 14
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-14 5/26/00 8:10PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
2-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,3,5-TRIMETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
4-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
T-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,4-TRIMETHYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
S-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
P-ISOPROPYLTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,3 DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,4-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
N-BUTYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DIBROMO 3-CHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
1,2,4-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
HEXACHLORO1,3-BUTADIENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
NAPHTHALENE	EPA-8260A	23	UG/L		6/5/00	LRK
1,2,3-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
PCB-1016	EPA-8082 MOD	ND(<0.1)	UG/L		6/12/00	LAH
PCB-1221	EPA-8082 MOD	ND(<0.1)	UG/L		6/12/00	LAH
PCB-1232	EPA-8082 MOD	ND(<0.1)	UG/L		6/12/00	LAH
PCB-1242	EPA-8082 MOD	ND(<0.1)	UG/L		6/12/00	LAH
PCB-1248	EPA-8082 MOD	ND(<0.1)	UG/L		6/12/00	LAH
PCB-1254	EPA-8082 MOD	ND(<0.1)	UG/L		6/12/00	LAH
PCB-1260	EPA-8082 MOD	ND(<0.1)	UG/L		6/12/00	LAH
DISSOLVED ARSENIC	EPA-7060	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED BARIUM	EPA-6010	0.004	MG/L		6/7/00	CMH
DISSOLVED CADMIUM	EPA-6010	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED CHROMIUM	EPA-6010	ND(<0.01)	MG/L		6/7/00	CMH
DISSOLVED LEAD	EPA-7421	ND(<0.004)	MG/L		6/12/00	CMH
DISSOLVED MERCURY	EPA-7470	0.0002	MG/L		6/9/00	CMH
DISSOLVED SELENIUM	EPA-6010	ND(<0.05)	MG/L		6/7/00	CMH
DISSOLVED SILVER	EPA-6010	ND(<0.007)	MG/L		6/7/00	CMH

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 14
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-14 5/26/00 8:10PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 50 UG/L
DIESEL RANGE REPORTING LIMIT IS 250 UG/L
LUBE OIL RANGE REPORTING LIMIT IS 500 UG/L

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: _____

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 15
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-15 5/26/00 9:00PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	200	UG/L		5/29/00	LAH
TPH-DIESEL RANGE	NWTPH-DX	960	UG/L		6/1/00	GLW
TPH-OIL RANGE	NWTPH-DX	960	UG/L		6/1/00	GLW
NAPHTHALENE	EPA-8270 SIM	110	UG/L		6/10/00	LRK
ACENAPHTHYLENE	EPA-8270 SIM	0.37	UG/L		6/9/00	LRK
ACENAPHATHENE	EPA-8270 SIM	64	UG/L		6/10/00	LRK
FLUORENE	EPA-8270 SIM	38	UG/L		6/10/00	LRK
PHENANTHRENE	EPA-8270 SIM	27	UG/L		6/10/00	LRK
ANTHRACENE	EPA-8270 SIM	5.3	UG/L		6/10/00	LRK
FLUORANTHENE	EPA-8270 SIM	9.2	UG/L		6/10/00	LRK
PYRENE	EPA-8270 SIM	7.1	UG/L		6/10/00	LRK
BENZO[A]ANTHRACENE	EPA-8270 SIM	0.59	UG/L		6/9/00	LRK
CHRYSENE	EPA-8270 SIM	0.54	UG/L		6/9/00	LRK
BENZO[B]FLUORANTHENE	EPA-8270 SIM	0.26	UG/L		6/9/00	LRK
BENZO[K]FLUORANTHENE	EPA-8270 SIM	0.23	UG/L		6/9/00	LRK
BENZO(A)PYRENE	EPA-8270 SIM	0.38	UG/L		6/9/00	LRK
INDENO[1,2,3-CD]PYRENE	EPA-8270 SIM	0.15	UG/L		6/9/00	LRK
DIBENZ[A,H]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
BENZO[G,H,I]PERYLENE	EPA-8270 SIM	0.18	UG/L		6/9/00	LRK
DICHLORODIFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
VINYL CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRICHLOROFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ACETONE	EPA-8260A	ND(<20)	UG/L		6/5/00	LRK
1,1-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
METHYLENE CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ACRYLONITRILE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
METHYL T-BUTYL ETHER	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRANS-1,2-DICHLOROETHENE	EPA-B260A	ND(<2)	UG/L		6/5/00	LRK
1,1-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2-BUTANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
CIS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 15
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-15 5/26/00 9:00PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
2,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROFORM	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,1-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CARBON TETRACHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
DIBROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMODICHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRANS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
4-METHYL-2-PENTANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
TOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CIS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,2-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2-HEXANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
1,3-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TETRACHLOROETHYLENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
DIBROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DIBROMOETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,1,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
M+P XYLENE	EPA-8260A	ND(<4)	UG/L		6/5/00	LRK
STYRENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
O-XYLENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOFORM	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ISOPROPYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,2,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,3-TRICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
N-PROPYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK

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LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 15
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-15 5/26/00 9:00PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
2-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,3,5-TRIMETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
4-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
T-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,4-TRIMETHYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
S-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
P-ISOPROPYLTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,3 DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,4-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
N-BUTYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DIBROMO 3-CHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
1,2,4-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
HEXACHLORO1,3-BUTADIENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
NAPHTHALENE	EPA-8260A	210	UG/L		6/7/00	LRK
1,2,3-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
PCB-1016	EPA-8082 MOD	ND(<1)	UG/L		5/30/00	LAH
PCB-1221	EPA-8082 MOD	ND(<1)	UG/L		5/30/00	LAH
PCB-1232	EPA-8082 MOD	ND(<1)	UG/L		5/30/00	LAH
PCB-1242	EPA-8082 MOD	ND(<1)	UG/L		5/30/00	LAH
PCB-1248	EPA-8082 MOD	ND(<1)	UG/L		5/30/00	LAH
PCB-1254	EPA-8082 MOD	ND(<1)	UG/L		5/30/00	LAH
PCB-1260	EPA-8082 MOD	ND(<1)	UG/L		5/30/00	LAH
DISSOLVED ARSENIC	EPA-7060	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED BARIUM	EPA-6010	0.004	MG/L		6/7/00	CMH
DISSOLVED CADMIUM	EPA-6010	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED CHROMIUM	EPA-6010	ND(<0.01)	MG/L		6/7/00	CMH
DISSOLVED LEAD	EPA-7421	ND(<0.004)	MG/L		6/12/00	CMH
DISSOLVED MERCURY	EPA-7470	ND(<.0002)	MG/L		6/9/00	CMH
DISSOLVED SELENIUM	EPA-6010	ND(<0.05)	MG/L		6/7/00	CMH
DISSOLVED SILVER	EPA-6010	ND(<0.007)	MG/L		6/7/00	CMH

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS PRODUCTS WHICH ARE LIKELY HIGHLY WEATHERED GASOLINE AND UNIDENTIFIED DIESEL RANGE PRODUCT
PCB REPORTING LIMIT RAISED DUE TO MATRIX INTERFERENCE

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CCIL SAMPLE #: 15
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WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-15 5/26/00 9:00PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 50 UG/L
DIESEL RANGE REPORTING LIMIT IS 250 UG/L
LUBE OIL RANGE REPORTING LIMIT IS 500 UG/L

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: _____

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 16
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-16 5/26/00 10:20PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	ND	UG/L		5/29/00	LAH
TPH-DIESEL RANGE	NWTPH-DX	1700	UG/L		6/2/00	GLW
TPH-OIL RANGE	NWTPH-DX	ND	UG/L		6/2/00	GLW
NAPHTHALENE	EPA-8270 SIM	0.21	UG/L		6/9/00	LRK
ACENAPHTHYLENE	EPA-8270 SIM	0.01	UG/L		6/9/00	LRK
ACENAPHATHENE	EPA-8270 SIM	0.13	UG/L		6/9/00	LRK
FLUORENE	EPA-8270 SIM	0.1	UG/L		6/9/00	LRK
PHENANTHRENE	EPA-8270 SIM	0.2	UG/L		6/9/00	LRK
ANTHRACENE	EPA-8270 SIM	0.04	UG/L		6/9/00	LRK
FLUORANTHENE	EPA-8270 SIM	0.05	UG/L		6/9/00	LRK
PYRENE	EPA-8270 SIM	0.04	UG/L		6/9/00	LRK
BENZO[A]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
CHRYSENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
BENZO[B]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
BENZO[K]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
BENZO(A)PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
INDENO[1,2,3-CD]PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
DIBENZ[A,H]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
BENZO[G,H,I]PERYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
DICHLORODIFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
CHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
VINYL CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
BROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
CHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
TRICHLOROFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
ACETONE	EPA-8260A	ND(<20)	UG/L		6/7/00	LRK
1,1-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
METHYLENE CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
ACRYLONITRILE	EPA-8260A	ND(<5)	UG/L		6/7/00	LRK
METHYL T-BUTYL ETHER	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
TRANS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
1,1-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
2-BUTANONE	EPA-8260A	ND(<5)	UG/L		6/7/00	LRK
CIS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK

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530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 16
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-16 5/26/00 10:20PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
2,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
BROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
CHLOROFORM	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
1,1,1-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
1,1-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
CARBON TETRACHLORIDE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
1,2-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
BENZENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
TRICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
1,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
DIBROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
BROMODICHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
TRANS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
4-METHYL-2-PENTANONE	EPA-8260A	ND(<5)	UG/L		6/7/00	LRK
TOLUENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
CIS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
1,1,2-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
2-HEXANONE	EPA-8260A	ND(<5)	UG/L		6/7/00	LRK
1,3-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
TETRACHLOROETHYLENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
DIBROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
1,2-DIBROMOETHANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
CHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
1,1,1,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
ETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
M+P XYLENE	EPA-8260A	ND(<4)	UG/L		6/7/00	LRK
STYRENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
O-XYLENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
BROMOFORM	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
ISOPROPYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
1,1,2,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
1,2,3-TRICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
BROMOBENZENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
N-PROPYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK

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530 SOUTH 336TH STREET
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WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-16 5/26/00 10:20PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
2-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
1,3,5-TRIMETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
4-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
T-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
1,2,4-TRIMETHYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
S-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
P-ISOPROPYLTOLUENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
1,3 DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
1,4-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
N-BUTYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
1,2-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
1,2-DIBROMO 3-CHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		6/7/00	LRK
1,2,4-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
HEXACHLORO1,3-BUTADIENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
NAPHTHALENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
1,2,3-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
PCB-1016	EPA-8082 MOD	ND(<0.2)	UG/L		6/12/00	LAH
PCB-1221	EPA-8082 MOD	ND(<0.2)	UG/L		6/12/00	LAH
PCB-1232	EPA-8082 MOD	ND(<0.2)	UG/L		6/12/00	LAH
PCB-1242	EPA-8082 MOD	ND(<0.2)	UG/L		6/12/00	LAH
PCB-1248	EPA-8082 MOD	ND(<0.2)	UG/L		6/12/00	LAH
PCB-1254	EPA-8082 MOD	ND(<0.2)	UG/L		6/12/00	LAH
PCB-1260	EPA-8082 MOD	ND(<0.2)	UG/L		6/12/00	LAH
DISSOLVED ARSENIC	EPA-7060	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED BARIUM	EPA-6010	0.012	MG/L		6/7/00	CMH
DISSOLVED CADMIUM	EPA-6010	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED CHROMIUM	EPA-6010	ND(<0.01)	MG/L		6/7/00	CMH
DISSOLVED LEAD	EPA-7421	ND(<0.004)	MG/L		6/12/00	CMH
DISSOLVED MERCURY	EPA-7470	ND(<.0002)	MG/L		6/9/00	CMH
DISSOLVED SELENIUM	EPA-6010	ND(<0.05)	MG/L		6/7/00	CMH
DISSOLVED SILVER	EPA-6010	ND(<0.007)	MG/L		6/7/00	CMH

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS PRODUCT WHICH IS LIKELY DIESEL
PCB REPORTING LIMIT RAISED DUE TO MATRIX INTERFERENCE

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CLIENT SAMPLE ID: RGW-16 5/26/00 10:20PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 50 UG/L
DIESEL RANGE REPORTING LIMIT IS 250 UG/L
LUBE OIL RANGE REPORTING LIMIT IS 500 UG/L

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CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-17 5/26/00 11:30PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	ND	UG/L		5/29/00	LAH
TPH-DIESEL RANGE	NWTPH-DX	ND	UG/L		6/2/00	GLW
TPH-OIL RANGE	NWTPH-DX	ND	UG/L		6/2/00	GLW
NAPHTHALENE	EPA-8270 SIM	0.22	UG/L		6/9/00	LRK
ACENAPHTHYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
ACENAPHATHENE	EPA-8270 SIM	0.19	UG/L		6/9/00	LRK
FLUORENE	EPA-8270 SIM	0.03	UG/L		6/9/00	LRK
PHENANTHRENE	EPA-8270 SIM	0.05	UG/L		6/9/00	LRK
ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
BENZO[A]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
CHRYSENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
BENZO[8]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
BENZO[K]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
BENZO(A)PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
INDENO[1,2,3-CD]PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
DI8ENZ[A,H]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
BENZO[G,H,I]PERYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		6/9/00	LRK
DICHLORODIFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
CHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
VINYL CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
BROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
CHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
TRICHLOROFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
ACETONE	EPA-8260A	ND(<20)	UG/L		6/7/00	LRK
1,1-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
METHYLENE CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
ACRYLONITRILE	EPA-8260A	ND(<5)	UG/L		6/7/00	LRK
METHYL T-BUTYL ETHER	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
TRANS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
1,1-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
2-BUTANONE	EPA-8260A	ND(<5)	UG/L		6/7/00	LRK

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LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 17
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-17 5/26/00 11:30PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
CIS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
2,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
BROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
CHLOROFORM	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
1,1,1-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
1,1-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
CARBON TETRACHLORIDE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
1,2-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
BENZENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
TRICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
1,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
DIBROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
BROMODICHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
TRANS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
4-METHYL-2-PENTANONE	EPA-8260A	ND(<5)	UG/L		6/7/00	LRK
TOLUENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
CIS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
1,1,2-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
2-HEXANONE	EPA-8260A	ND(<5)	UG/L		6/7/00	LRK
1,3-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
TETRACHLOROETHYLENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
DIBROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
1,2-DIBROMOETHANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
CHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
1,1,1,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
ETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
M+P XYLENE	EPA-8260A	ND(<4)	UG/L		6/7/00	LRK
STYRENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
O-XYLENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
BROMOFORM	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
ISOPROPYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
1,1,2,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
1,2,3-TRICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
BROMOBENZENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
N-PROPYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK

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CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-17 5/26/00 11:30PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
2-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
1,3,5-TRIMETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
4-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
T-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
1,2,4-TRIMETHYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
S-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
P-ISOPROPYLTOLUENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
1,3 DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
1,4-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
N-BUTYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
1,2-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
1,2-DIBROMO 3-CHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		6/7/00	LRK
1,2,4-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
HEXACHLORO1,3-BUTADIENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
NAPHTHALENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
1,2,3-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/7/00	LRK
PCB-1016	EPA-8082 MOD	ND(<0.2)	UG/L		5/31/00	LAH
PCB-1221	EPA-8082 MOD	ND(<0.2)	UG/L		5/31/00	LAH
PCB-1232	EPA-8082 MOD	ND(<0.2)	UG/L		5/31/00	LAH
PCB-1242	EPA-8082 MOD	ND(<0.2)	UG/L		5/31/00	LAH
PCB-1248	EPA-8082 MOD	ND(<0.2)	UG/L		5/31/00	LAH
PCB-1254	EPA-8082 MOD	ND(<0.2)	UG/L		5/31/00	LAH
PCB-1260	EPA-8082 MOD	ND(<0.2)	UG/L		5/31/00	LAH
DISSOLVED ARSENIC	EPA-7060	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED BARIUM	EPA-6010	0.014	MG/L		6/7/00	CMH
DISSOLVED CADMIUM	EPA-6010	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED CHROMIUM	EPA-6010	ND(<0.01)	MG/L		6/7/00	CMH
DISSOLVED LEAD	EPA-7421	ND(<0.004)	MG/L		6/12/00	CMH
DISSOLVED MERCURY	EPA-7470	ND(<.0002)	MG/L		6/9/00	CMH
DISSOLVED SELENIUM	EPA-6010	ND(<0.05)	MG/L		6/7/00	CMH
DISSOLVED SILVER	EPA-6010	ND(<0.007)	MG/L		6/7/00	CMH

NOTE: PCB REPORTING LIMIT RAISED DUE TO MATRIX INTERFERENCE

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CLIENT SAMPLE ID: RGW-17 5/26/00 11:30PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 50 UG/L
DIESEL RANGE REPORTING LIMIT IS 250 UG/L
LUBE OIL RANGE REPORTING LIMIT IS 500 UG/L

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: _____

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CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-18 5/26/00 12:45PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	90	UG/L		5/29/00	LAH
TPH-DIESEL RANGE	NWTPH-DX	860	UG/L		6/2/00	GLW
TPH-OIL RANGE	NWTPH-DX	ND	UG/L		6/2/00	GLW
NAPHTHALENE	EPA-8270 SIM	45	UG/L		6/10/00	LRK
ACENAPHTHYLENE	EPA-8270 SIM	0.82	UG/L		6/9/00	LRK
ACENAPHATHENE	EPA-8270 SIM	66	UG/L		6/10/00	LRK
FLUORENE	EPA-8270 SIM	47	UG/L		6/10/00	LRK
PHENANTHRENE	EPA-8270 SIM	130	UG/L		6/10/00	LRK
ANTHRACENE	EPA-8270 SIM	26	UG/L		6/10/00	LRK
FLUORANTHENE	EPA-8270 SIM	88	UG/L		6/10/00	LRK
PYRENE	EPA-8270 SIM	79	UG/L		6/10/00	LRK
BENZO[A]ANTHRACENE	EPA-8270 SIM	26	UG/L		6/10/00	LRK
CHRYSENE	EPA-8270 SIM	19	UG/L		6/10/00	LRK
BENZO[B]FLUORANTHENE	EPA-8270 SIM	13	UG/L		6/10/00	LRK
BENZO[K]FLUORANTHENE	EPA-8270 SIM	13	UG/L		6/10/00	LRK
BENZO(A)PYRENE	EPA-8270 SIM	16	UG/L		6/10/00	LRK
INDENO[1,2,3-CD]PYRENE	EPA-8270 SIM	6.6	UG/L		6/10/00	LRK
DIBENZ[A,H]ANTHRACENE	EPA-8270 SIM	2.4	UG/L		6/10/00	LRK
BENZO[G,H,I]PERYLENE	EPA-8270 SIM	7.4	UG/L		6/10/00	LRK
DICHLORODIFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
VINYL CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRICHLOROFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ACETONE	EPA-8260A	ND(<20)	UG/L		6/5/00	LRK
1,1-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
METHYLENE CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ACRYLONITRILE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
METHYL T-BUTYL ETHER	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRANS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2-BUTANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
CIS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK

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CLIENT SAMPLE ID: RGW-18 5/26/00 12:45PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
2,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROFORM	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,1-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CARBON TETRACHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
DIBROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMODICHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRANS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
4-METHYL-2-PENTANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
TOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CIS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,2-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2-HEXANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
1,3-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TETRACHLOROETHYLENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
DIBROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DIBROMOETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,1,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
M+P XYLENE	EPA-8260A	ND(<4)	UG/L		6/5/00	LRK
STYRENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
O-XYLENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOFORM	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ISOPROPYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,2,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,3-TRICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
N-PROPYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK

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DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
2-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,3,5-TRIMETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
4-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
T-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,4-TRIMETHYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
S-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
P-ISOPROPYLTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,3 DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,4-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
N-BUTYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DIBROMO 3-CHLOROPROPAN	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
1,2,4-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
HEXACHLORO1,3-BUTADIENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
NAPHTHALENE	EPA-8260A	77	UG/L		6/5/00	LRK
1,2,3-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
PCB-1016	EPA-8082 MOD	ND(<0.2)	UG/L		6/12/00	LAH
PCB-1221	EPA-8082 MOD	ND(<0.2)	UG/L		6/12/00	LAH
PCB-1232	EPA-8082 MOD	ND(<0.2)	UG/L		6/12/00	LAH
PCB-1242	EPA-8082 MOD	ND(<0.2)	UG/L		6/12/00	LAH
PCB-1248	EPA-8082 MOD	ND(<0.2)	UG/L		6/12/00	LAH
PCB-1254	EPA-8082 MOD	ND(<0.2)	UG/L		6/12/00	LAH
PCB-1260	EPA-8082 MOD	ND(<0.2)	UG/L		6/12/00	LAH
DISSOLVED ARSENIC	EPA-7060	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED BARIUM	EPA-6010	0.007	MG/L		6/7/00	CMH
DISSOLVED CADMIUM	EPA-6010	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED CHROMIUM	EPA-6010	ND(<0.01)	MG/L		6/7/00	CMH
DISSOLVED LEAD	EPA-7421	ND(<0.004)	MG/L		6/12/00	CMH
DISSOLVED MERCURY	EPA-7470	0.0002	MG/L		6/9/00	CMH
DISSOLVED SELENIUM	EPA-6010	ND(<0.05)	MG/L		6/7/00	CMH
DISSOLVED SILVER	EPA-6010	ND(<0.007)	MG/L		6/7/00	CMH

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS TWO PRODUCTS WHICH ARE LIKELY HIGHLY WEATHERED GASOLINE AND UNIDENTIFIED DIESEL RANGE PRODUCT
PCB REPORTING LIMIT RAISED DUE TO MATRIX INTERFERENCE

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CCI
ANALYTICAL
LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 18
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-18 5/26/00 12:45PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 50 UG/L
DIESEL RANGE REPORTING LIMIT IS 250 UG/L
LUBE OIL RANGE REPORTING LIMIT IS 500 UG/L

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: _____

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 19
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RBLANK-1 5/25/00 2:45PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TOTAL ARSENIC	EPA-7060	ND(<0.005)	MG/L		6/7/00	CMH
TOTAL BARIUM	EPA-6010	0.009	MG/L		6/7/00	CMH
TOTAL CADMIUM	EPA-6010	ND(<0.005)	MG/L		6/7/00	CMH
TOTAL CHROMIUM	EPA-6010	ND(<0.01)	MG/L		6/7/00	CMH
TOTAL LEAD	EPA-7421	0.033	MG/L		6/12/00	CMH
TOTAL MERCURY	EPA-7470	ND(<.0002)	MG/L		6/1/00	CMH
TOTAL SELENIUM	EPA-6010	ND(<0.05)	MG/L		6/7/00	CMH
TOTAL SILVER	EPA-6010	ND(<0.007)	MG/L		6/7/00	CMH

* "ND" INDICATES ANALYTE NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 20
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RBLANK-2 5/26/00 12:00PM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TOTAL ARSENIC	EPA-7060	ND(<0.005)	MG/L		6/7/00	CMH
TOTAL BARIUM	EPA-6010	0.024	MG/L		6/7/00	CMH
TOTAL CADMIUM	EPA-6010	ND(<0.005)	MG/L		6/7/00	CMH
TOTAL CHROMIUM	EPA-6010	0.02	MG/L		6/7/00	CMH
TOTAL LEAD	EPA-7421	0.031	MG/L		6/12/00	CMH
TOTAL MERCURY	EPA-7470	ND(<.0002)	MG/L		6/1/00	CMH
TOTAL SELENIUM	EPA-6010	ND(<0.05)	MG/L		6/7/00	CMH
TOTAL SILVER	EPA-6010	ND(<0.007)	MG/L		6/7/00	CMH

* "ND" INDICATES ANALYTE NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: _____

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 21
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: FBLANK-1 5/25/00 7:51AM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
DISSOLVED ARSENIC	EPA-7060	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED BARIUM	EPA-6010	ND(<0.003)	MG/L		6/7/00	CMH
DISSOLVED CADMIUM	EPA-6010	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED CHROMIUM	EPA-6010	ND(<0.01)	MG/L		6/7/00	CMH
DISSOLVED LEAD	EPA-7421	ND(<0.004)	MG/L		6/12/00	CMH
DISSOLVED MERCURY	EPA-7470	ND(<.0002)	MG/L		6/1/00	CMH
DISSOLVED SELENIUM	EPA-6010	ND(<0.05)	MG/L		6/7/00	CMH
DISSOLVED SILVER	EPA-6010	ND(<0.007)	MG/L		6/7/00	CMH

* "ND" INDICATES ANALYTE NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: _____

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 22
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-DUP 5/26/00 6:30AM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	250	UG/L		5/29/00	LAH
TPH-DIESEL RANGE	NWTPH-DX	1000	UG/L		6/2/00	GLW
TPH-OIL RANGE	NWTPH-DX	ND	UG/L		6/2/00	GLW
NAPHTHALENE	EPA-8270 SIM	97	UG/L		6/10/00	LRK
ACENAPHTHYLENE	EPA-8270 SIM	0.31	UG/L		6/9/00	LRK
ACENAPHATHENE	EPA-8270 SIM	60	UG/L		6/10/00	LRK
FLUORENE	EPA-8270 SIM	35	UG/L		6/10/00	LRK
PHENANTHRENE	EPA-8270 SIM	24	UG/L		6/10/00	LRK
ANTHRACENE	EPA-8270 SIM	4.6	UG/L		6/10/00	LRK
FLUORANTHENE	EPA-8270 SIM	7.2	UG/L		6/10/00	LRK
PYRENE	EPA-8270 SIM	5.5	UG/L		6/10/00	LRK
BENZO[A]ANTHRACENE	EPA-8270 SIM	0.41	UG/L		6/9/00	LRK
CHRYSENE	EPA-8270 SIM	0.37	UG/L		6/9/00	LRK
BENZO[B]FLUORANTHENE	EPA-8270 SIM	0.17	UG/L		6/9/00	LRK
BENZO[K]FLUORANTHENE	EPA-8270 SIM	0.15	UG/L		6/9/00	LRK
BENZO(A)PYRENE	EPA-8270 SIM	0.25	UG/L		6/9/00	LRK
INDENO[1,2,3-CD]PYRENE	EPA-8270 SIM	0.09	UG/L		6/9/00	LRK
DIBENZ[A,H]ANTHRACENE	EPA-8270 SIM	0.03	UG/L		6/9/00	LRK
BENZO[G,H,I]PERYLENE	EPA-8270 SIM	0.11	UG/L		6/9/00	LRK
DICHLORODIFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
VINYL CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRICHLOROFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ACETONE	EPA-8260A	ND(<20)	UG/L		6/5/00	LRK
1,1-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
METHYLENE CHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ACRYLONITRILE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
METHYL T-BUTYL ETHER	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRANS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2-BUTANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
CIS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 22
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-DUP 5/26/00 6:30AM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
2,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROFORM	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,1-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CARBON TETRACHLORIDE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
DIBROMOMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMODICHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TRANS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
4-METHYL-2-PENTANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
TOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CIS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,2-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
2-HEXANONE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
1,3-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
TETRACHLOROETHYLENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
DIBROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DIBROMOETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
CHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,1,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
M+P XYLENE	EPA-8260A	ND(<4)	UG/L		6/5/00	LRK
STYRENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
O-XYLENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOFORM	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
ISOPROPYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,1,2,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,3-TRICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
BROMOBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
N-PROPYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 22
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-DUP 5/26/00 6:30AM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
2-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,3,5-TRIMETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
4-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
T-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2,4-TRIMETHYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
S-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
P-ISOPROPYLTOLUENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,3 DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,4-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
N-BUTYLBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
1,2-DIBROMO 3-CHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		6/5/00	LRK
1,2,4-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
HEXACHLORO1,3-BUTADIENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
NAPHTHALENE	EPA-8260A	240	UG/L		6/7/00	LRK
1,2,3-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		6/5/00	LRK
PCB-1016	EPA-8082 MOD	ND(<1.0)	UG/L		5/31/00	LAH
PCB-1221	EPA-8082 MOD	ND(<1.0)	UG/L		5/31/00	LAH
PCB-1232	EPA-8082 MOD	ND(<1.0)	UG/L		5/31/00	LAH
PCB-1242	EPA-8082 MOD	ND(<1.0)	UG/L		5/31/00	LAH
PCB-1248	EPA-8082 MOD	ND(<1.0)	UG/L		5/31/00	LAH
PCB-1254	EPA-8082 MOD	ND(<1.0)	UG/L		5/31/00	LAH
PCB-1260	EPA-8082 MOD	ND(<1.0)	UG/L		5/31/00	LAH
DISSOLVED ARSENIC	EPA-7060	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED BARIUM	EPA-6010	ND(<0.003)	MG/L		6/7/00	CMH
DISSOLVED CADMIUM	EPA-6010	ND(<0.005)	MG/L		6/7/00	CMH
DISSOLVED CHROMIUM	EPA-6010	ND(<0.01)	MG/L		6/7/00	CMH
DISSOLVED LEAD	EPA-7421	ND(<0.004)	MG/L		6/12/00	CMH
DISSOLVED MERCURY	EPA-7470	ND(<.0002)	MG/L		6/9/00	CMH
DISSOLVED SELENIUM	EPA-6010	ND(<0.05)	MG/L		6/7/00	CMH
DISSOLVED SILVER	EPA-6010	ND(<0.007)	MG/L		6/7/00	CMH

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS TWO PRODUCTS WHICH ARE LIKELY HIGHLY WEATHERED GASOLINE AND UNIDENTIFIED DIESEL RANGE PRODUCT
PCB REPORTING LIMIT RAISED DUE TO MATRIX INTERFERENCE

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122
CCIL SAMPLE #: 22
DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: RGW-DUP 5/26/00 6:30AM

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 50 UG/L
DIESEL RANGE REPORTING LIMIT IS 250 UG/L
LUBE OIL RANGE REPORTING LIMIT IS 500 UG/L

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: _____

3229 Pine St. • Everett, WA 98201 • 425 252-2620 • FAX 425 259-6289 • Seattle 206 292-9059

CCI
ANALYTICAL
LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122

DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS

QUALITY CONTROL RESULTS

SURROGATE RECOVERY

CCIL SAMPLE ID	ANALYTE	SUR ID	% RECV
005122-01	NWTPH-GX	TFT	91
005122-01	NWTPH-DX	C25	84
005122-01	EPA-8270 SIM	TERPHENYL-d14	76
005122-01	EPA-8260A	1,2-DCE-d4	111
005122-01	EPA-8260A	TOLUENE-d8	105
005122-01	EPA-8260A	4-BFB	97
005122-01	EPA-8082 MOD	TCMX	129
005122-01	EPA-8082 MOD	DBC	155**
005122-02	NWTPH-GX	TFT	88
005122-02	NWTPH-DX	C25	83
005122-02 (6/8/00 DATA)	EPA-8270 SIM	TERPHENYL-d14	92
005122-02 (6/10/00 DATA)	EPA-8270 SIM	TERPHENYL-d14	88
005122-02	EPA-8260A	1,2-DCE-d4	104
005122-02	EPA-8260A	TOLUENE-d8	103
005122-02	EPA-8260A	4-BFB	94
005122-02	EPA-8082 MOD	TCMX	79
005122-02	EPA-8082 MOD	DBC	81
005122-03	NWTPH-GX	TFT	88
005122-03	NWTPH-DX	C25	88
005122-03	EPA-8270 SIM	TERPHENYL-d14	84
005122-03	EPA-8260A	1,2-DCE-d4	98
005122-03	EPA-8260A	TOLUENE-d8	109
005122-03	EPA-8260A	4-BFB	97
005122-03	EPA-8082 MOD	TCMX	39**
005122-03	EPA-8082 MOD	DBC	47**
005122-04	NWTPH-GX	TFT	77
005122-04	NWTPH-DX	C25	110
005122-04	EPA-8270 SIM	TERPHENYL-d14	88
005122-04	EPA-8260A	1,2-DCE-d4	102

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ANALYTICAL
LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122

DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS

QUALITY CONTROL RESULTS

SURROGATE RECOVERY

CCIL SAMPLE ID	ANALYTE	SUR ID	% RECV
005122-04	EPA-8260A	TOLUENE-d8	109
005122-04	EPA-8260A	4-BFB	93
005122-04	EPA-8082 MOD	TCMX	55
005122-04	EPA-8082 MOD	DBC	60
005122-05	NWTPH-GX	TFT	91
005122-05	NWTPH-DX	C25	99
005122-05	EPA-8270 SIM	TERPHENYL-d14	106
005122-05	EPA-8260A	1,2-DCE-d4	101
005122-05	EPA-8260A	TOLUENE-d8	109
005122-05	EPA-8260A	4-BFB	90
005122-05	EPA-8082 MOD	TCMX	*
005122-05	EPA-8082 MOD	DBC	*
005122-06	NWTPH-GX	TFT	86
005122-06	NWTPH-DX	C25	107
005122-06	EPA-8270 SIM	TERPHENYL-d14	65
005122-06	EPA-8260A	1,2-DCE-d4	102
005122-06	EPA-8260A	TOLUENE-d8	109
005122-06	EPA-8260A	4-BFB	91
005122-06	EPA-8082 MOD	TCMX	152**
005122-06	EPA-8082 MOD	DBC	166**
005122-07	NWTPH-GX	TFT	69
005122-07	NWTPH-DX	C25	78
005122-07 (6/9/00 DATA)	EPA-8270 SIM	TERPHENYL-d14	90
005122-07 (6/10/00 DATA)	EPA-8270 SIM	TERPHENYL-d14	98
005122-07	EPA-8260A	1,2-DCE-d4	99
005122-07	EPA-8260A	TOLUENE-d8	102
005122-07	EPA-8260A	4-BFB	96
005122-07	EPA-8082 MOD	TCMX	71
005122-07	EPA-8082 MOD	DBC	85

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122

DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS

QUALITY CONTROL RESULTS

SURROGATE RECOVERY

CCIL SAMPLE ID	ANALYTE	SUR ID	% RECV
005122-08	NWTPH-GX	TFT	92
005122-08	NWTPH-DX	C25	60
005122-08	EPA-8270 SIM	TERPHENYL-d14	84
005122-08	EPA-8260A	1,2-DCE-d4	99
005122-08	EPA-8260A	TOLUENE-d8	110
005122-08	EPA-8260A	4-BFB	114
005122-08	EPA-8082 MOD	TCMX	78
005122-08	EPA-8082 MOD	DBC	95
005122-09	NWTPH-GX	TFT	85
005122-09	NWTPH-DX	C25	90
005122-09	EPA-8270 SIM	TERPHENYL-d14	88
005122-09	EPA-8260A	1,2-DCE-d4	104
005122-09	EPA-8260A	TOLUENE-d8	103
005122-09	EPA-8260A	4-BFB	85
005122-09	EPA-8082 MOD	TCMX	51
005122-09	EPA-8082 MOD	DBC	60
005122-10	NWTPH-GX	TFT	84
005122-10	NWTPH-DX	C25	97
005122-10	EPA-8270 SIM	TERPHENYL-d14	90
005122-10	EPA-8260A	1,2-DCE-d4	111
005122-10	EPA-8260A	TOLUENE-d8	106
005122-10	EPA-8260A	4-BFB	89
005122-10	EPA-8082 MOD	TCMX	51
005122-10	EPA-8082 MOD	DBC	52
005122-11	NWTPH-GX	TFT	91
005122-11	NWTPH-DX	C25	75
005122-11 (6/9/00 DATA)	EPA-8270 SIM	TERPHENYL-d14	86
005122-11 (6/10/00 DATA)	EPA-8270 SIM	TERPHENYL-d14	89

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CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
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DATE: 6/12/00
CCIL JOB #: 005122

DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS

QUALITY CONTROL RESULTS

SURROGATE RECOVERY

CCIL SAMPLE ID	ANALYTE	SUR ID	% RECV
005122-11	EPA-8260A	1,2-DCE-d4	109
005122-11	EPA-8260A	TOLUENE-d8	94
005122-11	EPA-8260A	4-BFB	85**
005122-11	EPA-8082 MOD	TCMX	51
005122-11	EPA-8082 MOD	DBC	67
005122-12	NWTPH-GX	TFT	87
005122-12	NWTPH-DX	C25	80
005122-12	EPA-8270 SIM	TERPHENYL-d14	89
005122-12	EPA-8260A	1,2-DCE-d4	103
005122-12	EPA-8260A	TOLUENE-d8	103
005122-12	EPA-8260A	4-BFB	88
005122-12	EPA-8082 MOD	TCMX	53
005122-12	EPA-8082 MOD	DBC	64
005122-13	NWTPH-GX	TFT	74
005122-13	NWTPH-DX	C25	114
005122-13 (6/9/00 DATA)	EPA-8270 SIM	TERPHENYL-d14	80
005122-13 (6/10/00 DATA)	EPA-8270 SIM	TERPHENYL-d14	*
005122-13	EPA-8260A	1,2-DCE-d4	105
005122-13	EPA-8260A	TOLUENE-d8	102
005122-13	EPA-8260A	4-BFB	84**
005122-13	EPA-8082 MOD	TCMX	81
005122-13	EPA-8082 MOD	DBC	94
005122-14	NWTPH-GX	TFT	89
005122-14	NWTPH-DX	C25	71
005122-14 (6/9/00 DATA)	EPA-8270 SIM	TERPHENYL-d14	73
005122-14 (6/10/00 DATA)	EPA-8270 SIM	TERPHENYL-d14	80
005122-14	EPA-8260A	1,2-DCE-d4	110
005122-14	EPA-8260A	TOLUENE-d8	96
005122-14	EPA-8260A	4-BFB	95

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122

DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS

QUALITY CONTROL RESULTS

SURROGATE RECOVERY

CCIL SAMPLE ID	ANALYTE	SUR ID	% RECV
005122-14	EPA-8082 MOD	TCMX	26**
005122-14	EPA-8082 MOD	DBC	33**
005122-15	NWTPH-GX	TFT	66
005122-15	NWTPH-DX	C25	89
005122-15 (6/9/00 DATA)	EPA-8270 SIM	TERPHENYL-d14	75
005122-15 (6/10/00 DATA)	EPA-8270 SIM	TERPHENYL-d14	*
005122-15	EPA-8260A	1,2-DCE-d4	96
005122-15	EPA-8260A	TOLUENE-d8	99
005122-15	EPA-8260A	4-BFB	99
005122-15	EPA-8082 MOD	TCMX	23**
005122-15	EPA-8082 MOD	DBC	21**
005122-16	NWTPH-GX	TFT	85
005122-16	NWTPH-DX	C25	74
005122-16	EPA-8270 SIM	TERPHENYL-d14	80
005122-16	EPA-8260A	1,2-DCE-d4	113
005122-16	EPA-8260A	TOLUENE-d8	98
005122-16	EPA-8260A	4-BFB	96
005122-16	EPA-8082 MOD	TCMX	77
005122-16	EPA-8082 MOD	DBC	86
005122-17	NWTPH-GX	TFT	89
005122-17	NWTPH-DX	C25	86
005122-17 (6/9/00 DATA)	EPA-8270 SIM	TERPHENYL-d14	94
005122-17 (6/10/00 DATA)	EPA-8270 SIM	TERPHENYL-d14	*
005122-17	EPA-8260A	1,2-DCE-d4	97
005122-17	EPA-8260A	TOLUENE-d8	96
005122-17	EPA-8260A	4-BFB	96
005122-17	EPA-8082 MOD	TCMX	59
005122-17	EPA-8082 MOD	DBC	75

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/12/00
CCIL JOB #: 005122

DATE RECEIVED: 5/26/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS

QUALITY CONTROL RESULTS

SURROGATE RECOVERY

CCIL SAMPLE ID	ANALYTE	SUR ID	% RECV
005122-18	NWTPH-GX	TFT	81
005122-18	NWTPH-DX	C25	88
005122-18 (6/9/00 DATA)	EPA-8270 SIM	TERPHENYL-d14	113
005122-18 (6/10/00 DATA)	EPA-8270 SIM	TERPHENYL-d14	*
005122-18	EPA-8260A	1,2-DCE-d4	105
005122-18	EPA-8260A	TOLUENE-d8	105
005122-18	EPA-8260A	4-BFB	89
005122-18	EPA-8082 MOD	TCMX	72
005122-18	EPA-8082 MOD	DBC	80
005122-22	NWTPH-GX	TFT	84
005122-22	NWTPH-DX	C25	89
005122-22 (6/9/00 DATA)	EPA-8270 SIM	TERPHENYL-d14	72
005122-22 (6/10/00 DATA)	EPA-8270 SIM	TERPHENYL-d14	*
005122-22	EPA-8260A	1,2-DCE-d4	102
005122-22	EPA-8260A	TOLUENE-d8	107
005122-22	EPA-8260A	4-BFB	98
005122-22	EPA-8082 MOD	TCMX	45**
005122-22	EPA-8082 MOD	DBC	40**

* SURROGATE DILUTED OUT OF CALIBRATION RANGE
** SURROGATE RESULTS OUTSIDE OF CONTROL LIMITS LIKELY DUE TO MATRIX EFFECTS

APPROVED BY: _____

3229 Pine St. • Everett, WA 98201 • 425 252-2620 • FAX 425 259-6289 • Seattle 206 292-9059

CCI Analytical Laboratories, Inc.
3229 Pine Street
Everett, WA 98201
Phone (425) 252-2620
(206) 292-9059 Seattle
(425) 259-6289 Fax

Chain Of Custody/ Laboratory Analysis Request

CCI Job# (Laboratory Use Only)

Date 5/26/00 Page 1 Of 3

PROJECT ID: TACOMA METALS K/J# 996098.00
REPORT TO COMPANY: KENNEDY/JENKS CONSULTANTS
PROJECT MANAGER: TY SCHREINER
ADDRESS: 530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003
PHONE: (253)927-8688 FAX: (253)952-3435
INVOICE TO COMPANY:
ATTENTION:
ADDRESS:
P.O. NUMBER CCI QUOTE:

ANALYSIS REQUESTED / OTHER (Specify)

	SAMPLE I.D.	DATE	TIME	TYPE	LAB#	NWTPH-GX	BTEX	NWTPH-DX	NWTPH-HCID	EPA 8021 ☐ 602 ☐	EPA 8010 ☐ 601 ☐	EPA 8260 ☒ 624 ☐ VOCs	EPA 8270 ☐ 625 ☐	EPA 8081/8082 ☐ 608 ☐ PCB only ☐ Pest only ☐	Metals Priority Pollutant ☐ RCRA ☐ TAL ☐	Metals Other (Specify)	TCLP-Metals ☐ VOA ☐ Semi-Vol ☐ Pest ☐ Herbs ☐	PCBs (608/8081)	PAHs (625/8270)	RCRA Metals (dissolved)	↳ Samples are field filtered		~~TOTAL RCRA METALS~~	~~↳ Samples were NOT FIELD FILTERED~~				NUMBER OF CONTAINERS	RECEIVED IN GOOD CONDITION?
1.	RGW-1 5/25/00	~~5/26/00~~	7:51a	H_2O		X		X				X						X	X	X								9	
2.	RGW-2	5/25/00	8:30a																										
3.	RGW-3		9:15a																										
4.	RGW-4		9:50a																										
5.	RGW-5		10:25a																										
6.	RGW-6		11:15a																										
7.	RGW-7		12:00p																										
8.	RGW-8		1:40p																										
9.	RGW-9		3:00p																										
10.	RGW-10		4:10p																										

SPECIAL INSTRUCTIONS RETURN COPY OF EXECUTED CHAIN OF CUSTODY W/REPORT TO K/J

SIGNATURES (Name, Company, Date, Time):
1. Relinquished By: [signature] K/J 5/21/00 2:30pm
Received By: [signature] CCTAL 5/26/00 4:30
2. Relinquished By:
Received

TURNAROUND REQUESTED in Business Days*

Organic, Metals & Inorganic Analysis: 10 (Standard) 5 3 2 1 SAME DAY

Fuels & Hydrocarbon Analysis: 5 (Standard) 3 1 SAME DAY

OTHER:
Specify: USE EXCESS VOC samples for use for NWTPH-GX as needed

* Turnaround request less than stand... may incur Rush Charges

CCI Analytical Laboratories, Inc.
229 Pine Street
Everett, WA 98201
Phone (425) 252-2620
(206) 292-9059 Seattle
(425) 259-6289 Fax

Chain of Custody/ Laboratory Analysis Request

CCI Job# (Laboratory Use Only)

Date 5/26/00 Page 2 Of 3

PROJECT ID: TACOMA METALS K/J# 996098.00
REPORT TO COMPANY: KENNEDY/JENKS CONSULTANTS
PROJECT MANAGER: TY SCHREINER
ADDRESS: 530 SOUTH 336th ST.
FEDERAL WAY, WA 98003
PHONE: (253) 927-8688 FAX:
INVOICE TO COMPANY:
ATTENTION:
ADDRESS:
P.O. NUMBER CCI QUOTE:

ANALYSIS REQUESTED / OTHER (Specify)

	SAMPLE I.D.	DATE	TIME	TYPE	LAB#	NWTPH-GX	BTEX	NWTPH-DX	NWTPH-HCID	EPA 8021 ☐ 602 ☐	EPA 8010 ☐ 601 ☐	EPA 8260 ☒ 624 ☐ VOCs	EPA 8270 ☐ 625 ☐	EPA 8081/8082 ☐ 608 ☐ PCB only ☐ Pest only ☐	Metals Priority Pollutant ☐ RCRA ☐ TAL ☐	Metals Other (Specify)	TCLP-Metals ☐ VOA ☐ Semi-Vol ☐ Pest ☐ Herbs ☐	PCBs (608/8081)	PAHs (625/8270)	RCRA METALS (DISSOLVED)	Losamples are field filtered	TOTAL RCRA METALS	LOSAMPLES ARE NOT FIELD FILTERED			NUMBER OF CONTAINERS	RECEIVED IN GOOD CONDITION?
1.	RGW-11	5/25/00	4:45p	H_2O		X		X				X						X	X	X						9	
2.	RGW-12	5/25/00	5:30p																								
3.	RGW-13	5/26/00	7:50a																								
4.	RGW-14		8:10a																								
5.	RGW-15		9:00a																								
6.	RGW-16		10:20a																							11	
7.	RGW-17		11:30a																							9	
8.	RGW-18		12:45p																							9	
9.	R BLANK-1	5/25/00	2:45p																			X				4	
10.	R BLANK-2	5/26/00	12:00p																			X				4	

SPECIAL INSTRUCTIONS RETURN COPY OF EXECUTED CHAIN OF CUSTODY W/REPORT TO K/J; NOTE: 2 EXTRA PAH SAMPLES OF RGW-16 COLLECTED FOR LAB QA/QC

SIGNATURES (Name, Company, Date, Time):
1. Relinquished By: K/J 5/26/00 2:30pm
Received By: CCIAL 5/26/00 4:30
2. Relinquished By:
Received By:

TURNAROUND REQUESTED in Business Days*

Organic, Metals & Inorganic Analysis: 10 (Standard) 5 3 2 1 SAME DAY

Fuels & Hydrocarbon Analysis: 5 (Standard) 3 1 SAME DAY

OTHER: Specify: USE EXCESS VOC samples for use for NWTPH-Gx analysis as needed

* Turnaround request less than standard may incur Rush Charges

CCI Analytical Laboratories, Inc.
3229 Pine Street
Everett, WA 98201
Phone (425) 252-2620
(206) 292-9059 Seattle
(425) 259-6289 Fax

Chain Of Custody/ Laboratory Analysis Request

CCI Job# (Laboratory Use Only)

Date 5/26/00 Page 3 Of 3

PROJECT ID: TACOMA METALS K/J # 946098.00
REPORT TO COMPANY: KENNEDY / JENKS CONSULTANTS
PROJECT MANAGER: TY SCHREINER
ADDRESS: 530 - SOUTH 336th STREET
FEDERAL WAY, WA 98003
PHONE: (253) 927-8688 FAX: (253) 952-3435
INVOICE TO COMPANY:
ATTENTION:
ADDRESS:
P.O. NUMBER CCI QUOTE:

ANALYSIS REQUESTED / OTHER (Specify)

	SAMPLE I.D.	DATE	TIME	TYPE	LAB#	NWTPH-GX	BTEX	NWTPH-DX	NWTPH-HCID	EPA 8021 ☐ 602 ☐	EPA 8010 ☐ 601 ☐	EPA 8260 ☒ 624 ☐ VOCs	EPA 8270 ☐ 625 ☐	EPA 8081/8082 ☐ 608 ☐ PCB only ☐ Pest only ☐	Metals Priority Pollutant ☐ RCRA ☐ TAL ☐	Metals Other (Specify)	TCLP-Metals ☐ VOA ☐ Semi-Vol ☐ Pest ☐ Herbs ☐	PCBs (608/8081)	PAHs (625/8270)	RCRA METALS (DISSOLVED)	↳ Samples are field filtered							NUMBER OF CONTAINERS	RECEIVED IN GOOD CONDITION?
1.	F BLANK-1	5/25/00	7:56a	H_2O																X								1	
2.	R GW-DUP	5/26/00	6:30a	H_2O		X		X				X						X	X	X								9	
3.																													
4.																													
5.																													
6.																													
7.																													
8.																													
9.																													
10.																													

SPECIAL INSTRUCTIONS: RETURN COPY OF EXECUTED CHAIN OF CUSTODY W/ REPORT TO K/J. RETURN K/J ICE TO K/J

SIGNATURES (Name, Company, Date, Time):
1. Relinquished By: [signature] K/J 5/26/00 2:30pm
Received By: [signature] CCIAL 5/26/00 4:30
2. Relinquished By:
Received

TURNAROUND REQUESTED in Business Days*

Organic, Metals & Inorganic Analysis: 10 (Standard) 5 3 2 1 SAME DAY

Fuels & Hydrocarbon Analysis: 5 (Standard) 3 1 SAME DAY

OTHER: Specify: USE EXCESS VOC samples for use for NWTPH-Gx as needed

* Turnaround request less than standard may incur Rush Charges

Appendix L

Groundwater Analytical Reports
and Chain-of-Custody Documents

CCI
ANALYTICAL
LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 003052
CCIL SAMPLE #: 1
DATE RECEIVED: 3/15/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS 996098.00
CLIENT SAMPLE ID: MW-1 3/14/00 10:05

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	ND	UG/L		3/16/00	LAH
TPH-DIESEL RANGE	NWTPH-DX	ND	UG/L		3/16/00	SNC
TPH-OIL RANGE	NWTPH-DX	ND	UG/L		3/16/00	SNC
NAPHTHALENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
ACENAPHTHYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
ACENAPHATHENE	EPA-8270 SIM	0.09	UG/L		3/24/00	LRK
FLUORENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
PHENANTHRENE	EPA-8270 SIM	0.03	UG/L		3/24/00	LRK
ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
BENZO[A]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
CHRYSENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
BENZO[B]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
BENZO[K]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
BENZO(A)PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
INDENO[1,2,3-CD]PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
DIBENZ[A,H]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
BENZO[G,H,I]PERYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
DICHLORODIFLUOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CHLOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
VINYL CHLORIDE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
BROMOMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
TRICHLOROFLUOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
ACETONE	EPA-8260A	ND(<150)	UG/L		3/17/00	LRK
1,1-DICHLOROETHENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
METHYLENE CHLORIDE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
ACRYLONITRILE	EPA-8260A	ND(<25)	UG/L		3/17/00	LRK
METHYL T-BUTYL ETHER	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK

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ANALYTICAL
LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 003052
CCIL SAMPLE #: 1
DATE RECEIVED: 3/15/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS 996098.00
CLIENT SAMPLE ID: MW-1 3/14/00 10:05

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TRANS-1,2-DICHLOROETHENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1-DICHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
2-BUTANONE	EPA-8260A	ND(<25)	UG/L		3/17/00	LRK
CIS-1,2-DICHLOROETHENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
2,2-DICHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
BROMOCHLOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CHLOROFORM	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1,1-TRICHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1-DICHLOROPROPENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CARBON TETRACHLORIDE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2-DICHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
BENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
TRICHLOROETHENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2-DICHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
DIBROMOMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
BROMODICHLOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
TRANS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
4-METHYL-2-PENTANONE	EPA-8260A	ND(<25)	UG/L		3/17/00	LRK
TOLUENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CIS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1,2-TRICHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
2-HEXANONE	EPA-8260A	ND(<25)	UG/L		3/17/00	LRK
1,3-DICHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
TETRACHLOROETHYLENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
DIBROMOCHLOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2-DIBROMOETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1,1,2-TETRACHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
ETHYLBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
M+P XYLENE	EPA-8260A	ND(<10)	UG/L		3/17/00	LRK
STYRENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
O-XYLENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK

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530 SOUTH 336TH STREET
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DATE: 6/20/00
CCIL JOB #: 003052
CCIL SAMPLE #: 1
DATE RECEIVED: 3/15/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS 996098.00
CLIENT SAMPLE ID: MW-1 3/14/00 10:05

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
BROMOFORM	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
ISOPROPYLBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1,2,2-TETRACHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2,3-TRICHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
BROMOBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
N-PROPYL BENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
2-CHLOROTOLUENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,3,5-TRIMETHYLBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
4-CHLOROTOLUENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
T-BUTYL BENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2,4-TRIMETHYL BENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
S-BUTYL BENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
P-ISOPROPYLTOLUENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,3 DICHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,4-DICHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
N-BUTYLBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2-DICHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2-DIBROMO 3-CHLOROPROPANE	EPA-8260A	ND(<25)	UG/L		3/17/00	LRK
1,2,4-TRICHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
HEXACHLORO1,3-BUTADIENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
NAPHTHALENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2,3-TRICHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
PCB-1016	EPA-8082 MOD	ND(<.1)	UG/L		3/23/00	LAH
PCB-1221	EPA-8082 MOD	ND(<.1)	UG/L		3/23/00	LAH
PCB-1232	EPA-8082 MOD	ND(<.1)	UG/L		3/23/00	LAH
PCB-1242	EPA-8082 MOD	ND(<.1)	UG/L		3/23/00	LAH
PCB-1248	EPA-8082 MOD	ND(<.1)	UG/L		3/23/00	LAH
PCB-1254	EPA-8082 MOD	ND(<.1)	UG/L		3/23/00	LAH
PCB-1260	EPA-8082 MOD	ND(<.1)	UG/L		3/23/00	LAH

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530 SOUTH 336TH STREET
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CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS 996098.00
CLIENT SAMPLE ID: MW-1 3/14/00 10:05

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
ARSENIC	EPA-7060	ND(<0.005)	MG/L		3/21/00	CMH
BARIUM	EPA-6010	0.012	MG/L		3/17/00	CMH
CADMIUM	EPA-6010	ND(<0.005)	MG/L		3/17/00	CMH
CHROMIUM	EPA-6010	0.03	MG/L		3/17/00	CMH
LEAD	EPA-7421	ND(<0.004)	MG/L		3/17/00	CMH
MERCURY	EPA-7470	ND(<.0002)	MG/L		3/17/00	CMH
SELENIUM	EPA-6010	ND(<0.05)	MG/L		3/17/00	CMH
SILVER	EPA-6010	ND(<0.007)	MG/L		3/17/00	CMH

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 50 UG/L
DIESEL RANGE REPORTING LIMIT IS 250 UG/L
LUBE OIL RANGE REPORTING LIMIT IS 500 UG/L

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: _____

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 003052
CCIL SAMPLE #: 2
DATE RECEIVED: 3/15/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS 996098.00
CLIENT SAMPLE ID: MW-2 3/13/00 3:48

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	ND	UG/L		3/16/00	LAH
TPH-DIESEL RANGE	NWTPH-DX	ND	UG/L		3/16/00	SNC
TPH-OIL RANGE	NWTPH-DX	ND	UG/L		3/16/00	SNC
NAPHTHALENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
ACENAPHTHYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
ACENAPHATHENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
FLUORENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
PHENANTHRENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
BENZO[A]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
CHRYSENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
BENZO[B]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
BENZO[K]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
BENZO(A)PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
INDENO[1,2,3-CD]PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
DIBENZ[A,H]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
BENZO[G,H,I]PERYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
DICHLORODIFLUOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CHLOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
VINYL CHLORIDE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
BROMOMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
TRICHLOROFLUOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
ACETONE	EPA-8260A	ND(<150)	UG/L		3/17/00	LRK
1,1-DICHLOROETHENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
METHYLENE CHLORIDE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
ACRYLONITRILE	EPA-8260A	ND(<25)	UG/L		3/17/00	LRK
METHYL T-BUTYL ETHER	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
S30 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 003052
CCIL SAMPLE #: 2
DATE RECEIVED: 3/15/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS 996098.00
CLIENT SAMPLE ID: MW-2 3/13/00 3:48

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TRANS-1,2-DICHLOROETHENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1-DICHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
2-BUTANONE	EPA-8260A	ND(<25)	UG/L		3/17/00	LRK
CIS-1,2-DICHLOROETHENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
2,2-DICHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
BROMOCHLOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CHLOROFORM	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1,1-TRICHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1-DICHLOROPROPENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CARBON TETRACHLORIDE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2-DICHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
BENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
TRICHLOROETHENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2-DICHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
DIBROMOMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
BROMODICHLOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
TRANS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
4-METHYL-2-PENTANONE	EPA-8260A	ND(<25)	UG/L		3/17/00	LRK
TOLUENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CIS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1,2-TRICHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
2-HEXANONE	EPA-8260A	ND(<25)	UG/L		3/17/00	LRK
1,3-DICHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
TETRACHLOROETHYLENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
DIBROMOCHLOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2-DIBROMOETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1,1,2-TETRACHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
ETHYLBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
M+P XYLENE	EPA-8260A	ND(<10)	UG/L		3/17/00	LRK
STYRENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
O-XYLENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK

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CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS 996098.00
CLIENT SAMPLE ID: MW-2 3/13/00 3:48

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
BROMOFORM	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
ISOPROPYLBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1,2,2-TETRACHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2,3-TRICHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
BROMOBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
N-PROPYL BENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
2-CHLOROTOLUENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,3,5-TRIMETHYLBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
4-CHLOROTOLUENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
T-BUTYL BENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2,4-TRIMETHYL BENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
S-BUTYL BENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
P-ISOPROPYLTOLUENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,3 DICHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,4-DICHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
N-BUTYLBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2-DICHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2-DIBROMO 3-CHLOROPROPANE	EPA-8260A	ND(<25)	UG/L		3/17/00	LRK
1,2,4-TRICHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
HEXACHLORO1,3-BUTADIENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
NAPHTHALENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2,3-TRICHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
PCB-1016	EPA-8082 MOD	ND(<.1)	UG/L		3/23/00	LAH
PCB-1221	EPA-8082 MOD	ND(<.1)	UG/L		3/23/00	LAH
PCB-1232	EPA-8082 MOD	ND(<.1)	UG/L		3/23/00	LAH
PCB-1242	EPA-8082 MOD	ND(<.1)	UG/L		3/23/00	LAH
PCB-1248	EPA-8082 MOD	ND(<.1)	UG/L		3/23/00	LAH
PCB-1254	EPA-8082 MOD	ND(<.1)	UG/L		3/23/00	LAH
PCB-1260	EPA-8082 MOD	ND(<.1)	UG/L		3/23/00	LAH

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LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 003052
CCIL SAMPLE #: 2
DATE RECEIVED: 3/15/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS 996098.00
CLIENT SAMPLE ID: MW-2 3/13/00 3:48

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
ARSENIC	EPA-7060	ND(<0.005)	MG/L		3/21/00	CMH
BARIUM	EPA-6010	0.005	MG/L		3/17/00	CMH
CADMIUM	EPA-6010	ND(<0.005)	MG/L		3/17/00	CMH
CHROMIUM	EPA-6010	0.19	MG/L		3/17/00	CMH
LEAD	EPA-7421	ND(<0.004)	MG/L		3/17/00	CMH
MERCURY	EPA-7470	ND(<.0002)	MG/L		3/17/00	CMH
SELENIUM	EPA-6010	ND(<0.05)	MG/L		3/17/00	CMH
SILVER	EPA-6010	ND(<0.007)	MG/L		3/17/00	CMH

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 50 UG/L
DIESEL RANGE REPORTING LIMIT IS 250 UG/L
LUBE OIL RANGE REPORTING LIMIT IS 500 UG/L

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: _____

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 003052
CCIL SAMPLE #: 3
DATE RECEIVED: 3/15/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS 996098.00
CLIENT SAMPLE ID: MW-5 3/14/00 11:45

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	ND	UG/L		3/16/00	LAH
TPH-DIESEL RANGE	NWTPH-DX	ND****	UG/L		3/30/00	SNC
TPH-OIL RANGE	NWTPH-DX	ND****	UG/L		3/30/00	SNC
NAPHTHALENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
ACENAPHTHYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
ACENAPHATHENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
FLUORENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
PHENANTHRENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
BENZO[A]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
CHRYSENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
BENZO[B]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
BENZO[K]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
BENZO(A)PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
INDENO[1,2,3-CD]PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
DIBENZ[A,H]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
BENZO[G,H,I]PERYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
DICHLORODIFLUOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CHLOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
VINYL CHLORIDE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
BROMOMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
TRICHLOROFLUOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
ACETONE	EPA-8260A	ND(<150)	UG/L		3/17/00	LRK
1,1-DICHLOROETHENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
METHYLENE CHLORIDE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
ACRYLONITRILE	EPA-8260A	ND(<25)	UG/L		3/17/00	LRK
METHYL T-BUTYL ETHER	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 003052
CCIL SAMPLE #: 3
DATE RECEIVED: 3/15/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS 996098.00
CLIENT SAMPLE ID: MW-5 3/14/00 11:45

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TRANS-1,2-DICHLOROETHENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1-DICHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
2-BUTANONE	EPA-8260A	ND(<25)	UG/L		3/17/00	LRK
CIS-1,2-DICHLOROETHENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
2,2-DICHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
BROMOCHLOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CHLOROFORM	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1,1-TRICHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1-DICHLOROPROPENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CARBON TETRACHLORIDE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2-DICHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
BENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
TRICHLOROETHENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2-DICHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
DIBROMOMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
BROMODICHLOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
TRANS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
4-METHYL-2-PENTANONE	EPA-8260A	ND(<25)	UG/L		3/17/00	LRK
TOLUENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CIS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1,2-TRICHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
2-HEXANONE	EPA-8260A	ND(<25)	UG/L		3/17/00	LRK
1,3-DICHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
TETRACHLOROETHYLENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
DIBROMOCHLOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2-DIBROMOETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1,1,2-TETRACHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
ETHYLBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
M+P XYLENE	EPA-8260A	ND(<10)	UG/L		3/17/00	LRK
STYRENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
O-XYLENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK

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CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 003052
CCIL SAMPLE #: 3
DATE RECEIVED: 3/15/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS 996098.00
CLIENT SAMPLE ID: MW-5 3/14/00 11:45

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
BROMOFORM	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
ISOPROPYLBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1,2,2-TETRACHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2,3-TRICHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
BROMOBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
N-PROPYL BENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
2-CHLOROTOLUENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,3,5-TRIMETHYLBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
4-CHLOROTOLUENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
T-BUTYL BENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2,4-TRIMETHYL BENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
S-BUTYL BENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
P-ISOPROPYLTOLUENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,3 DICHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,4-DICHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
N-BUTYLBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2-DICHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2-DIBROMO 3-CHLOROPROPANE	EPA-8260A	ND(<25)	UG/L		3/17/00	LRK
1,2,4-TRICHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
HEXACHLORO1,3-BUTADIENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
NAPHTHALENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2,3-TRICHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
PCB-1016	EPA-8082 MOD	ND(<.1)	UG/L		3/23/00	LAH
PCB-1221	EPA-8082 MOD	ND(<.1)	UG/L		3/23/00	LAH
PCB-1232	EPA-8082 MOD	ND(<.1)	UG/L		3/23/00	LAH
PCB-1242	EPA-8082 MOD	ND(<.1)	UG/L		3/23/00	LAH
PCB-1248	EPA-8082 MOD	ND(<.1)	UG/L		3/23/00	LAH
PCB-1254	EPA-8082 MOD	ND(<1)	UG/L		3/23/00	LAH
PCB-1260	EPA-8082 MOD	ND(<1)	UG/L		3/23/00	LAH

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 003052
CCIL SAMPLE #: 3
DATE RECEIVED: 3/15/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS 996098.00
CLIENT SAMPLE ID: MW-5 3/14/00 11:45

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
ARSENIC	EPA-7060	ND(<0.005)	MG/L		3/21/00	CMH
BARIUM	EPA-6010	0.018	MG/L		3/17/00	CMH
CADMIUM	EPA-6010	ND(<0.005)	MG/L		3/17/00	CMH
CHROMIUM	EPA-6010	0.03	MG/L		3/17/00	CMH
LEAD	EPA-7421	ND(<0.004)	MG/L		3/17/00	CMH
MERCURY	EPA-7470	ND(<.0002)	MG/L		3/17/00	CMH
SELENIUM	EPA-6010	ND(<0.05)	MG/L		3/17/00	CMH
SILVER	EPA-6010	ND(<0.007)	MG/L		3/17/00	CMH

NOTE: REPORTING LIMIT RAISED FOR PCB-1254 AND 1260 DUE TO MATRIX INTERFERENCE

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 50 UG/L
DIESEL RANGE REPORTING LIMIT IS 250 UG/L
LUBE OIL RANGE REPORTING LIMIT IS 500 UG/L

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

**** ANALYSIS PERFORMED ON RE-EXTRACTED SAMPLE. REEXTRACTION PERFORMED OUTSIDE OF 7 DAY HOLD TIME

APPROVED BY: _____

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 003052
CCIL SAMPLE #: 4
DATE RECEIVED: 3/15/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS 996098.00
CLIENT SAMPLE ID: MW-6 3/14/00 10:48

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	ND	UG/L		3/16/00	LAH
TPH-DIESEL RANGE	NWTPH-DX	ND	UG/L		3/17/00	SNC
TPH-OIL RANGE	NWTPH-DX	ND	UG/L		3/17/00	SNC
NAPHTHALENE	EPA-8270 SIM	0.17	UG/L		3/24/00	LRK
ACENAPHTHYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
ACENAPHATHENE	EPA-8270 SIM	0.02	UG/L		3/24/00	LRK
FLUORENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
PHENANTHRENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
BENZO[A]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
CHRYSENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
BENZO[B]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
BENZO[K]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
BENZO(A)PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
INDENO[1,2,3-CD]PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
DIBENZ[A,H]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
BENZO[G,H,I]PERYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
DICHLORODIFLUOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CHLOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
VINYL CHLORIDE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
BROMOMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
TRICHLOROFLUOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
ACETONE	EPA-8260A	ND(<150)	UG/L		3/17/00	LRK
1,1-DICHLOROETHENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
METHYLENE CHLORIDE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
ACRYLONITRILE	EPA-8260A	ND(<25)	UG/L		3/17/00	LRK
METHYL T-BUTYL ETHER	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 003052
CCIL SAMPLE #: 4
DATE RECEIVED: 3/15/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS 996098.00
CLIENT SAMPLE ID: MW-6 3/14/00 10:48

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TRANS-1,2-DICHLOROETHENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1-DICHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
2-BUTANONE	EPA-8260A	ND(<25)	UG/L		3/17/00	LRK
CIS-1,2-DICHLOROETHENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
2,2-DICHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
BROMOCHLOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CHLOROFORM	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1,1-TRICHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1-DICHLOROPROPENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CARBON TETRACHLORIDE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2-DICHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
BENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
TRICHLOROETHENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2-DICHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
DIBROMOMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
BROMODICHLOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
TRANS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
4-METHYL-2-PENTANONE	EPA-8260A	ND(<25)	UG/L		3/17/00	LRK
TOLUENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CIS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1,2-TRICHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
2-HEXANONE	EPA-8260A	ND(<25)	UG/L		3/17/00	LRK
1,3-DICHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
TETRACHLOROETHYLENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
DIBROMOCHLOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2-DIBROMOETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CHLOROBENZENE	EPA-8260A	36	UG/L		3/17/00	LRK
1,1,1,2-TETRACHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
ETHYLBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
M+P XYLENE	EPA-8260A	ND(<10)	UG/L		3/17/00	LRK
STYRENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
O-XYLENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK

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ANALYTICAL
LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 003052
CCIL SAMPLE #: 4
DATE RECEIVED: 3/15/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS 996098.00
CLIENT SAMPLE ID: MW-6 3/14/00 10:48

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
BROMOFORM	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
ISOPROPYLBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1,2,2-TETRACHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2,3-TRICHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
BROMOBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
N-PROPYL BENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
2-CHLOROTOLUENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,3,5-TRIMETHYLBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
4-CHLOROTOLUENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
T-BUTYL BENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2,4-TRIMETHYL BENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
S-BUTYL BENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
P-ISOPROPYLTOLUENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,3 DICHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,4-DICHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
N-BUTYLBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2-DICHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2-DIBROMO 3-CHLOROPROPANE	EPA-8260A	ND(<25)	UG/L		3/17/00	LRK
1,2,4-TRICHLORDBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
HEXACHLORO1,3-BUTADIENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
NAPHTHALENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2,3-TRICHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
PCB-1016	EPA-8082 MOD	ND(<.1)	UG/L		3/23/00	LAH
PCB-1221	EPA-8082 MOD	ND(<.1)	UG/L		3/23/00	LAH
PCB-1232	EPA-8082 MOD	ND(<.1)	UG/L		3/23/00	LAH
PCB-1242	EPA-8082 MOD	ND(<.1)	UG/L		3/23/00	LAH
PCB-1248	EPA-8082 MOD	ND(<.1)	UG/L		3/23/00	LAH
PCB-1254	EPA-8082 MOD	ND(<1)	UG/L		3/23/00	LAH
PCB-1260	EPA-8082 MOD	ND(<1)	UG/L		3/23/00	LAH

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CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS 996098.00
CLIENT SAMPLE ID: MW-6 3/14/00 10:48

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
ARSENIC	EPA-7060	ND(<0.005)	MG/L		3/21/00	CMH
BARIUM	EPA-6010	0.024	MG/L		3/17/00	CMH
CADMIUM	EPA-6010	ND(<0.005)	MG/L		3/17/00	CMH
CHROMIUM	EPA-6010	0.07	MG/L		3/17/00	CMH
LEAD	EPA-7421	ND(<0.004)	MG/L		3/17/00	CMH
MERCURY	EPA-7470	ND(<.0002)	MG/L		3/17/00	CMH
SELENIUM	EPA-6010	ND(<0.05)	MG/L		3/17/00	CMH
SILVER	EPA-6010	ND(<0.007)	MG/L		3/17/00	CMH

NOTE: REPORTING LIMIT RAISED FOR PCB-1254 AND 1260 DUE TO MATRIX INTERFERENCE

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 50 UG/L
DIESEL RANGE REPORTING LIMIT IS 250 UG/L
LUBE OIL RANGE REPORTING LIMIT IS 500 UG/L

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: _____

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530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 003052
CCIL SAMPLE #: 5
DATE RECEIVED: 3/15/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS 996098.00
CLIENT SAMPLE ID: DUP-1 3/14/00

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	ND	UG/L		3/17/00	LAH
TPH-DIESEL RANGE	NWTPH-DX	ND	UG/L		3/17/00	SNC
TPH-OIL RANGE	NWTPH-DX	ND	UG/L		3/17/00	SNC
NAPHTHALENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
ACENAPHTHYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
ACENAPHATHENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
FLUORENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
PHENANTHRENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
BENZO[A]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
CHRYSENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
BENZO[B]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
BENZO[K]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
BENZO(A)PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
INDENO[1,2,3-CD]PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
DIBENZ[A,H]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
BENZO[G,H,I]PERYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
DICHLORODIFLUOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CHLOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
VINYL CHLORIDE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
BROMOMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
TRICHLOROFLUOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
ACETONE	EPA-8260A	ND(<150)	UG/L		3/17/00	LRK
1,1-DICHLOROETHENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
METHYLENE CHLORIDE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
ACRYLONITRILE	EPA-8260A	ND(<25)	UG/L		3/17/00	LRK
METHYL T-BUTYL ETHER	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK

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530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
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CCIL SAMPLE #: 5
DATE RECEIVED: 3/15/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS 996098.00
CLIENT SAMPLE ID: DUP-1 3/14/00

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TRANS-1,2-DICHLOROETHENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1-DICHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
2-BUTANONE	EPA-8260A	ND(<25)	UG/L		3/17/00	LRK
CIS-1,2-DICHLOROETHENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
2,2-DICHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
BROMOCHLOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CHLOROFORM	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1,1-TRICHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1-DICHLOROPROPENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CARBON TETRACHLORIDE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2-DICHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
BENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
TRICHLOROETHENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2-DICHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
DIBROMOMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
BROMODICHLOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
TRANS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
4-METHYL-2-PENTANONE	EPA-8260A	ND(<25)	UG/L		3/17/00	LRK
TOLUENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CIS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1,2-TRICHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
2-HEXANONE	EPA-8260A	ND(<25)	UG/L		3/17/00	LRK
1,3-DICHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
TETRACHLOROETHYLENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
DIBROMOCHLOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2-DIBROMOETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1,1,2-TETRACHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
ETHYLBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
M+P XYLENE	EPA-8260A	ND(<10)	UG/L		3/17/00	LRK
STYRENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
O-XYLENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK

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CLIENT CONTACT: TY SCHREINER

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CLIENT SAMPLE ID: DUP-1 3/14/00

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
BROMOFORM	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
ISOPROPYLBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1,2,2-TETRACHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2,3-TRICHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
BROMOBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
N-PROPYL BENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
2-CHLOROTOLUENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,3,5-TRIMETHYLBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
4-CHLOROTOLUENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
T-BUTYL BENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2,4-TRIMETHYL BENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
S-BUTYL BENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
P-ISOPROPYLTOLUENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,3 DICHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,4-DICHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
N-BUTYLBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2-DICHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2-DIBROMO 3-CHLOROPROPANE	EPA-8260A	ND(<25)	UG/L		3/17/00	LRK
1,2,4-TRICHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
HEXACHLORO1,3-BUTADIENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
NAPHTHALENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2,3-TRICHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
PCB-1016	EPA-8082 MOD	ND(<.1)	UG/L		3/23/00	LAH
PCB-1221	EPA-8082 MOD	ND(<.1)	UG/L		3/23/00	LAH
PCB-1232	EPA-8082 MOD	ND(<.1)	UG/L		3/23/00	LAH
PCB-1242	EPA-8082 MOD	ND(<.1)	UG/L		3/23/00	LAH
PCB-1248	EPA-8082 MOD	ND(<.1)	UG/L		3/23/00	LAH
PCB-1254	EPA-8082 MOD	ND(<1)	UG/L		3/23/00	LAH
PCB-1260	EPA-8082 MOD	ND(<1)	UG/L		3/23/00	LAH

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REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
ARSENIC	EPA-7060	ND(<0.005)	MG/L		3/21/00	CMH
BARIUM	EPA-6010	0.018	MG/L		3/17/00	CMH
CADMIUM	EPA-6010	ND(<0.005)	MG/L		3/17/00	CMH
CHROMIUM	EPA-6010	0.03	MG/L		3/17/00	CMH
LEAD	EPA-7421	ND(<0.004)	MG/L		3/17/00	CMH
MERCURY	EPA-7470	ND(<.0002)	MG/L		3/17/00	CMH
SELENIUM	EPA-6010	ND(<0.05)	MG/L		3/17/00	CMH
SILVER	EPA-6010	ND(<0.007)	MG/L		3/17/00	CMH

NOTE: REPORTING LIMIT RAISED FOR PCB-1254 AND 1260 DUE TO MATRIX INTERFERENCE

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 50 UG/L
DIESEL RANGE REPORTING LIMIT IS 250 UG/L
LUBE OIL RANGE REPORTING LIMIT IS 500 UG/L

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: _____

3229 Pine St. • Everett, WA 98201 • 425 252-2620 • FAX 425 259-6289 • Seattle 206 292-9059

CCI
ANALYTICAL
LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 003052
CCIL SAMPLE #: 6
DATE RECEIVED: 3/15/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS 996098.00
CLIENT SAMPLE ID: MW-7 3/14/00 2:50

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	ND	UG/L		3/17/00	LAH
TPH-DIESEL RANGE	NWTPH-DX	ND	UG/L		3/17/00	SNC
TPH-OIL RANGE	NWTPH-DX	ND	UG/L		3/17/00	SNC
NAPHTHALENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
ACENAPHTHYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
ACENAPHATHENE	EPA-8270 SIM	0.25	UG/L		3/24/00	LRK
FLUORENE	EPA-8270 SIM	0.11	UG/L		3/24/00	LRK
PHENANTHRENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
ANTHRACENE	EPA-8270 SIM	0.03	UG/L		3/24/00	LRK
FLUORANTHENE	EPA-8270 SIM	0.08	UG/L		3/24/00	LRK
PYRENE	EPA-8270 SIM	0.05	UG/L		3/24/00	LRK
BENZO[A]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
CHRYSENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
BENZO[B]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
BENZO[K]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
BENZO(A)PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
INDENO[1,2,3-CD]PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
DIBENZ[A,H]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
BENZO[G,H,I]PERYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
DICHLORODIFLUOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CHLOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
VINYL CHLORIDE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
BROMOMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
TRICHLOROFLUOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
ACETONE	EPA-8260A	ND(<150)	UG/L		3/17/00	LRK
1,1-DICHLOROETHENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
METHYLENE CHLORIDE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
ACRYLONITRILE	EPA-8260A	ND(<25)	UG/L		3/17/00	LRK
METHYL T-BUTYL ETHER	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK

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CLIENT SAMPLE ID: MW-7 3/14/00 2:50

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TRANS-1,2-DICHLOROETHENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1-DICHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
2-BUTANONE	EPA-8260A	ND(<25)	UG/L		3/17/00	LRK
CIS-1,2-DICHLOROETHENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
2,2-DICHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
BROMOCHLOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CHLOROFORM	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1,1-TRICHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1-DICHLOROPROPENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CARBON TETRACHLORIDE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2-DICHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
BENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
TRICHLOROETHENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2-DICHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
DIBROMOMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
BROMODICHLOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
TRANS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
4-METHYL-2-PENTANONE	EPA-8260A	ND(<25)	UG/L		3/17/00	LRK
TOLUENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CIS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1,2-TRICHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
2-HEXANONE	EPA-8260A	ND(<25)	UG/L		3/17/00	LRK
1,3-DICHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
TETRACHLOROETHYLENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
DIBROMOCHLOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2-DIBROMOETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1,1,2-TETRACHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
ETHYLBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
M+P XYLENE	EPA-8260A	ND(<10)	UG/L		3/17/00	LRK
STYRENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
O-XYLENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK

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DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
BROMOFORM	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
ISOPROPYLBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1,2,2-TETRACHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2,3-TRICHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
BROMOBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
N-PROPYL BENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
2-CHLOROTOLUENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,3,5-TRIMETHYLBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
4-CHLOROTOLUENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
T-BUTYL BENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2,4-TRIMETHYL BENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
S-BUTYL BENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
P-ISOPROPYLTOLUENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,3 DICHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,4-DICHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
N-BUTYLBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2-DICHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2-DIBROMO 3-CHLOROPROPANE	EPA-8260A	ND(<25)	UG/L		3/17/00	LRK
1,2,4-TRICHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
HEXACHLORO1,3-BUTADIENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
NAPHTHALENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2,3-TRICHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
PCB-1016	EPA-8082 MOD	ND(<.5)	UG/L		3/23/00	LAH
PCB-1221	EPA-8082 MOD	ND(<.5)	UG/L		3/23/00	LAH
PCB-1232	EPA-8082 MOD	ND(<.5)	UG/L		3/23/00	LAH
PCB-1242	EPA-8082 MOD	ND(<.5)	UG/L		3/23/00	LAH
PCB-1248	EPA-8082 MOD	ND(<.5)	UG/L		3/23/00	LAH
PCB-1254	EPA-8082 MOD	ND(<2)	UG/L		3/23/00	LAH
PCB-1260	EPA-8082 MOD	ND(<2)	UG/L		3/23/00	LAH

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DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
ARSENIC	EPA-7060	ND(<0.005)	MG/L		3/21/00	CMH
BARIUM	EPA-6010	0.023	MG/L		3/17/00	CMH
CADMIUM	EPA-6010	ND(<0.005)	MG/L		3/17/00	CMH
CHROMIUM	EPA-6010	0.02	MG/L		3/17/00	CMH
LEAD	EPA-7421	ND(<0.004)	MG/L		3/17/00	CMH
MERCURY	EPA-7470	ND(<.0002)	MG/L		3/17/00	CMH
SELENIUM	EPA-6010	ND(<0.05)	MG/L		3/17/00	CMH
SILVER	EPA-6010	ND(<0.007)	MG/L		3/17/00	CMH

NOTE: REPORTING LIMIT RAISED FOR PCB-1254 AND 1260 DUE TO MATRIX INTERFERENCE

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 50 UG/L
DIESEL RANGE REPORTING LIMIT IS 250 UG/L
LUBE OIL RANGE REPORTING LIMIT IS 500 UG/L

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

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DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	ND	UG/L		3/17/00	LAH
TPH-DIESEL RANGE	NWTPH-DX	ND	UG/L		3/17/00	SNC
TPH-OIL RANGE	NWTPH-DX	ND	UG/L		3/17/00	SNC
NAPHTHALENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
ACENAPHTHYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
ACENAPHATHENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
FLUORENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
PHENANTHRENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
BENZO[A]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
CHRYSENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
BENZO[B]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
BENZO[K]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
BENZO(A)PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
INDENO[1,2,3-CD]PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
DIBENZ[A,H]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
BENZO[G,H,I]PERYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		3/24/00	LRK
DICHLORODIFLUOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CHLOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
VINYL CHLORIDE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
BROMOMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
TRICHLOROFLUOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
ACETONE	EPA-8260A	ND(<150)	UG/L		3/17/00	LRK
1,1-DICHLOROETHENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
METHYLENE CHLORIDE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
ACRYLONITRILE	EPA-8260A	ND(<25)	UG/L		3/17/00	LRK
METHYL T-BUTYL ETHER	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK

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ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TRANS-1,2-DICHLOROETHENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1-DICHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
2-BUTANONE	EPA-8260A	ND(<25)	UG/L		3/17/00	LRK
CIS-1,2-DICHLOROETHENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
2,2-DICHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
BROMOCHLOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CHLOROFORM	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1,1-TRICHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1-DICHLOROPROPENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CARBON TETRACHLORIDE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2-DICHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
BENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
TRICHLOROETHENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2-DICHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
DIBROMOMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
BROMODICHLOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
TRANS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
4-METHYL-2-PENTANONE	EPA-8260A	ND(<25)	UG/L		3/17/00	LRK
TOLUENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CIS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1,2-TRICHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
2-HEXANONE	EPA-8260A	ND(<25)	UG/L		3/17/00	LRK
1,3-DICHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
TETRACHLOROETHYLENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
DIBROMOCHLOROMETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2-DIBROMOETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
CHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1,1,2-TETRACHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
ETHYLBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
M+P XYLENE	EPA-8260A	ND(<10)	UG/L		3/17/00	LRK
STYRENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
O-XYLENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK

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ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
BROMOFORM	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
ISOPROPYLBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,1,2,2-TETRACHLOROETHANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2,3-TRICHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
BROMOBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
N-PROPYL BENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
2-CHLOROTOLUENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,3,5-TRIMETHYLBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
4-CHLOROTOLUENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
T-BUTYL BENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2,4-TRIMETHYL BENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
S-BUTYL BENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
P-ISOPROPYLTOLUENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,3 DICHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,4-DICHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
N-BUTYLBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2-DICHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2-DIBROMO 3-CHLOROPROPANE	EPA-8260A	ND(<25)	UG/L		3/17/00	LRK
1,2,4-TRICHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
HEXACHLORO1,3-BUTADIENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
NAPHTHALENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
1,2,3-TRICHLOROBENZENE	EPA-8260A	ND(<5)	UG/L		3/17/00	LRK
PCB-1016	EPA-8082 MOD	ND(<0.1)	UG/L		3/23/00	LAH
PCB-1221	EPA-8082 MOD	ND(<0.1)	UG/L		3/23/00	LAH
PCB-1232	EPA-8082 MOD	ND(<0.1)	UG/L		3/23/00	LAH
PCB-1242	EPA-8082 MOD	ND(<0.1)	UG/L		3/23/00	LAH
PCB-1248	EPA-8082 MOD	ND(<0.1)	UG/L		3/23/00	LAH
PCB-1254	EPA-8082 MOD	ND(<0.1)	UG/L		3/23/00	LAH
PCB-1260	EPA-8082 MOD	ND(<0.1)	UG/L		3/23/00	LAH

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LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 0030S2
CCIL SAMPLE #: 7
DATE RECEIVED: 3/15/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS 996098.00
CLIENT SAMPLE ID: EQUIP 3/14/00 3:30

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
ARSENIC	EPA-7060	ND(<0.005)	MG/L		3/21/00	CMH
BARIUM	EPA-6010	ND(<0.003)	MG/L		3/17/00	CMH
CADMIUM	EPA-6010	ND(<0.005)	MG/L		3/17/00	CMH
CHROMIUM	EPA-6010	Nd(<0.01)	MG/L		3/17/00	CMH
LEAD	EPA-7421	ND(<0.004)	MG/L		3/17/00	CMH
MERCURY	EPA-7470	ND(<.0002)	MG/L		3/17/00	CMH
SELENIUM	EPA-6010	ND(<0.05)	MG/L		3/17/00	CMH
SILVER	EPA-6010	ND(<0.007)	MG/L		3/17/00	CMH

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 50 UG/L
DIESEL RANGE REPORTING LIMIT IS 250 UG/L
LUBE OIL RANGE REPORTING LIMIT IS 500 UG/L

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: _____

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 003052

DATE RECEIVED: 3/15/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS 996098.00

REVISED REPORT WITH UPDATED DATA

QUALITY CONTROL RESULTS

SURROGATE RECOVERY

CCIL SAMPLE ID	ANALYTE	SUR ID	% RECV
003052-01	NWTPH-GX	TFT	88
003052-01	NWTPH-DX	C25	109
003052-01	EPA-8270 SIM	TERPHENYL-d14	98
003052-01	EPA-8260A	1,2-DCE-d4	89
003052-01	EPA-8260A	TOLUENE-d8	101
003052-01	EPA-8260A	4-BFB	113
003052-01	EPA-8082 MOD	TCMX	78
003052-01	EPA-8082 MOD	DBC	88
003052-02	NWTPH-GX	TFT	94
003052-02	NWTPH-DX	C25	71
003052-02	EPA-8270 SIM	TERPHENYL-d14	96
003052-02	EPA-8260A	1,2-DCE-d4	84
003052-02	EPA-8260A	TOLUENE-d8	97
003052-02	EPA-8260A	4-BFB	105
003052-02	EPA-8082 MOD	TCMX	74
003052-02	EPA-8082 MOD	DBC	88
003052-03	NWTPH-GX	TFT	87
003052-03	NWTPH-DX	C25	84
003052-03	EPA-8270 SIM	TERPHENYL-d14	92
003052-03	EPA-8260A	1,2-DCE-d4	89
003052-03	EPA-8260A	TOLUENE-d8	98
003052-03	EPA-8260A	4-BFB	109
003052-03	EPA-8082 MOD	TCMX	76
003052-03	EPA-8082 MOD	DBC	86

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 003052

DATE RECEIVED: 3/15/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS 996098.00

REVISED REPORT WITH UPDATED DATA

QUALITY CONTROL RESULTS

SURROGATE RECOVERY

CCIL SAMPLE ID	ANALYTE	SUR ID	% RECV
003052-04	NWTPH-GX	TFT	92
003052-04	NWTPH-DX	C25	91
003052-04	EPA-8270 SIM	TERPHENYL-d14	88
003052-04	EPA-8260A	1,2-DCE-d4	96
003052-04	EPA-8260A	TOLUENE-d8	105
003052-04	EPA-8260A	4-BFB	100
003052-04	EPA-8082 MOD	TCMX	71
003052-04	EPA-8082 MOD	DBC	79
003052-05	NWTPH-GX	TFT	93
003052-05	NWTPH-DX	C25	101
003052-05	EPA-8270 SIM	TERPHENYL-d14	94
003052-05	EPA-8260A	1,2-DCE-d4	89
003052-05	EPA-8260A	TOLUENE-d8	100
003052-05	EPA-8260A	4-BFB	99
003052-05	EPA-8082 MOD	TCMX	78
003052-05	EPA-8082 MOD	DBC	83
003052-06	NWTPH-GX	TFT	82
003052-06	NWTPH-DX	C25	88
003052-06	EPA-8270 SIM	TERPHENYL-d14	80
003052-06	EPA-8260A	1,2-DCE-d4	98
003052-06	EPA-8260A	TOLUENE-d8	108
003052-06	EPA-8260A	4-BFB	106
003052-06	EPA-8082 MOD	TCMX	77
003052-06	EPA-8082 MOD	DBC	88

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 003052

DATE RECEIVED: 3/15/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS 996098.00

REVISED REPORT WITH UPDATED DATA

QUALITY CONTROL RESULTS

SURROGATE RECOVERY

CCIL SAMPLE ID	ANALYTE	SUR ID	% RECV
003052-07	NWTPH-GX	TFT	89
003052-07	NWTPH-DX	C25	89
003052-07	EPA-8270 SIM	TERPHENYL-d14	88
003052-07	EPA-8260A	1,2-DCE-d4	80
003052-07	EPA-8260A	TOLUENE-d8	101
003052-07	EPA-8260A	4-BF8	110
003052-07	EPA-8082 MOD	TCMX	53
003052-07	EPA-8082 MOD	DBC	69

APPROVED BY: _____

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CCI Analytical Laboratories, Inc.
3229 Pine Street
Everett, WA 98201
Phone (425) 252-2620
(206) 292-9059 Seattle
(425) 259-6289 Fax

Chain Of Custody/ Laboratory Analysis Request

CCI Job# (Laboratory Use Only)

Date _____ Page _____ Of _____

PROJECT ID: Tacoma metals 996093.00
REPORT TO COMPANY: Kennedy Jenks
PROJECT MANAGER: Ty Schreiner
ADDRESS: 530 5336th
PHONE: 253 927 6600
INVOICE TO COMPANY: Kennedy Jenks
ATTENTION:
ADDRESS:
P.O. NUMBER
CCI QUOTE:

ANALYSIS REQUESTED / OTHER (Specify)

	SAMPLE I.D.	DATE	TIME	TYPE	LAB#	NWTPH-GX	BTEX	NWTPH-DX	NWTPH-HCID	EPA 8021 ☐ 602 ☐	EPA 601 ☐	EPA 8260 ☒ 624 ☐ VOC	EPA 8270 ☐ 625 ☐	EPA 8081/8082 ☐ 608 ☐ PCB only ☐ Past only ☐	Metals Priority Pollutant ☐ RCRA ☐ TAL ☐	Metals Other (Specify)	TCLP-Metals ☐ VOA ☐ Semi-Vol ☐ Pest ☐ Herbs ☐	PCB (608/8081)	PAH (625/8270)	metals (6010/7000)	NUMBER OF CONTAINERS	RECEIVED IN GOOD CONDITION?
1.	MW-1	3/14/00	10:05	H2O		✓		✓			✓	✓						✓	✓	✓		
2.	MW-2	3/13/00	3:48	✓		✓		✓			✓	✓						✓	✓	✓		
3.	MW-5	3/14/00	11:45	✓		✓		✓			✓	✓						✓	✓	✓		
4.	MW-6	3/14/00	10:45	✓		✓		✓			✓	✓						✓	✓	✓		
5.	Dup-1	3/14/00	—	✓		✓		✓			✓	✓						✓	✓	✓		
6.	MW-7	3/14/00	2:50	✓		✓		✓			✓	✓						✓	✓	✓		
7.	Equip	3/14/00	3:30	✓		✓		✓				✓						✓	✓	✓		
8.	Trip Blank 1	Per	Cooler	✓																		
9.																						
10.																						

SPECIAL INSTRUCTIONS

SIGNATURES (Name, Company, Date, Time)

1. Relinquished By: [signature] 3/14/00 4:00 pm
   Received By: Coder — —
2. Relinquished By: [signature]
   Received By: [signature] CCIAL 3/15/00 10:00

TURNAROUND REQUESTED in Business Days*

Organic, Metals & Inorganic Analysis: 10 (Standard) | 5 | 3 | 2 | 1 | SAME DAY

Fuels & Hydrocarbon Analysis: 5 (Standard) | 3 | 1 | SAME DAY

OTHER:
Specify: _____

* Turnaround request less than standard may incur Rush Charges

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 005064
CCIL SAMPLE #: 1
DATE RECEIVED: 5/12/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: NMW-1 5/11/00 1:40PM

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-DIESEL RANGE	NWTPH-DX	ND	UG/L		5/15/00	CMH
TPH-OIL RANGE	NWTPH-DX	ND	UG/L		5/15/00	CMH
NAPHTHALENE	EPA-8270 SIM	0.07	UG/L		5/24/00	LRK
ACENAPHTHYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		5/24/00	LRK
ACENAPHATHENE	EPA-8270 SIM	0.46	UG/L		5/24/00	LRK
FLUORENE	EPA-8270 SIM	0.06	UG/L		5/24/00	LRK
PHENANTHRENE	EPA-8270 SIM	0.15	UG/L		5/24/00	LRK
ANTHRACENE	EPA-8270 SIM	0.07	UG/L		5/24/00	LRK
FLUORANTHENE	EPA-8270 SIM	0.12	UG/L		5/24/00	LRK
PYRENE	EPA-8270 SIM	0.10	UG/L		5/24/00	LRK
BENZO[A]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		5/24/00	LRK
CHRYSENE	EPA-8270 SIM	ND(<0.02)	UG/L		5/24/00	LRK
BENZO[B]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		5/24/00	LRK
BENZO[K]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		5/24/00	LRK
BENZO(A)PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		5/24/00	LRK
INDENO[1,2,3-CD]PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		5/24/00	LRK
DIBENZ[A,H]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		5/24/00	LRK
BENZO[G,H,I]PERYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		5/24/00	LRK
DICHLORODIFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
CHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
VINYL CHLORIDE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
BROMOMETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
CHLOROETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
TRICHLOROFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
ACETONE	EPA-8260A	ND(<20)	UG/L		5/24/00	LRK
1,1-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
METHYLENE CHLORIDE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
ACRYLONITRILE	EPA-8260A	ND(<5)	UG/L		5/24/00	LRK
METHYL T-BUTYL ETHER	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
TRANS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK

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LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 005064
CCIL SAMPLE #: 1
DATE RECEIVED: 5/12/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT 5AMPLE ID: NMW-1 5/11/00 1:40PM

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
1,1-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
2-BUTANONE	EPA-8260A	ND(<5)	UG/L		5/24/00	LRK
CIS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
2,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
BROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
CHLOROFORM	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,1,1-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,1-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
CARBON TETRACHLORIDE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,2-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
BENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
TRICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
DIBROMOMETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
BROMODICHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
TRANS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
4-METHYL-2-PENTANONE	EPA-8260A	ND(<5)	UG/L		5/24/00	LRK
TOLUENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
CIS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,1,2-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
2-HEXANONE	EPA-8260A	ND(<5)	UG/L		5/24/00	LRK
1,3-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
TETRACHLOROETHYLENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
DIBROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,2-DIBROMOETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
CHLOROBENZENE	EPA-8260A	16	UG/L		5/24/00	LRK
1,1,1,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
ETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
M+P XYLENE	EPA-8260A	ND(<4)	UG/L		5/24/00	LRK
STYRENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
O-XYLENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
BROMOFORM	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK

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CCI
ANALYTICAL
LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 005064
CCIL SAMPLE #: 1
DATE RECEIVED: 5/12/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: NMW-1 5/11/00 1:40PM

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
ISOPROPYLBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,1,2,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,2,3-TRICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
BROMOBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
N-PROPYL BENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
2-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,3,5-TRIMETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
4-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
T-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,2,4-TRIMETHYL BENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
S-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
P-ISOPROPYLTOLUENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,3 DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,4-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
N-BUTYLBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,2-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,2-DIBROMO 3-CHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		5/24/00	LRK
1,2,4-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
HEXACHLORO1,3-BUTADIENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
NAPHTHALENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,2,3-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
PCB-1016	EPA-8082 MOD	ND(<0.1)	UG/L		5/23/00	LAH
PCB-1221	EPA-8082 MOD	ND(<0.1)	UG/L		5/23/00	LAH
PCB-1232	EPA-8082 MOD	ND(<0.1)	UG/L		5/23/00	LAH
PCB-1242	EPA-8082 MOD	ND(<0.1)	UG/L		5/23/00	LAH
PCB-1248	EPA-8082 MOD	ND(<0.1)	UG/L		5/23/00	LAH
PCB-1254	EPA-8082 MOD	ND(<0.1)	UG/L		5/23/00	LAH
PCB-1260	EPA-8082 MOD	ND(<0.1)	UG/L		5/23/00	LAH

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 005064
CCIL SAMPLE #: 1
DATE RECEIVED: 5/12/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: NMW-1 5/11/00 1:40PM

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
ARSENIC	EPA-7060	ND(<0.005)	MG/L		5/22/00	CMH
BARIUM	EPA-6010	0.017	MG/L		5/21/00	CMH
CADMIUM	EPA-6010	ND(<0.005)	MG/L		5/21/00	CMH
CHROMIUM	EPA-6010	ND(<0.01)	MG/L		5/21/00	CMH
LEAD	EPA-7421	0.006	MG/L		5/23/00	CMH
MERCURY	EPA-7470	ND(<.0002)	MG/L		5/22/00	CMH
SELENIUM	EPA-6010	ND(<0.05)	MG/L		5/21/00	CMH
SILVER	EPA-6010	ND(<0.007)	MG/L		5/21/00	CMH

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
DIESEL RANGE REPORTING LIMIT IS 250 UG/L
LUBE OIL RANGE REPORTING LIMIT IS 500 UG/L

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: _____

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 005064
CCIL SAMPLE #: 2
DATE RECEIVED: 5/12/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: NMW-2 5/11/00 3:35PM

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-DIESEL RANGE	NWTPH-DX	420	UG/L		5/16/00	CMH
TPH-OIL RANGE	NWTPH-DX	ND	UG/L		5/16/00	CMH
NAPHTHALENE	EPA-8270 SIM	ND(<0.02)	UG/L		5/24/00	LRK
ACENAPHTHYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		5/24/00	LRK
ACENAPHATHENE	EPA-8270 SIM	0.30	UG/L		5/24/00	LRK
FLUORENE	EPA-8270 SIM	0.05	UG/L		5/24/00	LRK
PHENANTHRENE	EPA-8270 SIM	ND(<0.02)	UG/L		5/24/00	LRK
ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		5/24/00	LRK
FLUORANTHENE	EPA-8270 SIM	0.04	UG/L		5/24/00	LRK
PYRENE	EPA-8270 SIM	0.02	UG/L		5/24/00	LRK
BENZO[A]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		5/24/00	LRK
CHRYSENE	EPA-8270 SIM	ND(<0.02)	UG/L		5/24/00	LRK
BENZO[B]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		5/24/00	LRK
BENZO[K]FLUORANTHENE	EPA-8270 SIM	ND(<0.02)	UG/L		5/24/00	LRK
BENZO(A)PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		5/24/00	LRK
INDENO[1,2,3-CD]PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		5/24/00	LRK
DIBENZ[A,H]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		5/24/00	LRK
BENZO[G,H,I]PERYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		5/24/00	LRK
DICHLORODIFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
CHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
VINYL CHLORIDE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
BROMOMETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
CHLOROETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
TRICHLOROFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
ACETONE	EPA-8260A	ND(<20)	UG/L		5/24/00	LRK
1,1-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
METHYLENE CHLORIDE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
ACRYLONITRILE	EPA-8260A	ND(<5)	UG/L		5/24/00	LRK
METHYL T-BUTYL ETHER	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
TRANS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 005064
CCIL SAMPLE #: 2
DATE RECEIVED: 5/12/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: NMW-2 5/11/00 3:35PM

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
1,1-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
2-BUTANONE	EPA-8260A	ND(<5)	UG/L		5/24/00	LRK
CIS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
2,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
BROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
CHLOROFORM	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,1,1-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,1-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
CARBON TETRACHLORIDE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,2-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
BENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
TRICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
DIBROMOMETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
BROMODICHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
TRANS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
4-METHYL-2-PENTANONE	EPA-8260A	ND(<5)	UG/L		5/24/00	LRK
TOLUENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
CIS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,1,2-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
2-HEXANONE	EPA-8260A	ND(<5)	UG/L		5/24/00	LRK
1,3-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
TETRACHLOROETHYLENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
DIBROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,2-DIBROMOETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
CHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,1,1,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
ETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
M+P XYLENE	EPA-8260A	ND(<4)	UG/L		5/24/00	LRK
STYRENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
O-XYLENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
BROMOFORM	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK

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CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 005064
CCIL SAMPLE #: 2
DATE RECEIVED: 5/12/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: NMW-2 5/11/00 3:35PM

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
ISOPROPYLBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,1,2,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,2,3-TRICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
BROMOBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
N-PROPYL BENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
2-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,3,5-TRIMETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
4-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
T-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,2,4-TRIMETHYL BENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
S-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
P-ISOPROPYLTOLUENE	EPA-8260A	5	UG/L		5/24/00	LRK
1,3 DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,4-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
N-BUTYLBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,2-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,2-DIBROMO 3-CHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		5/24/00	LRK
1,2,4-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
HEXACHLORO1,3-BUTADIENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
NAPHTHALENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,2,3-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
PCB-1016	EPA-8082 MOD	ND(<0.1)	UG/L		5/23/00	LAH
PCB-1221	EPA-8082 MOD	ND(<0.1)	UG/L		5/23/00	LAH
PCB-1232	EPA-8082 MOD	ND(<0.1)	UG/L		5/23/00	LAH
PCB-1242	EPA-8082 MOD	ND(<0.1)	UG/L		5/23/00	LAH
PCB-1248	EPA-8082 MOD	ND(<0.1)	UG/L		5/23/00	LAH
PCB-1254	EPA-8082 MOD	ND(<0.1)	UG/L		5/23/00	LAH
PCB-1260	EPA-8082 MOD	ND(<0.1)	UG/L		5/23/00	LAH

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530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
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CCIL SAMPLE #: 2
DATE RECEIVED: 5/12/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: NMW-2 5/11/00 3:35PM

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
ARSENIC	EPA-7060	ND(<0.005)	MG/L		5/22/00	CMH
BARIUM	EPA-6010	0.008	MG/L		5/21/00	CMH
CADMIUM	EPA-6010	ND(<0.005)	MG/L		5/21/00	CMH
CHROMIUM	EPA-6010	ND(<0.01)	MG/L		5/21/00	CMH
LEAD	EPA-7421	0.020	MG/L		5/23/00	CMH
MERCURY	EPA-7470	ND(<.0002)	MG/L		5/22/00	CMH
SELENIUM	EPA-6010	ND(<0.05)	MG/L		5/21/00	CMH
SILVER	EPA-6010	ND(<0.007)	MG/L		5/21/00	CMH

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS UNIDENTIFIED DIESEL RANGE PRODUCT

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
DIESEL RANGE REPORTING LIMIT IS 250 UG/L
LUBE OIL RANGE REPORTING LIMIT IS 500 UG/L

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: CVD

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 005064
CCIL SAMPLE #: 3
DATE RECEIVED: 5/12/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: SPA-1 5/11/00 4:30PM

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-DIESEL RANGE	NWTPH-DX	640	UG/L		5/15/00	CMH
TPH-OIL RANGE	NWTPH-DX	2500	UG/L		5/15/00	CMH
DICHLORODIFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
CHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
VINYL CHLORIDE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
BROMOMETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
CHLOROETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
TRICHLOROFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
ACETONE	EPA-8260A	ND(<20)	UG/L		5/24/00	LRK
1,1-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
METHYLENE CHLORIDE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
ACRYLONITRILE	EPA-8260A	ND(<5)	UG/L		5/24/00	LRK
METHYL T-BUTYL ETHER	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
TRANS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,1-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
2-BUTANONE	EPA-8260A	ND(<5)	UG/L		5/24/00	LRK
CIS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
2,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
BROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
CHLOROFORM	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,1,1-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,1-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
CARBON TETRACHLORIDE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,2-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
BENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
TRICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
DIBROMOMETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
BROMODICHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
TRANS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
4-METHYL-2-PENTANONE	EPA-8260A	ND(<5)	UG/L		5/24/00	LRK

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DATE: 6/20/00
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CCIL SAMPLE #: 3
DATE RECEIVED: 5/12/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: SPA-1 5/11/00 4:30PM

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TOLUENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
CIS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,1,2-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
2-HEXANONE	EPA-8260A	ND(<5)	UG/L		5/24/00	LRK
1,3-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
TETRACHLOROETHYLENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
DIBROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,2-DIBROMOETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
CHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,1,1,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
ETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
M+P XYLENE	EPA-8260A	ND(<4)	UG/L		5/24/00	LRK
STYRENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
O-XYLENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
BROMOFORM	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
ISOPROPYLBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,1,2,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,2,3-TRICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
BROMOBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
N-PROPYL BENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
2-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,3,5-TRIMETHYLBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
4-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
T-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,2,4-TRIMETHYL BENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
S-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
P-ISOPROPYLTOLUENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,3 DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,4-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
N-BUTYLBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,2-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,2-DIBROMO 3-CHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		5/24/00	LRK

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ANALYTICAL
LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 005064
CCIL SAMPLE #: 3
DATE RECEIVED: 5/12/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: SPA-1 5/11/00 4:30PM

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
1,2,4-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
HEXACHLORO1,3-BUTADIENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
NAPHTHALENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,2,3-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
PCB-1016	EPA-8082 MOD	ND(<1)	UG/L		5/23/00	LAH
PCB-1221	EPA-8082 MOD	ND(<1)	UG/L		5/23/00	LAH
PCB-1232	EPA-8082 MOD	ND(<1)	UG/L		5/23/00	LAH
PCB-1242	EPA-8082 MOD	ND(<1)	UG/L		5/23/00	LAH
PCB-1248	EPA-8082 MOD	ND(<1)	UG/L		5/23/00	LAH
PCB-1254	EPA-8082 MOD	ND(<1)	UG/L		5/23/00	LAH
PCB-1260	EPA-8082 MOD	ND(<1)	UG/L		5/23/00	LAH
ARSENIC	EPA-7060	ND(<0.005)	MG/L		5/22/00	CMH
BARIUM	EPA-6010	0.089	MG/L		5/21/00	CMH
CADMIUM	EPA-6010	ND(<0.005)	MG/L		5/21/00	CMH
CHROMIUM	EPA-6010	ND(<0.01)	MG/L		5/21/00	CMH
LEAD	EPA-7421	0.026	MG/L		5/23/00	CMH
MERCURY	EPA-7470	ND(<.0002)	MG/L		5/22/00	CMH
SELENIUM	EPA-6010	ND(<0.05)	MG/L		5/21/00	CMH
SILVER	EPA-6010	ND(<0.007)	MG/L		5/21/00	CMH

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS UNIDENTIFIED PRODUCT(S) SPANNING DIESEL AND OIL RANGE
PCB REPORTING LIMIT RAISED DUE TO MATRIX INTERFERENCE

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 005064
CCIL SAMPLE #: 3
DATE RECEIVED: 5/12/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: SPA-1 5/11/00 4:30PM

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
DIESEL RANGE REPORTING LIMIT IS 250 UG/L
LUBE OIL RANGE REPORTING LIMIT IS 500 UG/L

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: _____

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 005064
CCIL SAMPLE #: 11
DATE RECEIVED: 5/12/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: NMW-2-1S 5/9/00 11:2S

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-DIESEL RANGE	NWTPH-DX	120	MG/KG		5/16/00	CMH
TPH-OIL RANGE	NWTPH-DX	490	MG/KG		5/16/00	CMH
BIS(2-CHLOROETHYL)ETHER	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK
PHENOL	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK
2-CHLOROPHENOL	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK
1,3-DICHLOROBENZENE	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK
1,4-DICHLOROBENZENE	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK
1,2-DICHLOROBENZENE	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK
BENZYL ALCOHOL/2-METHYLPHEN	EPA-8270	ND(<200)	UG/KG		5/22/00	LRK
BIS(2-CHLOROISOPROPYL)ETHER	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK
HEXACHLOROETHANE	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK
N-NITROSO-DI-N-PROPYLAMINE	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK
4-METHYLPHENOL	EPA-8270	180	UG/KG		5/22/00	LRK
NITROBENZENE	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK
ISOPHORONE	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK
2-NITROPHENOL	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK
2,4-DIMETHYLPHENOL	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK
BENZOIC ACID	EPA-8270	ND(<500)	UG/KG		5/22/00	LRK
BIS(2-CHLOROETHOXY)METHANE	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK
2,4-DICHLOROPHENOL	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK
1,2,4-TRICHLOROBENZENE	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK
NAPHTHALENE	EPA-8270	240	UG/KG		5/22/00	LRK
4-CHLOROANILINE	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK
HEXACHLOROBUTADIENE	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK
4-CHLORO-3-METHYLPHENOL	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK
2-METHYLNAPHTHALENE	EPA-8270	170	UG/KG		5/22/00	LRK
HEXACHLOROCYCLOPENTADIENE	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK
2,4,6-TRICHLOROPHENOL	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK
2,4,5-TRICHLOROPHENOL	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK
2-CHLORONAPHTHANLENE	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK
2-NITROANILINE	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 005064
CCIL SAMPLE #: 11
DATE RECEIVED: 5/12/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: NMW-2-15 5/9/00 11:25

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
ACENAPHTHYLENE	EPA-8270	680	UG/KG		5/22/00	LRK
DIMETHYLPHTHALATE	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK
2,6-DINITROTOLUENE	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK
ACENAPHATHENE	EPA-8270	190	UG/KG		5/22/00	LRK
3-NITROANILINE	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK
2,4-DINITROPHENOL	EPA-8270	ND(<1000)	UG/KG		5/22/00	LRK
DIBENZOFURAN	EPA-8270	340	UG/KG		5/22/00	LRK
2,4-DINITROTOLUENE	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK
4-NITROPHENOL	EPA-8270	ND(<1000)	UG/KG		5/22/00	LRK
FLUORENE	EPA-8270	580	UG/KG		5/22/00	LRK
4-CHLOROPHENYL-PHENYLETHER	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK
DIETHYLPHTHALATE	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK
4-NITROANILINE	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK
4,6-DINITRO-2-METHYLPHENOL	EPA-8270	ND(<1000)	UG/KG		5/22/00	LRK
N-NITROSODIPHENYLAMINE	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK
4-BROMOPHENYL-PHENYLETHER	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK
HEXACHLOROBENZENE	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK
PENTACHLOROPHENOL	EPA-8270	ND(<1000)	UG/KG		5/22/00	LRK
PHENANTHRENE	EPA-8270	2400	UG/KG		5/22/00	LRK
ANTHRACENE	EPA-8270	730	UG/KG		5/22/00	LRK
CARBAZOLE	EPA-8270	230	UG/KG		5/22/00	LRK
DI-N-BUTYLPHTHALATE	EPA-8270	880	UG/KG		5/22/00	LRK
FLUORANTHENE	EPA-8270	3400	UG/KG		5/22/00	LRK
PYRENE	EPA-8270	3300	UG/KG		5/22/00	LRK
BUTYLBENZYLPHTHALATE	EPA-8270	14000	UG/KG		5/23/00	LRK
3,3'-DICHLOROBENZIDINE	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK
BENZO[A]ANTHRACENE	EPA-8270	1900	UG/KG		5/22/00	LRK
CHRYSENE	EPA-8270	2000	UG/KG		5/22/00	LRK
BIS(2-ETHYLHEXYL)PHTHALATE	EPA-8270	800	UG/KG		5/22/00	LRK
DI-N-OCTYLPHTHALATE	EPA-8270	ND(<100)	UG/KG		5/22/00	LRK
BENZO[B]FLUORANTHENE	EPA-8270	1900	UG/KG		5/22/00	LRK
BENZO[K]FLUORANTHENE	EPA-8270	1700	UG/KG		5/22/00	LRK

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 005064
CCIL SAMPLE #: 11
DATE RECEIVED: 5/12/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: NMW-2-15 5/9/00 11:25

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
BENZO[A]PYRENE	EPA-8270	2000	UG/KG		5/22/00	LRK
INDENO[1,2,3-CD]PYRENE	EPA-8270	760	UG/KG		5/22/00	LRK
DIBENZ[A,H]ANTHRACENE	EPA-8270	310	UG/KG		5/22/00	LRK
BENZO[G,H,I]PERYLENE	EPA-8270	690	UG/KG		5/22/00	LRK

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS UNIDENTIFIED PRODUCT WHICH IS LIKELY BUNKER FUEL OR UNIDENTIFIED PRODUCT(S) SPANNING DIESEL AND OIL RANGE

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
DIESEL RANGE REPORTING LIMIT IS 25 MG/KG
LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: _____

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 005064
CCIL SAMPLE #: 11
DATE RECEIVED: 5/12/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: NMW-2-15 5/9/00 11:25

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	REPORTING LIMIT	ANALYSIS DATE
EXTRACTABLE PETROLEUM HYDROCARBONS					
C8-C10 ALIPHATICS	WDOE-EPH	U	MG/KG	6	5/18/00
>C10-C12 ALIPHATICS	WDOE-EPH	U	MG/KG	6	5/18/00
>C12-C16 ALIPHATICS	WDOE-EPH	26	MG/KG	6	5/18/00
>C16-C21 ALIPHATICS	WDOE-EPH	49	MG/KG	6	5/18/00
>C21-C34 ALIPHATICS	WDOE-EPH	58	MG/KG	6	5/18/00
>C10-C12 AROMATICS	WDOE-EPH	U	MG/KG	6	5/19/00
>C12-C16 AROMATICS	WDOE-EPH	13	MG/KG	6	5/19/00
>C16-C21 AROMATICS	WDOE-EPH	60	MG/KG	6	5/19/00
>C21-C34 AROMATICS	WDOE-EPH	100	MG/KG	6	5/19/00
TOTAL ALIPHATICS		140	MG/KG	15	
TOTAL AROMATICS		180	MG/KG	12	

SURROGATES	% RECOVERY
C25	88
P-TERPHENYL	73

NOTE: TOTAL ALIPHATICS AND AROMATICS ARE BASED ON EC RANGE "U" RESULTS SUMMED AT 1/2 OF RPT LIMIT

* "U" INDICATES ANALYTE NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

APPROVED BY: _____

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 005064
CCIL SAMPLE #: 14
DATE RECEIVED: 5/12/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: NMW-3-10 5/9/00 1:5S

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-DIESEL RANGE	NWTPH-DX	170	MG/KG		5/16/00	CMH
TPH-OIL RANGE	NWTPH-DX	65	MG/KG		5/16/00	CMH

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS UNIDENTIFIED PRIMARILY EARLY DIESEL RANGE PRODUCT

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
DIESEL RANGE REPORTING LIMIT IS 25 MG/KG
LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: CMH

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 005064
CCIL SAMPLE #: 16
DATE RECEIVED: 5/12/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: NMW-3 5/12/00 11:25PM

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-DIESEL RANGE	NWTPH-DX	4100	UG/L		5/16/00	CMH
TPH-OIL RANGE	NWTPH-DX	ND	UG/L		5/16/00	CMH
NAPHTHALENE	EPA-8270	6200	UG/L		5/26/00	LRK
ACENAPHTHYLENE	EPA-8270 SIM	2.1	UG/L		5/25/00	LRK
ACENAPHATHENE	EPA-8270 SIM	130	UG/L		5/25/00	LRK
FLUORENE	EPA-8270 SIM	68	UG/L		5/25/00	LRK
PHENANTHRENE	EPA-8270 SIM	50	UG/L		5/25/00	LRK
ANTHRACENE	EPA-8270 SIM	38	UG/L		5/25/00	LRK
FLUORANTHENE	EPA-8270 SIM	3.9	UG/L		5/25/00	LRK
PYRENE	EPA-8270 SIM	2.5	UG/L		5/25/00	LRK
BENZO[A]ANTHRACENE	EPA-8270 SIM	0.30	UG/L		5/24/00	LRK
CHRYSENE	EPA-8270 SIM	0.32	UG/L		5/24/00	LRK
BENZO[B]FLUORANTHENE	EPA-8270 SIM	0.05	UG/L		5/24/00	LRK
BENZO[K]FLUORANTHENE	EPA-8270 SIM	0.06	UG/L		5/24/00	LRK
BENZO(A)PYRENE	EPA-8270 SIM	0.06	UG/L		5/24/00	LRK
INDENO[1,2,3-CD]PYRENE	EPA-8270 SIM	ND(<0.02)	UG/L		5/24/00	LRK
DIBENZ[A,H]ANTHRACENE	EPA-8270 SIM	ND(<0.02)	UG/L		5/24/00	LRK
BENZO[G,H,I]PERYLENE	EPA-8270 SIM	ND(<0.02)	UG/L		5/24/00	LRK
DICHLORODIFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
CHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
VINYL CHLORIDE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
BROMOMETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
CHLOROETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
TRICHLOROFLUOROMETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
ACETONE	EPA-8260A	ND(<20)	UG/L		5/24/00	LRK
1,1-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
METHYLENE CHLORIDE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
ACRYLONITRILE	EPA-8260A	ND(<5)	UG/L		5/24/00	LRK
METHYL T-BUTYL ETHER	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
TRANS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK

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CCI
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LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 005064
CCIL SAMPLE #: 16
DATE RECEIVED: 5/12/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: NMW-3 5/12/00 11:25PM

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
1,1-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
2-BUTANONE	EPA-8260A	ND(<5)	UG/L		5/24/00	LRK
CIS-1,2-DICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
2,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
BROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
CHLOROFORM	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,1,1-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,1-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
CARBON TETRACHLORIDE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,2-DICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
BENZENE	EPA-8260A	23	UG/L		5/24/00	LRK
TRICHLOROETHENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,2-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
DIBROMOMETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
BROMODICHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
TRANS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
4-METHYL-2-PENTANONE	EPA-8260A	ND(<5)	UG/L		5/24/00	LRK
TOLUENE	EPA-8260A	47	UG/L		5/24/00	LRK
CIS-1,3-DICHLOROPROPENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,1,2-TRICHLOROETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
2-HEXANONE	EPA-8260A	ND(<5)	UG/L		5/24/00	LRK
1,3-DICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
TETRACHLOROETHYLENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
DIBROMOCHLOROMETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,2-DIBROMOETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
CHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,1,1,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
ETHYLBENZENE	EPA-8260A	220	UG/L		5/25/00	LRK
M+P XYLENE	EPA-8260A	590	UG/L		5/25/00	LRK
STYRENE	EPA-8260A	ND(<20)	UG/L		5/25/00	LRK
O-XYLENE	EPA-8260A	290	UG/L		5/25/00	LRK
BROMOFORM	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK

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CERTIFICATE OF ANALYSIS

CLIENT: KENNEDY/JENKS CONSULTANTS
530 SOUTH 336TH STREET
FEDERAL WAY, WA 98003

DATE: 6/20/00
CCIL JOB #: 005064
CCIL SAMPLE #: 16
DATE RECEIVED: 5/12/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: NMW-3 5/12/00 11:25PM

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
ISOPROPYLBENZENE	EPA-8260A	58	UG/L		5/24/00	LRK
1,1,2,2-TETRACHLOROETHANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,2,3-TRICHLOROPROPANE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
BROMOBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
N-PROPYL BENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
2-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,3,5-TRIMETHYLBENZENE	EPA-8260A	120	UG/L		5/24/00	LRK
4-CHLOROTOLUENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
T-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,2,4-TRIMETHYL BENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
S-BUTYL BENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
P-ISOPROPYLTOLUENE	EPA-8260A	38	UG/L		5/24/00	LRK
1,3 DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,4-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
N-BUTYLBENZENE	EPA-8260A	10	UG/L		5/24/00	LRK
1,2-DICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
1,2-DIBROMO 3-CHLOROPROPANE	EPA-8260A	ND(<5)	UG/L		5/24/00	LRK
1,2,4-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
HEXACHLORO1,3-BUTADIENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
NAPHTHALENE	EPA-8260A	2000	UG/L		5/25/00	LRK
1,2,3-TRICHLOROBENZENE	EPA-8260A	ND(<2)	UG/L		5/24/00	LRK
PCB-1016	EPA-8082 MOD	ND(<1)	UG/L		5/23/00	LAH
PCB-1221	EPA-8082 MOD	ND(<20)	UG/L		5/23/00	LAH
PCB-1232	EPA-8082 MOD	ND(<5)	UG/L		5/23/00	LAH
PCB-1242	EPA-8082 MOD	ND(<1)	UG/L		5/23/00	LAH
PCB-1248	EPA-8082 MOD	ND(<1)	UG/L		5/23/00	LAH
PCB-1254	EPA-8082 MOD	ND(<1)	UG/L		5/23/00	LAH
PCB-1260	EPA-8082 MOD	ND(<1)	UG/L		5/23/00	LAH

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CLIENT CONTACT: TY SCHREINER

CLIENT PROJECT ID: TACOMA METALS
CLIENT SAMPLE ID: NMW-3 5/12/00 11:25PM

REVISED REPORT WITH UPDATED DATA

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
ARSENIC	EPA-7060	ND(<0.005)	MG/L		5/22/00	CMH
BARIUM	EPA-6010	0.015	MG/L		5/21/00	CMH
CADMIUM	EPA-6010	ND(<0.005)	MG/L		5/21/00	CMH
CHROMIUM	EPA-6010	ND(<0.01)	MG/L		5/21/00	CMH
LEAD	EPA-7421	0.006	MG/L		5/23/00	CMH
MERCURY	EPA-7470	ND(<.0002)	MG/L		5/22/00	CMH
SELENIUM	EPA-6010	ND(<0.05)	MG/L		5/21/00	CMH
SILVER	EPA-6010	ND(<0.007)	MG/L		5/21/00	CMH

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS UNIDENTIFIED DIESEL RANGE PRODUCT. RESULT MAY BE BAISED HIGH DUE TO END OF VOLATILE RANGE PRODUCT ELUTING IN DIESEL RANGE

PCB REPORTING LIMIT RAISED DUE TO MATRIX INTERFERENCE

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
DIESEL RANGE REPORTING LIMIT IS 250 UG/L
LUBE OIL RANGE REPORTING LIMIT IS 500 UG/L

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: CMH

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CLIENT PROJECT ID: TACOMA METALS

REVISED REPORT WITH UPDATED DATA

QUALITY CONTROL RESULTS

SURROGATE RECOVERY

CCIL SAMPLE ID	ANALYTE	SUR ID	% RECV
005064-01	NWTPH-DX	C25	78
005064-01	EPA-8270 SIM	TERPHENYL-d14	113
005064-01	EPA-8260A	1,2-DCE-d4	108
005064-01	EPA-8260A	TOLUENE-d8	105
005064-01	EPA-8260A	4-BFB	104
005064-01	EPA-8082 MOD	TCMX	57
005064-01	EPA-8082 MOD	DBC	72
005064-02	NWTPH-DX	C25	96
005064-02	EPA-8270 SIM	TERPHENYL-d14	77
005064-02	EPA-8260A	1,2-DCE-d4	112
005064-02	EPA-8260A	TOLUENE-d8	104
005064-02	EPA-8260A	4-BFB	95
005064-02	EPA-8082 MOD	TCMX	61
005064-02	EPA-8082 MOD	DBC	68
005064-03	NWTPH-DX	C25	98
005064-03	EPA-8260A	1,2-DCE-d4	104
005064-03	EPA-8260A	TOLUENE-d8	102
005064-03	EPA-8260A	4-BFB	99
005064-03	EPA-8082 MOD	TCMX	60
005064-03	EPA-8082 MOD	DBC	64
005064-11	NWTPH-DX	C25	125
005064-11(5/22/00 DATA)	EPA-8270	2-FLUOROPHENOL	58
005064-11(5/22/00 DATA)	EPA-8270	PHENOL-d5	63
005064-11(5/22/00 DATA)	EPA-8270	NITROBENZENE-d5	55
005064-11(5/22/00 DATA)	EPA-8270	2-FLUOROBIPHENYL	63

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CLIENT PROJECT ID: TACOMA METALS

REVISED REPORT WITH UPDATED DATA

QUALITY CONTROL RESULTS

SURROGATE RECOVERY

CCIL SAMPLE ID	ANALYTE	SUR ID	% RECV
005064-11(5/22/00 DATA)	EPA-8270	2,4,6-TRIBROMOPHENOL	75
005064-11(5/22/00 DATA)	EPA-8270	TERPHENYL-d14	80
005064-11(5/23/00 DATA)	EPA-8270	2-FLUOROPHENOL	*
005064-11(5/23/00 DATA)	EPA-8270	PHENOL-d5	*
005064-11(5/23/00 DATA)	EPA-8270	NITROBENZENE-d5	*
005064-11(5/23/00 DATA)	EPA-8270	2-FLUOROBIPHENYL	*
005064-11(5/23/00 DATA)	EPA-8270	2,4,6-TRIBROMOPHENOL	*
005064-11(5/23/00 DATA)	EPA-8270	TERPHENYL-d14	*
005064-14	NWTPH-DX	C25	105
005064-16	NWTPH-DX	C25	105
005064-16(5/26/00 DATA)	EPA-8270	TERPHENYL-d14	*
005064-16(5/24/00 DATA)	EPA-8270 SIM	TERPHENYL-d14	86
005064-16(5/25/00 DATA)	EPA-8270 SIM	TERPHENYL-d14	*
005064-16(5/24/00 DATA)	EPA-8260A	1,2-DCE-d4	114
005064-16(5/24/00 DATA)	EPA-8260A	TOLUENE-d8	100
005064-16(5/24/00 DATA)	EPA-8260A	4-BFB	132**
005064-16(5/25/00 DATA)	EPA-8260A	1,2-DCE-d4	106
005064-16(5/25/00 DATA)	EPA-8260A	TOLUENE-d8	110
005064-16(5/25/00 DATA)	EPA-8260A	4-BFB	103
005064-16	EPA-8082 MOD	TCMX	**
005064-16	EPA-8082 MOD	DBC	75

* SURROGATE DILUTED OUT OF CALIBRATION RANGE
** SURROGATE DATA UNUSEABLE DUE TO MATRIX INTERFERENCE

APPROVED BY: _____

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Everett, WA 98201
Phone (425) 252-2620
(206) 292-9059 Seattle
(425) 259-6289 Fax

Chain Of Custody/ Laboratory Analysis Request

CCI Job# (Laboratory Use Only)

Date 5/12/00 Page 1 Of 3

PROJECT ID: TACOMA METALS
REPORT TO COMPANY: KENNEDY/JENKS CONSULTANTS
PROJECT MANAGER: TY SCHREINER
ADDRESS: 550 - SOUTH 336th ST
FEDERAL WAY, WA 98003
PHONE: (253) 927-8688 FAX: (253) 952-3435
INVOICE TO COMPANY: SAME AS ABOVE (K/J)
ATTENTION: TY SCHREINER
ADDRESS: SAME
P.O. NUMBER
CCI QUOTE:

ANALYSIS REQUESTED / OTHER (Specify)

	SAMPLE I.D.	DATE	TIME	TYPE	LAB#	NWTPH-GX	BTEX	NWTPH-DX	NWTPH-HCID	EPA 8021 ☐ 602 ☐	EPA 8010 ☐ 601 ☐	EPA 8260 ☐ 624 ☐ VOCs	EPA 8270 ☐ 625 ☐	EPA 8081/8082 ☐ 608 ☐ PCB only ☐ Pest only ☐	Metals Priority Pollutant ☐ RCRA ☐ TAL ☐	Metals Other (Specify)	TCLP-Metals ☐ VOA ☐ Semi-Vol ☐ Pest ☐ Herbs ☐	RED 608/8081	PAH (HOLD)	PAH 625/8270	TOTAL METALS 6010/7000	↳ SAMPLES ARE UNFILTERED. RUN FOR TOTAL METALS & RCRA		HOLD				NUMBER OF CONTAINERS	RECEIVED IN GOOD CONDITION?
1.	NMW-1	5/11/00	1:40p	H2O				X				X						X		X	X							8	
2.	NMW-2	5/11/00	3:35pm	↓				X				X						X		X	X							8	
3.	SFA-1	5/11/00	4:30p	↓				X				X						X	X		X							8	
4.	NMW-1-5	5/9/00	9:30a	SOIL																				X				1	
5.	NMW-1-10	↓	9:40a	↓																				X				2	
6.	NMW-1-15		9:50a																					X				2	
7.	NMW-1-20		10:00a																					X				3	
8.	NMW-2-0		11:00a																					X				2	
9.	NMW-2-5		11:10a																					X				2	
10.	NMW-2-10	↓	11:15a	↓																				X				2	

SPECIAL INSTRUCTIONS: RETURN ALL K/J ICE PACKS

SIGNATURES (Name, Company, Date, Time):
1. Relinquished By: K/J 5/12/00 ~~[illegible]~~ 2:00pm
Received By: [signature] CCI AK 5/12/00 2:00
2. Relinquished By:
Received By

TURNAROUND REQUESTED in Business Days*

Organic, Metals & Inorganic Analysis: 10 (Standard) | 5 | 3 | 2 | 1 | SAME DAY

Fuels & Hydrocarbon Analysis: 5 (Standard) | 3 | 1 | SAME DAY

OTHER: Specify: RETURN YELLOW COPY TO K/J WHEN FORM COMPLETED

* Turnaround request less than standard may incur Rush Charges

CCI Analytical Laboratories, Inc.
229 Pine Street
Everett, WA 98201
Phone (425) 252-2620
(206) 292-9059 Seattle
(425) 259-6269 Fax

Chain of Custody/ Laboratory Analysis Request

CCI Job# (Laboratory Use Only)

Date 5/12/00 Page 2 Of 3

PROJECT ID: TACOMA METALS
REPORT TO COMPANY: KENNEDY/JENKS CONSULTANTS
PROJECT MANAGER: TY SCHREINER
ADDRESS: 536 SOUTH 336th ST
FEDERAL WAY, WA 98003
PHONE: (253)927-8688 FAX: (253)952-3435
INVOICE TO COMPANY: SAME AS ABOVE (K/J)
ATTENTION: TY SCHREINER
ADDRESS: SAME
P.O. NUMBER CCI QUOTE:

ANALYSIS REQUESTED / OTHER (Specify)

SAMPLE I.D.	DATE	TIME	TYPE	LAB#	NWTPH-GX	BTEX	NWTPH-DX (IF > 200 ppm, EPH)	NWTPH-HCID	EPA 8021 ☐ 602 ☐	EPA 8010 ☐ 601 ☐	EPA 8260 ☒ 624 ☐	EPA 8270 ☐ 625 ☐	EPA 8081/8082 ☐ 608 ☐ PCB only ☐ Pest only ☐	Metals Priority Pollutant ☐ RCRA ☐ TAL ☐	Metals Other (Specify)	TCLP-Metals ☐ VOA ☐ Semi-Vol ☐ Pest ☐ Herbs ☐	SEMI-VOLATILES 625/8270	HOLD		NWTPH-DX	PCBs 608/8081	PAHs 625/8270	TOTAL METALS 6010/7000	SAMPLE IS UNFILTERED	RUN FOR TOTAL RCRA METALS		NUMBER OF CONTAINERS	RECEIVED IN GOOD CONDITION?
1. NMW-2-15	5/9/00	11:25A	Soil				X										X										1	
2. NMW-2-20	↓	11:35A	↓															X									3	
3. NMW-3-5		1:35P																X									2	
4. NMW-3-10		1:55P					X																				2	
5. NMW-3-20	↓	2:20P	↓															X									2	
6.																												
7.	RETURN		ALL		K/J			ICE		PACKS																		
8. NMW-3	5/12/00	11:25A	H_2O								X									X	X	X	X				8	
9.																												
10.																												

SPECIAL INSTRUCTIONS: Use Silica/Gel Cleanup on WTPH-DX analyses for NMW-2-15

SIGNATURES (Name, Company, Date, Time):
1. Relinquished By: K/J 5/12/00 2:00pm
Received By: CCIAL 5/12/00 2:00
2. Relinquished By:
Received By:

TURNAROUND REQUESTED in Business Days*

Organic, Metals & Inorganic Analysis: 10 (Standard) 5 3 2 1 SAME DAY

Fuels & Hydrocarbon Analysis: 5 (Standard) 3 1 SAME DAY

OTHER: Specify: FOR SAMPLE NMW-2-15 do silica gel cleanup

RETURN YELLOW COPY TO K/J WHEN FORM COMPLETED

* Turnaround request less than standard may incur Rush Charges

CCI Analytical Laboratories, Inc.
3229 Pine Street
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Chain Of Custody/ Laboratory Analysis Request

CCI Job# (Laboratory Use Only)

Date 5/12/00 Page 3 Of 3

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ATTENTION: TY SCHREINER
ADDRESS: SAME
P.O. NUMBER CCI QUOTE:

ANALYSIS REQUESTED / OTHER (Specify)

SAMPLE I.D.	DATE	TIME	TYPE	LAB#	NWTPH-GX	BTEX	NWTPH-DX	NWTPH-HCID	EPA 8021 ☐ 602 ☐	EPA 8010 ☐ 601 ☐	EPA 8260 ☐ 624 ☐	EPA 8270 ☐ 625 ☐	EPA 8081/8082 ☐ 608 ☐ PCB only ☐ Pest only ☐	Metals Priority Pollutant ☐ RCRA ☐ TAL ☐	Metals Other (Specify)	TCLP-Metals ☐ VOA ☐ Semi-Vol ☐ Pest ☐ Herbs ☐	Vertical conductivity (ASTM D4222)	Soil Grain Size (ASTM D2434)	Organic carbon content (EPA 415.2)	Cation Exchange Capacity (EPA 9081A)						NUMBER OF CONTAINERS 1/2 Tubes	RECEIVED IN GOOD CONDITION?
1. NMW-1-10	5/9	10:00A	SOIL														X	X	X	X						1	
2. NMW-1-15	↓	10:30A	↓														X	X	X	X						1	
3. NMW-2-0		11:30A																	X	X						1	
4. NMW-3-5		1:30p															X	X	X	X						1	
5.																											
6. RETURN																											
7. ALL																											
8. K/J ICE PACKS			1																								
9.																											
10.																											

SEND THESE SAMPLES TO:
ROSA ENVIRONMENTAL LABORATORY, LLC
1001 SW KLICKITAT WAY, SUITE 107
SEATTLE, WA 98134
(206) 287-9122

SPECIAL INSTRUCTIONS HAVE ROSA BILL TO KENNEDY/ JENKS, ATTN: TY SCHREINER. SHIP VERTICALLY

SIGNATURES (Name, Company, Date, Time):
1. Relinquished By: K/J 5/12/00 2:00pm
Received By: CCI/AL 5/12/00 2:00
2. Relinquished By:
Received By:

TURNAROUND REQUESTED in Business Days*
Organic, Metals & Inorganic Analysis: 10 (Standard) 5 3 2 1 SAME DAY
Fuels & Hydrocarbon Analysis: 5 (Standard) 3 1 SAME DAY

OTHER:
Specify: RETURN YELLOW COPY TO: K/J WHEN FORM IS COMPLETED

* Turnaround request less than standard may incur Rush Charges

Analytical Resources, Incorporated
Analytical Chemists and Consultants

18, December, 2000

Ty Schreiner
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: Project: Tacoma Metals / ARI Job: CM51

Dear Ty:

Please find enclosed sample custody records and final analytical results for the above referenced project. Thirteen water samples were received in good condition on November 22, 2000.

Samples were analyzed for volatile organic compounds referencing EPA 8260, PCBs referencing EPA 8082, total and dissolved metals referencing EPA 6010/7471 and PAH by GC/MS-SIM. Total diesel and motor oil range hydrocarbons were determined referencing WDOE method NWTPH-Dx and gasoline range hydrocarbons by WDOE method NWTPH-G.

All samples were run as concentrated as possible for volatile organic's to provide the lowest possible detection limits for the undetected analytes. Some samples required one to two reruns using a smaller sample size in order to quantitate all target analytes within the linear range of the GC/MS. The required reporting limit for this project is 0.2 ppb, this level was not achievable for two samples (C & F) at a 20 ml purge. Naphthalene exceeded QC limits in the matrix spike/matrix spike duplicate due to high level of the target analyte in the native sample. Please see LSC's for QC acceptance criteria.

Methylene Chloride was detected in the 11/28/00 volatile Organics method blank. There were no associated sample results above the detection limit associated with this method blank.

No other analytical complications were noted. Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Susan Snyder
Project Manager
susan@arilabs.com

RECEIVED
DEC 19 2000
K/J Federal Way
K/J No/File
Route
Return To/By

Enclosures

333 Ninth Avenue North • Seattle WA 98109-5187 • **206-621-6490** • **206-621-7523** fax

00-22650 to 00-22674 CMS1

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
400 Ninth Avenue North
Seattle, WA 98109-4708
206-621-6490 206-621-7523 (fax)

Page 1 of 1 4.0, 3.5, 4.5, 3.0, 4.0 Turn Around Requested: Std

Report to: Ty Schreiner	Proj Name: Tacoma Metals
Company: Kennedy/Jenks	Proj Number: 996098.00
Address: 530 S. 336th St	Sampler: JBB
Federal Way, 98003	
Phone: 253-874-0555	Shipping Method: Courier
Fax: 253 952 3435	AirBill:

Sample ID	Sample Date	Sample Time	Sample Matrix	No Containers	VOC (8260)	NWTPH-G	NWTPH-D (ext)	PCBs	PAH (SIM)	Total RCRA Metals + Cu	Dissolved RCRA Metals + Cu				Notes/Comments
NMW-4	11/20/00	10:00	W	10	X	X	X	X	X	X	X				
NMW-5		11:45			X	X	X	X	X	X	X				
NMW-6		12:52			X	X	X	X	X	X	X				
NMW-3		2:02			X	X	X	X	X	X	X				
NMW-300		2:40			X	X	X	X	X	X	X				
NMW-2		3:22			X	X	X	X	X	X	X				
MW-5	11/21/00	9:00			X	X	X	X	X	X	X				
MW-6		9:52			X	X	X	X	X	X	X				
MW-2		11:30			X	X	X	X	X	X	X				
NMW-1		12:30			X	X	X	X	X	X	X				
MW-7		1:30			X	X	X	X	X	X	X				
TRIP BLANK				2	X										
MW-1		10:45		10	X	X	X	X	X	X	X				

* Dissolved Metals Samples Field Filtered

Relinquished:	Relinquished:	Relinquished:	Special Instructions/Notes
(Signature) [signature]	(Signature)	(Signature)	
Printed name: TODD BRUNDAGE	Printed name:	Printed name:	
Company: Kennedy/Jenks	Company:	Company:	
Date: 11/22/00 Time: 8:00	Date: Time:	Date: Time:	

Received by:	Received by:	Received by:	
[signature]			
Printed name: ELIZABETH JOSHI	Printed name:	Printed name:	
Company: ARI	Company:	Company:	Number of Coolers:
			Cooler Temp(s):
Date: 11/22/00 Time: 1130	Date: Time:	Date: Time:	COC Seals Intact?
			Bottles Intact?

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ORGANIC COMPOUND DATA REPORTING QUALIFIERS

U	Indicates the compound was undetected at the reported concentration. (Same as ND).
J	Indicates an estimated concentration when the value is less than the calculated reporting limit.
D	Indicates the surrogate/spike(s) was not detected, due to dilution of extract.
NR	Indicates the surrogate recovery cannot be reported due to matrix interference.
E	Indicates a value above the linear range of the detector. Sample dilution required.
S	Indicates no value reported due to saturation of the detector. Sample dilution required.
NA	Indicates compound not analyzed for.
M	Indicates an estimated value of analyte found and confirmed by analyst but with low spectral match.
B	Indicates possible/probable blank contamination. Flagged when the analyte is detected in the blank as well as the sample.
Y	Indicates raised reporting limit due to background interference or to activity on the instrument. Compound is still not detected at or above the raised level.

333 Ninth Avenue North • Seattle WA 98109-5187 • **206-621-6490** • **206-621-7523** fax

ANALYTICAL RESOURCES INCORPORATED

WATER VOLATILE SYSTEM MONITORING COMPOUND SUMMARY

Matrix: Water 5 mL

QC Report No: CM51

Lab ID	Client ID	DCE	TOL	BFB	DCB	TOT OUT
113000MB	Method Blank	98%	99%	102%	99%	0
CM51A-RE	NMW-4	97%	101%	100%	99%	0
CM51A-MS	NMW-4	103%	101%	105%	102%	0
CM51A-MSD	NMW-4	103%	101%	102%	100%	0
CM51LCS	Lab Cntrl Sample	101%	100%	100%	100%	0
CM51B-DL	NMW-5	102%	100%	102%	99%	0
112900MB	Method Blank	95%	98%	96%	98%	0
CM51C	NMW-6	96%	100%	99%	99%	0
CM51LCS	Lab Cntrl Sample	100%	103%	97%	98%	0
CM51D-DL	NMW-3	94%	100%	102%	100%	0
CM51D-DL2	NMW-3	99%	99%	103%	100%	0
120600MB	Method Blank	96%	97%	101%	101%	0
CM51E-DL	NMW-300	96%	100%	102%	97%	0
CM51E-DL2	NMW-300	95%	97%	100%	100%	0
CM51LCS	Lab Cntrl Sample	98%	100%	101%	100%	0
CM51F	NMW-2	98%	100%	103%	100%	0
CM51H-RE	MW-6	99%	99%	99%	100%	0
CM51J-RE	NMW-1	97%	101%	98%	99%	0

	LCS/MB LIMITS	QC LIMITS
(DCE) = 1,2-Dichloroethane-d4	(70-130)	(70-130)
(TOL) = Toluene-d8	(70-130)	(70-130)
(BFB) = Bromofluorobenzene	(70-130)	(70-130)
(DCB) = 1,2-Dichlorobenzene-d4	(70-130)	(70-130)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D System Monitoring Compound diluted out

ANALYTICAL RESOURCES INCORPORATED

WATER VOLATILE SYSTEM MONITORING COMPOUND SUMMARY

Matrix: Water (Low Level) QC Report No: CM51

Lab ID	Client ID	DCE	TOL	BFB	DCB	TOT OUT
CM51A	NMW-4	104%	96%	98%	98%	0
CM51B	NMW-5	96%	91%	96%	106%	0
CM51D	NMW-3	92%	96%	120%	128%	0
CM51E	NMW-300	92%	96%	112%	127%	0
120300MB	Method Blank	97%	103%	101%	102%	0
CM51G	MW-5	93%	101%	100%	94%	0
CM51LCS	Lab Cntrl Sample	100%	102%	98%	95%	0
CM51H	MW-6	83%	91%	86%	101%	0
CM51I	MW-2	98%	106%	109%	98%	0
CM51J	NMW-1	91%	92%	91%	100%	0
CM51K	MW-7	95%	98%	107%	106%	0
CM51L	MW-1	96%	99%	101%	99%	0
112800MB	Method Blank	107%	98%	90%	107%	0
CM51Y	Trip Blank	109%	98%	92%	101%	0
CM51LCS	Lab Cntrl Sample	102%	97%	97%	102%	0

		LCS/MB LIMITS	QC LIMITS
(DCE)	= 1,2-Dichloroethane-d4	(70-130)	(70-130)
(TOL)	= Toluene-d8	(70-130)	(70-130)
(BFB)	= Bromofluorobenzene	(70-130)	(70-130)
(DCB)	= 1,2-Dichlorobenzene-d4	(70-130)	(70-130)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D System Monitoring Compound diluted out

FORM-II VOA-1

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 112800MB
LIMS ID: 00-22674
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN3
Date Analyzed: 11/28/00 16:32

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	0.2 U
74-83-9	Bromomethane	0.2 U
75-01-4	Vinyl Chloride	0.2 U
75-00-3	Chloroethane	0.2 U
75-09-2	**Methylene Chloride**	**0.4**
67-64-1	Acetone	1.0 U
75-15-0	Carbon Disulfide	0.2 U
75-35-4	1,1-Dichloroethene	0.2 U
75-34-3	1,1-Dichloroethane	0.2 U
156-60-5	trans-1,2-Dichloroethene	0.2 U
156-59-2	cis-1,2-Dichloroethene	0.2 U
67-66-3	Chloroform	0.2 U
107-06-2	1,2-Dichloroethane	0.2 U
78-93-3	2-Butanone	1.0 U
71-55-6	1,1,1-Trichloroethane	0.2 U
56-23-5	Carbon Tetrachloride	0.2 U
108-05-4	Vinyl Acetate	0.2 U
75-27-4	Bromodichloromethane	0.2 U
78-87-5	1,2-Dichloropropane	0.2 U
10061-01-5	cis-1,3-Dichloropropene	0.2 U
79-01-6	Trichloroethene	0.2 U
124-48-1	Dibromochloromethane	0.2 U
79-00-5	1,1,2-Trichloroethane	0.2 U
71-43-2	Benzene	0.2 U
10061-02-6	trans-1,3-Dichloropropene	0.2 U
110-75-8	2-Chloroethylvinylether	0.5 U
75-25-2	Bromoform	0.5 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	1.0 U
591-78-6	2-Hexanone	1.0 U
127-18-4	Tetrachloroethene	0.2 U
79-34-5	1,1,2,2-Tetrachloroethane	0.2 U
108-88-3	Toluene	0.2 U
108-90-7	Chlorobenzene	0.2 U
100-41-4	Ethylbenzene	0.2 U
100-42-5	Styrene	0.2 U
75-69-4	Trichlorofluoromethane	0.2 U
76-13-1	1,1,2-Trichlorotrifluoroethane	0.2 U
1330-20-7	m,p-Xylene	0.4 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 112800MB
LIMS ID: 00-22674
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN3
Date Analyzed: 11/28/00 16:32

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	ug/L
95-47-6	o-Xylene	0.2 U
95-50-1	1,2-Dichlorobenzene	0.2 U
541-73-1	1,3-Dichlorobenzene	0.2 U
106-46-7	1,4-Dichlorobenzene	0.2 U
107-02-8	Acrolein	5.0 U
74-88-4	Methyl Iodide	0.2 U
74-96-4	Bromoethane	0.2 U
107-13-1	Acrylonitrile	1.0 U
563-58-6	1,1-Dichloropropene	0.2 U
74-95-3	Dibromomethane	0.2 U
630-20-6	1,1,1,2-Tetrachloroethane	0.2 U
96-12-8	1,2-Dibromo-3-chloropropane	1.0 U
96-18-4	1,2,3-Trichloropropane	0.5 U
110-57-6	trans-1,4-Dichloro-2-butene	1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.2 U
95-63-6	1,2,4-Trimethylbenzene	0.2 U
87-68-3	Hexachlorobutadiene	0.5 U
106-93-4	Ethylene Dibromide	0.2 U
74-97-5	Bromochloromethane	0.2 U
594-20-7	2,2-Dichloropropane	0.2 U
142-28-9	1,3-Dichloropropane	0.2 U
98-82-8	Isopropylbenzene	0.2 U
103-65-1	n-Propylbenzene	0.2 U
108-86-1	Bromobenzene	0.2 U
95-49-8	2-Chlorotoluene	0.2 U
106-43-4	4-Chlorotoluene	0.2 U
98-06-6	tert-Butylbenzene	0.2 U
135-98-8	sec-Butylbenzene	0.2 U
99-87-6	4-Isopropyltoluene	0.2 U
104-51-8	n-Butylbenzene	0.2 U
120-82-1	1,2,4-Trichlorobenzene	0.5 U
91-20-3	Naphthalene	0.5 U
87-61-6	1,2,3-Trichlorobenzene	0.5 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	107%
d8-Toluene	97.5%
Bromofluorobenzene	90.5%
d4-1,2-Dichlorobenzene	107%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 112900MB
LIMS ID: 00-22652
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: NT3
Date Analyzed: 11/29/00 12:04

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	2.0 U
67-64-1	Acetone	5.0 U
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	trans-1,2-Dichloroethene	1.0 U
156-59-2	cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
108-05-4	Vinyl Acetate	5.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-02-6	trans-1,3-Dichloropropene	1.0 U
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.0 U
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	2.0 U
1330-20-7	m,p-Xylene	1.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 112900MB
LIMS ID: 00-22652
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: NT3
Date Analyzed: 11/29/00 12:04

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	o-Xylene	1.0 U
95-50-1	1,2-Dichlorobenzene	1.0 U
541-73-1	1,3-Dichlorobenzene	1.0 U
106-46-7	1,4-Dichlorobenzene	1.0 U
107-02-8	Acrolein	50 U
74-88-4	Methyl Iodide	1.0 U
74-96-4	Bromoethane	2.0 U
107-13-1	Acrylonitrile	5.0 U
563-58-6	1,1-Dichloropropene	1.0 U
74-95-3	Dibromomethane	1.0 U
630-20-6	1,1,1,2-Tetrachloroethane	1.0 U
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U
96-18-4	1,2,3-Trichloropropane	3.0 U
110-57-6	trans-1,4-Dichloro-2-butene	5.0 U
108-67-8	1,3,5-Trimethylbenzene	1.0 U
95-63-6	1,2,4-Trimethylbenzene	1.0 U
87-68-3	Hexachlorobutadiene	5.0 U
106-93-4	Ethylene Dibromide	1.0 U
74-97-5	Bromochloromethane	1.0 U
594-20-7	2,2-Dichloropropane	1.0 U
142-28-9	1,3-Dichloropropane	1.0 U
98-82-8	Isopropylbenzene	1.0 U
103-65-1	n-Propylbenzene	1.0 U
108-86-1	Bromobenzene	1.0 U
95-49-8	2-Chlorotoluene	1.0 U
106-43-4	4-Chlorotoluene	1.0 U
98-06-6	tert-Butylbenzene	1.0 U
135-98-8	sec-Butylbenzene	1.0 U
99-87-6	4-Isopropyltoluene	1.0 U
104-51-8	n-Butylbenzene	1.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0 U
91-20-3	Naphthalene	5.0 U
87-61-6	1,2,3-Trichlorobenzene	5.0 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	94.8%
d8-Toluene	98.2%
Bromofluorobenzene	96.1%
d4-1,2-Dichlorobenzene	97.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 113000MB
LIMS ID: 00-22650
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: NT3
Date Analyzed: 11/30/00 11:45

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	2.0 U
67-64-1	Acetone	5.0 U
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	trans-1,2-Dichloroethene	1.0 U
156-59-2	cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
108-05-4	Vinyl Acetate	5.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-02-6	trans-1,3-Dichloropropene	1.0 U
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.0 U
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	2.0 U
1330-20-7	m,p-Xylene	1.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 113000MB
LIMS ID: 00-22650
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: NT3
Date Analyzed: 11/30/00 11:45

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	o-Xylene	1.0 U
95-50-1	1,2-Dichlorobenzene	1.0 U
541-73-1	1,3-Dichlorobenzene	1.0 U
106-46-7	1,4-Dichlorobenzene	1.0 U
107-02-8	Acrolein	50 U
74-88-4	Methyl Iodide	1.0 U
74-96-4	Bromoethane	2.0 U
107-13-1	Acrylonitrile	5.0 U
563-58-6	1,1-Dichloropropene	1.0 U
74-95-3	Dibromomethane	1.0 U
630-20-6	1,1,1,2-Tetrachloroethane	1.0 U
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U
96-18-4	1,2,3-Trichloropropane	3.0 U
110-57-6	trans-1,4-Dichloro-2-butene	5.0 U
108-67-8	1,3,5-Trimethylbenzene	1.0 U
95-63-6	1,2,4-Trimethylbenzene	1.0 U
87-68-3	Hexachlorobutadiene	5.0 U
106-93-4	Ethylene Dibromide	1.0 U
74-97-5	Bromochloromethane	1.0 U
594-20-7	2,2-Dichloropropane	1.0 U
142-28-9	1,3-Dichloropropane	1.0 U
98-82-8	Isopropylbenzene	1.0 U
103-65-1	n-Propylbenzene	1.0 U
108-86-1	Bromobenzene	1.0 U
95-49-8	2-Chlorotoluene	1.0 U
106-43-4	4-Chlorotoluene	1.0 U
98-06-6	tert-Butylbenzene	1.0 U
135-98-8	sec-Butylbenzene	1.0 U
99-87-6	4-Isopropyltoluene	1.0 U
104-51-8	n-Butylbenzene	1.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0 U
91-20-3	Naphthalene	5.0 U
87-61-6	1,2,3-Trichlorobenzene	5.0 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	98.1%
d8-Toluene	99.1%
Bromofluorobenzene	102%
d4-1,2-Dichlorobenzene	98.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 120300MB
LIMS ID: 00-22656
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN3
Date Analyzed: 12/03/00 15:57

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	0.2 U
74-83-9	Bromomethane	0.2 U
75-01-4	Vinyl Chloride	0.2 U
75-00-3	Chloroethane	0.2 U
75-09-2	Methylene Chloride	0.3 U
67-64-1	Acetone	1.0 U
75-15-0	Carbon Disulfide	0.2 U
75-35-4	1,1-Dichloroethene	0.2 U
75-34-3	1,1-Dichloroethane	0.2 U
156-60-5	trans-1,2-Dichloroethene	0.2 U
156-59-2	cis-1,2-Dichloroethene	0.2 U
67-66-3	Chloroform	0.2 U
107-06-2	1,2-Dichloroethane	0.2 U
78-93-3	2-Butanone	1.0 U
71-55-6	1,1,1-Trichloroethane	0.2 U
56-23-5	Carbon Tetrachloride	0.2 U
108-05-4	Vinyl Acetate	0.2 U
75-27-4	Bromodichloromethane	0.2 U
78-87-5	1,2-Dichloropropane	0.2 U
10061-01-5	cis-1,3-Dichloropropene	0.2 U
79-01-6	Trichloroethene	0.2 U
124-48-1	Dibromochloromethane	0.2 U
79-00-5	1,1,2-Trichloroethane	0.2 U
71-43-2	Benzene	0.2 U
10061-02-6	trans-1,3-Dichloropropene	0.2 U
110-75-8	2-Chloroethylvinylether	0.5 U
75-25-2	Bromoform	0.5 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	1.0 U
591-78-6	2-Hexanone	1.0 U
127-18-4	Tetrachloroethene	0.2 U
79-34-5	1,1,2,2-Tetrachloroethane	0.2 U
108-88-3	Toluene	0.2 U
108-90-7	Chlorobenzene	0.2 U
100-41-4	Ethylbenzene	0.2 U
100-42-5	Styrene	0.2 U
75-69-4	Trichlorofluoromethane	0.2 U
76-13-1	1,1,2-Trichlorotrifluoroethane	0.2 U
1330-20-7	m,p-Xylene	0.4 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 120300MB
LIMS ID: 00-22656
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN3
Date Analyzed: 12/03/00 15:57

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	ug/L
95-47-6	o-Xylene	0.2 U
95-50-1	1,2-Dichlorobenzene	0.2 U
541-73-1	1,3-Dichlorobenzene	0.2 U
106-46-7	1,4-Dichlorobenzene	0.2 U
107-02-8	Acrolein	5.0 U
74-88-4	Methyl Iodide	0.2 U
74-96-4	Bromoethane	0.2 U
107-13-1	Acrylonitrile	1.0 U
563-58-6	1,1-Dichloropropene	0.2 U
74-95-3	Dibromomethane	0.2 U
630-20-6	1,1,1,2-Tetrachloroethane	0.2 U
96-12-8	1,2-Dibromo-3-chloropropane	1.0 U
96-18-4	1,2,3-Trichloropropane	0.5 U
110-57-6	trans-1,4-Dichloro-2-butene	1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.2 U
95-63-6	1,2,4-Trimethylbenzene	0.2 U
87-68-3	Hexachlorobutadiene	0.5 U
106-93-4	Ethylene Dibromide	0.2 U
74-97-5	Bromochloromethane	0.2 U
594-20-7	2,2-Dichloropropane	0.2 U
142-28-9	1,3-Dichloropropane	0.2 U
98-82-8	Isopropylbenzene	0.2 U
103-65-1	n-Propylbenzene	0.2 U
108-86-1	Bromobenzene	0.2 U
95-49-8	2-Chlorotoluene	0.2 U
106-43-4	4-Chlorotoluene	0.2 U
98-06-6	tert-Butylbenzene	0.2 U
135-98-8	sec-Butylbenzene	0.2 U
99-87-6	4-Isopropyltoluene	0.2 U
104-51-8	n-Butylbenzene	0.2 U
120-82-1	1,2,4-Trichlorobenzene	0.5 U
91-20-3	Naphthalene	0.5 U
87-61-6	1,2,3-Trichlorobenzene	0.5 U

Volatile Surrogate Recovery	
d4-1,2-Dichloroethane	96.8%
d8-Toluene	103%
Bromofluorobenzene	101%
d4-1,2-Dichlorobenzene	102%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 120600MB
LIMS ID: 00-22654
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: NT3
Date Analyzed: 12/06/00 10:45

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	2.0 U
67-64-1	Acetone	5.0 U
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	trans-1,2-Dichloroethene	1.0 U
156-59-2	cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
108-05-4	Vinyl Acetate	5.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-02-6	trans-1,3-Dichloropropene	1.0 U
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.0 U
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	2.0 U
1330-20-7	m,p-Xylene	1.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 120600MB
LIMS ID: 00-22654
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: NT3
Date Analyzed: 12/06/00 10:45

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	o-Xylene	1.0 U
95-50-1	1,2-Dichlorobenzene	1.0 U
541-73-1	1,3-Dichlorobenzene	1.0 U
106-46-7	1,4-Dichlorobenzene	1.0 U
107-02-8	Acrolein	50 U
74-88-4	Methyl Iodide	1.0 U
74-96-4	Bromoethane	2.0 U
107-13-1	Acrylonitrile	5.0 U
563-58-6	1,1-Dichloropropene	1.0 U
74-95-3	Dibromomethane	1.0 U
630-20-6	1,1,1,2-Tetrachloroethane	1.0 U
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U
96-18-4	1,2,3-Trichloropropane	3.0 U
110-57-6	trans-1,4-Dichloro-2-butene	5.0 U
108-67-8	1,3,5-Trimethylbenzene	1.0 U
95-63-6	1,2,4-Trimethylbenzene	1.0 U
87-68-3	Hexachlorobutadiene	5.0 U
106-93-4	Ethylene Dibromide	1.0 U
74-97-5	Bromochloromethane	1.0 U
594-20-7	2,2-Dichloropropane	1.0 U
142-28-9	1,3-Dichloropropane	1.0 U
98-82-8	Isopropylbenzene	1.0 U
103-65-1	n-Propylbenzene	1.0 U
108-86-1	Bromobenzene	1.0 U
95-49-8	2-Chlorotoluene	1.0 U
106-43-4	4-Chlorotoluene	1.0 U
98-06-6	tert-Butylbenzene	1.0 U
135-98-8	sec-Butylbenzene	1.0 U
99-87-6	4-Isopropyltoluene	1.0 U
104-51-8	n-Butylbenzene	1.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0 U
91-20-3	Naphthalene	5.0 U
87-61-6	1,2,3-Trichlorobenzene	5.0 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	96.5%
d8-Toluene	97.4%
Bromofluorobenzene	101%
d4-1,2-Dichlorobenzene	101%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: NMW-4

Lab Sample ID: CM51A
LIMS ID: 00-22650
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Instrument: FINN3
Date Analyzed: 11/28/00 17:28

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	0.2 U
74-83-9	Bromomethane	0.2 U
75-01-4	Vinyl Chloride	0.2 U
75-00-3	Chloroethane	0.2 U
75-09-2	Methylene Chloride	0.3 U
67-64-1	**Acetone**	**1.5**
75-15-0	Carbon Disulfide	0.2 U
75-35-4	1,1-Dichloroethene	0.2 U
75-34-3	1,1-Dichloroethane	0.2 U
156-60-5	trans-1,2-Dichloroethene	0.2 U
156-59-2	cis-1,2-Dichloroethene	0.2 U
67-66-3	Chloroform	0.2 U
107-06-2	1,2-Dichloroethane	0.2 U
78-93-3	2-Butanone	1.0 U
71-55-6	1,1,1-Trichloroethane	0.2 U
56-23-5	Carbon Tetrachloride	0.2 U
108-05-4	Vinyl Acetate	0.2 U
75-27-4	Bromodichloromethane	0.2 U
78-87-5	1,2-Dichloropropane	0.2 U
10061-01-5	cis-1,3-Dichloropropene	0.2 U
79-01-6	Trichloroethene	0.2 U
124-48-1	Dibromochloromethane	0.2 U
79-00-5	1,1,2-Trichloroethane	0.2 U
71-43-2	**Benzene**	**0.6**
10061-02-6	trans-1,3-Dichloropropene	0.2 U
110-75-8	2-Chloroethylvinylether	0.5 U
75-25-2	Bromoform	0.5 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	1.0 U
591-78-6	2-Hexanone	1.0 U
127-18-4	Tetrachloroethene	0.2 U
79-34-5	1,1,2,2-Tetrachloroethane	0.2 U
108-88-3	**Toluene**	**0.4**
108-90-7	Chlorobenzene	0.2 U
100-41-4	**Ethylbenzene**	**0.6**
100-42-5	Styrene	0.2 U
75-69-4	Trichlorofluoromethane	0.2 U
76-13-1	1,1,2-Trichlorotrifluoroethane	0.2 U
1330-20-7	**m,p-Xylene**	**1.0**

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: NMW-4

Lab Sample ID: CM51A
LIMS ID: 00-22650
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Instrument: FINN3
Date Analyzed: 11/28/00 17:28

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	ug/L
95-47-6	**o-Xylene**	**1.1**
95-50-1	1,2-Dichlorobenzene	0.2 U
541-73-1	1,3-Dichlorobenzene	0.2 U
106-46-7	1,4-Dichlorobenzene	0.2 U
107-02-8	Acrolein	5.0 U
74-88-4	Methyl Iodide	0.2 U
74-96-4	Bromoethane	0.2 U
107-13-1	Acrylonitrile	1.0 U
563-58-6	1,1-Dichloropropene	0.2 U
74-95-3	Dibromomethane	0.2 U
630-20-6	1,1,1,2-Tetrachloroethane	0.2 U
96-12-8	1,2-Dibromo-3-chloropropane	1.0 U
96-18-4	1,2,3-Trichloropropane	0.5 U
110-57-6	trans-1,4-Dichloro-2-butene	1.0 U
108-67-8	**1,3,5-Trimethylbenzene**	**0.6**
95-63-6	**1,2,4-Trimethylbenzene**	**1.8**
87-68-3	Hexachlorobutadiene	0.5 U
106-93-4	Ethylene Dibromide	0.2 U
74-97-5	Bromochloromethane	0.2 U
594-20-7	2,2-Dichloropropane	0.2 U
142-28-9	1,3-Dichloropropane	0.2 U
98-82-8	**Isopropylbenzene**	**0.9**
103-65-1	**n-Propylbenzene**	**0.3**
108-86-1	Bromobenzene	0.2 U
95-49-8	2-Chlorotoluene	0.2 U
106-43-4	4-Chlorotoluene	0.2 U
98-06-6	tert-Butylbenzene	0.2 U
135-98-8	sec-Butylbenzene	0.2 U
99-87-6	**4-Isopropyltoluene**	**5.8**
104-51-8	n-Butylbenzene	0.2 U
120-82-1	1,2,4-Trichlorobenzene	0.5 U
91-20-3	**Naphthalene**	**140 E**
87-61-6	1,2,3-Trichlorobenzene	0.5 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	104%
d8-Toluene	96.0%
Bromofluorobenzene	98.5%
d4-1,2-Dichlorobenzene	98.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: NMW-4
REANALYSIS

Lab Sample ID: CM51A-RE
LIMS ID: 00-22650
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Instrument: NT3
Date Analyzed: 11/29/00 18:32

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	2.0 U
67-64-1	Acetone	5.0 U
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	trans-1,2-Dichloroethene	1.0 U
156-59-2	cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
108-05-4	Vinyl Acetate	5.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	**Benzene**	**0.6 J**
10061-02-6	trans-1,3-Dichloropropene	1.0 U
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.0 U
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	2.0 U
1330-20-7	**m,p-Xylene**	**1.1 J**

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: NMW-4
REANALYSIS

Lab Sample ID: CM51A-RE
LIMS ID: 00-22650
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Instrument: NT3
Date Analyzed: 11/29/00 18:32

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	**o-Xylene**	**1.1**
95-50-1	1,2-Dichlorobenzene	1.0 U
541-73-1	1,3-Dichlorobenzene	1.0 U
106-46-7	1,4-Dichlorobenzene	1.0 U
107-02-8	Acrolein	50 U
74-88-4	Methyl Iodide	1.0 U
74-96-4	Bromoethane	2.0 U
107-13-1	Acrylonitrile	5.0 U
563-58-6	1,1-Dichloropropene	1.0 U
74-95-3	Dibromomethane	1.0 U
630-20-6	1,1,1,2-Tetrachloroethane	1.0 U
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U
96-18-4	1,2,3-Trichloropropane	3.0 U
110-57-6	trans-1,4-Dichloro-2-butene	5.0 U
108-67-8	**1,3,5-Trimethylbenzene**	**0.6 J**
95-63-6	**1,2,4-Trimethylbenzene**	**1.7**
87-68-3	Hexachlorobutadiene	5.0 U
106-93-4	Ethylene Dibromide	1.0 U
74-97-5	Bromochloromethane	1.0 U
594-20-7	2,2-Dichloropropane	1.0 U
142-28-9	1,3-Dichloropropane	1.0 U
98-82-8	**Isopropylbenzene**	**1.0 J**
103-65-1	n-Propylbenzene	1.0 U
108-86-1	Bromobenzene	1.0 U
95-49-8	2-Chlorotoluene	1.0 U
106-43-4	4-Chlorotoluene	1.0 U
98-06-6	tert-Butylbenzene	1.0 U
135-98-8	sec-Butylbenzene	1.0 U
99-87-6	**4-Isopropyltoluene**	**4.9**
104-51-8	n-Butylbenzene	1.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0 U
91-20-3	**Naphthalene**	**96**
87-61-6	1,2,3-Trichlorobenzene	5.0 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	97.2%
d8-Toluene	101%
Bromofluorobenzene	100%
d4-1,2-Dichlorobenzene	98.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: NMW-5

Lab Sample ID: CM51B
LIMS ID: 00-22651
Matrix: Water
Data Release Authorized
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Instrument: FINN3
Date Analyzed: 11/28/00 17:57

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	0.2 U
74-83-9	Bromomethane	0.2 U
75-01-4	Vinyl Chloride	0.2 U
75-00-3	Chloroethane	0.2 U
75-09-2	Methylene Chloride	0.3 U
67-64-1	**Acetone**	**3.7**
75-15-0	Carbon Disulfide	0.2 U
75-35-4	1,1-Dichloroethene	0.2 U
75-34-3	1,1-Dichloroethane	0.2 U
156-60-5	trans-1,2-Dichloroethene	0.2 U
156-59-2	cis-1,2-Dichloroethene	0.2 U
67-66-3	Chloroform	0.2 U
107-06-2	1,2-Dichloroethane	0.2 U
78-93-3	2-Butanone	1.0 U
71-55-6	1,1,1-Trichloroethane	0.2 U
56-23-5	Carbon Tetrachloride	0.2 U
108-05-4	Vinyl Acetate	0.2 U
75-27-4	Bromodichloromethane	0.2 U
78-87-5	1,2-Dichloropropane	0.2 U
10061-01-5	cis-1,3-Dichloropropene	0.2 U
79-01-6	Trichloroethene	0.2 U
124-48-1	Dibromochloromethane	0.2 U
79-00-5	1,1,2-Trichloroethane	0.2 U
71-43-2	**Benzene**	**1.5**
10061-02-6	trans-1,3-Dichloropropene	0.2 U
110-75-8	2-Chloroethylvinylether	0.5 U
75-25-2	Bromoform	0.5 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	1.0 U
591-78-6	2-Hexanone	1.0 U
127-18-4	Tetrachloroethene	0.2 U
79-34-5	1,1,2,2-Tetrachloroethane	0.2 U
108-88-3	**Toluene**	**1.4**
108-90-7	Chlorobenzene	0.2 U
100-41-4	**Ethylbenzene**	**6.6**
100-42-5	Styrene	0.2 U
75-69-4	Trichlorofluoromethane	0.2 U
76-13-1	1,1,2-Trichlorotrifluoroethane	0.2 U
1330-20-7	**m,p-Xylene**	**6.6**

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: NMW-5

Lab Sample ID: CM51B
LIMS ID: 00-22651
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Instrument: FINN3
Date Analyzed: 11/28/00 17:57

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	ug/L
95-47-6	**o-Xylene**	**5.9**
95-50-1	1,2-Dichlorobenzene	0.2 U
541-73-1	1,3-Dichlorobenzene	0.2 U
106-46-7	1,4-Dichlorobenzene	0.2 U
107-02-8	Acrolein	5.0 U
74-88-4	Methyl Iodide	0.2 U
74-96-4	Bromoethane	0.2 U
107-13-1	Acrylonitrile	1.0 U
563-58-6	1,1-Dichloropropene	0.2 U
74-95-3	Dibromomethane	0.2 U
630-20-6	1,1,1,2-Tetrachloroethane	0.2 U
96-12-8	1,2-Dibromo-3-chloropropane	1.0 U
96-18-4	1,2,3-Trichloropropane	0.5 U
110-57-6	trans-1,4-Dichloro-2-butene	1.0 U
108-67-8	**1,3,5-Trimethylbenzene**	**6.0**
95-63-6	**1,2,4-Trimethylbenzene**	**18 E**
87-68-3	Hexachlorobutadiene	0.5 U
106-93-4	Ethylene Dibromide	0.2 U
74-97-5	Bromochloromethane	0.2 U
594-20-7	2,2-Dichloropropane	0.2 U
142-28-9	1,3-Dichloropropane	0.2 U
98-82-8	**Isopropylbenzene**	**3.8**
103-65-1	**n-Propylbenzene**	**2.2**
108-86-1	Bromobenzene	0.2 U
95-49-8	2-Chlorotoluene	0.2 U
106-43-4	4-Chlorotoluene	0.2 U
98-06-6	tert-Butylbenzene	0.2 U
135-98-8	sec-Butylbenzene	0.2 U
99-87-6	**4-Isopropyltoluene**	**14**
104-51-8	n-Butylbenzene	0.2 U
120-82-1	1,2,4-Trichlorobenzene	0.5 U
91-20-3	**Naphthalene**	**180 ES**
87-61-6	1,2,3-Trichlorobenzene	0.5 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	95.5%
d8-Toluene	91.2%
Bromofluorobenzene	96.2%
d4-1,2-Dichlorobenzene	106%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: NMW-5
REANALYSIS

Lab Sample ID: CM51B-RE
LIMS ID: 00-22651
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Instrument: NT3
Date Analyzed: 11/30/00 14:53

Sample Amount: 0.50 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	10 U
74-83-9	Bromomethane	10 U
75-01-4	Vinyl Chloride	10 U
75-00-3	Chloroethane	10 U
75-09-2	Methylene Chloride	20 U
67-64-1	Acetone	50 U
75-15-0	Carbon Disulfide	10 U
75-35-4	1,1-Dichloroethene	10 U
75-34-3	1,1-Dichloroethane	10 U
156-60-5	trans-1,2-Dichloroethene	10 U
156-59-2	cis-1,2-Dichloroethene	10 U
67-66-3	Chloroform	10 U
107-06-2	1,2-Dichloroethane	10 U
78-93-3	2-Butanone	50 U
71-55-6	1,1,1-Trichloroethane	10 U
56-23-5	Carbon Tetrachloride	10 U
108-05-4	Vinyl Acetate	50 U
75-27-4	Bromodichloromethane	10 U
78-87-5	1,2-Dichloropropane	10 U
10061-01-5	cis-1,3-Dichloropropene	10 U
79-01-6	Trichloroethene	10 U
124-48-1	Dibromochloromethane	10 U
79-00-5	1,1,2-Trichloroethane	10 U
71-43-2	Benzene	10 U
10061-02-6	trans-1,3-Dichloropropene	10 U
110-75-8	2-Chloroethylvinylether	50 U
75-25-2	Bromoform	10 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	50 U
591-78-6	2-Hexanone	50 U
127-18-4	Tetrachloroethene	10 U
79-34-5	1,1,2,2-Tetrachloroethane	10 U
108-88-3	Toluene	10 U
108-90-7	Chlorobenzene	10 U
100-41-4	**Ethylbenzene**	**6.0 J**
100-42-5	Styrene	10 U
75-69-4	Trichlorofluoromethane	10 U
76-13-1	1,1,2-Trichlorotrifluoroethane	20 U
1330-20-7	**m,p-Xylene**	**6.8 J**

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: NMW-5
REANALYSIS

Lab Sample ID: CM51B-RE
LIMS ID: 00-22651
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Instrument: NT3
Date Analyzed: 11/30/00 14:53

Sample Amount: 0.50 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	**o-Xylene**	**5.4 J**
95-50-1	1,2-Dichlorobenzene	10 U
541-73-1	1,3-Dichlorobenzene	10 U
106-46-7	1,4-Dichlorobenzene	10 U
107-02-8	Acrolein	500 U
74-88-4	Methyl Iodide	10 U
74-96-4	Bromoethane	20 U
107-13-1	Acrylonitrile	50 U
563-58-6	1,1-Dichloropropene	10 U
74-95-3	Dibromomethane	10 U
630-20-6	1,1,1,2-Tetrachloroethane	10 U
96-12-8	1,2-Dibromo-3-chloropropane	50 U
96-18-4	1,2,3-Trichloropropane	30 U
110-57-6	trans-1,4-Dichloro-2-butene	50 U
108-67-8	**1,3,5-Trimethylbenzene**	**9.6 J**
95-63-6	**1,2,4-Trimethylbenzene**	**17**
87-68-3	Hexachlorobutadiene	50 U
106-93-4	Ethylene Dibromide	10 U
74-97-5	Bromochloromethane	10 U
594-20-7	2,2-Dichloropropane	10 U
142-28-9	1,3-Dichloropropane	10 U
98-82-8	Isopropylbenzene	10 U
103-65-1	n-Propylbenzene	10 U
108-86-1	Bromobenzene	10 U
95-49-8	2-Chlorotoluene	10 U
106-43-4	4-Chlorotoluene	10 U
98-06-6	tert-Butylbenzene	10 U
135-98-8	sec-Butylbenzene	10 U
99-87-6	**4-Isopropyltoluene**	**9.9 J**
104-51-8	n-Butylbenzene	10 U
120-82-1	1,2,4-Trichlorobenzene	50 U
91-20-3	**Naphthalene**	**1100**
87-61-6	1,2,3-Trichlorobenzene	50 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	102%
d8-Toluene	99.8%
Bromofluorobenzene	102%
d4-1,2-Dichlorobenzene	99.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: NMW-6

Lab Sample ID: CM51C
LIMS ID: 00-22652
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Instrument: NT3
Date Analyzed: 11/29/00 19:00

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	2.0 U
67-64-1	Acetone	5.0 U
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	trans-1,2-Dichloroethene	1.0 U
156-59-2	cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
108-05-4	Vinyl Acetate	5.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-02-6	trans-1,3-Dichloropropene	1.0 U
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.0 U
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	2.0 U
1330-20-7	m,p-Xylene	1.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: NMW-6

Lab Sample ID: CM51C
LIMS ID: 00-22652
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Instrument: NT3
Date Analyzed: 11/29/00 19:00

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	o-Xylene	1.0 U
95-50-1	1,2-Dichlorobenzene	1.0 U
541-73-1	1,3-Dichlorobenzene	1.0 U
106-46-7	1,4-Dichlorobenzene	1.0 U
107-02-8	Acrolein	50 U
74-88-4	Methyl Iodide	1.0 U
74-96-4	Bromoethane	2.0 U
107-13-1	Acrylonitrile	5.0 U
563-58-6	1,1-Dichloropropene	1.0 U
74-95-3	Dibromomethane	1.0 U
630-20-6	1,1,1,2-Tetrachloroethane	1.0 U
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U
96-18-4	1,2,3-Trichloropropane	3.0 U
110-57-6	trans-1,4-Dichloro-2-butene	5.0 U
108-67-8	1,3,5-Trimethylbenzene	1.0 U
95-63-6	1,2,4-Trimethylbenzene	1.0 U
87-68-3	Hexachlorobutadiene	5.0 U
106-93-4	Ethylene Dibromide	1.0 U
74-97-5	Bromochloromethane	1.0 U
594-20-7	2,2-Dichloropropane	1.0 U
142-28-9	1,3-Dichloropropane	1.0 U
98-82-8	Isopropylbenzene	1.0 U
103-65-1	n-Propylbenzene	1.0 U
108-86-1	Bromobenzene	1.0 U
95-49-8	2-Chlorotoluene	1.0 U
106-43-4	4-Chlorotoluene	1.0 U
98-06-6	tert-Butylbenzene	1.0 U
135-98-8	sec-Butylbenzene	1.0 U
99-87-6	**4-Isopropyltoluene**	**4.5**
104-51-8	n-Butylbenzene	1.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0 U
91-20-3	**Naphthalene**	**11**
87-61-6	1,2,3-Trichlorobenzene	5.0 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	96.2%
d8-Toluene	99.6%
Bromofluorobenzene	98.9%
d4-1,2-Dichlorobenzene	98.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: NMW-3

Lab Sample ID: CM51D
LIMS ID: 00-22653
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Instrument: FINN3
Date Analyzed: 11/28/00 18:53

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	0.2 U
74-83-9	Bromomethane	0.2 U
75-01-4	Vinyl Chloride	0.2 U
75-00-3	Chloroethane	0.2 U
75-09-2	Methylene Chloride	0.3 U
67-64-1	**Acetone**	**4.2**
75-15-0	Carbon Disulfide	0.2 U
75-35-4	1,1-Dichloroethene	0.2 U
75-34-3	1,1-Dichloroethane	0.2 U
156-60-5	trans-1,2-Dichloroethene	0.2 U
156-59-2	cis-1,2-Dichloroethene	0.2 U
67-66-3	Chloroform	0.2 U
107-06-2	1,2-Dichloroethane	0.8 Y
78-93-3	2-Butanone	1.0 U
71-55-6	1,1,1-Trichloroethane	0.2 U
56-23-5	Carbon Tetrachloride	0.2 U
108-05-4	Vinyl Acetate	0.2 U
75-27-4	Bromodichloromethane	0.2 U
78-87-5	1,2-Dichloropropane	0.2 U
10061-01-5	cis-1,3-Dichloropropene	0.2 U
79-01-6	Trichloroethene	0.2 U
124-48-1	Dibromochloromethane	0.2 U
79-00-5	1,1,2-Trichloroethane	0.2 U
71-43-2	**Benzene**	**17 E**
10061-02-6	trans-1,3-Dichloropropene	0.2 U
110-75-8	2-Chloroethylvinylether	0.5 U
75-25-2	Bromoform	0.5 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	1.0 U
591-78-6	2-Hexanone	1.0 U
127-18-4	Tetrachloroethene	0.2 U
79-34-5	1,1,2,2-Tetrachloroethane	0.2 U
108-88-3	**Toluene**	**49 E**
108-90-7	Chlorobenzene	0.2 U
100-41-4	**Ethylbenzene**	**42 ES**
100-42-5	Styrene	0.2 U
75-69-4	Trichlorofluoromethane	0.2 U
76-13-1	1,1,2-Trichlorotrifluoroethane	0.2 U
1330-20-7	**m,p-Xylene**	**180 ES**

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: NMW-3

Lab Sample ID: CM51D
LIMS ID: 00-22653
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Instrument: FINN3
Date Analyzed: 11/28/00 18:53

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	ug/L	
95-47-6	**o-Xylene**	**120**	**ES**
95-50-1	1,2-Dichlorobenzene	0.2	U
541-73-1	1,3-Dichlorobenzene	0.2	U
106-46-7	1,4-Dichlorobenzene	0.2	U
107-02-8	Acrolein	5.0	U
74-88-4	Methyl Iodide	0.2	U
74-96-4	Bromoethane	0.2	U
107-13-1	Acrylonitrile	1.0	U
563-58-6	1,1-Dichloropropene	0.2	U
74-95-3	Dibromomethane	0.2	U
630-20-6	1,1,1,2-Tetrachloroethane	0.2	U
96-12-8	1,2-Dibromo-3-chloropropane	1.0	U
96-18-4	1,2,3-Trichloropropane	0.5	U
110-57-6	trans-1,4-Dichloro-2-butene	1.0	U
108-67-8	**1,3,5-Trimethylbenzene**	**180**	**ES**
95-63-6	**1,2,4-Trimethylbenzene**	**320**	**ES**
87-68-3	Hexachlorobutadiene	0.5	U
106-93-4	Ethylene Dibromide	0.2	U
74-97-5	Bromochloromethane	0.2	U
594-20-7	2,2-Dichloropropane	0.2	U
142-28-9	1,3-Dichloropropane	0.2	U
98-82-8	**Isopropylbenzene**	**26**	**ES**
103-65-1	**n-Propylbenzene**	**12**	
108-86-1	Bromobenzene	0.2	U
95-49-8	2-Chlorotoluene	0.2	U
106-43-4	4-Chlorotoluene	0.2	U
98-06-6	tert-Butylbenzene	0.2	U
135-98-8	sec-Butylbenzene	0.2	U
99-87-6	**4-Isopropyltoluene**	**32**	**ES**
104-51-8	**n-Butylbenzene**	**12**	**M**
120-82-1	1,2,4-Trichlorobenzene	0.5	U
91-20-3	**Naphthalene**	**260**	**ES**
87-61-6	1,2,3-Trichlorobenzene	0.5	U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	91.8%
d8-Toluene	96.0%
Bromofluorobenzene	120%
d4-1,2-Dichlorobenzene	128%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: NMW-3
REANALYSIS

Lab Sample ID: CM51D-RE
LIMS ID: 00-22653
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Instrument: NT3
Date Analyzed: 11/29/00 20:51

Sample Amount: 1.0 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	5.0 U
74-83-9	Bromomethane	5.0 U
75-01-4	Vinyl Chloride	5.0 U
75-00-3	Chloroethane	5.0 U
75-09-2	Methylene Chloride	10 U
67-64-1	Acetone	25 U
75-15-0	Carbon Disulfide	5.0 U
75-35-4	1,1-Dichloroethene	5.0 U
75-34-3	1,1-Dichloroethane	5.0 U
156-60-5	trans-1,2-Dichloroethene	5.0 U
156-59-2	cis-1,2-Dichloroethene	5.0 U
67-66-3	Chloroform	5.0 U
107-06-2	1,2-Dichloroethane	5.0 U
78-93-3	2-Butanone	25 U
71-55-6	1,1,1-Trichloroethane	5.0 U
56-23-5	Carbon Tetrachloride	5.0 U
108-05-4	Vinyl Acetate	25 U
75-27-4	Bromodichloromethane	5.0 U
78-87-5	1,2-Dichloropropane	5.0 U
10061-01-5	cis-1,3-Dichloropropene	5.0 U
79-01-6	Trichloroethene	5.0 U
124-48-1	Dibromochloromethane	5.0 U
79-00-5	1,1,2-Trichloroethane	5.0 U
71-43-2	**Benzene**	**23**
10061-02-6	trans-1,3-Dichloropropene	5.0 U
110-75-8	2-Chloroethylvinylether	25 U
75-25-2	Bromoform	5.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	25 U
591-78-6	2-Hexanone	25 U
127-18-4	Tetrachloroethene	5.0 U
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U
108-88-3	**Toluene**	**98**
108-90-7	Chlorobenzene	5.0 U
100-41-4	**Ethylbenzene**	**280**
100-42-5	**Styrene**	**13 M**
75-69-4	Trichlorofluoromethane	5.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	10 U
1330-20-7	**m,p-Xylene**	**1000**

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: NMW-3
REANALYSIS

Lab Sample ID: CM51D-RE
LIMS ID: 00-22653
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Instrument: NT3
Date Analyzed: 11/29/00 20:51

Sample Amount: 1.0 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	**o-Xylene**	**560**
95-50-1	1,2-Dichlorobenzene	5.0 U
541-73-1	1,3-Dichlorobenzene	5.0 U
106-46-7	1,4-Dichlorobenzene	5.0 U
107-02-8	Acrolein	250 U
74-88-4	Methyl Iodide	5.0 U
74-96-4	Bromoethane	10 U
107-13-1	Acrylonitrile	25 U
563-58-6	1,1-Dichloropropene	5.0 U
74-95-3	Dibromomethane	5.0 U
630-20-6	1,1,1,2-Tetrachloroethane	5.0 U
96-12-8	1,2-Dibromo-3-chloropropane	25 U
96-18-4	1,2,3-Trichloropropane	15 U
110-57-6	trans-1,4-Dichloro-2-butene	25 U
108-67-8	**1,3,5-Trimethylbenzene**	**170**
95-63-6	**1,2,4-Trimethylbenzene**	**520**
87-68-3	Hexachlorobutadiene	25 U
106-93-4	Ethylene Dibromide	5.0 U
74-97-5	Bromochloromethane	5.0 U
594-20-7	2,2-Dichloropropane	5.0 U
142-28-9	1,3-Dichloropropane	5.0 U
98-82-8	**Isopropylbenzene**	**59**
103-65-1	n-Propylbenzene	5.0 U
108-86-1	Bromobenzene	5.0 U
95-49-8	2-Chlorotoluene	5.0 U
106-43-4	4-Chlorotoluene	5.0 U
98-06-6	tert-Butylbenzene	5.0 U
135-98-8	sec-Butylbenzene	5.0 U
99-87-6	**4-Isopropyltoluene**	**45**
104-51-8	n-Butylbenzene	5.0 U
120-82-1	1,2,4-Trichlorobenzene	25 U
91-20-3	**Naphthalene**	**6000 E**
87-61-6	1,2,3-Trichlorobenzene	25 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	94.1%
d8-Toluene	99.8%
Bromofluorobenzene	102%
d4-1,2-Dichlorobenzene	100%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: NMW-3
DILUTION-2

Lab Sample ID: CM51D-DL2
LIMS ID: 00-22653
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Instrument: NT3
Date Analyzed: 11/30/00 15:21

Sample Amount: 0.050 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	100 U
74-83-9	Bromomethane	100 U
75-01-4	Vinyl Chloride	100 U
75-00-3	Chloroethane	100 U
75-09-2	Methylene Chloride	200 U
67-64-1	Acetone	500 U
75-15-0	Carbon Disulfide	100 U
75-35-4	1,1-Dichloroethene	100 U
75-34-3	1,1-Dichloroethane	100 U
156-60-5	trans-1,2-Dichloroethene	100 U
156-59-2	cis-1,2-Dichloroethene	100 U
67-66-3	Chloroform	100 U
107-06-2	1,2-Dichloroethane	100 U
78-93-3	2-Butanone	500 U
71-55-6	1,1,1-Trichloroethane	100 U
56-23-5	Carbon Tetrachloride	100 U
108-05-4	Vinyl Acetate	500 U
75-27-4	Bromodichloromethane	100 U
78-87-5	1,2-Dichloropropane	100 U
10061-01-5	cis-1,3-Dichloropropene	100 U
79-01-6	Trichloroethene	100 U
124-48-1	Dibromochloromethane	100 U
79-00-5	1,1,2-Trichloroethane	100 U
71-43-2	Benzene	100 U
10061-02-6	trans-1,3-Dichloropropene	100 U
110-75-8	2-Chloroethylvinylether	500 U
75-25-2	Bromoform	100 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	500 U
591-78-6	2-Hexanone	500 U
127-18-4	Tetrachloroethene	100 U
79-34-5	1,1,2,2-Tetrachloroethane	100 U
108-88-3	**Toluene**	**92 J**
108-90-7	Chlorobenzene	100 U
100-41-4	**Ethylbenzene**	**250**
100-42-5	Styrene	100 U
75-69-4	Trichlorofluoromethane	100 U
76-13-1	1,1,2-Trichlorotrifluoroethane	200 U
1330-20-7	**m,p-Xylene**	**960**

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: NMW-3
DILUTION-2

Lab Sample ID: CM51D-DL2
LIMS ID: 00-22653
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Instrument: NT3
Date Analyzed: 11/30/00 15:21

Sample Amount: 0.050 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	**o-Xylene**	**510**
95-50-1	1,2-Dichlorobenzene	100 U
541-73-1	1,3-Dichlorobenzene	100 U
106-46-7	1,4-Dichlorobenzene	100 U
107-02-8	Acrolein	5000 U
74-88-4	Methyl Iodide	100 U
74-96-4	Bromoethane	200 U
107-13-1	Acrylonitrile	500 U
563-58-6	1,1-Dichloropropene	100 U
74-95-3	Dibromomethane	100 U
630-20-6	1,1,1,2-Tetrachloroethane	100 U
96-12-8	1,2-Dibromo-3-chloropropane	500 U
96-18-4	1,2,3-Trichloropropane	300 U
110-57-6	trans-1,4-Dichloro-2-butene	500 U
108-67-8	**1,3,5-Trimethylbenzene**	**160**
95-63-6	**1,2,4-Trimethylbenzene**	**470**
87-68-3	Hexachlorobutadiene	500 U
106-93-4	Ethylene Dibromide	100 U
74-97-5	Bromochloromethane	100 U
594-20-7	2,2-Dichloropropane	100 U
142-28-9	1,3-Dichloropropane	100 U
98-82-8	Isopropylbenzene	100 U
103-65-1	n-Propylbenzene	100 U
108-86-1	Bromobenzene	100 U
95-49-8	2-Chlorotoluene	100 U
106-43-4	4-Chlorotoluene	100 U
98-06-6	tert-Butylbenzene	100 U
135-98-8	sec-Butylbenzene	100 U
99-87-6	4-Isopropyltoluene	100 U
104-51-8	n-Butylbenzene	100 U
120-82-1	1,2,4-Trichlorobenzene	500 U
91-20-3	**Naphthalene**	**8500**
87-61-6	1,2,3-Trichlorobenzene	500 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	99.4%
d8-Toluene	99.1%
Bromofluorobenzene	103%
d4-1,2-Dichlorobenzene	99.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: NMW-300

Lab Sample ID: CM51E
LIMS ID: 00-22654
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Instrument: FINN3
Date Analyzed: 11/28/00 19:21

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	0.2 U
74-83-9	Bromomethane	0.2 U
75-01-4	Vinyl Chloride	0.2 U
75-00-3	Chloroethane	0.2 U
75-09-2	Methylene Chloride	0.3 U
67-64-1	**Acetone**	**4.5**
75-15-0	Carbon Disulfide	0.2 U
75-35-4	1,1-Dichloroethene	0.2 U
75-34-3	1,1-Dichloroethane	0.2 U
156-60-5	trans-1,2-Dichloroethene	0.2 U
156-59-2	cis-1,2-Dichloroethene	0.2 U
67-66-3	Chloroform	0.2 U
107-06-2	1,2-Dichloroethane	0.2 U
78-93-3	2-Butanone	1.0 U
71-55-6	1,1,1-Trichloroethane	0.2 U
56-23-5	Carbon Tetrachloride	0.2 U
108-05-4	Vinyl Acetate	0.2 U
75-27-4	Bromodichloromethane	0.2 U
78-87-5	1,2-Dichloropropane	0.2 U
10061-01-5	cis-1,3-Dichloropropene	0.2 U
79-01-6	Trichloroethene	0.2 U
124-48-1	Dibromochloromethane	0.2 U
79-00-5	1,1,2-Trichloroethane	0.2 U
71-43-2	**Benzene**	**15 E**
10061-02-6	trans-1,3-Dichloropropene	0.2 U
110-75-8	2-Chloroethylvinylether	0.5 U
75-25-2	Bromoform	0.5 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	1.0 U
591-78-6	2-Hexanone	1.0 U
127-18-4	Tetrachloroethene	0.2 U
79-34-5	1,1,2,2-Tetrachloroethane	0.2 U
108-88-3	**Toluene**	**46 ES**
108-90-7	Chlorobenzene	0.2 U
100-41-4	**Ethylbenzene**	**44 ES**
100-42-5	Styrene	0.2 U
75-69-4	Trichlorofluoromethane	0.2 U
76-13-1	1,1,2-Trichlorotrifluoroethane	0.2 U
1330-20-7	**m,p-Xylene**	**190 ES**

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: NMW-300

Lab Sample ID: CM51E
LIMS ID: 00-22654
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Instrument: FINN3
Date Analyzed: 11/28/00 19:21

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	ug/L
95-47-6	**o-Xylene**	**120 ES**
95-50-1	1,2-Dichlorobenzene	0.2 U
541-73-1	1,3-Dichlorobenzene	0.2 U
106-46-7	1,4-Dichlorobenzene	0.2 U
107-02-8	Acrolein	5.0 U
74-88-4	Methyl Iodide	0.2 U
74-96-4	Bromoethane	0.2 U
107-13-1	Acrylonitrile	1.0 U
563-58-6	1,1-Dichloropropene	0.2 U
74-95-3	Dibromomethane	0.2 U
630-20-6	1,1,1,2-Tetrachloroethane	0.2 U
96-12-8	1,2-Dibromo-3-chloropropane	1.0 U
96-18-4	1,2,3-Trichloropropane	0.5 U
110-57-6	trans-1,4-Dichloro-2-butene	1.0 U
108-67-8	**1,3,5-Trimethylbenzene**	**190 ES**
95-63-6	**1,2,4-Trimethylbenzene**	**150 ES**
87-68-3	Hexachlorobutadiene	0.5 U
106-93-4	Ethylene Dibromide	0.2 U
74-97-5	Bromochloromethane	0.2 U
594-20-7	2,2-Dichloropropane	0.2 U
142-28-9	1,3-Dichloropropane	0.2 U
98-82-8	**Isopropylbenzene**	**26 ES**
103-65-1	**n-Propylbenzene**	**12**
108-86-1	Bromobenzene	0.2 U
95-49-8	2-Chlorotoluene	0.2 U
106-43-4	4-Chlorotoluene	0.2 U
98-06-6	tert-Butylbenzene	0.2 U
135-98-8	sec-Butylbenzene	0.2 U
99-87-6	**4-Isopropyltoluene**	**32 ES**
104-51-8	n-Butylbenzene	0.2 U
120-82-1	1,2,4-Trichlorobenzene	0.5 U
91-20-3	**Naphthalene**	**220 ES**
87-61-6	1,2,3-Trichlorobenzene	0.5 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	92.0%
d8-Toluene	96.2%
Bromofluorobenzene	112%
d4-1,2-Dichlorobenzene	127%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: NMW-300
REANALYSIS

Lab Sample ID: CM51E-RE
LIMS ID: 00-22654
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Instrument: NT3
Date Analyzed: 11/29/00 21:19

Sample Amount: 1.0 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	5.0 U
74-83-9	Bromomethane	5.0 U
75-01-4	Vinyl Chloride	5.0 U
75-00-3	Chloroethane	5.0 U
75-09-2	Methylene Chloride	10 U
67-64-1	Acetone	25 U
75-15-0	Carbon Disulfide	5.0 U
75-35-4	1,1-Dichloroethene	5.0 U
75-34-3	1,1-Dichloroethane	5.0 U
156-60-5	trans-1,2-Dichloroethene	5.0 U
156-59-2	cis-1,2-Dichloroethene	5.0 U
67-66-3	Chloroform	5.0 U
107-06-2	1,2-Dichloroethane	5.0 U
78-93-3	2-Butanone	25 U
71-55-6	1,1,1-Trichloroethane	5.0 U
56-23-5	Carbon Tetrachloride	5.0 U
108-05-4	Vinyl Acetate	25 U
75-27-4	Bromodichloromethane	5.0 U
78-87-5	1,2-Dichloropropane	5.0 U
10061-01-5	cis-1,3-Dichloropropene	5.0 U
79-01-6	Trichloroethene	5.0 U
124-48-1	Dibromochloromethane	5.0 U
79-00-5	1,1,2-Trichloroethane	5.0 U
71-43-2	**Benzene**	25
10061-02-6	trans-1,3-Dichloropropene	5.0 U
110-75-8	2-Chloroethylvinylether	25 U
75-25-2	Bromoform	5.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	25 U
591-78-6	2-Hexanone	25 U
127-18-4	Tetrachloroethene	5.0 U
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U
108-88-3	**Toluene**	100
108-90-7	Chlorobenzene	5.0 U
100-41-4	**Ethylbenzene**	280
100-42-5	**Styrene**	13 M
75-69-4	Trichlorofluoromethane	5.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	10 U
1330-20-7	**m,p-Xylene**	1100

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: NMW-300
REANALYSIS

Lab Sample ID: CM51E-RE
LIMS ID: 00-22654
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Instrument: NT3
Date Analyzed: 11/29/00 21:19

Sample Amount: 1.0 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	**o-Xylene**	**580**
95-50-1	1,2-Dichlorobenzene	5.0 U
541-73-1	1,3-Dichlorobenzene	5.0 U
106-46-7	1,4-Dichlorobenzene	5.0 U
107-02-8	Acrolein	250 U
74-88-4	Methyl Iodide	5.0 U
74-96-4	Bromoethane	10 U
107-13-1	Acrylonitrile	25 U
563-58-6	1,1-Dichloropropene	5.0 U
74-95-3	Dibromomethane	5.0 U
630-20-6	1,1,1,2-Tetrachloroethane	5.0 U
96-12-8	1,2-Dibromo-3-chloropropane	25 U
96-18-4	1,2,3-Trichloropropane	15 U
110-57-6	trans-1,4-Dichloro-2-butene	25 U
108-67-8	**1,3,5-Trimethylbenzene**	**180**
95-63-6	**1,2,4-Trimethylbenzene**	**540**
87-68-3	Hexachlorobutadiene	25 U
106-93-4	Ethylene Dibromide	5.0 U
74-97-5	Bromochloromethane	5.0 U
594-20-7	2,2-Dichloropropane	5.0 U
142-28-9	1,3-Dichloropropane	5.0 U
98-82-8	**Isopropylbenzene**	**59**
103-65-1	n-Propylbenzene	5.0 U
108-86-1	Bromobenzene	5.0 U
95-49-8	2-Chlorotoluene	5.0 U
106-43-4	4-Chlorotoluene	5.0 U
98-06-6	tert-Butylbenzene	5.0 U
135-98-8	sec-Butylbenzene	5.0 U
99-87-6	**4-Isopropyltoluene**	**44**
104-51-8	n-Butylbenzene	5.0 U
120-82-1	1,2,4-Trichlorobenzene	25 U
91-20-3	**Naphthalene**	**5000 ES**
87-61-6	1,2,3-Trichlorobenzene	25 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	95.9%
d8-Toluene	99.9%
Bromofluorobenzene	102%
d4-1,2-Dichlorobenzene	97.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: NMW-300
DILUTION-2

Lab Sample ID: CM51E-DL2
LIMS ID: 00-22654
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Instrument: NT3
Date Analyzed: 12/06/00 11:11

Sample Amount: 0.050 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	100 U
74-83-9	Bromomethane	100 U
75-01-4	Vinyl Chloride	100 U
75-00-3	Chloroethane	100 U
75-09-2	Methylene Chloride	200 U
67-64-1	Acetone	500 U
75-15-0	Carbon Disulfide	100 U
75-35-4	1,1-Dichloroethene	100 U
75-34-3	1,1-Dichloroethane	100 U
156-60-5	trans-1,2-Dichloroethene	100 U
156-59-2	cis-1,2-Dichloroethene	100 U
67-66-3	Chloroform	100 U
107-06-2	1,2-Dichloroethane	100 U
78-93-3	2-Butanone	500 U
71-55-6	1,1,1-Trichloroethane	100 U
56-23-5	Carbon Tetrachloride	100 U
108-05-4	Vinyl Acetate	500 U
75-27-4	Bromodichloromethane	100 U
78-87-5	1,2-Dichloropropane	100 U
10061-01-5	cis-1,3-Dichloropropene	100 U
79-01-6	Trichloroethene	100 U
124-48-1	Dibromochloromethane	100 U
79-00-5	1,1,2-Trichloroethane	100 U
71-43-2	Benzene	100 U
10061-02-6	trans-1,3-Dichloropropene	100 U
110-75-8	2-Chloroethylvinylether	500 U
75-25-2	Bromoform	100 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	500 U
591-78-6	2-Hexanone	500 U
127-18-4	Tetrachloroethene	100 U
79-34-5	1,1,2,2-Tetrachloroethane	100 U
108-88-3	**Toluene**	**110**
108-90-7	Chlorobenzene	100 U
100-41-4	**Ethylbenzene**	**290**
100-42-5	Styrene	100 U
75-69-4	Trichlorofluoromethane	100 U
76-13-1	1,1,2-Trichlorotrifluoroethane	200 U
1330-20-7	**m,p-Xylene**	**1000**

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: NMW-300
DILUTION-2

Lab Sample ID: CM51E-DL2
LIMS ID: 00-22654
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Instrument: NT3
Date Analyzed: 12/06/00 11:11

Sample Amount: 0.050 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	**o-Xylene**	**560**
95-50-1	1,2-Dichlorobenzene	100 U
541-73-1	1,3-Dichlorobenzene	100 U
106-46-7	1,4-Dichlorobenzene	100 U
107-02-8	Acrolein	5000 U
74-88-4	Methyl Iodide	100 U
74-96-4	Bromoethane	200 U
107-13-1	Acrylonitrile	500 U
563-58-6	1,1-Dichloropropene	100 U
74-95-3	Dibromomethane	100 U
630-20-6	1,1,1,2-Tetrachloroethane	100 U
96-12-8	1,2-Dibromo-3-chloropropane	500 U
96-18-4	1,2,3-Trichloropropane	300 U
110-57-6	trans-1,4-Dichloro-2-butene	500 U
108-67-8	**1,3,5-Trimethylbenzene**	**180**
95-63-6	**1,2,4-Trimethylbenzene**	**540**
87-68-3	Hexachlorobutadiene	500 U
106-93-4	Ethylene Dibromide	100 U
74-97-5	Bromochloromethane	100 U
594-20-7	2,2-Dichloropropane	100 U
142-28-9	1,3-Dichloropropane	100 U
98-82-8	Isopropylbenzene	100 U
103-65-1	n-Propylbenzene	100 U
108-86-1	Bromobenzene	100 U
95-49-8	2-Chlorotoluene	100 U
106-43-4	4-Chlorotoluene	100 U
98-06-6	tert-Butylbenzene	100 U
135-98-8	sec-Butylbenzene	100 U
99-87-6	4-Isopropyltoluene	100 U
104-51-8	n-Butylbenzene	100 U
120-82-1	1,2,4-Trichlorobenzene	500 U
91-20-3	**Naphthalene**	**7200**
87-61-6	1,2,3-Trichlorobenzene	500 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	95.2%
d8-Toluene	97.3%
Bromofluorobenzene	100%
d4-1,2-Dichlorobenzene	100%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: NMW-2

Lab Sample ID: CM51F
LIMS ID: 00-22655
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Instrument: NT3
Date Analyzed: 11/30/00 15:48

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	2.0 U
67-64-1	Acetone	5.0 U
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	trans-1,2-Dichloroethene	1.0 U
156-59-2	cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
108-05-4	Vinyl Acetate	5.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-02-6	trans-1,3-Dichloropropene	1.0 U
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.0 U
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	2.0 U
1330-20-7	m,p-Xylene	1.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: NMW-2

Lab Sample ID: CM51F
LIMS ID: 00-22655
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Instrument: NT3
Date Analyzed: 11/30/00 15:48

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	o-Xylene	1.0 U
95-50-1	1,2-Dichlorobenzene	1.0 U
541-73-1	1,3-Dichlorobenzene	1.0 U
106-46-7	1,4-Dichlorobenzene	1.0 U
107-02-8	Acrolein	50 U
74-88-4	Methyl Iodide	1.0 U
74-96-4	Bromoethane	2.0 U
107-13-1	Acrylonitrile	5.0 U
563-58-6	1,1-Dichloropropene	1.0 U
74-95-3	Dibromomethane	1.0 U
630-20-6	1,1,1,2-Tetrachloroethane	1.0 U
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U
96-18-4	1,2,3-Trichloropropane	3.0 U
110-57-6	trans-1,4-Dichloro-2-butene	5.0 U
108-67-8	1,3,5-Trimethylbenzene	1.0 U
95-63-6	1,2,4-Trimethylbenzene	1.0 U
87-68-3	Hexachlorobutadiene	5.0 U
106-93-4	Ethylene Dibromide	1.0 U
74-97-5	Bromochloromethane	1.0 U
594-20-7	2,2-Dichloropropane	1.0 U
142-28-9	1,3-Dichloropropane	1.0 U
98-82-8	Isopropylbenzene	1.0 U
103-65-1	n-Propylbenzene	1.0 U
108-86-1	Bromobenzene	1.0 U
95-49-8	2-Chlorotoluene	1.0 U
106-43-4	4-Chlorotoluene	1.0 U
98-06-6	tert-Butylbenzene	1.0 U
135-98-8	sec-Butylbenzene	1.0 U
99-87-6	**4-Isopropyltoluene**	**10**
104-51-8	n-Butylbenzene	1.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0 U
91-20-3	Naphthalene	5.0 U
87-61-6	1,2,3-Trichlorobenzene	5.0 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	98.0%
d8-Toluene	100%
Bromofluorobenzene	103%
d4-1,2-Dichlorobenzene	99.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: MW-5

Lab Sample ID: CM51G
LIMS ID: 00-22656
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Instrument: FINN3
Date Analyzed: 12/03/00 16:52

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	0.2 U
74-83-9	Bromomethane	0.2 U
75-01-4	Vinyl Chloride	0.2 U
75-00-3	Chloroethane	0.2 U
75-09-2	Methylene Chloride	0.3 U
67-64-1	**Acetone**	**1.7**
75-15-0	Carbon Disulfide	0.2 U
75-35-4	1,1-Dichloroethene	0.2 U
75-34-3	1,1-Dichloroethane	0.2 U
156-60-5	trans-1,2-Dichloroethene	0.2 U
156-59-2	cis-1,2-Dichloroethene	0.2 U
67-66-3	Chloroform	0.2 U
107-06-2	1,2-Dichloroethane	0.2 U
78-93-3	2-Butanone	1.0 U
71-55-6	1,1,1-Trichloroethane	0.2 U
56-23-5	Carbon Tetrachloride	0.2 U
108-05-4	Vinyl Acetate	0.2 U
75-27-4	Bromodichloromethane	0.2 U
78-87-5	1,2-Dichloropropane	0.2 U
10061-01-5	cis-1,3-Dichloropropene	0.2 U
79-01-6	Trichloroethene	0.2 U
124-48-1	Dibromochloromethane	0.2 U
79-00-5	1,1,2-Trichloroethane	0.2 U
71-43-2	Benzene	0.2 U
10061-02-6	trans-1,3-Dichloropropene	0.2 U
110-75-8	2-Chloroethylvinylether	0.5 U
75-25-2	Bromoform	0.5 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	1.0 U
591-78-6	2-Hexanone	1.0 U
127-18-4	Tetrachloroethene	0.2 U
79-34-5	1,1,2,2-Tetrachloroethane	0.2 U
108-88-3	Toluene	0.2 U
108-90-7	Chlorobenzene	0.2 U
100-41-4	Ethylbenzene	0.2 U
100-42-5	Styrene	0.2 U
75-69-4	Trichlorofluoromethane	0.2 U
76-13-1	1,1,2-Trichlorotrifluoroethane	0.2 U
1330-20-7	m,p-Xylene	0.4 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: MW-5

Lab Sample ID: CM51G
LIMS ID: 00-22656
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Instrument: FINN3
Date Analyzed: 12/03/00 16:52

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	ug/L
95-47-6	o-Xylene	0.2 U
95-50-1	1,2-Dichlorobenzene	0.2 U
541-73-1	1,3-Dichlorobenzene	0.2 U
106-46-7	1,4-Dichlorobenzene	0.2 U
107-02-8	Acrolein	5.0 U
74-88-4	Methyl Iodide	0.2 U
74-96-4	Bromoethane	0.2 U
107-13-1	Acrylonitrile	1.0 U
563-58-6	1,1-Dichloropropene	0.2 U
74-95-3	Dibromomethane	0.2 U
630-20-6	1,1,1,2-Tetrachloroethane	0.2 U
96-12-8	1,2-Dibromo-3-chloropropane	1.0 U
96-18-4	1,2,3-Trichloropropane	0.5 U
110-57-6	trans-1,4-Dichloro-2-butene	1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.2 U
95-63-6	1,2,4-Trimethylbenzene	0.2 U
87-68-3	Hexachlorobutadiene	0.5 U
106-93-4	Ethylene Dibromide	0.2 U
74-97-5	Bromochloromethane	0.2 U
594-20-7	2,2-Dichloropropane	0.2 U
142-28-9	1,3-Dichloropropane	0.2 U
98-82-8	Isopropylbenzene	0.2 U
103-65-1	n-Propylbenzene	0.2 U
108-86-1	Bromobenzene	0.2 U
95-49-8	2-Chlorotoluene	0.2 U
106-43-4	4-Chlorotoluene	0.2 U
98-06-6	tert-Butylbenzene	0.2 U
135-98-8	sec-Butylbenzene	0.2 U
99-87-6	4-Isopropyltoluene	0.2 U
104-51-8	n-Butylbenzene	0.2 U
120-82-1	1,2,4-Trichlorobenzene	0.5 U
91-20-3	Naphthalene	0.5 U
87-61-6	1,2,3-Trichlorobenzene	0.5 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	92.8%
d8-Toluene	101%
Bromofluorobenzene	100%
d4-1,2-Dichlorobenzene	94.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: MW-6

Lab Sample ID: CM51H
LIMS ID: 00-22657
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Instrument: FINN3
Date Analyzed: 11/28/00 20:44

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	0.2 U
74-83-9	Bromomethane	0.2 U
75-01-4	Vinyl Chloride	0.2 U
75-00-3	Chloroethane	0.2 U
75-09-2	Methylene Chloride	0.3 U
67-64-1	**Acetone**	**1.3**
75-15-0	**Carbon Disulfide**	**0.3**
75-35-4	1,1-Dichloroethene	0.2 U
75-34-3	1,1-Dichloroethane	0.2 U
156-60-5	trans-1,2-Dichloroethene	0.2 U
156-59-2	cis-1,2-Dichloroethene	0.2 U
67-66-3	Chloroform	0.2 U
107-06-2	1,2-Dichloroethane	0.2 U
78-93-3	2-Butanone	1.0 U
71-55-6	1,1,1-Trichloroethane	0.2 U
56-23-5	Carbon Tetrachloride	0.2 U
108-05-4	Vinyl Acetate	0.2 U
75-27-4	Bromodichloromethane	0.2 U
78-87-5	1,2-Dichloropropane	0.2 U
10061-01-5	cis-1,3-Dichloropropene	0.2 U
79-01-6	Trichloroethene	0.2 U
124-48-1	Dibromochloromethane	0.2 U
79-00-5	1,1,2-Trichloroethane	0.2 U
71-43-2	Benzene	0.2 U
10061-02-6	trans-1,3-Dichloropropene	0.2 U
110-75-8	2-Chloroethylvinylether	0.5 U
75-25-2	Bromoform	0.5 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	1.0 U
591-78-6	2-Hexanone	1.0 U
127-18-4	Tetrachloroethene	0.2 U
79-34-5	1,1,2,2-Tetrachloroethane	0.2 U
108-88-3	Toluene	0.2 U
108-90-7	**Chlorobenzene**	**31 E**
100-41-4	Ethylbenzene	0.2 U
100-42-5	Styrene	0.2 U
75-69-4	Trichlorofluoromethane	0.2 U
76-13-1	1,1,2-Trichlorotrifluoroethane	0.2 U
1330-20-7	m,p-Xylene	0.4 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: MW-6

Lab Sample ID: CM51H
LIMS ID: 00-22657
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Instrument: FINN3
Date Analyzed: 11/28/00 20:44

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	ug/L
95-47-6	o-Xylene	0.2 U
95-50-1	1,2-Dichlorobenzene	0.2 U
541-73-1	1,3-Dichlorobenzene	0.2 U
106-46-7	**1,4-Dichlorobenzene**	**0.4**
107-02-8	Acrolein	5.0 U
74-88-4	Methyl Iodide	0.2 U
74-96-4	Bromoethane	0.2 U
107-13-1	Acrylonitrile	1.0 U
563-58-6	1,1-Dichloropropene	0.2 U
74-95-3	Dibromomethane	0.2 U
630-20-6	1,1,1,2-Tetrachloroethane	0.2 U
96-12-8	1,2-Dibromo-3-chloropropane	1.0 U
96-18-4	1,2,3-Trichloropropane	0.5 U
110-57-6	trans-1,4-Dichloro-2-butene	1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.2 U
95-63-6	1,2,4-Trimethylbenzene	0.2 U
87-68-3	Hexachlorobutadiene	0.5 U
106-93-4	Ethylene Dibromide	0.2 U
74-97-5	Bromochloromethane	0.2 U
594-20-7	2,2-Dichloropropane	0.2 U
142-28-9	1,3-Dichloropropane	0.2 U
98-82-8	Isopropylbenzene	0.2 U
103-65-1	n-Propylbenzene	0.2 U
108-86-1	Bromobenzene	0.2 U
95-49-8	2-Chlorotoluene	0.2 U
106-43-4	4-Chlorotoluene	0.2 U
98-06-6	tert-Butylbenzene	0.2 U
135-98-8	sec-Butylbenzene	0.2 U
99-87-6	4-Isopropyltoluene	0.2 U
104-51-8	n-Butylbenzene	0.2 U
120-82-1	1,2,4-Trichlorobenzene	0.5 U
91-20-3	**Naphthalene**	**18 EC**
87-61-6	1,2,3-Trichlorobenzene	0.5 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	83.0%
d8-Toluene	91.2%
Bromofluorobenzene	86.0%
d4-1,2-Dichlorobenzene	101%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: MW-6
REANALYSIS

Lab Sample ID: CM51H-RE
LIMS ID: 00-22657
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Instrument: NT3
Date Analyzed: 11/29/00 19:27

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	2.0 U
67-64-1	Acetone	5.0 U
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	trans-1,2-Dichloroethene	1.0 U
156-59-2	cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
108-05-4	Vinyl Acetate	5.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-02-6	trans-1,3-Dichloropropene	1.0 U
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.0 U
108-90-7	**Chlorobenzene**	**72**
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	2.0 U
1330-20-7	m,p-Xylene	1.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: MW-6
REANALYSIS

Lab Sample ID: CM51H-RE
LIMS ID: 00-22657
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Instrument: NT3
Date Analyzed: 11/29/00 19:27

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	o-Xylene	1.0 U
95-50-1	1,2-Dichlorobenzene	1.0 U
541-73-1	1,3-Dichlorobenzene	1.0 U
106-46-7	1,4-Dichlorobenzene	1.0 U
107-02-8	Acrolein	50 U
74-88-4	Methyl Iodide	1.0 U
74-96-4	Bromoethane	2.0 U
107-13-1	Acrylonitrile	5.0 U
563-58-6	1,1-Dichloropropene	1.0 U
74-95-3	Dibromomethane	1.0 U
630-20-6	1,1,1,2-Tetrachloroethane	1.0 U
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U
96-18-4	1,2,3-Trichloropropane	3.0 U
110-57-6	trans-1,4-Dichloro-2-butene	5.0 U
108-67-8	1,3,5-Trimethylbenzene	1.0 U
95-63-6	1,2,4-Trimethylbenzene	1.0 U
87-68-3	Hexachlorobutadiene	5.0 U
106-93-4	Ethylene Dibromide	1.0 U
74-97-5	Bromochloromethane	1.0 U
594-20-7	2,2-Dichloropropane	1.0 U
142-28-9	1,3-Dichloropropane	1.0 U
98-82-8	Isopropylbenzene	1.0 U
103-65-1	n-Propylbenzene	1.0 U
108-86-1	Bromobenzene	1.0 U
95-49-8	2-Chlorotoluene	1.0 U
106-43-4	4-Chlorotoluene	1.0 U
98-06-6	tert-Butylbenzene	1.0 U
135-98-8	sec-Butylbenzene	1.0 U
99-87-6	4-Isopropyltoluene	1.0 U
104-51-8	n-Butylbenzene	1.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0 U
91-20-3	Naphthalene	5.0 U
87-61-6	1,2,3-Trichlorobenzene	5.0 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	99.4%
d8-Toluene	99.2%
Bromofluorobenzene	99.0%
d4-1,2-Dichlorobenzene	99.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: MW-2

Lab Sample ID: CM51I
LIMS ID: 00-22658
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Instrument: FINN3
Date Analyzed: 12/03/00 17:20

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	0.2 U
74-83-9	Bromomethane	0.2 U
75-01-4	Vinyl Chloride	0.2 U
75-00-3	Chloroethane	0.2 U
75-09-2	Methylene Chloride	0.3 U
67-64-1	Acetone	1.0 U
75-15-0	Carbon Disulfide	0.2 U
75-35-4	1,1-Dichloroethene	0.2 U
75-34-3	**1,1-Dichloroethane**	**0.2**
156-60-5	trans-1,2-Dichloroethene	0.2 U
156-59-2	cis-1,2-Dichloroethene	0.2 U
67-66-3	Chloroform	0.2 U
107-06-2	1,2-Dichloroethane	0.2 U
78-93-3	2-Butanone	1.0 U
71-55-6	1,1,1-Trichloroethane	0.2 U
56-23-5	Carbon Tetrachloride	0.2 U
108-05-4	Vinyl Acetate	0.2 U
75-27-4	Bromodichloromethane	0.2 U
78-87-5	1,2-Dichloropropane	0.2 U
10061-01-5	cis-1,3-Dichloropropene	0.2 U
79-01-6	Trichloroethene	0.2 U
124-48-1	Dibromochloromethane	0.2 U
79-00-5	1,1,2-Trichloroethane	0.2 U
71-43-2	Benzene	0.2 U
10061-02-6	trans-1,3-Dichloropropene	0.2 U
110-75-8	2-Chloroethylvinylether	0.5 U
75-25-2	Bromoform	0.5 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	1.0 U
591-78-6	2-Hexanone	1.0 U
127-18-4	Tetrachloroethene	0.2 U
79-34-5	1,1,2,2-Tetrachloroethane	0.2 U
108-88-3	Toluene	0.2 U
108-90-7	Chlorobenzene	0.2 U
100-41-4	Ethylbenzene	0.2 U
100-42-5	Styrene	0.2 U
75-69-4	Trichlorofluoromethane	0.2 U
76-13-1	1,1,2-Trichlorotrifluoroethane	0.2 U
1330-20-7	m,p-Xylene	0.4 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: MW-2

Lab Sample ID: CM51I
LIMS ID: 00-22658
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Instrument: FINN3
Date Analyzed: 12/03/00 17:20

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	ug/L
95-47-6	o-Xylene	0.2 U
95-50-1	1,2-Dichlorobenzene	0.2 U
541-73-1	1,3-Dichlorobenzene	0.2 U
106-46-7	1,4-Dichlorobenzene	0.2 U
107-02-8	Acrolein	5.0 U
74-88-4	Methyl Iodide	0.2 U
74-96-4	Bromoethane	0.2 U
107-13-1	Acrylonitrile	1.0 U
563-58-6	1,1-Dichloropropene	0.2 U
74-95-3	Dibromomethane	0.2 U
630-20-6	1,1,1,2-Tetrachloroethane	0.2 U
96-12-8	1,2-Dibromo-3-chloropropane	1.0 U
96-18-4	1,2,3-Trichloropropane	0.5 U
110-57-6	trans-1,4-Dichloro-2-butene	1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.2 U
95-63-6	1,2,4-Trimethylbenzene	0.2 U
87-68-3	Hexachlorobutadiene	0.5 U
106-93-4	Ethylene Dibromide	0.2 U
74-97-5	Bromochloromethane	0.2 U
594-20-7	2,2-Dichloropropane	0.2 U
142-28-9	1,3-Dichloropropane	0.2 U
98-82-8	Isopropylbenzene	0.2 U
103-65-1	n-Propylbenzene	0.2 U
108-86-1	Bromobenzene	0.2 U
95-49-8	2-Chlorotoluene	0.2 U
106-43-4	4-Chlorotoluene	0.2 U
98-06-6	tert-Butylbenzene	0.2 U
135-98-8	sec-Butylbenzene	0.2 U
99-87-6	4-Isopropyltoluene	0.2 U
104-51-8	n-Butylbenzene	0.2 U
120-82-1	1,2,4-Trichlorobenzene	0.5 U
91-20-3	Naphthalene	0.5 U
87-61-6	1,2,3-Trichlorobenzene	0.5 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	98.0%
d8-Toluene	106%
Bromofluorobenzene	109%
d4-1,2-Dichlorobenzene	98.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: NMW-1

Lab Sample ID: CM51J
LIMS ID: 00-22659
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Instrument: FINN3
Date Analyzed: 11/28/00 21:40

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	0.2 U
74-83-9	Bromomethane	0.2 U
75-01-4	Vinyl Chloride	0.2 U
75-00-3	Chloroethane	0.2 U
75-09-2	Methylene Chloride	0.3 U
67-64-1	Acetone	1.0 U
75-15-0	Carbon Disulfide	0.2 U
75-35-4	1,1-Dichloroethene	0.2 U
75-34-3	1,1-Dichloroethane	0.2 U
156-60-5	trans-1,2-Dichloroethene	0.2 U
156-59-2	cis-1,2-Dichloroethene	0.2 U
67-66-3	Chloroform	0.2 U
107-06-2	1,2-Dichloroethane	0.2 U
78-93-3	2-Butanone	1.0 U
71-55-6	1,1,1-Trichloroethane	0.2 U
56-23-5	Carbon Tetrachloride	0.2 U
108-05-4	Vinyl Acetate	0.2 U
75-27-4	Bromodichloromethane	0.2 U
78-87-5	1,2-Dichloropropane	0.2 U
10061-01-5	cis-1,3-Dichloropropene	0.2 U
79-01-6	Trichloroethene	0.2 U
124-48-1	Dibromochloromethane	0.2 U
79-00-5	1,1,2-Trichloroethane	0.2 U
71-43-2	Benzene	0.2 U
10061-02-6	trans-1,3-Dichloropropene	0.2 U
110-75-8	2-Chloroethylvinylether	0.5 U
75-25-2	Bromoform	0.5 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	1.0 U
591-78-6	2-Hexanone	1.0 U
127-18-4	Tetrachloroethene	0.2 U
79-34-5	1,1,2,2-Tetrachloroethane	0.2 U
108-88-3	Toluene	0.2 U
108-90-7	**Chlorobenzene**	**11**
100-41-4	**Ethylbenzene**	**1.8**
100-42-5	Styrene	0.2 U
75-69-4	Trichlorofluoromethane	0.2 U
76-13-1	1,1,2-Trichlorotrifluoroethane	0.2 U
1330-20-7	**m,p-Xylene**	**1.0**

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: NMW-1

Lab Sample ID: CM51J
LIMS ID: 00-22659
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Instrument: FINN3
Date Analyzed: 11/28/00 21:40

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	ug/L
95-47-6	**o-Xylene**	**1.4**
95-50-1	1,2-Dichlorobenzene	0.2 U
541-73-1	1,3-Dichlorobenzene	0.2 U
106-46-7	1,4-Dichlorobenzene	0.2 U
107-02-8	Acrolein	5.0 U
74-88-4	Methyl Iodide	0.2 U
74-96-4	Bromoethane	0.2 U
107-13-1	Acrylonitrile	1.0 U
563-58-6	1,1-Dichloropropene	0.2 U
74-95-3	Dibromomethane	0.2 U
630-20-6	1,1,1,2-Tetrachloroethane	0.2 U
96-12-8	1,2-Dibromo-3-chloropropane	1.0 U
96-18-4	1,2,3-Trichloropropane	0.5 U
110-57-6	trans-1,4-Dichloro-2-butene	1.0 U
108-67-8	**1,3,5-Trimethylbenzene**	**0.2**
95-63-6	**1,2,4-Trimethylbenzene**	**1.5**
87-68-3	Hexachlorobutadiene	0.5 U
106-93-4	Ethylene Dibromide	0.2 U
74-97-5	Bromochloromethane	0.2 U
594-20-7	2,2-Dichloropropane	0.2 U
142-28-9	1,3-Dichloropropane	0.2 U
98-82-8	**Isopropylbenzene**	**0.4**
103-65-1	n-Propylbenzene	0.2 U
108-86-1	Bromobenzene	0.2 U
95-49-8	2-Chlorotoluene	0.2 U
106-43-4	4-Chlorotoluene	0.2 U
98-06-6	tert-Butylbenzene	0.2 U
135-98-8	sec-Butylbenzene	0.2 U
99-87-6	4-Isopropyltoluene	0.2 U
104-51-8	n-Butylbenzene	0.2 U
120-82-1	1,2,4-Trichlorobenzene	0.5 U
91-20-3	**Naphthalene**	**86 EC**
87-61-6	1,2,3-Trichlorobenzene	0.5 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	91.2%
d8-Toluene	92.2%
Bromofluorobenzene	90.8%
d4-1,2-Dichlorobenzene	100%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: NMW-1
REANALYSIS

Lab Sample ID: CM51J-RE
LIMS ID: 00-22659
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Instrument: NT3
Date Analyzed: 11/29/00 19:55

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	2.0 U
67-64-1	Acetone	5.0 U
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	trans-1,2-Dichloroethene	1.0 U
156-59-2	cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
108-05-4	Vinyl Acetate	5.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-02-6	trans-1,3-Dichloropropene	1.0 U
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.0 U
108-90-7	**Chlorobenzene**	11
100-41-4	**Ethylbenzene**	1.8
100-42-5	Styrene	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	2.0 U
1330-20-7	**m,p-Xylene**	1.1

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: NMW-1
REANALYSIS

Lab Sample ID: CM51J-RE
LIMS ID: 00-22659
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Instrument: NT3
Date Analyzed: 11/29/00 19:55

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	**o-Xylene**	**1.4**
95-50-1	1,2-Dichlorobenzene	1.0 U
541-73-1	1,3-Dichlorobenzene	1.0 U
106-46-7	1,4-Dichlorobenzene	1.0 U
107-02-8	Acrolein	50 U
74-88-4	Methyl Iodide	1.0 U
74-96-4	Bromoethane	2.0 U
107-13-1	Acrylonitrile	5.0 U
563-58-6	1,1-Dichloropropene	1.0 U
74-95-3	Dibromomethane	1.0 U
630-20-6	1,1,1,2-Tetrachloroethane	1.0 U
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U
96-18-4	1,2,3-Trichloropropane	3.0 U
110-57-6	trans-1,4-Dichloro-2-butene	5.0 U
108-67-8	1,3,5-Trimethylbenzene	1.0 U
95-63-6	**1,2,4-Trimethylbenzene**	**1.5**
87-68-3	Hexachlorobutadiene	5.0 U
106-93-4	Ethylene Dibromide	1.0 U
74-97-5	Bromochloromethane	1.0 U
594-20-7	2,2-Dichloropropane	1.0 U
142-28-9	1,3-Dichloropropane	1.0 U
98-82-8	Isopropylbenzene	1.0 U
103-65-1	n-Propylbenzene	1.0 U
108-86-1	Bromobenzene	1.0 U
95-49-8	2-Chlorotoluene	1.0 U
106-43-4	4-Chlorotoluene	1.0 U
98-06-6	tert-Butylbenzene	1.0 U
135-98-8	sec-Butylbenzene	1.0 U
99-87-6	4-Isopropyltoluene	1.0 U
104-51-8	n-Butylbenzene	1.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0 U
91-20-3	**Naphthalene**	**43**
87-61-6	1,2,3-Trichlorobenzene	5.0 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	96.9%
d8-Toluene	101%
Bromofluorobenzene	98.0%
d4-1,2-Dichlorobenzene	98.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: MW-7

Lab Sample ID: CM51K
LIMS ID: 00-22660
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Instrument: FINN3
Date Analyzed: 12/03/00 17:47

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	0.2 U
74-83-9	Bromomethane	0.2 U
75-01-4	Vinyl Chloride	0.2 U
75-00-3	Chloroethane	0.2 U
75-09-2	Methylene Chloride	0.3 U
67-64-1	**Acetone**	**1.1**
75-15-0	Carbon Disulfide	0.2 U
75-35-4	1,1-Dichloroethene	0.2 U
75-34-3	1,1-Dichloroethane	0.2 U
156-60-5	trans-1,2-Dichloroethene	0.2 U
156-59-2	cis-1,2-Dichloroethene	0.2 U
67-66-3	Chloroform	0.2 U
107-06-2	1,2-Dichloroethane	0.2 U
78-93-3	2-Butanone	1.0 U
71-55-6	1,1,1-Trichloroethane	0.2 U
56-23-5	Carbon Tetrachloride	0.2 U
108-05-4	Vinyl Acetate	0.2 U
75-27-4	Bromodichloromethane	0.2 U
78-87-5	1,2-Dichloropropane	0.2 U
10061-01-5	cis-1,3-Dichloropropene	0.2 U
79-01-6	Trichloroethene	0.2 U
124-48-1	Dibromochloromethane	0.2 U
79-00-5	1,1,2-Trichloroethane	0.2 U
71-43-2	Benzene	0.2 U
10061-02-6	trans-1,3-Dichloropropene	0.2 U
110-75-8	2-Chloroethylvinylether	0.5 U
75-25-2	Bromoform	0.5 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	1.0 U
591-78-6	2-Hexanone	1.0 U
127-18-4	Tetrachloroethene	0.2 U
79-34-5	1,1,2,2-Tetrachloroethane	0.2 U
108-88-3	Toluene	0.2 U
108-90-7	Chlorobenzene	0.2 U
100-41-4	Ethylbenzene	0.2 U
100-42-5	Styrene	0.2 U
75-69-4	Trichlorofluoromethane	0.2 U
76-13-1	1,1,2-Trichlorotrifluoroethane	0.2 U
1330-20-7	m,p-Xylene	0.4 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: MW-7

Lab Sample ID: CM51K
LIMS ID: 00-22660
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Instrument: FINN3
Date Analyzed: 12/03/00 17:47

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	ug/L
95-47-6	o-Xylene	0.2 U
95-50-1	1,2-Dichlorobenzene	0.2 U
541-73-1	1,3-Dichlorobenzene	0.2 U
106-46-7	1,4-Dichlorobenzene	0.2 U
107-02-8	Acrolein	5.0 U
74-88-4	Methyl Iodide	0.2 U
74-96-4	Bromoethane	0.2 U
107-13-1	Acrylonitrile	1.0 U
563-58-6	1,1-Dichloropropene	0.2 U
74-95-3	Dibromomethane	0.2 U
630-20-6	1,1,1,2-Tetrachloroethane	0.2 U
96-12-8	1,2-Dibromo-3-chloropropane	1.0 U
96-18-4	1,2,3-Trichloropropane	0.5 U
110-57-6	trans-1,4-Dichloro-2-butene	1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.2 U
95-63-6	1,2,4-Trimethylbenzene	0.2 U
87-68-3	Hexachlorobutadiene	0.5 U
106-93-4	Ethylene Dibromide	0.2 U
74-97-5	Bromochloromethane	0.2 U
594-20-7	2,2-Dichloropropane	0.2 U
142-28-9	1,3-Dichloropropane	0.2 U
98-82-8	Isopropylbenzene	0.2 U
103-65-1	n-Propylbenzene	0.2 U
108-86-1	Bromobenzene	0.2 U
95-49-8	2-Chlorotoluene	0.2 U
106-43-4	4-Chlorotoluene	0.2 U
98-06-6	tert-Butylbenzene	0.2 U
135-98-8	sec-Butylbenzene	0.2 U
99-87-6	4-Isopropyltoluene	0.2 U
104-51-8	n-Butylbenzene	0.2 U
120-82-1	1,2,4-Trichlorobenzene	0.5 U
91-20-3	Naphthalene	0.5 U
87-61-6	1,2,3-Trichlorobenzene	0.5 U

Volatile Surrogate Recovery	
d4-1,2-Dichloroethane	95.0%
d8-Toluene	97.5%
Bromofluorobenzene	107%
d4-1,2-Dichlorobenzene	106%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: MW-1

Lab Sample ID: CM51L
LIMS ID: 00-22661
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Instrument: FINN3
Date Analyzed: 12/03/00 18:14

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	0.2 U
74-83-9	Bromomethane	0.2 U
75-01-4	Vinyl Chloride	0.2 U
75-00-3	Chloroethane	0.2 U
75-09-2	Methylene Chloride	0.3 U
67-64-1	**Acetone**	**1.8**
75-15-0	Carbon Disulfide	0.2 U
75-35-4	1,1-Dichloroethene	0.2 U
75-34-3	1,1-Dichloroethane	0.2 U
156-60-5	trans-1,2-Dichloroethene	0.2 U
156-59-2	cis-1,2-Dichloroethene	0.2 U
67-66-3	Chloroform	0.2 U
107-06-2	1,2-Dichloroethane	0.2 U
78-93-3	2-Butanone	1.0 U
71-55-6	1,1,1-Trichloroethane	0.2 U
56-23-5	Carbon Tetrachloride	0.2 U
108-05-4	Vinyl Acetate	0.2 U
75-27-4	Bromodichloromethane	0.2 U
78-87-5	1,2-Dichloropropane	0.2 U
10061-01-5	cis-1,3-Dichloropropene	0.2 U
79-01-6	Trichloroethene	0.2 U
124-48-1	Dibromochloromethane	0.2 U
79-00-5	1,1,2-Trichloroethane	0.2 U
71-43-2	Benzene	0.2 U
10061-02-6	trans-1,3-Dichloropropene	0.2 U
110-75-8	2-Chloroethylvinylether	0.5 U
75-25-2	Bromoform	0.5 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	1.0 U
591-78-6	2-Hexanone	1.0 U
127-18-4	Tetrachloroethene	0.2 U
79-34-5	1,1,2,2-Tetrachloroethane	0.2 U
108-88-3	Toluene	0.2 U
108-90-7	Chlorobenzene	0.2 U
100-41-4	Ethylbenzene	0.2 U
100-42-5	Styrene	0.2 U
75-69-4	Trichlorofluoromethane	0.2 U
76-13-1	1,1,2-Trichlorotrifluoroethane	0.2 U
1330-20-7	m,p-Xylene	0.4 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: MW-1

Lab Sample ID: CM51L
LIMS ID: 00-22661
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Instrument: FINN3
Date Analyzed: 12/03/00 18:14

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	ug/L
95-47-6	o-Xylene	0.2 U
95-50-1	1,2-Dichlorobenzene	0.2 U
541-73-1	1,3-Dichlorobenzene	0.2 U
106-46-7	1,4-Dichlorobenzene	0.2 U
107-02-8	Acrolein	5.0 U
74-88-4	Methyl Iodide	0.2 U
74-96-4	Bromoethane	0.2 U
107-13-1	Acrylonitrile	1.0 U
563-58-6	1,1-Dichloropropene	0.2 U
74-95-3	Dibromomethane	0.2 U
630-20-6	1,1,1,2-Tetrachloroethane	0.2 U
96-12-8	1,2-Dibromo-3-chloropropane	1.0 U
96-18-4	1,2,3-Trichloropropane	0.5 U
110-57-6	trans-1,4-Dichloro-2-butene	1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.2 U
95-63-6	1,2,4-Trimethylbenzene	0.2 U
87-68-3	Hexachlorobutadiene	0.5 U
106-93-4	Ethylene Dibromide	0.2 U
74-97-5	Bromochloromethane	0.2 U
594-20-7	2,2-Dichloropropane	0.2 U
142-28-9	1,3-Dichloropropane	0.2 U
98-82-8	Isopropylbenzene	0.2 U
103-65-1	n-Propylbenzene	0.2 U
108-86-1	Bromobenzene	0.2 U
95-49-8	2-Chlorotoluene	0.2 U
106-43-4	4-Chlorotoluene	0.2 U
98-06-6	tert-Butylbenzene	0.2 U
135-98-8	sec-Butylbenzene	0.2 U
99-87-6	4-Isopropyltoluene	0.2 U
104-51-8	n-Butylbenzene	0.2 U
120-82-1	1,2,4-Trichlorobenzene	0.5 U
91-20-3	Naphthalene	0.5 U
87-61-6	1,2,3-Trichlorobenzene	0.5 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	96.5%
d8-Toluene	99.0%
Bromofluorobenzene	101%
d4-1,2-Dichlorobenzene	98.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Trip Blank

Lab Sample ID: CM51Y
LIMS ID: 00-22674
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Instrument: FINN3
Date Analyzed: 11/28/00 17:00

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	0.2 U
74-83-9	Bromomethane	0.2 U
75-01-4	Vinyl Chloride	0.2 U
75-00-3	Chloroethane	0.2 U
75-09-2	Methylene Chloride	0.3 U
67-64-1	Acetone	1.0 U
75-15-0	Carbon Disulfide	0.2 U
75-35-4	1,1-Dichloroethene	0.2 U
75-34-3	1,1-Dichloroethane	0.2 U
156-60-5	trans-1,2-Dichloroethene	0.2 U
156-59-2	cis-1,2-Dichloroethene	0.2 U
67-66-3	Chloroform	0.2 U
107-06-2	1,2-Dichloroethane	0.2 U
78-93-3	2-Butanone	1.0 U
71-55-6	1,1,1-Trichloroethane	0.2 U
56-23-5	Carbon Tetrachloride	0.2 U
108-05-4	Vinyl Acetate	0.2 U
75-27-4	Bromodichloromethane	0.2 U
78-87-5	1,2-Dichloropropane	0.2 U
10061-01-5	cis-1,3-Dichloropropene	0.2 U
79-01-6	Trichloroethene	0.2 U
124-48-1	Dibromochloromethane	0.2 U
79-00-5	1,1,2-Trichloroethane	0.2 U
71-43-2	Benzene	0.2 U
10061-02-6	trans-1,3-Dichloropropene	0.2 U
110-75-8	2-Chloroethylvinylether	0.5 U
75-25-2	Bromoform	0.5 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	1.0 U
591-78-6	2-Hexanone	1.0 U
127-18-4	Tetrachloroethene	0.2 U
79-34-5	1,1,2,2-Tetrachloroethane	0.2 U
108-88-3	Toluene	0.2 U
108-90-7	Chlorobenzene	0.2 U
100-41-4	Ethylbenzene	0.2 U
100-42-5	Styrene	0.2 U
75-69-4	Trichlorofluoromethane	0.2 U
76-13-1	1,1,2-Trichlorotrifluoroethane	0.2 U
1330-20-7	m,p-Xylene	0.4 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Trip Blank

Lab Sample ID: CM51Y
LIMS ID: 00-22674
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Instrument: FINN3
Date Analyzed: 11/28/00 17:00

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	ug/L
95-47-6	o-Xylene	0.2 U
95-50-1	1,2-Dichlorobenzene	0.2 U
541-73-1	1,3-Dichlorobenzene	0.2 U
106-46-7	1,4-Dichlorobenzene	0.2 U
107-02-8	Acrolein	5.0 U
74-88-4	Methyl Iodide	0.2 U
74-96-4	Bromoethane	0.2 U
107-13-1	Acrylonitrile	1.0 U
563-58-6	1,1-Dichloropropene	0.2 U
74-95-3	Dibromomethane	0.2 U
630-20-6	1,1,1,2-Tetrachloroethane	0.2 U
96-12-8	1,2-Dibromo-3-chloropropane	1.0 U
96-18-4	1,2,3-Trichloropropane	0.5 U
110-57-6	trans-1,4-Dichloro-2-butene	1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.2 U
95-63-6	1,2,4-Trimethylbenzene	0.2 U
87-68-3	Hexachlorobutadiene	0.5 U
106-93-4	Ethylene Dibromide	0.2 U
74-97-5	Bromochloromethane	0.2 U
594-20-7	2,2-Dichloropropane	0.2 U
142-28-9	1,3-Dichloropropane	0.2 U
98-82-8	Isopropylbenzene	0.2 U
103-65-1	n-Propylbenzene	0.2 U
108-86-1	Bromobenzene	0.2 U
95-49-8	2-Chlorotoluene	0.2 U
106-43-4	4-Chlorotoluene	0.2 U
98-06-6	tert-Butylbenzene	0.2 U
135-98-8	sec-Butylbenzene	0.2 U
99-87-6	4-Isopropyltoluene	0.2 U
104-51-8	n-Butylbenzene	0.2 U
120-82-1	1,2,4-Trichlorobenzene	0.5 U
91-20-3	Naphthalene	0.5 U
87-61-6	1,2,3-Trichlorobenzene	0.5 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	109%
d8-Toluene	98.0%
Bromofluorobenzene	91.5%
d4-1,2-Dichlorobenzene	101%

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Sample No: NMW-4
Lab Sample ID: CM51A
QC Report No: CM51-Kennedy Jenks Consultants
LIMS ID: 00-22650
Project: Tacoma Metals
Matrix: Water
996098.00
Date Received: 11/22/00

Data Release Authorized
Reported: 12/14/00

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY
Date Analyzed: 11/30/00

CONSTITUENT	SAMPLE VALUE	SPIKE VALUE	SPIKE AMT	% RECOVERY
MATRIX SPIKE				
Chloromethane	< 0.2	50.7	50.0	101%
Bromomethane	< 0.2	52.4	50.0	105%
Vinyl Chloride	< 0.2	41.3	50.0	82.6%
Chloroethane	< 0.2	47.0	50.0	94.0%
Methylene Chloride	< 0.3	45.9	50.0	91.8%
Acetone	1.5	323	250	129%
Carbon Disulfide	< 0.2	51.8	50.0	104%
1,1-Dichloroethene	< 0.2	44.2	50.0	88.4%
1,1-Dichloroethane	< 0.2	44.2	50.0	88.4%
trans-1,2-Dichloroethene	< 0.2	43.6	50.0	87.2%
cis-1,2-Dichloroethene	< 0.2	46.5	50.0	93.0%
Chloroform	< 0.2	46.3	50.0	92.6%
1,2-Dichloroethane	< 0.2	46.8	50.0	93.6%
2-Butanone	< 1.0	326	250	130%
1,1,1-Trichloroethane	< 0.2	45.6	50.0	91.2%
Carbon Tetrachloride	< 0.2	45.3	50.0	90.6%
Vinyl Acetate	< 0.2	56.0	50.0	112%
Bromodichloromethane	< 0.2	46.4	50.0	92.8%
1,2-Dichloropropane	< 0.2	48.8	50.0	97.6%
cis-1,3-Dichloropropene	< 0.2	42.6	50.0	85.2%
Trichloroethene	< 0.2	45.3	50.0	90.6%
Dibromochloromethane	< 0.2	47.4	50.0	94.8%
1,1,2-Trichloroethane	< 0.2	48.0	50.0	96.0%
Benzene	0.6	46.9	50.0	92.7%
trans-1,3-Dichloropropene	< 0.2	42.6	50.0	85.2%
Bromoform	< 0.5	48.8	50.0	97.6%
4-Methyl-2-Pentanone (MIBK)	< 1.0	324	250	130%
2-Hexanone	< 1.0	326	250	130%
Tetrachloroethene	< 0.2	45.6	50.0	91.2%
1,1,2,2-Tetrachloroethane	< 0.2	49.4	50.0	98.8%
Toluene	0.4	48.1	50.0	95.4%
Chlorobenzene	< 0.2	46.8	50.0	93.6%
Ethylbenzene	0.6	46.4	50.0	91.6%
Styrene	< 0.2	48.2	50.0	96.4%
Trichlorofluoromethane	< 0.2	41.8	50.0	83.6%

Reported in ug/L

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Sample No: NMW-4
Lab Sample ID: CM51A
QC Report No: CM51-Kennedy Jenks Consultants
LIMS ID: 00-22650
Project: Tacoma Metals
Matrix: Water
996098.00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/14/00

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY
Date Analyzed: 11/30/00

CONSTITUENT		SAMPLE VALUE	SPIKE VALUE	SPIKE AMT	% RECOVERY
MATRIX SPIKE					
1,1,2-Trichlorotrifluoroethane	<	0.2	49.7	50.0	99.4%
m,p-Xylene		1.0	96.7	100	95.7%
O-Xylene		1.1	49.1	50.0	96.0%
1,2-Dichlorobenzene	<	0.2	47.0	50.0	94.0%
1,3-Dichlorobenzene	<	0.2	47.3	50.0	94.6%
1,4-Dichlorobenzene	<	0.2	47.3	50.0	94.6%
Acrolein	<	5.0	319	250	128%
Methyl Iodide	<	0.2	43.6	50.0	87.2%
Bromoethane	<	0.2	47.3	50.0	94.6%
Acrylonitrile	<	1.0	59.3	50.0	119%
1,1-Dichloropropene	<	0.2	46.8	50.0	93.6%
Dibromomethane	<	0.2	48.2	50.0	96.4%
1,1,1,2-Tetrachloroethane	<	0.2	45.2	50.0	90.4%
1,2-Dibromo-3-chloropropane	<	1.0	56.4	50.0	113%
1,2,3-Trichloropropane	<	0.5	50.3	50.0	101%
trans-1,4-Dichloro-2-butene	<	1.0	41.2	50.0	82.4%
1,3,5-Trimethylbenzene		0.6	47.5	50.0	93.8%
1,2,4-Trimethylbenzene		1.8	49.6	50.0	95.5%
Hexachlorobutadiene	<	0.5	49.3	50.0	98.6%
Ethylene Dibromide	<	0.2	47.5	50.0	95.0%
Bromochloromethane	<	0.2	45.4	50.0	90.8%
2,2-Dichloropropane	<	0.2	44.9	50.0	89.8%
1,3-Dichloropropane	<	0.2	46.7	50.0	93.4%
Isopropylbenzene		0.9	48.2	50.0	94.6%
n-Propylbenzene		0.3	46.7	50.0	92.7%
Bromobenzene	<	0.2	46.4	50.0	92.8%
2-Chlorotoluene	<	0.2	46.9	50.0	93.8%
4-Chlorotoluene	<	0.2	45.1	50.0	90.2%
tert-Butylbenzene	<	0.2	47.8	50.0	95.6%
sec-Butylbenzene	<	0.2	48.9	50.0	97.8%
4-Isopropyltoluene		5.8	52.6	50.0	93.7%
n-Butylbenzene	<	0.2	47.1	50.0	94.2%
1,2,4-Trichlorobenzene	<	0.5	47.6	50.0	95.2%
Naphthalene		140	161	50.0	42.0%
1,2,3-Trichlorobenzene	<	0.5	49.0	50.0	98.0%

Reported in ug/L

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Sample No: NMW-4
QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 11/22/00

Lab Sample ID: CM51A
LIMS ID: 00-22650
Matrix: Water

Data Release Authorized
Reported: 12/14/00

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY
Date Analyzed: 11/30/00

CONSTITUENT	SAMPLE VALUE	SPIKE VALUE	SPIKE AMT	% RECOVERY	RPD
MATRIX SPIKE DUPLICATE					
Chloromethane	< 0.2	51.8	50.0	104%	2.5%
Bromomethane	< 0.2	54.9	50.0	110%	4.8%
Vinyl Chloride	< 0.2	38.2	50.0	76.4%	7.8%
Chloroethane	< 0.2	48.1	50.0	96.2%	2.3%
Methylene Chloride	< 0.3	46.7	50.0	93.4%	1.7%
Acetone	1.5	345	250	137%	6.3%
Carbon Disulfide	< 0.2	50.4	50.0	101%	2.5%
1,1-Dichloroethene	< 0.2	45.5	50.0	91.0%	2.9%
1,1-Dichloroethane	< 0.2	46.4	50.0	92.8%	4.9%
trans-1,2-Dichloroethene	< 0.2	45.4	50.0	90.8%	4.0%
cis-1,2-Dichloroethene	< 0.2	48.5	50.0	97.0%	4.2%
Chloroform	< 0.2	46.8	50.0	93.6%	1.1%
1,2-Dichloroethane	< 0.2	48.4	50.0	96.8%	3.4%
2-Butanone	< 1.0	348	250	139%	6.4%
1,1,1-Trichloroethane	< 0.2	47.1	50.0	94.2%	3.2%
Carbon Tetrachloride	< 0.2	45.7	50.0	91.4%	0.9%
Vinyl Acetate	< 0.2	56.3	50.0	113%	0.9%
Bromodichloromethane	< 0.2	47.4	50.0	94.8%	2.1%
1,2-Dichloropropane	< 0.2	49.8	50.0	99.6%	2.0%
cis-1,3-Dichloropropene	< 0.2	43.5	50.0	87.0%	2.1%
Trichloroethene	< 0.2	46.1	50.0	92.2%	1.8%
Dibromochloromethane	< 0.2	47.0	50.0	94.0%	0.8%
1,1,2-Trichloroethane	< 0.2	47.5	50.0	95.0%	1.0%
Benzene	0.6	47.4	50.0	93.7%	1.1%
trans-1,3-Dichloropropene	< 0.2	43.7	50.0	87.4%	2.5%
Bromoform	< 0.5	48.4	50.0	96.8%	0.8%
4-Methyl-2-Pentanone (MIBK)	< 1.0	337	250	135%	4.1%
2-Hexanone	< 1.0	328	250	131%	0.5%
Tetrachloroethene	< 0.2	45.6	50.0	91.2%	0.0%
1,1,2,2-Tetrachloroethane	< 0.2	49.7	50.0	99.4%	0.6%
Toluene	0.4	48.5	50.0	96.2%	0.9%
Chlorobenzene	< 0.2	46.4	50.0	92.8%	0.9%
Ethylbenzene	0.6	45.9	50.0	90.6%	1.1%
Styrene	< 0.2	48.1	50.0	96.2%	0.2%
Trichlorofluoromethane	< 0.2	43.0	50.0	86.0%	2.8%

Reported in ug/L

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Sample No: NMW-4
Lab Sample ID: CM51A
QC Report No: CM51-Kennedy Jenks Consultants
LIMS ID: 00-22650
Project: Tacoma Metals
Matrix: Water
996098.00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/14/00

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Date Analyzed: 11/30/00

CONSTITUENT	SAMPLE VALUE	SPIKE VALUE	SPIKE AMT	% RECOVERY	RPD
MATRIX SPIKE DUPLICATE					
1,1,2-Trichlorotrifluoroethane	< 0.2	47.4	50.0	94.8%	4.7%
m,p-Xylene	1.0	95.3	100	94.3%	1.5%
O-Xylene	1.1	48.7	50.0	95.2%	0.8%
1,2-Dichlorobenzene	< 0.2	47.2	50.0	94.4%	0.4%
1,3-Dichlorobenzene	< 0.2	47.2	50.0	94.4%	0.2%
1,4-Dichlorobenzene	< 0.2	46.9	50.0	93.8%	0.8%
Acrolein	< 5.0	359	250	144%	12%
Methyl Iodide	< 0.2	52.2	50.0	104%	18%
Bromoethane	< 0.2	46.0	50.0	92.0%	2.8%
Acrylonitrile	< 1.0	57.3	50.0	115%	3.1%
1,1-Dichloropropene	< 0.2	47.8	50.0	95.6%	2.1%
Dibromomethane	< 0.2	49.0	50.0	98.0%	1.6%
1,1,1,2-Tetrachloroethane	< 0.2	44.9	50.0	89.8%	0.7%
1,2-Dibromo-3-chloropropane	< 1.0	52.9	50.0	106%	6.2%
1,2,3-Trichloropropane	< 0.5	50.1	50.0	100%	0.6%
trans-1,4-Dichloro-2-butene	< 1.0	38.2	50.0	76.4%	7.6%
1,3,5-Trimethylbenzene	0.6	47.1	50.0	93.0%	0.9%
1,2,4-Trimethylbenzene	1.8	49.5	50.0	95.3%	0.2%
Hexachlorobutadiene	< 0.5	49.2	50.0	98.4%	0.2%
Ethylene Dibromide	< 0.2	48.3	50.0	96.6%	1.7%
Bromochloromethane	< 0.2	48.2	50.0	96.4%	6.0%
2,2-Dichloropropane	< 0.2	45.6	50.0	91.2%	1.5%
1,3-Dichloropropane	< 0.2	47.2	50.0	94.4%	1.1%
Isopropylbenzene	0.9	48.4	50.0	95.0%	0.4%
n-Propylbenzene	0.3	46.5	50.0	92.3%	0.5%
Bromobenzene	< 0.2	49.0	50.0	98.0%	5.5%
2-Chlorotoluene	< 0.2	49.0	50.0	98.0%	4.4%
4-Chlorotoluene	< 0.2	43.5	50.0	87.0%	3.6%
tert-Butylbenzene	< 0.2	47.1	50.0	94.2%	1.5%
sec-Butylbenzene	< 0.2	48.6	50.0	97.2%	0.6%
4-Isopropyltoluene	5.8	51.9	50.0	92.3%	1.5%
n-Butylbenzene	< 0.2	46.4	50.0	92.8%	1.5%
1,2,4-Trichlorobenzene	< 0.5	48.0	50.0	96.0%	0.8%
Naphthalene	140	149	50.0	18.0%	80%
1,2,3-Trichlorobenzene	< 0.5	49.5	50.0	99.0%	1.0%

Reported in ug/L

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: NMW-4
MATRIX SPIKE

Lab Sample ID: CM51A-MS
LIMS ID: 00-22650
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Instrument: NT3
Date Analyzed: 11/30/00 16:16

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	---
74-83-9	Bromomethane	---
75-01-4	Vinyl Chloride	---
75-00-3	Chloroethane	---
75-09-2	Methylene Chloride	---
67-64-1	Acetone	---
75-15-0	Carbon Disulfide	---
75-35-4	1,1-Dichloroethene	---
75-34-3	1,1-Dichloroethane	---
156-60-5	trans-1,2-Dichloroethene	---
156-59-2	cis-1,2-Dichloroethene	---
67-66-3	Chloroform	---
107-06-2	1,2-Dichloroethane	---
78-93-3	2-Butanone	---
71-55-6	1,1,1-Trichloroethane	---
56-23-5	Carbon Tetrachloride	---
108-05-4	Vinyl Acetate	---
75-27-4	Bromodichloromethane	---
78-87-5	1,2-Dichloropropane	---
10061-01-5	cis-1,3-Dichloropropene	---
79-01-6	Trichloroethene	---
124-48-1	Dibromochloromethane	---
79-00-5	1,1,2-Trichloroethane	---
71-43-2	Benzene	---
10061-02-6	trans-1,3-Dichloropropene	---
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	---
108-10-1	4-Methyl-2-Pentanone (MIBK)	---
591-78-6	2-Hexanone	---
127-18-4	Tetrachloroethene	---
79-34-5	1,1,2,2-Tetrachloroethane	---
108-88-3	Toluene	---
108-90-7	Chlorobenzene	---
100-41-4	Ethylbenzene	---
100-42-5	Styrene	---
75-69-4	Trichlorofluoromethane	---
76-13-1	1,1,2-Trichlorotrifluoroethane	---
1330-20-7	m,p-Xylene	---

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: NMW-4
MATRIX SPIKE

Lab Sample ID: CM51A-MS
LIMS ID: 00-22650
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Instrument: NT3
Date Analyzed: 11/30/00 16:16

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	o-Xylene	---
95-50-1	1,2-Dichlorobenzene	---
541-73-1	1,3-Dichlorobenzene	---
106-46-7	1,4-Dichlorobenzene	---
107-02-8	Acrolein	---
74-88-4	Methyl Iodide	---
74-96-4	Bromoethane	---
107-13-1	Acrylonitrile	---
563-58-6	1,1-Dichloropropene	---
74-95-3	Dibromomethane	---
630-20-6	1,1,1,2-Tetrachloroethane	---
96-12-8	1,2-Dibromo-3-chloropropane	---
96-18-4	1,2,3-Trichloropropane	---
110-57-6	trans-1,4-Dichloro-2-butene	---
108-67-8	1,3,5-Trimethylbenzene	---
95-63-6	1,2,4-Trimethylbenzene	---
87-68-3	Hexachlorobutadiene	---
106-93-4	Ethylene Dibromide	---
74-97-5	Bromochloromethane	---
594-20-7	2,2-Dichloropropane	---
142-28-9	1,3-Dichloropropane	---
98-82-8	Isopropylbenzene	---
103-65-1	n-Propylbenzene	---
108-86-1	Bromobenzene	---
95-49-8	2-Chlorotoluene	---
106-43-4	4-Chlorotoluene	---
98-06-6	tert-Butylbenzene	---
135-98-8	sec-Butylbenzene	---
99-87-6	4-Isopropyltoluene	---
104-51-8	n-Butylbenzene	---
120-82-1	1,2,4-Trichlorobenzene	---
91-20-3	Naphthalene	---
87-61-6	1,2,3-Trichlorobenzene	---

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	103%
d8-Toluene	101%
Bromofluorobenzene	105%
d4-1,2-Dichlorobenzene	102%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: NMW-4
SPIKE DUPLICATE

Lab Sample ID: CM51A-MSD
LIMS ID: 00-22650
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Instrument: NT3
Date Analyzed: 11/30/00 16:43

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	---
74-83-9	Bromomethane	---
75-01-4	Vinyl Chloride	---
75-00-3	Chloroethane	---
75-09-2	Methylene Chloride	---
67-64-1	Acetone	---
75-15-0	Carbon Disulfide	---
75-35-4	1,1-Dichloroethene	---
75-34-3	1,1-Dichloroethane	---
156-60-5	trans-1,2-Dichloroethene	---
156-59-2	cis-1,2-Dichloroethene	---
67-66-3	Chloroform	---
107-06-2	1,2-Dichloroethane	---
78-93-3	2-Butanone	---
71-55-6	1,1,1-Trichloroethane	---
56-23-5	Carbon Tetrachloride	---
108-05-4	Vinyl Acetate	---
75-27-4	Bromodichloromethane	---
78-87-5	1,2-Dichloropropane	---
10061-01-5	cis-1,3-Dichloropropene	---
79-01-6	Trichloroethene	---
124-48-1	Dibromochloromethane	---
79-00-5	1,1,2-Trichloroethane	---
71-43-2	Benzene	---
10061-02-6	trans-1,3-Dichloropropene	---
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	---
108-10-1	4-Methyl-2-Pentanone (MIBK)	---
591-78-6	2-Hexanone	---
127-18-4	Tetrachloroethene	---
79-34-5	1,1,2,2-Tetrachloroethane	---
108-88-3	Toluene	---
108-90-7	Chlorobenzene	---
100-41-4	Ethylbenzene	---
100-42-5	Styrene	---
75-69-4	Trichlorofluoromethane	---
76-13-1	1,1,2-Trichlorotrifluoroethane	---
1330-20-7	m,p-Xylene	---

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: NMW-4
SPIKE DUPLICATE

Lab Sample ID: CM51A-MSD
LIMS ID: 00-22650
Matrix: Water
Data Release Authorized:
Reported: 12/14/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Instrument: NT3
Date Analyzed: 11/30/00 16:43

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	o-Xylene	---
95-50-1	1,2-Dichlorobenzene	---
541-73-1	1,3-Dichlorobenzene	---
106-46-7	1,4-Dichlorobenzene	---
107-02-8	Acrolein	---
74-88-4	Methyl Iodide	---
74-96-4	Bromoethane	---
107-13-1	Acrylonitrile	---
563-58-6	1,1-Dichloropropene	---
74-95-3	Dibromomethane	---
630-20-6	1,1,1,2-Tetrachloroethane	---
96-12-8	1,2-Dibromo-3-chloropropane	---
96-18-4	1,2,3-Trichloropropane	---
110-57-6	trans-1,4-Dichloro-2-butene	---
108-67-8	1,3,5-Trimethylbenzene	---
95-63-6	1,2,4-Trimethylbenzene	---
87-68-3	Hexachlorobutadiene	---
106-93-4	Ethylene Dibromide	---
74-97-5	Bromochloromethane	---
594-20-7	2,2-Dichloropropane	---
142-28-9	1,3-Dichloropropane	---
98-82-8	Isopropylbenzene	---
103-65-1	n-Propylbenzene	---
108-86-1	Bromobenzene	---
95-49-8	2-Chlorotoluene	---
106-43-4	4-Chlorotoluene	---
98-06-6	tert-Butylbenzene	---
135-98-8	sec-Butylbenzene	---
99-87-6	4-Isopropyltoluene	---
104-51-8	n-Butylbenzene	---
120-82-1	1,2,4-Trichlorobenzene	---
91-20-3	Naphthalene	---
87-61-6	1,2,3-Trichlorobenzene	---

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	103%
d8-Toluene	101%
Bromofluorobenzene	102%
d4-1,2-Dichlorobenzene	100%

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CM51SB
LIMS ID: 00-22674
Matrix: Water
Data Release Authorized:
Reported: 12/14/00
Date Analyzed: 11/28/00
Instrument: FINN3

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 11/22/00

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
Chloromethane	3.20	4.0	80.0%
Bromomethane	3.47	4.0	86.8%
Vinyl Chloride	3.26	4.0	81.5%
Chloroethane	3.59	4.0	89.8%
Methylene Chloride	3.68	4.0	92.0%
Acetone	24.5	20.0	122%
Carbon Disulfide	4.25	4.0	106%
1,1-Dichloroethene	3.48	4.0	87.0%
1,1-Dichloroethane	3.59	4.0	89.8%
trans-1,2-Dichloroethene	3.52	4.0	88.0%
cis-1,2-Dichloroethene	3.42	4.0	85.5%
Chloroform	3.66	4.0	91.5%
1,2-Dichloroethane	3.57	4.0	89.2%
2-Butanone	20.4	20.0	102%
1,1,1-Trichloroethane	3.44	4.0	86.0%
Carbon Tetrachloride	3.34	4.0	83.5%
Vinyl Acetate	4.44	4.0	111%
Bromodichloromethane	3.33	4.0	83.2%
1,2-Dichloropropane	3.59	4.0	89.8%
cis-1,3-Dichloropropene	3.18	4.0	79.5%
Trichloroethene	3.41	4.0	85.2%
Dibromochloromethane	3.46	4.0	86.5%
1,1,2-Trichloroethane	3.48	4.0	87.0%
Benzene	3.52	4.0	88.0%
trans-1,3-Dichloropropene	3.13	4.0	78.2%
Bromoform	3.51	4.0	87.8%
4-Methyl-2-Pentanone (MIBK)	18.3	20.0	91.5%
2-Hexanone	19.5	20.0	97.5%
Tetrachloroethene	3.58	4.0	89.5%
1,1,2,2-Tetrachloroethane	3.55	4.0	88.8%
Toluene	3.36	4.0	84.0%
Chlorobenzene	3.48	4.0	87.0%
Ethylbenzene	3.36	4.0	84.0%
Styrene	3.36	4.0	84.0%
Trichlorofluoromethane	3.26	4.0	81.5%
1,1,2-Trichlorotrifluoroethane	3.94	4.0	98.5%
m,p-Xylene	7.05	8.0	88.1%
O-Xylene	3.43	4.0	85.8%
1,2-Dichlorobenzene	3.63	4.0	90.8%

Reported in ug/L

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CM51SB
LIMS ID: 00-22674
Matrix: Water
Data Release Authorized:
Reported: 12/14/00
Date Analyzed: 11/28/00
Instrument: FINN3

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 11/22/00

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
1,3-Dichlorobenzene	3.52	4.0	88.0%
1,4-Dichlorobenzene	3.50	4.0	87.5%
Acrolein	19.9	20.0	99.5%
Methyl Iodide	3.44	4.0	86.0%
Bromoethane	3.66	4.0	91.5%
Acrylonitrile	4.14	4.0	104%
1,1-Dichloropropene	3.45	4.0	86.2%
Dibromomethane	3.41	4.0	85.2%
1,1,1,2-Tetrachloroethane	3.51	4.0	87.8%
1,2-Dibromo-3-chloropropane	3.98	4.0	99.5%
1,2,3-Trichloropropane	3.49	4.0	87.2%
trans-1,4-Dichloro-2-butene	3.01	4.0	75.2%
1,3,5-Trimethylbenzene	3.62	4.0	90.5%
1,2,4-Trimethylbenzene	3.72	4.0	93.0%
Hexachlorobutadiene	3.64	4.0	91.0%
Ethylene Dibromide	3.40	4.0	85.0%
Bromochloromethane	3.51	4.0	87.8%
2,2-Dichloropropane	3.49	4.0	87.2%
1,3-Dichloropropane	3.44	4.0	86.0%
Isopropylbenzene	3.63	4.0	90.8%
n-Propylbenzene	3.51	4.0	87.8%
Bromobenzene	3.50	4.0	87.5%
2-Chlorotoluene	3.22	4.0	80.5%
4-Chlorotoluene	3.95	4.0	98.8%
tert-Butylbenzene	3.19	4.0	79.8%
sec-Butylbenzene	3.71	4.0	92.8%
4-Isopropyltoluene	3.73	4.0	93.2%
n-Butylbenzene	3.81	4.0	95.2%
1,2,4-Trichlorobenzene	3.91	4.0	97.8%
Naphthalene	3.82	4.0	95.5%
1,2,3-Trichlorobenzene	3.97	4.0	99.2%

Lab Control Surrogate Recovery	
d4-1,2-Dichloroethane	102%
d8-Toluene	97.2%
Bromofluorobenzene	97.0%
d4-1,2-Dichlorobenzene	102%

Reported in ug/L

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CM51SB
LIMS ID: 00-22652
Matrix: Water
Data Release Authorized:
Reported: 12/14/00
Date Analyzed: 11/29/00
Instrument: NT3

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 11/22/00

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
Chloromethane	52.0	50.0	104%
Bromomethane	58.9	50.0	118%
Vinyl Chloride	51.6	50.0	103%
Chloroethane	50.3	50.0	101%
Methylene Chloride	47.5	50.0	95.0%
Acetone	281.	250	112%
Carbon Disulfide	47.6	50.0	95.2%
1,1-Dichloroethene	47.1	50.0	94.2%
1,1-Dichloroethane	48.8	50.0	97.6%
trans-1,2-Dichloroethene	46.2	50.0	92.4%
cis-1,2-Dichloroethene	48.0	50.0	96.0%
Chloroform	48.3	50.0	96.6%
1,2-Dichloroethane	47.5	50.0	95.0%
2-Butanone	285.	250	114%
1,1,1-Trichloroethane	47.8	50.0	95.6%
Carbon Tetrachloride	49.3	50.0	98.6%
Vinyl Acetate	53.9	50.0	108%
Bromodichloromethane	49.8	50.0	99.6%
1,2-Dichloropropane	50.8	50.0	102%
cis-1,3-Dichloropropene	45.6	50.0	91.2%
Trichloroethene	48.4	50.0	96.8%
Dibromochloromethane	49.0	50.0	98.0%
1,1,2-Trichloroethane	48.4	50.0	96.8%
Benzene	49.0	50.0	98.0%
trans-1,3-Dichloropropene	46.0	50.0	92.0%
Bromoform	50.2	50.0	100%
4-Methyl-2-Pentanone (MIBK)	280.	250	112%
2-Hexanone	273.	250	109%
Tetrachloroethene	47.5	50.0	95.0%
1,1,2,2-Tetrachloroethane	47.5	50.0	95.0%
Toluene	49.1	50.0	98.2%
Chlorobenzene	47.9	50.0	95.8%
Ethylbenzene	47.0	50.0	94.0%
Styrene	48.3	50.0	96.6%
Trichlorofluoromethane	45.2	50.0	90.4%
1,1,2-Trichlorotrifluoroethane	44.8	50.0	89.6%
m,p-Xylene	95.8	100	95.8%
O-Xylene	47.8	50.0	95.6%
1,2-Dichlorobenzene	47.2	50.0	94.4%

Reported in ug/L

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CM51SB
LIMS ID: 00-22652
Matrix: Water
Data Release Authorized:
Reported: 12/14/00
Date Analyzed: 11/29/00
Instrument: NT3

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 11/22/00

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
1,3-Dichlorobenzene	48.6	50.0	97.2%
1,4-Dichlorobenzene	49.1	50.0	98.2%
Acrolein	293.	250	117%
Methyl Iodide	48.5	50.0	97.0%
Bromoethane	44.9	50.0	89.8%
Acrylonitrile	49.8	50.0	99.6%
1,1-Dichloropropene	50.6	50.0	101%
Dibromomethane	47.9	50.0	95.8%
1,1,1,2-Tetrachloroethane	47.0	50.0	94.0%
1,2-Dibromo-3-chloropropane	47.6	50.0	95.2%
1,2,3-Trichloropropane	49.8	50.0	99.6%
trans-1,4-Dichloro-2-butene	36.4	50.0	72.8%
1,3,5-Trimethylbenzene	48.5	50.0	97.0%
1,2,4-Trimethylbenzene	49.9	50.0	99.8%
Hexachlorobutadiene	47.5	50.0	95.0%
Ethylene Dibromide	47.4	50.0	94.8%
Bromochloromethane	47.3	50.0	94.6%
2,2-Dichloropropane	48.3	50.0	96.6%
1,3-Dichloropropane	48.6	50.0	97.2%
Isopropylbenzene	49.0	50.0	98.0%
n-Propylbenzene	47.9	50.0	95.8%
Bromobenzene	48.5	50.0	97.0%
2-Chlorotoluene	48.0	50.0	96.0%
4-Chlorotoluene	48.0	50.0	96.0%
tert-Butylbenzene	48.1	50.0	96.2%
sec-Butylbenzene	50.2	50.0	100%
4-Isopropyltoluene	49.0	50.0	98.0%
n-Butylbenzene	48.3	50.0	96.6%
1,2,4-Trichlorobenzene	48.9	50.0	97.8%
Naphthalene	49.3	50.0	98.6%
1,2,3-Trichlorobenzene	48.4	50.0	96.8%

Lab Control Surrogate Recovery	
d4-1,2-Dichloroethane	100%
d8-Toluene	103%
Bromofluorobenzene	97.3%
d4-1,2-Dichlorobenzene	97.9%

Reported in ug/L

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CM51SB
LIMS ID: 00-22650
Matrix: Water
Data Release Authorized:
Reported: 12/14/00
Date Analyzed: 11/30/00
Instrument: NT3

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 11/22/00

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
Chloromethane	50.6	50.0	101%
Bromomethane	54.8	50.0	110%
Vinyl Chloride	31.7	50.0	63.4%
Chloroethane	50.1	50.0	100%
Methylene Chloride	47.4	50.0	94.8%
Acetone	316.	250	126%
Carbon Disulfide	47.5	50.0	95.0%
1,1-Dichloroethene	45.7	50.0	91.4%
1,1-Dichloroethane	46.8	50.0	93.6%
trans-1,2-Dichloroethene	45.0	50.0	90.0%
cis-1,2-Dichloroethene	48.2	50.0	96.4%
Chloroform	47.4	50.0	94.8%
1,2-Dichloroethane	48.4	50.0	96.8%
2-Butanone	317.	250	127%
1,1,1-Trichloroethane	45.8	50.0	91.6%
Carbon Tetrachloride	47.5	50.0	95.0%
Vinyl Acetate	53.6	50.0	107%
Bromodichloromethane	48.3	50.0	96.6%
1,2-Dichloropropane	48.5	50.0	97.0%
cis-1,3-Dichloropropene	43.3	50.0	86.6%
Trichloroethene	45.7	50.0	91.4%
Dibromochloromethane	48.9	50.0	97.8%
1,1,2-Trichloroethane	47.2	50.0	94.4%
Benzene	46.9	50.0	93.8%
trans-1,3-Dichloropropene	43.8	50.0	87.6%
Bromoform	51.5	50.0	103%
4-Methyl-2-Pentanone (MIBK)	309.	250	124%
2-Hexanone	313.	250	125%
Tetrachloroethene	46.6	50.0	93.2%
1,1,2,2-Tetrachloroethane	49.6	50.0	99.2%
Toluene	47.3	50.0	94.6%
Chlorobenzene	47.9	50.0	95.8%
Ethylbenzene	46.5	50.0	93.0%
Styrene	48.5	50.0	97.0%
Trichlorofluoromethane	44.1	50.0	88.2%
1,1,2-Trichlorotrifluoroethane	45.8	50.0	91.6%
m,p-Xylene	96.1	100	96.1%
O-Xylene	48.0	50.0	96.0%
1,2-Dichlorobenzene	47.6	50.0	95.2%

Reported in ug/L

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CM51SB
LIMS ID: 00-22650
Matrix: Water
Data Release Authorized:
Reported: 12/14/00
Date Analyzed: 11/30/00
Instrument: NT3

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 11/22/00

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
1,3-Dichlorobenzene	48.0	50.0	96.0%
1,4-Dichlorobenzene	47.9	50.0	95.8%
Acrolein	296.	250	118%
Methyl Iodide	42.5	50.0	85.0%
Bromoethane	42.4	50.0	84.8%
Acrylonitrile	51.3	50.0	103%
1,1-Dichloropropene	48.0	50.0	96.0%
Dibromomethane	48.0	50.0	96.0%
1,1,1,2-Tetrachloroethane	46.6	50.0	93.2%
1,2-Dibromo-3-chloropropane	52.9	50.0	106%
1,2,3-Trichloropropane	49.8	50.0	99.6%
trans-1,4-Dichloro-2-butene	38.6	50.0	77.2%
1,3,5-Trimethylbenzene	48.2	50.0	96.4%
1,2,4-Trimethylbenzene	49.0	50.0	98.0%
Hexachlorobutadiene	50.4	50.0	101%
Ethylene Dibromide	48.0	50.0	96.0%
Bromochloromethane	46.3	50.0	92.6%
2,2-Dichloropropane	45.6	50.0	91.2%
1,3-Dichloropropane	47.2	50.0	94.4%
Isopropylbenzene	47.9	50.0	95.8%
n-Propylbenzene	47.5	50.0	95.0%
Bromobenzene	46.8	50.0	93.6%
2-Chlorotoluene	47.8	50.0	95.6%
4-Chlorotoluene	46.0	50.0	92.0%
tert-Butylbenzene	47.6	50.0	95.2%
sec-Butylbenzene	49.0	50.0	98.0%
4-Isopropyltoluene	48.6	50.0	97.2%
n-Butylbenzene	48.3	50.0	96.6%
1,2,4-Trichlorobenzene	49.0	50.0	98.0%
Naphthalene	52.6	50.0	105%
1,2,3-Trichlorobenzene	50.4	50.0	101%

Lab Control Surrogate Recovery

d4-1,2-Dichloroethane	101%
d8-Toluene	100%
Bromofluorobenzene	99.9%
d4-1,2-Dichlorobenzene	100%

Reported in ug/L

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CM51SB
LIMS ID: 00-22656
Matrix: Water
Data Release Authorized
Reported: 12/14/00
Date Analyzed: 12/03/00
Instrument: FINN3

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 11/22/00

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
Chloromethane	4.38	4.0	110%
Bromomethane	4.54	4.0	114%
Vinyl Chloride	4.14	4.0	104%
Chloroethane	4.41	4.0	110%
Methylene Chloride	3.99	4.0	99.8%
Acetone	27.7	20.0	138%
Carbon Disulfide	4.11	4.0	103%
1,1-Dichloroethene	4.17	4.0	104%
1,1-Dichloroethane	4.03	4.0	101%
trans-1,2-Dichloroethene	3.97	4.0	99.2%
cis-1,2-Dichloroethene	3.91	4.0	97.8%
Chloroform	4.09	4.0	102%
1,2-Dichloroethane	4.00	4.0	100%
2-Butanone	23.6	20.0	118%
1,1,1-Trichloroethane	3.80	4.0	95.0%
Carbon Tetrachloride	4.00	4.0	100%
Vinyl Acetate	4.39	4.0	110%
Bromodichloromethane	3.75	4.0	93.8%
1,2-Dichloropropane	4.15	4.0	104%
cis-1,3-Dichloropropene	3.75	4.0	93.8%
Trichloroethene	3.76	4.0	94.0%
Dibromochloromethane	4.02	4.0	100%
1,1,2-Trichloroethane	3.99	4.0	99.8%
Benzene	4.04	4.0	101%
trans-1,3-Dichloropropene	3.61	4.0	90.2%
2-Chloroethylvinylether	1.77	4.0	44.2%
Bromoform	4.00	4.0	100%
4-Methyl-2-Pentanone (MIBK)	20.6	20.0	103%
2-Hexanone	22.4	20.0	112%
Tetrachloroethene	4.06	4.0	102%
1,1,2,2-Tetrachloroethane	3.85	4.0	96.2%
Toluene	3.94	4.0	98.5%
Chlorobenzene	4.02	4.0	100%
Ethylbenzene	3.85	4.0	96.2%
Styrene	4.00	4.0	100%
Trichlorofluoromethane	3.94	4.0	98.5%
1,1,2-Trichlorotrifluoroethane	3.95	4.0	98.8%
m,p-Xylene	7.78	8.0	97.2%
O-Xylene	4.06	4.0	102%

Reported in ug/L

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CM51SB
LIMS ID: 00-22656
Matrix: Water
Data Release Authorized:
Reported: 12/14/00
Date Analyzed: 12/03/00
Instrument: FINN3

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 11/22/00

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
1,2-Dichlorobenzene	3.83	4.0	95.8%
1,3-Dichlorobenzene	3.78	4.0	94.5%
1,4-Dichlorobenzene	3.89	4.0	97.2%
Acrolein	19.9	20.0	99.5%
Methyl Iodide	3.41	4.0	85.2%
Bromoethane	3.45	4.0	86.2%
Acrylonitrile	3.99	4.0	99.8%
1,1-Dichloropropene	4.26	4.0	106%
Dibromomethane	4.00	4.0	100%
1,1,1,2-Tetrachloroethane	3.76	4.0	94.0%
1,2-Dibromo-3-chloropropane	3.57	4.0	89.2%
1,2,3-Trichloropropane	4.13	4.0	103%
trans-1,4-Dichloro-2-butene	2.48	4.0	62.0%
1,3,5-Trimethylbenzene	3.73	4.0	93.2%
1,2,4-Trimethylbenzene	3.86	4.0	96.5%
Hexachlorobutadiene	3.84	4.0	96.0%
Ethylene Dibromide	3.92	4.0	98.0%
Bromochloromethane	3.99	4.0	99.8%
2,2-Dichloropropane	3.94	4.0	98.5%
1,3-Dichloropropane	3.89	4.0	97.2%
Isopropylbenzene	4.13	4.0	103%
n-Propylbenzene	3.86	4.0	96.5%
Bromobenzene	3.83	4.0	95.8%
2-Chlorotoluene	3.91	4.0	97.8%
4-Chlorotoluene	3.61	4.0	90.2%
tert-Butylbenzene	4.08	4.0	102%
sec-Butylbenzene	3.96	4.0	99.0%
4-Isopropyltoluene	3.69	4.0	92.2%
n-Butylbenzene	3.66	4.0	91.5%
1,2,4-Trichlorobenzene	3.68	4.0	92.0%
Naphthalene	3.40	4.0	85.0%
1,2,3-Trichlorobenzene	3.83	4.0	95.8%

Lab Control Surrogate Recovery	
d4-1,2-Dichloroethane	100%
d8-Toluene	102%
Bromofluorobenzene	98.2%
d4-1,2-Dichlorobenzene	94.8%

Reported in ug/L

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CM51SB
LIMS ID: 00-22654
Matrix: Water
Data Release Authorized:
Reported: 12/14/00
Date Analyzed: 12/06/00
Instrument: NT3

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 11/22/00

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
Chloromethane	44.9	50.0	89.8%
Bromomethane	55.9	50.0	112%
Vinyl Chloride	45.4	50.0	90.8%
Chloroethane	49.7	50.0	99.4%
Methylene Chloride	48.4	50.0	96.8%
Acetone	258.	250	103%
Carbon Disulfide	51.6	50.0	103%
1,1-Dichloroethene	48.2	50.0	96.4%
1,1-Dichloroethane	49.1	50.0	98.2%
trans-1,2-Dichloroethene	47.0	50.0	94.0%
cis-1,2-Dichloroethene	48.7	50.0	97.4%
Chloroform	47.8	50.0	95.6%
1,2-Dichloroethane	49.1	50.0	98.2%
2-Butanone	255.	250	102%
1,1,1-Trichloroethane	47.6	50.0	95.2%
Carbon Tetrachloride	47.9	50.0	95.8%
Vinyl Acetate	56.0	50.0	112%
Bromodichloromethane	47.5	50.0	95.0%
1,2-Dichloropropane	48.5	50.0	97.0%
cis-1,3-Dichloropropene	45.0	50.0	90.0%
Trichloroethene	46.8	50.0	93.6%
Dibromochloromethane	47.5	50.0	95.0%
1,1,2-Trichloroethane	47.8	50.0	95.6%
Benzene	48.0	50.0	96.0%
trans-1,3-Dichloropropene	43.9	50.0	87.8%
Bromoform	47.6	50.0	95.2%
4-Methyl-2-Pentanone (MIBK)	260.	250	104%
2-Hexanone	253.	250	101%
Tetrachloroethene	48.2	50.0	96.4%
1,1,2,2-Tetrachloroethane	45.4	50.0	90.8%
Toluene	47.8	50.0	95.6%
Chlorobenzene	48.4	50.0	96.8%
Ethylbenzene	46.7	50.0	93.4%
Styrene	48.0	50.0	96.0%
Trichlorofluoromethane	44.4	50.0	88.8%
1,1,2-Trichlorotrifluoroethane	48.6	50.0	97.2%
m,p-Xylene	96.6	100	96.6%
O-Xylene	48.1	50.0	96.2%
1,2-Dichlorobenzene	47.7	50.0	95.4%

Reported in ug/L

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CM51SB
LIMS ID: 00-22654
Matrix: Water
Data Release Authorized:
Reported: 12/14/00
Date Analyzed: 12/06/00
Instrument: NT3

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 11/22/00

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
1,3-Dichlorobenzene	47.5	50.0	95.0%
1,4-Dichlorobenzene	48.1	50.0	96.2%
Acrolein	292.	250	117%
Methyl Iodide	54.9	50.0	110%
Bromoethane	46.2	50.0	92.4%
Acrylonitrile	49.7	50.0	99.4%
1,1-Dichloropropene	49.5	50.0	99.0%
Dibromomethane	47.3	50.0	94.6%
1,1,1,2-Tetrachloroethane	47.9	50.0	95.8%
1,2-Dibromo-3-chloropropane	42.6	50.0	85.2%
1,2,3-Trichloropropane	46.0	50.0	92.0%
trans-1,4-Dichloro-2-butene	37.1	50.0	74.2%
1,3,5-Trimethylbenzene	47.6	50.0	95.2%
1,2,4-Trimethylbenzene	49.5	50.0	99.0%
Hexachlorobutadiene	47.7	50.0	95.4%
Ethylene Dibromide	45.6	50.0	91.2%
Bromochloromethane	49.1	50.0	98.2%
2,2-Dichloropropane	48.5	50.0	97.0%
1,3-Dichloropropane	47.2	50.0	94.4%
Isopropylbenzene	48.9	50.0	97.8%
n-Propylbenzene	47.2	50.0	94.4%
Bromobenzene	48.1	50.0	96.2%
2-Chlorotoluene	48.0	50.0	96.0%
4-Chlorotoluene	46.6	50.0	93.2%
tert-Butylbenzene	46.8	50.0	93.6%
sec-Butylbenzene	49.4	50.0	98.8%
4-Isopropyltoluene	48.1	50.0	96.2%
n-Butylbenzene	47.5	50.0	95.0%
1,2,4-Trichlorobenzene	48.0	50.0	96.0%
Naphthalene	46.8	50.0	93.6%
1,2,3-Trichlorobenzene	47.6	50.0	95.2%

Lab Control Surrogate Recovery	
d4-1,2-Dichloroethane	98.2%
d8-Toluene	100%
Bromofluorobenzene	101%
d4-1,2-Dichlorobenzene	99.5%

Reported in ug/L

ANALYTICAL RESOURCES INCORPORATED

SIM SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Client ID	MNP	DBA	TOT OUT
Method Blank	83%	91%	0
Lab Control	85%	102%	0
LCDuplicate	86%	92%	0
NMW-4	84%	85%	0
NMW-4-DL	D	D	0
NMW-5	99%	87%	0
NMW-5-DL	D	D	0
NMW-6	74%	92%	0
NMW-3	60%	96%	0
NMW-3-DL	D	D	0
NMW-3-RE	D	D	0
NMW-300	59%	92%	0
NMW-300-DL	D	D	0
NMW-300-RE	D	D	0
NMW-2	73%	94%	0
MW-5	61%	79%	0
MW-6	75%	95%	0
MW-2	69%	93%	0
NMW-1	67%	98%	0
NMW-1-DL	D	D	0
MW-7	72%	91%	0
MW-1	73%	94%	0

	LCS/MB LIMITS	QC LIMITS
(MNP) = d10-2-Methylnaphthalene	(30-160)	(30-160)
(DBA) = d14-Dibenz(a,h)anthracene	(30-160)	(30-160)

(Present limits for LCS/MB are advisory only)

D Surrogate Compound diluted out

FORM-II 8270-SIM

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: Method Blank**
PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: CM51MB
LIMS ID: 00-22650
Matrix: Water
Data Release Authorized:
Reported: 12/04/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Date extracted: 11/27/00
Date analyzed: 11/30/00 21:19
Instrument: FINN4

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	0.10 U
91-57-6	2-Methylnaphthalene	0.10 U
208-96-8	Acenaphthylene	0.10 U
83-32-9	Acenaphthene	0.10 U
86-73-7	Fluorene	0.10 U
85-01-8	Phenanthrene	0.10 U
120-12-7	Anthracene	0.10 U
206-44-0	Fluoranthene	0.10 U
129-00-0	Pyrene	0.10 U
56-55-3	Benzo(a)anthracene	0.10 U
218-01-9	Chrysene	0.10 U
205-99-2	Benzo(b)fluoranthene	0.10 U
207-08-9	Benzo(k)fluoranthene	0.10 U
50-32-8	Benzo(a)pyrene	0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10 U
53-70-3	Dibenzo(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10 U
132-64-9	Dibenzofuran	0.10 U

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	82.7%
d14-Dibenzo(a,h)anthracene	90.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: NMW-4**
PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: CM51A
LIMS ID: 00-22650
Matrix: Water
Data Release Authorized:
Reported: 12/04/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Date extracted: 11/27/00
Date analyzed: 11/30/00 23:07
Instrument: FINN4

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	21 E
91-57-6	2-Methylnaphthalene	18 E
208-96-8	Acenaphthylene	0.44
83-32-9	Acenaphthene	51 E
86-73-7	Fluorene	35 E
85-01-8	Phenanthrene	43 E
120-12-7	Anthracene	8.0
206-44-0	Fluoranthene	10 E
129-00-0	Pyrene	7.9
56-55-3	Benzo(a)anthracene	0.70
218-01-9	Chrysene	0.59
205-99-2	Benzo(b)fluoranthene	0.27
207-08-9	Benzo(k)fluoranthene	0.21
50-32-8	Benzo(a)pyrene	0.28
193-39-5	Indeno(1,2,3-cd)pyrene	0.11
53-70-3	Dibenzo(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.11
132-64-9	Dibenzofuran	27 E

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	84.0%
d14-Dibenzo(a,h)anthracene	85.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: NMW-4**
PNAs by Selected Ion Monitoring GC/MS **DILUTION**

Lab Sample ID: CM51A-DL
LIMS ID: 00-22650
Matrix: Water
Data Release Authorized
Reported: 12/04/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 02:31
Instrument: NT2

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:50

CAS Number	Analyte	ug/L
91-20-3	**Naphthalene**	**63**
91-57-6	**2-Methylnaphthalene**	**15**
208-96-8	Acenaphthylene	5.0 U
83-32-9	**Acenaphthene**	**96**
86-73-7	**Fluorene**	**50**
85-01-8	**Phenanthrene**	**66**
120-12-7	**Anthracene**	**6.5**
206-44-0	**Fluoranthene**	**10**
129-00-0	**Pyrene**	**8.0**
56-55-3	Benzo(a)anthracene	5.0 U
218-01-9	Chrysene	5.0 U
205-99-2	Benzo(b)fluoranthene	5.0 U
207-08-9	Benzo(k)fluoranthene	5.0 U
50-32-8	Benzo(a)pyrene	5.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	5.0 U
53-70-3	Dibenzo(a,h)anthracene	5.0 U
191-24-2	Benzo(g,h,i)perylene	5.0 U
132-64-9	**Dibenzofuran**	**41**

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracene	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: NMW-5**
PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: CM51B
LIMS ID: 00-22651
Matrix: Water
Data Release Authorized:
Reported: 12/04/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 05:07
Instrument: NT2

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	0.46 M
91-57-6	2-Methylnaphthalene	0.10 U
208-96-8	Acenaphthylene	2.4 Y
83-32-9	Acenaphthene	200 E
86-73-7	Fluorene	150 E
85-01-8	Phenanthrene	110 E
120-12-7	Anthracene	30 E
206-44-0	Fluoranthene	51 E
129-00-0	Pyrene	50 E
56-55-3	Benzo(a)anthracene	4.8
218-01-9	Chrysene	4.0 M
205-99-2	Benzo(b)fluoranthene	1.8
207-08-9	Benzo(k)fluoranthene	1.5
50-32-8	Benzo(a)pyrene	1.8
193-39-5	Indeno(1,2,3-cd)pyrene	0.72
53-70-3	Dibenzo(a,h)anthracene	0.23
191-24-2	Benzo(g,h,i)perylene	0.75
132-64-9	Dibenzofuran	93 E

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	98.7%
d14-Dibenzo(a,h)anthracene	87.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: NMW-5**
PNAs by Selected Ion Monitoring GC/MS **DILUTION**

Lab Sample ID: CM51B-DL
LIMS ID: 00-22651
Matrix: Water
Data Release Authorized: AKB
Reported: 12/04/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 20:53
Instrument: NT2

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:200

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	20 U
91-57-6	2-Methylnaphthalene	20 U
208-96-8	Acenaphthylene	20 U
83-32-9	**Acenaphthene**	**340**
86-73-7	**Fluorene**	**190**
85-01-8	**Phenanthrene**	**230**
120-12-7	**Anthracene**	**26**
206-44-0	**Fluoranthene**	**38**
129-00-0	**Pyrene**	**30**
56-55-3	Benzo(a)anthracene	20 U
218-01-9	Chrysene	20 U
205-99-2	Benzo(b)fluoranthene	20 U
207-08-9	Benzo(k)fluoranthene	20 U
50-32-8	Benzo(a)pyrene	20 U
193-39-5	Indeno(1,2,3-cd)pyrene	20 U
53-70-3	Dibenzo(a,h)anthracene	20 U
191-24-2	Benzo(g,h,i)perylene	20 U
132-64-9	**Dibenzofuran**	**130**

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracene	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: NMW-6**
PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: CM51C
LIMS ID: 00-22652
Matrix: Water
Data Release Authorized:
Reported: 12/04/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 02:53
Instrument: NT2

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	**Naphthalene**	**1.3**
91-57-6	**2-Methylnaphthalene**	**0.29**
208-96-8	Acenaphthylene	0.10 U
83-32-9	**Acenaphthene**	**2.3**
86-73-7	**Fluorene**	**0.83**
85-01-8	**Phenanthrene**	**0.25**
120-12-7	**Anthracene**	**0.14**
206-44-0	**Fluoranthene**	**0.24**
129-00-0	**Pyrene**	**0.14**
56-55-3	Benzo(a)anthracene	0.10 U
218-01-9	Chrysene	0.10 U
205-99-2	Benzo(b)fluoranthene	0.10 U
207-08-9	Benzo(k)fluoranthene	0.10 U
50-32-8	Benzo(a)pyrene	0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10 U
53-70-3	Dibenzo(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10 U
132-64-9	**Dibenzofuran**	**0.35**

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	73.7%
d14-Dibenzo(a,h)anthracene	92.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: NMW-3**
PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: CM51D
LIMS ID: 00-22653
Matrix: Water
Data Release Authorized:
Reported: 12/04/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 05:30
Instrument: NT2

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	**Naphthalene**	500 E
91-57-6	**2-Methylnaphthalene**	240 E
208-96-8	**Acenaphthylene**	3.0
83-32-9	**Acenaphthene**	140 E
86-73-7	**Fluorene**	79 E
85-01-8	**Phenanthrene**	66 E
120-12-7	**Anthracene**	5.2
206-44-0	**Fluoranthene**	5.9
129-00-0	**Pyrene**	2.9
56-55-3	**Benzo(a)anthracene**	0.18
218-01-9	**Chrysene**	0.17
205-99-2	Benzo(b)fluoranthene	0.10 U
207-08-9	Benzo(k)fluoranthene	0.10 U
50-32-8	Benzo(a)pyrene	0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10 U
53-70-3	Dibenzo(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10 U
132-64-9	**Dibenzofuran**	73 E

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	60.3%
d14-Dibenzo(a,h)anthracene	96.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: NMW-3**
PNAs by Selected Ion Monitoring GC/MS **DILUTION**

Lab Sample ID: CM51D-DL
LIMS ID: 00-22653
Matrix: Water
Data Release Authorized:
Reported: 12/04/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 21:17
Instrument: NT2

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:500

CAS Number	Analyte	ug/L
91-20-3	**Naphthalene**	**6,800 E**
91-57-6	**2-Methylnaphthalene**	**700**
208-96-8	Acenaphthylene	50 U
83-32-9	**Acenaphthene**	**220**
86-73-7	**Fluorene**	**100**
85-01-8	**Phenanthrene**	**70**
120-12-7	Anthracene	50 U
206-44-0	Fluoranthene	50 U
129-00-0	Pyrene	50 U
56-55-3	Benzo(a)anthracene	50 U
218-01-9	Chrysene	50 U
205-99-2	Benzo(b)fluoranthene	50 U
207-08-9	Benzo(k)fluoranthene	50 U
50-32-8	Benzo(a)pyrene	50 U
193-39-5	Indeno(1,2,3-cd)pyrene	50 U
53-70-3	Dibenzo(a,h)anthracene	50 U
191-24-2	Benzo(g,h,i)perylene	50 U
132-64-9	**Dibenzofuran**	**120**

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracene	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: NMW-3**
PNAs by Selected Ion Monitoring GC/MS **DILUTION**

Lab Sample ID: CM51D-DL2
LIMS ID: 00-22653
Matrix: Water
Data Release Authorized:
Reported: 12/04/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Date extracted: 11/27/00
Date analyzed: 12/01/00
Instrument: NT2

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:5000

CAS Number	Analyte	ug/L
91-20-3	**Naphthalene**	**6,200**
91-57-6	**2-Methylnaphthalene**	**650**
208-96-8	Acenaphthylene	500 U
83-32-9	Acenaphthene	500 U
86-73-7	Fluorene	500 U
85-01-8	Phenanthrene	500 U
120-12-7	Anthracene	500 U
206-44-0	Fluoranthene	500 U
129-00-0	Pyrene	500 U
56-55-3	Benzo(a)anthracene	500 U
218-01-9	Chrysene	500 U
205-99-2	Benzo(b)fluoranthene	500 U
207-08-9	Benzo(k)fluoranthene	500 U
50-32-8	Benzo(a)pyrene	500 U
193-39-5	Indeno(1,2,3-cd)pyrene	500 U
53-70-3	Dibenzo(a,h)anthracene	500 U
191-24-2	Benzo(g,h,i)perylene	500 U
132-64-9	Dibenzofuran	500 U

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracene	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: NMW-300**
PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: CM51E
LIMS ID: 00-22654
Matrix: Water
Data Release Authorized:
Reported: 12/04/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 05:54
Instrument: NT2

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	530 E
91-57-6	2-Methylnaphthalene	260 E
208-96-8	Acenaphthylene	2.9
83-32-9	Acenaphthene	150 E
86-73-7	Fluorene	86 E
85-01-8	Phenanthrene	68 E
120-12-7	Anthracene	4.9
206-44-0	Fluoranthene	6.2
129-00-0	Pyrene	2.8
56-55-3	Benzo(a)anthracene	0.19
218-01-9	Chrysene	0.18
205-99-2	Benzo(b)fluoranthene	0.10 U
207-08-9	Benzo(k)fluoranthene	0.10 U
50-32-8	Benzo(a)pyrene	0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10 U
53-70-3	Dibenzo(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10 U
132-64-9	Dibenzofuran	80 E

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	59.0%
d14-Dibenzo(a,h)anthracene	91.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: NMW-300**
PNAs by Selected Ion Monitoring GC/MS **DILUTION**

Lab Sample ID: CM51E-DL
LIMS ID: 00-22654
Matrix: Water
Data Release Authorized:
Reported: 12/04/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 21:41
Instrument: NT2

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:500

CAS Number	Analyte	ug/L
91-20-3	**Naphthalene**	**6,100 E**
91-57-6	**2-Methylnaphthalene**	**650**
208-96-8	Acenaphthylene	50 U
83-32-9	**Acenaphthene**	**200**
86-73-7	**Fluorene**	**95**
85-01-8	**Phenanthrene**	**65**
120-12-7	Anthracene	50 U
206-44-0	Fluoranthene	50 U
129-00-0	Pyrene	50 U
56-55-3	Benzo(a)anthracene	50 U
218-01-9	Chrysene	50 U
205-99-2	Benzo(b)fluoranthene	50 U
207-08-9	Benzo(k)fluoranthene	50 U
50-32-8	Benzo(a)pyrene	50 U
193-39-5	Indeno(1,2,3-cd)pyrene	50 U
53-70-3	Dibenzo(a,h)anthracene	50 U
191-24-2	Benzo(g,h,i)perylene	50 U
132-64-9	**Dibenzofuran**	**100**

Base/Neutral Surrogate Recovery

d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracene	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: NMW-300
DILUTION

Lab Sample ID: CM51E-DL2
LIMS ID: 00-22654
Matrix: Water
Data Release Authorized:
Reported: 12/04/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Date extracted: 11/27/00
Date analyzed: 12/01/00
Instrument: NT2

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:5000

CAS Number	Analyte	ug/L
91-20-3	**Naphthalene**	**5,600**
91-57-6	**2-Methylnaphthalene**	**600**
208-96-8	Acenaphthylene	500 U
83-32-9	Acenaphthene	500 U
86-73-7	Fluorene	500 U
85-01-8	Phenanthrene	500 U
120-12-7	Anthracene	500 U
206-44-0	Fluoranthene	500 U
129-00-0	Pyrene	500 U
56-55-3	Benzo(a)anthracene	500 U
218-01-9	Chrysene	500 U
205-99-2	Benzo(b)fluoranthene	500 U
207-08-9	Benzo(k)fluoranthene	500 U
50-32-8	Benzo(a)pyrene	500 U
193-39-5	Indeno(1,2,3-cd)pyrene	500 U
53-70-3	Dibenzo(a,h)anthracene	500 U
191-24-2	Benzo(g,h,i)perylene	500 U
132-64-9	Dibenzofuran	500 U

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracene	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: NMW-2**
PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: CM51F
LIMS ID: 00-22655
Matrix: Water
Data Release Authorized:
Reported: 12/04/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 06:18
Instrument: NT2

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	**Naphthalene**	**2.4**
91-57-6	**2-Methylnaphthalene**	**0.33**
208-96-8	Acenaphthylene	0.10 U
83-32-9	**Acenaphthene**	**0.54**
86-73-7	**Fluorene**	**0.17**
85-01-8	**Phenanthrene**	**0.21**
120-12-7	**Anthracene**	**0.05 J**
206-44-0	**Fluoranthene**	**0.10**
129-00-0	**Pyrene**	**0.06 J**
56-55-3	Benzo(a)anthracene	0.10 U
218-01-9	Chrysene	0.10 U
205-99-2	Benzo(b)fluoranthene	0.10 U
207-08-9	Benzo(k)fluoranthene	0.10 U
50-32-8	Benzo(a)pyrene	0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10 U
53-70-3	Dibenzo(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10 U
132-64-9	**Dibenzofuran**	**0.10**

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	73.3%
d14-Dibenzo(a,h)anthracene	94.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: MW-5**
PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: CM51G
LIMS ID: 00-22656
Matrix: Water
Data Release Authorized:
Reported: 12/04/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 03:14
Instrument: NT2

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	**Naphthalene**	**0.40**
91-57-6	**2-Methylnaphthalene**	**0.05 J**
208-96-8	Acenaphthylene	0.10 U
83-32-9	**Acenaphthene**	**0.06 J**
86-73-7	Fluorene	0.10 U
85-01-8	Phenanthrene	0.10 U
120-12-7	Anthracene	0.10 U
206-44-0	Fluoranthene	0.10 U
129-00-0	Pyrene	0.10 U
56-55-3	Benzo(a)anthracene	0.10 U
218-01-9	Chrysene	0.10 U
205-99-2	Benzo(b)fluoranthene	0.10 U
207-08-9	Benzo(k)fluoranthene	0.10 U
50-32-8	Benzo(a)pyrene	0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10 U
53-70-3	Dibenzo(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10 U
132-64-9	Dibenzofuran	0.10 U

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	61.0%
d14-Dibenzo(a,h)anthracene	78.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: MW-6**
PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: CM51H
LIMS ID: 00-22657
Matrix: Water
Data Release Authorized:
Reported: 12/04/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 03:36
Instrument: NT2

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	**Naphthalene**	**0.12**
91-57-6	2-Methylnaphthalene	0.10 U
208-96-8	Acenaphthylene	0.10 U
83-32-9	**Acenaphthene**	**0.09 J**
86-73-7	Fluorene	0.10 U
85-01-8	Phenanthrene	0.10 U
120-12-7	Anthracene	0.10 U
206-44-0	Fluoranthene	0.10 U
129-00-0	Pyrene	0.10 U
56-55-3	Benzo(a)anthracene	0.10 U
218-01-9	Chrysene	0.10 U
205-99-2	Benzo(b)fluoranthene	0.10 U
207-08-9	Benzo(k)fluoranthene	0.10 U
50-32-8	Benzo(a)pyrene	0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10 U
53-70-3	Dibenzo(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10 U
132-64-9	Dibenzofuran	0.10 U

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	74.7%
d14-Dibenzo(a,h)anthracene	94.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: MW-2**
PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: CM51I
LIMS ID: 00-22658
Matrix: Water
Data Release Authorized:
Reported: 12/04/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 03:57
Instrument: NT2

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	**Naphthalene**	**0.08 J**
91-57-6	2-Methylnaphthalene	0.10 U
208-96-8	Acenaphthylene	0.10 U
83-32-9	Acenaphthene	0.10 U
86-73-7	Fluorene	0.10 U
85-01-8	Phenanthrene	0.10 U
120-12-7	Anthracene	0.10 U
206-44-0	Fluoranthene	0.10 U
129-00-0	Pyrene	0.10 U
56-55-3	Benzo(a)anthracene	0.10 U
218-01-9	Chrysene	0.10 U
205-99-2	Benzo(b)fluoranthene	0.10 U
207-08-9	Benzo(k)fluoranthene	0.10 U
50-32-8	Benzo(a)pyrene	0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10 U
53-70-3	Dibenzo(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10 U
132-64-9	Dibenzofuran	0.10 U

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	68.7%
d14-Dibenzo(a,h)anthracene	93.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: NMW-1**
PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: CM51J
LIMS ID: 00-22659
Matrix: Water
Data Release Authorized:
Reported: 12/04/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 06:42
Instrument: NT2

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	**Naphthalene**	**35 E**
91-57-6	**2-Methylnaphthalene**	**5.8**
208-96-8	Acenaphthylene	0.10 U
83-32-9	**Acenaphthene**	**3.9**
86-73-7	**Fluorene**	**1.1**
85-01-8	**Phenanthrene**	**0.77**
120-12-7	**Anthracene**	**0.15**
206-44-0	**Fluoranthene**	**0.32**
129-00-0	**Pyrene**	**0.22**
56-55-3	Benzo(a)anthracene	0.10 U
218-01-9	Chrysene	0.10 U
205-99-2	Benzo(b)fluoranthene	0.10 U
207-08-9	Benzo(k)fluoranthene	0.10 U
50-32-8	Benzo(a)pyrene	0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10 U
53-70-3	Dibenzo(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10 U
132-64-9	**Dibenzofuran**	**0.43**

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	67.3%
d14-Dibenzo(a,h)anthracene	97.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: NMW-1**
PNAs by Selected Ion Monitoring GC/MS **DILUTION**

Lab Sample ID: CM51J-DL
LIMS ID: 00-22659
Matrix: Water
Data Release Authorized:
Reported: 12/04/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 22:30
Instrument: NT2

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:40

CAS Number	Analyte	ug/L
91-20-3	**Naphthalene**	**28**
91-57-6	**2-Methylnaphthalene**	**6.0**
208-96-8	Acenaphthylene	4.0 U
83-32-9	**Acenaphthene**	**3.6 J**
86-73-7	Fluorene	4.0 U
85-01-8	Phenanthrene	4.0 U
120-12-7	Anthracene	4.0 U
206-44-0	Fluoranthene	4.0 U
129-00-0	Pyrene	4.0 U
56-55-3	Benzo(a)anthracene	4.0 U
218-01-9	Chrysene	4.0 U
205-99-2	Benzo(b)fluoranthene	4.0 U
207-08-9	Benzo(k)fluoranthene	4.0 U
50-32-8	Benzo(a)pyrene	4.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	4.0 U
53-70-3	Dibenzo(a,h)anthracene	4.0 U
191-24-2	Benzo(g,h,i)perylene	4.0 U
132-64-9	Dibenzofuran	4.0 U

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracene	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: MW-7**
PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: CM51K
LIMS ID: 00-22660
Matrix: Water
Data Release Authorized:
Reported: 12/04/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 04:19
Instrument: NT2

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	**Naphthalene**	**0.19**
91-57-6	2-Methylnaphthalene	0.10 U
208-96-8	Acenaphthylene	0.10 U
83-32-9	**Acenaphthene**	**0.79**
86-73-7	**Fluorene**	**0.28**
85-01-8	**Phenanthrene**	**0.06 J**
120-12-7	**Anthracene**	**0.13**
206-44-0	**Fluoranthene**	**0.26**
129-00-0	**Pyrene**	**0.16**
56-55-3	Benzo(a)anthracene	0.10 U
218-01-9	Chrysene	0.10 U
205-99-2	Benzo(b)fluoranthene	0.10 U
207-08-9	Benzo(k)fluoranthene	0.10 U
50-32-8	Benzo(a)pyrene	0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10 U
53-70-3	Dibenzo(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10 U
132-64-9	Dibenzofuran	0.10 U

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	71.7%
d14-Dibenzo(a,h)anthracene	90.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: MW-1**
PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: CM51L
LIMS ID: 00-22661
Matrix: Water
Data Release Authorized:
Reported: 12/04/00

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 04:43
Instrument: NT2

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	**Naphthalene**	**0.09 J**
91-57-6	2-Methylnaphthalene	0.10 U
208-96-8	Acenaphthylene	0.10 U
83-32-9	**Acenaphthene**	**0.26**
86-73-7	Fluorene	0.10 U
85-01-8	**Phenanthrene**	**0.09 J**
120-12-7	Anthracene	0.10 U
206-44-0	Fluoranthene	0.10 U
129-00-0	Pyrene	0.10 U
56-55-3	Benzo(a)anthracene	0.10 U
218-01-9	Chrysene	0.10 U
205-99-2	Benzo(b)fluoranthene	0.10 U
207-08-9	Benzo(k)fluoranthene	0.10 U
50-32-8	Benzo(a)pyrene	0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10 U
53-70-3	Dibenzo(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10 U
132-64-9	Dibenzofuran	0.10 U

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	72.7%
d14-Dibenzo(a,h)anthracene	94.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNA's by Selected Ion Monitoring GC/MS

Lab Sample ID: CM51SB
LIMS ID: 00-22650
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 12/04/00

	SPIKE VALUE	SPIKE AMT	% RECOVERY	RPD
LAB CONTROL SAMPLE				
Phenanthrene	2.73	3.00	91.0%	
Chrysene	2.99	3.00	99.7%	
Benzo(k)fluoranthene	2.54	3.00	84.7%	
LCDUPLICATE				
Phenanthrene	2.95	3.00	98.3%	7.7%
Chrysene	2.97	3.00	99.0%	0.7%
Benzo(k)fluoranthene	2.68	3.00	89.3%	5.4%

Values reported in ug/L

Spike Blank Surrogate Recovery

SB-d10-2-Methylnaphthalene	84.7%
SB-d14-Dibenzo(a,h)anthracene	102%
SD-d10-2-Methylnaphthalene	86.3%
SD-d14-Dibenzo(a,h)anthracene	91.7%

ANALYTICAL RESOURCES INCORPORATED

WATER AROCLOR SURROGATE SUMMARY

Matrix: Water

QC Report No: CM51
Project: Tacoma Metals
996098.00

LIMS ID	Lab ID	Client ID	TCMX #	DCBP #	TOT OUT
00-22650MB	112700MB	Method Blank	92.0%	79.5%	0
00-22650SB	112700SB	Lab Control	94.0%	82.5%	0
00-22650SBD	112700SBD	Lab Control Dup	96.5%	78.0%	0
00-22650	CM51A	NMW-4	79.5%	92.0%	0
00-22651	CM51B	NMW-5	68.5%	91.0%	0
00-22652	CM51C	NMW-6	92.0%	98.0%	0
00-22653	CM51D	NMW-3	85.0%	89.5%	0
00-22654	CM51E	NMW-300	100%	84.5%	0
00-22655	CM51F	NMW-2	82.5%	90.0%	0
00-22656	CM51G	MW-5	84.0%	91.5%	0
00-22657	CM51H	MW-6	53.0%	62.5%	0
00-22658	CM51I	MW-2	103%	104%	0
00-22659	CM51J	NMW-1	92.0%	99.5%	0
00-22660	CM51K	MW-7	94.0%	96.5%	0
00-22661	CM51L	MW-1	106%	106%	0

	QC LIMITS
(TCMX) = Tetrachloro-m-xylene	(34-112)
(DCBP) = Decachlorobiphenyl	(22-139)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D Surrogate Compound diluted out

FORM-II PCB

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: Method Blank

Lab Sample ID: CM51MB
LIMS ID: 00-22650
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized:
Reported: 12/05/00 CR 12/15/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 13:29
Instrument ID: ECD2
Sample Amount: 500 mL
Final Ext Vol: 5.0 mL

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value	
12674-11-2	Aroclor 1016	1.0	U
53469-21-9	Aroclor 1242	1.0	U
12672-29-6	Aroclor 1248	1.0	U
11097-69-1	Aroclor 1254	1.0	U
11096-82-5	Aroclor 1260	1.0	U
11104-28-2	Aroclor 1221	2.0	U
11141-16-5	Aroclor 1232	1.0	U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	79.5%
Tetrachlorometaxylene	92.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: NMW-4

Lab Sample ID: CM51A
LIMS ID: 00-22650
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/05/00 CR 12/5/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 15:07
Instrument ID: ECD2
Sample Amount: 500 mL
Final Ext Vol: 5.0 mL

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U
11104-28-2	Aroclor 1221	2.0 U
11141-16-5	Aroclor 1232	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	92.0%
Tetrachlorometaxylene	79.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: NMW-5

Lab Sample ID: CM51B
LIMS ID: 00-22651
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/05/00 UR 12/5/00

Date extracted: 11/27/00
Date analyzed: 12/04/00
Instrument ID: ECD2
Sample Amount: 500 mL
Final Ext Vol: 5.0 mL

GPC Cleanup: No
Florisil Cleanup: No
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	2.0 Y
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U
11104-28-2	Aroclor 1221	2.0 U
11141-16-5	Aroclor 1232	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	91.0%
Tetrachlorometaxylene	68.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: NMW-6

Lab Sample ID: CM51C
LIMS ID: 00-22652
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/05/00 CR 12/5/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 16:12
Instrument ID: ECD2
Sample Amount: 500 mL
Final Ext Vol: 5.0 mL

GPC Cleanup: No
Florisil Cleanup: No
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U
11104-28-2	Aroclor 1221	2.0 U
11141-16-5	Aroclor 1232	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	98.0%
Tetrachlorometaxylene	92.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: NMW-3

Lab Sample ID: CM51D
LIMS ID: 00-22653
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/05/00 CR 12/15/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 16:44
Instrument ID: ECD2
Sample Amount: 500 mL
Final Ext Vol: 5.0 mL

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U
11104-28-2	Aroclor 1221	2.0 U
11141-16-5	Aroclor 1232	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	89.5%
Tetrachlorometaxylene	85.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: NMW-300

Lab Sample ID: CM51E
LIMS ID: 00-22654
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/05/00 CR 12/5/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 17:17
Instrument ID: ECD2
Sample Amount: 500 mL
Final Ext Vol: 5.0 mL

GPC Cleanup: No
Florisil Cleanup: No
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	5.6 Y
12672-29-6	Aroclor 1248	1.9 Y
11097-69-1	Aroclor 1254	1.3 Y
11096-82-5	Aroclor 1260	1.0 U
11104-28-2	Aroclor 1221	2.0 U
11141-16-5	Aroclor 1232	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	84.5%
Tetrachlorometaxylene	100%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: NMW-2

Lab Sample ID: CM51F
LIMS ID: 00-22655
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/05/00 CR 12/5/00

Date extracted: 11/27/00
Date analyzed: 12/04/00
Instrument ID: ECD2
Sample Amount: 500 mL
Final Ext Vol: 5.0 mL

GPC Cleanup: No
Florisil Cleanup: No
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U
11104-28-2	Aroclor 1221	2.0 U
11141-16-5	Aroclor 1232	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	90.0%
Tetrachlorometaxylene	82.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: MW-5

Lab Sample ID: CM51G
LIMS ID: 00-22656
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/05/00 CK 12/5/00

Date extracted: 11/27/00
Date analyzed: 12/04/00
Instrument ID: ECD2
Sample Amount: 500 mL
Final Ext Vol: 5.0 mL

GPC Cleanup: No
Florisil Cleanup: No
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U
11104-28-2	Aroclor 1221	2.0 U
11141-16-5	Aroclor 1232	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	91.5%
Tetrachlorometaxylene	84.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: MW-6

Lab Sample ID: CM51H
LIMS ID: 00-22657
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/05/00 CR 12/5/00

Date extracted: 11/27/00
Date analyzed: 12/04/00
Instrument ID: ECD2
Sample Amount: 500 mL
Final Ext Vol: 5.0 mL

GPC Cleanup: No
Florisil Cleanup: No

Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U
11104-28-2	Aroclor 1221	2.0 U
11141-16-5	Aroclor 1232	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	62.5%
Tetrachlorometaxylene	53.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: MW-2

Lab Sample ID: CM51I
LIMS ID: 00-22658
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/05/00 CR 12/5/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 21:04
Instrument ID: ECD2
Sample Amount: 500 mL
Final Ext Vol: 5.0 mL

GPC Cleanup: No
Florisil Cleanup: No
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U
11104-28-2	Aroclor 1221	2.0 U
11141-16-5	Aroclor 1232	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	104%
Tetrachlorometaxylene	103%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: NMW-1

Lab Sample ID: CM51J
LIMS ID: 00-22659
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/05/00 LR 12/5/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 21:37
Instrument ID: ECD2
Sample Amount: 500 mL
Final Ext Vol: 5.0 mL

GPC Cleanup: No
Florisil Cleanup: No
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U
11104-28-2	Aroclor 1221	2.0 U
11141-16-5	Aroclor 1232	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	99.5%
Tetrachlorometaxylene	92.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: MW-7

Lab Sample ID: CM51K
LIMS ID: 00-22660
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/05/00 CR 12/5/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 22:09
Instrument ID: ECD2
Sample Amount: 500 mL
Final Ext Vol: 5.0 mL

GPC Cleanup: No
Florisil Cleanup: No
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U
11104-28-2	Aroclor 1221	2.0 U
11141-16-5	Aroclor 1232	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	96.5%
Tetrachlorometaxylene	94.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MW-1

Lab Sample ID: CM51L
LIMS ID: 00-22661
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/05/00 UR 12/5/00

Date extracted: 11/27/00
Date analyzed: 12/01/00 22:42
Instrument ID: ECD2
Sample Amount: 500 mL
Final Ext Vol: 5.0 mL

GPC Cleanup: No
Florisil Cleanup: No
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U
11104-28-2	Aroclor 1221	2.0 U
11141-16-5	Aroclor 1232	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	106%
Tetrachlorometaxylene	106%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by METHOD 8080

Lab Sample ID: CM51SB
LIMS ID: 00-22650
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 12/05/00 CR 12/5/00

LABORATORY CONTROL SAMPLE RECOVERY
Date extracted: 11/27/00

CONSTITUENT	SPIKE VALUE	SPIKE ADDED	% RECOVERY	RPD
LABORATORY CONTROL SAMPLE				
Aroclor 1242	9.0600	10.1	89.9%	
LAB CONTROL DUPLICATE				
Aroclor 1242	9.4000	10.1	93.3%	3.7%

Aroclor Surrogate Recoveries

LCS-Decachlorobiphenyl	82.5%
LCS-Tetrachlorometaxylene	94.0%
LCSD-Decachlorobiphenyl	78.0%
LCSD-Tetrachlorometaxylene	96.5%

Values reported in ug/L

ANALYTICAL RESOURCES INCORPORATED

WATER TPHg SYSTEM MONITORING COMPOUND SUMMARY

Matrix: Water

QC Report No: CM51

LIMS ID	Lab ID	Client ID	TFT	BB	TOT OUT
00-22650MB	112800MB	Method Blank	94.5%	90.5%	0
00-22650	CM51A	NMW-4	97.7%	96.4%	0
00-22650	CM51A-DP	NMW-4-DP	98.0%	98.6%	0
00-22651LC	112800LC	Lab Control	102%	105%	0
00-22651LCD	112800LCD	Lab Control Dup	103%	107%	0
00-22651	CM51B	NMW-5	103%	107%	0
00-22652	CM51C	NMW-6	102%	84.9%	0
00-22653	CM51D	NMW-3	107%	106%	0
00-22654	CM51E	NMW-300	105%	105%	0
00-22655	CM51F	NMW-2	99.2%	94.8%	0
00-22656	CM51G	MW-5	98.0%	95.3%	0
00-22657	CM51H	MW-6	95.9%	95.2%	0
00-22658	CM51I	MW-2	101%	100%	0
00-22659	CM51J	NMW-1	99.1%	101%	0
00-22660	CM51K	MW-7	97.4%	95.8%	0
00-22661	CM51L	MW-1	98.9%	98.5%	0

	MB/LCS QC LIMITS	SAMPLE QC LIMITS
(TFT) = Trifluorotoluene	(69.0-135)	(80.0-120)
(BB) = Bromobenzene	(68.0-127)	(80.0-120)

Limits Updated - 08/01/00

\# Column to be used to flag recovery values

* Values outside of required QC limits

D System Monitoring Compound diluted out

FORM-II TPHg

ANALYTICAL RESOURCES INCORPORATED

TOTAL GASOLINE RANGE HYDROCARBONS
NWTPHg - Toluene to Naphthalene

QC Report No: CM51-Kennedy Jenks Consultants
Matrix: Water Project: Tacoma Metals
996098.00
Data Release Authorized: CR 12/1/00 Date Received: 11/22/00
Reported: 12/01/00

Lab ID	Client Sample ID	Date Analyzed	Dilution Factor	Gas Range	Gas ID	Surr A Rec	Surr B Rec
CM51-1128MB	Method Blank	11/28/00	1:1	0.25 U	NO	94.5%	90.5%
00-22650-CM51A	**NMW-4**	11/28/00	1:1	**0.42**	NO	97.7%	96.4%
00-22650-Dupl	**NMW-4**	11/28/00	1:1	**0.37**	NO	98.0%	98.6%
00-22651-CM51B	**NMW-5**	11/28/00	1:1	**1.9**	NO	103%	107%
00-22652-CM51C	NMW-6	11/29/00	1:1	0.25 U	NO	102%	84.9%
00-22653-CM51D	**NMW-3**	11/29/00	1:5	**29**	NO	107%	106%
00-22654-CM51E	**NMW-300**	11/29/00	1:5	30	NO	105%	105%
00-22655-CM51F	NMW-2	11/29/00	1:1	0.25 U	NO	99.2%	94.8%
00-22656-CM51G	MW-5	11/29/00	1:1	0.25 U	NO	98.0%	95.3%
00-22657-CM51H	MW-6	11/29/00	1:1	0.25 U	NO	95.9%	95.2%
00-22658-CM51I	MW-2	11/28/00	1:1	0.25 U	NO	101%	100%
00-22659-CM51J	NMW-1	11/28/00	1:1	0.25 U	NO	99.1%	101%
00-22660-CM51K	MW-7	11/28/00	1:1	0.25 U	NO	97.4%	95.8%
00-22661-CM51L	MW-1	11/28/00	1:1	0.25 U	NO	98.9%	98.5%

Surrogate A is Trifluorotoluene.
Surrogate B is Bromobenzene.

Values reported in ppm (mg/L).
Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

Data Qualifiers

U Compound not detected at the given detection limit.
X Value detected above linear range of instrument. Dilution required.
J Indicates an estimated value below the calculated detection limit.
S No value reported due to saturation of the detector. Dilution required.
D Indicates the surrogate was not detected because of dilution of the extract.
NR Indicates no recovery due to matrix interference.

FORM-1 TPH-g

TOTAL GASOLINE RANGE HYDROCARBONS
NWTPHg - Toluene to Naphthalene

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CM51SB
LIMS ID: 00-22651
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 12/01/00 CR 12/1/00

LABORATORY CONTROL SAMPLE RECOVERY REPORT
Analyzed 11/28/00

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% REC	RPD
LABORATORY CONTROL SAMPLE				
Gasoline Range Hydrocarbons	2.47	2.50	98.8%	
LCS DUPLICATE SAMPLE				
Gasoline Range Hydrocarbons	2.41	2.50	96.4%	2.5%

TPHg Surrogate Rec	LC	LCD
Trifluorotoluene	102%	103%
Bromobenzene	105%	107%

Values reported in parts per million (mg/L)

TPHg SPIKE CONTROL LIMITS

Percent Recovery 50-150%
Duplicate RPD <50%

Advisory QA Limits

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL HYDROCARBONS COMPOUND SUMMARY

Matrix: Water

QC Report No: CM51

LIMS ID	Lab ID	Extracted	Client ID	MeArach	TOT OUT
00-22650MB	113000MB	11/27/00	Method Blank	98%	0
00-22650LC	113000LC	11/27/00	Lab Control	87%	0
00-22650LCD	113000LCD	11/27/00	Lab Control Dup	85%	0
00-22650	CM51A	11/27/00	NMW-4	82%	0
00-22651	CM51B	11/27/00	NMW-5	88%	0
00-22652	CM51C	11/27/00	NMW-6	87%	0
00-22653	CM51D	11/27/00	NMW-3	68%	0
00-22654	CM51E	11/27/00	NMW-300	65%	0
00-22655	CM51F	11/27/00	NMW-2	75%	0
00-22656	CM51G	11/27/00	MW-5	74%	0
00-22657	CM51H	11/27/00	MW-6	55%	0
00-22658	CM51I	11/27/00	MW-2	95%	0
00-22659	CM51J	11/27/00	NMW-1	79%	0
00-22660	CM51K	11/27/00	MW-7	63%	0
00-22661	CM51L	11/27/00	MW-1	68%	0

	Control QC LIMITS	Sample QC LIMITS
(MeArach) = Methylarachidate	(65-118)	(54-133)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D System Monitoring Compound diluted out

FORM-II TPHD

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID
and Motor Oil

ANALYTICAL RESOURCES INCORPORATED

Lab ID: 00-22650
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/05/00 CR 12/5/00

Lab ID	Sample ID	Date Extracted	Date Analyzed	Dilution Factor	Diesel Range	*HC ID	Motor Oil Range	Surr Rec
CM51MB	Method Blank	11/27/00	11/30/00	1:1	0.25 U	---	0.50 U	98.0%
CM51A	NMW-4	11/27/00	11/30/00	1:1	1.3	NO	0.50 U	82.0%
CM51B	NMW-5	11/27/00	11/30/00	1:1	3.6	NO	0.50 U	88.0%
CM51C	NMW-6	11/27/00	11/30/00	1:1	0.64	NO	0.50 U	87.0%
CM51D	NMW-3	11/27/00	11/30/00	1:1	4.0	NO	0.50 U	68.0%
CM51E	NMW-300	11/27/00	11/30/00	1:1	3.8	NO	0.50 U	65.0%
CM51F	NMW-2	11/27/00	11/30/00	1:1	0.56	NO	0.50 U	75.0%
CM51G	MW-5	11/27/00	11/30/00	1:1	0.62	NO	0.50 U	74.0%
CM51H	MW-6	11/27/00	11/30/00	1:1	1.2	NO	0.50 U	55.0%
CM51I	MW-2	11/27/00	11/30/00	1:1	0.25 U	---	0.50 U	95.0%
CM51J	NMW-1	11/27/00	11/30/00	1:1	0.52	NO	0.50 U	79.0%
CM51K	MW-7	11/27/00	11/30/00	1:1	0.44	NO	0.50 U	63.0%
CM51L	MW-1	11/27/00	11/30/00	1:1	0.25 U	---	0.50 U	68.0%

Surrogate is Methyl-Arachidate.

* ID indicates, in the opinion of the analyst, the petroleum product with the best pattern match. 'NO' indicates that there was not a good match for any of the requested products.
Values reported in ppm (mg/L)
Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.

Data Qualifiers

U Compound not detected at the given detection limit.
J Indicates an estimated value below the calculated detection limit.
S No value reported due to saturation of the detector. Dilution required.
D Indicates the surrogate was not detected because of dilution of the extract.
E Indicates a value above the linear range of the detector. Dilution required.
NR Indicates no recovery due to matrix interference.
B Indicates compound also detected in the method blank.

FORM-1 TPHD

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CM51SB
LIMS ID: 00-22650
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 12/05/00 CR 12/5/00

LABORATORY CONTROL SAMPLE RECOVERY REPORT
Extracted: 11/27/00
Analyzed: 11/30/00

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY	RPD
Diesel Range Hydrocarbons-LCS	2.42	2.50	96.8%	
Diesel Range Hydrocarbons-LCD	2.48	2.50	99.2%	2.4%

TPHd Surrogate Recovery

Methylarachidate-LCS 87.0%

Methylarachidate-LCD 85.0%

Values reported in parts per million (mg/L)

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: Method Blank**
TOTAL METALS

Lab Sample ID: CM51MB
LIMS ID: 00-22650
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized:
Reported: 12/15/00

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010	12/08/00	6010	12/12/00	7440-38-2	Arsenic	0.05	0.05 U
3010	12/08/00	6010	12/12/00	7440-39-3	Barium	0.003	0.003 U
3010	12/08/00	6010	12/12/00	7440-43-9	Cadmium	0.002	0.002 U
3010	12/08/00	6010	12/12/00	7440-47-3	Chromium	0.005	0.005 U
3010	12/08/00	6010	12/12/00	7440-50-8	Copper	0.002	0.002 U
3010	12/08/00	6010	12/12/00	7439-92-1	Lead	0.02	0.02 U
7470	12/11/00	7470	12/12/00	7439-97-6	Mercury	0.0001	0.0001 U
3010	12/08/00	6010	12/12/00	7782-49-2	Selenium	0.05	0.05 U
3010	12/08/00	6010	12/12/00	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET
DISSOLVED METALS

Sample No: Method Blank

Lab Sample ID: CM51MB
LIMS ID: 00-22662
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized:
Reported: 12/15/00

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
6010	12/08/00	6010	12/08/00	7440-38-2	Arsenic	0.05	0.05 U
6010	12/08/00	6010	12/08/00	7440-39-3	Barium	0.003	0.003 U
6010	12/08/00	6010	12/08/00	7440-43-9	Cadmium	0.002	0.002 U
6010	12/08/00	6010	12/08/00	7440-47-3	Chromium	0.005	0.005 U
6010	12/08/00	6010	12/08/00	7440-50-8	Copper	0.002	0.002 U
6010	12/08/00	6010	12/08/00	7439-92-1	Lead	0.02	0.02 U
7470	12/11/00	7470	12/12/00	7439-97-6	Mercury	0.0001	0.0001 U
6010	12/08/00	6010	12/08/00	7782-49-2	Selenium	0.05	0.05 U
6010	12/08/00	6010	12/08/00	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: NMW-4**
TOTAL METALS

Lab Sample ID: CM51A
LIMS ID: 00-22650
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/15/00

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010	12/08/00	6010	12/12/00	7440-38-2	Arsenic	0.05	0.05 U
3010	12/08/00	6010	12/12/00	**7440-39-3**	**Barium**	0.003	**0.010**
3010	12/08/00	6010	12/12/00	7440-43-9	Cadmium	0.002	0.002 U
3010	12/08/00	6010	12/12/00	7440-47-3	Chromium	0.005	0.005 U
3010	12/08/00	6010	12/12/00	**7440-50-8**	**Copper**	0.002	**0.003**
3010	12/08/00	6010	12/12/00	7439-92-1	Lead	0.02	0.02 U
7470	12/11/00	7470	12/12/00	7439-97-6	Mercury	0.0001	0.0001 U
3010	12/08/00	6010	12/12/00	7782-49-2	Selenium	0.05	0.05 U
3010	12/08/00	6010	12/12/00	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Sample No: NMW-4
Lab Sample ID: CM51A
QC Report No: CM51-Kennedy Jenks Consultants
LIMS ID: 00-22650
Project: Tacoma Metals
Matrix: Water
996098.00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/15/00

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Sample mg/L	Spike mg/L	Spike Added	% Recovery	Q
Arsenic	0.05 U	1.86	2.00	93.0%	
Barium	0.010	1.95	2.00	97.0%	
Cadmium	0.002 U	0.464	0.500	92.8%	
Chromium	0.005 U	0.475	0.500	95.0%	
Copper	0.003	0.493	0.500	98.0%	
Lead	0.02 U	1.83	2.00	91.5%	
Mercury	0.0001 U	0.0010	0.0010	100%	
Selenium	0.05 U	1.88	2.00	94.0%	
Silver	0.003 U	0.464	0.500	92.8%	

'Q' codes:
N = control limit not met
H = %R not applicable, sample concentration too high
* = RPD control limit not met
NA = Not applicable - analyte not spiked

Control Limits:
Percent Recovery: 75-125%
RPD: +/-20%

FORM-V

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: NMW-5**
TOTAL METALS

Lab Sample ID: CM51B
LIMS ID: 00-22651
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/15/00

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010	12/08/00	6010	12/12/00	7440-38-2	Arsenic	0.05	0.05 U
3010	12/08/00	6010	12/12/00	**7440-39-3**	**Barium**	0.003	**0.009**
3010	12/08/00	6010	12/12/00	7440-43-9	Cadmium	0.002	0.002 U
3010	12/08/00	6010	12/12/00	7440-47-3	Chromium	0.005	0.005 U
3010	12/08/00	6010	12/12/00	**7440-50-8**	**Copper**	0.002	**0.003**
3010	12/08/00	6010	12/12/00	7439-92-1	Lead	0.02	0.02 U
7470	12/11/00	7470	12/12/00	7439-97-6	Mercury	0.0001	0.0001 U
3010	12/08/00	6010	12/12/00	7782-49-2	Selenium	0.05	0.05 U
3010	12/08/00	6010	12/12/00	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Sample No: NMW-5
Lab Sample ID: CM51B
QC Report No: CM51-Kennedy Jenks Consultants
LIMS ID: 00-22651
Project: Tacoma Metals
Matrix: Water
996098.00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/15/00

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Sample mg/L	Duplicate mg/L	RPD	Control Limit	Q
Arsenic	0.05 U	0.05 U	0.0%	+/- 0.05	L
Barium	0.009	0.011	20.0%	+/- 0.003	L
Cadmium	0.002 U	0.002 U	0.0%	+/- 0.002	L
Chromium	0.005 U	0.005 U	0.0%	+/- 0.005	L
Copper	0.003	0.004	28.6%	+/- 0.002	L
Lead	0.02 U	0.02 U	0.0%	+/- 0.02	L
Mercury	0.0001 U	0.0001 U	0.0%	+/- 0.0001	L
Selenium	0.05 U	0.05 U	0.0%	+/- 0.05	L
Silver	0.003 U	0.003 U	0.0%	+/- 0.003	L

'Q' codes: * = control limit not met
L = RPD not valid, alternate limit = detection limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: NMW-6**
TOTAL METALS

Lab Sample ID: CM51C
LIMS ID: 00-22652
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/15/00

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010	12/08/00	6010	12/12/00	7440-38-2	Arsenic	0.05	0.05 U
3010	12/08/00	6010	12/12/00	**7440-39-3**	**Barium**	0.003	**0.030**
3010	12/08/00	6010	12/12/00	7440-43-9	Cadmium	0.002	0.002 U
3010	12/08/00	6010	12/12/00	7440-47-3	Chromium	0.005	0.005 U
3010	12/08/00	6010	12/12/00	7440-50-8	Copper	0.002	0.002 U
3010	12/08/00	6010	12/12/00	7439-92-1	Lead	0.02	0.02 U
7470	12/11/00	7470	12/12/00	7439-97-6	Mercury	0.0001	0.0001 U
3010	12/08/00	6010	12/12/00	7782-49-2	Selenium	0.05	0.05 U
3010	12/08/00	6010	12/12/00	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: NMW-3**
TOTAL METALS

Lab Sample ID: CM51D
LIMS ID: 00-22653
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Data Release Authorized
Reported: 12/15/00

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010	12/08/00	6010	12/12/00	7440-38-2	Arsenic	0.05	0.05 U
3010	12/08/00	6010	12/12/00	**7440-39-3**	**Barium**	0.003	**0.013**
3010	12/08/00	6010	12/12/00	7440-43-9	Cadmium	0.002	0.002 U
3010	12/08/00	6010	12/12/00	7440-47-3	Chromium	0.005	0.005 U
3010	12/08/00	6010	12/12/00	**7440-50-8**	**Copper**	0.002	**0.002**
3010	12/08/00	6010	12/12/00	7439-92-1	Lead	0.02	0.02 U
7470	12/11/00	7470	12/12/00	7439-97-6	Mercury	0.0001	0.0001 U
3010	12/08/00	6010	12/12/00	7782-49-2	Selenium	0.05	0.05 U
3010	12/08/00	6010	12/12/00	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: NMW-300**
TOTAL METALS

Lab Sample ID: CM51E
LIMS ID: 00-22654
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/15/00

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010	12/08/00	6010	12/12/00	7440-38-2	Arsenic	0.05	0.05 U
3010	12/08/00	6010	12/12/00	7440-39-3	**Barium**	0.003	**0.011**
3010	12/08/00	6010	12/12/00	7440-43-9	Cadmium	0.002	0.002 U
3010	12/08/00	6010	12/12/00	7440-47-3	Chromium	0.005	0.005 U
3010	12/08/00	6010	12/12/00	7440-50-8	Copper	0.002	0.002 U
3010	12/08/00	6010	12/12/00	7439-92-1	Lead	0.02	0.02 U
7470	12/11/00	7470	12/12/00	7439-97-6	Mercury	0.0001	0.0001 U
3010	12/08/00	6010	12/12/00	7782-49-2	Selenium	0.05	0.05 U
3010	12/08/00	6010	12/12/00	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: NMW-2**
TOTAL METALS

Lab Sample ID: CM51F
LIMS ID: 00-22655
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Data Release Authorized
Reported: 12/15/00

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010	12/08/00	6010	12/12/00	7440-38-2	Arsenic	0.05	0.05 U
3010	12/08/00	6010	12/12/00	7440-39-3	Barium	0.003	0.012
3010	12/08/00	6010	12/12/00	7440-43-9	Cadmium	0.002	0.002 U
3010	12/08/00	6010	12/12/00	7440-47-3	Chromium	0.005	0.005 U
3010	12/08/00	6010	12/12/00	7440-50-8	Copper	0.002	0.002 U
3010	12/08/00	6010	12/12/00	7439-92-1	Lead	0.02	0.02 U
7470	12/11/00	7470	12/12/00	7439-97-6	Mercury	0.0001	0.0001 U
3010	12/08/00	6010	12/12/00	7782-49-2	Selenium	0.05	0.05 U
3010	12/08/00	6010	12/12/00	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: MW-5**
TOTAL METALS

Lab Sample ID: CM51G
LIMS ID: 00-22656
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/15/00

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010	12/08/00	6010	12/12/00	7440-38-2	Arsenic	0.05	0.05 U
3010	12/08/00	6010	12/12/00	**7440-39-3**	**Barium**	0.003	**0.020**
3010	12/08/00	6010	12/12/00	7440-43-9	Cadmium	0.002	0.002 U
3010	12/00/00	6010	12/12/00	7440-47-3	Chromium	0.005	0.005 U
3010	12/08/00	6010	12/12/00	**7440-50-8**	**Copper**	0.002	**0.004**
3010	12/08/00	6010	12/12/00	7439-92-1	Lead	0.02	0.02 U
7470	12/11/00	7470	12/12/00	7439-97-6	Mercury	0.0001	0.0001 U
3010	12/08/00	6010	12/12/00	7782-49-2	Selenium	0.05	0.05 U
3010	12/08/00	6010	12/12/00	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: MW-6**
TOTAL METALS

Lab Sample ID: CM51H
LIMS ID: 00-22657
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/15/00

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010	12/08/00	6010	12/12/00	7440-38-2	Arsenic	0.05	0.05 U
3010	12/08/00	6010	12/12/00	**7440-39-3**	**Barium**	0.003	**0.030**
3010	12/08/00	6010	12/12/00	7440-43-9	Cadmium	0.002	0.002 U
3010	12/08/00	6010	12/12/00	7440-47-3	Chromium	0.005	0.005 U
3010	12/08/00	6010	12/12/00	**7440-50-8**	**Copper**	0.002	**0.005**
3010	12/08/00	6010	12/12/00	7439-92-1	Lead	0.02	0.02 U
7470	12/11/00	7470	12/12/00	7439-97-6	Mercury	0.0001	0.0001 U
3010	12/08/00	6010	12/12/00	7782-49-2	Selenium	0.05	0.05 U
3010	12/08/00	6010	12/12/00	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: MW-2**
TOTAL METALS

Lab Sample ID: CM51I
LIMS ID: 00-22658
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/15/00

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010	12/08/00	6010	12/12/00	7440-38-2	Arsenic	0.05	0.05 U
3010	12/08/00	6010	12/12/00	**7440-39-3**	**Barium**	0.003	**0.028**
3010	12/08/00	6010	12/12/00	7440-43-9	Cadmium	0.002	0.002 U
3010	12/08/00	6010	12/12/00	7440-47-3	Chromium	0.005	0.005 U
3010	12/08/00	6010	12/12/00	**7440-50-8**	**Copper**	0.002	**0.020**
3010	12/08/00	6010	12/12/00	7439-92-1	Lead	0.02	0.02 U
7470	12/11/00	7470	12/12/00	7439-97-6	Mercury	0.0001	0.0001 U
3010	12/08/00	6010	12/12/00	7782-49-2	Selenium	0.05	0.05 U
3010	12/08/00	6010	12/12/00	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: NMW-1**
TOTAL METALS

Lab Sample ID: CM51J
LIMS ID: 00-22659
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Data Release Authorized
Reported: 12/15/00

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010	12/08/00	6010	12/12/00	7440-38-2	Arsenic	0.05	0.05 U
3010	12/08/00	6010	12/12/00	**7440-39-3**	**Barium**	0.003	**0.090**
3010	12/08/00	6010	12/12/00	7440-43-9	Cadmium	0.002	0.002 U
3010	12/08/00	6010	12/12/00	7440-47-3	Chromium	0.005	0.005 U
3010	12/08/00	6010	12/12/00	7440-50-8	Copper	0.002	0.002 U
3010	12/08/00	6010	12/12/00	7439-92-1	Lead	0.02	0.02 U
7470	12/11/00	7470	12/12/00	7439-97-6	Mercury	0.0001	0.0001 U
3010	12/08/00	6010	12/12/00	7782-49-2	Selenium	0.05	0.05 U
3010	12/08/00	6010	12/12/00	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: MW-7**
TOTAL METALS

Lab Sample ID: CM51K
LIMS ID: 00-22660
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/15/00

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010	12/08/00	6010	12/12/00	7440-38-2	Arsenic	0.05	0.05 U
3010	12/08/00	6010	12/12/00	**7440-39-3**	**Barium**	0.003	**0.031**
3010	12/08/00	6010	12/12/00	7440-43-9	Cadmium	0.002	0.002 U
3010	12/08/00	6010	12/12/00	7440-47-3	Chromium	0.005	0.005 U
3010	12/08/00	6010	12/12/00	**7440-50-8**	**Copper**	0.002	**0.008**
3010	12/08/00	6010	12/12/00	7439-92-1	Lead	0.02	0.02 U
7470	12/11/00	7470	12/12/00	7439-97-6	Mercury	0.0001	0.0001 U
3010	12/08/00	6010	12/12/00	7782-49-2	Selenium	0.05	0.05 U
3010	12/08/00	6010	12/12/00	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: MW-1**
TOTAL METALS

Lab Sample ID: CM51L
LIMS ID: 00-22661
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/15/00

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010	12/08/00	6010	12/12/00	7440-38-2	Arsenic	0.05	0.05 U
3010	12/08/00	6010	12/12/00	7440-39-3	Barium	0.003	0.016
3010	12/08/00	6010	12/12/00	7440-43-9	Cadmium	0.002	0.002 U
3010	12/08/00	6010	12/12/00	7440-47-3	Chromium	0.005	0.005 U
3010	12/08/00	6010	12/12/00	7440-50-8	Copper	0.002	0.011
3010	12/08/00	6010	12/12/00	7439-92-1	Lead	0.02	0.02 U
7470	12/11/00	7470	12/12/00	7439-97-6	Mercury	0.0001	0.0001 U
3010	12/08/00	6010	12/12/00	7782-49-2	Selenium	0.05	0.05 U
3010	12/08/00	6010	12/12/00	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET **Sample No: NMW-4 (D)**
DISSOLVED METALS

Lab Sample ID: CM51M
LIMS ID: 00-22662
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/15/00

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
6010	12/08/00	6010	12/08/00	7440-38-2	Arsenic	0.05	0.05 U
6010	12/08/00	6010	12/08/00	**7440-39-3**	**Barium**	0.003	**0.012**
6010	12/08/00	6010	12/08/00	7440-43-9	Cadmium	0.002	0.002 U
6010	12/08/00	6010	12/08/00	7440-47-3	Chromium	0.005	0.005 U
6010	12/08/00	6010	12/08/00	7440-50-8	Copper	0.002	0.002 U
6010	12/08/00	6010	12/08/00	7439-92-1	Lead	0.02	0.02 U
7470	12/11/00	7470	12/12/00	7439-97-6	Mercury	0.0001	0.0001 U
6010	12/08/00	6010	12/08/00	7782-49-2	Selenium	0.05	0.05 U
6010	12/08/00	6010	12/08/00	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS

ANALYTICAL RESOURCES INCORPORATED

Sample No: NMW-4 (D)
Lab Sample ID: CM51M
QC Report No: CM51-Kennedy Jenks Consultants
LIMS ID: 00-22662
Project: Tacoma Metals
Matrix: Water
996098.00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/15/00

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Sample mg/L	Spike mg/L	Spike Added	% Recovery	Q
Arsenic	0.05 U	1.95	2.00	97.5%	
Barium	0.012	1.97	2.00	97.9%	
Cadmium	0.002 U	0.506	0.500	101%	
Chromium	0.005 U	0.494	0.500	98.8%	
Copper	0.002 U	0.503	0.500	101%	
Lead	0.02 U	1.95	2.00	97.5%	
Mercury	0.0001 U	0.0012	0.0010	120%	
Selenium	0.05 U	1.99	2.00	99.5%	
Silver	0.003 U	0.429	0.500	85.8%	

'Q' codes:
N = control limit not met
H = %R not applicable, sample concentration too high
* = RPD control limit not met
NA = Not applicable - analyte not spiked

Control Limits: Percent Recovery: 75-125%
RPD: +/-20%

FORM-V

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET
DISSOLVED METALS

Sample No: NMW-5 (D)

Lab Sample ID: CM51N
LIMS ID: 00-22663
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/15/00

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
6010	12/08/00	6010	12/08/00	7440-38-2	Arsenic	0.05	0.05 U
6010	12/08/00	6010	12/08/00	**7440-39-3**	**Barium**	0.003	**0.010**
6010	12/08/00	6010	12/08/00	7440-43-9	Cadmium	0.002	0.002 U
6010	12/08/00	6010	12/08/00	7440-47-3	Chromium	0.005	0.005 U
6010	12/08/00	6010	12/08/00	7440-50-8	Copper	0.002	0.002 U
6010	12/08/00	6010	12/08/00	7439-92-1	Lead	0.02	0.02 U
7470	12/11/00	7470	12/12/00	7439-97-6	Mercury	0.0001	0.0001 U
6010	12/08/00	6010	12/08/00	7782-49-2	Selenium	0.05	0.05 U
6010	12/08/00	6010	12/08/00	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS

ANALYTICAL RESOURCES INCORPORATED

Sample No: NMW-5 (D)
QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 11/22/00

Lab Sample ID: CM51N
LIMS ID: 00-22663
Matrix: Water

Data Release Authorized By
Reported: 12/15/00

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Sample mg/L	Duplicate mg/L	RPD	Control Limit	Q
Arsenic	0.05 U	0.05 U	0.0%	+/- 0.05	L
Barium	0.010	0.010	0.0%	+/- 0.003	L
Cadmium	0.002 U	0.002 U	0.0%	+/- 0.002	L
Chromium	0.005 U	0.005 U	0.0%	+/- 0.005	L
Copper	0.002 U	0.002 U	0.0%	+/- 0.002	L
Lead	0.02 U	0.02 U	0.0%	+/- 0.02	L
Mercury	0.0001 U	0.0001 U	0.0%	+/- 0.0001	L
Selenium	0.05 U	0.05 U	0.0%	+/- 0.05	L
Silver	0.003 U	0.003 U	0.0%	+/- 0.003	L

'Q' codes: * = control limit not met
L = RPD not valid, alternate limit = detection limit

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET **Sample No:** NMW-6 (D)
DISSOLVED METALS

Lab Sample ID: CM510
LIMS ID: 00-22664
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Data Release Authorized
Reported: 12/15/00

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
6010	12/08/00	6010	12/08/00	7440-38-2	Arsenic	0.05	0.05 U
6010	12/08/00	6010	12/08/00	7440-39-3	Barium	0.003	0.035
6010	12/08/00	6010	12/08/00	7440-43-9	Cadmium	0.002	0.002 U
6010	12/08/00	6010	12/08/00	7440-47-3	Chromium	0.005	0.005 U
6010	12/08/00	6010	12/08/00	7440-50-8	Copper	0.002	0.002 U
6010	12/08/00	6010	12/08/00	7439-92-1	Lead	0.02	0.02 U
7470	12/11/00	7470	12/12/00	7439-97-6	Mercury	0.0001	0.0001 U
6010	12/08/00	6010	12/08/00	7782-49-2	Selenium	0.05	0.05 U
6010	12/08/00	6010	12/08/00	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET **Sample No: NMW-3 (D)**
DISSOLVED METALS

Lab Sample ID: CM51P
LIMS ID: 00-22665
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/15/00

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
6010	12/08/00	6010	12/08/00	7440-38-2	Arsenic	0.05	0.05 U
6010	12/08/00	6010	12/08/00	7440-39-3	Barium	0.003	0.015
6010	12/08/00	6010	12/08/00	7440-43-9	Cadmium	0.002	0.002 U
6010	12/08/00	6010	12/08/00	7440-47-3	Chromium	0.005	0.005 U
6010	12/08/00	6010	12/08/00	7440-50-8	Copper	0.002	0.002 U
6010	12/08/00	6010	12/08/00	7439-92-1	Lead	0.02	0.02 U
7470	12/11/00	7470	12/12/00	7439-97-6	Mercury	0.0001	0.0001 U
6010	12/08/00	6010	12/08/00	7782-49-2	Selenium	0.05	0.05 U
6010	12/08/00	6010	12/08/00	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET **Sample No: NMW-300 (D)**
DISSOLVED METALS

Lab Sample ID: CM51Q
LIMS ID: 00-22666
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/15/00

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
6010	12/08/00	6010	12/08/00	7440-38-2	Arsenic	0.05	0.05 U
6010	12/08/00	6010	12/08/00	**7440-39-3**	**Barium**	0.003	**0.015**
6010	12/08/00	6010	12/08/00	7440-43-9	Cadmium	0.002	0.002 U
6010	12/08/00	6010	12/08/00	7440-47-3	Chromium	0.005	0.005 U
6010	12/08/00	6010	12/08/00	7440-50-8	Copper	0.002	0.002 U
6010	12/08/00	6010	12/08/00	7439-92-1	Lead	0.02	0.02 U
7470	12/11/00	7470	12/12/00	7439-97-6	Mercury	0.0001	0.0001 U
6010	12/08/00	6010	12/08/00	7782-49-2	Selenium	0.05	0.05 U
6010	12/08/00	6010	12/08/00	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET
DISSOLVED METALS

Sample No: NMW-2 (D)

Lab Sample ID: CM51R
LIMS ID: 00-22667
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/20/00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/15/00

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
6010	12/08/00	6010	12/08/00	7440-38-2	Arsenic	0.05	0.05 U
6010	12/08/00	6010	12/08/00	**7440-39-3**	**Barium**	0.003	**0.013**
6010	12/08/00	6010	12/08/00	7440-43-9	Cadmium	0.002	0.002 U
6010	12/08/00	6010	12/08/00	7440-47-3	Chromium	0.005	0.005 U
6010	12/08/00	6010	12/08/00	7440-50-8	Copper	0.002	0.002 U
6010	12/08/00	6010	12/08/00	7439-92-1	Lead	0.02	0.02 U
7470	12/11/00	7470	12/12/00	7439-97-6	Mercury	0.0001	0.0001 U
6010	12/08/00	6010	12/08/00	7782-49-2	Selenium	0.05	0.05 U
6010	12/08/00	6010	12/08/00	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET **Sample No: MW-5 (D)**
DISSOLVED METALS

Lab Sample ID: CM51S
LIMS ID: 00-22668
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/15/00

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
6010	12/08/00	6010	12/08/00	7440-38-2	Arsenic	0.05	0.05 U
6010	12/08/00	6010	12/08/00	**7440-39-3**	**Barium**	0.003	**0.035**
6010	12/08/00	6010	12/08/00	7440-43-9	Cadmium	0.002	0.002 U
6010	12/08/00	6010	12/08/00	7440-47-3	Chromium	0.005	0.005 U
6010	12/08/00	6010	12/08/00	7440-50-8	Copper	0.002	0.002 U
6010	12/08/00	6010	12/08/00	7439-92-1	Lead	0.02	0.02 U
7470	12/11/00	7470	12/12/00	7439-97-6	Mercury	0.0001	0.0001 U
6010	12/08/00	6010	12/08/00	7782-49-2	Selenium	0.05	0.05 U
6010	12/08/00	6010	12/08/00	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET **Sample No: MW-6 (D)**
DISSOLVED METALS

Lab Sample ID: CM51T
LIMS ID: 00-22669
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/15/00

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
6010	12/08/00	6010	12/08/00	7440-38-2	Arsenic	0.05	0.05 U
6010	12/08/00	6010	12/08/00	7440-39-3	Barium	0.003	0.034
6010	12/08/00	6010	12/08/00	7440-43-9	Cadmium	0.002	0.002 U
6010	12/08/00	6010	12/08/00	7440-47-3	Chromium	0.005	0.005 U
6010	12/08/00	6010	12/08/00	7440-50-8	Copper	0.002	0.002 U
6010	12/08/00	6010	12/08/00	7439-92-1	Lead	0.02	0.02 U
7470	12/11/00	7470	12/12/00	7439-97-6	Mercury	0.0001	0.0001 U
6010	12/08/00	6010	12/08/00	7782-49-2	Selenium	0.05	0.05 U
6010	12/08/00	6010	12/08/00	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET **Sample No: MW-2 (D)**
DISSOLVED METALS

Lab Sample ID: CM51U
LIMS ID: 00-22670
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/15/00

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
6010	12/08/00	6010	12/08/00	7440-38-2	Arsenic	0.05	0.05 U
6010	12/08/00	6010	12/08/00	**7440-39-3**	**Barium**	0.003	**0.011**
6010	12/08/00	6010	12/08/00	7440-43-9	Cadmium	0.002	0.002 U
6010	12/08/00	6010	12/08/00	7440-47-3	Chromium	0.005	0.005 U
6010	12/08/00	6010	12/08/00	7440-50-8	Copper	0.002	0.002 U
6010	12/08/00	6010	12/08/00	7439-92-1	Lead	0.02	0.02 U
7470	12/11/00	7470	12/12/00	7439-97-6	Mercury	0.0001	0.0001 U
6010	12/08/00	6010	12/08/00	7782-49-2	Selenium	0.05	0.05 U
6010	12/08/00	6010	12/08/00	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET
DISSOLVED METALS

Sample No: NMW-1 (D)

Lab Sample ID: CMS1V
LIMS ID: 00-22671
Matrix: Water

QC Report No: CMS1-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Data Release Authorized
Reported: 12/15/00

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
6010	12/08/00	6010	12/08/00	7440-38-2	Arsenic	0.05	0.05 U
6010	12/08/00	6010	12/08/00	**7440-39-3**	**Barium**	0.003	**0.102**
6010	12/08/00	6010	12/08/00	7440-43-9	Cadmium	0.002	0.002 U
6010	12/08/00	6010	12/08/00	7440-47-3	Chromium	0.005	0.005 U
6010	12/08/00	6010	12/08/00	7440-50-8	Copper	0.002	0.002 U
6010	12/08/00	6010	12/08/00	7439-92-1	Lead	0.02	0.02 U
7470	12/11/00	7470	12/12/00	7439-97-6	Mercury	0.0001	0.0001 U
6010	12/08/00	6010	12/08/00	**7782-49-2**	**Selenium**	0.05	**0.07**
6010	12/08/00	6010	12/08/00	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET Sample No: MW-7 (D)
DISSOLVED METALS

Lab Sample ID: CM51W
LIMS ID: 00-22672
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/15/00

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
6010	12/08/00	6010	12/08/00	7440-38-2	Arsenic	0.05	0.05 U
6010	12/08/00	6010	12/08/00	**7440-39-3**	**Barium**	0.003	**0.039**
6010	12/08/00	6010	12/08/00	7440-43-9	Cadmium	0.002	0.002 U
6010	12/08/00	6010	12/08/00	7440-47-3	Chromium	0.005	0.005 U
6010	12/08/00	6010	12/08/00	**7440-50-8**	**Copper**	0.002	**0.003**
6010	12/08/00	6010	12/08/00	7439-92-1	Lead	0.02	0.02 U
7470	12/11/00	7470	12/12/00	7439-97-6	Mercury	0.0001	0.0001 U
6010	12/08/00	6010	12/08/00	7782-49-2	Selenium	0.05	0.05 U
6010	12/08/00	6010	12/08/00	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET **Sample No: MW-1 (D)**
DISSOLVED METALS

Lab Sample ID: CM51X
LIMS ID: 00-22673
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/21/00
Date Received: 11/22/00

Data Release Authorized:
Reported: 12/15/00

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
6010	12/08/00	6010	12/08/00	7440-38-2	Arsenic	0.05	0.05 U
6010	12/08/00	6010	12/08/00	7440-39-3	**Barium**	0.003	**0.019**
6010	12/08/00	6010	12/08/00	7440-43-9	Cadmium	0 002	0.002 U
6010	12/08/00	6010	12/08/00	7440-47-3	Chromium	0.005	0.005 U
6010	12/08/00	6010	12/08/00	7440-50-8	Copper	0.002	0.002 U
6010	12/08/00	6010	12/08/00	7439-92-1	Lead	0.02	0.02 U
7470	12/11/00	7470	12/12/00	7439-97-6	Mercury	0.0001	0.0001 U
6010	12/08/00	6010	12/08/00	7782-49-2	Selenium	0.05	0.05 U
6010	12/08/00	6010	12/08/00	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CM51LCS
LIMS ID: 00-22651
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 12/15/00

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Spike mg/L	Spike Added	% Recovery	Q
Arsenic	1.86	2.00	93.0%	
Barium	1.97	2.00	98.5%	
Cadmium	0.470	0.500	94.0%	
Chromium	0.485	0.500	97.0%	
Copper	0.500	0.500	100%	
Lead	1.86	2.00	93.0%	
Mercury	0.0019	0.0020	95.0%	
Selenium	1.90	2.00	95.0%	
Silver	0.474	0.500	94.8%	

'Q' codes: N = control limit not met

Control Limits: 80-120%

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CM51LCS
LIMS ID: 00-22663
Matrix: Water

QC Report No: CM51-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized
Reported: 12/15/00

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Spike mg/L	Spike Added	% Recovery	Q
Arsenic	2.00	2.00	100%	
Barium	2.01	2.00	100%	
Cadmium	0.525	0.500	105%	
Chromium	0.509	0.500	102%	
Copper	0.503	0.500	101%	
Lead	2.01	2.00	100%	
Mercury	0.0023	0.0020	115%	
Selenium	2.04	2.00	102%	
Silver	0.414	0.500	83.0%	

RECEIVED
MAR 2 3 2001
K/J Federal Way
K/J No/File
Route
Return To/By

'Q' codes: N = control limit not met
NA = Not applicable - analyte not spiked

Control Limits: 80-120%

FORM-VII

Analytical Resources, Incorporated
Analytical Chemists and Consultants

December 26, 2000

Ty Schreiner
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: Project: Tacoma Metals
ARI Job: CM97

Dear Ty:

Please find enclosed sample custody records and final analytical results for the above referenced project. Four water samples were received in good condition on November 30, 2000.

Selected samples were analyzed for sulfate referencing EPA method 375.2, total dissolved solids referencing EPA method 160.1 and total metals referencing EPA methods 6010 and 7000 series.

No analytical complications were noted. Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Susan Snyder
Project Manager
susan@arilabs.com

SS/ss
Enclosures

RECEIVED

DEC 27 2000

K/J Federal Way
K/J No/File
Route
Return To/By

333 Ninth Avenue North • Seattle WA 98109-5187 • **206-621-6490** • **206-621-7523** fax

CM97 00-23056 to 00-23059

6.5

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
400 Ninth Avenue North
Seattle, WA 98109-4708
206-621-6490 206-621-7523 (fax)

Page 1 of 1

Turn Around Requested: STD.

Report to: TY SCHREINER	Proj Name: TACOMA METALS
Company: K/J	Proj Number: 996098.00
Address: 530 S. 336th ST	Sampler:
FEDERAL WAY WA 98003	
Phone: 253 874-0555	Shipping Method: COURIER
Fax: 253 952 3435	AirBill:

Sample ID	Sample Date	Sample Time	Sample Matrix	No Containers	SULFATE	TDS	HARDNESS	IRON, MANGANESE POTASSIUM, SODIUM & CALCIUM							Notes/Comments
MNW-3	11/29/00	10:20	WATER	3	X	X	X	X							
MW-1	↓	11:00	↓	↓	X	X	X	X							
MW-2	↓	11:30	↓	↓	X	X	X	X							
MW-5	↓	12:15	↓	↓	X	X	X	X							

Relinquished: (Signature)	Relinquished: (Signature)	Relinquished: (Signature)	Special Instructions/Notes
Printed name: JOANE Brundage	Printed name:	Printed name:	
Company: KENNEDY / JENKS	Company:	Company:	
Date: 11/30/00 Time: 9:00	Date: Time:	Date: Time:	
Received by: [illegible]	Received by:	Received by:	
Printed name: [illegible]	Printed name:	Printed name:	
Company: ARI	Company:	Company:	Number of Coolers:
			Cooler Temp(s):
Date: 11/30/00 Time: 1235	Date: Time:	Date: Time:	COC Seals Intact?
			Bottles Intact?

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: Method Blank**
TOTAL METALS

Lab Sample ID: CM97MB
LIMS ID: 00-23056
Matrix: Water

QC Report No: CM97-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized:
Reported: 12/15/00

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010	12/11/00	6010	12/13/00	7440-70-2	Calcium	0.05	0.05 U
3010	12/11/00	6010	12/13/00	7439-89-6	Iron	0.02	0.02 U
3010	12/11/00	6010	12/13/00	7439-96-5	Manganese	0.001	0.001 U
3010	12/11/00	6010	12/13/00	7440-09-7	Potassium	0.5	0.5 U
3010	12/11/00	6010	12/13/00	7440-23-5	Sodium	0.05	0.05 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: MW-3**
TOTAL METALS

Lab Sample ID: CM97A
LIMS ID: 00-23056
Matrix: Water

QC Report No: CM97-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/29/00
Date Received: 11/30/00

Data Release Authorized:
Reported: 12/15/00

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010	12/11/00	6010	12/13/00	7440-70-2	Calcium	0.05	10.0
3010	12/11/00	6010	12/13/00	7439-89-6	Iron	0.02	26.2
3010	12/11/00	6010	12/13/00	7439-96-5	Manganese	0.001	0.365
3010	12/11/00	6010	12/13/00	7440-09-7	Potassium	0.5	8.3
3010	12/11/00	6010	12/13/00	7440-23-5	Sodium	0.05	14.3

Calculated Hardness (mg-CaCO3/L): 78

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: MW-1**
TOTAL METALS

Lab Sample ID: CM97B
LIMS ID: 00-23057
Matrix: Water

QC Report No: CM97-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/29/00
Date Received: 11/30/00

Data Release Authorized:
Reported: 12/15/00

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010	12/11/00	6010	12/13/00	7440-70-2	Calcium	0.05	30.8
3010	12/11/00	6010	12/13/00	7439-89-6	Iron	0.02	36.8
3010	12/11/00	6010	12/13/00	7439-96-5	Manganese	0.001	0.746
3010	12/11/00	6010	12/13/00	7440-09-7	Potassium	0.5	9.0
3010	12/11/00	6010	12/13/00	7440-23-5	Sodium	0.05	23.6

Calculated Hardness (mg-CaCO3/L): 140

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: MW-2**
TOTAL METALS

Lab Sample ID: CM97C
LIMS ID: 00-23058
Matrix: Water

QC Report No: CM97-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/29/00
Date Received: 11/30/00

Data Release Authorized
Reported: 12/15/00

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010	12/11/00	6010	12/13/00	7440-70-2	Calcium	0.05	35.7
3010	12/11/00	6010	12/13/00	7439-89-6	Iron	0.02	14.1
3010	12/11/00	6010	12/13/00	7439-96-5	Manganese	0.001	0.309
3010	12/11/00	6010	12/13/00	7440-09-7	Potassium	0.5	17.8
3010	12/11/00	6010	12/13/00	7440-23-5	Sodium	0.05	277

Calculated Hardness (mg-CaCO3/L): 290

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: MW-5**
TOTAL METALS

Lab Sample ID: CM97D
LIMS ID: 00-23059
Matrix: Water

QC Report No: CM97-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/29/00
Date Received: 11/30/00

Data Release Authorized:
Reported: 12/15/00

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010	12/11/00	6010	12/13/00	7440-70-2	Calcium	0.05	31.7
3010	12/11/00	6010	12/13/00	7439-89-6	Iron	0.02	6.22
3010	12/11/00	6010	12/13/00	7439-96-5	Manganese	0.001	0.627
3010	12/11/00	6010	12/13/00	7440-09-7	Potassium	0.5	6.3
3010	12/11/00	6010	12/13/00	7440-23-5	Sodium	0.05	20.2

Calculated Hardness (mg-$CaCO_3$/L): 210

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CM97LCS
LIMS ID: 00-23056
Matrix: Water

QC Report No: CM97-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 12/15/00

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Spike mg/L	Spike Added	% Recovery	Q
Calcium	9.88	10.0	98.8%	
Iron	1.93	2.00	96.5%	
Manganese	0.479	0.500	95.8%	
Potassium	9.6	10.0	96.0%	
Sodium	9.79	10.0	97.9%	

'Q' codes: N = control limit not met

Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

QA Report - Method Blank Analysis

QC Report No: CM97-Kennedy Jenks Consultants
Matrix: Water
Project: Tacoma Metals
996098.00
Date Received: NA

Data Release Authorized:
Reported: 12/26/00 Dr. M.A. Perkins

METHOD BLANK RESULTS
CONVENTIONALS

Analysis Date & Batch	Constituent	Units		Result	
12/06/00 12060#1	Total Dissolved Solids	mg/L	<	5.0	U
12/20/00 12200#1	Sulfate	mg/L	<	2.5	U

ANALYTICAL RESOURCES INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: MW-3

Lab Sample ID: CM97A
LIMS ID: 00-23056
Matrix: Water

Data Release Authorized:
Reported: 12/26/00 Dr. M.A. Perkins

QC Report No: CM97-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/29/00
Date Received: 11/30/00

Analyte	Analysis Date & Batch	Method	RL	Units	Result
Total Dissolved Solids	12/06/00 12060#1	EPA 160.1	10	mg/L	290
Sulfate	12/20/00 12200#1	EPA 375.2	2.5	mg/L	45

RL Analytical reporting limit
U Undetected at reported detection limit

Report for CM97 received 11/30/00

ANALYTICAL RESOURCES INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: MW-1

Lab Sample ID: CM97B
LIMS ID: 00-23057
Matrix: Water

QC Report No: CM97-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/29/00
Date Received: 11/30/00

Data Release Authorized:
Reported: 12/26/00 Dr. M.A. Perkins

Analyte	Analysis Date & Batch	Method	RL	Units	Result
Total Dissolved Solids	12/06/00 12060#1	EPA 160.1	10	mg/L	300
Sulfate	12/20/00 12200#1	EPA 375.2	2.5	mg/L	13

RL Analytical reporting limit
U Undetected at reported detection limit

Report for CM97 received 11/30/00

ANALYTICAL RESOURCES INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: MW-2

Lab Sample ID: CM97C
LIMS ID: 00-23058
Matrix: Water

QC Report No: CM97-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/29/00
Date Received: 11/30/00

Data Release Authorized:
Reported: 12/26/00 Dr. M.A. Perkins

Analyte	Analysis Date & Batch	Method	RL	Units	Result
Total Dissolved Solids	12/06/00 12060#1	EPA 160.1	20	mg/L	910
Sulfate	12/20/00 12200#1	EPA 375.2	5.0	mg/L	72

RL Analytical reporting limit
U Undetected at reported detection limit

Report for CM97 received 11/30/00

ANALYTICAL RESOURCES INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: MW-5

Lab Sample ID: CM97D
LIMS ID: 00-23059
Matrix: Water

QC Report No: CM97-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 11/29/00
Date Received: 11/30/00

Data Release Authorized:
Reported: 12/26/00 Dr. M.A. Perkins

Analyte	Analysis Date & Batch	Method	RL	Units	Result
Total Dissolved Solids	12/06/00 12060#1	EPA 160.1	10	mg/L	320
Sulfate	12/20/00 12200#1	EPA 375.2	2.5	mg/L	14

RL Analytical reporting limit
U Undetected at reported detection limit

Report for CM97 received 11/30/00

ANALYTICAL RESOURCES INCORPORATED

QA Report - Standard Reference Material Analysis

QC Report No: CM97-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: NA

Data Release Authorized
Reported: 12/26/00 Dr. M.A. Perkins

STANDARD REFERENCE MATERIAL ANALYSIS
CONVENTIONALS

Constituent	Units	Value	True Value	Recovery
SPEX #17-44				
Sulfate	mg/L	24.7	25.0	98.8%

Date analyzed: 12/20/00 Batch ID: 12200#1

ANALYTICAL RESOURCES INCORPORATED

QA Report - Replicate Analysis

QC Report No: CM97-Kennedy Jenks Consultants
Matrix: Water
Project: Tacoma Metals
996098.00
Date Received: 11/30/00

Data Release Authorized:
Reported: 12/26/00 Dr. M.A. Perkins

DUPLICATE ANALYSIS RESULTS
CONVENTIONALS

Constituent	Units	Sample Value	Duplicate Value	RPD
ARI ID: 00-23056, CM97 A	**Client Sample ID: MW-3**			
Total Dissolved Solids	mg/L	290	260	10.9%
ARI ID: 00-23059, CM97 D	**Client Sample ID: MW-5**			
Sulfate	mg/L	14	14	0.0%

ANALYTICAL RESOURCES INCORPORATED

QA Report - Matrix Spike/Matrix Spike Duplicate Analysis

QC Report No: CM97-Kennedy Jenks Consultants
Matrix: Water
Project: Tacoma Metals
996098.00
Date Received: 11/30/00

Data Release Authorized:
Reported: 12/26/00 Dr. M.A. Perkins

MATRIX SPIKE QA/QC REPORT
CONVENTIONALS

Constituent	Units	Sample Value	Spike Value	Spike Added	Recovery
ARI ID: 00-23059, CM97 D Client Sample ID: MW-5					
Sulfate	mg/L	13.9	31.7	20.0	89.0%

MS/MSD Recovery Limits: 75 - 125 %

Analytical Resources, Incorporated
Analytical Chemists and Consultants

March 19, 2001

Ty Schreiner
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: Project: Tacoma Metals / ARI Job: CU99

Dear Ty:

Please find enclosed sample custody records and final analytical results for the above referenced project. Six water samples were received in good condition on March 6, 2001. The samples were analyzed for volatiles referencing EPA 8260, PAH referencing GC/MS-SIM, PCBs referencing EPA 8082, and total and dissolved metals referencing EPA 6010/7471. Total diesel and motor oil range hydrocarbons were determined referencing WDOE method NWTPH-Dx and total gasoline range hydrocarbons were determined by NWTPH-G. pH was analyzed by EPA 150.1, conductivity by EPA 120.1, total dissolved solids by EPA 160.1 and sulfate by EPA method 375.2.

In tbe NWTPH-Dx analysis, samples MW-5, MW-5 (re-extract), MW-4 and MW-4 (re-extract) surrogate exceeded QC limits low, the samples were re-extracted due to the low surrogate recovery. The re-extracted data confirmed the initial data indicating matrix effects. SamplesMW-1 and MW-2 show a peak pattern in the diesel and motor oil range that do not resemble the diesel or motor oil typical standard pattern. MW-9, MW-6, MW-5 and MW-4 have a pattern in the diesel and motor oil range that does not resemble the typical diesel or motor oil standard pattern. Pattern looks to be heavier oil such as bunker C.

No other analytical complications were noted. Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

Susan Snyder
Project manger

SS/ss
Enclosures

RECEIVED
MAR 21 2001
K/J Federal Way
K/J No/File
Route
Return To

CC: Jodi Brundage, Kennedy Jenks Consultants, Federal Way, WA

333 Ninth Avenue North • Seattle WA 98109-5187 • **206-621-6490** • **206-621-7523** fax

3 oa
6°C CL99 G2455-60

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
400 Ninth Avenue North
Seattle, WA 98109-4708
206-621-6490 206-621-7523 (fax)

Turn Around Requested: STD

Report to: Ty Schreiner	Proj Name: TACOMA METALS
Company: Kennedy/Jenks	Proj Number: 9916098.00
Address: 530 S. 336th ST	Sampler: JCB
Federal Way, WA 98003	
Phone: 253 874-0555	Shipping Method: Courier
Fax: 253 952-3435	AirBill:

Analyses Requested

Sample ID	Sample Date	Sample Time	Sample Matrix	No Containers	VOC (8260)	NWTPH-G	NWTPH-D (ext)	PCB	PAH (SIM)	TOTAL RCRA METALS + Cu	DISSOLVED RCRA METALS + Cu				Notes/Comments
MW-1	3/5/01	10:10	WATER	10	X	X	X	X	X	X	X				"DISSOLVED" METALS
MW-2		10:55			X	X	X	X	X	X	X				SAMPLES WERE FIELD FILTERED
MW-9		12:15			X	X	X	X	X	X	X				
MW-6		1:15			X	X	X	X	X	X	X				
MW-5		2:25			X	X	X	X	X	X	X				
MW-4 ← (4)		3:20			X	X	X	X	X	X	X				

Relinquished: (Signature)	Relinquished: (Signature)	Relinquished: (Signature)	Special Instructions/Notes
Printed name: JOHN E. Brundige	Printed name:	Printed name:	
Company: K/J	Company:	Company:	
Date: 3/6/01 Time: 9:00	Date: Time:	Date: Time:	
Received by:	Received by:	Received by:	
Printed name:	Printed name:	Printed name:	
Company:	Company:	Company:	Number of Coolers:
			Cooler Temp(s):
Date: Time:	Date: Time:	Date: Time:	COC Seals Intact?
			Bottles Intact?

01-2845 01-2850 01-2855 60

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
400 Ninth Avenue North
Seattle, WA 98109-4708
206-621-6490 206-621-7523 (fax)

Page ___ of ___ Turn Around Requested: STD

Report to: TY Schreiner	Proj Name: Tacoma metals
Company: Kennedy/Jenks	Proj Number: 9960098.00
Address: 530 S. 336th ST Federal Way WA 98003	Sampler:
Phone: 253 874 0555	Shipping Method: Courier
Fax: 253 952 3435	AirBill:

Analyses Requested

Sample ID	Sample Date	Sample Time	Sample Matrix	No Containers	SULFATE	TDS	HARDNESS	Iron, manganese, potassium, sodium & calcium	pH / specific conductance						Notes/Comments
MW-1	3/5/01	10:10	WATER	2	X	X	X	X	X						Per Dean Matte all metals are total & dissolved. SR 3/6/01
MW-2	3/5/01	10:55	WATER	2	X	X	X	X	X						

Relinquished:	Relinquished:	Relinquished:	Special Instructions/Notes
(Signature) [signature]	(Signature)	(Signature)	
Printed name: Jodie Bailey	Printed name:	Printed name:	
Company: K/J	Company:	Company:	
Date: 3/6/01 Time: 9:00	Date: Time:	Date: Time:	
Received by:	Received by:	Received by:	
Printed name:	Printed name:	Printed name:	
Company:	Company:	Company:	Number of Coolers:
			Cooler Temp(s):
Date: Time:	Date: Time:	Date: Time:	COC Seals Intact?
			Bottles Intact?

ANALYTICAL RESOURCES INCORPORATED

WATER VOLATILE SYSTEM MONITORING COMPOUND SUMMARY

Matrix: Water 5 mL

QC Report No: CU99

Lab ID	Client ID	DCE	TOL	BFB	DCB	TOT OUT
030701MB	Method Blank	97%	95%	93%	106%	0
CU99A	MW-1	117%	100%	94%	107%	0
CU99LCS	Lab Cntrl Sample	90%	96%	100%	98%	0
CU99B	MW-2	106%	99%	93%	104%	0
CU99C	MW-9	106%	102%	90%	110%	0
CU99D	MW-6	112%	102%	88%	109%	0
031301MB	Method Blank	102%	97%	96%	100%	0
CU99E	MW-5	104%	100%	96%	102%	0
CU99LCS	Lab Cntrl Sample	97%	99%	99%	100%	0
CU99F	MW-4	111%	102%	91%	110%	0

		LCS/MB LIMITS	QC LIMITS
(DCE)	= 1,2-Dichloroethane-d4	(70-130)	(70-130)
(TOL)	= Toluene-d8	(70-130)	(70-130)
(BFB)	= Bromofluorobenzene	(70-130)	(70-130)
(DCB)	= 1,2-Dichlorobenzene-d4	(70-130)	(70-130)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D System Monitoring Compound diluted out

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 030701MB
LIMS ID: 01-2845
Matrix: Water
Data Release Authorized:
Reported: 03/16/01

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN3
Date Analyzed: 03/07/01 17:58

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	2.0 U
67-64-1	Acetone	5.0 U
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	trans-1,2-Dichloroethene	1.0 U
156-59-2	cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
108-05-4	Vinyl Acetate	5.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-02-6	trans-1,3-Dichloropropene	1.0 U
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.0 U
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2.0 U
1330-20-7	m,p-Xylene	1.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 030701MB
LIMS ID: 01-2845
Matrix: Water
Data Release Authorized:
Reported: 03/16/01

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: FINN3
Date Analyzed: 03/07/01 17:58

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	o-Xylene	1.0 U
95-50-1	1,2-Dichlorobenzene	1.0 U
541-73-1	1,3-Dichlorobenzene	1.0 U
106-46-7	1,4-Dichlorobenzene	1.0 U
107-02-8	Acrolein	50 U
74-88-4	Methyl Iodide	1.0 U
74-96-4	Bromoethane	2.0 U
107-13-1	Acrylonitrile	5.0 U
563-58-6	1,1-Dichloropropene	1.0 U
74-95-3	Dibromomethane	1.0 U
630-20-6	1,1,1,2-Tetrachloroethane	1.0 U
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U
96-18-4	1,2,3-Trichloropropane	3.0 U
110-57-6	trans-1,4-Dichloro-2-butene	5.0 U
108-67-8	1,3,5-Trimethylbenzene	1.0 U
95-63-6	1,2,4-Trimethylbenzene	1.0 U
87-68-3	Hexachlorobutadiene	5.0 U
106-93-4	Ethylene Dibromide	1.0 U
74-97-5	Bromochloromethane	1.0 U
594-20-7	2,2-Dichloropropane	1.0 U
142-28-9	1,3-Dichloropropane	1.0 U
98-82-8	Isopropylbenzene	1.0 U
103-65-1	n-Propylbenzene	1.0 U
108-86-1	Bromobenzene	1.0 U
95-49-8	2-Chlorotoluene	1.0 U
106-43-4	4-Chlorotoluene	1.0 U
98-06-6	tert-Butylbenzene	1.0 U
135-98-8	sec-Butylbenzene	1.0 U
99-87-6	4-Isopropyltoluene	1.0 U
104-51-8	n-Butylbenzene	1.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0 U
91-20-3	Naphthalene	5.0 U
87-61-6	1,2,3-Trichlorobenzene	5.0 U

Volatile Surrogate Recovery	
d4-1,2-Dichloroethane	97.4%
d8-Toluene	95.3%
Bromofluorobenzene	93.0%
d4-1,2-Dichlorobenzene	106%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 031301MB
LIMS ID: 01-2849
Matrix: Water
Data Release Authorized:
Reported: 03/16/01

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: NT3
Date Analyzed: 03/13/01 10:15

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	2.0 U
67-64-1	Acetone	5.0 U
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	trans-1,2-Dichloroethene	1.0 U
156-59-2	cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
108-05-4	Vinyl Acetate	5.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-02-6	trans-1,3-Dichloropropene	1.0 U
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.0 U
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2.0 U
1330-20-7	m,p-Xylene	1.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 031301MB
LIMS ID: 01-2849
Matrix: Water
Data Release Authorized
Reported: 03/16/01

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: NT3
Date Analyzed: 03/13/01 10:15

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	o-Xylene	1.0 U
95-50-1	1,2-Dichlorobenzene	1.0 U
541-73-1	1,3-Dichlorobenzene	1.0 U
106-46-7	1,4-Dichlorobenzene	1.0 U
107-02-8	Acrolein	50 U
74-88-4	Methyl Iodide	1.0 U
74-96-4	Bromoethane	2.0 U
107-13-1	Acrylonitrile	5.0 U
563-58-6	1,1-Dichloropropene	1.0 U
74-95-3	Dibromomethane	1.0 U
630-20-6	1,1,1,2-Tetrachloroethane	1.0 U
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U
96-18-4	1,2,3-Trichloropropane	3.0 U
110-57-6	trans-1,4-Dichloro-2-butene	5.0 U
108-67-8	1,3,5-Trimethylbenzene	1.0 U
95-63-6	1,2,4-Trimethylbenzene	1.0 U
87-68-3	Hexachlorobutadiene	5.0 U
106-93-4	Ethylene Dibromide	1.0 U
74-97-5	Bromochloromethane	1.0 U
594-20-7	2,2-Dichloropropane	1.0 U
142-28-9	1,3-Dichloropropane	1.0 U
98-82-8	Isopropylbenzene	1.0 U
103-65-1	n-Propylbenzene	1.0 U
108-86-1	Bromobenzene	1.0 U
95-49-8	2-Chlorotoluene	1.0 U
106-43-4	4-Chlorotoluene	1.0 U
98-06-6	tert-Butylbenzene	1.0 U
135-98-8	sec-Butylbenzene	1.0 U
99-87-6	4-Isopropyltoluene	1.0 U
104-51-8	n-Butylbenzene	1.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0 U
91-20-3	Naphthalene	5.0 U
87-61-6	1,2,3-Trichlorobenzene	5.0 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	102%
d8-Toluene	96.8%
Bromofluorobenzene	95.9%
d4-1,2-Dichlorobenzene	100%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: MW-1

Lab Sample ID: CU99A
LIMS ID: 01-2845
Matrix: Water
Data Release Authorized:
Reported: 03/16/01

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Instrument: FINN3
Date Analyzed: 03/07/01 19:27

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	2.0 U
67-64-1	Acetone	5.0 U
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	trans-1,2-Dichloroethene	1.0 U
156-59-2	cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
108-05-4	Vinyl Acetate	5.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-02-6	trans-1,3-Dichloropropene	1.0 U
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.0 U
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2.0 U
1330-20-7	m,p-Xylene	1.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: MW-1

Lab Sample ID: CU99A
LIMS ID: 01-2845
Matrix: Water
Data Release Authorized:
Reported: 03/16/01

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Instrument: FINN3
Date Analyzed: 03/07/01 19:27

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	o-Xylene	1.0 U
95-50-1	1,2-Dichlorobenzene	1.0 U
541-73-1	1,3-Dichlorobenzene	1.0 U
106-46-7	1,4-Dichlorobenzene	1.0 U
107-02-8	Acrolein	50 U
74-88-4	Methyl Iodide	1.0 U
74-96-4	Bromoethane	2.0 U
107-13-1	Acrylonitrile	5.0 U
563-58-6	1,1-Dichloropropene	1.0 U
74-95-3	Dibromomethane	1.0 U
630-20-6	1,1,1,2-Tetrachloroethane	1.0 U
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U
96-18-4	1,2,3-Trichloropropane	3.0 U
110-57-6	trans-1,4-Dichloro-2-butene	5.0 U
108-67-8	1,3,5-Trimethylbenzene	1.0 U
95-63-6	1,2,4-Trimethylbenzene	1.0 U
87-68-3	Hexachlorobutadiene	5.0 U
106-93-4	Ethylene Dibromide	1.0 U
74-97-5	Bromochloromethane	1.0 U
594-20-7	2,2-Dichloropropane	1.0 U
142-28-9	1,3-Dichloropropane	1.0 U
98-82-8	Isopropylbenzene	1.0 U
103-65-1	n-Propylbenzene	1.0 U
108-86-1	Bromobenzene	1.0 U
95-49-8	2-Chlorotoluene	1.0 U
106-43-4	4-Chlorotoluene	1.0 U
98-06-6	tert-Butylbenzene	1.0 U
135-98-8	sec-Butylbenzene	1.0 U
99-87-6	4-Isopropyltoluene	1.0 U
104-51-8	n-Butylbenzene	1.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0 U
91-20-3	Naphthalene	5.0 U
87-61-6	1,2,3-Trichlorobenzene	5.0 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	117%
d8-Toluene	100%
Bromofluorobenzene	93.8%
d4-1,2-Dichlorobenzene	107%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: MW-2

Lab Sample ID: CU99B
LIMS ID: 01-2846
Matrix: Water
Data Release Authorized:
Reported: 03/16/01

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Instrument: FINN3
Date Analyzed: 03/07/01 19:56

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	2.0 U
67-64-1	Acetone	5.0 U
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	trans-1,2-Dichloroethene	1.0 U
156-59-2	cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
108-05-4	Vinyl Acetate	5.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-02-6	trans-1,3-Dichloropropene	1.0 U
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.0 U
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2.0 U
1330-20-7	m,p-Xylene	1.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: MW-2

Lab Sample ID: CU99B
LIMS ID: 01-2846
Matrix: Water
Data Release Authorized:
Reported: 03/16/01

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Instrument: FINN3
Date Analyzed: 03/07/01 19:56

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	o-Xylene	1.0 U
95-50-1	1,2-Dichlorobenzene	1.0 U
541-73-1	1,3-Dichlorobenzene	1.0 U
106-46-7	1,4-Dichlorobenzene	1.0 U
107-02-8	Acrolein	50 U
74-88-4	Methyl Iodide	1.0 U
74-96-4	Bromoethane	2.0 U
107-13-1	Acrylonitrile	5.0 U
563-58-6	1,1-Dichloropropene	1.0 U
74-95-3	Dibromomethane	1.0 U
630-20-6	1,1,1,2-Tetrachloroethane	1.0 U
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U
96-18-4	1,2,3-Trichloropropane	3.0 U
110-57-6	trans-1,4-Dichloro-2-butene	5.0 U
108-67-8	1,3,5-Trimethylbenzene	1.0 U
95-63-6	1,2,4-Trimethylbenzene	1.0 U
87-68-3	Hexachlorobutadiene	5.0 U
106-93-4	Ethylene Dibromide	1.0 U
74-97-5	Bromochloromethane	1.0 U
594-20-7	2,2-Dichloropropane	1.0 U
142-28-9	1,3-Dichloropropane	1.0 U
98-82-8	Isopropylbenzene	1.0 U
103-65-1	n-Propylbenzene	1.0 U
108-86-1	Bromobenzene	1.0 U
95-49-8	2-Chlorotoluene	1.0 U
106-43-4	4-Chlorotoluene	1.0 U
98-06-6	tert-Butylbenzene	1.0 U
135-98-8	sec-Butylbenzene	1.0 U
99-87-6	4-Isopropyltoluene	1.0 U
104-51-8	n-Butylbenzene	1.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0 U
91-20-3	Naphthalene	5.0 U
87-61-6	1,2,3-Trichlorobenzene	5.0 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	106%
d8-Toluene	98.6%
Bromofluorobenzene	92.8%
d4-1,2-Dichlorobenzene	104%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: MW-9

Lab Sample ID: CU99C
LIMS ID: 01-2847
Matrix: Water
Data Release Authorized:
Reported: 03/16/01

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Instrument: FINN3
Date Analyzed: 03/07/01 20:25

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	2.0 U
67-64-1	Acetone	5.0 U
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	trans-1,2-Dichloroethene	1.0 U
156-59-2	cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
108-05-4	Vinyl Acetate	5.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-02-6	trans-1,3-Dichloropropene	1.0 U
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.0 U
108-90-7	**Chlorobenzene**	**19**
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2.0 U
1330-20-7	m,p-Xylene	1.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: MW-9

Lab Sample ID: CU99C
LIMS ID: 01-2847
Matrix: Water
Data Release Authorized:
Reported: 03/16/01

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Instrument: FINN3
Date Analyzed: 03/07/01 20:25

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	o-Xylene	1.0 U
95-50-1	1,2-Dichlorobenzene	1.0 U
541-73-1	1,3-Dichlorobenzene	1.0 U
106-46-7	1,4-Dichlorobenzene	1.0 U
107-02-8	Acrolein	50 U
74-88-4	Methyl Iodide	1.0 U
74-96-4	Bromoethane	2.0 U
107-13-1	Acrylonitrile	5.0 U
563-58-6	1,1-Dichloropropene	1.0 U
74-95-3	Dibromomethane	1.0 U
630-20-6	1,1,1,2-Tetrachloroethane	1.0 U
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U
96-18-4	1,2,3-Trichloropropane	3.0 U
110-57-6	trans-1,4-Dichloro-2-butene	5.0 U
108-67-8	1,3,5-Trimethylbenzene	1.0 U
95-63-6	1,2,4-Trimethylbenzene	1.0 U
87-68-3	Hexachlorobutadiene	5.0 U
106-93-4	Ethylene Dibromide	1.0 U
74-97-5	Bromochloromethane	1.0 U
594-20-7	2,2-Dichloropropane	1.0 U
142-28-9	1,3-Dichloropropane	1.0 U
98-82-8	Isopropylbenzene	1.0 U
103-65-1	n-Propylbenzene	1.0 U
108-86-1	Bromobenzene	1.0 U
95-49-8	2-Chlorotoluene	1.0 U
106-43-4	4-Chlorotoluene	1.0 U
98-06-6	tert-Butylbenzene	1.0 U
135-98-8	sec-Butylbenzene	1.0 U
99-87-6	4-Isopropyltoluene	1.0 U
104-51-8	n-Butylbenzene	1.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0 U
91-20-3	**Naphthalene**	**6.0**
87-61-6	1,2,3-Trichlorobenzene	5.0 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	106%
d8-Toluene	102%
Bromofluorobenzene	90.5%
d4-1,2-Dichlorobenzene	110%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: MW-6

Lab Sample ID: CU99D
LIMS ID: 01-2848
Matrix: Water
Data Release Authorized:
Reported: 03/16/01

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Instrument: FINN3
Date Analyzed: 03/07/01 20:55

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	2.0 U
67-64-1	Acetone	5.0 U
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	trans-1,2-Dichloroethene	1.0 U
156-59-2	cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
108-05-4	Vinyl Acetate	5.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-02-6	trans-1,3-Dichloropropene	1.0 U
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.0 U
108-90-7	**Chlorobenzene**	88
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2.0 U
1330-20-7	m,p-Xylene	1.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: MW-6

Lab Sample ID: CU99D
LIMS ID: 01-2848
Matrix: Water
Data Release Authorized:
Reported: 03/16/01

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Instrument: FINN3
Date Analyzed: 03/07/01 20:55

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	o-Xylene	1.0 U
95-50-1	1,2-Dichlorobenzene	1.0 U
541-73-1	1,3-Dichlorobenzene	1.0 U
106-46-7	1,4-Dichlorobenzene	1.0 U
107-02-8	Acrolein	50 U
74-88-4	Methyl Iodide	1.0 U
74-96-4	Bromoethane	2.0 U
107-13-1	Acrylonitrile	5.0 U
563-58-6	1,1-Dichloropropene	1.0 U
74-95-3	Dibromomethane	1.0 U
630-20-6	1,1,1,2-Tetrachloroethane	1.0 U
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U
96-18-4	1,2,3-Trichloropropane	3.0 U
110-57-6	trans-1,4-Dichloro-2-butene	5.0 U
108-67-8	1,3,5-Trimethylbenzene	1.0 U
95-63-6	1,2,4-Trimethylbenzene	1.0 U
87-68-3	Hexachlorobutadiene	5.0 U
106-93-4	Ethylene Dibromide	1.0 U
74-97-5	Bromochloromethane	1.0 U
594-20-7	2,2-Dichloropropane	1.0 U
142-28-9	1,3-Dichloropropane	1.0 U
98-82-8	Isopropylbenzene	1.0 U
103-65-1	n-Propylbenzene	1.0 U
108-86-1	Bromobenzene	1.0 U
95-49-8	2-Chlorotoluene	1.0 U
106-43-4	4-Chlorotoluene	1.0 U
98-06-6	tert-Butylbenzene	1.0 U
135-98-8	sec-Butylbenzene	1.0 U
99-87-6	4-Isopropyltoluene	1.0 U
104-51-8	n-Butylbenzene	1.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0 U
91-20-3	Naphthalene	5.0 U
87-61-6	1,2,3-Trichlorobenzene	5.0 U

Volatile Surrogate Recovery	
d4-1,2-Dichloroethane	112%
d8-Toluene	102%
Bromofluorobenzene	88.5%
d4-1,2-Dichlorobenzene	109%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: MW-5

Lab Sample ID: CU99E
LIMS ID: 01-2849
Matrix: Water
Data Release Authorized:
Reported: 03/16/01

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Instrument: NT3
Date Analyzed: 03/13/01 15:43

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	2.0 U
67-64-1	Acetone	5.0 U
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	trans-1,2-Dichloroethene	1.0 U
156-59-2	cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
108-05-4	Vinyl Acetate	5.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-02-6	trans-1,3-Dichloropropene	1.0 U
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.0 U
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2.0 U
1330-20-7	m,p-Xylene	1.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: MW-5

Lab Sample ID: CU99E
LIMS ID: 01-2849
Matrix: Water
Data Release Authorized:
Reported: 03/16/01

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Instrument: NT3
Date Analyzed: 03/13/01 15:43

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	o-Xylene	1.0 U
95-50-1	1,2-Dichlorobenzene	1.0 U
541-73-1	1,3-Dichlorobenzene	1.0 U
106-46-7	1,4-Dichlorobenzene	1.0 U
107-02-8	Acrolein	50 U
74-88-4	Methyl Iodide	1.0 U
74-96-4	Bromoethane	2.0 U
107-13-1	Acrylonitrile	5.0 U
563-58-6	1,1-Dichloropropene	1.0 U
74-95-3	Dibromomethane	1.0 U
630-20-6	1,1,1,2-Tetrachloroethane	1.0 U
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U
96-18-4	1,2,3-Trichloropropane	3.0 U
110-57-6	trans-1,4-Dichloro-2-butene	5.0 U
108-67-8	1,3,5-Trimethylbenzene	1.0 U
95-63-6	1,2,4-Trimethylbenzene	1.0 U
87-68-3	Hexachlorobutadiene	5.0 U
106-93-4	Ethylene Dibromide	1.0 U
74-97-5	Bromochloromethane	1.0 U
594-20-7	2,2-Dichloropropane	1.0 U
142-28-9	1,3-Dichloropropane	1.0 U
98-82-8	Isopropylbenzene	1.0 U
103-65-1	n-Propylbenzene	1.0 U
108-86-1	Bromobenzene	1.0 U
95-49-8	2-Chlorotoluene	1.0 U
106-43-4	4-Chlorotoluene	1.0 U
98-06-6	tert-Butylbenzene	1.0 U
135-98-8	sec-Butylbenzene	1.0 U
99-87-6	4-Isopropyltoluene	1.0 U
104-51-8	n-Butylbenzene	1.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0 U
91-20-3	Naphthalene	5.0 U
87-61-6	1,2,3-Trichlorobenzene	5.0 U

Volatile Surrogate Recovery	
d4-1,2-Dichloroethane	104%
d8-Toluene	99.7%
Bromofluorobenzene	96.0%
d4-1,2-Dichlorobenzene	102%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: MW-4

Lab Sample ID: CU99F
LIMS ID: 01-2850
Matrix: Water
Data Release Authorized:
Reported: 03/16/01

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Instrument: FINN3
Date Analyzed: 03/07/01 21:53

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	2.0 U
67-64-1	Acetone	5.0 U
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	trans-1,2-Dichloroethene	1.0 U
156-59-2	cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
108-05-4	Vinyl Acetate	5.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-02-6	trans-1,3-Dichloropropene	1.0 U
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.0 U
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2.0 U
1330-20-7	m,p-Xylene	1.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: MW-4

Lab Sample ID: CU99F
LIMS ID: 01-2850
Matrix: Water
Data Release Authorized:
Reported: 03/16/01

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Instrument: FINN3
Date Analyzed: 03/07/01 21:53

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	o-Xylene	1.0 U
95-50-1	1,2-Dichlorobenzene	1.0 U
541-73-1	1,3-Dichlorobenzene	1.0 U
106-46-7	1,4-Dichlorobenzene	1.0 U
107-02-8	Acrolein	50 U
74-88-4	Methyl Iodide	1.0 U
74-96-4	Bromoethane	2.0 U
107-13-1	Acrylonitrile	5.0 U
563-58-6	1,1-Dichloropropene	1.0 U
74-95-3	Dibromomethane	1.0 U
630-20-6	1,1,1,2-Tetrachloroethane	1.0 U
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U
96-18-4	1,2,3-Trichloropropane	3.0 U
110-57-6	trans-1,4-Dichloro-2-butene	5.0 U
108-67-8	1,3,5-Trimethylbenzene	1.0 U
95-63-6	1,2,4-Trimethylbenzene	1.0 U
87-68-3	Hexachlorobutadiene	5.0 U
106-93-4	Ethylene Dibromide	1.0 U
74-97-5	Bromochloromethane	1.0 U
594-20-7	2,2-Dichloropropane	1.0 U
142-28-9	1,3-Dichloropropane	1.0 U
98-82-8	Isopropylbenzene	1.0 U
103-65-1	n-Propylbenzene	1.0 U
108-86-1	Bromobenzene	1.0 U
95-49-8	2-Chlorotoluene	1.0 U
106-43-4	4-Chlorotoluene	1.0 U
98-06-6	tert-Butylbenzene	1.0 U
135-98-8	sec-Butylbenzene	1.0 U
99-87-6	4-Isopropyltoluene	1.0 U
104-51-8	n-Butylbenzene	1.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0 U
91-20-3	Naphthalene	5.0 U
87-61-6	1,2,3-Trichlorobenzene	5.0 U

Volatile Surrogate Recovery	
d4-1,2-Dichloroethane	111%
d8-Toluene	102%
Bromofluorobenzene	90.6%
d4-1,2-Dichlorobenzene	110%

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CU99SB
LIMS ID: 01-2845
Matrix: Water
Data Release Authorized:
Reported: 03/16/01
Date Analyzed: 03/07/01
Instrument: FINN3

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 03/06/01

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
Chloromethane	46.8	50.0	93.6%
Bromomethane	46.5	50.0	93.0%
Vinyl Chloride	59.2	50.0	118%
Chloroethane	49.0	50.0	98.0%
Methylene Chloride	47.0	50.0	94.0%
Acetone	233.	250	93.2%
Carbon Disulfide	39.0	50.0	78.0%
1,1-Dichloroethene	48.7	50.0	97.4%
1,1-Dichloroethane	47.0	50.0	94.0%
trans-1,2-Dichloroethene	47.2	50.0	94.4%
cis-1,2-Dichloroethene	48.0	50.0	96.0%
Chloroform	47.4	50.0	94.8%
1,2-Dichloroethane	47.7	50.0	95.4%
2-Butanone	230.	250	92.0%
1,1,1-Trichloroethane	46.8	50.0	93.6%
Carbon Tetrachloride	52.2	50.0	104%
Vinyl Acetate	39.5	50.0	79.0%
Bromodichloromethane	46.9	50.0	93.8%
1,2-Dichloropropane	50.2	50.0	100%
cis-1,3-Dichloropropene	44.0	50.0	88.0%
Trichloroethene	49.1	50.0	98.2%
Dibromochloromethane	47.9	50.0	95.8%
1,1,2-Trichloroethane	45.3	50.0	90.6%
Benzene	48.3	50.0	96.6%
trans-1,3-Dichloropropene	43.7	50.0	87.4%
2-Chloroethylvinylether	46.8	50.0	93.6%
Bromoform	46.7	50.0	93.4%
4-Methyl-2-Pentanone (MIBK)	231.	250	92.4%
2-Hexanone	241.	250	96.4%
Tetrachloroethene	52.9	50.0	106%
1,1,2,2-Tetrachloroethane	45.6	50.0	91.2%
Toluene	47.4	50.0	94.8%
Chlorobenzene	49.0	50.0	98.0%
Ethylbenzene	48.9	50.0	97.8%
Styrene	49.1	50.0	98.2%
Trichlorofluoromethane	44.6	50.0	89.2%
1,1,2-Trichlorotrifluoroethane	41.4	50.0	82.8%
m,p-Xylene	99.1	100	99.1%
O-Xylene	50.9	50.0	102%

Reported in ug/L

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CU99SB
LIMS ID: 01-2845
Matrix: Water
Data Release Authorized:
Reported: 03/16/01
Date Analyzed: 03/07/01
Instrument: FINN3

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 03/06/01

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
1,2-Dichlorobenzene	48.8	50.0	97.6%
1,3-Dichlorobenzene	50.5	50.0	101%
1,4-Dichlorobenzene	49.6	50.0	99.2%
Acrolein	245.	250	98.0%
Methyl Iodide	36.1	50.0	72.2%
Bromoethane	38.9	50.0	77.8%
Acrylonitrile	44.6	50.0	89.2%
1,1-Dichloropropene	51.7	50.0	103%
Dibromomethane	47.2	50.0	94.4%
1,1,1,2-Tetrachloroethane	46.7	50.0	93.4%
1,2-Dibromo-3-chloropropane	45.3	50.0	90.6%
1,2,3-Trichloropropane	45.2	50.0	90.4%
trans-1,4-Dichloro-2-butene	33.8	50.0	67.6%
1,3,5-Trimethylbenzene	51.8	50.0	104%
1,2,4-Trimethylbenzene	51.8	50.0	104%
Hexachlorobutadiene	67.9	50.0	136%
Ethylene Dibromide	44.5	50.0	89.0%
Bromochloromethane	46.6	50.0	93.2%
2,2-Dichloropropane	50.6	50.0	101%
1,3-Dichloropropane	48.4	50.0	96.8%
Isopropylbenzene	50.9	50.0	102%
n-Propylbenzene	50.5	50.0	101%
Bromobenzene	48.3	50.0	96.6%
2-Chlorotoluene	52.9	50.0	106%
4-Chlorotoluene	46.2	50.0	92.4%
tert-Butylbenzene	54.1	50.0	108%
sec-Butylbenzene	53.9	50.0	108%
4-Isopropyltoluene	54.9	50.0	110%
n-Butylbenzene	57.6	50.0	115%
1,2,4-Trichlorobenzene	57.1	50.0	114%
Naphthalene	49.4	50.0	98.8%
1,2,3-Trichlorobenzene	54.7	50.0	109%

Lab Control Surrogate Recovery	
d4-1,2-Dichloroethane	90.3%
d8-Toluene	95.7%
Bromofluorobenzene	100%
d4-1,2-Dichlorobenzene	98.2%

Reported in ug/L

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CU99SB
LIMS ID: 01-2849
Matrix: Water
Data Release Authorized:
Reported: 03/16/01
Date Analyzed: 03/13/01
Instrument: NT3

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 03/06/01

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
Chloromethane	46.6	50.0	93.2%
Bromomethane	51.6	50.0	103%
Vinyl Chloride	44.9	50.0	89.8%
Chloroethane	48.6	50.0	97.2%
Methylene Chloride	46.7	50.0	93.4%
Acetone	199.	250	79.6%
Carbon Disulfide	52.6	50.0	105%
1,1-Dichloroethene	47.2	50.0	94.4%
1,1-Dichloroethane	47.2	50.0	94.4%
trans-1,2-Dichloroethene	45.3	50.0	90.6%
cis-1,2-Dichloroethene	47.8	50.0	95.6%
Chloroform	47.4	50.0	94.8%
1,2-Dichloroethane	47.5	50.0	95.0%
2-Butanone	196.	250	78.4%
1,1,1-Trichloroethane	46.3	50.0	92.6%
Carbon Tetrachloride	47.2	50.0	94.4%
Vinyl Acetate	59.0	50.0	118%
Bromodichloromethane	46.8	50.0	93.6%
1,2-Dichloropropane	49.3	50.0	98.6%
cis-1,3-Dichloropropene	44.4	50.0	88.8%
Trichloroethene	46.1	50.0	92.2%
Dibromochloromethane	47.0	50.0	94.0%
1,1,2-Trichloroethane	46.1	50.0	92.2%
Benzene	47.5	50.0	95.0%
trans-1,3-Dichloropropene	43.0	50.0	86.0%
2-Chloroethylvinylether	49.7	50.0	99.4%
Bromoform	45.7	50.0	91.4%
4-Methyl-2-Pentanone (MIBK)	198.	250	79.2%
2-Hexanone	198.	250	79.2%
Tetrachloroethene	46.5	50.0	93.0%
1,1,2,2-Tetrachloroethane	44.3	50.0	88.6%
Toluene	47.2	50.0	94.4%
Chlorobenzene	47.4	50.0	94.8%
Ethylbenzene	46.7	50.0	93.4%
Styrene	46.9	50.0	93.8%
Trichlorofluoromethane	43.3	50.0	86.6%
1,1,2-Trichlorotrifluoroethane	51.5	50.0	103%
m,p-Xylene	95.6	100	95.6%
O-Xylene	47.2	50.0	94.4%

Reported in ug/L

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CU99SB
LIMS ID: 01-2849
Matrix: Water
Data Release Authorized:
Reported: 03/16/01
Date Analyzed: 03/13/01
Instrument: NT3

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 03/06/01

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
1,2-Dichlorobenzene	46.9	50.0	93.8%
1,3-Dichlorobenzene	47.6	50.0	95.2%
1,4-Dichlorobenzene	48.2	50.0	96.4%
Acrolein	233.	250	93.2%
Methyl Iodide	49.1	50.0	98.2%
Bromoethane	48.8	50.0	97.6%
Acrylonitrile	51.5	50.0	103%
1,1-Dichloropropene	47.3	50.0	94.6%
Dibromomethane	46.6	50.0	93.2%
1,1,1,2-Tetrachloroethane	46.3	50.0	92.6%
1,2-Dibromo-3-chloropropane	43.3	50.0	86.6%
1,2,3-Trichloropropane	45.4	50.0	90.8%
trans-1,4-Dichloro-2-butene	40.4	50.0	80.8%
1,3,5-Trimethylbenzene	48.2	50.0	96.4%
1,2,4-Trimethylbenzene	49.4	50.0	98.8%
Hexachlorobutadiene	52.5	50.0	105%
Ethylene Dibromide	45.2	50.0	90.4%
Bromochloromethane	46.5	50.0	93.0%
2,2-Dichloropropane	46.7	50.0	93.4%
1,3-Dichloropropane	45.5	50.0	91.0%
Isopropylbenzene	48.0	50.0	96.0%
n-Propylbenzene	48.0	50.0	96.0%
Bromobenzene	48.0	50.0	96.0%
2-Chlorotoluene	47.4	50.0	94.8%
4-Chlorotoluene	47.4	50.0	94.8%
tert-Butylbenzene	48.2	50.0	96.4%
sec-Butylbenzene	48.4	50.0	96.8%
4-Isopropyltoluene	49.5	50.0	99.0%
n-Butylbenzene	49.4	50.0	98.8%
1,2,4-Trichlorobenzene	47.8	50.0	95.6%
Naphthalene	44.6	50.0	89.2%
1,2,3-Trichlorobenzene	47.3	50.0	94.6%

Lab Control Surrogate Recovery	
d4-1,2-Dichloroethane	97.4%
d8-Toluene	99.1%
Bromofluorobenzene	98.6%
d4-1,2-Dichlorobenzene	100%

Reported in ug/L

ANALYTICAL RESOURCES INCORPORATED

SIM SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Client ID	MNP	DBA	TOT OUT
Method Blank	92%	83%	0
Lab Control	89%	85%	0
LCDuplicate	89%	88%	0
MW-1	77%	78%	0
MW-2	75%	72%	0
MW-9	84%	65%	0
MW-6	94%	85%	0
MW-5	88%	81%	0
MW-4	79%	78%	0

	LCS/MB LIMITS	QC LIMITS
(MNP) = d10-2-Methylnaphthalene	(30-160)	(30-160)
(DBA) = d14-Dibenz(a,h)anthracene	(30-160)	(30-160)

(Present limits for LCS/MB are advisory only)

D Surrogate Compound diluted out

FORM-II 8270-SIM

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: Method Blank**
PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: CU99MB
LIMS ID: 01-2845
Matrix: Water
Data Release Authorized:
Reported: 03/09/01

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Date extracted: 03/07/01
Date analyzed: 03/08/01 18:11
Instrument: FINN8

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	0.10 U
91-57-6	2-Methylnaphthalene	0.10 U
208-96-8	Acenaphthylene	0.10 U
83-32-9	Acenaphthene	0.10 U
86-73-7	Fluorene	0.10 U
85-01-8	Phenanthrene	0.10 U
120-12-7	Anthracene	0.10 U
206-44-0	Fluoranthene	0.10 U
129-00-0	Pyrene	0.10 U
56-55-3	Benzo(a)anthracene	0.10 U
218-01-9	Chrysene	0.10 U
205-99-2	Benzo(b)fluoranthene	0.10 U
207-08-9	Benzo(k)fluoranthene	0.10 U
50-32-8	Benzo(a)pyrene	0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10 U
132-64-9	Dibenzofuran	0.10 U

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	92.0%
d14-Dibenzo(a,h)anthracene	83.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: MW-1**
PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: CU99A
LIMS ID: 01-2845
Matrix: Water
Data Release Authorized:
Reported: 03/09/01

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Date extracted: 03/07/01
Date analyzed: 03/08/01 19:49
Instrument: FINN8

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	0.10 U
91-57-6	2-Methylnaphthalene	0.10 U
208-96-8	Acenaphthylene	0.10 U
83-32-9	**Acenaphthene**	**0.22**
86-73-7	Fluorene	0.10 U
85-01-8	Phenanthrene	0.10 U
120-12-7	Anthracene	0.10 U
206-44-0	Fluoranthene	0.10 U
129-00-0	Pyrene	0.10 U
56-55-3	Benzo(a)anthracene	0.10 U
218-01-9	Chrysene	0.10 U
205-99-2	Benzo(b)fluoranthene	0.10 U
207-08-9	Benzo(k)fluoranthene	0.10 U
50-32-8	Benzo(a)pyrene	0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10 U
132-64-9	Dibenzofuran	0.10 U

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	76.7%
d14-Dibenzo(a,h)anthracene	78.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: MW-2**
PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: CU99B
LIMS ID: 01-2846
Matrix: Water
Data Release Authorized:
Reported: 03/09/01

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Date extracted: 03/07/01
Date analyzed: 03/08/01 20:22
Instrument: FINN8

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	0.10 U
91-57-6	2-Methylnaphthalene	0.10 U
208-96-8	Acenaphthylene	0.10 U
83-32-9	Acenaphthene	0.10 U
86-73-7	Fluorene	0.10 U
85-01-8	Phenanthrene	0.10 U
120-12-7	Anthracene	0.10 U
206-44-0	Fluoranthene	0.10 U
129-00-0	Pyrene	0.10 U
56-55-3	Benzo(a)anthracene	0.10 U
218-01-9	Chrysene	0.10 U
205-99-2	Benzo(b)fluoranthene	0.10 U
207-08-9	Benzo(k)fluoranthene	0.10 U
50-32-8	Benzo(a)pyrene	0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10 U
132-64-9	Dibenzofuran	0.10 U

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	75.0%
d14-Dibenzo(a,h)anthracene	72.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: MW-9**
PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: CU99C
LIMS ID: 01-2847
Matrix: Water
Data Release Authorized:
Reported: 03/09/01

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Date extracted: 03/07/01
Date analyzed: 03/08/01 20:55
Instrument: FINN8

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	**Naphthalene**	**4.9**
91-57-6	**2-Methylnaphthalene**	**1.1**
208-96-8	Acenaphthylene	0.10 U
83-32-9	**Acenaphthene**	**1.4**
86-73-7	**Fluorene**	**0.37**
85-01-8	**Phenanthrene**	**0.60**
120-12-7	**Anthracene**	**0.20**
206-44-0	**Fluoranthene**	**0.40**
129-00-0	**Pyrene**	**0.30**
56-55-3	Benzo(a)anthracene	0.10 U
218-01-9	Chrysene	0.10 U
205-99-2	Benzo(b)fluoranthene	0.10 U
207-08-9	Benzo(k)fluoranthene	0.10 U
50-32-8	Benzo(a)pyrene	0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10 U
132-64-9	**Dibenzofuran**	**0.15**

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	83.7%
d14-Dibenzo(a,h)anthracene	65.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: MW-6**
PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: CU99D
LIMS ID: 01-2848
Matrix: Water
Data Release Authorized:
Reported: 03/09/01

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Date extracted: 03/07/01
Date analyzed: 03/08/01 21:27
Instrument: FINN8

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	**Naphthalene**	**0.10**
91-57-6	2-Methylnaphthalene	0.10 U
208-96-8	Acenaphthylene	0.10 U
83-32-9	**Acenaphthene**	**0.15**
86-73-7	Fluorene	0.10 U
85-01-8	Phenanthrene	0.10 U
120-12-7	Anthracene	0.10 U
206-44-0	Fluoranthene	0.10 U
129-00-0	Pyrene	0.10 U
56-55-3	Benzo(a)anthracene	0.10 U
218-01-9	Chrysene	0.10 U
205-99-2	Benzo(b)fluoranthene	0.10 U
207-08-9	Benzo(k)fluoranthene	0.10 U
50-32-8	Benzo(a)pyrene	0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10 U
132-64-9	Dibenzofuran	0.10 U

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	94.0%
d14-Dibenzo(a,h)anthracene	85.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: MW-5**
PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: CU99E
LIMS ID: 01-2849
Matrix: Water
Data Releaae Authorized:
Reported: 03/09/01

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Date extracted: 03/07/01
Date analyzed: 03/08/01 22:00
Instrument: FINN8

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	0.10 U
91-57-6	2-Methylnaphthalene	0.10 U
208-96-8	Acenaphthylene	0.10 U
83-32-9	Acenaphthene	0.10 U
86-73-7	Fluorene	0.10 U
85-01-8	Phenanthrene	0.10 U
120-12-7	Anthracene	0.10 U
206-44-0	Fluoranthene	0.10 U
129-00-0	Pyrene	0.10 U
56-55-3	Benzo(a)anthracene	0.10 U
218-01-9	Chrysene	0.10 U
205-99-2	Benzo(b)fluoranthene	0.10 U
207-08-9	Benzo(k)fluoranthene	0.10 U
50-32-8	Benzo(a)pyrene	0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10 U
132-64-9	Dibenzofuran	0.10 U

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	87.7%
d14-Dibenzo(a,h)anthracene	81.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: MW-4**
PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: CU99F
LIMS ID: 01-2850
Matrix: Water
Data Release Authorized:
Reported: 03/09/01

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Date extracted: 03/07/01
Date analyzed: 03/08/01 22:33
Instrument: FINN8

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	**Naphthalene**	**0.13**
91-57-6	2-Methylnaphthalene	0.10 U
208-96-8	Acenaphthylene	0.10 U
83-32-9	**Acenaphthene**	**0.34**
86-73-7	**Fluorene**	**0.08 J**
85-01-8	**Phenanthrene**	**0.10**
120-12-7	Anthracene	0.10 U
206-44-0	**Fluoranthene**	**0.10**
129-00-0	**Pyrene**	**0.06 J**
56-55-3	Benzo(a)anthracene	0.10 U
218-01-9	Chrysene	0.10 U
205-99-2	Benzo(b)fluoranthene	0.10 U
207-08-9	Benzo(k)fluoranthene	0.10 U
50-32-8	Benzo(a)pyrene	0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10 U
132-64-9	Dibenzofuran	0.10 U

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	79.3%
d14-Dibenzo(a,h)anthracene	78.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNA's by Selected Ion Monitoring GC/MS

Lab Sample ID: CU99LC
LIMS ID: 01-2845
Matrix: Water

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 03/09/01

	SPIKE VALUE	SPIKE AMT	% RECOVERY	RPD
LAB CONTROL SAMPLE				
Phenanthrene	2.89	3.00	96.3%	
Chrysene	2.62	3.00	87.3%	
Benzo(k)fluoranthene	2.44	3.00	81.3%	
LCDUPLICATE				
Phenanthrene	2.95	3.00	98.3%	2.1%
Chrysene	2.73	3.00	91.0%	4.1%
Benzo(k)fluoranthene	2.53	3.00	84.3%	3.6%

Values reported in ug/L

Spike Blank Surrogate Recovery

LC-d10-2-Methylnaphthalene	89.0%
LC-d14-Dibenzo(a,h)anthracene	84.7%
SD-d10-2-Methylnaphthalene	89.0%
SD-d14-Dibenzo(a,h)anthracene	87.7%

ANALYTICAL RESOURCES INCORPORATED

WATER AROCLOR SURROGATE SUMMARY

Matrix: Water

QC Report No: CU99
Project: Tacoma Metals
996098.00

LIMS ID	Lab ID	Client ID	TCMX #	DCBP #	TOT OUT
01-2845MB	030701MB	Method Blank	66.0%	55.5%	0
01-2845SB	030701SB	Lab Control	70.0%	59.0%	0
01-2845	CU99A	MW-1	72.5%	61.0%	0
01-2846	CU99B	MW-2	75.5%	63.0%	0
01-2847	CU99C	MW-9	79.0%	60.0%	0
01-2848	CU99D	MW-6	70.0%	64.5%	0
01-2849	CU99E	MW-5	72.5%	75.0%	0
01-2850	CU99F	MW-4	74.5%	64.5%	0

	QC LIMITS
(TCMX) = Tetrachloro-m-xylene	(34-112)
(DCBP) = Decachlorobiphenyl	(22-139)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D Surrogate Compound diluted out

FORM-II PCB

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: Method Blank

Lab Sample ID: CU99MB
LIMS ID: 01-2845
Matrix: Water

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized: clr
Reported: 03/19/01 3/19/01

Date extracted: 03/07/01
Date analyzed: 03/16/01 03:34
Instrument ID: ECD3
Sample Amount: 500 mL
Final Ext Vol: 5.0 mL

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value	
12674-11-2	Aroclor 1016	1.0	U
53469-21-9	Aroclor 1242	1.0	U
12672-29-6	Aroclor 1248	1.0	U
11097-69-1	Aroclor 1254	1.0	U
11096-82-5	Aroclor 1260	1.0	U
11104-28-2	Aroclor 1221	2.0	U
11141-16-5	Aroclor 1232	1.0	U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	55.5%
Tetrachlorometaxylene	66.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MW-1

Lab Sample ID: CU99A
LIMS ID: 01-2845
Matrix: Water

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Data Release Authorized: CK 3/19/01
Reported: 03/19/01

Date extracted: 03/07/01
Date analyzed: 03/16/01 18:38
Instrument ID: ECD3
Sample Amount: 500 mL
Final Ext Vol: 5.0 mL

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U
11104-28-2	Aroclor 1221	2.0 U
11141-16-5	Aroclor 1232	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	61.0%
Tetrachlorometaxylene	72.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MW-2

Lab Sample ID: CU99B
LIMS ID: 01-2846
Matrix: Water

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Data Release Authorized: clk 3/19/01
Reported: 03/19/01

Date extracted: 03/07/01
Date analyzed: 03/16/01 19:13
Instrument ID: ECD3
Sample Amount: 500 mL
Final Ext Vol: 5.0 mL

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U
11104-28-2	Aroclor 1221	2.0 U
11141-16-5	Aroclor 1232	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	63.0%
Tetrachlorometaxylene	75.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MW-9

Lab Sample ID: CU99C
LIMS ID: 01-2847
Matrix: Water

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Data Release Authorized: CLK 3/19/01
Reported: 03/19/01

Date extracted: 03/07/01
Date analyzed: 03/16/01 19:48
Instrument ID: ECD3
Sample Amount: 500 mL
Final Ext Vol: 5.0 mL

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U
11104-28-2	Aroclor 1221	2.0 U
11141-16-5	Aroclor 1232	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	60.0%
Tetrachlorometaxylene	79.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MW-6

Lab Sample ID: CU99D
LIMS ID: 01-2848
Matrix: Water

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Data Release Authorized:
Reported: 03/19/01

Date extracted: 03/07/01
Date analyzed: 03/16/01 20:24
Instrument ID: ECD3
Sample Amount: 500 mL
Final Ext Vol: 5.0 mL

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U
11104-28-2	Aroclor 1221	2.0 U
11141-16-5	Aroclor 1232	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	64.5%
Tetrachlorometaxylene	70.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MW-5

Lab Sample ID: CU99E
LIMS ID: 01-2849
Matrix: Water

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Data Release Authorized: clk
Reported: 03/19/01 3/19/01

Date extracted: 03/07/01
Date analyzed: 03/16/01 23:19
Instrument ID: ECD3
Sample Amount: 500 mL
Final Ext Vol: 5.0 mL

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U
11104-28-2	Aroclor 1221	2.0 U
11141-16-5	Aroclor 1232	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	75.0%
Tetrachlorometaxylene	72.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: MW-4

Lab Sample ID: CU99F
LIMS ID: 01-2850
Matrix: Water

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Data Release Authorized: CH
Reported: 03/19/01 3/19/01

Date extracted: 03/07/01
Date analyzed: 03/16/01 23:54
Instrument ID: ECD3
Sample Amount: 500 mL
Final Ext Vol: 5.0 mL

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U
11104-28-2	Aroclor 1221	2.0 U
11141-16-5	Aroclor 1232	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	64.5%
Tetrachlorometaxylene	74.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by METHOD 8080

Lab Sample ID: CU99SB
LIMS ID: 01-2845
Matrix: Water

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized: CF
Reported: 03/19/01 3/19/01

LABORATORY CONTROL SAMPLE RECOVERY
Date extracted: 03/07/01

CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	8.11	10.1	80.5%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	59.0%
Tetrachlorometaxylene	70.0%

Values reported in ug/L

ANALYTICAL RESOURCES INCORPORATED

WATER TPHg SYSTEM MONITORING COMPOUND SUMMARY

Matrix: Water

QC Report No: CU99

LIMS ID	Lab ID	Client ID	TFT	BB	TOT OUT
01-2845MB	030901MB	Method Blank	91.5%	89.6%	0
01-2845LC	030901LC	Lab Control	99.3%	107%	0
01-2845	CU99A	MW-1	93.8%	88.6%	0
01-2845	CU99A-DP	MW-1-DP	92.2%	88.4%	0
01-2846	CU99B	MW-2	88.2%	87.8%	0
01-2847	CU99C	MW-9	91.6%	93.8%	0
01-2848	CU99D	MW-6	88.0%	92.3%	0
01-2849	CU99E	MW-5	81.8%	84.3%	0
01-2850	CU99F	MW-4	85.2%	86.4%	0

	MB/LCS QC LIMITS	SAMPLE QC LIMITS
(TFT) = Trifluorotoluene	(69.0-135)	(80.0-120)
(BB) = Bromobenzene	(68.0-127)	(80.0-120)

Limits Updated - 08/01/00

\# Column to be used to flag recovery values

* Values outside of required QC limits

D System Monitoring Compound diluted out

FORM-II TPHg

ANALYTICAL RESOURCES INCORPORATED

TOTAL GASOLINE RANGE HYDROCARBONS
NWTPHg - Toluene to Naphthalene

QC Report No: CU99-Kennedy Jenks Consultants
Matrix: Water
Project: Tacoma Metals
996098.00
Data Release Authorized: CH
Date Received: 03/06/01
Reported: 03/13/01 3/13/01

Lab ID	Client Sample ID	Date Analyzed	Dilution Factor	Gas Range	Gas ID	Surr A Rec	Surr B Rec
CU99-0309MB	Method Blank	03/09/01	1:1	0.25 U	NO	91.5%	89.6%
01-2845-CU99A	MW-1	03/10/01	1:1	0.25 U	NO	93.8%	88.6%
01-2845-Dupl	MW-1	03/10/01	1:1	0.25 U	NO	92.2%	88.4%
01-2846-CU99B	MW-2	03/10/01	1:1	0.25 U	NO	88.2%	87.8%
01-2847-CU99C	MW-9	03/10/01	1:1	0.25 U	NO	91.6%	93.8%
01-2848-CU99D	MW-6	03/10/01	1:1	0.25 U	NO	88.0%	92.3%
01-2849-CU99E	MW-5	03/10/01	1:1	0.25 U	NO	81.8%	84.3%
01-2850-CU99F	MW-4	03/10/01	1:1	0.25 U	NO	85.2%	86.4%

Surrogate A is Trifluorotoluene.
Surrogate B is Bromobenzene.

Values reported in ppm (mg/L).
Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

Data Qualifiers

U Compound not detected at the given detection limit.
X Value detected above linear range of instrument. Dilution required.
J Indicates an estimated value below the calculated detection limit.
S No value reported due to saturation of the detector. Dilution required.
D Indicates the surrogate was not detected because of dilution of the extract.
NR Indicates no recovery due to matrix interference.

FORM-1 TPH-g

TOTAL GASOLINE RANGE HYDROCARBONS
NWTPHg - Toluene to Naphthalene

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CU99SB
LIMS ID: 01-2845
Matrix: Water

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized: CJF
Reported: 03/13/01 3/13/01

LABORATORY CONTROL SAMPLE RECOVERY REPORT
Analyzed 03/09/01

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
LABORATORY CONTROL SAMPLE			
Gasoline Range Hydrocarbons	2.32	2.50	92.8%

TPHg Surrogate Recovery

Trifluorotoluene	99.3%
Bromobenzene	107%

Values reported in parts per million (mg/L)

TPHg SPIKE CONTROL LIMITS

Percent Recovery	50-150%
Duplicate RPD	<50%

Advisory QA Limits

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL HYDROCARBONS COMPOUND SUMMARY

Matrix: Water

QC Report No: CU99

LIMS ID	Lab ID	Extracted	Client ID	MeArach	TOT OUT
01-2845MB	030901MB	03/08/01	Method Blank	95%	0
01-2845LC	030901LC	03/08/01	Lab Control	86%	0
01-2845	CU99A	03/08/01	MW-1	69%	0
01-2846	CU99B	03/08/01	MW-2	81%	0
01-2847	CU99C	03/08/01	MW-9	57%	0
01-2848	CU99D	03/08/01	MW-6	110%	0
01-2849MB	031401MB	03/13/01	Method Blank	98%	0
01-2849LC	031401LC	03/13/01	Lab Control	85%	0
01-2849	CU99E	03/08/01	MW-5	41%*	1
01-2849	CU99E-DL	03/08/01	MW-5-DL	47%*	1
01-2850	CU99F	03/08/01	MW-4	31%*	1
01-2850	CU99F-DL	03/08/01	MW-4-DL	51%*	1

	Control QC LIMITS	Sample QC LIMITS
(MeArach) = Methylarachidate	(65-118)	(54-133)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D System Monitoring Compound diluted out

FORM-II TPHD

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID
and Motor Oil

ANALYTICAL RESOURCES INCORPORATED

Lab ID: 01-2845
Matrix: Water

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 03/06/01

Data Release Authorized: CH 3/16/01
Reported: 03/16/01

Lab ID	Sample ID	Date Extracted	Date Analyzed	Dilution Factor	Diesel Range	*HC ID	Motor Oil Range	Surr Rec
CU99MB	Method Blank	03/08/01	03/09/01	1:1	0.25 U	---	0.50 U	95.0%
CU99A	MW-1	03/08/01	03/09/01	1:1	0.25 U	---	0.50 U	69.0%
CU99B	MW-2	03/08/01	03/09/01	1:1	0.25 U	---	0.50 U	81.0%
CU99C	MW-9	03/08/01	03/09/01	1:1	0.63	NO	0.50 U	57.0%
CU99D	MW-6	03/08/01	03/09/01	1:1	1.0	NO	0.50 U	110%
CU99MB	Method Blank	03/13/01	03/14/01	1:1	0.25 U	---	0.50 U	98.0%
CU99E	MW-5	03/08/01	03/09/01	1:1	0.76	NO	0.50 U	41.0%
CU99E	MW-5	03/08/01	03/14/01	1:1	0.82	NO	0.50 U	47.0%
CU99F	MW-4	03/08/01	03/09/01	1:1	0.67	NO	0.50 U	31.0%
CU99F	MW-4	03/08/01	03/14/01	1:1	0.55	NO	0.50 U	51.0%

Surrogate is Methyl-Arachidate.

* ID indicates, in the opinion of the analyst, the petroleum product with the best pattern match. 'NO' indicates that there was not a good match for any of the requested products.
Values reported in ppm (mg/L)
Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.

Data Qualifiers

U Compound not detected at the given detection limit.
J Indicates an estimated value below the calculated detection limit.
S No value reported due to saturation of the detector. Dilution required.
D Indicates the surrogate was not detected because of dilution of the extract.
E Indicates a value above the linear range of the detector. Dilution required.
NR Indicates no recovery due to matrix interference.
B Indicates compound also detected in the method blank.

FORM-1 TPHD

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CU99SB
LIMS ID: 01-2849
Matrix: Water

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized: CH
Reported: 03/16/01 3/16/01

LABORATORY CONTROL SAMPLE RECOVERY REPORT
Extracted: 03/13/01
Analyzed 03/14/01

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
Diesel Range Hydrocarbons	2.21	2.50	88.4%

TPHd Surrogate Recovery

Methylarachidate 85.0%

Values reported in parts per million (mg/L)

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: Method Blank**
TOTAL METALS

Lab Sample ID: CU99MB
LIMS ID: 01-2845
Matrix: Water

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized:
Reported: 03/13/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010	03/07/01	6010	03/09/01	7440-38-2	Arsenic	0.05	0.05 U
3010	03/07/01	6010	03/09/01	7440-39-3	Barium	0.003	0.003 U
3010	03/07/01	6010	03/09/01	7440-43-9	Cadmium	0.002	0.002 U
3010	03/07/01	6010	03/09/01	7440-70-2	Calcium	0.05	0.05 U
3010	03/07/01	6010	03/09/01	7440-47-3	Chromium	0.005	0.005 U
3010	03/07/01	6010	03/09/01	7440-50-8	Copper	0.002	0.002 U
3010	03/07/01	6010	03/09/01	7439-89-6	Iron	0.02	0.02 U
3010	03/07/01	6010	03/09/01	7439-92-1	Lead	0.02	0.02 U
3010	03/07/01	6010	03/09/01	7439-95-4	Magnesium	0.02	0.02 U
3010	03/07/01	6010	03/09/01	7439-96-5	Manganese	0.001	0.001 U
7470	03/07/01	7470	03/12/01	7439-97-6	Mercury	0.0001	0.0001 U
3010	03/07/01	6010	03/09/01	7440-09-7	Potassium	0.5	0.5 U
3010	03/07/01	6010	03/09/01	7782-49-2	Selenium	0.05	0.05 U
3010	03/07/01	6010	03/09/01	7440-22-4	Silver	0.003	0.003 U
3010	03/07/01	6010	03/09/01	7440-23-5	Sodium	0.05	0.05 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: MW-1**
TOTAL METALS

Lab Sample ID: CU99A
LIMS ID: 01-2845
Matrix: Water

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Data Release Authorized:
Reported: 03/13/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010	03/07/01	6010	03/09/01	7440-38-2	Arsenic	0.05	0.05 U
3010	03/07/01	6010	03/09/01	**7440-39-3**	**Barium**	0.003	**0.013**
3010	03/07/01	6010	03/09/01	7440-43-9	Cadmium	0.002	0.002 U
3010	03/07/01	6010	03/09/01	**7440-70-2**	**Calcium**	0.05	**25.9**
3010	03/07/01	6010	03/09/01	7440-47-3	Chromium	0.005	0.005 U
3010	03/07/01	6010	03/09/01	7440-50-8	Copper	0.002	0.002 U
3010	03/07/01	6010	03/09/01	**7439-89-6**	**Iron**	0.02	**31.7**
3010	03/07/01	6010	03/09/01	7439-92-1	Lead	0.02	0.02 U
3010	03/07/01	6010	03/09/01	**7439-95-4**	**Magnesium**	0.02	**14.4**
3010	03/07/01	6010	03/09/01	**7439-96-5**	**Manganese**	0.001	**0.734**
7470	03/07/01	7470	03/12/01	7439-97-6	Mercury	0.0001	0.0001 U
3010	03/07/01	6010	03/09/01	**7440-09-7**	**Potassium**	0.5	**7.3**
3010	03/07/01	6010	03/09/01	7782-49-2	Selenium	0.05	0.05 U
3010	03/07/01	6010	03/09/01	7440-22-4	Silver	0.003	0.003 U
3010	03/07/01	6010	03/09/01	**7440-23-5**	**Sodium**	0.05	18.0

Calculated Hardness (mg-CaCO3/L): 120

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: MW-2**
TOTAL METALS

Lab Sample ID: CU99B
LIMS ID: 01-2846
Matrix: Water

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Data Release Authorized
Reported: 03/13/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010	03/07/01	6010	03/09/01	7440-38-2	Arsenic	0.05	0.05 U
3010	03/07/01	6010	03/09/01	**7440-39-3**	**Barium**	0.003	**0.013**
3010	03/07/01	6010	03/09/01	7440-43-9	Cadmium	0.002	0.002 U
3010	03/07/01	6010	03/09/01	**7440-70-2**	**Calcium**	0.05	**32.5**
3010	03/07/01	6010	03/09/01	7440-47-3	Chromium	0.005	0.005 U
3010	03/07/01	6010	03/09/01	7440-50-8	Copper	0.002	0.002 U
3010	03/07/01	6010	03/09/01	**7439-89-6**	**Iron**	0.02	**10.2**
3010	03/07/01	6010	03/09/01	7439-92-1	Lead	0.02	0.02 U
3010	03/07/01	6010	03/09/01	**7439-95-4**	**Magnesium**	0.02	**45.7**
3010	03/07/01	6010	03/09/01	**7439-96-5**	**Manganese**	0.001	**0.284**
7470	03/07/01	7470	03/12/01	7439-97-6	Mercury	0.0001	0.0001 U
3010	03/07/01	6010	03/09/01	**7440-09-7**	**Potassium**	0.5	**16.2**
3010	03/07/01	6010	03/09/01	7782-49-2	Selenium	0.05	0.05 U
3010	03/07/01	6010	03/09/01	7440-22-4	Silver	0.003	0.003 U
3010	03/07/01	6010	03/09/01	**7440-23-5**	**Sodium**	0.05	**289**

Calculated Hardness (mg-CaCO3/L): 270

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: MW-9**
TOTAL METALS

Lab Sample ID: CU99C
LIMS ID: 01-2847
Matrix: Water

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Data Release Authorized:
Reported: 03/13/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010	03/07/01	6010	03/09/01	7440-38-2	Arsenic	0.05	0.05 U
3010	03/07/01	6010	03/09/01	7440-39-3	Barium	0.003	0.090
3010	03/07/01	6010	03/09/01	7440-43-9	Cadmium	0.002	0.002 U
3010	03/07/01	6010	03/09/01	7440-47-3	Chromium	0.005	0.005 U
3010	03/07/01	6010	03/09/01	7440-50-8	Copper	0.002	0.002 U
3010	03/07/01	6010	03/09/01	7439-92-1	Lead	0.02	0.02 U
7470	03/07/01	7470	03/12/01	7439-97-6	Mercury	0.0001	0.0001 U
3010	03/07/01	6010	03/09/01	7782-49-2	Selenium	0.05	0.05 U
3010	03/07/01	6010	03/09/01	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: MW-6**
TOTAL METALS

Lab Sample ID: CU99D
LIMS ID: 01-2848
Matrix: Water

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Data Release Authorized:
Reported: 03/13/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010	03/07/01	6010	03/09/01	7440-38-2	Arsenic	0.05	0.05 U
3010	03/07/01	6010	03/09/01	**7440-39-3**	**Barium**	0.003	**0.022**
3010	03/07/01	6010	03/09/01	**7440-43-9**	**Cadmium**	0.002	**0.003**
3010	03/07/01	6010	03/09/01	7440-47-3	Chromium	0.005	0.005 U
3010	03/07/01	6010	03/09/01	7440-50-8	Copper	0.002	0.002 U
3010	03/07/01	6010	03/09/01	7439-92-1	Lead	0.02	0.02 U
7470	03/07/01	7470	03/12/01	7439-97-6	Mercury	0.0001	0.0001 U
3010	03/07/01	6010	03/09/01	7782-49-2	Selenium	0.05	0.05 U
3010	03/07/01	6010	03/09/01	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: MW-5**
TOTAL METALS

Lab Sample ID: CU99E
LIMS ID: 01-2849
Matrix: Water

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Data Release Authorized:
Reported: 03/13/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010	03/07/01	6010	03/09/01	7440-38-2	Arsenic	0.05	0.05 U
3010	03/07/01	6010	03/09/01	**7440-39-3**	**Barium**	0.003	**0.021**
3010	03/07/01	6010	03/09/01	7440-43-9	Cadmium	0.002	0.002 U
3010	03/07/01	6010	03/09/01	7440-47-3	Chromium	0.005	0.005 U
3010	03/07/01	6010	03/09/01	**7440-50-8**	**Copper**	0.002	**0.003**
3010	03/07/01	6010	03/09/01	7439-92-1	Lead	0.02	0.02 U
7470	03/07/01	7470	03/12/01	7439-97-6	Mercury	0.0001	0.0001 U
3010	03/07/01	6010	03/09/01	7782-49-2	Selenium	0.05	0.05 U
3010	03/07/01	6010	03/09/01	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: MW-4**
TOTAL METALS

Lab Sample ID: CU99F
LIMS ID: 01-2850
Matrix: Water

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Data Release Authorized:
Reported: 03/13/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010	03/07/01	6010	03/09/01	7440-38-2	Arsenic	0.05	0.05 U
3010	03/07/01	6010	03/09/01	**7440-39-3**	**Barium**	0.003	**0.014**
3010	03/07/01	6010	03/09/01	7440-43-9	Cadmium	0.002	0.002 U
3010	03/07/01	6010	03/09/01	7440-47-3	Chromium	0.005	0.005 U
3010	03/07/01	6010	03/09/01	**7440-50-8**	**Copper**	0.002	**0.008**
3010	03/07/01	6010	03/09/01	7439-92-1	Lead	0.02	0.02 U
7470	03/07/01	7470	03/12/01	7439-97-6	Mercury	0.0001	0.0001 U
3010	03/07/01	6010	03/09/01	7782-49-2	Selenium	0.05	0.05 U
3010	03/07/01	6010	03/09/01	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET
DISSOLVED METALS

Sample No: Method Blank

Lab Sample ID: CU99MB
LIMS ID: 01-2855
Matrix: Water

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized
Reported: 03/13/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
6010	03/07/01	6010	03/08/01	7440-38-2	Arsenic	0.05	0.05 U
6010	03/07/01	6010	03/08/01	7440-39-3	Barium	0.003	0.003 U
6010	03/07/01	6010	03/08/01	7440-43-9	Cadmium	0.002	0.002 U
6010	03/07/01	6010	03/08/01	7440-70-2	Calcium	0.05	0.05 U
6010	03/07/01	6010	03/08/01	7440-47-3	Chromium	0.005	0.005 U
6010	03/07/01	6010	03/08/01	7440-50-8	Copper	0.002	0.002 U
6010	03/07/01	6010	03/08/01	7439-89-6	Iron	0.02	0.02 U
6010	03/07/01	6010	03/08/01	7439-92-1	Lead	0.02	0.02 U
6010	03/07/01	6010	03/08/01	7439-95-4	Magnesium	0.02	0.02 U
6010	03/07/01	6010	03/08/01	7439-96-5	Manganese	0.001	0.001 U
7470	03/07/01	7470	03/12/01	7439-97-6	Mercury	0.0001	0.0001 U
6010	03/07/01	6010	03/08/01	7440-09-7	Potassium	0.5	0.5 U
6010	03/07/01	6010	03/08/01	7782-49-2	Selenium	0.05	0.05 U
6010	03/07/01	6010	03/08/01	7440-22-4	Silver	0.003	0.003 U
6010	03/07/01	6010	03/08/01	7440-23-5	Sodium	0.05	0.05 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET **Sample No: MW-1(D)**
DISSOLVED METALS

Lab Sample ID: CU99G
LIMS ID: 01-2855
Matrix: Water

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Data Release Authorized:
Reported: 03/13/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
6010	03/07/01	6010	03/08/01	7440-38-2	Arsenic	0.05	0.05 U
6010	03/07/01	6010	03/08/01	**7440-39-3**	**Barium**	0.003	**0.014**
6010	03/07/01	6010	03/08/01	7440-43-9	Cadmium	0.002	0.002 U
6010	03/07/01	6010	03/08/01	**7440-70-2**	**Calcium**	0.05	**28.7**
6010	03/07/01	6010	03/08/01	7440-47-3	Chromium	0.005	0.005 U
6010	03/07/01	6010	03/08/01	7440-50-8	Copper	0.002	0.002 U
6010	03/07/01	6010	03/08/01	**7439-89-6**	**Iron**	0.02	**35.4**
6010	03/07/01	6010	03/08/01	7439-92-1	Lead	0.02	0.02 U
6010	03/07/01	6010	03/08/01	**7439-95-4**	**Magnesium**	0.02	**16.0**
6010	03/07/01	6010	03/08/01	**7439-96-5**	**Manganese**	0.001	**0.807**
7470	03/07/01	7470	03/12/01	7439-97-6	Mercury	0.0001	0.0001 U
6010	03/07/01	6010	03/08/01	**7440-09-7**	**Potassium**	0.5	**8.8**
6010	03/07/01	6010	03/08/01	7782-49-2	Selenium	0.05	0.05 U
6010	03/07/01	6010	03/08/01	7440-22-4	Silver	0.003	0.003 U
6010	03/07/01	6010	03/08/01	**7440-23-5**	**Sodium**	0.05	**19.6**

Calculated Dissolved Hardness (mg-CaCO3/L): 140

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET **Sample No: MW-2(D)**
DISSOLVED METALS

Lab Sample ID: CU99H
LIMS ID: 01-2856
Matrix: Water

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Data Release Authorized:
Reported: 03/13/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
6010	03/07/01	6010	03/08/01	7440-38-2	Arsenic	0.05	0.05 U
6010	03/07/01	6010	03/08/01	**7440-39-3**	**Barium**	0.003	**0.010**
6010	03/07/01	6010	03/08/01	7440-43-9	Cadmium	0.002	0.002 U
6010	03/07/01	6010	03/08/01	**7440-70-2**	**Calcium**	0.05	**34.6**
6010	03/07/01	6010	03/08/01	7440-47-3	Chromium	0.005	0.005 U
6010	03/07/01	6010	03/08/01	7440-50-8	Copper	0.002	0.002 U
6010	03/07/01	6010	03/08/01	**7439-89-6**	**Iron**	0.02	**9.98**
6010	03/07/01	6010	03/08/01	7439-92-1	Lead	0.02	0.02 U
6010	03/07/01	6010	03/08/01	**7439-95-4**	**Magnesium**	0.02	**47.4**
6010	03/07/01	6010	03/08/01	**7439-96-5**	**Manganese**	0.001	**0.295**
7470	03/07/01	7470	03/12/01	7439-97-6	Mercury	0.0001	0.0001 U
6010	03/07/01	6010	03/08/01	**7440-09-7**	**Potassium**	0.5	**17.3**
6010	03/07/01	6010	03/08/01	7782-49-2	Selenium	0.05	0.05 U
6010	03/07/01	6010	03/08/01	7440-22-4	Silver	0.003	0.003 U
6010	03/07/01	6010	03/08/01	**7440-23-5**	**Sodium**	0.05	**295**

Calculated Dissolved Hardness (mg-$CaCO_3$/L): 280

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET **Sample No: MW-9(D)**
DISSOLVED METALS

Lab Sample ID: CU99I
LIMS ID: 01-2857
Matrix: Water

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Data Release Authorized:
Reported: 03/13/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
6010	03/07/01	6010	03/08/01	7440-38-2	Arsenic	0.05	0.05 U
6010	03/07/01	6010	03/08/01	**7440-39-3**	**Barium**	0.003	**0.097**
6010	03/07/01	6010	03/08/01	7440-43-9	Cadmium	0.002	0.002 U
6010	03/07/01	6010	03/08/01	7440-47-3	Chromium	0.005	0.005 U
6010	03/07/01	6010	03/08/01	7440-50-8	Copper	0.002	0.002 U
6010	03/07/01	6010	03/08/01	7439-92-1	Lead	0.02	0.02 U
7470	03/07/01	7470	03/12/01	7439-97-6	Mercury	0.0001	0.0001 U
6010	03/07/01	6010	03/08/01	7782-49-2	Selenium	0.05	0.05 U
6010	03/07/01	6010	03/08/01	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET **Sample No: MW-6(D)**
DISSOLVED METALS

Lab Sample ID: CU99J
LIMS ID: 01-2862
Matrix: Water

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Data Release Authorized:
Reported: 03/13/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
6010	03/07/01	6010	03/08/01	7440-38-2	Arsenic	0.05	0.05 U
6010	03/07/01	6010	03/08/01	**7440-39-3**	**Barium**	0.003	**0.022**
6010	03/07/01	6010	03/08/01	7440-43-9	Cadmium	0.002	0.002 U
6010	03/07/01	6010	03/08/01	7440-47-3	Chromium	0.005	0.005 U
6010	03/07/01	6010	03/08/01	7440-50-8	Copper	0.002	0.002 U
6010	03/07/01	6010	03/08/01	7439-92-1	Lead	0.02	0.02 U
7470	03/07/01	7470	03/12/01	7439-97-6	Mercury	0.0001	0.0001 U
6010	03/07/01	6010	03/08/01	7782-49-2	Selenium	0.05	0.05 U
6010	03/07/01	6010	03/08/01	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET **Sample No: MW-5(D)**
DISSOLVED METALS

Lab Sample ID: CU99K
LIMS ID: 01-2863
Matrix: Water

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Data Release Authorized:
Reported: 03/13/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
6010	03/07/01	6010	03/08/01	7440-38-2	Arsenic	0.05	0.05 U
6010	03/07/01	6010	03/08/01	**7440-39-3**	**Barium**	0.003	**0.021**
6010	03/07/01	6010	03/08/01	7440-43-9	Cadmium	0.002	0.002 U
6010	03/07/01	6010	03/08/01	7440-47-3	Chromium	0.005	0.005 U
6010	03/07/01	6010	03/08/01	7440-50-8	Copper	0.002	0.002 U
6010	03/07/01	6010	03/08/01	7439-92-1	Lead	0.02	0.02 U
7470	03/07/01	7470	03/12/01	7439-97-6	Mercury	0.0001	0.0001 U
6010	03/07/01	6010	03/08/01	7782-49-2	Selenium	0.05	0.05 U
6010	03/07/01	6010	03/08/01	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET **Sample No: MW-4(D)**
DISSOLVED METALS

Lab Sample ID: CU99L
LIMS ID: 01-2864
Matrix: Water

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Data Release Authorized:
Reported: 03/13/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
6010	03/07/01	6010	03/08/01	7440-38-2	Arsenic	0.05	0.05 U
6010	03/07/01	6010	03/08/01	**7440-39-3**	**Barium**	0.003	**0.010**
6010	03/07/01	6010	03/08/01	7440-43-9	Cadmium	0.002	0.002 U
6010	03/07/01	6010	03/08/01	7440-47-3	Chromium	0.005	0.005 U
6010	03/07/01	6010	03/08/01	7440-50-8	Copper	0.002	0.002 U
6010	03/07/01	6010	03/08/01	7439-92-1	Lead	0.02	0.02 U
7470	03/07/01	7470	03/12/01	7439-97-6	Mercury	0.0001	0.0001 U
6010	03/07/01	6010	03/08/01	7782-49-2	Selenium	0.05	0.05 U
6010	03/07/01	6010	03/08/01	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CU99LCS
LIMS ID: 01-2845
Matrix: Water

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 03/13/01

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Spike mg/L	Spike Added	% Recovery	Q
Arsenic	1.84	2.00	92.0%	
Barium	1.91	2.00	95.5%	
Cadmium	0.470	0.500	94.0%	
Calcium	9.89	10.0	98.9%	
Chromium	0.486	0.500	97.2%	
Copper	0.483	0.500	96.6%	
Iron	1.87	2.00	93.5%	
Lead	1.82	2.00	91.0%	
Magnesium	9.60	10.0	96.0%	
Manganese	0.483	0.500	96.6%	
Mercury	0.0021	0.0020	105%	
Potassium	9.0	10.0	90.0%	
Selenium	1.85	2.00	92.5%	
Silver	0.462	0.500	92.4%	
Sodium	9.26	10.0	92.6%	

'Q' codes: N = control limit not met

Control Limits: 80-120%

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CU99LCS
LIMS ID: 01-2855
Matrix: Water

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 03/13/01

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Spike mg/L	Spike Added	% Recovery	Q
Arsenic	2.01	2.00	100%	
Barium	1.96	2.00	98.0%	
Cadmium	0.525	0.500	105%	
Calcium	10.5	10.0	105%	
Chromium	0.511	0.500	102%	
Copper	0.505	0.500	101%	
Iron	2.00	2.00	100%	
Lead	2.03	2.00	102%	
Magnesium	10.2	10.0	102%	
Manganese	0.504	0.500	101%	
Mercury	0.0021	0.0020	105%	
Potassium	10.1	10.0	101%	
Selenium	2.08	2.00	104%	
Silver	0.474	0.500	94.8%	
Sodium	9.74	10.0	97.4%	

'Q' codes: N = control limit not met
NA = Not applicable - analyte not spiked

Control Limits: 80-120%

FORM-VII

ANALYTICAL RESOURCES INCORPORATED

QA Report - Method Blank Analysis

QC Report No: CU99-Kennedy Jenks Consultants
Matrix: Water
Project: Tacoma Metals
996098.00
Date Received: NA

Data Release Authorized:
Reported: 03/19/01 Dr. M.A. Perkins

METHOD BLANK RESULTS
CONVENTIONALS

Analysis Date & Batch	Constituent	Units		Result	
03/08/01 03081#1	Conductivity	umhos/cm	<	1.0	U
03/12/01 03121#1	Total Dissolved Solids	mg/L	<	5.0	U
03/12/01 03121#3	Sulfate	mg/L	<	2.5	U

ANALYTICAL RESOURCES INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: MW-1

Lab Sample ID: CU99A
LIMS ID: 01-2845
Matrix: Water

Data Release Authorized:
Reported: 03/19/01 Dr. M.A. Perkins

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Analyte	Analysis Date & Batch	Method	RL	Units	Result
pH	03/06/01 03061#1	EPA 150.1	0.05	std units	6.26
Conductivity	03/08/01 03081#1	EPA 120.1	1.0	umhos/cm	350
Total Dissolved Solids	03/12/01 03121#1	EPA 160.1	5.0	mg/L	250
Sulfate	03/12/01 03121#3	EPA 375.2	2.5	mg/L	30

RL Analytical reporting limit
U Undetected at reported detection limit

Report for CU99 received 03/06/01

ANALYTICAL RESOURCES INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: MW-2

Lab Sample ID: CU99B
LIMS ID: 01-2846
Matrix: Water

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/05/01
Date Received: 03/06/01

Data Release Authorized:
Reported: 03/19/01 Dr. M.A. Perkins

Analyte	Analysis Date & Batch	Method	RL	Units	Result
pH	03/06/01 03061#1	EPA 150.1	0.05	std units	6.43
Conductivity	03/08/01 03081#1	EPA 120.1	1.0	umhos/cm	2,100
Total Dissolved Solids	03/12/01 03121#1	EPA 160.1	10	mg/L	1,100
Sulfate	03/12/01 03121#3	EPA 375.2	5.0	mg/L	65

RL Analytical reporting limit
U Undetected at reported detection limit

Report for CU99 received 03/06/01

ANALYTICAL RESOURCES INCORPORATED

QA Report - Standard Reference Material Analysis

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: NA

Data Release Authorized:
Reported: 03/19/01 Dr. M.A. Perkins

STANDARD REFERENCE MATERIAL ANALYSIS
CONVENTIONALS

Constituent	Units	Value	True Value	Recovery
VWR #2377				
Conductivity	umhos/cm	1,020	997	102%
Date analyzed: 03/08/01 Batch ID: 03081#1				
SPEX #18-88				
Sulfate	mg/L	25.4	25.0	102%
Date analyzed: 03/12/01 Batch ID: 03121#3				

ANALYTICAL RESOURCES INCORPORATED

QA Report - Replicate Analysis

QC Report No: CU99-Kennedy Jenks Consultants
Matrix: Water
Project: Tacoma Metals
996098.00
Date Received: 03/06/01

Data Release Authorized:
Reported: 03/19/01 Dr. M.A. Perkins

DUPLICATE ANALYSIS RESULTS
CONVENTIONALS

Constituent	Units	Sample Value	Duplicate Value	RPD
ARI ID: 01-2845, CU99 A	**Client Sample ID: MW-1**			
pH	std units	6.26	6.23	1.6%
ARI ID: 01-2846, CU99 B	**Client Sample ID: MW-2**			
Total Dissolved Solids	mg/L	1,100	1,100	0.0%
Sulfate	mg/L	65	66	1.5%

ANALYTICAL RESOURCES INCORPORATED

QA Report - Laboratory Control Samples

QC Report No: CU99-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: NA

Data Release Authorized
Reported: 03/19/01 Dr. M.A. Perkins

LABORATORY CONTROL SAMPLES
CONVENTIONALS

Constituent	Units	Measured Value	True Value	Recovery
pH Calibration Standard				
pH	std units	7.02	7.00	100%

Date analyzed: 03/06/01 Batch ID: 03061#1

ANALYTICAL RESOURCES INCORPORATED

QA Report - Matrix Spike/Matrix Spike Duplicate Analysis

QC Report No: CU99-Kennedy Jenks Consultants
Matrix: Water
Project: Tacoma Metals
996098.00
Date Received: 03/06/01

Data Release Authorized:
Reported: 03/19/01 Dr. M.A. Perkins

MATRIX SPIKE QA/QC REPORT
CONVENTIONALS

Constituent	Units	Sample Value	Spike Value	Spike Added	Recovery
ARI ID: 01-2846, CU99 B Client Sample ID: MW-2					
Sulfate	mg/L	64.9	101	40.0	90.2%

MS/MSD Recovery Limits: 75 - 125 %

Analytical Resources, Incorporated
Analytical Chemists and Consultants

March 23, 2001

Ty Schreiner
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: Project: Tacoma Metals / ARI Job: CV13

Dear Ty:

Please find enclosed sample custody records and final analytical results for the above referenced project. Six water samples were received in good condition on March 7, 2001. The samples were analyzed for volatiles referencing EPA 8260, PNA's by GC/MS-SIM, PCBs referencing EPA 8082, total and dissolved metals referencing EPA 6010/7471. Total diesel and motor oil range hydrocarbons were determined referencing WDOE method NWTPH-Dx and total gasoline range hydrocarbons by NWTPH-G. Conductivity was analyzed by EPA method 120.1, pH by method 150.1, total dissolved solids by EPA 160.1 and sulfate by method 375.2.

Please see the case narrative for any anomalies that may have occurred during the analysis of these samples.

Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,
Analytical Resources, Inc.

Susan Snyder
Project Manager

SS/ss
Enclosures

CC: Jodi Brundage, Kennedy Jenks Consultants, Federal Way, WA

RECEIVED
MAR 28 2001
K/J Federal Way
K/J No/File
Route
Return To/By

333 Ninth Avenue North • Seattle WA 98109-5187 • **206-621-6490** • **206-621-7523** fax

01-2915 → 01-2924
CV13

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
400 Ninth Avenue North
Seattle, WA 98109-4708
206-621-6490 206-621-7523 (fax)

Page 1 of 2

Turn Around Requested: STD

Report to: TY Schmeiner	Proj Name: TACOMA METALS
Company: Kennedy/Jenks	Proj Number: 996092.00
Address: 530 S. 336 ST Federal Way WA 98003	Sampler:
Phone: 253 874-0555	Shipping Method: Courier
Fax: 253 952-3435	AirBill:

Analyses Requested

Sample ID	Sample Date	Sample Time	Sample Matrix	No Containers	VOC (8260)	NWTPH-G	NWTPH-D (EXT)	PCB	PAH (SIM)	TOTAL RCRA METALS w/ CN	DISSOLVED RCRA METALS w/ CN				Notes/Comments
MW-7	3/6/01	10:00	WATER	10	X	X	X	X	X	X	X				"DISSOLVED" METALS
MW-10		11:00			X	X	X	X	X	X	X				
MW-11		12:45			X	X	X	X	X	X	X				
MW-8		1:25			X	X	X	X	X	X	X				SAMPLES WERE FIELD FILTERED
MW-12		3:00			X	X	X	X	X	X	X				
MW-800		4:00			X	X	X	X	X	X	X				

Relinquished: (Signature)	Relinquished: (Signature)	Relinquished: (Signature)	Special Instructions/Notes
Printed name: JODLE Boundage	Printed name:	Printed name:	
Company: K/J	Company:	Company:	
Date: 3/7/01 Time: 9:00	Date: Time:	Date: Time:	
Received by:	Received by:	Received by:	
Printed name:	Printed name:	Printed name:	
Company:	Company:	Company:	Number of Coolers:
			Cooler Temp(s):
Date: Time:	Date: Time:	Date: Time:	COC Seals Intact?
			Bottles Intact?

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
400 Ninth Avenue North
Seattle, WA 98109-4708
206-621-6490 206-621-7523 (fax)

Page 2 of 2

Turn Around Requested: STD

Report to: Ty Schreiner	Proj Name: TACOMA METALS
Company: Kennedy Jenks	Proj Number: 996098.00
Address: 530 S. 336th ST Federal Way, WA 98003	Sampler:
Phone: 253 874-0555	Shipping Method: Courier
Fax: 253 952 3435	AirBill:

Analyses Requested

Sample ID	Sample Date	Sample Time	Sample Matrix	No Containers	SULFATE	TDS	HARDNESS	pH/specific conductance	iron, manganese, potassium, sodium & calcium						Notes/Comments
MW-11	3/6/01	12:45	WATER	2	X	X	X	X	X						
MW-8	3/6/01	1:25	WATER	2	X	X	X	X	X						

Relinquished: (Signature)	Relinquished: (Signature)	Relinquished: (Signature)	Special Instructions/Notes
Printed name: Jodie Brundage	Printed name:	Printed name:	
Company: K/J	Company:	Company:	
Date: 3/7/01 Time: 9:00	Date: Time:	Date: Time:	
Received by:	Received by:	Received by:	
Printed name:	Printed name:	Printed name:	
Company:	Company:	Company:	Number of Coolers: 3 total
Date: Time:	Date: Time:	Date: Time:	Cooler Temp(s):
			COC Seals Intact?
			Bottles Intact?

ANALYTICAL RESOURCES INCORPORATED

CASE NARRATIVE
Tacoma Metals
ARI Job no.: CV13

Volatile Organics (8260):

All samples received were preserved with pH <2.0. All samples were analyzed within the recommended holding time. The LCS for 3/12/01 showed slight breakdown of carbon disulfide, methyl iodide, bromoethane and 1,1,2-trichlorotrifluoroethane. The mix was remade on 3/12/01 and set in to the sequence to be analyzed. The LCS was analyzed and reported on 3/13/01. All analytes were within specified QC criteria.

No other anomalies occurred during this analysis

PAH by GC/MS SIM:

All samples were extracted and analyzed within the specified holding times. Samples "B", "D", "E" & "F" had analytes that were flagged with an "E" to indicate over the linear range of the curve. The samples were re-analyzed at a dilution (s). Samples "D" "E" & "F" had naphthalene-d8 interference, (the internal standard could not be reliably identified due to matrix interference). Secondary internal standard quantitation was used with acenaphthene-d10.

No other anomalies occurred during this analysis

PCB'S by 8082:

All samples were extracted and analyzed within the recommended holding times. Samples were sulfuric acid and mercury cleaned prior to analysis. The continuing calibration for aroclor 1254 (peaks 5 & 6) exceeded QC limits but the average was within criteria. For aroclor 1262 all peaks exceeded QC limits high, results associated with these aroclors may be biased high. All associated samples were clean, no further action was taken.

No other anomalies occurred during this analysis.

NWTPH-G:

All samples were preserved with pH <2.0. All samples were analyzed within the recommended holding time.

No anomalies occurred during this analysis.

NWTPH-Dx:

All samples were extracted and analyzed within the recommended holding time. Samples "A, B, C & E" showed an overlapping peak pattern in the diesel and motor oil range, that does not resemble the typical standard patterns. Could be a weathered fuel pattern. Samples "D & F" have a large pattern in the gas and diesel range that do not resemble the typical standard pattern. Could be a mixture of gas, diesel or mineral spirits.

No other anomalies occurred during this analysis.

Metals:

No other anomalies occurred during this analysis.

Conventionals:

PH was received outside the recommended holding time.

No other anomalies occurred during this analysis.

ANALYTICAL RESOURCES INCORPORATED

ORGANIC COMPOUND DATA REPORTING QUALIFIERS

U Indicates the compound was undetected at the reported concentration. (Same as ND).

J Indicates an estimated concentration when the value is less than the calculated reporting limit.

D Indicates the surrogote/spike(s) was not detected, due to dilution of extract.

NR Indicates the surrogate recovery cannot be reported due to matrix interference.

E Indicates a value above the linear range of the detector. Sample dilution required.

S Indicates no value reported due to saturation of the detector. Sample dilution required.

NA Indicates compound not analyzed for.

M Indicates an estimated value of analyte found and confirmed by analyst but with low spectral match.

B Indicates possible/probable blank contamination. Flagged when the analyte is detected in the blank as well as the sample.

Y Indicates raised reporting limit due to background interference or to activity on the instrument. Compound is still not detected at or above the raised level.

ANALYTICAL RESOURCES INCORPORATED

WATER VOLATILE SYSTEM MONITORING COMPOUND SUMMARY

Matrix: Water 5 mL

QC Report No: CV13

Lab ID	Client ID	DCE	TOL	BFB	DCB	TOT OUT
031201MB	Method Blank	102%	101%	96%	102%	0
CV13LCS	Lab Cntrl Sample	99%	99%	99%	100%	0
CV13A	MW-7	101%	101%	96%	101%	0
CV13B	MW-10	99%	100%	97%	100%	0
CV13C	MW-12	99%	101%	96%	101%	0
031301MB	Method Blank	102%	97%	96%	100%	0
CV13LCS	Lab Cntrl Sample	97%	99%	99%	100%	0
CV13D	MW-800	102%	100%	96%	102%	0
CV13D-DL	MW-800	102%	100%	98%	100%	0
031601MB	Method Blank	101%	100%	98%	99%	0
CV13LCS	Lab Cntrl Sample	99%	99%	100%	100%	0
CV13E	MW-11	101%	99%	96%	102%	0
CV13E-RE	MW-11	97%	101%	97%	100%	0
CV13F	MW-8	103%	100%	96%	101%	0
CV13F-DL	MW-8	101%	99%	99%	99%	0
CV13M	Trip Blank	99%	101%	95%	100%	0

	LCS/MB LIMITS	QC LIMITS
(DCE) = 1,2-Dichloroethane-d4	(70-130)	(70-130)
(TOL) = Toluene-d8	(70-130)	(70-130)
(BFB) = Bromofluorobenzene	(70-130)	(70-130)
(DCB) = 1,2-Dichlorobenzene-d4	(70-130)	(70-130)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D System Monitoring Compound diluted out

FORM-II VOA-1

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Sample No: Method Blank

Lab Sample ID: 031201MB
LIMS ID: 01-2915
Matrix: Water
Data Release Authorized:
Reported: 03/20/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: NT3
Date Analyzed: 03/12/01 14:15

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	2.0 U
67-64-1	Acetone	5.0 U
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	trans-1,2-Dichloroethene	1.0 U
156-59-2	cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
108-05-4	Vinyl Acetate	5.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-02-6	trans-1,3-Dichloropropene	1.0 U
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.0 U
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2.0 U
1330-20-7	m,p-Xylene	1.0 U

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Sample No: Method Blank

Lab Sample ID: 031201MB
LIMS ID: 01-2915
Matrix: Water
Data Release Authorized:
Reported: 03/20/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: NT3
Date Analyzed: 03/12/01 14:15

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	o-Xylene	1.0 U
95-50-1	1,2-Dichlorobenzene	1.0 U
541-73-1	1,3-Dichlorobenzene	1.0 U
106-46-7	1,4-Dichlorobenzene	1.0 U
107-02-8	Acrolein	50 U
74-88-4	Methyl Iodide	1.0 U
74-96-4	Bromoethane	2.0 U
107-13-1	Acrylonitrile	5.0 U
563-58-6	1,1-Dichloropropene	1.0 U
74-95-3	Dibromomethane	1.0 U
630-20-6	1,1,1,2-Tetrachloroethane	1.0 U
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U
96-18-4	1,2,3-Trichloropropane	3.0 U
110-57-6	trans-1,4-Dichloro-2-butene	5.0 U
108-67-8	1,3,5-Trimethylbenzene	1.0 U
95-63-6	1,2,4-Trimethylbenzene	1.0 U
87-68-3	Hexachlorobutadiene	5.0 U
106-93-4	Ethylene Dibromide	1.0 U
74-97-5	Bromochloromethane	1.0 U
594-20-7	2,2-Dichloropropane	1.0 U
142-28-9	1,3-Dichloropropane	1.0 U
98-82-8	Isopropylbenzene	1.0 U
103-65-1	n-Propylbenzene	1.0 U
108-86-1	Bromobenzene	1.0 U
95-49-8	2-Chlorotoluene	1.0 U
106-43-4	4-Chlorotoluene	1.0 U
98-06-6	tert-Butylbenzene	1.0 U
135-98-8	sec-Butylbenzene	1.0 U
99-87-6	4-Isopropyltoluene	1.0 U
104-51-8	n-Butylbenzene	1.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0 U
91-20-3	Naphthalene	5.0 U
87-61-6	1,2,3-Trichlorobenzene	5.0 U

Volatile Surrogate Recovery	
d4-1,2-Dichloroethane	102%
d8-Toluene	101%
Bromofluorobenzene	96.0%
d4-1,2-Dichlorobenzene	102%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 031301MB
LIMS ID: 01-2918
Matrix: Water
Data Release Authorized:
Reported: 03/20/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: NT3
Date Analyzed: 03/13/01 10:15

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	2.0 U
67-64-1	Acetone	5.0 U
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	trans-1,2-Dichloroethene	1.0 U
156-59-2	cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
108-05-4	Vinyl Acetate	5.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-02-6	trans-1,3-Dichloropropene	1.0 U
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.0 U
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2.0 U
1330-20-7	m,p-Xylene	1.0 U

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Sample No: Method Blank

Lab Sample ID: 031301MB
LIMS ID: 01-2918
Matrix: Water
Data Release Authorized:
Reported: 03/20/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: NT3
Date Analyzed: 03/13/01 10:15

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	o-Xylene	1.0 U
95-50-1	1,2-Dichlorobenzene	1.0 U
541-73-1	1,3-Dichlorobenzene	1.0 U
106-46-7	1,4-Dichlorobenzene	1.0 U
107-02-8	Acrolein	50 U
74-88-4	Methyl Iodide	1.0 U
74-96-4	Bromoethane	2.0 U
107-13-1	Acrylonitrile	5.0 U
563-58-6	1,1-Dichloropropene	1.0 U
74-95-3	Dibromomethane	1.0 U
630-20-6	1,1,1,2-Tetrachloroethane	1.0 U
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U
96-18-4	1,2,3-Trichloropropane	3.0 U
110-57-6	trans-1,4-Dichloro-2-butene	5.0 U
108-67-8	1,3,5-Trimethylbenzene	1.0 U
95-63-6	1,2,4-Trimethylbenzene	1.0 U
87-68-3	Hexachlorobutadiene	5.0 U
106-93-4	Ethylene Dibromide	1.0 U
74-97-5	Bromochloromethane	1.0 U
594-20-7	2,2-Dichloropropane	1.0 U
142-28-9	1,3-Dichloropropane	1.0 U
98-82-8	Isopropylbenzene	1.0 U
103-65-1	n-Propylbenzene	1.0 U
108-86-1	Bromobenzene	1.0 U
95-49-8	2-Chlorotoluene	1.0 U
106-43-4	4-Chlorotoluene	1.0 U
98-06-6	tert-Butylbenzene	1.0 U
135-98-8	sec-Butylbenzene	1.0 U
99-87-6	4-Isopropyltoluene	1.0 U
104-51-8	n-Butylbenzene	1.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0 U
91-20-3	Naphthalene	5.0 U
87-61-6	1,2,3-Trichlorobenzene	5.0 U

Volatile Surrogate Recovery	
d4-1,2-Dichloroethane	102%
d8-Toluene	96.8%
Bromofluorobenzene	95.9%
d4-1,2-Dichlorobenzene	100%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 031601MB
LIMS ID: 01-2919
Matrix: Water
Data Release Authorized:
Reported: 03/20/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: NT3
Date Analyzed: 03/16/01 09:26

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	2.0 U
67-64-1	Acetone	5.0 U
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	trans-1,2-Dichloroethene	1.0 U
156-59-2	cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
108-05-4	Vinyl Acetate	5.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-02-6	trans-1,3-Dichloropropene	1.0 U
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.0 U
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2.0 U
1330-20-7	m,p-Xylene	1.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: Method Blank

Lab Sample ID: 031601MB
LIMS ID: 01-2919
Matrix: Water
Data Release Authorized:
Reported: 03/20/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Instrument: NT3
Date Analyzed: 03/16/01 09:26

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	o-Xylene	1.0 U
95-50-1	1,2-Dichlorobenzene	1.0 U
541-73-1	1,3-Dichlorobenzene	1.0 U
106-46-7	1,4-Dichlorobenzene	1.0 U
107-02-8	Acrolein	50 U
74-88-4	Methyl Iodide	1.0 U
74-96-4	Bromoethane	2.0 U
107-13-1	Acrylonitrile	5.0 U
563-58-6	1,1-Dichloropropene	1.0 U
74-95-3	Dibromomethane	1.0 U
630-20-6	1,1,1,2-Tetrachloroethane	1.0 U
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U
96-18-4	1,2,3-Trichloropropane	3.0 U
110-57-6	trans-1,4-Dichloro-2-butene	5.0 U
108-67-8	1,3,5-Trimethylbenzene	1.0 U
95-63-6	1,2,4-Trimethylbenzene	1.0 U
87-68-3	Hexachlorobutadiene	5.0 U
106-93-4	Ethylene Dibromide	1.0 U
74-97-5	Bromochloromethane	1.0 U
594-20-7	2,2-Dichloropropane	1.0 U
142-28-9	1,3-Dichloropropane	1.0 U
98-82-8	Isopropylbenzene	1.0 U
103-65-1	n-Propylbenzene	1.0 U
108-86-1	Bromobenzene	1.0 U
95-49-8	2-Chlorotoluene	1.0 U
106-43-4	4-Chlorotoluene	1.0 U
98-06-6	tert-Butylbenzene	1.0 U
135-98-8	sec-Butylbenzene	1.0 U
99-87-6	4-Isopropyltoluene	1.0 U
104-51-8	n-Butylbenzene	1.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0 U
91-20-3	Naphthalene	5.0 U
87-61-6	1,2,3-Trichlorobenzene	5.0 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	101%
d8-Toluene	99.6%
Bromofluorobenzene	98.4%
d4-1,2-Dichlorobenzene	99.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: MW-7

Lab Sample ID: CV13A
LIMS ID: 01-2915
Matrix: Water
Data Release Authorized:
Reported: 03/20/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Instrument: NT3
Date Analyzed: 03/12/01 16:55

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	2.0 U
67-64-1	Acetone	5.0 U
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	trans-1,2-Dichloroethene	1.0 U
156-59-2	cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
108-05-4	Vinyl Acetate	5.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-02-6	trans-1,3-Dichloropropene	1.0 U
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.0 U
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2.0 U
1330-20-7	m,p-Xylene	1.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: MW-7

Lab Sample ID: CV13A
LIMS ID: 01-2915
Matrix: Water
Data Release Authorized:
Reported: 03/20/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Instrument: NT3
Date Analyzed: 03/12/01 16:55

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	o-Xylene	1.0 U
95-50-1	1,2-Dichlorobenzene	1.0 U
541-73-1	1,3-Dichlorobenzene	1.0 U
106-46-7	1,4-Dichlorobenzene	1.0 U
107-02-8	Acrolein	50 U
74-88-4	Methyl Iodide	1.0 U
74-96-4	Bromoethane	2.0 U
107-13-1	Acrylonitrile	5.0 U
563-58-6	1,1-Dichloropropene	1.0 U
74-95-3	Dibromomethane	1.0 U
630-20-6	1,1,1,2-Tetrachloroethane	1.0 U
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U
96-18-4	1,2,3-Trichloropropane	3.0 U
110-57-6	trans-1,4-Dichloro-2-butene	5.0 U
108-67-8	1,3,5-Trimethylbenzene	1.0 U
95-63-6	1,2,4-Trimethylbenzene	1.0 U
87-68-3	Hexachlorobutadiene	5.0 U
106-93-4	Ethylene Dibromide	1.0 U
74-97-5	Bromochloromethane	1.0 U
594-20-7	2,2-Dichloropropane	1.0 U
142-28-9	1,3-Dichloropropane	1.0 U
98-82-8	Isopropylbenzene	1.0 U
103-65-1	n-Propylbenzene	1.0 U
108-86-1	Bromobenzene	1.0 U
95-49-8	2-Chlorotoluene	1.0 U
106-43-4	4-Chlorotoluene	1.0 U
98-06-6	tert-Butylbenzene	1.0 U
135-98-8	sec-Butylbenzene	1.0 U
99-87-6	4-Isopropyltoluene	1.0 U
104-51-8	n-Butylbenzene	1.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0 U
91-20-3	Naphthalene	5.0 U
87-61-6	1,2,3-Trichlorobenzene	5.0 U

Volatile Surrogate Recovery	
d4-1,2-Dichloroethane	101%
d8-Toluene	101%
Bromofluorobenzene	96.0%
d4-1,2-Dichlorobenzene	101%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: MW-10

Lab Sample ID: CV13B
LIMS ID: 01-2916
Matrix: Water
Data Release Authorized:
Reported: 03/20/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Instrument: NT3
Date Analyzed: 03/12/01 17:21

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	2.0 U
67-64-1	Acetone	5.0 U
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	trans-1,2-Dichloroethene	1.0 U
156-59-2	cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
108-05-4	Vinyl Acetate	5.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	**Benzene**	**1.2**
10061-02-6	trans-1,3-Dichloropropene	1.0 U
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.0 U
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2.0 U
1330-20-7	m,p-Xylene	1.0 U

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Sample No: MW-10

Lab Sample ID: CV13B
LIMS ID: 01-2916
Matrix: Water
Data Release Authorized:
Reported: 03/20/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Instrument: NT3
Date Analyzed: 03/12/01 17:21

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	**o-Xylene**	**1.1**
95-50-1	1,2-Dichlorobenzene	1.0 U
541-73-1	1,3-Dichlorobenzene	1.0 U
106-46-7	1,4-Dichlorobenzene	1.0 U
107-02-8	Acrolein	50 U
74-88-4	**Methyl Iodide**	1.0 U
74-96-4	Bromoethane	2.0 U
107-13-1	Acrylonitrile	5.0 U
563-58-6	1,1-Dichloropropene	1.0 U
74-95-3	Dibromomethane	1.0 U
630-20-6	1,1,1,2-Tetrachloroethane	1.0 U
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U
96-18-4	1,2,3-Trichloropropane	3.0 U
110-57-6	trans-1,4-Dichloro-2-butene	5.0 U
108-67-8	1,3,5-Trimethylbenzene	1.0 U
95-63-6	**1,2,4-Trimethylbenzene**	**1.0**
87-68-3	Hexachlorobutadiene	5.0 U
106-93-4	Ethylene Dibromide	1.0 U
74-97-5	Bromochloromethane	1.0 U
594-20-7	2,2-Dichloropropane	1.0 U
142-28-9	1,3-Dichloropropane	1.0 U
98-82-8	Isopropylbenzene	1.0 U
103-65-1	n-Propylbenzene	1.0 U
108-86-1	Bromobenzene	1.0 U
95-49-8	2-Chlorotoluene	1.0 U
106-43-4	4-Chlorotoluene	1.0 U
98-06-6	tert-Butylbenzene	1.0 U
135-98-8	sec-Butylbenzene	1.0 U
99-87-6	4-Isopropyltoluene	1.0 U
104-51-8	n-Butylbenzene	1.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0 U
91-20-3	**Naphthalene**	**29**
87-61-6	1,2,3-Trichlorobenzene	5.0 U

Volatile Surrogate Recovery	
d4-1,2-Dichloroethane	99.0%
d8-Toluene	100%
Bromofluorobenzene	96.7%
d4-1,2-Dichlorobenzene	100%

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Sample No: MW-12

Lab Sample ID: CV13C
LIMS ID: 01-2917
Matrix: Water
Data Release Authorized
Reported: 03/20/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Instrument: NT3
Date Analyzed: 03/12/01 17:46

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	2.0 U
67-64-1	Acetone	5.0 U
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	trans-1,2-Dichloroethene	1.0 U
156-59-2	cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
108-05-4	Vinyl Acetate	5.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-02-6	trans-1,3-Dichloropropene	1.0 U
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.0 U
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2.0 U
1330-20-7	m,p-Xylene	1.0 U

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Sample No: MW-12

Lab Sample ID: CV13C
LIMS ID: 01-2917
Matrix: Water
Data Release Authorized:
Reported: 03/20/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Instrument: NT3
Date Analyzed: 03/12/01 17:46

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	o-Xylene	1.0 U
95-50-1	1,2-Dichlorobenzene	1.0 U
541-73-1	1,3-Dichlorobenzene	1.0 U
106-46-7	1,4-Dichlorobenzene	1.0 U
107-02-8	Acrolein	50 U
74-88-4	Methyl Iodide	1.0 U
74-96-4	Bromoethane	2.0 U
107-13-1	Acrylonitrile	5.0 U
563-58-6	1,1-Dichloropropene	1.0 U
74-95-3	Dibromomethane	1.0 U
630-20-6	1,1,1,2-Tetrachloroethane	1.0 U
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U
96-18-4	1,2,3-Trichloropropane	3.0 U
110-57-6	trans-1,4-Dichloro-2-butene	5.0 U
108-67-8	1,3,5-Trimethylbenzene	1.0 U
95-63-6	1,2,4-Trimethylbenzene	1.0 U
87-68-3	Hexachlorobutadiene	5.0 U
106-93-4	Ethylene Dibromide	1.0 U
74-97-5	Bromochloromethane	1.0 U
594-20-7	2,2-Dichloropropane	1.0 U
142-28-9	1,3-Dichloropropane	1.0 U
98-82-8	Isopropylbenzene	1.0 U
103-65-1	n-Propylbenzene	1.0 U
108-86-1	Bromobenzene	1.0 U
95-49-8	2-Chlorotoluene	1.0 U
106-43-4	4-Chlorotoluene	1.0 U
98-06-6	tert-Butylbenzene	1.0 U
135-98-8	sec-Butylbenzene	1.0 U
99-87-6	4-Isopropyltoluene	1.0 U
104-51-8	n-Butylbenzene	1.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0 U
91-20-3	Naphthalene	5.0 U
87-61-6	1,2,3-Trichlorobenzene	5.0 U

Volatile Surrogate Recovery	
d4-1,2-Dichloroethane	98.9%
d8-Toluene	101%
Bromofluorobenzene	95.5%
d4-1,2-Dichlorobenzene	101%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: MW-B00

Lab Sample ID: CV13D
LIMS ID: 01-2918
Matrix: Water
Data Release Authorized:
Reported: 03/20/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Instrument: NT3
Date Analyzed: 03/13/01 16:09

Sample Amount: 0.50 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	10 U
74-83-9	Bromomethane	10 U
75-01-4	Vinyl Chloride	10 U
75-00-3	Chloroethane	10 U
75-09-2	Methylene Chloride	20 U
67-64-1	Acetone	50 U
75-15-0	Carbon Disulfide	10 U
75-35-4	1,1-Dichloroethene	10 U
75-34-3	1,1-Dichloroethane	10 U
156-60-5	trans-1,2-Dichloroethene	10 U
156-59-2	cis-1,2-Dichloroethene	10 U
67-66-3	Chloroform	10 U
107-06-2	1,2-Dichloroethane	10 U
78-93-3	2-Butanone	50 U
71-55-6	1,1,1-Trichloroethane	10 U
56-23-5	Carbon Tetrachloride	10 U
108-05-4	Vinyl Acetate	50 U
75-27-4	Bromodichloromethane	10 U
78-87-5	1,2-Dichloropropane	10 U
10061-01-5	cis-1,3-Dichloropropene	10 U
79-01-6	Trichloroethene	10 U
124-48-1	Dibromochloromethane	10 U
79-00-5	1,1,2-Trichloroethane	10 U
71-43-2	**Benzene**	**25**
10061-02-6	trans-1,3-Dichloropropene	10 U
110-75-8	2-Chloroethylvinylether	50 U
75-25-2	Bromoform	10 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	50 U
591-78-6	2-Hexanone	50 U
127-18-4	Tetrachloroethene	10 U
79-34-5	1,1,2,2-Tetrachloroethane	10 U
108-88-3	**Toluene**	**61**
108-90-7	Chlorobenzene	10 U
100-41-4	**Ethylbenzene**	**190**
100-42-5	Styrene	10 U
75-69-4	Trichlorofluoromethane	10 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	20 U
1330-20-7	m,p-Xylene	650

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Sample No: MW-800

Lab Sample ID: CV13D
LIMS ID: 01-2918
Matrix: Water
Data Release Authorized:
Reported: 03/20/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Instrument: NT3
Date Analyzed: 03/13/01 16:09

Sample Amount: 0.50 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	**o-Xylene**	**350**
95-50-1	1,2-Dichlorobenzene	10 U
541-73-1	1,3-Dichlorobenzene	10 U
106-46-7	1,4-Dichlorobenzene	10 U
107-02-8	Acrolein	500 U
74-88-4	Methyl Iodide	10 U
74-96-4	Bromoethane	20 U
107-13-1	Acrylonitrile	50 U
563-58-6	1,1-Dichloropropene	10 U
74-95-3	Dibromomethane	10 U
630-20-6	1,1,1,2-Tetrachloroethane	10 U
96-12-8	1,2-Dibromo-3-chloropropane	50 U
96-18-4	1,2,3-Trichloropropane	30 U
110-57-6	trans-1,4-Dichloro-2-butene	50 U
108-67-8	**1,3,5-Trimethylbenzene**	**150**
95-63-6	**1,2,4-Trimethylbenzene**	**420**
87-68-3	Hexachlorobutadiene	50 U
106-93-4	Ethylene Dibromide	10 U
74-97-5	Bromochloromethane	10 U
594-20-7	2,2-Dichloropropane	10 U
142-28-9	1,3-Dichloropropane	10 U
98-82-8	**Isopropylbenzene**	**44**
103-65-1	n-Propylbenzene	10 U
108-86-1	Bromobenzene	10 U
95-49-8	2-Chlorotoluene	10 U
106-43-4	4-Chlorotoluene	10 U
98-06-6	tert-Butylbenzene	10 U
135-98-8	sec-Butylbenzene	10 U
99-87-6	**4-Isopropyltoluene**	**34**
104-51-8	n-Butylbenzene	10 U
120-82-1	1,2,4-Trichlorobenzene	50 U
91-20-3	**Naphthalene**	**5400 E**
87-61-6	1,2,3-Trichlorobenzene	50 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	102%
d8-Toluene	100%
Bromofluorobenzene	95.6%
d4-1,2-Dichlorobenzene	102%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: MW-800
DILUTION

Lab Sample ID: CV13D-DL
LIMS ID: 01-2918
Matrix: Water
Data Release Authorized:
Reported: 03/20/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Instrument: NT3
Date Analyzed: 03/16/01 11:27

Sample Amount: 0.10 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	50 U
74-83-9	Bromomethane	50 U
75-01-4	Vinyl Chloride	50 U
75-00-3	Chloroethane	50 U
75-09-2	**Methylene Chloride**	**120**
67-64-1	Acetone	250 U
75-15-0	Carbon Disulfide	50 U
75-35-4	1,1-Dichloroethene	50 U
75-34-3	1,1-Dichloroethane	50 U
156-60-5	trans-1,2-Dichloroethene	50 U
156-59-2	cis-1,2-Dichloroethene	50 U
67-66-3	Chloroform	50 U
107-06-2	1,2-Dichloroethane	50 U
78-93-3	2-Butanone	250 U
71-55-6	1,1,1-Trichloroethane	50 U
56-23-5	Carbon Tetrachloride	50 U
108-05-4	Vinyl Acetate	250 U
75-27-4	Bromodichloromethane	50 U
78-87-5	1,2-Dichloropropane	50 U
10061-01-5	cis-1,3-Dichloropropene	50 U
79-01-6	Trichloroethene	50 U
124-48-1	Dibromochloromethane	50 U
79-00-5	1,1,2-Trichloroethane	50 U
71-43-2	Benzene	50 U
10061-02-6	trans-1,3-Dichloropropene	50 U
110-75-8	2-Chloroethylvinylether	250 U
75-25-2	Bromoform	50 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	250 U
591-78-6	2-Hexanone	250 U
127-18-4	Tetrachloroethene	50 U
79-34-5	1,1,2,2-Tetrachloroethane	50 U
108-88-3	**Toluene**	**86**
108-90-7	Chlorobenzene	50 U
100-41-4	**Ethylbenzene**	**240**
100-42-5	Styrene	50 U
75-69-4	Trichlorofluoromethane	50 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	100 U
1330-20-7	**m,p-Xylene**	**840**

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Sample No: MW-800
DILUTION

Lab Sample ID: CV13D-DL
LIMS ID: 01-2918
Matrix: Water
Data Release Authorized:
Reported: 03/20/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Instrument: NT3
Date Analyzed: 03/16/01 11:27

Sample Amount: 0.10 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	**o-Xylene**	**450**
95-50-1	1,2-Dichlorobenzene	50 U
541-73-1	1,3-Dichlorobenzene	50 U
106-46-7	1,4-Dichlorobenzene	50 U
107-02-8	Acrolein	2500 U
74-88-4	Methyl Iodide	50 U
74-96-4	Bromoethane	100 U
107-13-1	Acrylonitrile	250 U
563-58-6	1,1-Dichloropropene	50 U
74-95-3	Dibromomethane	50 U
630-20-6	1,1,1,2-Tetrachloroethane	50 U
96-12-8	1,2-Dibromo-3-chloropropane	250 U
96-18-4	1,2,3-Trichloropropane	150 U
110-57-6	trans-1,4-Dichloro-2-butene	250 U
108-67-8	**1,3,5-Trimethylbenzene**	**200**
95-63-6	**1,2,4-Trimethylbenzene**	**560**
87-68-3	Hexachlorobutadiene	250 U
106-93-4	Ethylene Dibromide	50 U
74-97-5	Bromochloromethane	50 U
594-20-7	2,2-Dichloropropane	50 U
142-28-9	1,3-Dichloropropane	50 U
98-82-8	**Isopropylbenzene**	**56**
103-65-1	n-Propylbenzene	50 U
108-86-1	Bromobenzene	50 U
95-49-8	2-Chlorotoluene	50 U
106-43-4	4-Chlorotoluene	50 U
98-06-6	tert-Butylbenzene	50 U
135-98-8	sec-Butylbenzene	50 U
99-87-6	4-Isopropyltoluene	50 U
104-51-8	n-Butylbenzene	50 U
120-82-1	1,2,4-Trichlorobenzene	250 U
91-20-3	**Naphthalene**	**6000**
87-61-6	1,2,3-Trichlorobenzene	250 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	102%
d8-Toluene	99.9%
Bromofluorobenzene	98.4%
d4-1,2-Dichlorobenzene	100%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: MW-11

Lab Sample ID: CV13E
LIMS ID: 01-2919
Matrix: Water
Data Release Authorized:
Reported: 03/20/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Instrument: NT3
Date Analyzed: 03/13/01 16:35

Sample Amount: 1.0 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	5.0 U
74-83-9	Bromomethane	5.0 U
75-01-4	Vinyl Chloride	5.0 U
75-00-3	Chloroethane	5.0 U
75-09-2	Methylene Chloride	10 U
67-64-1	Acetone	25 U
75-15-0	Carbon Disulfide	5.0 U
75-35-4	1,1-Dichloroethene	5.0 U
75-34-3	1,1-Dichloroethane	5.0 U
156-60-5	trans-1,2-Dichloroethene	5.0 U
156-59-2	cis-1,2-Dichloroethene	5.0 U
67-66-3	Chloroform	5.0 U
107-06-2	1,2-Dichloroethane	5.0 U
78-93-3	2-Butanone	25 U
71-55-6	1,1,1-Trichloroethane	5.0 U
56-23-5	Carbon Tetrachloride	5.0 U
108-05-4	Vinyl Acetate	25 U
75-27-4	Bromodichloromethane	5.0 U
78-87-5	1,2-Dichloropropane	5.0 U
10061-01-5	cis-1,3-Dichloropropene	5.0 U
79-01-6	Trichloroethene	5.0 U
124-48-1	Dibromochloromethane	5.0 U
79-00-5	1,1,2-Trichloroethane	5.0 U
71-43-2	Benzene	5.0 U
10061-02-6	trans-1,3-Dichloropropene	5.0 U
110-75-8	2-Chloroethylvinylether	25 U
75-25-2	Bromoform	5.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	25 U
591-78-6	2-Hexanone	25 U
127-18-4	Tetrachloroethene	5.0 U
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U
108-88-3	Toluene	5.0 U
108-90-7	Chlorobenzene	5.0 U
100-41-4	**Ethylbenzene**	**7.6**
100-42-5	Styrene	5.0 U
75-69-4	Trichlorofluoromethane	5.0 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	10 U
1330-20-7	**m,p-Xylene**	**6.6**

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Sample No: MW-11

Lab Sample ID: CV13E
LIMS ID: 01-2919
Matrix: Water
Data Release Authorized:
Reported: 03/20/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Instrument: NT3
Date Analyzed: 03/13/01 16:35

Sample Amount: 1.0 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	**o-Xylene**	**5.5**
95-50-1	1,2-Dichlorobenzene	5.0 U
541-73-1	1,3-Dichlorobenzene	5.0 U
106-46-7	1,4-Dichlorobenzene	5.0 U
107-02-8	Acrolein	250 U
74-88-4	Methyl Iodide	5.0 U
74-96-4	Bromoethane	10 U
107-13-1	Acrylonitrile	25 U
563-58-6	1,1-Dichloropropene	5.0 U
74-95-3	Dibromomethane	5.0 U
630-20-6	1,1,1,2-Tetrachloroethane	5.0 U
96-12-8	1,2-Dibromo-3-chloropropane	25 U
96-18-4	1,2,3-Trichloropropane	15 U
110-57-6	trans-1,4-Dichloro-2-butene	25 U
108-67-8	1,3,5-Trimethylbenzene	5.0 U
95-63-6	**1,2,4-Trimethylbenzene**	**14**
87-68-3	Hexachlorobutadiene	25 U
106-93-4	Ethylene Dibromide	5.0 U
74-97-5	Bromochloromethane	5.0 U
594-20-7	2,2-Dichloropropane	5.0 U
142-28-9	1,3-Dichloropropane	5.0 U
98-82-8	Isopropylbenzene	5.0 U
103-65-1	n-Propylbenzene	5.0 U
108-86-1	Bromobenzene	5.0 U
95-49-8	2-Chlorotoluene	5.0 U
106-43-4	4-Chlorotoluene	5.0 U
98-06-6	tert-Butylbenzene	5.0 U
135-98-8	sec-Butylbenzene	5.0 U
99-87-6	**4-Isopropyltoluene**	**28**
104-51-8	n-Butylbenzene	5.0 U
120-82-1	1,2,4-Trichlorobenzene	25 U
91-20-3	**Naphthalene**	**550**
87-61-6	1,2,3-Trichlorobenzene	25 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	101%
d8-Toluene	98.9%
Bromofluorobenzene	96.1%
d4-1,2-Dichlorobenzene	102%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: MW-11
REANALYSIS

Lab Sample ID: CV13E-RE
LIMS ID: 01-2919
Matrix: Water
Data Release Authorized:
Reported: 03/20/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Instrument: NT3
Date Analyzed: 03/16/01 11:52

Sample Amount: 1.0 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	5.0 U
74-83-9	Bromomethane	5.0 U
75-01-4	Vinyl Chloride	5.0 U
75-00-3	Chloroethane	5.0 U
75-09-2	**Methylene Chloride**	**12**
67-64-1	Acetone	25 U
75-15-0	Carbon Disulfide	5.0 U
75-35-4	1,1-Dichloroethene	5.0 U
75-34-3	1,1-Dichloroethane	5.0 U
156-60-5	trans-1,2-Dichloroethene	5.0 U
156-59-2	cis-1,2-Dichloroethene	5.0 U
67-66-3	Chloroform	5.0 U
107-06-2	1,2-Dichloroethane	5.0 U
78-93-3	2-Butanone	25 U
71-55-6	1,1,1-Trichloroethane	5.0 U
56-23-5	Carbon Tetrachloride	5.0 U
108-05-4	Vinyl Acetate	25 U
75-27-4	Bromodichloromethane	5.0 U
78-87-5	1,2-Dichloropropane	5.0 U
10061-01-5	cis-1,3-Dichloropropene	5.0 U
79-01-6	Trichloroethene	5.0 U
124-48-1	Dibromochloromethane	5.0 U
79-00-5	1,1,2-Trichloroethane	5.0 U
71-43-2	Benzene	5.0 U
10061-02-6	trans-1,3-Dichloropropene	5.0 U
110-75-8	2-Chloroethylvinylether	25 U
75-25-2	Bromoform	5.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	25 U
591-78-6	2-Hexanone	25 U
127-18-4	Tetrachloroethene	5.0 U
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U
108-88-3	Toluene	5.0 U
108-90-7	Chlorobenzene	5.0 U
100-41-4	**Ethylbenzene**	**7.6**
100-42-5	Styrene	5.0 U
75-69-4	Trichlorofluoromethane	5.0 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	10 U
1330-20-7	**m,p-Xylene**	**5.5**

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Sample No: MW-11
REANALYSIS

Lab Sample ID: CV13E-RE
LIMS ID: 01-2919
Matrix: Water
Data Release Authorized:
Reported: 03/20/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Instrument: NT3
Date Analyzed: 03/16/01 11:52

Sample Amount: 1.0 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	**o-Xylene**	**5.6**
95-50-1	1,2-Dichlorobenzene	5.0 U
541-73-1	1,3-Dichlorobenzene	5.0 U
106-46-7	1,4-Dichlorobenzene	5.0 U
107-02-8	Acrolein	250 U
74-88-4	Methyl Iodide	5.0 U
74-96-4	Bromoethane	10 U
107-13-1	Acrylonitrile	25 U
563-58-6	1,1-Dichloropropene	5.0 U
74-95-3	Dibromomethane	5.0 U
630-20-6	1,1,1,2-Tetrachloroethane	5.0 U
96-12-8	1,2-Dibromo-3-chloropropane	25 U
96-18-4	1,2,3-Trichloropropane	15 U
110-57-6	trans-1,4-Dichloro-2-butene	25 U
108-67-8	1,3,5-Trimethylbenzene	5.0 U
95-63-6	**1,2,4-Trimethylbenzene**	**15**
87-68-3	Hexachlorobutadiene	25 U
106-93-4	Ethylene Dibromide	5.0 U
74-97-5	Bromochloromethane	5.0 U
594-20-7	2,2-Dichloropropane	5.0 U
142-28-9	1,3-Dichloropropane	5.0 U
98-82-8	Isopropylbenzene	5.0 U
103-65-1	n-Propylbenzene	5.0 U
108-86-1	Bromobenzene	5.0 U
95-49-8	2-Chlorotoluene	5.0 U
106-43-4	4-Chlorotoluene	5.0 U
98-06-6	tert-Butylbenzene	5.0 U
135-98-8	sec-Butylbenzene	5.0 U
99-87-6	**4-Isopropyltoluene**	**31**
104-51-8	n-Butylbenzene	5.0 U
120-82-1	1,2,4-Trichlorobenzene	25 U
91-20-3	**Naphthalene**	**410**
87-61-6	1,2,3-Trichlorobenzene	25 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	97.2%
d8-Toluene	101%
Bromofluorobenzene	97.0%
d4-1,2-Dichlorobenzene	100%

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Sample No: MW-8

Lab Sample ID: CV13F
LIMS ID: 01-2920
Matrix: Water
Data Release Authorized
Reported: 03/20/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Instrument: NT3
Date Analyzed: 03/13/01 17:02

Sample Amount: 0.50 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	10 U
74-83-9	Bromomethane	10 U
75-01-4	Vinyl Chloride	10 U
75-00-3	Chloroethane	10 U
75-09-2	Methylene Chloride	20 U
67-64-1	Acetone	50 U
75-15-0	Carbon Disulfide	10 U
75-35-4	1,1-Dichloroethene	10 U
75-34-3	1,1-Dichloroethane	10 U
156-60-5	trans-1,2-Dichloroethene	10 U
156-59-2	cis-1,2-Dichloroethene	10 U
67-66-3	Chloroform	10 U
107-06-2	1,2-Dichloroethane	10 U
78-93-3	2-Butanone	50 U
71-55-6	1,1,1-Trichloroethane	10 U
56-23-5	Carbon Tetrachloride	10 U
108-05-4	Vinyl Acetate	50 U
75-27-4	Bromodichloromethane	10 U
78-87-5	1,2-Dichloropropane	10 U
10061-01-5	cis-1,3-Dichloropropene	10 U
79-01-6	Trichloroethene	10 U
124-48-1	Dibromochloromethane	10 U
79-00-5	1,1,2-Trichloroethane	10 U
71-43-2	**Benzene**	**24**
10061-02-6	trans-1,3-Dichloropropene	10 U
110-75-8	2-Chloroethylvinylether	50 U
75-25-2	Bromoform	10 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	50 U
591-78-6	2-Hexanone	50 U
127-18-4	Tetrachloroethene	10 U
79-34-5	1,1,2,2-Tetrachloroethane	10 U
108-88-3	**Toluene**	**70**
108-90-7	Chlorobenzene	10 U
100-41-4	**Ethylbenzene**	**190**
100-42-5	Styrene	10 U
75-69-4	Trichlorofluoromethane	10 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	20 U
1330-20-7	**m,p-Xylene**	**700**

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Sample No: MW-8

Lab Sample ID: CV13F
LIMS ID: 01-2920
Matrix: Water
Data Release Authorized:
Reported: 03/20/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Instrument: NT3
Date Analyzed: 03/13/01 17:02

Sample Amount: 0.50 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	**o-Xylene**	**370**
95-50-1	1,2-Dichlorobenzene	10 U
541-73-1	1,3-Dichlorobenzene	10 U
106-46-7	1,4-Dichlorobenzene	10 U
107-02-8	Acrolein	500 U
74-88-4	Methyl Iodide	10 U
74-96-4	Bromoethane	20 U
107-13-1	Acrylonitrile	50 U
563-58-6	1,1-Dichloropropene	10 U
74-95-3	Dibromomethane	10 U
630-20-6	1,1,1,2-Tetrachloroethane	10 U
96-12-8	1,2-Dibromo-3-chloropropane	50 U
96-18-4	1,2,3-Trichloropropane	30 U
110-57-6	trans-1,4-Dichloro-2-butene	50 U
108-67-8	**1,3,5-Trimethylbenzene**	**150**
95-63-6	**1,2,4-Trimethylbenzene**	**430**
87-68-3	Hexachlorobutadiene	50 U
106-93-4	Ethylene Dibromide	10 U
74-97-5	Bromochloromethane	10 U
594-20-7	2,2-Dichloropropane	10 U
142-28-9	1,3-Dichloropropane	10 U
98-82-8	**Isopropylbenzene**	**44**
103-65-1	n-Propylbenzene	10 U
108-86-1	Bromobenzene	10 U
95-49-8	2-Chlorotoluene	10 U
106-43-4	4-Chlorotoluene	10 U
98-06-6	tert-Butylbenzene	10 U
135-98-8	sec-Butylbenzene	10 U
99-87-6	**4-Isopropyltoluene**	**34**
104-51-8	n-Butylbenzene	10 U
120-82-1	1,2,4-Trichlorobenzene	50 U
91-20-3	**Naphthalene**	**5500 E**
87-61-6	1,2,3-Trichlorobenzene	50 U

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	103%
d8-Toluene	100%
Bromofluorobenzene	96.3%
d4-1,2-Dichlorobenzene	101%

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Sample No: MW-8
DILUTION

Lab Sample ID: CV13F-DL
LIMS ID: 01-2920
Matrix: Water
Data Release Authorized:
Reported: 03/20/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Instrument: NT3
Date Analyzed: 03/16/01 12:18

Sample Amount: 0.10 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	50 U
74-83-9	Bromomethane	50 U
75-01-4	Vinyl Chloride	50 U
75-00-3	Chloroethane	50 U
75-09-2	**Methylene Chloride**	**150**
67-64-1	Acetone	250 U
75-15-0	Carbon Disulfide	50 U
75-35-4	1,1-Dichloroethene	50 U
75-34-3	1,1-Dichloroethane	50 U
156-60-5	trans-1,2-Dichloroethene	50 U
156-59-2	cis-1,2-Dichloroethene	50 U
67-66-3	Chloroform	50 U
107-06-2	1,2-Dichloroethane	50 U
78-93-3	2-Butanone	250 U
71-55-6	1,1,1-Trichloroethane	50 U
56-23-5	Carbon Tetrachloride	50 U
108-05-4	Vinyl Acetate	250 U
75-27-4	Bromodichloromethane	50 U
78-87-5	1,2-Dichloropropane	50 U
10061-01-5	cis-1,3-Dichloropropene	50 U
79-01-6	Trichloroethene	50 U
124-48-1	Dibromochloromethane	50 U
79-00-5	1,1,2-Trichloroethane	50 U
71-43-2	Benzene	50 U
10061-02-6	trans-1,3-Dichloropropene	50 U
110-75-8	2-Chloroethylvinylether	250 U
75-25-2	Bromoform	50 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	250 U
591-78-6	2-Hexanone	250 U
127-18-4	Tetrachloroethene	50 U
79-34-5	1,1,2,2-Tetrachloroethane	50 U
108-88-3	**Toluene**	**88**
108-90-7	Chlorobenzene	50 U
100-41-4	**Ethylbenzene**	**250**
100-42-5	Styrene	50 U
75-69-4	Trichlorofluoromethane	50 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	100 U
1330-20-7	m,p-Xylene	910

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Sample No: MW-8
DILUTION

Lab Sample ID: CV13F-DL
LIMS ID: 01-2920
Matrix: Water
Data Release Authorized:
Reported: 03/20/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Instrument: NT3
Date Analyzed: 03/16/01 12:18

Sample Amount: 0.10 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	**o-Xylene**	**470**
95-50-1	1,2-Dichlorobenzene	50 U
541-73-1	1,3-Dichlorobenzene	50 U
106-46-7	1,4-Dichlorobenzene	50 U
107-02-8	Acrolein	2500 U
74-88-4	Methyl Iodide	50 U
74-96-4	Bromoethane	100 U
107-13-1	Acrylonitrile	250 U
563-58-6	1,1-Dichloropropene	50 U
74-95-3	Dibromomethane	50 U
630-20-6	1,1,1,2-Tetrachloroethane	50 U
96-12-8	1,2-Dibromo-3-chloropropane	250 U
96-18-4	1,2,3-Trichloropropane	150 U
110-57-6	trans-1,4-Dichloro-2-butene	250 U
108-67-8	**1,3,5-Trimethylbenzene**	**210**
95-63-6	**1,2,4-Trimethylbenzene**	**560**
87-68-3	Hexachlorobutadiene	250 U
106-93-4	Ethylene Dibromide	50 U
74-97-5	Bromochloromethane	50 U
594-20-7	2,2-Dichloropropane	50 U
142-28-9	1,3-Dichloropropane	50 U
98-82-8	**Isopropylbenzene**	**60**
103-65-1	n-Propylbenzene	50 U
108-86-1	Bromobenzene	50 U
95-49-8	2-Chlorotoluene	50 U
106-43-4	4-Chlorotoluene	50 U
98-06-6	tert-Butylbenzene	50 U
135-98-8	sec-Butylbenzene	50 U
99-87-6	4-Isopropyltoluene	50 U
104-51-8	n-Butylbenzene	50 U
120-82-1	1,2,4-Trichlorobenzene	250 U
91-20-3	**Naphthalene**	**5600**
87-61-6	1,2,3-Trichlorobenzene	250 U

Volatile Surrogate Recovery	
d4-1,2-Dichloroethane	101%
d8-Toluene	99.0%
Bromofluorobenzene	99.0%
d4-1,2-Dichlorobenzene	99.2%

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Sample No: Trip Blank

Lab Sample ID: CV13M
LIMS ID: 01-2927
Matrix: Water
Data Release Authorized:
Reported: 03/20/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled:
Date Received: 03/07/01

Instrument: NT3
Date Analyzed: 03/12/01 16:29

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	2.0 U
67-64-1	Acetone	5.0 U
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	trans-1,2-Dichloroethene	1.0 U
156-59-2	cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
108-05-4	Vinyl Acetate	5.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-02-6	trans-1,3-Dichloropropene	1.0 U
110-75-8	2-Chloroethylvinylether	5.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.0 U
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2.0 U
1330-20-7	m,p-Xylene	1.0 U

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Sample No: Trip Blank

Lab Sample ID: CV13M
LIMS ID: 01-2927
Matrix: Water
Data Release Authorized:
Reported: 03/20/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled:
Date Received: 03/07/01

Instrument: NT3
Date Analyzed: 03/12/01 16:29

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	ug/L
95-47-6	o-Xylene	1.0 U
95-50-1	1,2-Dichlorobenzene	1.0 U
541-73-1	1,3-Dichlorobenzene	1.0 U
106-46-7	1,4-Dichlorobenzene	1.0 U
107-02-8	Acrolein	50 U
74-88-4	Methyl Iodide	1.0 U
74-96-4	Bromoethane	2.0 U
107-13-1	Acrylonitrile	5.0 U
563-58-6	1,1-Dichloropropene	1.0 U
74-95-3	Dibromomethane	1.0 U
630-20-6	1,1,1,2-Tetrachloroethane	1.0 U
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U
96-18-4	1,2,3-Trichloropropane	3.0 U
110-57-6	trans-1,4-Dichloro-2-butene	5.0 U
108-67-8	1,3,5-Trimethylbenzene	1.0 U
95-63-6	1,2,4-Trimethylbenzene	1.0 U
87-68-3	Hexachlorobutadiene	5.0 U
106-93-4	Ethylene Dibromide	1.0 U
74-97-5	Bromochloromethane	1.0 U
594-20-7	2,2-Dichloropropane	1.0 U
142-28-9	1,3-Dichloropropane	1.0 U
98-82-8	Isopropylbenzene	1.0 U
103-65-1	n-Propylbenzene	1.0 U
108-86-1	Bromobenzene	1.0 U
95-49-8	2-Chlorotoluene	1.0 U
106-43-4	4-Chlorotoluene	1.0 U
98-06-6	tert-Butylbenzene	1.0 U
135-98-8	sec-Butylbenzene	1.0 U
99-87-6	4-Isopropyltoluene	1.0 U
104-51-8	n-Butylbenzene	1.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0 U
91-20-3	Naphthalene	5.0 U
87-61-6	1,2,3-Trichlorobenzene	5.0 U

Volatile Surrogate Recovery	
d4-1,2-Dichloroethane	98.7%
d8-Toluene	101%
Bromofluorobenzene	95.2%
d4-1,2-Dichlorobenzene	100%

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CV13SB
LIMS ID: 01-2915
Matrix: Water
Data Release Authorized:
Reported: 03/20/01
Date Analyzed: 03/12/01
Instrument: NT3

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 03/07/01

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
Chloromethane	36.8	50.0	73.6%
Bromomethane	32.2	50.0	64.4%
Vinyl Chloride	34.8	50.0	69.6%
Chloroethane	39.4	50.0	78.8%
Methylene Chloride	40.5	50.0	81.0%
Acetone	249.	250	99.6%
Carbon Disulfide	1.69	50.0	3.4%
1,1-Dichloroethene	39.4	50.0	78.8%
1,1-Dichloroethane	39.2	50.0	78.4%
trans-1,2-Dichloroethene	38.1	50.0	76.2%
cis-1,2-Dichloroethene	39.9	50.0	79.8%
Chloroform	39.5	50.0	79.0%
1,2-Dichloroethane	38.6	50.0	77.2%
2-Butanone	248.	250	99.2%
1,1,1-Trichloroethane	38.8	50.0	77.6%
Carbon Tetrachloride	38.9	50.0	77.8%
Vinyl Acetate	38.6	50.0	77.2%
Bromodichloromethane	38.3	50.0	76.6%
1,2-Dichloropropane	41.7	50.0	83.4%
cis-1,3-Dichloropropene	37.2	50.0	74.4%
Trichloroethene	38.9	50.0	77.8%
Dibromochloromethane	39.3	50.0	78.6%
1,1,2-Trichloroethane	39.4	50.0	78.8%
Benzene	39.6	50.0	79.2%
trans-1,3-Dichloropropene	36.3	50.0	72.6%
2-Chloroethylvinylether	46.9	50.0	93.8%
Bromoform	39.7	50.0	79.4%
4-Methyl-2-Pentanone (MIBK)	250.	250	100%
2-Hexanone	246.	250	98.4%
Tetrachloroethene	38.7	50.0	77.4%
1,1,2,2-Tetrachloroethane	39.5	50.0	79.0%
Toluene	39.6	50.0	79.2%
Chlorobenzene	39.1	50.0	78.2%
Ethylbenzene	38.6	50.0	77.2%
Styrene	39.3	50.0	78.6%
Trichlorofluoromethane	35.2	50.0	70.4%
1,1,2-Trichlorotrifluoroethane	9.55	50.0	19.1%
m,p-Xylene	78.5	100	78.5%
O-Xylene	39.1	50.0	78.2%

Reported in ug/L

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CV13SB
LIMS ID: 01-2915
Matrix: Water
Data Release Authorized:
Reported: 03/20/01
Date Analyzed: 03/12/01
Instrument: NT3

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 03/07/01

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
1,2-Dichlorobenzene	39.3	50.0	78.6%
1,3-Dichlorobenzene	40.0	50.0	80.0%
1,4-Dichlorobenzene	40.5	50.0	81.0%
Acrolein	300.	250	120%
Methyl Iodide	14.4	50.0	28.8%
Bromoethane	8.06	50.0	16.1%
Acrylonitrile	38.7	50.0	77.4%
1,1-Dichloropropene	39.4	50.0	78.8%
Dibromomethane	39.8	50.0	79.6%
1,1,1,2-Tetrachloroethane	38.3	50.0	76.6%
1,2-Dibromo-3-chloropropane	41.1	50.0	82.2%
1,2,3-Trichloropropane	40.5	50.0	81.0%
trans-1,4-Dichloro-2-butene	49.9	50.0	99.8%
1,3,5-Trimethylbenzene	39.5	50.0	79.0%
1,2,4-Trimethylbenzene	40.9	50.0	81.8%
Hexachlorobutadiene	39.8	50.0	79.6%
Ethylene Dibromide	38.9	50.0	77.8%
Bromochloromethane	39.0	50.0	78.0%
2,2-Dichloropropane	38.1	50.0	76.2%
1,3-Dichloropropane	38.9	50.0	77.8%
Isopropylbenzene	39.4	50.0	78.8%
n-Propylbenzene	39.2	50.0	78.4%
Bromobenzene	40.9	50.0	81.8%
2-Chlorotoluene	39.9	50.0	79.8%
4-Chlorotoluene	38.9	50.0	77.8%
tert-Butylbenzene	39.8	50.0	79.6%
sec-Butylbenzene	39.8	50.0	79.6%
4-Isopropyltoluene	39.8	50.0	79.6%
n-Butylbenzene	39.3	50.0	78.6%
1,2,4-Trichlorobenzene	40.2	50.0	80.4%
Naphthalene	41.4	50.0	82.8%
1,2,3-Trichlorobenzene	40.7	50.0	81.4%

Lab Control Surrogate Recovery	
d4-1,2-Dichloroethane	99.1%
d8-Toluene	99.2%
Bromofluorobenzene	98.9%
d4-1,2-Dichlorobenzene	100%

Reported in ug/L

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CV13SB
LIMS ID: 01-2918
Matrix: Water
Data Release Authorized:
Reported: 03/20/01
Date Analyzed: 03/13/01
Instrument: NT3

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 03/07/01

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
Chloromethane	46.6	50.0	93.2%
Bromomethane	51.6	50.0	103%
Vinyl Chloride	44.9	50.0	89.8%
Chloroethane	48.6	50.0	97.2%
Methylene Chloride	46.7	50.0	93.4%
Acetone	199.	250	79.6%
Carbon Disulfide	52.6	50.0	105%
1,1-Dichloroethene	47.2	50.0	94.4%
1,1-Dichloroethane	47.2	50.0	94.4%
trans-1,2-Dichloroethene	45.3	50.0	90.6%
cis-1,2-Dichloroethene	47.8	50.0	95.6%
Chloroform	47.4	50.0	94.8%
1,2-Dichloroethane	47.5	50.0	95.0%
2-Butanone	196.	250	78.4%
1,1,1-Trichloroethane	46.3	50.0	92.6%
Carbon Tetrachloride	47.2	50.0	94.4%
Vinyl Acetate	59.0	50.0	118%
Bromodichloromethane	46.8	50.0	93.6%
1,2-Dichloropropane	49.3	50.0	98.6%
cis-1,3-Dichloropropene	44.4	50.0	88.8%
Trichloroethene	46.1	50.0	92.2%
Dibromochloromethane	47.0	50.0	94.0%
1,1,2-Trichloroethane	46.1	50.0	92.2%
Benzene	47.5	50.0	95.0%
trans-1,3-Dichloropropene	43.0	50.0	86.0%
2-Chloroethylvinylether	49.7	50.0	99.4%
Bromoform	45.7	50.0	91.4%
4-Methyl-2-Pentanone (MIBK)	198.	250	79.2%
2-Hexanone	198.	250	79.2%
Tetrachloroethene	46.5	50.0	93.0%
1,1,2,2-Tetrachloroethane	44.3	50.0	88.6%
Toluene	47.2	50.0	94.4%
Chlorobenzene	47.4	50.0	94.8%
Ethylbenzene	46.7	50.0	93.4%
Styrene	46.9	50.0	93.8%
Trichlorofluoromethane	43.3	50.0	86.6%
1,1,2-Trichlorotrifluoroethane	51.5	50.0	103%
m,p-Xylene	95.6	100	95.6%
O-Xylene	47.2	50.0	94.4%

Reported in ug/L

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CV13SB
LIMS ID: 01-2918
Matrix: Water
Data Release Authorized:
Reported: 03/20/01
Date Analyzed: 03/13/01
Instrument: NT3

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 03/07/01

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
1,2-Dichlorobenzene	46.9	50.0	93.8%
1,3-Dichlorobenzene	47.6	50.0	95.2%
1,4-Dichlorobenzene	48.2	50.0	96.4%
Acrolein	233.	250	93.2%
Methyl Iodide	49.1	50.0	98.2%
Bromoethane	48.8	50.0	97.6%
Acrylonitrile	51.5	50.0	103%
1,1-Dichloropropene	47.3	50.0	94.6%
Dibromomethane	46.6	50.0	93.2%
1,1,1,2-Tetrachloroethane	46.3	50.0	92.6%
1,2-Dibromo-3-chloropropane	43.3	50.0	86.6%
1,2,3-Trichloropropane	45.4	50.0	90.8%
trans-1,4-Dichloro-2-butene	40.4	50.0	80.8%
1,3,5-Trimethylbenzene	48.2	50.0	96.4%
1,2,4-Trimethylbenzene	49.4	50.0	98.8%
Hexachlorobutadiene	52.5	50.0	105%
Ethylene Dibromide	45.2	50.0	90.4%
Bromochloromethane	46.5	50.0	93.0%
2,2-Dichloropropane	46.7	50.0	93.4%
1,3-Dichloropropane	45.5	50.0	91.0%
Isopropylbenzene	48.0	50.0	96.0%
n-Propylbenzene	48.0	50.0	96.0%
Bromobenzene	48.0	50.0	96.0%
2-Chlorotoluene	47.4	50.0	94.8%
4-Chlorotoluene	47.4	50.0	94.8%
tert-Butylbenzene	48.2	50.0	96.4%
sec-Butylbenzene	48.4	50.0	96.8%
4-Isopropyltoluene	49.5	50.0	99.0%
n-Butylbenzene	49.4	50.0	98.8%
1,2,4-Trichlorobenzene	47.8	50.0	95.6%
Naphthalene	44.6	50.0	89.2%
1,2,3-Trichlorobenzene	47.3	50.0	94.6%

Lab Control Surrogate Recovery	
d4-1,2-Dichloroethane	97.4%
d8-Toluene	99.1%
Bromofluorobenzene	98.6%
d4-1,2-Dichlorobenzene	100%

Reported in ug/L

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CV13SB
LIMS ID: 01-2919
Matrix: Water
Data Release Authorized:
Reported: 03/20/01
Date Analyzed: 03/16/01
Instrument: NT3

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 03/07/01

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
Chloromethane	61.7	50.0	123%
Bromomethane	59.7	50.0	119%
Vinyl Chloride	52.7	50.0	105%
Chloroethane	58.2	50.0	116%
Methylene Chloride	54.2	50.0	108%
Acetone	221.	250	88.4%
Carbon Disulfide	49.3	50.0	98.6%
1,1-Dichloroethene	56.6	50.0	113%
1,1-Dichloroethane	54.5	50.0	109%
trans-1,2-Dichloroethene	53.8	50.0	108%
cis-1,2-Dichloroethene	55.6	50.0	111%
Chloroform	54.9	50.0	110%
1,2-Dichloroethane	53.6	50.0	107%
2-Butanone	251.	250	100%
1,1,1-Trichloroethane	54.5	50.0	109%
Carbon Tetrachloride	56.0	50.0	112%
Vinyl Acetate	58.8	50.0	118%
Bromodichloromethane	54.4	50.0	109%
1,2-Dichloropropane	56.8	50.0	114%
cis-1,3-Dichloropropene	50.7	50.0	101%
Trichloroethene	53.9	50.0	108%
Dibromochloromethane	55.5	50.0	111%
1,1,2-Trichloroethane	54.0	50.0	108%
Benzene	54.7	50.0	109%
trans-1,3-Dichloropropene	49.7	50.0	99.4%
2-Chloroethylvinylether	54.2	50.0	108%
Bromoform	55.9	50.0	112%
4-Methyl-2-Pentanone (MIBK)	285.	250	114%
2-Hexanone	282.	250	113%
Tetrachloroethene	56.2	50.0	112%
1,1,2,2-Tetrachloroethane	56.7	50.0	113%
Toluene	55.6	50.0	111%
Chlorobenzene	55.6	50.0	111%
Ethylbenzene	55.1	50.0	110%
Styrene	55.3	50.0	111%
Trichlorofluoromethane	52.7	50.0	105%
1,1,2-Trichlorotrifluoroethane	51.2	50.0	102%
m,p-Xylene	114.	100	114%
O-Xylene	55.7	50.0	111%

Reported in ug/L

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CV13SB
LIMS ID: 01-2919
Matrix: Water
Data Release Authorized:
Reported: 03/20/01
Date Analyzed: 03/16/01
Instrument: NT3

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 03/07/01

LABORATORY CONTROL SAMPLE CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
1,2-Dichlorobenzene	57.5	50.0	115%
1,3-Dichlorobenzene	58.7	50.0	117%
1,4-Dichlorobenzene	58.3	50.0	117%
Acrolein	271.	250	108%
Methyl Iodide	55.9	50.0	112%
Bromoethane	46.2	50.0	92.4%
Acrylonitrile	54.2	50.0	108%
1,1-Dichloropropene	55.7	50.0	111%
Dibromomethane	54.8	50.0	110%
1,1,1,2-Tetrachloroethane	53.3	50.0	107%
1,2-Dibromo-3-chloropropane	58.8	50.0	118%
1,2,3-Trichloropropane	55.5	50.0	111%
trans-1,4-Dichloro-2-butene	44.2	50.0	88.4%
1,3,5-Trimethylbenzene	60.3	50.0	121%
1,2,4-Trimethylbenzene	62.3	50.0	125%
Hexachlorobutadiene	69.6	50.0	139%
Ethylene Dibromide	53.2	50.0	106%
Bromochloromethane	54.7	50.0	109%
2,2-Dichloropropane	53.9	50.0	108%
1,3-Dichloropropane	53.7	50.0	107%
Isopropylbenzene	59.0	50.0	118%
n-Propylbenzene	59.9	50.0	120%
Bromobenzene	55.9	50.0	112%
2-Chlorotoluene	58.1	50.0	116%
4-Chlorotoluene	56.4	50.0	113%
tert-Butylbenzene	62.4	50.0	125%
sec-Butylbenzene	64.1	50.0	128%
4-Isopropyltoluene	64.1	50.0	128%
n-Butylbenzene	65.2	50.0	130%
1,2,4-Trichlorobenzene	63.7	50.0	127%
Naphthalene	61.7	50.0	123%
1,2,3-Trichlorobenzene	64.2	50.0	128%

Lab Control Surrogate Recovery	
d4-1,2-Dichloroethane	98.6%
d8-Toluene	99.4%
Bromofluorobenzene	99.9%
d4-1,2-Dichlorobenzene	99.6%

Reported in ug/L

ANALYTICAL RESOURCES INCORPORATED

SIM SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Client ID	MNP	DBA	TOT OUT
Method Blank	85%	95%	0
Lab Control	89%	99%	0
MW-7	85%	86%	0
MW-10	97%	94%	0
MW-10-DL	D	D	0
MW-12	91%	92%	0
MW-800	70%	89%	0
MW-800-DL	D	D	0
MW-800-RE	D	D	0
MW-11	69%	94%	0
MW-11-DL	D	D	0
MW-8	70%	91%	0
MW-8-DL	D	D	0
MW-8-RE	D	D	0

	LCS/MB LIMITS	QC LIMITS
(MNP) = d10-2-Methylnaphthalene	(30-160)	(30-160)
(DBA) = d14-Dibenz(a,h)anthracene	(30-160)	(30-160)

(Present limits for LCS/MB are advisory only)

D Surrogate Compound diluted out

FORM-II 8270-SIM

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: Method Blank

Lab Sample ID: CV13MB
LIMS ID: 01-2915
Matrix: Water
Data Release Authorized:
Reported: 03/19/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Date extracted: 03/12/01
Date analyzed: 03/14/01 23:47
Instrument: NT2

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	0.10 U
91-57-6	2-Methylnaphthalene	0.10 U
208-96-8	Acenaphthylene	0.10 U
83-32-9	Acenaphthene	0.10 U
86-73-7	Fluorene	0.10 U
85-01-8	Phenanthrene	0.10 U
120-12-7	Anthracene	0.10 U
206-44-0	Fluoranthene	0.10 U
129-00-0	Pyrene	0.10 U
56-55-3	Benzo(a)anthracene	0.10 U
218-01-9	Chrysene	0.10 U
205-99-2	Benzo(b)fluoranthene	0.10 U
207-08-9	Benzo(k)fluoranthene	0.10 U
50-32-8	Benzo(a)pyrene	0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10 U
132-64-9	Dibenzofuran	0.10 U

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	85.0%
d14-Dibenzo(a,h)anthracene	94.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: MW-7

Lab Sample ID: CV13A
LIMS ID: 01-2915
Matrix: Water
Data Release Authorized:
Reported: 03/19/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Date extracted: 03/12/01
Date analyzed: 03/15/01 00:34
Instrument: NT2

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	0.12
91-57-6	2-Methylnaphthalene	0.10 U
208-96-8	Acenaphthylene	0.10 U
83-32-9	Acenaphthene	0.72
86-73-7	Fluorene	0.28
85-01-8	Phenanthrene	0.06 J
120-12-7	Anthracene	0.13
206-44-0	Fluoranthene	0.20
129-00-0	Pyrene	0.13
56-55-3	Benzo(a)anthracene	0.10 U
218-01-9	Chrysene	0.10 U
205-99-2	Benzo(b)fluoranthene	0.10 U
207-08-9	Benzo(k)fluoranthene	0.10 U
50-32-8	Benzo(a)pyrene	0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10 U
132-64-9	Dibenzofuran	0.10 U

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	85.3%
d14-Dibenzo(a,h)anthracene	86.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: MW-10**
PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: CV13B
LIMS ID: 01-2916
Matrix: Water
Data Release Authorized:
Reported: 03/19/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Date extracted: 03/12/01
Date analyzed: 03/15/01 00:58
Instrument: NT2

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L	
91-20-3	Naphthalene	7.0	
91-57-6	2-Methylnaphthalene	1.8	
208-96-8	Acenaphthylene	0.86	M
83-32-9	Acenaphthene	78	E
86-73-7	Fluorene	41	E
85-01-8	Phenanthrene	49	E
120-12-7	Anthracene	6.9	
206-44-0	Fluoranthene	12	E
129-00-0	Pyrene	8.9	
56-55-3	Benzo(a)anthracene	1.4	
218-01-9	Chrysene	1.2	
205-99-2	Benzo(b)fluoranthene	0.56	
207-08-9	Benzo(k)fluoranthene	0.63	
50-32-8	Benzo(a)pyrene	0.71	
193-39-5	Indeno(1,2,3-cd)pyrene	0.26	
53-70-3	Dibenz(a,h)anthracene	0.09	MJ
191-24-2	Benzo(g,h,i)perylene	0.31	
132-64-9	Dibenzofuran	27	E

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	97.0%
d14-Dibenzo(a,h)anthracene	94.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: MW-10
DILUTION

Lab Sample ID: CV13B-DL
LIMS ID: 01-2916
Matrix: Water
Data Release Authorized: MW
Reported: 03/19/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Date extracted: 03/12/01
Date analyzed: 03/16/01 17:22
Instrument: NT2

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:50

CAS Number	Analyte	ug/L
91-20-3	**Naphthalene**	**7.0**
91-57-6	2-Methylnaphthalene	5.0 U
208-96-8	Acenaphthylene	5.0 U
83-32-9	**Acenaphthene**	**68**
86-73-7	**Fluorene**	**36**
85-01-8	**Phenanthrene**	**46**
120-12-7	**Anthracene**	**6.0**
206-44-0	**Fluoranthene**	**8.5**
129-00-0	**Pyrene**	**8.0**
56-55-3	Benzo(a)anthracene	5.0 U
218-01-9	Chrysene	5.0 U
205-99-2	Benzo(b)fluoranthene	5.0 U
207-08-9	Benzo(k)fluoranthene	5.0 U
50-32-8	Benzo(a)pyrene	5.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	5.0 U
53-70-3	Dibenz(a,h)anthracene	5.0 U
191-24-2	Benzo(g,h,i)perylene	5.0 U
132-64-9	**Dibenzofuran**	**28**

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracene	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: MW-12**
PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: CV13C
LIMS ID: 01-2917
Matrix: Water
Data Release Authorized:
Reported: 03/19/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Date extracted: 03/12/01
Date analyzed: 03/15/01 01:22
Instrument: NT2

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	**Naphthalene**	**2.1**
91-57-6	2-Methylnaphthalene	0.10 U
208-96-8	Acenaphthylene	0.10 U
83-32-9	**Acenaphthene**	**2.0**
86-73-7	**Fluorene**	**0.82**
85-01-8	**Phenanthrene**	**0.11**
120-12-7	**Anthracene**	**0.13**
206-44-0	**Fluoranthene**	**0.18**
129-00-0	**Pyrene**	**0.11**
56-55-3	Benzo(a)anthracene	0.10 U
218-01-9	Chrysene	0.10 U
205-99-2	Benzo(b)fluoranthene	0.10 U
207-08-9	Benzo(k)fluoranthene	0.10 U
50-32-8	Benzo(a)pyrene	0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10 U
132-64-9	**Dibenzofuran**	**0.22**

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	91.0%
d14-Dibenzo(a,h)anthracene	92.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: MW-800**
PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: CV13D
LIMS ID: 01-2918
Matrix: Water
Data Release Authorized:
Reported: 03/19/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Date extracted: 03/12/01
Date analyzed: 03/15/01 01:45
Instrument: NT2

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	340 E
91-57-6	2-Methylnaphthalene	200 E
208-96-8	Acenaphthylene	3.6 M
83-32-9	Acenaphthene	140 E
86-73-7	Fluorene	80 E
85-01-8	Phenanthrene	48 E
120-12-7	Anthracene	4.9
206-44-0	Fluoranthene	4.7
129-00-0	Pyrene	2.5
56-55-3	Benzo(a)anthracene	0.19
218-01-9	Chrysene	0.13
205-99-2	Benzo(b)fluoranthene	0.10 U
207-08-9	Benzo(k)fluoranthene	0.10 U
50-32-8	Benzo(a)pyrene	0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10 U
132-64-9	Dibenzofuran	67 E

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	70.3%
d14-Dibenzo(a,h)anthracene	89.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: MW-800
DILUTION

Lab Sample ID: CV13D-DL
LIMS ID: 01-2918
Matrix: Water
Data Release Authorized:
Reported: 03/19/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Date extracted: 03/12/01
Date analyzed: 03/16/01 17:45
Instrument: NT2

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:100

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	4,400 E
91-57-6	2-Methylnaphthalene	620
208-96-8	Acenaphthylene	6.0 MJ
83-32-9	Acenaphthene	190
86-73-7	Fluorene	79
85-01-8	Phenanthrene	54
120-12-7	Anthracene	5.0 J
206-44-0	Fluoranthene	10 U
129-00-0	Pyrene	10 U
56-55-3	Benzo(a)anthracene	10 U
218-01-9	Chrysene	10 U
205-99-2	Benzo(b)fluoranthene	10 U
207-08-9	Benzo(k)fluoranthene	10 U
50-32-8	Benzo(a)pyrene	10 U
193-39-5	Indeno(1,2,3-cd)pyrene	10 U
53-70-3	Dibenz(a,h)anthracene	10 U
191-24-2	Benzo(g,h,i)perylene	10 U
132-64-9	Dibenzofuran	90

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracene	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: MW-800
DILUTION

Lab Sample ID: CV13D-DL2
LIMS ID: 01-2918
Matrix: Water
Data Release Authorized:
Reported: 03/19/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Date extracted: 03/12/01
Date analyzed: 03/16/01
Instrument: NT2

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1000

CAS Number	Analyte	ug/L
91-20-3	**Naphthalene**	**4,000**
91-57-6	**2-Methylnaphthalene**	**600**
208-96-8	Acenaphthylene	100 U
83-32-9	**Acenaphthene**	**170**
86-73-7	**Fluorene**	**70 J**
85-01-8	**Phenanthrene**	**50 J**
120-12-7	Anthracene	100 U
206-44-0	Fluoranthene	100 U
129-00-0	Pyrene	100 U
56-55-3	Benzo(a)anthracene	100 U
218-01-9	Chrysene	100 U
205-99-2	Benzo(b)fluoranthene	100 U
207-08-9	Benzo(k)fluoranthene	100 U
50-32-8	Benzo(a)pyrene	100 U
193-39-5	Indeno(1,2,3-cd)pyrene	100 U
53-70-3	Dibenz(a,h)anthracene	100 U
191-24-2	Benzo(g,h,i)perylene	100 U
132-64-9	**Dibenzofuran**	**90 J**

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracene	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: MW-11

Lab Sample ID: CV13E
LIMS ID: 01-2919
Matrix: Water
Data Release Authorized:
Reported: 03/19/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Date extracted: 03/12/01
Date analyzed: 03/15/01 02:09
Instrument: NT2

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	96 E
91-57-6	2-Methylnaphthalene	19 E
208-96-8	Acenaphthylene	2.2 M
83-32-9	Acenaphthene	140 E
86-73-7	Fluorene	100 E
85-01-8	Phenanthrene	86 E
120-12-7	Anthracene	18 E
206-44-0	Fluoranthene	23 E
129-00-0	Pyrene	19 E
56-55-3	Benzo(a)anthracene	1.8
218-01-9	Chrysene	1.1
205-99-2	Benzo(b)fluoranthene	0.52
207-08-9	Benzo(k)fluoranthene	0.51
50-32-8	Benzo(a)pyrene	0.65
193-39-5	Indeno(1,2,3-cd)pyrene	0.23
53-70-3	Dibenz(a,h)anthracene	0.07 MJ
191-24-2	Benzo(g,h,i)perylene	0.26
132-64-9	Dibenzofuran	65 E

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	68.7%
d14-Dibenzo(a,h)anthracene	93.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: MW-11
DILUTION

Lab Sample ID: CV13E-DL
LIMS ID: 01-2919
Matrix: Water
Data Release Authorized:
Reported: 03/19/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Date extracted: 03/12/01
Date analyzed: 03/16/01 19:22
Instrument: NT2

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:50

CAS Number	Analyte	ug/L
91-20-3	**Naphthalene**	**280**
91-57-6	**2-Methylnaphthalene**	**21**
208-96-8	**Acenaphthylene**	**4.0 MJ**
83-32-9	**Acenaphthene**	**210**
86-73-7	**Fluorene**	**140**
85-01-8	**Phenanthrene**	**170**
120-12-7	**Anthracene**	**16**
206-44-0	**Fluoranthene**	**18**
129-00-0	**Pyrene**	**18**
56-55-3	Benzo(a)anthracene	5.0 U
218-01-9	Chrysene	5.0 U
205-99-2	Benzo(b)fluoranthene	5.0 U
207-08-9	Benzo(k)fluoranthene	5.0 U
50-32-8	Benzo(a)pyrene	5.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	5.0 U
53-70-3	Dibenz(a,h)anthracene	5.0 U
191-24-2	Benzo(g,h,i)perylene	5.0 U
132-64-9	**Dibenzofuran**	**97**

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracene	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: MW-8

Lab Sample ID: CV13F
LIMS ID: 01-2920
Matrix: Water
Data Release Authorized:
Reported: 03/19/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Date extracted: 03/12/01
Date analyzed: 03/15/01 02:33
Instrument: NT2

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	320 E
91-57-6	2-Methylnaphthalene	200 E
208-96-8	Acenaphthylene	3.6 M
83-32-9	Acenaphthene	140 E
86-73-7	Fluorene	80 E
85-01-8	Phenanthrene	50 E
120-12-7	Anthracene	5.0
206-44-0	Fluoranthene	5.4
129-00-0	Pyrene	3.0
56-55-3	Benzo(a)anthracene	0.29
218-01-9	Chrysene	0.21 M
205-99-2	Benzo(b)fluoranthene	0.06 J
207-08-9	Benzo(k)fluoranthene	0.05 J
50-32-8	Benzo(a)pyrene	0.06 MJ
193-39-5	Indeno(1,2,3-cd)pyrene	0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10 U
132-64-9	Dibenzofuran	67 E

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	70.0%
d14-Dibenzo(a,h)anthracene	91.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: MW-8
DILUTION

Lab Sample ID: CV13F-DL
LIMS ID: 01-2920
Matrix: Water
Data Release Authorized:
Reported: 03/19/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Date extracted: 03/12/01
Date analyzed: 03/16/01 18:09
Instrument: NT2

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:200

CAS Number	Analyte	ug/L
91-20-3	**Naphthalene**	**4,400 E**
91-57-6	**2-Methylnaphthalene**	**640**
208-96-8	Acenaphthylene	20 U
83-32-9	**Acenaphthene**	**210**
86-73-7	**Fluorene**	**88**
85-01-8	**Phenanthrene**	**60**
120-12-7	**Anthracene**	**4.0 J**
206-44-0	Fluoranthene	20 U
129-00-0	Pyrene	20 U
56-55-3	Benzo(a)anthracene	20 U
218-01-9	Chrysene	20 U
205-99-2	Benzo(b)fluoranthene	20 U
207-08-9	Benzo(k)fluoranthene	20 U
50-32-8	Benzo(a)pyrene	20 U
193-39-5	Indeno(1,2,3-cd)pyrene	20 U
53-70-3	Dibenz(a,h)anthracene	20 U
191-24-2	Benzo(g,h,i)perylene	20 U
132-64-9	**Dibenzofuran**	**100**

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracene	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: MW-8**
PNAs by Selected Ion Monitoring GC/MS **DILUTION**

Lab Sample ID: CV13F-DL2
LIMS ID: 01-2920
Matrix: Water
Data Release Authorized:
Reported: 03/19/01

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Date extracted: 03/12/01
Date analyzed: 03/16/01
Instrument: NT2

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1000

CAS Number	Analyte	ug/L
91-20-3	**Naphthalene**	4,500
91-57-6	**2-Methylnaphthalene**	630
208-96-8	Acenaphthylene	100 U
83-32-9	**Acenaphthene**	210
86-73-7	**Fluorene**	90 J
85-01-8	**Phenanthrene**	60 J
120-12-7	Anthracene	100 U
206-44-0	Fluoranthene	100 U
129-00-0	Pyrene	100 U
56-55-3	Benzo(a)anthracene	100 U
218-01-9	Chrysene	100 U
205-99-2	Benzo(b)fluoranthene	100 U
207-08-9	Benzo(k)fluoranthene	100 U
50-32-8	Benzo(a)pyrene	100 U
193-39-5	Indeno(1,2,3-cd)pyrene	100 U
53-70-3	Dibenz(a,h)anthracene	100 U
191-24-2	Benzo(g,h,i)perylene	100 U
132-64-9	**Dibenzofuran**	100

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracene	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNA's by Selected Ion Monitoring GC/MS

Lab Sample ID: CV13LC
LIMS ID: 01-2915
Matrix: Water

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 03/19/01

LABORATORY CONTROL SAMPLE
Extracted: 03/12/01
Analyzed: 03/15/01

CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
Phenanthrene	2.70	3.00	90.0%
Chrysene	2.69	3.00	89.7%
Benzo(k)fluoranthene	2.89	3.00	96.3%

Values reported in ug/L

Spike Blank Surrogate Recovery

d10-2-Methylnaphthalene	88.7%
d14-Dibenzo(a,h)anthracene	98.7%

ANALYTICAL RESOURCES INCORPORATED

WATER AROCLOR SURROGATE SUMMARY

Matrix: Water

QC Report No: CV13
Project: Tacoma Metals
996098.00

LIMS ID	Lab ID	Client ID	TCMX #	DCBP #	TOT OUT
01-2915MB	030901MB	Method Blank	71.5%	64.5%	0
01-2915SB	030901SB	Lab Control	76.0%	66.0%	0
01-2915	CV13A	MW-7	73.0%	77.0%	0
01-2916	CV13B	MW-10	78.0%	75.5%	0
01-2917	CV13C	MW-12	71.5%	78.5%	0
01-2918	CV13D	MW-800	86.5%	70.0%	0
01-2919	CV13E	MW-11	100%	78.0%	0
01-2920	CV13F	MW-8	88.5%	73.0%	0

	QC LIMITS
(TCMX) = Tetrachloro-m-xylene	(34-112)
(DCBP) = Decachlorobiphenyl	(22-139)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D Surrogate Compound diluted out

FORM-II PCB

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: Method Blank

Lab Sample ID: CV13MB
LIMS ID: 01-2915
Matrix: Water

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized: CH
Reported: 03/15/01 3/15/01

Date extracted: 03/09/01
Date analyzed: 03/14/01 11:18
Instrument ID: ECD4
Sample Amount: 500 mL
Final Ext Vol: 5.0 mL

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value	
12674-11-2	Aroclor 1016	1.0	U
53469-21-9	Aroclor 1242	1.0	U
12672-29-6	Aroclor 1248	1.0	U
11097-69-1	Aroclor 1254	1.0	U
11096-82-5	Aroclor 1260	1.0	U
11104-28-2	Aroclor 1221	2.0	U
11141-16-5	Aroclor 1232	1.0	U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	64.5%
Tetrachlorometaxylene	71.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: MW-7

Lab Sample ID: CV13A
LIMS ID: 01-2915
Matrix: Water

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Data Release Authorized: CH
Reported: 03/15/01 3/15/01

Date extracted: 03/09/01
Date analyzed: 03/14/01 12:27
Instrument ID: ECD4
Sample Amount: 500 mL
Final Ext Vol: 5.0 mL

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U
11104-28-2	Aroclor 1221	2.0 U
11141-16-5	Aroclor 1232	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	77.0%
Tetrachlorometaxylene	73.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: MW-10

Lab Sample ID: CV13B
LIMS ID: 01-2916
Matrix: Water

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Data Release Authorized: CH
Reported: 03/15/01 3/15/01

Date extracted: 03/09/01
Date analyzed: 03/14/01 13:02
Instrument ID: ECD4
Sample Amount: 500 mL
Final Ext Vol: 5.0 mL

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U
11104-28-2	Aroclor 1221	2.0 U
11141-16-5	Aroclor 1232	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	75.5%
Tetrachlorometaxylene	78.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: MW-12

Lab Sample ID: CV13C
LIMS ID: 01-2917
Matrix: Water

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Data Release Authorized: CH
Reported: 03/15/01 3/15/01

Date extracted: 03/09/01
Date analyzed: 03/14/01 13:37
Instrument ID: ECD4
Sample Amount: 500 mL
Final Ext Vol: 5.0 mL

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U
11104-28-2	Aroclor 1221	2.0 U
11141-16-5	Aroclor 1232	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	78.5%
Tetrachlorometaxylene	71.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: MW-800

Lab Sample ID: CV13D
LIMS ID: 01-2918
Matrix: Water

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Data Release Authorized: CA
Reported: 03/15/01 3/15/01

Date extracted: 03/09/01
Date analyzed: 03/14/01 14:12
Instrument ID: ECD4
Sample Amount: 500 mL
Final Ext Vol: 5.0 mL

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U
11104-28-2	Aroclor 1221	2.0 U
11141-16-5	Aroclor 1232	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	70.0%
Tetrachlorometaxylene	86.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: MW-11

Lab Sample ID: CV13E
LIMS ID: 01-2919
Matrix: Water

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Data Release Authorized: CH
Reported: 03/15/01 3/15/01

Date extracted: 03/09/01
Date analyzed: 03/14/01 14:47
Instrument ID: ECD4
Sample Amount: 500 mL
Final Ext Vol: 5.0 mL

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U
11104-28-2	Aroclor 1221	2.0 U
11141-16-5	Aroclor 1232	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	78.0%
Tetrachlorometaxylene	100%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: MW-8

Lab Sample ID: CV13F
LIMS ID: 01-2920
Matrix: Water

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Data Release Authorized: CH
Reported: 03/15/01 3/15/01

Date extracted: 03/09/01
Date analyzed: 03/14/01 15:22
Instrument ID: ECD4
Sample Amount: 500 mL
Final Ext Vol: 5.0 mL

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U
11104-28-2	Aroclor 1221	2.0 U
11141-16-5	Aroclor 1232	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	73.0%
Tetrachlorometaxylene	88.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by METHOD 8080

Lab Sample ID: CV13SB
LIMS ID: 01-2915
Matrix: Water

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized: CH
Reported: 03/15/01 3/15/-1

LABORATORY CONTROL SAMPLE RECOVERY
Date extracted: 03/09/01

CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	8.69	10.1	86.2%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	66.0%
Tetrachlorometaxylene	76.0%

Values reported in ug/L

FORM-III

ANALYTICAL RESOURCES INCORPORATED

WATER TPHg SYSTEM MONITORING COMPOUND SUMMARY

Matrix: Water

QC Report No: CV13

LIMS ID	Lab ID	Client ID	TFT	BB	TOT OUT
01-2915MB	031601MB	Method Blank	89.8%	97.4%	0
01-2915LC	031601LC	Lab Control	102%	110%	0
01-2915LCD	CV13LCD	LCDuplicate	112%	119%	0
01-2915	CV13A	MW-7	101%	105%	0
01-2916	CV13B	MW-10	102%	110%	0
01-2917	CV13C	MW-12	102%	103%	0
01-2918	CV13D	MW-800	104%	110%	0
01-2919	CV13E	MW-11	100%	107%	0
01-2920MB	032001MB	Method Blank	96.7%	103%	0
01-2920LC	032001LC	Lab Control	105%	108%	0
01-2920	CV13F	MW-8	112%	114%	0

	MB/LCS QC LIMITS	SAMPLE QC LIMITS
(TFT) = Trifluorotoluene	(60.0-130)	(60.0-130)
(BB) = Bromobenzene	(60.0-130)	(60.0-130)

ADVISORY LIMITS

Column to be used to flag recovery values

* Values outside of required QC limits

D System Monitoring Compound diluted out

FORM-II TPHg

ANALYTICAL RESOURCES INCORPORATED

TOTAL GASOLINE RANGE HYDROCARBONS
NWTPHg - Toluene to Naphthalene

QC Report No: CV13-Kennedy Jenks Consultants
Matrix: Water
Project: Tacoma Metals
996098.00
Data Release Authorized: 3/21/01
Date Received: 03/07/01
Reported: 03/21/01

Lab ID	Client Sample ID	Date Analyzed	Dilution Factor	Gas Range	Gas ID	Surr A Rec	Surr B Rec
CV13-0316MB	Method Blank	03/16/01	1:1	0.25 U	NO	89.8%	97.4%
01-2915-CV13A	MW-7	03/16/01	1:1	0.25 U	NO	101%	105%
01-2916-CV13B	MW-10	03/16/01	1:1	0.39	NO	102%	110%
01-2917-CV13C	MW-12	03/17/01	1:1	0.25 U	NO	102%	103%
01-2918-CV13D	MW-800	03/17/01	1:10	39	NO	104%	110%
01-2919-CV13E	MW-11	03/17/01	1:5	2.5	NO	100%	107%
CV13-0320MB	Method Blank	03/20/01	1:1	0.25 U	NO	96.7%	103%
01-2920-CV13F	MW-8	03/20/01	1:10	38	NO	112%	114%

Surrogate A is Trifluorotoluene.
Surrogate B is Bromobenzene.

Values reported in ppm (mg/L).
Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

Data Qualifiers

U	Compound not detected at the given detection limit.
X	Value detected above linear range of instrument. Dilution required.
J	Indicates an estimated value below the calculated detection limit.
S	No value reported due to saturation of the detector. Dilution required.
D	Indicates the surrogate was not detected because of dilution of the extract.
NR	Indicates no recovery due to matrix interference.

FORM-1 TPH-g

TOTAL GASOLINE RANGE HYDROCARBONS
NWTPHg - Toluene to Naphthalene

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CV13SB
LIMS ID: 01-2915
Matrix: Water

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized: CH
Reported: 03/21/01 3/21/01

LABORATORY CONTROL SAMPLE RECOVERY REPORT
Analyzed 03/16/01

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% REC	RPD
LABORATORY CONTROL SAMPLE				
Gasoline Range Hydrocarbons	2.20	2.50	88.0%	
LCS DUPLICATE SAMPLE				
Gasoline Range Hydrocarbons	2.59	2.50	104%	16.7%

TPHg Surrogate Rec	LC	LCD
Trifluorotoluene	102%	112%
Bromobenzene	110%	119%

Values reported in parts per million (mg/L)

TPHg SPIKE CONTROL LIMITS

Percent Recovery 50-150%
Duplicate RPD <50%

Advisory QA Limits

ANALYTICAL RESOURCES INCORPORATED

TOTAL GASOLINE RANGE HYDROCARBONS
NWTPHg - Toluene to Naphthalene

Lab Sample ID: CV13SB
LIMS ID: 01-2920
Matrix: Water

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized: CK
Reported: 03/21/01 3/21/01

LABORATORY CONTROL SAMPLE RECOVERY REPORT
Analyzed 03/20/01

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
LABORATORY CONTROL SAMPLE			
Gasoline Range Hydrocarbons	2.58	2.50	103%

TPHg Surrogate Recovery

Trifluorotoluene	105%
Bromobenzene	108%

Values reported in parts per million (mg/L)

TPHg SPIKE CONTROL LIMITS

Percent Recovery	50-150%
Duplicate RPD	<50%

Advisory QA Limits

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL HYDROCARBONS COMPOUND SUMMARY

Matrix: Water

QC Report No: CV13

LIMS ID	Lab ID	Extracted	Client ID	MeArach	TOT OUT
01-2915MB	031201MB	03/09/01	Method Blank	92%	0
01-2915LC	031201LC	03/09/01	Lab Control	81%	0
01-2915LCD	031201LCD	03/09/01	Lab Control Dup	93%	0
01-2915	CV13A	03/09/01	MW-7	54%	0
01-2916	CV13B	03/09/01	MW-10	62%	0
01-2917	CV13C	03/09/01	MW-12	63%	0
01-2918	CV13D	03/09/01	MW-800	75%	0
01-2919	CV13E	03/09/01	MW-11	69%	0
01-2920	CV13F	03/09/01	MW-8	56%	0

	Control QC LIMITS	Sample QC LIMITS
(MeArach) = Methylarachidate	(65-118)	(54-133)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D System Monitoring Compound diluted out

FORM-II TPHD

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID
and Motor Oil

ANALYTICAL RESOURCES INCORPORATED

Lab ID: 01-2915
Matrix: Water

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 03/07/01

Data Release Authorized: C/A
Reported: 03/15/01 3/15/01

Lab ID	Sample ID	Date Extracted	Date Analyzed	Dilution Factor	Diesel Range	*HC ID	Motor Oil Range	Surr Rec
CV13MB	Method Blank	03/09/01	03/12/01	1:1	0.25 U	---	0.50 U	92.0%
CV13A	MW-7	03/09/01	03/12/01	1:1	0.33	NO	0.50 U	54.0%
CV13B	MW-10	03/09/01	03/13/01	1:1	1.1	NO	0.50 U	62.0%
CV13C	MW-12	03/09/01	03/12/01	1:1	1.0	NO	1.4	63.0%
CV13D	MW-800	03/09/01	03/13/01	1:1	3.7	NO	0.50 U	75.0%
CV13E	MW-11	03/09/01	03/13/01	1:1	3.1	NO	0.50 U	69.0%
CV13F	MW-8	03/09/01	03/13/01	1:1	3.8	NO	0.50 U	56.0%

Surrogate is Methyl-Arachidate.

* ID indicatea, in the opinion of the analyst, the petroleum product with the best pattern match. 'NO' indicates that there was not a good match for any of the requested products.
Values reported in ppm (mg/L)
Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.

Data Qualifiers

U Compound not detected at the given detection limit.
J Indicates an estimated value below the calculated detection limit.
S No value reported due to saturation of the detector. Dilution required.
D Indicates the surrogate was not detected because of dilution of the extract.
E Indicates a value above the linear range of the detector. Dilution required.
NR Indicates no recovery due to matrix interference.
B Indicates compound also detected in the method blank.

FORM-1 TPHD

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CV13SB
LIMS ID: 01-2915
Matrix: Water

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized: CH
Reported: 03/15/01 3/15/01

LABORATORY CONTROL SAMPLE RECOVERY REPORT
Extracted: 03/09/01
Analyzed: 03/12/01

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY	RPD
Diesel Range Hydrocarbons-LCS	2.41	2.50	96.4%	
Diesel Range Hydrocarbons-LCD	2.69	2.50	108%	11.4%

TPHd Surrogate Recovery

Methylarachidate-LCS 81.0%

Methylarachidate-LCD 93.0%

Values reported in parts per million (mg/L)

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: Method Blank**
TOTAL METALS

Lab Sample ID: CV13MB
LIMS ID: 01-2919
Matrix: Water

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized:
Reported: 03/14/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010	03/10/01	6010	03/13/01	7440-38-2	Arsenic	0.05	0.05 U
3010	03/10/01	6010	03/13/01	7440-39-3	Barium	0.003	0.003 U
3010	03/10/01	6010	03/13/01	7440-43-9	Cadmium	0.002	0.002 U
3010	03/10/01	6010	03/13/01	7440-70-2	Calcium	0.05	0.05 U
3010	03/10/01	6010	03/13/01	7440-47-3	Chromium	0.005	0.005 U
3010	03/10/01	6010	03/13/01	7440-50-8	Copper	0.002	0.002 U
3010	03/10/01	6010	03/13/01	7439-89-6	Iron	0.02	0.02 U
3010	03/10/01	6010	03/13/01	7439-92-1	Lead	0.02	0.02 U
3010	03/10/01	6010	03/13/01	7439-95-4	Magnesium	0.02	0.02 U
3010	03/10/01	6010	03/13/01	7439-96-5	Manganese	0.001	0.001 U
7470	03/10/01	7470	03/12/01	7439-97-6	Mercury	0.0001	0.0001 U
3010	03/10/01	6010	03/13/01	7440-09-7	Potassium	0.5	0.5 U
3010	03/10/01	6010	03/13/01	7782-49-2	Selenium	0.05	0.05 U
3010	03/10/01	6010	03/13/01	7440-22-4	Silver	0.003	0.003 U
3010	03/10/01	6010	03/13/01	7440-23-5	Sodium	0.05	0.05 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: MW-7**
TOTAL METALS

Lab Sample ID: CV13A
LIMS ID: 01-2915
Matrix: Water

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Data Release Authorized:
Reported: 03/14/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010	03/10/01	6010	03/13/01	7440-38-2	Arsenic	0.05	0.05 U
3010	03/10/01	6010	03/13/01	**7440-39-3**	**Barium**	0.003	**0.034**
3010	03/10/01	6010	03/13/01	7440-43-9	Cadmium	0.002	0.002 U
3010	03/10/01	6010	03/13/01	7440-47-3	Chromium	0.005	0.005 U
3010	03/10/01	6010	03/13/01	7440-50-8	Copper	0.002	0.002 U
3010	03/10/01	6010	03/13/01	7439-92-1	Lead	0.02	0.02 U
7470	03/10/01	7470	03/12/01	7439-97-6	Mercury	0.0001	0.0001 U
3010	03/10/01	6010	03/13/01	7782-49-2	Selenium	0.05	0.05 U
3010	03/10/01	6010	03/13/01	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: MW-10**
TOTAL METALS

Lab Sample ID: CV13B
LIMS ID: 01-2916
Matrix: Water

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Data Release Authorized:
Reported: 03/14/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010	03/10/01	6010	03/13/01	7440-38-2	Arsenic	0.05	0.05 U
3010	03/10/01	6010	03/13/01	**7440-39-3**	**Barium**	0.003	**0.009**
3010	03/10/01	6010	03/13/01	7440-43-9	Cadmium	0.002	0.002 U
3010	03/10/01	6010	03/13/01	7440-47-3	Chromium	0.005	0.005 U
3010	03/10/01	6010	03/13/01	**7440-50-8**	**Copper**	0.002	**0.004**
3010	03/10/01	6010	03/13/01	7439-92-1	Lead	0.02	0.02 U
7470	03/10/01	7470	03/12/01	7439-97-6	Mercury	0.0001	0.0001 U
3010	03/10/01	6010	03/13/01	7782-49-2	Selenium	0.05	0.05 U
3010	03/10/01	6010	03/13/01	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: MW-12**
TOTAL METALS

Lab Sample ID: CV13C
LIMS ID: 01-2917
Matrix: Water

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Data Release Authorized:
Reported: 03/14/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010	03/10/01	6010	03/13/01	7440-38-2	Arsenic	0.05	0.05 U
3010	03/10/01	6010	03/13/01	**7440-39-3**	**Barium**	0.003	**0.031**
3010	03/10/01	6010	03/13/01	7440-43-9	Cadmium	0.002	0.002 U
3010	03/10/01	6010	03/13/01	7440-47-3	Chromium	0.005	0.005 U
3010	03/10/01	6010	03/13/01	7440-50-8	Copper	0.002	0.002 U
3010	03/10/01	6010	03/13/01	7439-92-1	Lead	0.02	0.02 U
7470	03/10/01	7470	03/12/01	7439-97-6	Mercury	0.0001	0.0001 U
3010	03/10/01	6010	03/13/01	7782-49-2	Selenium	0.05	0.05 U
3010	03/10/01	6010	03/13/01	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: MW-800**
TOTAL METALS

Lab Sample ID: CV13D
LIMS ID: 01-2918
Matrix: Water

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Data Release Authorized
Reported: 03/14/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010	03/10/01	6010	03/13/01	7440-38-2	Arsenic	0.05	0.05 U
3010	03/10/01	6010	03/13/01	**7440-39-3**	**Barium**	0.003	**0.015**
3010	03/10/01	6010	03/13/01	7440-43-9	Cadmium	0.002	0.002 U
3010	03/10/01	6010	03/13/01	7440-47-3	Chromium	0.005	0.005 U
3010	03/10/01	6010	03/13/01	7440-50-8	Copper	0.002	0.002 U
3010	03/10/01	6010	03/13/01	7439-92-1	Lead	0.02	0.02 U
7470	03/10/01	7470	03/12/01	7439-97-6	Mercury	0.0001	0.0001 U
3010	03/10/01	6010	03/13/01	7782-49-2	Selenium	0.05	0.05 U
3010	03/10/01	6010	03/13/01	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: MW-11**
TOTAL METALS

Lab Sample ID: CV13E
LIMS ID: 01-2919
Matrix: Water

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Data Release Authorized:
Reported: 03/14/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010	03/10/01	6010	03/13/01	7440-38-2	Arsenic	0.05	0.05 U
3010	03/10/01	6010	03/13/01	**7440-39-3**	**Barium**	0.003	**0.008**
3010	03/10/01	6010	03/13/01	7440-43-9	Cadmium	0.002	0.002 U
3010	03/10/01	6010	03/13/01	**7440-70-2**	**Calcium**	0.05	**22.4**
3010	03/10/01	6010	03/13/01	7440-47-3	Chromium	0.005	0.005 U
3010	03/10/01	6010	03/13/01	7440-50-8	Copper	0.002	0.002 U
3010	03/10/01	6010	03/13/01	**7439-89-6**	**Iron**	0.02	**6.16**
3010	03/10/01	6010	03/13/01	7439-92-1	Lead	0.02	0.02 U
3010	03/10/01	6010	03/13/01	**7439-95-4**	**Magnesium**	0.02	**8.70**
3010	03/10/01	6010	03/13/01	**7439-96-5**	**Manganese**	0.001	**0.557**
7470	03/10/01	7470	03/12/01	7439-97-6	Mercury	0.0001	0.0001 U
3010	03/10/01	6010	03/13/01	**7440-09-7**	**Potassium**	0.5	**2.9**
3010	03/10/01	6010	03/13/01	7782-49-2	Selenium	0.05	0.05 U
3010	03/10/01	6010	03/13/01	7440-22-4	Silver	0.003	0.003 U
3010	03/10/01	6010	03/13/01	**7440-23-5**	**Sodium**	0.05	**13.1**

Calculated Hardness (mg-CaCO3/L): 92

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: MW-8**
TOTAL METALS

Lab Sample ID: CV13F
LIMS ID: 01-2920
Matrix: Water

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Data Release Authorized:
Reported: 03/14/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010	03/10/01	6010	03/13/01	7440-38-2	Arsenic	0.05	0.05 U
3010	03/10/01	6010	03/13/01	**7440-39-3**	**Barium**	0.003	**0.014**
3010	03/10/01	6010	03/13/01	7440-43-9	Cadmium	0.002	0.002 U
3010	03/10/01	6010	03/13/01	**7440-70-2**	**Calcium**	0.05	**10.5**
3010	03/10/01	6010	03/13/01	7440-47-3	Chromium	0.005	0.005 U
3010	03/10/01	6010	03/13/01	7440-50-8	Copper	0.002	0.002 U
3010	03/10/01	6010	03/13/01	**7439-89-6**	**Iron**	0.02	**28.4**
3010	03/10/01	6010	03/13/01	7439-92-1	Lead	0.02	0.02 U
3010	03/10/01	6010	03/13/01	**7439-95-4**	**Magnesium**	0.02	**15.0**
3010	03/10/01	6010	03/13/01	**7439-96-5**	**Manganese**	0.001	**0.393**
7470	03/10/01	7470	03/12/01	7439-97-6	Mercury	0.0001	0.0001 U
3010	03/10/01	6010	03/13/01	**7440-09-7**	**Potassium**	0.5	**9.4**
3010	03/10/01	6010	03/13/01	7782-49-2	Selenium	0.05	0.05 U
3010	03/10/01	6010	03/13/01	7440-22-4	Silver	0.003	0.003 U
3010	03/10/01	6010	03/13/01	**7440-23-5**	**Sodium**	0.05	**14.5**

Calculated Hardness (mg-CaCO3/L): 88

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET **Sample No: Method Blank**
DISSOLVED METALS

Lab Sample ID: CV13MB
LIMS ID: 01-2925
Matrix: Water

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized:
Reported: 03/14/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
6010	03/09/01	6010	03/12/01	7440-38-2	Arsenic	0.05	0.05 U
6010	03/09/01	6010	03/12/01	7440-39-3	Barium	0.003	0.003 U
6010	03/09/01	6010	03/12/01	7440-43-9	Cadmium	0.002	0.002 U
6010	03/09/01	6010	03/12/01	7440-70-2	Calcium	0.05	0.05 U
6010	03/09/01	6010	03/12/01	7440-47-3	Chromium	0.005	0.005 U
6010	03/09/01	6010	03/12/01	7440-50-8	Copper	0.002	0.002 U
6010	03/09/01	6010	03/12/01	7439-89-6	Iron	0.02	0.02 U
6010	03/09/01	6010	03/12/01	7439-92-1	Lead	0.02	0.02 U
6010	03/09/01	6010	03/12/01	7439-95-4	Magnesium	0.02	0.02 U
6010	03/09/01	6010	03/12/01	7439-96-5	Manganese	0.001	0.001 U
7470	03/09/01	7470	03/12/01	7439-97-6	Mercury	0.0001	0.0001 U
6010	03/09/01	6010	03/12/01	7440-09-7	Potassium	0.5	0.5 U
6010	03/09/01	6010	03/12/01	7782-49-2	Selenium	0.05	0.05 U
6010	03/09/01	6010	03/12/01	7440-22-4	Silver	0.003	0.003 U
6010	03/09/01	6010	03/12/01	7440-23-5	Sodium	0.05	0.05 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET **Sample No: MW-7 (D)**
DISSOLVED METALS

Lab Sample ID: CV13G
LIMS ID: 01-2921
Matrix: Water

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Data Release Authorized:
Reported: 03/14/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
6010	03/09/01	6010	03/12/01	7440-38-2	Arsenic	0.05	0.05 U
6010	03/09/01	6010	03/12/01	**7440-39-3**	**Barium**	0.003	**0.034**
6010	03/09/01	6010	03/12/01	7440-43-9	Cadmium	0.002	0.002 U
6010	03/09/01	6010	03/12/01	7440-47-3	Chromium	0.005	0.005 U
6010	03/09/01	6010	03/12/01	7440-50-8	Copper	0.002	0.002 U
6010	03/09/01	6010	03/12/01	7439-92-1	Lead	0.02	0.02 U
7470	03/09/01	7470	03/12/01	7439-97-6	Mercury	0.0001	0.0001 U
6010	03/09/01	6010	03/12/01	7782-49-2	Selenium	0.05	0.05 U
6010	03/09/01	6010	03/12/01	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET **Sample No: MW-10 (D)**
DISSOLVED METALS

Lab Sample ID: CV13H
LIMS ID: 01-2922
Matrix: Water

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Data Release Authorized:
Reported: 03/14/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
6010	03/09/01	6010	03/12/01	7440-38-2	Arsenic	0.05	0.05 U
6010	03/09/01	6010	03/12/01	**7440-39-3**	**Barium**	0.003	**0.011**
6010	03/09/01	6010	03/12/01	7440-43-9	Cadmium	0.002	0.002 U
6010	03/09/01	6010	03/12/01	7440-47-3	Chromium	0.005	0.005 U
6010	03/09/01	6010	03/12/01	7440-50-8	Copper	0.002	0.002 U
6010	03/09/01	6010	03/12/01	7439-92-1	Lead	0.02	0.02 U
7470	03/09/01	7470	03/12/01	7439-97-6	Mercury	0.0001	0.0001 U
6010	03/09/01	6010	03/12/01	7782-49-2	Selenium	0.05	0.05 U
6010	03/09/01	6010	03/12/01	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET **Sample No: MW-12 (D)**
DISSOLVED METALS

Lab Sample ID: CV13I
LIMS ID: 01-2923
Matrix: Water

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Data Release Authorized:
Reported: 03/14/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
6010	03/09/01	6010	03/12/01	7440-38-2	Arsenic	0.05	0.05 U
6010	03/09/01	6010	03/12/01	7440-39-3	Barium	0.003	0.033
6010	03/09/01	6010	03/12/01	7440-43-9	Cadmium	0.002	0.002 U
6010	03/09/01	6010	03/12/01	7440-47-3	Chromium	0.005	0.005 U
6010	03/09/01	6010	03/12/01	7440-50-8	Copper	0.002	0.002 U
6010	03/09/01	6010	03/12/01	7439-92-1	Lead	0.02	0.02 U
7470	03/09/01	7470	03/12/01	7439-97-6	Mercury	0.0001	0.0001 U
6010	03/09/01	6010	03/12/01	7782-49-2	Selenium	0.05	0.05 U
6010	03/09/01	6010	03/12/01	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET **Sample No: MW-800 (D)**
DISSOLVED METALS

Lab Sample ID: CV13J
LIMS ID: 01-2924
Matrix: Water

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Data Release Authorized
Reported: 03/14/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
6010	03/09/01	6010	03/12/01	7440-38-2	Arsenic	0.05	0.05 U
6010	03/09/01	6010	03/12/01	**7440-39-3**	**Barium**	0.003	**0.019**
6010	03/09/01	6010	03/12/01	7440-43-9	Cadmium	0.002	0.002 U
6010	03/09/01	6010	03/12/01	7440-47-3	Chromium	0.005	0.005 U
6010	03/09/01	6010	03/12/01	7440-50-8	Copper	0.002	0.002 U
6010	03/09/01	6010	03/12/01	7439-92-1	Lead	0.02	0.02 U
7470	03/09/01	7470	03/12/01	7439-97-6	Mercury	0.0001	0.0001 U
6010	03/09/01	6010	03/12/01	7782-49-2	Selenium	0.05	0.05 U
6010	03/09/01	6010	03/12/01	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET **Sample No: MW-11 (D)**
DISSOLVED METALS

Lab Sample ID: CV13K
LIMS ID: 01-2925
Matrix: Water

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Data Release Authorized:
Reported: 03/14/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	
6010	03/09/01	6010	03/12/01	7440-38-2	Arsenic	0.05	0.05	U
6010	03/09/01	6010	03/12/01	**7440-39-3**	**Barium**	0.003	**0.009**	
6010	03/09/01	6010	03/12/01	7440-43-9	Cadmium	0.002	0.002	U
6010	03/09/01	6010	03/12/01	**7440-70-2**	**Calcium**	0.05	**24.4**	
6010	03/09/01	6010	03/12/01	7440-47-3	Chromium	0.005	0.005	U
6010	03/09/01	6010	03/12/01	7440-50-8	Copper	0.002	0.002	U
6010	03/09/01	6010	03/12/01	**7439-89-6**	**Iron**	0.02	**6.40**	
6010	03/09/01	6010	03/12/01	7439-92-1	Lead	0.02	0.02	U
6010	03/09/01	6010	03/12/01	**7439-95-4**	**Magnesium**	0.02	**9.23**	
6010	03/09/01	6010	03/12/01	**7439-96-5**	**Manganese**	0.001	**0.585**	
7470	03/09/01	7470	03/12/01	7439-97-6	Mercury	0.0001	0.0001	U
6010	03/09/01	6010	03/12/01	**7440-09-7**	**Potassium**	0.5	**3.2**	
6010	03/09/01	6010	03/12/01	7782-49-2	Selenium	0.05	0.05	U
6010	03/09/01	6010	03/12/01	7440-22-4	Silver	0.003	0.003	U
6010	03/09/01	6010	03/12/01	**7440-23-5**	**Sodium**	0.05	**13.4**	

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET **Sample No:** **MW-8 (D)**
DISSOLVED METALS

Lab Sample ID: CV13L
LIMS ID: 01-2926
Matrix: Water

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Data Release Authorized:
Reported: 03/14/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
6010	03/09/01	6010	03/12/01	7440-38-2	Arsenic	0.05	0.05 U
6010	03/09/01	6010	03/12/01	**7440-39-3**	**Barium**	0.003	**0.019**
6010	03/09/01	6010	03/12/01	7440-43-9	Cadmium	0.002	0.002 U
6010	03/09/01	6010	03/12/01	**7440-70-2**	**Calcium**	0.05	**14.1**
6010	03/09/01	6010	03/12/01	7440-47-3	Chromium	0.005	0.005 U
6010	03/09/01	6010	03/12/01	7440-50-8	Copper	0.002	0.002 U
6010	03/09/01	6010	03/12/01	**7439-89-6**	**Iron**	0.02	**37.2**
6010	03/09/01	6010	03/12/01	7439-92-1	Lead	0.02	0.02 U
6010	03/09/01	6010	03/12/01	**7439-95-4**	**Magnesium**	0.02	**19.8**
6010	03/09/01	6010	03/12/01	**7439-96-5**	**Manganese**	0.001	**0.514**
7470	03/09/01	7470	03/12/01	7439-97-6	Mercury	0.0001	0.0001 U
6010	03/09/01	6010	03/12/01	**7440-09-7**	**Potassium**	0.5	**12.4**
6010	03/09/01	6010	03/12/01	7782-49-2	Selenium	0.05	0.05 U
6010	03/09/01	6010	03/12/01	7440-22-4	Silver	0.003	0.003 U
6010	03/09/01	6010	03/12/01	**7440-23-5**	**Sodium**	0.05	**18.3**

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CV13LCS
LIMS ID: 01-2919
Matrix: Water

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 03/14/01

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Spike mg/L	Spike Added	% Recovery	Q
Arsenic	1.83	2.00	91.5%	
Barium	1.90	2.00	95.0%	
Cadmium	0.446	0.500	89.2%	
Calcium	9.19	10.0	91.9%	
Chromium	0.461	0.500	92.2%	
Copper	0.494	0.500	98.8%	
Iron	1.85	2.00	92.5%	
Lead	1.81	2.00	90.5%	
Magnesium	9.45	10.0	94.5%	
Manganese	0.457	0.500	91.4%	
Mercury	0.0022	0.0020	110%	
Potassium	9.5	10.0	95.0%	
Selenium	1.88	2.00	94.0%	
Silver	0.459	0.500	91.8%	
Sodium	9.51	10.0	95.1%	

'Q' codes: N = control limit not met

Control Limits: 80-120%

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CV13LCS
LIMS ID: 01-2925
Matrix: Water

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized
Reported: 03/14/01

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Spike mg/L	Spike Added	% Recovery	Q
Arsenic	2.11	2.00	106%	
Barium	2.01	2.00	100%	
Cadmium	0.539	0.500	108%	
Calcium	10.6	10.0	106%	
Chromium	0.515	0.500	103%	
Copper	0.527	0.500	105%	
Iron	2.05	2.00	102%	
Lead	2.11	2.00	106%	
Magnesium	10.5	10.0	105%	
Manganese	0.506	0.500	101%	
Mercury	0.0020	0.0020	100%	
Potassium	10.5	10.0	105%	
Selenium	2.13	2.00	106%	
Silver	0.496	0.500	99.2%	
Sodium	9.99	10.0	99.9%	

'Q' codes: N = control limit not met
NA = Not applicable - analyte not spiked

Control Limits: 80-120%

FORM-VII

ANALYTICAL RESOURCES INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: MW-11

Lab Sample ID: CV13E
LIMS ID: 01-2919
Matrix: Water

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Data Release Authorized:
Reported: 03/22/01 Jake Perrins

Analyte	Analysis Date & Batch	Method	RL	Units	Result
pH	03/07/01 03071#1	EPA 150.1	0.05	std units	6.19
Conductivity	03/08/01 03081#1	EPA 120.1	1.0	umhos/cm	260
Total Dissolved Solids	03/12/01 03121#1	EPA 160.1	2.5	mg/L	180
Sulfate	03/12/01 03121#3	EPA 375.2	2.5	mg/L	18

RL Analytical reporting limit
U Undetected at reported detection limit

Report for CV13 received 03/07/01

ANALYTICAL RESOURCES INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: MW-8

Lab Sample ID: CV13F
LIMS ID: 01-2920
Matrix: Water

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/06/01
Date Received: 03/07/01

Data Release Authorized:
Reported: 03/22/01 Jake Perrins

Analyte	Analysis Date & Batch	Method	RL	Units	Result
pH	03/07/01 03071#1	EPA 150.1	0.05	std units	6.31
Conductivity	03/08/01 03081#1	EPA 120.1	1.0	umhos/cm	340
Total Dissolved Solids	03/12/01 03121#1	EPA 160.1	2.5	mg/L	280
Sulfate	03/12/01 03121#3	EPA 375.2	2.5	mg/L	52

RL Analytical reporting limit
U Undetected at reported detection limit

Report for CV13 received 03/07/01

ANALYTICAL RESOURCES INCORPORATED

QA Report - Method Blank Analysis

QC Report No: CV13-Kennedy Jenks Consultants
Matrix: Water
Project: Tacoma Metals
996098.00
Date Received: NA

Data Release Authorized:
Reported: 03/22/01 Jake Perrins

METHOD BLANK RESULTS
CONVENTIONALS

Analysis Date & Batch	Constituent	Units		Result	
03/08/01 03081#1	Conductivity	umhos/cm	<	1.0	U
03/12/01 03121#1	Total Dissolved Solids	mg/L	<	5.0	U
03/12/01 03121#3	Sulfate	mg/L	<	2.5	U

ANALYTICAL RESOURCES INCORPORATED

QA Report - Laboratory Control Samples

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: NA

Data Release Authorized:
Reported: 03/22/01 Jake Perrins

LABORATORY CONTROL SAMPLES
CONVENTIONALS

Constituent	Units	Measured Value	True Value	Recovery
pH Calibration Standard				
pH	std units	7.02	7.00	100%

Date analyzed: 03/07/01 Batch ID: 03071#1

ANALYTICAL RESOURCES INCORPORATED

QA Report - Standard Reference Material Analysis

QC Report No: CV13-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: NA

Data Release Authorized:
Reported: 03/22/01 Jake Perrins

STANDARD REFERENCE MATERIAL ANALYSIS
CONVENTIONALS

Constituent	Units	Value	True Value	Recovery
VWR#2377				
Conductivity	umhos/cm	1,020	997	102%
Date analyzed: 03/08/01 Batch ID: 03081#1				
SPEX# 18-88				
Sulfate	mg/L	25.3	25.0	101%
Date analyzed: 03/12/01 Batch ID: 03121#3				

ANALYTICAL RESOURCES INCORPORATED

QA Report - Replicate Analysis

QC Report No: CV13-Kennedy Jenks Consultants
Matrix: Water
Project: Tacoma Metals
996098.00
Date Received: 03/07/01

Data Release Authorized:
Reported: 03/22/01 Jake Perrins

DUPLICATE ANALYSIS RESULTS
CONVENTIONALS

Constituent	Units	Sample Value	Duplicate Value	RPD
ARI ID: 01-2919, CV13 E	**Client Sample ID: MW-11**			
pH	std units	6.19	6.23	0.0%

Analytical Resources, Incorporated
Analytical Chemists and Consultants

3, May, 2001

Dean Malte
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: Project: Tacoma Metals / ARI Job: DA85

Dear Dean:

Please find enclosed sample custody records and final analytical results for the above referenced project. Three water samples were received in good condition on April 27, 2001 with no discrepancies between the COC and sample containers. The cooler temperature was 4.0 °C. The samples were analyzed for PAH referencing GC/MS-SIM.

Sample MW-11 required a 50x dilution due to the high level of target analytes. Sample MW-10 required a 10x dilution and sample MW-8 required a 20x dilution and a 1000x dilution to bring all analytes into the linear range of the curve.

No other analytical complications were noted. Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,
Analytical Resources, Inc.

Susan Snyder
Project Manager
206-389-6167

RECEIVED
MAY - 7 2001
K/J Federal Way
K/J No/File
Route
Return To/By

333 Ninth Avenue North • Seattle WA 98109-5187 • **206-621-6490** • **206-621-7523** fax

01-6723 01-6728 #4.0 DA85

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
400 Ninth Avenue North
Seattle, WA 98109-4708
206-621-6490 206-621-7523 (fax)

Page 1 of 1

Turn Around Requested: STD

Report to: DEAN MAUTE
Company: Kennedy Jenks
Address: 5305 S. 33th ST
Federal Way WA 98003
Phone: 253 874-0555
Fax: 253 952-3435

Proj Name: TACOMA METALS
Proj Number: 9960098.00
Sampler:
Shipping Method: Courier
AirBill:

Sample ID	Sample Date	Sample Time	Sample Matrix	No Containers	PAHs (SIM)										Notes/Comments
MW-11	4/26/01	2:50	WATER	1	X										
MW-10		3:25		1	X										please send back supply of ice packs
MW-8		4:10		1	X										

Relinquished (Signature)	Relinquished: (Signature)	Relinquished: (Signature)	Special Instructions/Notes
Printed name: JODIE BRUNDAGE	Printed name:	Printed name:	
Company: Kennedy Jenks	Company:	Company:	
Date: 4/27/01 Time: 9:00	Date: Time:	Date: Time:	
Received by	Received by:	Received by:	
Printed name: Deborah Johnson	Printed name:	Printed name:	
Company: ARI	Company:	Company:	Number of Coolers: 1
Date: 4/27/01 Time: 10:15	Date: Time:	Date: Time:	Cooler Temp(s):
			COC Seals Intact?
			Bottles Intact?

ANALYTICAL RESOURCES INCORPORATED

SIM SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: DA85-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Client ID	MNP	DBA	TOT OUT
Method Blank	75%	89%	0
Lab Control	71%	87%	0
MW-11	77%	96%	0
MW-11-DL	85%	87%	0
MW-10	68%	97%	0
MW-10-DL	63%	53%	0
MW-8	57%	86%	0
MW-8-DL	87%	59%	0

	LCS/MB LIMITS	QC LIMITS
(MNP) = d10-2-Methylnaphthalene	(30-160)	(30-160)
(DBA) = d14-Dibenz(a,h)anthracene	(30-160)	(30-160)

(Present limits for LCS/MB are advisory only)

D Surrogate Compound diluted out

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: Method Blank**
PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: DA85MB
LIMS ID: 01-6723
Matrix: Water
Data Release Authorized: MW
Reported: 05/03/01

QC Report No: DA85-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Date extracted: 04/30/01
Date analyzed: 05/01/01 17:20
Instrument: NT1

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	0.10 U
91-57-6	2-Methylnaphthalene	0.10 U
208-96-8	Acenaphthylene	0.10 U
83-32-9	Acenaphthene	0.10 U
86-73-7	Fluorene	0.10 U
85-01-8	Phenanthrene	0.10 U
120-12-7	Anthracene	0.10 U
206-44-0	Fluoranthene	0.10 U
129-00-0	Pyrene	0.10 U
56-55-3	Benzo(a)anthracene	0.10 U
218-01-9	Chrysene	0.10 U
205-99-2	Benzo(b)fluoranthene	0.10 U
207-08-9	Benzo(k)fluoranthene	0.10 U
50-32-8	Benzo(a)pyrene	0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10 U
132-64-9	Dibenzofuran	0.10 U

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	74.7%
d14-Dibenzo(a,h)anthracene	89.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: MW-11**
PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: DA85A
LIMS ID: 01-6723
Matrix: Water
Data Release Authorized: MV
Reported: 05/03/01

QC Report No: DA85-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 04/26/01
Date Received: 04/27/01

Date extracted: 04/30/01
Date analyzed: 05/01/01 18:09
Instrument: NT1

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	81 E
91-57-6	2-Methylnaphthalene	15 E
208-96-8	Acenaphthylene	2.5
83-32-9	Acenaphthene	92 E
86-73-7	Fluorene	81 E
85-01-8	Phenanthrene	110 E
120-12-7	Anthracene	30 E
206-44-0	Fluoranthene	41 E
129-00-0	Pyrene	32 E
56-55-3	Benzo(a)anthracene	8.3
218-01-9	Chrysene	7.6
205-99-2	Benzo(b)fluoranthene	3.8
207-08-9	Benzo(k)fluoranthene	4.7
50-32-8	Benzo(a)pyrene	4.5
193-39-5	Indeno(1,2,3-cd)pyrene	2.2
53-70-3	Dibenz(a,h)anthracene	0.77
191-24-2	Benzo(g,h,i)perylene	2.5
132-64-9	Dibenzofuran	56 E

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	77.3%
d14-Dibenzo(a,h)anthracene	96.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: MW-11**
PNAs by Selected Ion Monitoring GC/MS **DILUTION**

Lab Sample ID: DA85A-DL
LIMS ID: 01-6723
Matrix: Water
Data Release Authorized: MW
Reported: 05/03/01

QC Report No: DA85-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 04/26/01
Date Received: 04/27/01

Date extracted: 04/30/01
Date analyzed: 05/01/01 18:59
Instrument: NT1

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:50

CAS Number	Analyte	ug/L
91-20-3	**Naphthalene**	190
91-57-6	**2-Methylnaphthalene**	14
208-96-8	Acenaphthylene	5.0 U
83-32-9	**Acenaphthene**	220
86-73-7	**Fluorene**	160
85-01-8	**Phenanthrene**	210
120-12-7	**Anthracene**	38
206-44-0	**Fluoranthene**	52
129-00-0	**Pyrene**	40
56-55-3	**Benzo(a)anthracene**	8.5
218-01-9	**Chrysene**	8.5
205-99-2	Benzo(b)fluoranthene	5.0 U
207-08-9	Benzo(k)fluoranthene	5.0 U
50-32-8	Benzo(a)pyrene	5.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	5.0 U
53-70-3	Dibenz(a,h)anthracene	5.0 U
191-24-2	Benzo(g,h,i)perylene	5.0 U
132-64-9	**Dibenzofuran**	110

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	85.0%
d14-Dibenzo(a,h)anthracene	86.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: MW-10**
PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: DA85B
LIMS ID: 01-6724
Matrix: Water
Data Release Authorized: MW
Reported: 05/03/01

QC Report No: DA85-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 04/26/01
Date Received: 04/27/01

Date extracted: 04/30/01
Date analyzed: 05/01/01 19:23
Instrument: NT1

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	17 E
91-57-6	2-Methylnaphthalene	2.5
208-96-8	Acenaphthylene	0.48
83-32-9	Acenaphthene	44 E
86-73-7	Fluorene	29 E
85-01-8	Phenanthrene	38 E
120-12-7	Anthracene	6.4
206-44-0	Fluoranthene	8.5
129-00-0	Pyrene	6.3
56-55-3	Benzo(a)anthracene	0.93
218-01-9	Chrysene	0.86
205-99-2	Benzo(b)fluoranthene	0.38
207-08-9	Benzo(k)fluoranthene	0.53
50-32-8	Benzo(a)pyrene	0.46
193-39-5	Indeno(1,2,3-cd)pyrene	0.22
53-70-3	Dibenz(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.23
132-64-9	Dibenzofuran	24 E

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	67.7%
d14-Dibenzo(a,h)anthracene	97.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: MW-10**
PNAs by Selected Ion Monitoring GC/MS **DILUTION**

Lab Sample ID: DA85B-DL
LIMS ID: 01-6724
Matrix: Water
Data Release Authorized: MW
Reported: 05/03/01

QC Report No: DA85-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 04/26/01
Date Received: 04/27/01

Date extracted: 04/30/01
Date analyzed: 05/02/01 11:11
Instrument: NT1

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:10

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	16
91-57-6	2-Methylnaphthalene	2.1
208-96-8	Acenaphthylene	1.0 U
83-32-9	Acenaphthene	50
86-73-7	Fluorene	29
85-01-8	Phenanthrene	42
120-12-7	Anthracene	5.4
206-44-0	Fluoranthene	7.8
129-00-0	Pyrene	5.5
56-55-3	Benzo(a)anthracene	1.0 U
218-01-9	Chrysene	1.0 U
205-99-2	Benzo(b)fluoranthene	1.0 U
207-08-9	Benzo(k)fluoranthene	1.0 U
50-32-8	Benzo(a)pyrene	1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0 U
132-64-9	Dibenzofuran	22

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	63.3%
d14-Dibenzo(a,h)anthracene	53.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: MW-8**
PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: DA85C
LIMS ID: 01-6725
Matrix: Water
Data Release Authorized:
Reported: 05/03/01

QC Report No: DA85-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 04/26/01
Date Received: 04/27/01

Date extracted: 04/30/01
Date analyzed: 05/01/01 19:48
Instrument: NT1

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	460 E
91-57-6	2-Methylnaphthalene	210 E
208-96-8	Acenaphthylene	3.6
83-32-9	Acenaphthene	79 E
86-73-7	Fluorene	46 E
85-01-8	Phenanthrene	39 E
120-12-7	Anthracene	5.3
206-44-0	Fluoranthene	4.4
129-00-0	Pyrene	2.6
56-55-3	Benzo(a)anthracene	0.32
218-01-9	Chrysene	0.31
205-99-2	Benzo(b)fluoranthene	0.20
207-08-9	Benzo(k)fluoranthene	0.17
50-32-8	Benzo(a)pyrene	0.18
193-39-5	Indeno(1,2,3-cd)pyrene	0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10 U
132-64-9	Dibenzofuran	49 E

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	56.7%
d14-Dibenzo(a,h)anthracene	85.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: MW-8**
PNAs by Selected Ion Monitoring GC/MS **DILUTION**

Lab Sample ID: DA85C-DL
LIMS ID: 01-6725
Matrix: Water
Data Release Authorized:
Reported: 05/03/01

QC Report No: DA85-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 04/26/01
Date Received: 04/27/01

Date extracted: 04/30/01
Date analyzed: 05/02/01 11:38
Instrument: NT1

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:20

CAS Number	Analyte	ug/L
91-20-3	**Naphthalene**	**2,700 E**
91-57-6	**2-Methylnaphthalene**	**700 E**
208-96-8	**Acenaphthylene**	**4.2**
83-32-9	**Acenaphthene**	**160**
86-73-7	**Fluorene**	**71**
85-01-8	**Phenanthrene**	**54**
120-12-7	**Anthracene**	**5.8**
206-44-0	**Fluoranthene**	**4.8**
129-00-0	**Pyrene**	**2.6**
56-55-3	Benzo(a)anthracene	2.0 U
218-01-9	Chrysene	2.0 U
205-99-2	Benzo(b)fluoranthene	2.0 U
207-08-9	Benzo(k)fluoranthene	2.0 U
50-32-8	Benzo(a)pyrene	2.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	2.0 U
53-70-3	Dibenz(a,h)anthracene	2.0 U
191-24-2	Benzo(g,h,i)perylene	2.0 U
132-64-9	**Dibenzofuran**	**83**

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	86.7%
d14-Dibenzo(a,h)anthracene	59.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: MW-8
DILUTION-2

Lab Sample ID: DA85CDL-2
LIMS ID: 01-6725
Matrix: Water
Data Release Authorized: MW
Reported: 05/03/01

QC Report No: DA85-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 04/26/01
Date Received: 04/27/01

Date extracted: 04/30/01
Date analyzed: 05/02/01 12:02
Instrument: NT1

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1000

CAS Number	Analyte	ug/L
91-20-3	**Naphthalene**	**5,900**
91-57-6	**2-Methylnaphthalene**	**700**
208-96-8	Acenaphthylene	100 U
83-32-9	**Acenaphthene**	**150**
86-73-7	Fluorene	100 U
85-01-8	Phenanthrene	100 U
120-12-7	Anthracene	100 U
206-44-0	Fluoranthene	100 U
129-00-0	Pyrene	100 U
56-55-3	Benzo(a)anthracene	100 U
218-01-9	Chrysene	100 U
205-99-2	Benzo(b)fluoranthene	100 U
207-08-9	Benzo(k)fluoranthene	100 U
50-32-8	Benzo(a)pyrene	100 U
193-39-5	Indeno(1,2,3-cd)pyrene	100 U
53-70-3	Dibenz(a,h)anthracene	100 U
191-24-2	Benzo(g,h,i)perylene	100 U
132-64-9	Dibenzofuran	100 U

Base/Neutral Surrogate Recovery	
d10-Fluoranthene	D
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracene	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNA's by Selected Ion Monitoring GC/MS

Lab Sample ID: DA85LC
LIMS ID: 01-6723
Matrix: Water

QC Report No: DA85-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 05/03/01

LABORATORY CONTROL SAMPLE
Extracted: 04/30/01
Analyzed: 05/01/01

CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
Phenanthrene	2.35	3.00	78.3%
Chrysene	2.38	3.00	79.3%
Benzo(k)fluoranthene	2.38	3.00	79.3%

Values reported in ug/L

Spike Blank Surrogate Recovery

d10-2-Methylnaphthalene	71.3%
d14-Dibenzo(a,h)anthracene	87.0%

Analytical Resources, Incorporated
Analytical Chemists and Consultants

23, May, 2001

Dean Malte
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: Project: Tacoma Metals / ARI Job: DC73

Dear Dean:

Please find enclosed sample custody records and final analytical results for the above referenced project. Three water samples were received in good condition on May 15, 2001 with no discrepancies between the COC and sample containers. The cooler temperature was 3.1 °C. The samples were analyzed for PAH referencing GC/MS-SIM.

Sample MW-10 required a 3x dilution and sample MW-8 required a 10x dilution and a 500x dilution to bring all analytes into the linear range of the curve.

No other analytical complications were noted. Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,
Analytical Resources, Inc.

Susan Snyder
Project Manager
206-389-6167

RECEIVED
MAY 24 2001
K/J Federal Way
K/J No/File
Route
Return To/By

333 Ninth Avenue North • Seattle WA 98109-5187 • **206-621-6490** • **206-621-7523** fax

DC73 3.1 01-78 01-78

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
400 Ninth Avenue North
Seattle, WA 98109-4708
206-621-6490 206-621-7523 (fax)

Page 1 of 1

Turn Around Requested: STD

Report to: DEAN MALTE	Proj Name: TACOMA METALS
Company: Kennedy Jenks	Proj Number: 9960098.00
Address: 530 S. 336th ST Federal Way, WA 98003	Sampler:
Phone: 253 874-0535	Shipping Method: Courier
Fax: 253 952 3435	AirBill:

Sample ID	Sample Date	Sample Time	Sample Matrix	No Containers	PAHs (SIM)	Notes/Comments
MW-8	5/14/01	2:20	WATER	1	X	ALL SAMPLES WERE FIELD FILTERED
MW-10		1:40		1	X	
MW-11		4:00		1	X	

Relinquished: (Signature)	Relinquished: (Signature)	Relinquished: (Signature)	Special Instructions/Notes
Printed name: JODIE Brundage	Printed name:	Printed name:	Please send back ice packs
Company: Kennedy Jenks	Company:	Company:	
Date: 5/15/01 Time: 9:00	Date: Time:	Date: Time:	
Received by: Deborah Johnson	Received by:	Received by:	
Printed name: Deborah Johnson	Printed name:	Printed name:	
Company: ARI	Company:	Company:	Number of Coolers: 1
Date: 5/15/01 Time: 9:00	Date: Time:	Date: Time:	Cooler Temp(s):
			COC Seals Intact?
			Bottles Intact?

ANALYTICAL RESOURCES INCORPORATED

SIM SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: DC73-Kennedy Jenks Consultants
Project: TACOMA METALS
996098.00

Client ID	MNP	DBA	TOT OUT
Method Blank	59%	57%	0
Lab Control	78%	81%	0
MW-8	60%	86%	0
MW-8-DL	D	D	0
MW-10	77%	92%	0
MW-10-DL	62%	71%	0
MW-11	71%	80%	0

	LCS/MB LIMITS	QC LIMITS
(MNP) = d10-2-Methylnaphthalene	(30-160)	(30-160)
(DBA) = d14-Dibenz(a,h)anthracene	(30-160)	(30-160)

(Present limits for LCS/MB are advisory only)

D Surrogate Compound diluted out

FORM-II 8270-SIM

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: Method Blank**
PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: DC73MB
LIMS ID: 01-7853
Matrix: Water
Data Release Authorized:
Reported: 05/22/01

QC Report No: DC73-Kennedy Jenks Consultants
Project: TACOMA METALS
996098.00
Date Sampled: NA
Date Received: NA

Date extracted: 05/16/01
Date analyzed: 05/17/01 21:05
Instrument: NT1

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	0.10 U
91-57-6	2-Methylnaphthalene	0.10 U
208-96-8	Acenaphthylene	0.10 U
83-32-9	Acenaphthene	0.10 U
86-73-7	Fluorene	0.10 U
85-01-8	Phenanthrene	0.10 U
120-12-7	Anthracene	0.10 U
206-44-0	Fluoranthene	0.10 U
129-00-0	Pyrene	0.10 U
56-55-3	Benzo(a)anthracene	0.10 U
218-01-9	Chrysene	0.10 U
205-99-2	Benzo(b)fluoranthene	0.10 U
207-08-9	Benzo(k)fluoranthene	0.10 U
50-32-8	Benzo(a)pyrene	0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10 U
132-64-9	Dibenzofuran	0.10 U

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	58.7%
d14-Dibenzo(a,h)anthracene	57.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: MW-8**

PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: DC73A
LIMS ID: 01-7853
Matrix: Water
Data Release Authorized:
Reported: 05/22/01

QC Report No: DC73-Kennedy Jenks Consultants
Project: TACOMA METALS
996098.00
Date Sampled: 05/14/01
Date Received: 05/15/01

Date extracted: 05/16/01
Date analyzed: 05/17/01 21:55
Instrument: NT1

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	**Naphthalene**	**410 E**
91-57-6	**2-Methylnaphthalene**	**170 E**
208-96-8	**Acenaphthylene**	**2.8**
83-32-9	**Acenaphthene**	**76 E**
86-73-7	**Fluorene**	**39 E**
85-01-8	**Phenanthrene**	**24 E**
120-12-7	**Anthracene**	**2.7**
206-44-0	**Fluoranthene**	**1.1**
129-00-0	**Pyrene**	**0.57**
56-55-3	Benzo(a)anthracene	0.10 U
218-01-9	Chrysene	0.10 U
205-99-2	Benzo(b)fluoranthene	0.10 U
207-08-9	Benzo(k)fluoranthene	0.10 U
50-32-8	Benzo(a)pyrene	0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10 U
132-64-9	**Dibenzofuran**	**47 E**

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	59.7%
d14-Dibenzo(a,h)anthracene	85.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: MW-8**
PNAs by Selected Ion Monitoring GC/MS **DILUTION**

Lab Sample ID: DC73A-DL
LIMS ID: 01-7853
Matrix: Water
Data Release Authorized: CW
Reported: 05/22/01

QC Report No: DC73-Kennedy Jenks Consultants
Project: TACOMA METALS
996098.00
Date Sampled: 05/14/01
Date Received: 05/15/01

Date extracted: 05/16/01
Date analyzed: 05/18/01 15:28
Instrument: NT1

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:500

CAS Number	Analyte	ug/L
91-20-3	**Naphthalene**	**4,900**
91-57-6	**2-Methylnaphthalene**	**530**
208-96-8	Acenaphthylene	50 U
83-32-9	**Acenaphthene**	**140**
86-73-7	Fluorene	50 U
85-01-8	Phenanthrene	50 U
120-12-7	Anthracene	50 U
206-44-0	Fluoranthene	50 U
129-00-0	Pyrene	50 U
56-55-3	Benzo(a)anthracene	50 U
218-01-9	Chrysene	50 U
205-99-2	Benzo(b)fluoranthene	50 U
207-08-9	Benzo(k)fluoranthene	50 U
50-32-8	Benzo(a)pyrene	50 U
193-39-5	Indeno(1,2,3-cd)pyrene	50 U
53-70-3	Dibenz(a,h)anthracene	50 U
191-24-2	Benzo(g,h,i)perylene	50 U
132-64-9	**Dibenzofuran**	**60**

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracene	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: MW-8
DILUTION-2

Lab Sample ID: DC73ADL-2
LIMS ID: 01-7853
Matrix: Water
Data Release Authorized:
Reported: 05/22/01

QC Report No: DC73-Kennedy Jenks Consultants
Project: TACOMA METALS
996098.00
Date Sampled: 05/14/01
Date Received: 05/15/01

Date extracted: 05/16/01
Date analyzed: 05/18/01 16:09
Instrument: NT1

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:10

CAS Number	Analyte	ug/L
91-20-3	**Naphthalene**	**2,000 E**
91-57-6	**2-Methylnaphthalene**	**510 E**
208-96-8	**Acenaphthylene**	**3.4**
83-32-9	**Acenaphthene**	**130 E**
86-73-7	**Fluorene**	**56**
85-01-8	**Phenanthrene**	**30**
120-12-7	**Anthracene**	**2.5**
206-44-0	**Fluoranthene**	**1.1**
129-00-0	Pyrene	1.0 U
56-55-3	Benzo(a)anthracene	1.0 U
218-01-9	Chrysene	1.0 U
205-99-2	Benzo(b)fluoranthene	1.0 U
207-08-9	Benzo(k)fluoranthene	1.0 U
50-32-8	Benzo(a)pyrene	1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0 U
132-64-9	**Dibenzofuran**	**68**

Base/Neutral Surrogate Recovery	
d10-Fluoranthene	103%
d10-2-Methylnaphthalene	100%
d14-Dibenzo(a,h)anthracene	73.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: MW-10**
PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: DC73B
LIMS ID: 01-7854
Matrix: Water
Data Release Authorized:
Reported: 05/22/01

QC Report No: DC73-Kennedy Jenks Consultants
Project: TACOMA METALS
996098.00
Date Sampled: 05/14/01
Date Received: 05/15/01

Date extracted: 05/16/01
Date analyzed: 05/18/01 14:58
Instrument: NT1

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	3.7
91-57-6	2-Methylnaphthalene	0.26
208-96-8	Acenaphthylene	0.10 U
83-32-9	Acenaphthene	19 E
86-73-7	Fluorene	9.9
85-01-8	Phenanthrene	9.9
120-12-7	Anthracene	1.4
206-44-0	Fluoranthene	1.2
129-00-0	Pyrene	0.76
56-55-3	Benzo(a)anthracene	0.11
218-01-9	Chrysene	0.10 U
205-99-2	Benzo(b)fluoranthene	0.10 U
207-08-9	Benzo(k)fluoranthene	0.10 U
50-32-8	Benzo(a)pyrene	0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10 U
132-64-9	Dibenzofuran	7.7

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	77.3%
d14-Dibenzo(a,h)anthracene	91.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: MW-10
DILUTION

Lab Sample ID: DC73B-DL
LIMS ID: 01-7854
Matrix: Water
Data Release Authorized:
Reported: 05/22/01

QC Report No: DC73-Kennedy Jenks Consultants
Project: TACOMA METALS
996098.00
Date Sampled: 05/14/01
Date Received: 05/15/01

Date extracted: 05/16/01
Date analyzed: 05/21/01 12:47
Instrument: NT1

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:3

CAS Number	Analyte	ug/L
91-20-3	**Naphthalene**	**3.4**
91-57-6	2-Methylnaphthalene	0.30 U
208-96-8	Acenaphthylene	0.30 U
83-32-9	**Acenaphthene**	**18**
86-73-7	**Fluorene**	**7.7**
85-01-8	**Phenanthrene**	**8.5**
120-12-7	**Anthracene**	**1.2**
206-44-0	**Fluoranthene**	**0.99**
129-00-0	**Pyrene**	**0.72**
56-55-3	Benzo(a)anthracene	0.30 U
218-01-9	Chrysene	0.30 U
205-99-2	Benzo(b)fluoranthene	0.30 U
207-08-9	Benzo(k)fluoranthene	0.30 U
50-32-8	Benzo(a)pyrene	0.30 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.30 U
53-70-3	Dibenz(a,h)anthracene	0.30 U
191-24-2	Benzo(g,h,i)perylene	0.30 U
132-64-9	**Dibenzofuran**	**6.1**

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	62.0%
d14-Dibenzo(a,h)anthracene	71.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: MW-11**
PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: DC73C
LIMS ID: 01-7855
Matrix: Water
Data Release Authorized:
Reported: 05/22/01

QC Report No: DC73-Kennedy Jenks Consultants
Project: TACOMA METALS
996098.00
Date Sampled: 05/14/01
Date Received: 05/15/01

Date extracted: 05/16/01
Date analyzed: 05/17/01 22:44
Instrument: NT1

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	**Naphthalene**	**0.28**
91-57-6	2-Methylnaphthalene	0.10 U
208-96-8	Acenaphthylene	0.10 U
83-32-9	**Acenaphthene**	**0.23**
86-73-7	Fluorene	0.10 U
85-01-8	Phenanthrene	0.10 U
120-12-7	**Anthracene**	**0.11**
206-44-0	Fluoranthene	0.10 U
129-00-0	Pyrene	0.10 U
56-55-3	Benzo(a)anthracene	0.10 U
218-01-9	Chrysene	0.10 U
205-99-2	Benzo(b)fluoranthene	0.10 U
207-08-9	Benzo(k)fluoranthene	0.10 U
50-32-8	Benzo(a)pyrene	0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10 U
132-64-9	Dibenzofuran	0.10 U

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	71.3%
d14-Dibenzo(a,h)anthracene	80.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNA's by Selected Ion Monitoring GC/MS

Lab Sample ID: DC73LC
LIMS ID: 01-7853
Matrix: Water

QC Report No: DC73-Kennedy Jenks Consultants
Project: TACOMA METALS
996098.00

Data Release Authorized: TMW
Reported: 05/22/01

LABORATORY CONTROL SAMPLE
Extracted: 05/16/01
Analyzed: 05/17/01

CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
Phenanthrene	2.41	3.00	80.3%
Chrysene	2.46	3.00	82.0%
Benzo(k)fluoranthene	2.75	3.00	91.7%

Values reported in ug/L

Spike Blank Surrogate Recovery

d10-2-Methylnaphthalene	78.0%
d14-Dibenzo(a,h)anthracene	81.3%

Seattle 425.420.9200 FAX 420.9210
Spokane 509.924.9200 FAX 924.9290
Portland 503.906.9200 FAX 906.9210
Bend 541.383.9310 FAX 382.7588

FAX

Date: 8-17-01

Total Pages: 6

To: AMANDA ALDERSLEY

From: Scott Woerman

Company: KENNEDY JENKS

Company: NCA Seattle (Bothell)

Fax: 253-952-3435

Swoerman@ncalabs.com PHN: 425.420.9237

☐ Urgent ☐ Please Confirm Receipt ☐ Please Reply ASAP

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North Creek Analytical, Inc.
Environmental Laboratory Network

Kennedy/Jenks Consultants	Project: Tacoma Metals	
530 S. 336th Street	Project Number: 996098.00	**Reported:**
Federal Way WA/USA, 98003	Project Manager: Amanda Aldersley	08/17/01 11:59

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-8 (R)	B1H0380-01	Water	08/15/01 15:55	08/16/01 10:17
MW-4 (R)	B1H0380-02	Water	08/15/01 16:05	08/16/01 10:17
MW-5	B1H0380-03	Water	08/15/01 16:15	08/16/01 10:17
MW-6	B1H0380-04	Water	08/15/01 16:25	08/16/01 10:17
MW-9	B1H0380-05	Water	08/15/01 16:35	08/16/01 10:17
MW-2	B1H0380-06	Water	08/15/01 16:45	08/16/01 10:17

Kennedy/Jenks Consultants	Project: Tacoma Metals	
530 S. 336th Street	Project Number: 996098.00	**Reported:**
Federal Way WA/USA, 98003	Project Manager: Amanda Aldersley	08/17/01 11:59

Conventional Chemistry Parameters by APHA/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-8 (R) (B1H0380-01) Water Sampled: 08/15/01 15:55 Received: 08/16/01 10:17									
Salinity	**0.152**	0.00100	g/kg (ppt)	1	1H17015	08/17/01	08/17/01	SM 2520	
MW-4 (R) (B1H0380-02) Water Sampled: 08/15/01 16:05 Received: 08/16/01 10:17									
Salinity	**0.109**	0.00100	g/kg (ppt)	1	1H17015	08/17/01	08/17/01	SM 2520	
MW-5 (B1H0380-03) Water Sampled: 08/15/01 16:15 Received: 08/16/01 10:17									
Salinity	**0.197**	0.00100	g/kg (ppt)	1	1H17015	08/17/01	08/17/01	SM 2520	
MW-6 (B1H0380-04) Water Sampled: 08/15/01 16:25 Received: 08/16/01 10:17									
Salinity	**0.985**	0.00100	g/kg (ppt)	1	1H17015	08/17/01	08/17/01	SM 2520	
MW-9 (B1H0380-05) Water Sampled: 08/15/01 16:35 Received: 08/16/01 10:17									
Salinity	**0.944**	0.00100	g/kg (ppt)	1	1H17015	08/17/01	08/17/01	SM 2520	
MW-2 (B1H0380-06) Water Sampled: 08/15/01 16:45 Received: 08/16/01 10:17									
Salinity	**0.994**	0.00100	g/kg (ppt)	1	1H17015	08/17/01	08/17/01	SM 2520	

Kennedy/Jenks Consultants	Project: Tacoma Metals	
530 S. 336th Street	Project Number: 996098.00	**Reported:**
Federal Way WA/USA, 98003	Project Manager: Amanda Aldersley	08/17/01 11:59

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1H17015: Prepared 08/17/01 Using General Preparation										
Blank (1H17015-BLK1)										
Salinity	ND	0.00100	g/kg (ppt)							
LCS (1H17015-BS1)										
Salinity	36.5	0.00100	g/kg (ppt)	35.0		104	70-130			
LCS Dup (1H17015-BSD1)										
Salinity	34.4	0.00100	g/kg (ppt)	35.0		98.3	70-130	5.92	200	
Duplicate (1H17015-DUP1)					**Source: B1H0380-01**					
Salinity	0.159	0.00100	g/kg (ppt)		0.152			4.50	25	

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

18939 120th Avenue N.E., Suite 101, Bothell, WA 98011-9508 (206) 481-9200 FAX 485-2992
East 11115 Montgomery, Suite B, Spokane, WA 99206-4779 (509) 924-9200 FAX 924-9290
9405 S.W. Nimbus Avenue, Beaverton, OR 97008-7132 (503) 643-9200 FAX 644-2202

CHAIN OF CUSTODY REPORT

Work Order # B1HD380

REPORT TO: KENNEDY/JENKS
ATTENTION: AMANDA ALDERSLEY
ADDRESS: 530 S. 336th ST
FEDERAL WAY WA 98003
PHONE: (253) 874-0555 FAX: (253) 952-3435
PROJECT NAME: TACOMA METALS
PROJECT NUMBER: 9960098.00
SAMPLED BY: CB

INVOICE TO: SAME
ATTENTION:
ADDRESS:
P.O. NUMBER: NCA QUOTE #:

TURNAROUND REQUEST in Business Days *
Organic & Inorganic Analyses: 10 (Standard) | 7 | 5 | 4 | 3 | 2 | X | Same Day
Fuels & Hydrocarbon Analyses: 5 (Standard) | 3-4 | 2 | 1 | Same Day
OTHER Specify:
* Turnaround Request less than standard may incur Rush Charges.

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NCA SAMPLE ID (Laboratory Use Only)	Analysis Request: SAMPLITY	MATRIX (W, S, A, O)	# OF CONTAINERS	COMMENTS
MW-8(R)	8/15/01 3:55		X	WATER	1	-01
MW-4(R)	4:05		X		1	-02
MW-5	4:15		X		1	-03
MW-6	4:25		X		1	-04
MW-9	4:35		X		1	-05
MW-2	4:45		X		1	-06

RELINQUISHED BY (Signature): [signature] DATE: 8/16/01
PRINT NAME: JODIE Brundage FIRM: V&S TIME: 9:00
RECEIVED BY (Signature): Prany Tontz DATE: 8/16/01
PRINT NAME: PRANY TONTZ FIRM: NCA TIME: 10:17

RELINQUISHED BY (Signature): DATE:
PRINT NAME: FIRM: TIME:
RECEIVED BY (Signature): DATE:
PRINT NAME: FIRM: TIME:

ADDITIONAL REMARKS:
2-8°C/0

PAGE OF

08/17/01 FRI 12:08 [TX/RX NO 7603]
TOTAL P.06

Appendix M

Surface Water Analytical Reports
and Chain-of-Custody Documents

Analytical Resources, Incorporated
Analytical Chemists and Consultants

March 27, 2001

Ty Schreiner
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: Project: Tacoma Metals / ARI Job: CV82

Dear Mr. Schreiner:

Please find enclosed sample custody records and final analytical results for the above referenced project. One water sample was received in good condition on March 13, 2001. The sample was analyzed for PAH referencing GC/MS-SIM, PCBs referencing EPA 8082, and total and dissolved metals referencing EPA 6010/7471. Total diesel and motor oil range hydrocarbons were determined referencing WDOE method NWTPH-Dx.

In the NWTPH-Dx analysis, the sample has a pattern in the motor oil range that does not match the typical motor oil peak pattern. Could possibly be a mixture of motor oil and a lighter oil.

No analytical complications were noted. Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

Susan Snyder
Project manger

SS/ss
Enclosures

CC: Jodi Brundage, Kennedy Jenks Consultants, Federal Way, WA

333 Ninth Avenue North • Seattle WA 98109-5187 • **206-621-6490** • **206-621-7523** fax

10.1 C

01-3273 to 01-3274 CV82

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
400 Ninth Avenue North
Seattle, WA 98109-4708
206-621-6490 206-621-7523 (fax)

Page 1 of 1

Turn Around Requested: STD

Report to: TY SCHREIBER	Proj Name: TACOMA METALS
Company: KENNEDY/JENKS	Proj Number: 9960098.00
Address: 530 S. 336th ST Federal Way WA 98003	Sampler: JB, DM
Phone: 253 874 0555	Shipping Method: COURIER
Fax: 253 942 3435	AirBill:

Sample ID	Sample Date	Sample Time	Sample Matrix	No Containers	TOTAL RCRA METALS + CN	DISSOLVED RCRA METALS + CN	TPH-D (EXT)	PAH's (SIM)	PCB's						Notes/Comments
SW-1	3/13/01	11:45	WATER	5	X	X	X	X	X						
															*DISSOLVED METALS WERE FIELD FILTERED

Relinquished: (Signature)	Relinquished: (Signature)	Relinquished: (Signature)	Special Instructions/Notes
Printed name: JODIE BOURDAGE	Printed name:	Printed name:	
Company: K/J	Company:	Company:	
Date: 3/13/01 Time: 1:30pm	Date: Time:	Date: Time:	
Received by:	Received by:	Received by:	
Printed name: McDonald	Printed name:	Printed name:	
Company: ART	Company:	Company:	Number of Coolers:
			Cooler Temp(s):
Date: 3/13/01 Time: 1400	Date: Time:	Date: Time:	COC Seals Intact?
			Bottles Intact?

ANALYTICAL RESOURCES INCORPORATED

SIM SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: CV82-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Client ID	MNP	DBA	TOT OUT
Method Blank	91%	86%	0
Lab Control	93%	84%	0
SW-1	87%	74%	0

	LCS/MB LIMITS	QC LIMITS
(MNP) = d10-2-Methylnaphthalene	(30-160)	(30-160)
(DBA) = d14-Dibenz(a,h)anthracene	(30-160)	(30-160)

(Present limits for LCS/MB are advisory only)

D Surrogate Compound diluted out

FORM-II 8270-SIM

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: Method Blank**
PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: CV82MB
LIMS ID: 01-3273
Matrix: Water
Data Release Authorized: MW
Reported: 03/20/01

QC Report No: CV82-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Date extracted: 03/15/01
Date analyzed: 03/16/01 15:42
Instrument: FINN8

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	0.10 U
91-57-6	2-Methylnaphthalene	0.10 U
208-96-8	Acenaphthylene	0.10 U
83-32-9	Acenaphthene	0.10 U
86-73-7	Fluorene	0.10 U
85-01-8	Phenanthrene	0.10 U
120-12-7	Anthracene	0.10 U
206-44-0	Fluoranthene	0.10 U
129-00-0	Pyrene	0.10 U
56-55-3	Benzo(a)anthracene	0.10 U
218-01-9	Chrysene	0.10 U
205-99-2	Benzo(b)fluoranthene	0.10 U
207-08-9	Benzo(k)fluoranthene	0.10 U
50-32-8	Benzo(a)pyrene	0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10 U
132-64-9	Dibenzofuran	0.10 U

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	90 7%
d14-Dibenzo(a,h)anthracene	86.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample No: SW-1

Lab Sample ID: CV82A
LIMS ID: 01-3273
Matrix: Water
Data Release Authorized:
Reported: 03/20/01

QC Report No: CV82-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/13/01
Date Received: 03/13/01

Date extracted: 03/15/01
Date analyzed: 03/16/01 16:47
Instrument: FINN8

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	0.63
91-57-6	2-Methylnaphthalene	0.33
208-96-8	Acenaphthylene	0.33
83-32-9	Acenaphthene	0.37
86-73-7	Fluorene	0.36
85-01-8	Phenanthrene	0.99
120-12-7	Anthracene	0.81
206-44-0	Fluoranthene	2.0
129-00-0	Pyrene	2.1
56-55-3	Benzo(a)anthracene	0.71
218-01-9	Chrysene	1.8
205-99-2	Benzo(b)fluoranthene	1.0
207-08-9	Benzo(k)fluoranthene	1.2
50-32-8	Benzo(a)pyrene	1.0
193-39-5	Indeno(1,2,3-cd)pyrene	0.71
53-70-3	Dibenz(a,h)anthracene	0.20
191-24-2	Benzo(g,h,i)perylene	0.59
132-64-9	Dibenzofuran	0.39

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	86.7%
d14-Dibenzo(a,h)anthracene	74.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNA's by Selected Ion Monitoring GC/MS

Lab Sample ID: CV82LC
LIMS ID: 01-3273
Matrix: Water

QC Report No: CV82-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 03/20/01

LABORATORY CONTROL SAMPLE
Extracted: 03/15/01
Analyzed: 03/16/01

CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
Phenanthrene	2.69	3.00	89.7%
Chrysene	2.41	3.00	80.3%
Benzo(k)fluoranthene	2.46	3.00	82.0%

Values reported in ug/L

Spike Blank Surrogate Recovery

d10-2-Methylnaphthalene	93.3%
d14-Dibenzo(a,h)anthracene	84.0%

ANALYTICAL RESOURCES INCORPORATED

WATER AROCLOR SURROGATE SUMMARY

Matrix: Water

QC Report No: CV82
Project: Tacoma Metals
996098.00

LIMS ID	Lab ID	Client ID	TCMX #	DCBP #	TOT OUT
01-3273MB	031901MB	Method Blank	68.0%	68.0%	0
01-3273SB	031901SB	Lab Control	63.0%	61.0%	0
01-3273	CV82A	SW-1	67.5%	45.5%	0

	QC LIMITS
(TCMX) = Tetrachloro-m-xylene	(34-112)
(DCBP) = Decachlorobiphenyl	(22-139)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D Surrogate Compound diluted out

FORM-II PCB

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: Method Blank

Lab Sample ID: CV82MB
LIMS ID: 01-3273
Matrix: Water

QC Report No: CV82-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized: CH 3/23/01
Reported: 03/23/01

Date extracted: 03/19/01
Date analyzed: 03/20/01 22:53
Instrument ID: ECD3
Sample Amount: 500 mL
Final Ext Vol: 5.0 mL

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value	
12674-11-2	Aroclor 1016	1.0	U
53469-21-9	Aroclor 1242	1.0	U
12672-29-6	Aroclor 1248	1.0	U
11097-69-1	Aroclor 1254	1.0	U
11096-82-5	Aroclor 1260	1.0	U
11104-28-2	Aroclor 1221	2.0	U
11141-16-5	Aroclor 1232	1.0	U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	68.0%
Tetrachlorometaxylene	68.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: SW-1

Lab Sample ID: CV82A
LIMS ID: 01-3273
Matrix: Water

QC Report No: CV82-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/13/01
Date Received: 03/13/01

Data Release Authorized: CH 3/23/01
Reported: 03/23/01

Date extracted: 03/19/01
Date analyzed: 03/21/01 00:03
Instrument ID: ECD3
Sample Amount: 500 mL
Final Ext Vol: 5.0 mL

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	**Aroclor 1254**	**2.7**
11096-82-5	**Aroclor 1260**	**2.1**
11104-28-2	Aroclor 1221	2.0 U
11141-16-5	Aroclor 1232	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	45.5%
Tetrachlorometaxylene	67.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by METHOD 8080

Lab Sample ID: CV82SB
LIMS ID: 01-3273
Matrix: Water

QC Report No: CV82-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized: CH 3/23/01
Reported: 03/23/01

LABORATORY CONTROL SAMPLE RECOVERY
Date extracted: 03/19/01

CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	7.61	10.1	75.5%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	61.0%
Tetrachlorometaxylene	63.0%

Values reported in ug/L

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL HYDROCARBONS COMPOUND SUMMARY

Matrix: Water

QC Report No: CV82

LIMS ID	Lab ID	Extracted	Client ID	MeArach	TOT OUT
01-3273MB	032001MB	03/16/01	Method Blank	107%	0
01-3273LC	032001LC	03/16/01	Lab Control	91%	0
01-3273	CV82A	03/16/01	SW-1	95%	0

	Control QC LIMITS	Sample QC LIMITS
(MeArach) = Methylarachidate	(65-118)	(54-133)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D System Monitoring Compound diluted out

FORM-II TPHD

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID
and Motor Oil

ANALYTICAL RESOURCES INCORPORATED

Lab ID: 01-3273
Matrix: Water

QC Report No: CV82-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 03/13/01

Data Release Authorized: CH
Reported: 03/23/01 3/23/01

Lab ID	Sample ID	Date Extracted	Date Analyzed	Dilution Factor	Diesel Range	*HC ID	Motor Oil Range	Surr Rec
CV82MB	Method Blank	03/16/01	03/20/01	1:1	0.25 U	---	0.50 U	107%
CV82A	SW-1	03/16/01	03/20/01	1:1	1.8	NO	2.9	95.0%

Surrogate is Methyl-Arachidate.

* ID indicates, in the opinion of the analyst, the petroleum product with the best pattern match. 'NO' indicates that there was not a good match for any of the requested products.
Values reported in ppm (mg/L)
Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.

Data Qualifiers

U	Compound not detected at the given detection limit
J	Indicates an estimated value below the calculated detection limit.
S	No value reported due to saturation of the detector. Dilution required.
D	Indicates the surrogate was not detected because of dilution of the extract.
E	Indicates a value above the linear range of the detector. Dilution required.
NR	Indicates no recovery due to matrix interference.
B	Indicates compound also detected in the method blank.

FORM-1 TPHD

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CV82SB
LIMS ID: 01-3273
Matrix: Water

QC Report No: CV82-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized: clk
Reported: 03/23/01 3/23/01

LABORATORY CONTROL SAMPLE RECOVERY REPORT
Extracted: 03/16/01
Analyzed 03/20/01

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
Diesel Range Hydrocarbons	2.50	2.50	100%

TPHd Surrogate Recovery

Methylarachidate 91.0%

Values reported in parts per million (mg/L)

FORM-III

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: Method Blank**
TOTAL METALS

Lab Sample ID: CV82MB
LIMS ID: 01-3273
Matrix: Water

QC Report No: CV82-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized: GM
Reported: 03/22/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010A	03/16/01	6010B	03/20/01	7440-38-2	Arsenic	0.05	0.05 U
3010A	03/16/01	6010B	03/20/01	7440-39-3	Barium	0.003	0.003 U
3010A	03/16/01	6010B	03/20/01	7440-43-9	Cadmium	0.002	0.002 U
3010A	03/16/01	6010B	03/20/01	7440-47-3	Chromium	0.005	0.005 U
3010A	03/16/01	6010B	03/20/01	7440-50-8	Copper	0.002	0.002 U
3010A	03/16/01	6010B	03/20/01	7439-92-1	Lead	0.02	0.02 U
7470	03/16/01	7470	03/19/01	7439-97-6	Mercury	0.0001	0.0001 U
3010A	03/16/01	6010B	03/20/01	7782-49-2	Selenium	0.05	0.05 U
3010A	03/16/01	6010B	03/20/01	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: SW-1**
TOTAL METALS

Lab Sample ID: CV82A
LIMS ID: 01-3273
Matrix: Water

QC Report No: CV82-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/13/01
Date Received: 03/13/01

Data Release Authorized:
Reported: 03/22/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010A	03/16/01	6010B	03/20/01	7440-38-2	Arsenic	0.05	0.05 U
3010A	03/16/01	6010B	03/20/01	7440-39-3	Barium	0.003	0.175
3010A	03/16/01	6010B	03/20/01	7440-43-9	Cadmium	0.002	0.008
3010A	03/16/01	6010B	03/20/01	7440-47-3	Chromium	0.005	0.127
3010A	03/16/01	6010B	03/20/01	7440-50-8	Copper	0.002	2.07
3010A	03/16/01	6010B	03/20/01	7439-92-1	Lead	0.02	8.09
7470	03/16/01	7470	03/19/01	7439-97-6	Mercury	0.0001	0.0094
3010A	03/16/01	6010B	03/20/01	7782-49-2	Selenium	0.05	0.05 U
3010A	03/16/01	6010B	03/20/01	7440-22-4	Silver	0.003	0.006

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET
DISSOLVED METALS

Sample No: **Method Blank**

Lab Sample ID: CV82MB
LIMS ID: 01-3274
Matrix: Water

QC Report No: CV82-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized:
Reported: 03/22/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
6010	03/16/01	6010	03/20/01	7440-38-2	Arsenic	0.05	0.05 U
6010	03/16/01	6010	03/20/01	7440-39-3	Barium	0.003	0.003 U
6010	03/16/01	6010	03/20/01	7440-43-9	Cadmium	0.002	0.002 U
6010	03/16/01	6010	03/20/01	7440-47-3	Chromium	0.005	0.005 U
6010	03/16/01	6010	03/20/01	7440-50-8	Copper	0.002	0.002 U
6010	03/16/01	6010	03/20/01	7439-92-1	Lead	0.02	0.02 U
7470	03/16/01	7470	03/19/01	7439-97-6	Mercury	0.0001	0.0001 U
6010	03/16/01	6010	03/20/01	7782-49-2	Selenium	0.05	0.05 U
6010	03/16/01	6010	03/20/01	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET
DISSOLVED METALS

Sample No: SW-1 (D)

Lab Sample ID: CV82B
LIMS ID: 01-3274
Matrix: Water

QC Report No: CV82-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/13/01
Date Received: 03/13/01

Data Release Authorized:
Reported: 03/22/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
6010	03/16/01	6010	03/21/01	7440-38-2	Arsenic	0.05	0.05 U
6010	03/16/01	6010	03/21/01	**7440-39-3**	**Barium**	0.003	**0.012**
6010	03/16/01	6010	03/21/01	7440-43-9	Cadmium	0.002	0.002 U
6010	03/16/01	6010	03/21/01	7440-47-3	Chromium	0.005	0.005 U
6010	03/16/01	6010	03/21/01	**7440-50-8**	**Copper**	0.002	**0.090**
6010	03/16/01	6010	03/21/01	7439-92-1	Lead	0.02	0.02 U
7470	03/16/01	7470	03/19/01	7439-97-6	Mercury	0.0001	0.0001 U
6010	03/16/01	6010	03/21/01	7782-49-2	Selenium	0.05	0.05 U
6010	03/16/01	6010	03/21/01	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CV82LCS
LIMS ID: 01-3273
Matrix: Water

QC Report No: CV82-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized: 53
Reported: 03/22/01

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Spike mg/L	Spike Added	% Recovery	Q
Arsenic	1.78	2.00	89.0%	
Barium	1.77	2.00	88.5%	
Cadmium	0.434	0.500	86.8%	
Chromium	0.436	0.500	87.2%	
Copper	0.441	0.500	88.2%	
Lead	1.77	2.00	88.5%	
Mercury	0.0019	0.0020	95.0%	
Selenium	1.78	2.00	89.0%	
Silver	0.441	0.500	88.2%	

'Q' codes: N = control limit not met

Control Limits: 80-120%

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CV82LCS
LIMS ID: 01-3274
Matrix: Water

QC Report No: CV82-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 03/22/01

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Spike mg/L	Spike Added	% Recovery	Q
Arsenic	2.08	2.00	104%	
Barium	2.02	2.00	101%	
Cadmium	0.524	0.500	105%	
Chromium	0.506	0.500	101%	
Copper	0.507	0.500	101%	
Lead	2.08	2.00	104%	
Mercury	0.0019	0.0020	95.0%	
Selenium	2.10	2.00	105%	
Silver	0.514	0.500	103%	

'Q' codes: N = control limit not met
NA = Not applicable - analyte not spiked

Control Limits: 80-120%

FORM-VII

Analytical Resources, Incorporated
Analytical Chemists and Consultants

March 27, 2001

Ty Schreiner
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: Project: Tacoma Metals / ARI Job: CV89

Dear Mr. Schreiner:

Please find enclosed sample custody records and final analytical results for the above referenced project. One water sample was received in good condition on March 14, 2001. The sample was analyzed for PAH referencing GC/MS-SIM, PCBs referencing EPA 8082, and total and dissolved metals referencing EPA 6010/7471. Total diesel and motor oil range hydrocarbons were determined referencing WDOE method NWTPH-Dx.

In the NWTPH-Dx analysis, the peak pattern shows sample maybe a weathered diesel and lube oil.

The metals samples were batched with CV82. Please see that report for associated QC data sheets.

No analytical complications were noted. Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

Susan Snyder
Project manger

SS/ss
Enclosures

CC: Jodi Brundage, Kennedy Jenks Consultants, Federal Way, WA

RECEIVED
MAR 29 2001
K/J Federal Way
K/J No/File
Route
Return To/By

333 Ninth Avenue North • Seattle WA 98109-5187 • **206-621-6490** • **206-621-7523** fax

CJ89 01-3316 1001-2511

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
400 Ninth Avenue North
Seattle, WA 98109-4708
206-621-6490 206-621-7523 (fax)

Page 1 of 1

Turn Around Requested: STD

Report to: TY Schreiner	Proj Name: TACOMA METALS
Company: Kennedy Jenks	Proj Number: 9960098.00
Address: 530 S. 336th ST Federal Way WA 98003	Sampler:
Phone: 253 874 0555	Shipping Method: COURIER
Fax: 253 942 3435	AirBill:

Sample ID	Sample Date	Sample Time	Sample Matrix	No Containers	TOTAL RCRA METALS + CU	DISSOLVED RCRA METALS + CU	NWTPH-D (EXT)	PAH'S (SIM)	PCB'S						Notes/Comments
SW-2	3/13/01	1:45	WATER	5	X	X	X	X	X						"DISSOLVED" METALS WERE FIELD FILTERED

Relinquished: (Signature)	Relinquished: (Signature)	Relinquished: (Signature)	Special Instructions/Notes
Printed name: JODIE Brundage	Printed name:	Printed name:	
Company: KJS	Company:	Company:	
Date: 3/14/01 Time: 9:00	Date: Time:	Date: Time:	
Received by: Deborah Johnson	Received by:	Received by:	
Printed name: Deborah Johnson	Printed name:	Printed name:	
Company: Analytical Resources	Company:	Company:	Number of Coolers: 1
			Cooler Temp(s):
Date: 3/14/01 Time: 9:00	Date: Time:	Date: Time:	COC Seals Intact?
			Bottles Intact?

ANALYTICAL RESOURCES INCORPORATED

ORGANIC COMPOUND DATA REPORTING QUALIFIERS

U Indicates the compound was undetected at the reported concentration. (Same as ND).

J Indicates an estimated concentration when the value is less than the calculated reporting limit.

D Indicates the surrogate/spike(s) was not detected, due to dilution of extract.

NR Indicates the surrogate recovery cannot be reported due to matrix interference.

E Indicates a value above the linear range of the detector. Sample dilution required.

S Indicates no value reported due to saturation of the detector. Sample dilution required.

NA Indicates compound not analyzed for.

M Indicates an estimated value of analyte found and confirmed by analyst but with low spectral match.

B Indicates possible/probable blank contamination. Flagged when the analyte is detected in the blank as well as the sample.

Y Indicates raised reporting limit due to background interference or to activity on the instrument. Compound is still not detected at or above the raised level.

ANALYTICAL RESOURCES INCORPORATED

SIM SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: CV89-Kennedy/Jenks Consultants
Project: Tacoma Metals
996098.00

Client ID	MNP	DBA	TOT OUT
Method Blank	91%	86%	0
Lab Control	93%	84%	0
SW-2	86%	64%	0

	LCS/MB LIMITS	QC LIMITS
(MNP) = d10-2-Methylnaphthalene	(30-160)	(30-160)
(DBA) = d14-Dibenz(a,h)anthracene	(30-160)	(30-160)

(Present limits for LCS/MB are advisory only)

D Surrogate Compound diluted out

FORM-II 8270-SIM

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: Method Blank**

PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: CV89MB
LIMS ID: 01-3376
Matrix: Water
Data Release Authorized:
Reported: 03/20/01

QC Report No: CV89-Kennedy/Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Date extracted: 03/15/01
Date analyzed: 03/16/01 15:42
Instrument: FINN8

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	0.10 U
91-57-6	2-Methylnaphthalene	0.10 U
208-96-8	Acenaphthylene	0.10 U
83-32-9	Acenaphthene	0.10 U
86-73-7	Fluorene	0.10 U
85-01-8	Phenanthrene	0.10 U
120-12-7	Anthracene	0.10 U
206-44-0	Fluoranthene	0.10 U
129-00-0	Pyrene	0.10 U
56-55-3	Benzo(a)anthracene	0.10 U
218-01-9	Chrysene	0.10 U
205-99-2	Benzo(b)fluoranthene	0.10 U
207-08-9	Benzo(k)fluoranthene	0.10 U
50-32-8	Benzo(a)pyrene	0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10 U
132-64-9	Dibenzofuran	0.10 U

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	90.7%
d14-Dibenzo(a,h)anthracene	86.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET Sample No: SW-2
PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: CV89A
LIMS ID: 01-3376
Matrix: Water
Data Release Authorized:
Reported: 03/20/01

QC Report No: CV89-Kennedy/Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/13/01
Date Received: 03/14/01

Date extracted: 03/15/01
Date analyzed: 03/16/01 17:20
Instrument: FINN8

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	**Naphthalene**	**0.12**
91-57-6	2-Methylnaphthalene	0.10 U
208-96-8	Acenaphthylene	0.10 U
83-32-9	**Acenaphthene**	**0.15**
86-73-7	**Fluorene**	**0.10**
85-01-8	**Phenanthrene**	**0.24**
120-12-7	Anthracene	0.10 U
206-44-0	**Fluoranthene**	**0.26**
129-00-0	**Pyrene**	**0.17**
56-55-3	**Benzo(a)anthracene**	**0.08 J**
218-01-9	**Chrysene**	**0.11**
205-99-2	Benzo(b)fluoranthene	0.10 U
207-08-9	Benzo(k)fluoranthene	0.10 U
50-32-8	Benzo(a)pyrene	0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10 U
132-64-9	**Dibenzofuran**	**0.08 J**

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	86.0%
d14-Dibenzo(a,h)anthracene	64.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNA's by Selected Ion Monitoring GC/MS

Lab Sample ID: CV89LC
LIMS ID: 01-3376
Matrix: Water

QC Report No: CV89-Kennedy/Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 03/20/01

LABORATORY CONTROL SAMPLE
Extracted: 03/15/01
Analyzed: 03/16/01

CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
Phenanthrene	2.69	3.00	89.7%
Chrysene	2.41	3.00	80.3%
Benzo(k)fluoranthene	2.46	3.00	82.0%

Values reported in ug/L

Spike Blank Surrogate Recovery

d10-2-Methylnaphthalene	93.3%
d14-Dibenzo(a,h)anthracene	84.0%

ANALYTICAL RESOURCES INCORPORATED

WATER AROCLOR SURROGATE SUMMARY

Matrix: Water

QC Report No: CV89
Project: Tacoma Metals
996098.00

LIMS ID	Lab ID	Client ID	TCMX #	DCBP #	TOT OUT
01-3376MB	031901MB	Method Blank	68.0%	68.0%	0
01-3376SB	031901SB	Lab Control	63.0%	61.0%	0
01-3376	CV89A	SW-2	71.5%	52.0%	0

	QC LIMITS
(TCMX) = Tetrachloro-m-xylene	(34-112)
(DCBP) = Decachlorobiphenyl	(22-139)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D Surrogate Compound diluted out

FORM-II PCB

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

ANALYTICAL RESOURCES INCORPORATED

Sample No: Method Blank

Lab Sample ID: CV89MB
LIMS ID: 01-3376
Matrix: Water

QC Report No: CV89-Kennedy/Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized: CH
Reported: 03/23/01 3/23/01

Date extracted: 03/19/01
Date analyzed: 03/20/01 22:53
Instrument ID: ECD3
Sample Amount: 500 mL
Final Ext Vol: 5.0 mL

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value	
12674-11-2	Aroclor 1016	1.0	U
53469-21-9	Aroclor 1242	1.0	U
12672-29-6	Aroclor 1248	1.0	U
11097-69-1	Aroclor 1254	1.0	U
11096-82-5	Aroclor 1260	1.0	U
11104-28-2	Aroclor 1221	2.0	U
11141-16-5	Aroclor 1232	1.0	U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	68.0%
Tetrachlorometaxylene	68.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: SW-2

Lab Sample ID: CV89A
LIMS ID: 01-3376
Matrix: Water

QC Report No: CV89-Kennedy/Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/13/01
Date Received: 03/14/01

Data Release Authorized: CH
Reported: 03/23/01 3/23/01

Date extracted: 03/19/01
Date analyzed: 03/21/01 00:38
Instrument ID: ECD3
Sample Amount: 500 mL
Final Ext Vol: 5.0 mL

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	**Aroclor 1254**	**1.0**
11096-82-5	Aroclor 1260	1.0 U
11104-28-2	Aroclor 1221	2.0 U
11141-16-5	Aroclor 1232	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	52.0%
Tetrachlorometaxylene	71.5%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculatsd detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by METHOD 8080

Lab Sample ID: CV89SB
LIMS ID: 01-3376
Matrix: Water

QC Report No: CV89-Kennedy/Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized: CH 3/23/01
Reported: 03/23/01

LABORATORY CONTROL SAMPLE RECOVERY
Date extracted: 03/19/01

CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	7.61	10.1	75.5%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	61.0%
Tetrachlorometaxylene	63.0%

Values reported in ug/L

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL HYDROCARBONS COMPOUND SUMMARY

Matrix: Water

QC Report No: CV89

LIMS ID	Lab ID	Extracted	Client ID	MeArach	TOT OUT
01-3376MB	032001MB	03/16/01	Method Blank	107%	0
01-3376LC	032001LC	03/16/01	Lab Control	91%	0
01-3376	CV89A	03/16/01	SW-2	57%	0

	Control QC LIMITS	Sample QC LIMITS
(MeArach) = Methylarachidate	(65-118)	(54-133)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D System Monitoring Compound diluted out

FORM-II TPHD

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID
and Motor Oil

ANALYTICAL RESOURCES INCORPORATED

Lab ID: 01-3376
Matrix: Water

QC Report No: CV89-Kennedy/Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 03/14/01

Data Release Authorized: CH
Reported: 03/23/01 3/23/01

Lab ID	Sample ID	Date Extracted	Date Analyzed	Dilution Factor	Diesel Range	*HC ID	Motor Oil Range	Surr Rec
CV89MB	Method Blank	03/16/01	03/20/01	1:1	0.25 U	---	0.50 U	107%
CV89A	SW-2	03/16/01	03/21/01	1:1	2.0	NO	2.6	57.0%

Surrogate is Methyl-Arachidate.

* ID indicates, in the opinion of the analyst, the petroleum product with the best pattern match. 'NO' indicates that there was not a good match for any of the requested products.
Values reported in ppm (mg/L)
Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.

Data Qualifiers

U	Compound not detected at the given detection limit.
J	Indicates an estimated value below the calculated detection limit.
S	No value reported due to saturation of the detector. Dilution required.
D	Indicates the surrogate was not detected because of dilution of the extract.
E	Indicates a value above the linear range of the detector. Dilution required.
NR	Indicates no recovery due to matrix interference.
B	Indicates compound also detected in the method blank.

FORM-1 TPHD

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: CV89SB
LIMS ID: 01-3376
Matrix: Water

QC Report No: CV89-Kennedy/Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized: CA
Reported: 03/23/01 3/23/01

LABORATORY CONTROL SAMPLE RECOVERY REPORT
Extracted: 03/16/01
Analyzed 03/20/01

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
Diesel Range Hydrocarbons	2.50	2.50	100%

TPHd Surrogate Recovery

Methylarachidate 91.0%

Values reported in parts per million (mg/L)

FORM-III

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: SW-2**
TOTAL METALS

Lab Sample ID: CV89A
LIMS ID: 01-3376
Matrix: Water

QC Report No: CV89-Kennedy/Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/13/01
Date Received: 03/14/01

Data Release Authorized: GM
Reported: 03/22/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010A	03/16/01	6010B	03/20/01	7440-38-2	Arsenic	0.05	0.05 U
3010A	03/16/01	6010B	03/20/01	**7440-39-3**	**Barium**	0.003	**0.057**
3010A	03/16/01	6010B	03/20/01	**7440-43-9**	**Cadmium**	0.002	**0.008**
3010A	03/16/01	6010B	03/20/01	**7440-47-3**	**Chromium**	0.005	**0.007**
3010A	03/16/01	6010B	03/20/01	**7440-50-8**	**Copper**	0.002	**0.410**
3010A	03/16/01	6010B	03/20/01	**7439-92-1**	**Lead**	0.02	**0.25**
7470	03/16/01	7470	03/19/01	**7439-97-6**	**Mercury**	0.0001	**0.0007**
3010A	03/16/01	6010B	03/20/01	7782-49-2	Selenium	0.05	0.05 U
3010A	03/16/01	6010B	03/20/01	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET **Sample No: SW-2 (D)**
DISSOLVED METALS

Lab Sample ID: CV89B
LIMS ID: 01-3377
Matrix: Water

QC Report No: CV89-Kennedy/Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/13/01
Date Received: 03/14/01

Data Release Authorized:
Reported: 03/22/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
6010	03/16/01	6010	03/20/01	7440-38-2	Arsenic	0.05	0.05 U
6010	03/16/01	6010	03/20/01	**7440-39-3**	**Barium**	0.003	**0.035**
6010	03/16/01	6010	03/20/01	**7440-43-9**	**Cadmium**	0.002	**0.008**
6010	03/16/01	6010	03/20/01	7440-47-3	Chromium	0.005	0.005 U
6010	03/16/01	6010	03/20/01	**7440-50-8**	**Copper**	0.002	**0.172**
6010	03/16/01	6010	03/20/01	7439-92-1	Lead	0.02	0.02 U
7470	03/16/01	7470	03/19/01	**7439-97-6**	**Mercury**	0.0001	**0.0001**
6010	03/16/01	6010	03/20/01	7782-49-2	Selenium	0.05	0.05 U
6010	03/16/01	6010	03/20/01	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

Analytical Resources, Incorporated
Analytical Chemists and Consultants

16, May, 2001

Dean Malte
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

Project Name: **Tacoma Metals**
Project Number: **996098.00**
ARI Job: **DB11**

Dear Dean:

Please find enclosed sample custody records and final analytical results for the above referenced project. Two water samples were received in good condition on April 30, 2001 with no discrepancies between the COC and sample containers. The cooler temperature was 2.8 °C.

The samples were analyzed for PAH referencing GC/MS-SIM, PCB's by EPA 8082, NWTPH-Dx by Washington DOE methods and total and dissolved metals by EPA 6010/7000 methods.

No analytical complications were noted. Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,
Analytical Resources, Inc.

Susan Snyder
Project Manager
206-389-6167

RECEIVED
MAY 17 2001
K/J Federal Way
K/J No/File
Route
Return To/By

333 Ninth Avenue North • Seattle WA 98109-5187 • **206-621-6490** • **206-621-7523** fax

01-6828 to 01-6831 2-8

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
400 Ninth Avenue North
Seattle, WA 98109-4708
206-621-6490 206-621-7523 (fax)

Page 1 of 1 DB11 Turn Around Requested: STD

Report to: DEAN MALTE	Proj Name: TACOMA METALS
Company: Kennedy Jenks	Proj Number: 960098.00
Address: 530 S 336th St Federal Way 98390	Sampler:
Phone: 253 874-0555	Shipping Method: Courier
Fax: 253 942-3435	AirBill:

Analyses Requested

Sample ID	Sample Date	Sample Time	Sample Matrix	No Containers	TOTAL RCRA METALS + Cu	DISSOLVED RCRA METALS + Cu	NWTPH-D (EXT)	PAHs (SIM)	PCBs						Notes/Comments
SW-1	4/29/01	3:30	WATER	5	X	X	X	X	X						DISSOLVED METALS WERE FIELD FILTERED
SW-2	4/29/01	3:55	WATER	5	X	X	X	X	X						

Relinquished: (Signature)	Relinquished: (Signature)	Relinquished: (Signature)	Special Instructions/Notes
Printed name: JODIE Brundage	Printed name:	Printed name:	
Company: Kennedy Jenks	Company:	Company:	
Date: 4/30/01 Time: 9:00	Date: Time:	Date: Time:	
Received by:	Received by:	Received by:	
Printed name:	Printed name:	Printed name:	
Company:	Company:	Company:	Number of Coolers:
Date: 4/30/01 Time: 1100	Date: Time:	Date: Time:	Cooler Temp(s):
			COC Seals Intact?
			Bottles Intact?

ANALYTICAL RESOURCES INCORPORATED

SIM SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: DB11-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Client ID	MNP	DBA	TOT OUT
Method Blank	77%	94%	0
Lab Control	80%	100%	0
SW-1	80%	83%	0
SW-2	75%	89%	0

	LCS/MB LIMITS	QC LIMITS
(MNP) = d10-2-Methylnaphthalene	(30-160)	(30-160)
(DBA) = d14-Dibenz(a,h)anthracene	(30-160)	(30-160)

(Present limits for LCS/MB are advisory only)

D Surrogate Compound diluted out

FORM-II 8270-SIM

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: Method Blank**
PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: DB11MB
LIMS ID: 01-6828
Matrix: Water
Data Release Authorized:
Reported: 05/08/01

QC Report No: DB11-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Date extracted: 05/02/01
Date analyzed: 05/04/01 12:04
Instrument: NT1

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	0.10 U
91-57-6	2-Methylnaphthalene	0.10 U
208-96-8	Acenaphthylene	0.10 U
83-32-9	Acenaphthene	0.10 U
86-73-7	Fluorene	0.10 U
85-01-8	Phenanthrene	0.10 U
120-12-7	Anthracene	0.10 U
206-44-0	Fluoranthene	0.10 U
129-00-0	Pyrene	0.10 U
56-55-3	Benzo(a)anthracene	0.10 U
218-01-9	Chrysene	0.10 U
205-99-2	Benzo(b)fluoranthene	0.10 U
207-08-9	Benzo(k)fluoranthene	0.10 U
50-32-8	Benzo(a)pyrene	0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10 U
132-64-9	Dibenzofuran	0.10 U

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	77.0%
d14-Dibenzo(a,h)anthracene	94.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: SW-1**
PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: DB11A
LIMS ID: 01-6828
Matrix: Water
Data Release Authorized:
Reported: 05/08/01

QC Report No: DB11-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 04/29/01
Date Received: 04/30/01

Date extracted: 05/02/01
Date analyzed: 05/04/01 13:03
Instrument: NT1

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	0.50
91-57-6	2-Methylnaphthalene	0.24
208-96-8	Acenaphthylene	0.24
83-32-9	Acenaphthene	0.33
86-73-7	Fluorene	0.27
85-01-8	Phenanthrene	0.74
120-12-7	Anthracene	0.69
206-44-0	Fluoranthene	1.1
129-00-0	Pyrene	1.2
56-55-3	Benzo(a)anthracene	0.34
218-01-9	Chrysene	1.4
205-99-2	Benzo(b)fluoranthene	0.73
207-08-9	Benzo(k)fluoranthene	0.70
50-32-8	Benzo(a)pyrene	0.44
193-39-5	Indeno(1,2,3-cd)pyrene	0.36
53-70-3	Dibenz(a,h)anthracene	0.12
191-24-2	Benzo(g,h,i)perylene	0.36
132-64-9	Dibenzofuran	0.29

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	79.7%
d14-Dibenzo(a,h)anthracene	83.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET **Sample No: SW-2**
PNAs by Selected Ion Monitoring GC/MS

Lab Sample ID: DB11B
LIMS ID: 01-6829
Matrix: Water
Data Release Authorized:
Reported: 05/08/01

QC Report No: DB11-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 04/29/01
Date Received: 04/30/01

Date extracted: 05/02/01
Date analyzed: 05/04/01 13:28
Instrument: NT1

Sample Volume: 500 mL
Final Extract Volume: 0.50 mL
Conc/Dilution Factor: 1:1

CAS Number	Analyte	ug/L
91-20-3	Naphthalene	0.10 U
91-57-6	2-Methylnaphthalene	0.10 U
208-96-8	Acenaphthylene	0.10 U
83-32-9	Acenaphthene	0.10 U
86-73-7	Fluorene	0.10 U
85-01-8	Phenanthrene	0.10 U
120-12-7	Anthracene	0.10 U
206-44-0	Fluoranthene	0.10 U
129-00-0	Pyrene	0.10 U
56-55-3	Benzo(a)anthracene	0.10 U
218-01-9	Chrysene	0.10 U
205-99-2	Benzo(b)fluoranthene	0.10 U
207-08-9	Benzo(k)fluoranthene	0.10 U
50-32-8	Benzo(a)pyrene	0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10 U
132-64-9	Dibenzofuran	0.10 U

Base/Neutral Surrogate Recovery	
d10-2-Methylnaphthalene	75.0%
d14-Dibenzo(a,h)anthracene	89.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNA's by Selected Ion Monitoring GC/MS

Lab Sample ID: DB11LC
LIMS ID: 01-6828
Matrix: Water

QC Report No: DB11-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 05/08/01

LABORATORY CONTROL SAMPLE
Extracted: 05/02/01
Analyzed: 05/04/01

CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
Phenanthrene	2.75	3.00	91.7%
Chrysene	2.68	3.00	89.3%
Benzo(k)fluoranthene	2.63	3.00	87.7%

Values reported in ug/L

Spike Blank Surrogate Recovery

d10-2-Methylnaphthalene	80.0%
d14-Dibenzo(a,h)anthracene	100%

ANALYTICAL RESOURCES INCORPORATED

WATER AROCLOR SURROGATE SUMMARY

Matrix: Water

QC Report No: DB11
Project: Tacoma Metals
996098.00

LIMS ID	Lab ID	Client ID	TCMX #	DCBP #	TOT OUT
01-6828MB	050301MB	Method Blank	83.0%	57.5%	0
01-6828SB	050301SB	Lab Control	87.0%	64.0%	0
01-6828	DB11A	SW-1	84.0%	65.0%	0
01-6829	DB11B	SW-2	78.0%	65.0%	0

	QC LIMITS
(TCMX) = Tetrachloro-m-xylene	(34-112)
(DCBP) = Decachlorobiphenyl	(22-139)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D Surrogate Compound diluted out

FORM-II PCB

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: Method Blank

Lab Sample ID: DB11MB
LIMS ID: 01-6828
Matrix: Water

QC Report No: DB11-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized: C/H
Reported: 05/15/01 5/15/01

Date extracted: 05/03/01
Date analyzed: 05/14/01 17:41
Instrument ID: ECD4
Sample Amount: 500 mL
Final Ext Vol: 5.0 mL

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value	
12674-11-2	Aroclor 1016	1.0	U
53469-21-9	Aroclor 1242	1.0	U
12672-29-6	Aroclor 1248	1.0	U
11097-69-1	Aroclor 1254	1.0	U
11096-82-5	Aroclor 1260	1.0	U
11104-28-2	Aroclor 1221	2.0	U
11141-16-5	Aroclor 1232	1.0	U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	57.5%
Tetrachlorometaxylene	83.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: SW-1

Lab Sample ID: DB11A
LIMS ID: 01-6828
Matrix: Water

QC Report No: DB11-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 04/29/01
Date Received: 04/30/01

Data Release Authorized: CK
Reported: 05/15/01 5/15/01

Date extracted: 05/03/01
Date analyzed: 05/14/01 18:52
Instrument ID: ECD4
Sample Amount: 500 mL
Final Ext Vol: 5.0 mL

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	**Aroclor 1254**	1.8
11096-82-5	Aroclor 1260	1.0 U
11104-28-2	Aroclor 1221	2.0 U
11141-16-5	Aroclor 1232	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	65.0%
Tetrachlorometaxylene	84.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: SW-2

Lab Sample ID: DB11B
LIMS ID: 01-6829
Matrix: Water

QC Report No: DB11-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 04/29/01
Date Received: 04/30/01

Data Release Authorized: CH
Reported: 05/15/01 5/15/01

Date extracted: 05/03/01
Date analyzed: 05/14/01 19:27
Instrument ID: ECD4
Sample Amount: 500 mL
Final Ext Vol: 5.0 mL

GPC Cleanup: No
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	1.0 U
53469-21-9	Aroclor 1242	1.0 U
12672-29-6	Aroclor 1248	1.0 U
11097-69-1	Aroclor 1254	1.0 U
11096-82-5	Aroclor 1260	1.0 U
11104-28-2	Aroclor 1221	2.0 U
11141-16-5	Aroclor 1232	1.0 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	65.0%
Tetrachlorometaxylene	78.0%

Data Qualifiers

J Indicates an estimated value when that result is less than the calculated detection limit.
E Indicates a value above the linear range of the detector. Dilution Required
S Indicates no value reported due to saturation of the detector.
D Indicates the surrogate was diluted out.
U Indicates compound was analyzed for, but not detected at the given detection limit.
B Found in associated method blank
NA Indicates compound was not analyzed.
NR Indicates no recovery due to interferences.
Y Indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Lab Sample ID: DB11SB
LIMS ID: 01-6828
Matrix: Water

QC Report No: DB11-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized: c/f
Reported: 05/15/01 5/15/01

LABORATORY CONTROL SAMPLE RECOVERY
Date extracted: 05/03/01

CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	9.00	10.1	89.3%

Aroclor Surrogate Recoveries

Decachlorobiphenyl	64.0%
Tetrachlorometaxylene	87.0%

Values reported in ug/L

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL HYDROCARBONS COMPOUND SUMMARY

Matrix: Water

QC Report No: DB11

LIMS ID	Lab ID	Extracted	Client ID	MeArach	TOT OUT
01-6828MB	050501MB	05/03/01	Method Blank	97%	0
01-6828LC	050501LC	05/03/01	Lab Control	88%	0
01-6828	DB11A	05/03/01	SW-1	80%	0
01-6829	DB11B	05/03/01	SW-2	61%	0

	Control QC LIMITS	Sample QC LIMITS
(MeArach) = Methylarachidate	(65-118)	(54-133)

\# Column to be used to flag recovery values

* Values outside of required QC limits

D System Monitoring Compound diluted out

FORM-II TPHD

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID
and Motor Oil

ANALYTICAL RESOURCES INCORPORATED

Lab ID: 01-6828
Matrix: Water

QC Report No: DB11-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Received: 04/30/01

Data Release Authorized: CH
Reported: 05/10/01 5/10/01

Lab ID	Sample ID	Date Extracted	Date Analyzed	Dilution Factor	Diesel Range	*HC ID	Motor Oil Range	Surr Rec
DB11MB	Method Blank	05/03/01	05/05/01	1:1	0.25 U	---	0.50 U	97.0%
DB11A	**SW-1**	05/03/01	05/05/01	1:1	**3.2**	NO	**3.2**	80.0%
DB11B	**SW-2**	05/03/01	05/05/01	1:1	**2.8**	NO	**1.4**	61.0%

Surrogate is Methyl-Arachidate.

* ID indicates, in the opinion of the analyst, the petroleum product with the best pattern match. 'NO' indicates that there was not a good match for any of the requested products.
Values reported in ppm (mg/L)
Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.

Data Qualifiers

U	Compound not detected at the given detection limit.
J	Indicates an estimated value below the calculated detection limit.
S	No value reported due to saturation of the detector. Dilution required.
D	Indicates the surrogate was not detected because of dilution of the extract.
E	Indicates a value above the linear range of the detector. Dilution required.
NR	Indicates no recovery due to matrix interference.
B	Indicates compound also detected in the method blank.

FORM-1 TPHD

TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD Range C12 to C24 by GC/FID

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: DB11SB
LIMS ID: 01-6828
Matrix: Water

QC Report No: DB11-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized: CH
Reported: 05/10/01 5/10/01

LABORATORY CONTROL SAMPLE RECOVERY REPORT
Extracted: 05/03/01
Analyzed 05/05/01

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
Diesel Range Hydrocarbons	2.27	2.50	90.8%

TPHd Surrogate Recovery

Methylarachidate 88.0%

Values reported in parts per million (mg/L)

FORM-III

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: Method Blank**
TOTAL METALS

Lab Sample ID: DB11MB
LIMS ID: 01-6828
Matrix: Water

QC Report No: DB11-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized:
Reported: 05/10/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010A	05/01/01	6010B	05/08/01	7440-38-2	Arsenic	0.05	0.05 U
3010A	05/01/01	6010B	05/08/01	7440-39-3	Barium	0.003	0.003 U
3010A	05/01/01	6010B	05/08/01	7440-43-9	Cadmium	0.002	0.002 U
3010A	05/01/01	6010B	05/08/01	7440-47-3	Chromium	0.005	0.005 U
3010A	05/01/01	6010B	05/08/01	7440-50-8	Copper	0.002	0.002 U
3010A	05/01/01	6010B	05/08/01	7439-92-1	Lead	0.02	0.02 U
7470A	05/01/01	7470A	05/02/01	7439-97-6	Mercury	0.0001	0.0001 U
3010A	05/01/01	6010B	05/08/01	7782-49-2	Selenium	0.05	0.05 U
3010A	05/01/01	6010B	05/08/01	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: SW-1

Lab Sample ID: DB11A
LIMS ID: 01-6828
Matrix: Water

QC Report No: DB11-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 04/29/01
Date Received: 04/30/01

Data Release Authorized
Reported: 05/10/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010A	05/01/01	6010B	05/08/01	7440-38-2	Arsenic	0.05	0.05 U
3010A	05/01/01	6010B	05/08/01	7440-39-3	Barium	0.003	0.049
3010A	05/01/01	6010B	05/08/01	7440-43-9	Cadmium	0.002	0.002
3010A	05/01/01	6010B	05/08/01	7440-47-3	Chromium	0.005	0.008
3010A	05/01/01	6010B	05/08/01	7440-50-8	Copper	0.002	0.437
3010A	05/01/01	6010B	05/08/01	7439-92-1	Lead	0.02	0.36
7470A	05/01/01	7470A	05/02/01	7439-97-6	Mercury	0.0001	0.0009
3010A	05/01/01	6010B	05/08/01	7782-49-2	Selenium	0.05	0.05 U
3010A	05/01/01	6010B	05/08/01	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: SW-2**
TOTAL METALS

Lab Sample ID: DB11B
LIMS ID: 01-6829
Matrix: Water

QC Report No: DB11-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 04/29/01
Date Received: 04/30/01

Data Release Authorized:
Reported: 05/10/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010A	05/01/01	6010B	05/08/01	7440-38-2	Arsenic	0.05	0.05 U
3010A	05/01/01	6010B	05/08/01	**7440-39-3**	**Barium**	0.003	**0.027**
3010A	05/01/01	6010B	05/08/01	**7440-43-9**	**Cadmium**	0.002	**0.005**
3010A	05/01/01	6010B	05/08/01	7440-47-3	Chromium	0.005	0.005 U
3010A	05/01/01	6010B	05/08/01	**7440-50-8**	**Copper**	0.002	**0.231**
3010A	05/01/01	6010B	05/08/01	7439-92-1	Lead	0.02	0.02 U
7470A	05/01/01	7470A	05/02/01	**7439-97-6**	**Mercury**	0.0001	**0.0003**
3010A	05/01/01	6010B	05/08/01	7782-49-2	Selenium	0.05	0.05 U
3010A	05/01/01	6010B	05/08/01	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: DB11LCS
LIMS ID: 01-6828
Matrix: Water

QC Report No: DB11-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 05/10/01

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Spike mg/L	Spike Added	% Recovery	Q
Arsenic	2.00	2.00	100%	
Barium	1.97	2.00	98.5%	
Cadmium	0.483	0.500	96.6%	
Chromium	0.491	0.500	98.2%	
Copper	0.492	0.500	98.4%	
Lead	1.98	2.00	99.0%	
Mercury	0.0021	0.0020	105%	
Selenium	2.03	2.00	102%	
Silver	0.491	0.500	98.2%	

'Q' codes: N = control limit not met

Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET **Sample No: Method Blank**
DISSOLVED METALS

Lab Sample ID: DB11MB
LIMS ID: 01-6830
Matrix: Water

QC Report No: DB11-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized
Reported: 05/10/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
6010B	05/01/01	6010B	05/08/01	7440-38-2	Arsenic	0.05	0.05 U
6010B	05/01/01	6010B	05/08/01	7440-39-3	Barium	0.003	0.003 U
6010B	05/01/01	6010B	05/08/01	7440-43-9	Cadmium	0.002	0.002 U
6010B	05/01/01	6010B	05/08/01	7440-47-3	Chromium	0.005	0.005 U
6010B	05/01/01	6010B	05/08/01	7440-50-8	Copper	0.002	0.002 U
6010B	05/01/01	6010B	05/08/01	7439-92-1	Lead	0.02	0.02 U
7470A	05/01/01	7470A	05/02/01	7439-97-6	Mercury	0.0001	0.0001 U
6010B	05/01/01	6010B	05/08/01	7782-49-2	Selenium	0.05	0.05 U
6010B	05/01/01	6010B	05/08/01	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET **Sample No: SW-1 (D)**
DISSOLVED METALS

Lab Sample ID: DB11C
LIMS ID: 01-6830
Matrix: Water

QC Report No: DB11-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 04/29/01
Date Received: 04/30/01

Data Release Authorized:
Reported: 05/10/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
6010B	05/01/01	6010B	05/08/01	7440-38-2	Arsenic	0.05	0.05 U
6010B	05/01/01	6010B	05/08/01	**7440-39-3**	**Barium**	0.003	**0.021**
6010B	05/01/01	6010B	05/08/01	7440-43-9	Cadmium	0.002	0.002 U
6010B	05/01/01	6010B	05/08/01	7440-47-3	Chromium	0.005	0.005 U
6010B	05/01/01	6010B	05/08/01	**7440-50-8**	**Copper**	0.002	**0.181**
6010B	05/01/01	6010B	05/08/01	7439-92-1	Lead	0.02	0.02 U
7470A	05/01/01	7470A	05/02/01	**7439-97-6**	**Mercury**	0.0001	**0.0002**
6010B	05/01/01	6010B	05/08/01	7782-49-2	Selenium	0.05	0.05 U
6010B	05/01/01	6010B	05/08/01	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANIC ANALYSIS DATA SHEET
DISSOLVED METALS

Sample No: SW-2 (D)

Lab Sample ID: DB11D
LIMS ID: 01-6831
Matrix: Water

QC Report No: DB11-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 04/29/01
Date Received: 04/30/01

Data Release Authorized:
Reported: 05/10/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
6010B	05/01/01	6010B	05/08/01	7440-38-2	Arsenic	0.05	0.05 U
6010B	05/01/01	6010B	05/08/01	**7440-39-3**	**Barium**	0.003	**0.027**
6010B	05/01/01	6010B	05/08/01	**7440-43-9**	**Cadmium**	0.002	**0.005**
6010B	05/01/01	6010B	05/08/01	7440-47-3	Chromium	0.005	0.005 U
6010B	05/01/01	6010B	05/08/01	**7440-50-8**	**Copper**	0.002	**0.240**
6010B	05/01/01	6010B	05/08/01	7439-92-1	Lead	0.02	0.02 U
7470A	05/01/01	7470A	05/02/01	**7439-97-6**	**Mercury**	0.0001	**0.0002**
6010B	05/01/01	6010B	05/08/01	7782-49-2	Selenium	0.05	0.05 U
6010B	05/01/01	6010B	05/08/01	7440-22-4	Silver	0.003	0.003 U

U Analyte undetected at given RL

RL Reporting Limit

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: DB11LCS
LIMS ID: 01-6830
Matrix: Water

QC Report No: DB11-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 05/10/01

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Spike mg/L	Spike Added	% Recovery	Q
Arsenic	2.12	2.00	106%	
Barium	2.04	2.00	102%	
Cadmium	0.533	0.500	107%	
Chromium	0.516	0.500	103%	
Copper	0.506	0.500	101%	
Lead	2.12	2.00	106%	
Mercury	0.0021	0.0020	105%	
Selenium	2.13	2.00	106%	
Silver	0.520	0.500	104%	

'Q' codes: N = control limit not met
NA = Not applicable - analyte not spiked

Control Limits: 80-120%

FORM-VII

Analytical Resources, Incorporated
Analytical Chemists and Consultants

30, May 2001

Jodie Brundage
Kennedy Jenks Consultants
530 South 336th Street
Federal Way, WA 98003

RE: Project: Tacoma Metals
ARI Job: DD-59

Dear Jodie:

Please find enclosed additional analysis requests and final analytical results for the above referenced project. Two water samples were retrieved from sample archive per your request on May 23, 2001.

Selected samples were analyzed for total metals referencing EPA method 6010 and hardness via calculation.

No analytical complications were noted. Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Susan Snyder
Project Manager
susan@arilabs.com

SS/ss
Enclosures

RECEIVED
JUN 05 2001
K/J Federal Way
K/J No/File
Route
Return To/By

333 Ninth Avenue North • Seattle WA 98109-5187 • **206-621-6490** • **206-621-7523** fax

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: DD59LCS
LIMS ID: 01-8483
Matrix: Water

QC Report No: DD59-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00

Data Release Authorized:
Reported: 05/29/01

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Spike mg/L	Spike Added	% Recovery	Q
Calcium	8.77	10.0	87.7%	
Magnesium	9.02	10.0	90.2%	

'Q' codes: N = control limit not met

ontrol Limits: 80-120%

FORM-VII

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: SW-2**
TOTAL METALS

Lab Sample ID: DD59B
LIMS ID: 01-8484
Matrix: Water

QC Report No: DD59-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/13/01
Date Received: 03/13/01

Data Release Authorized:
Reported: 05/29/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010A	05/23/01	6010B	05/25/01	**7440-70-2**	**Calcium**	0.05	**9.61**
3010A	05/23/01	6010B	05/25/01	**7439-95-4**	**Magnesium**	0.02	**1.96**

Calculated Hardness (mg-CaCO3/L): 32

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: SW-1

Lab Sample ID: DD59A
LIMS ID: 01-8483
Matrix: Water

QC Report No: DD59-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: 03/13/01
Date Received: 03/13/01

Data Release Authorized:
Reported: 05/29/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010A	05/23/01	6010B	05/25/01	7440-70-2	Calcium	0.05	7.81
3010A	05/23/01	6010B	05/25/01	7439-95-4	Magnesium	0.02	2.31

Calculated Hardness (mg-CaCO3/L): 29

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: Method Blank**
TOTAL METALS

Lab Sample ID: DD59MB
LIMS ID: 01-8483
Matrix: Water

QC Report No: DD59-Kennedy Jenks Consultants
Project: Tacoma Metals
996098.00
Date Sampled: NA
Date Received: NA

Data Release Authorized:
Reported: 05/29/01

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
3010A	05/23/01	6010B	05/25/01	7440-70-2	Calcium	0.05	0.05 U
3010A	05/23/01	6010B	05/25/01	7439-95-4	Magnesium	0.02	0.02 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

Appendix N

Input Parameters to VLEACH Model

```
|-------------------------------------------------------------|
|                 VLEACH (Version 2.2a, 1996)                 |
|                                                             |
|                            By:                              |
|        Varadhan Ravi and Jeffrey A. Johnson                 |
|                  (USEPA Contractors)                        |
|        Center for Subsurface Modeling Support               |
|        Robert S. Kerr Environmental Research Laboratory     |
|        U.S. Environmental Protection Agency                 |
|        P.O. Box 1198                                        |
|        Ada, OK 74820                                        |
|                                                             |
|        Based on the original VLEACH (version 1.0)           |
|        developed by CH2M Hill, Redding, California          |
|        for USEPA Region IX                                  |
|-------------------------------------------------------------|
```

TACOMA METALS FACILITY, TACOMA, WA, NAPHTHALENE, TP-40, TP-46, TP-61.
1 polygons.
Timestep = 0.10 years. Simulation length = 500.00 years.
Printout every 50.00 years. Vertical profile stored every 50.00 years.
Koc = 55228. ml/g, 1.9503 cu.ft./g
Kh = 0.19000E-01 (dimensionless).
Aqueous solubility = 31.000 mg/l, 0.87783 g/cu.ft
Free air diffusion coefficient = .51000 sq. m/day, 2003.8 sq.ft./yr

Polygon 1
NAPHTHALENE, TP-40, TP-46, TP-61
Polygon area = 1.0000 sq. ft.
20 cells, each cell 0.500 ft. thick.
Soil Properties:
Bulk density = 1.3500 g/ml, 38228. g/cu.ft.
Porosity = 0.4900 Volumetric water content = 0.2600
Organic carbon content = 0.03100000
Recharge Rate = 0.03000000 ft/yr
Conc. in recharge water = 0.00000 mg/l, 0.00000 g/cu.ft
Atmospheric concentration = 0.00000 mg/l, 0.00000 g/cu.ft
Water table has a fixed concentration of 0.00000 mg/l, 0.00000 g/cu.ft.
with respect to gas diffusion.

```
TACOMA METALS FACILITY, TACOMA, WA, NAPHTHALENE, TP-40, TP-46, TP-61.
 1
        .1       500.         50         50
    55228.      0.019         31       0.51
NAPHTHALENE, TP-40, TP-46, TP-61
        1.         .5       0.03       1.35       .49         .26    0.031
       0.0         0.         0.
   20y       100.
    1    2       980.
    3    4      1890.
    5    6      2800.
    7    8      1505.
    9   10       210.
   11   12       210.
   13   20         0.
```

```
|-------------------------------------------------------------|
|                 VLEACH (Version 2.2a, 1996)                 |
|                                                             |
|                            By:                              |
|        Varadhan Ravi and Jeffrey A. Johnson                 |
|                  (USEPA Contractors)                        |
|        Center for Subsurface Modeling Support               |
|        Robert S. Kerr Environmental Research Laboratory     |
|        U.S. Environmental Protection Agency                 |
|        P.O. Box 1198                                        |
|        Ada, OK 74820                                        |
|                                                             |
|        Based on the original VLEACH (version 1.0)           |
|        developed by CH2M Hill, Redding, California          |
|        for USEPA Region IX                                  |
|-------------------------------------------------------------|
```

TACOMA METALS FACILITY, TACOMA, WA, CHRYSENE, TP-40, TP-43, TP-46.
1 polygons.
Timestep = 0.10 years. Simulation length = 500.00 years.
Printout every 50.00 years. Vertical profile stored every 50.00 years.
Koc = 0.13000E+08ml/g, 459.09 cu.ft./g
Kh = 0.10000E-03 (dimensionless).
Aqueous solubility = 0.20000E-02 mg/l, 0.56634E-04 g/cu.ft
Free air diffusion coefficient = .21000 sq. m/day, 825.09 sq.ft./yr

Polygon 1
CHRYSENE, TP-40, TP-43, TP-46
Polygon area = 1.0000 sq. ft.
20 cells, each cell 0.500 ft. thick.
Soil Properties:
Bulk density = 1.3500 g/ml, 38228. g/cu.ft.
Porosity = 0.4900 Volumetric water content = 0.2600
Organic carbon content = 0.03100000
Recharge Rate = 0.03000000 ft/yr
Conc. in recharge water = 0.00000 mg/l, 0.00000 g/cu.ft
Atmospheric concentration = 0.00000 mg/l, 0.00000 g/cu.ft
Water table has a fixed concentration of 0.00000 mg/l, 0.00000 g/cu.ft.
with respect to gas diffusion.

```
 TACOMA METALS FACILITY, TACOMA, WA, CHRYSENE, TP-40, TP-43, TP-46.
  1
        .1       500.         50         50
 13000000.    0.0001      0.002       0.21
CHRYSENE, TP-40, TP-43, TP-46
        1.        .5      0.030       1.35       .49         .26   0.031
       0.0         0.         0.
   20y       100.
    1    2    41000.
    3    4    22950.
    5    6     4900.
    7    8     2675.
    9   10      450.
   11   12      450.
   13   20        0.
```

TACHYS 1.P

```
|-----------------------------------------------------------|
|                 VLEACH (Version 2.2a, 1996)               |
|                                                           |
|                            By:                            |
|        Varadhan Ravi and Jeffrey A. Johnson               |
|                  (USEPA Contractors)                      |
|        Center for Subsurface Modeling Support             |
|        Robert S. Kerr Environmental Research Laboratory   |
|        U.S. Environmental Protection Agency               |
|        P.O. Box 1198                                      |
|        Ada, OK 74820                                      |
|                                                           |
|        Based on the original VLEACH (version 1.0)         |
|        developed by CH2M Hill, Redding, California        |
|        for USEPA Region IX                                |
|-----------------------------------------------------------|
```

```
TACOMA METALS FACILITY, BENZO K FLUORANTHENE, TP-40, TP-46, TP-61.
  1 polygons.
Timestep =    0.10 years.  Simulation length =  500.00 years.
Printout every  50.00 years.  Vertical profile stored every  50.00 years.
Koc =      0.56000E+08ml/g,       1977.6     cu.ft./g
Kh =     0.22000E-05 (dimensionless).
Aqueous solubility =     0.13000E-02 mg/l,      0.36812E-04 g/cu.ft
Free air diffusion coefficient = .19500     sq. m/day,  766.15     sq.ft./yr


Polygon   1
BENZO K FLUORANTHENE, TP-40, TP-46, TP-61
Polygon area =      1.0000    sq. ft.
 20 cells, each cell  0.500 ft. thick.
Soil Properties:
 Bulk density =     1.3500    g/ml,       38228.    g/cu.ft.
 Porosity = 0.4900 Volumetric water content = 0.2600
 Organic carbon content = 0.03100000
Recharge Rate = 0.03000000 ft/yr
Conc. in recharge water =     0.00000    mg/l,      0.00000    g/cu.ft
Atmospheric concentration =     0.00000    mg/l,      0.00000    g/cu.ft
Water table has a fixed concentration of     0.00000    mg/l,      0.00000
g/cu.ft.
   with respect to gas diffusion.
```

```
TACOMA METALS FACILITY, BENZO K FLUORANTHENE, TP-40, TP-46, TP-61.
  1
        .1      500.        50        50
 56000000. 0.0000022    0.0013     0.195
BENZO K FLUORANTHENE, TP-40, TP-46, TP-61
        1.       .5      0.030      1.35      .49        .26   0.031
       0.0        0.        0.
   20y      100.
    1    2    23000.
    3    4    12850.
    5    6     2700.
    7    8     1500.
    9   10      300.
   11   12      300.
   13   20        0.
```

```
|-------------------------------------------------------------|
|                 VLEACH (Version 2.2a, 1996)                 |
|                                                             |
|                            By:                              |
|        Varadhan Ravi and Jeffrey A. Johnson                 |
|                  (USEPA Contractors)                        |
|        Center for Subsurface Modeling Support               |
|        Robert S. Kerr Environmental Research Laboratory     |
|        U.S. Environmental Protection Agency                 |
|        P.O. Box 1198                                        |
|        Ada, OK 74820                                        |
|                                                             |
|        Based on the original VLEACH (version 1.0)           |
|        developed by CH2M Hill, Redding, California          |
|        for USEPA Region IX                                  |
|-------------------------------------------------------------|
```

TACOMA METALS FACILITY, BENZO (B) FLUORANTHENE, TP-40, TP-46, TP-61.
1 polygons.
Timestep = 0.10 years. Simulation length = 500.00 years.
Printout every 50.00 years. Vertical profile stored every 50.00 years.
Koc = 0.53000E+08ml/g, 1871.7 cu.ft./g
Kh = 0.10000E-02 (dimensionless).
Aqueous solubility = 0.79000E-02 mg/l, 0.22370E-03 g/cu.ft
Free air diffusion coefficient = .19500 sq. m/day, 766.15 sq.ft./yr

Polygon 1
BENZO B FLUORANTHENE, TP-40, TP-46, TP-61
Polygon area = 1.0000 sq. ft.
20 cells, each cell 0.500 ft. thick.
Soil Properties:
Bulk density = 1.3500 g/ml, 38228. g/cu.ft.
Porosity = 0.4900 Volumetric water content = 0.2600
Organic carbon content = 0.03100000
Recharge Rate = 0.03000000 ft/yr
Conc. in recharge water = 0.00000 mg/l, 0.00000 g/cu.ft
Atmospheric concentration = 0.00000 mg/l, 0.00000 g/cu.ft
Water table has a fixed concentration of 0.00000 mg/l, 0.00000 g/cu.ft.
with respect to gas diffusion.

```
TACOMA METALS FACILITY, BENZO (B) FLUORANTHENE, TP-40, TP-46, TP-61.
  1
        .1       500.         50         50
 53000000.     0.001    0.0079     0.195
BENZO B FLUORANTHENE, TP-40, TP-46, TP-61
        1.        .5      0.030      1.35      .49        .26   0.031
       0.0        0.         0.
   20y       100.
    1    2    24000.
    3    4    13450.
    5    6     2900.
    7    8     1600.
    9   10      300.
   11   12      300.
   13   20        0.
```

```
|-------------------------------------------------------------|
|                 VLEACH (Version 2.2a, 1996)                 |
|                                                             |
|                            By:                              |
|        Varadhan Ravi and Jeffrey A. Johnson                 |
|                  (USEPA Contractors)                        |
|        Center for Subsurface Modeling Support               |
|        Robert S. Kerr Environmental Research Laboratory     |
|        U.S. Environmental Protection Agency                 |
|        P.O. Box 1198                                        |
|        Ada, OK 74820                                        |
|                                                             |
|        Based on the original VLEACH (version 1.0)           |
|        developed by CH2M Hill, Redding, California          |
|        for USEPA Region IX                                  |
|-------------------------------------------------------------|
```

```
TACOMA METALS FACILITY, BENZO A PYRENE, TP-40, TP-46, TP-61.
  1 polygons.
Timestep =   0.10 years.  Simulation length =  500.00 years.
Printout every  50.00 years.  Vertical profile stored every  50.00 years.
Koc =     0.85000E+08ml/g,       3001.7    cu.ft./g
Kh =     0.10000E-03 (dimensionless).
Aqueous solubility =    0.32000E-02 mg/l,     0.90614E-04 g/cu.ft
Free air diffusion coefficient = .37000     sq. m/day,  1453.7     sq.ft./yr


Polygon   1
BENZO A PYRENE, TP-40, TP-46, TP-61
Polygon area =      1.0000    sq. ft.
 20 cells, each cell  0.500 ft. thick.
Soil Properties:
 Bulk density =     1.3500    g/ml,       38228.    g/cu.ft.
 Porosity = 0.4900 Volumetric water content = 0.2600
 Organic carbon content = 0.03100000
Recharge Rate = 0.03000000 ft/yr
Conc. in recharge water =     0.00000    mg/l,      0.00000    g/cu.ft
Atmospheric concentration =     0.00000    mg/l,      0.00000    g/cu.ft
Water table has a fixed concentration of     0.00000    mg/l,      0.00000
g/cu.ft.
   with respect to gas diffusion.
```

```
TACOMA METALS FACILITY, BENZO A PYRENE, TP-40, TP-46, TP-61.
  1
        .1       500.        50        50
 85000000.    0.0001    0.0032      0.37
BENZO A PYRENE, TP-40, TP-46, TP-61
        1.        .5      0.030      1.35       .49        .26   0.031
       0.0        0.        0.
   20y       100.
    1    2    28000.
    3    4    15450.
    5    6     2900.
    7    8     1605.
    9   10      310.
   11   12      310.
   13   20        0.
```

```
|-------------------------------------------------------------|
|                VLEACH (Version 2.2a, 1996)                  |
|                                                             |
|                            By:                              |
|        Varadhan Ravi and Jeffrey A. Johnson                 |
|                  (USEPA Contractors)                        |
|        Center for Subsurface Modeling Support               |
|        Robert S. Kerr Environmental Research Laboratory     |
|        U.S. Environmental Protection Agency                 |
|        P.O. Box 1198                                        |
|        Ada, OK 74820                                        |
|                                                             |
|        Based on the original VLEACH (version 1.0)           |
|        developed by CH2M Hill, Redding, California          |
|        for USEPA Region IX                                  |
|-------------------------------------------------------------|
```

TACOMA METALS FACILITY, BENZO A ANTHRACENE, TP-40, TP-46, TP-61.
1 polygons.
Timestep = 0.10 years. Simulation length = 500.00 years.
Printout every 50.00 years. Vertical profile stored every 50.00 years.
Koc = 0.18500E+08ml/g, 653.32 cu.ft./g
Kh = 0.10000E-03 (dimensionless).
Aqueous solubility = 0.17000E-01 mg/l, 0.48139E-03 g/cu.ft
Free air diffusion coefficient = .44000 sq. m/day, 1728.8 sq.ft./yr

Polygon 1
BENZO A ANTHRACENE, TP-40, TP-46, TP-61
Polygon area = 1.0000 sq. ft.
20 cells, each cell 0.500 ft. thick.
Soil Properties:
Bulk density = 1.3500 g/ml, 38228. g/cu.ft.
Porosity = 0.4900 Volumetric water content = 0.2600
Organic carbon content = 0.03100000
Recharge Rate = 0.03000000 ft/yr
Conc. in recharge water = 0.00000 mg/l, 0.00000 g/cu.ft
Atmospheric concentration = 0.00000 mg/l, 0.00000 g/cu.ft
Water table has a fixed concentration of 0.00000 mg/l, 0.00000 g/cu.ft.
with respect to gas diffusion.

```
TACOMA METALS FACILITY, BENZO A ANTHRACENE, TP-40, TP-46, TP-61.
  1
        .1       500.        50        50
 18500000.    0.0001     0.017      0.44
BENZO A ANTHRACENE, TP-40, TP-46, TP-61
        1.        .5     0.030      1.35      .49        .26   0.031
       0.0        0.        0.
   20y      100.
    1    2    33000.
    3    4    18550.
    5    6     4100.
    7    8     2175.
    9   10      250.
   11   12      250.
   13   20        0.
```

```
|-----------------------------------------------------------|
|                VLEACH (Version 2.2a, 1996)                |
|                                                           |
|                            By:                            |
|        Varadhan Ravi and Jeffrey A. Johnson               |
|                  (USEPA Contractors)                      |
|        Center for Subsurface Modeling Support             |
|        Robert S. Kerr Environmental Research Laboratory   |
|        U.S. Environmental Protection Agency               |
|        P.O. Box 1198                                      |
|        Ada, OK 74820                                      |
|                                                           |
|        Based on the original VLEACH (version 1.0)         |
|        developed by CH2M Hill, Redding, California        |
|        for USEPA Region IX                                |
|-----------------------------------------------------------|
```

```
TACOMA METALS FACILITY, DIBENZ A,H ANTHRACENE, TP-40, TP-46, TP-61.
  1 polygons.
Timestep =   0.10 years.  Simulation length =  500.00 years.
Printout every  50.00 years.  Vertical profile stored every  50.00 years.
Koc =     0.33000E+07ml/g,       116.54    cu.ft./g
Kh =     0.30000E-05 (dimensionless).
Aqueous solubility =    0.90000E-03 mg/l,     0.25485E-04 g/cu.ft
Free air diffusion coefficient = .17000     sq. m/day,  667.93     sq.ft./yr


Polygon   1
DIBENZ A,H ANTHRACENE, TP-40, TP-46, TP-61
Polygon area =      1.0000    sq. ft.
 20 cells, each cell  0.500 ft. thick.
Soil Properties:
 Bulk density =     1.3500    g/ml,        38228.    g/cu.ft.
 Porosity = 0.4900 Volumetric water content = 0.2600
 Organic carbon content = 0.03100000
Recharge Rate = 0.03000000 ft/yr
Conc. in recharge water =     0.00000    mg/l,       0.00000    g/cu.ft
Atmospheric concentration =     0.00000    mg/l,       0.00000    g/cu.ft
Water table has a fixed concentration of     0.00000    mg/l,       0.00000
g/cu.ft.
   with respect to gas diffusion.
```

```
TACOMA METALS FACILITY, DIBENZ A,H ANTHRACENE, TP-40, TP-46, TP-61.
  1
        .1       500.        50        50
  3300000.  0.000003    0.0009      0.17
DIBENZ A,H ANTHRACENE, TP-40, TP-46, TP-61
        1.        .5      0.030      1.35      .49        .26   0.031
       0.0        0.        0.
   20y       100.
    1    2     4800.
    3    4     2705.
    5    6      610.
    7    8      352.
    9   10       94.
   11   12       94.
   13   20        0.
```

```
|-----------------------------------------------------------|
|                VLEACH (Version 2.2a, 1996)                |
|                                                           |
|                            By:                            |
|        Varadhan Ravi and Jeffrey A. Johnson               |
|                  (USEPA Contractors)                      |
|        Center for Subsurface Modeling Support             |
|        Robert S. Kerr Environmental Research Laboratory   |
|        U.S. Environmental Protection Agency               |
|        P.O. Box 1198                                      |
|        Ada, OK 74820                                      |
|                                                           |
|        Based on the original VLEACH (version 1.0)         |
|        developed by CH2M Hill, Redding, California        |
|        for USEPA Region IX                                |
|-----------------------------------------------------------|
```

```
TACOMA METALS FACILITY, AROCLOR 1248, TP-43, TP-59.
  1 polygons.
Timestep =   0.10 years.  Simulation length =  500.00 years.
Printout every  50.00 years.  Vertical profile stored every  50.00 years.
Koc =     0.11600E+08ml/g,       409.65    cu.ft./g
Kh =     0.89000E-01 (dimensionless).
Aqueous solubility =    0.60000E-01 mg/l,     0.16990E-02 g/cu.ft
Free air diffusion coefficient = .00000     sq. m/day,  .00000     sq.ft./yr


Polygon   1
AROCLOR 1248, TP-43, TP-59
Polygon area =      1.0000    sq. ft.
 20 cells, each cell  0.500 ft. thick.
Soil Properties:
 Bulk density =     1.3500    g/ml,       38228.    g/cu.ft.
 Porosity = 0.4900 Volumetric water content = 0.2600
 Organic carbon content = 0.03100000
Recharge Rate = 0.03000000 ft/yr
Conc. in recharge water =     0.00000    mg/l,      0.00000    g/cu.ft
Atmospheric concentration =     0.00000    mg/l,      0.00000    g/cu.ft
Water table has a fixed concentration of     0.00000    mg/l,      0.00000
g/cu.ft.
   with respect to gas diffusion.
```

```
TACOMA METALS FACILITY, AROCLOR 1248, TP-43, TP-59.
  1
        .1       500.        50        50
 11600000.     0.089      0.06         0
AROCLOR 1248, TP-43, TP-59
        1.        .5     0.030      1.35       .49        .26    0.031
       0.0        0.        0.
   20y       100.
    1    2    13000.
    3    4     7450.
    5    6     1900.
    7    8      959.
    9   10       18.
   11   12       18.
   13   20        0.
```

```
|-------------------------------------------------------------|
|                 VLEACH (Version 2.2a, 1996)                 |
|                                                             |
|                            By:                              |
|        Varadhan Ravi and Jeffrey A. Johnson                 |
|                  (USEPA Contractors)                        |
|        Center for Subsurface Modeling Support               |
|        Robert S. Kerr Environmental Research Laboratory     |
|        U.S. Environmental Protection Agency                 |
|        P.O. Box 1198                                        |
|        Ada, OK 74820                                        |
|                                                             |
|        Based on the original VLEACH (version 1.0)           |
|        developed by CH2M Hill, Redding, California          |
|        for USEPA Region IX                                  |
|-------------------------------------------------------------|
```

```
TACOMA METALS FACILITY, AROCLOR 1254, TP-43, TP-60.
  1 polygons.
Timestep =   0.10 years.  Simulation length =  500.00 years.
Printout every  50.00 years.  Vertical profile stored every  50.00 years.
Koc =     0.38000E+08ml/g,       1342.0    cu.ft./g
Kh =     0.15000E-01 (dimensionless).
Aqueous solubility =    0.34000E-01 mg/l,     0.96278E-03 g/cu.ft
Free air diffusion coefficient = .00000     sq. m/day,  .00000     sq.ft./yr


Polygon   1
AROCLOR 1254, TP-43, TP-60
Polygon area =      1.0000    sq. ft.
 20 cells, each cell  0.500 ft. thick.
Soil Properties:
 Bulk density =     1.3500    g/ml,       38228.    g/cu.ft.
 Porosity = 0.4900 Volumetric water content = 0.2600
 Organic carbon content = 0.03100000
Recharge Rate = 0.03000000 ft/yr
Conc. in recharge water =     0.00000    mg/l,      0.00000    g/cu.ft
Atmospheric concentration =     0.00000    mg/l,      0.00000    g/cu.ft
Water table has a fixed concentration of     0.00000    mg/l,      0.00000
g/cu.ft.
   with respect to gas diffusion.
```

```
TACOMA METALS FACILITY, AROCLOR 1254, TP-43, TP-60.
  1
        .1      500.          50         50
 38000000.      0.015      0.034          0
AROCLOR 1254, TP-43, TP-60
        1.        .5       0.030      1.35       .49         .26   0.031
       0.0         0.         0.
   20y       100.
    1    2    29000.
    3    4    18550.
    5    6     8100.
    7    8     4068.
    9   10       36.
   11   12       36.
   13   20        0.
```

```
|-------------------------------------------------------------|
|                 VLEACH (Version 2.2a, 1996)                 |
|                                                             |
|                            By:                              |
|        Varadhan Ravi and Jeffrey A. Johnson                 |
|                  (USEPA Contractors)                        |
|        Center for Subsurface Modeling Support               |
|        Robert S. Kerr Environmental Research Laboratory     |
|        U.S. Environmental Protection Agency                 |
|        P.O. Box 1198                                        |
|        Ada, OK 74820                                        |
|                                                             |
|        Based on the original VLEACH (version 1.0)           |
|        developed by CH2M Hill, Redding, California          |
|        for USEPA Region IX                                  |
|-------------------------------------------------------------|
```

TACOMA METALS FACILITY, AROCLOR 1260, TP-43, TP-45.
1 polygons.
Timestep = 0.10 years. Simulation length = 500.00 years.
Printout every 50.00 years. Vertical profile stored every 50.00 years.
Koc = 0.82000E+08ml/g, 2895.8 cu.ft./g
Kh = 0.32000E-01 (dimensionless).
Aqueous solubility = 0.53000E-01 mg/l, 0.15008E-02 g/cu.ft
Free air diffusion coefficient = .00000 sq. m/day, .00000 sq.ft./yr

Polygon 1
AROCLOR 1260, TP-43, TP-45
Polygon area = 1.0000 sq. ft.
20 cells, each cell 0.500 ft. thick.
Soil Properties:
Bulk density = 1.3500 g/ml, 38228. g/cu.ft.
Porosity = 0.4900 Volumetric water content = 0.2600
Organic carbon content = 0.03100000
Recharge Rate = 0.03000000 ft/yr
Conc. in recharge water = 0.00000 mg/l, 0.00000 g/cu.ft
Atmospheric concentration = 0.00000 mg/l, 0.00000 g/cu.ft
Water table has a fixed concentration of 0.00000 mg/l, 0.00000 g/cu.ft.
with respect to gas diffusion.

```
TACOMA METALS FACILITY, AROCLOR 1260, TP-43, TP-45.
  1
        .1       500.         50        50.
 82000000.      0.032      0.053          0
AROCLOR 1260, TP-43, TP-45
        1.        .5       0.030      1.35       .49         .26    0.031
       0.0         0.         0.
   20y       100.
    1    2      9500.
    3    4      9050.
    5    6      8600.
    7    8      4309.
    9   10        18.
   11   12        18.
   13   20         0.
```

```
|-------------------------------------------------------------|
|                 VLEACH (Version 2.2a, 1996)                 |
|                                                             |
|                            By:                              |
|        Varadhan Ravi and Jeffrey A. Johnson                 |
|                  (USEPA Contractors)                        |
|        Center for Subsurface Modeling Support               |
|        Robert S. Kerr Environmental Research Laboratory     |
|        U.S. Environmental Protection Agency                 |
|        P.O. Box 1198                                        |
|        Ada, OK 74820                                        |
|                                                             |
|        Based on the original VLEACH (version 1.0)           |
|        developed by CH2M Hill, Redding, California          |
|        for USEPA Region IX                                  |
|-------------------------------------------------------------|
```

```
TACOMA METALS FACILITY, LEAD, TP-14, TP-16.
  1 polygons.
Timestep =    0.10 years.  Simulation length =  500.00 years.
Printout every  50.00 years.  Vertical profile stored every  50.00 years.
Koc =       10000.    ml/g,       0.35314    cu.ft./g
Kh =     0.00000     (dimensionless).
Aqueous solubility =     1000.0     mg/l,       28.317     g/cu.ft
Free air diffusion coefficient = .00000     sq. m/day,  .00000     sq.ft./yr


Polygon   1
LEAD, TP-14, TP-16
Polygon area =      1.0000    sq. ft.
 20 cells, each cell  0.500 ft. thick.
Soil Properties:
 Bulk density =     1.3500    g/ml,       38228.    g/cu.ft.
 Porosity = 0.4900 Volumetric water content = 0.2600
 Organic carbon content = 1.00000000
Recharge Rate = 0.03000000 ft/yr
Conc. in recharge water =     0.00000    mg/l,       0.00000    g/cu.ft
Atmospheric concentration =     0.00000    mg/l,       0.00000    g/cu.ft
Water table has a fixed concentration of     0.00000    mg/l,       0.00000
g/cu.ft.
   with respect to gas diffusion.
```

```
TACOMA METALS FACILITY, LEAD, TP-14, TP-16.
  1
       .10       500.        50.        50.
    10000.         0.      1000          0
LEAD, TP-14, TP-16
        1.        .5       0.03      1.35       .49        .26      1
       0.0         0.        0.
   20y       100.
    1    2  2590000.
    3    4  5415000.
    5    6  8240000.
    7    8  4130000.
    9   12    20000.
   13   20   152000.
```

```
|-----------------------------------------------------------|
|                VLEACH (Version 2.2a, 1996)                |
|                                                           |
|                            By:                            |
|        Varadhan Ravi and Jeffrey A. Johnson               |
|                  (USEPA Contractors)                      |
|        Center for Subsurface Modeling Support             |
|        Robert S. Kerr Environmental Research Laboratory   |
|        U.S. Environmental Protection Agency               |
|        P.O. Box 1198                                      |
|        Ada, OK 74820                                      |
|                                                           |
|        Based on the original VLEACH (version 1.0)         |
|        developed by CH2M Hill, Redding, California        |
|        for USEPA Region IX                                |
|-----------------------------------------------------------|
```

```
TACOMA METALS FACILITY, LEAD, TP-21.
  1 polygons.
Timestep =   0.10 years.  Simulation length =  500.00 years.
Printout every  50.00 years.  Vertical profile stored every  50.00 years.
Koc =      10000.    ml/g,      0.35314    cu.ft./g
Kh =     0.00000     (dimensionless).
Aqueous solubility =     1000.0     mg/l,      28.317     g/cu.ft
Free air diffusion coefficient = .00000     sq. m/day,  .00000     sq.ft./yr


Polygon   1
LEAD, TP-21
Polygon area =      1.0000    sq. ft.
 20 cells, each cell  0.500 ft. thick.
Soil Properties:
 Bulk density =     1.3500    g/ml,       38228.    g/cu.ft.
 Porosity = 0.4900 Volumetric water content = 0.2600
 Organic carbon content = 1.00000000
Recharge Rate = 0.03000000 ft/yr
Conc. in recharge water =     0.00000    mg/l,      0.00000    g/cu.ft
Atmospheric concentration =     0.00000    mg/l,      0.00000    g/cu.ft
Water table has a fixed concentration of     0.00000    mg/l,      0.00000
g/cu.ft.
   with respect to gas diffusion.
```

```
TACOMA METALS FACILITY, LEAD, TP-21.
  1
       0.1       500.        50.        50.
    10000.          0      1000          0
LEAD, TP-21
        1.        .5      0.030      1.35       .49        .26     1
       0.0        0.         0.
   20y       100.
    1    2  6020000.
    3    4  7030000.
    5    6  7570000.
    7    8  1688000.
    9   20    20000.
```

```
|-------------------------------------------------------------|
|                 VLEACH (Version 2.2a, 1996)                 |
|                                                             |
|                            By:                              |
|        Varadhan Ravi and Jeffrey A. Johnson                 |
|                  (USEPA Contractors)                        |
|        Center for Subsurface Modeling Support               |
|        Robert S. Kerr Environmental Research Laboratory     |
|        U.S. Environmental Protection Agency                 |
|        P.O. Box 1198                                        |
|        Ada, OK 74820                                        |
|                                                             |
|        Based on the original VLEACH (version 1.0)           |
|        developed by CH2M Hill, Redding, California          |
|        for USEPA Region IX                                  |
|-------------------------------------------------------------|
```

```
TACOMA METALS FACILITY, LEAD, TP-60.
  1 polygons.
Timestep =   0.10 years.  Simulation length =  500.00 years.
Printout every  50.00 years.  Vertical profile stored every  50.00 years.
Koc =      10000.    ml/g,      0.35314    cu.ft./g
Kh =     0.00000     (dimensionless).
Aqueous solubility =     1000.0     mg/l,      28.317     g/cu.ft
Free air diffusion coefficient = .00000     sq. m/day,  .00000     sq.ft./yr


Polygon   1
LEAD, TP-60
Polygon area =      1.0000    sq. ft.
 20 cells, each cell  0.500 ft. thick.
Soil Properties:
 Bulk density =     1.3500    g/ml,       38228.    g/cu.ft.
 Porosity = 0.4900 Volumetric water content = 0.2600
 Organic carbon content = 1.00000000
Recharge Rate = 0.03000000 ft/yr
Conc. in recharge water =     0.00000    mg/l,      0.00000    g/cu.ft
Atmospheric concentration =     0.00000    mg/l,      0.00000    g/cu.ft
Water table has a fixed concentration of     0.00000    mg/l,      0.00000
g/cu.ft.
   with respect to gas diffusion.
```

```
TACOMA METALS FACILITY, LEAD, TP-60.
  1
       0.1       500.        50.        50.
     10000          0      1000          0
LEAD, TP-60
        1.        .5      0.030      1.35      .49        .26     1
       0.0        0.         0.
   20y       100.
    1    2 10800000.
    3    4  7030000.
    5    6  3260000.
    7    8  1688000.
    9   12   116000.
   13   20    49000.
```

```
|-----------------------------------------------------------|
|                VLEACH (Version 2.2a, 1996)                |
|                                                           |
|                           By:                             |
|        Varadhan Ravi and Jeffrey A. Johnson               |
|                  (USEPA Contractors)                      |
|        Center for Subsurface Modeling Support             |
|        Robert S. Kerr Environmental Research Laboratory   |
|        U.S. Environmental Protection Agency               |
|        P.O. Box 1198                                      |
|        Ada, OK 74820                                      |
|                                                           |
|        Based on the original VLEACH (version 1.0)         |
|        developed by CH2M Hill, Redding, California        |
|        for USEPA Region IX                                |
|-----------------------------------------------------------|
```

```
TACOMA METALS FACILITY, MERCURY, TP-43.
  1 polygons.
Timestep =   0.10 years.  Simulation length =  500.00 years.
Printout every  50.00 years.  Vertical profile stored every  50.00 years.
Koc =      82.000    ml/g,      0.28958E-02cu.ft./g
Kh =     0.00000     (dimensionless).
Aqueous solubility =     1000.0     mg/l,      28.317     g/cu.ft
Free air diffusion coefficient = .00000     sq. m/day,  .00000     sq.ft./yr


Polygon   1
MERCURY, TP-43
Polygon area =      1.0000    sq. ft.
 20 cells, each cell  0.500 ft. thick.
Soil Properties:
 Bulk density =     1.3500    g/ml,       38228.    g/cu.ft.
 Porosity = 0.4900 Volumetric water content = 0.2600
 Organic carbon content = 1.00000000
Recharge Rate = 0.03000000 ft/yr
Conc. in recharge water =     0.00000    mg/l,      0.00000    g/cu.ft
Atmospheric concentration =     0.00000    mg/l,      0.00000    g/cu.ft
Water table has a fixed concentration of     0.00000    mg/l,      0.00000
g/cu.ft.
   with respect to gas diffusion.
```

```
TACOMA METALS FACILITY, MERCURY, TP-43.
  1
        0.1       500.        50.        50.
        82.          0      1000          0
MERCURY, TP-43
         1.        .5      0.030      1.35      .49        .26     1
        0.0        0.         0.
   20y       100.
    1    2    47000.
    3    4    34000.
    5    6    21000.
    7    8    10510.
    9   12       20.
   13   20        0.
```

```
|-------------------------------------------------------------|
|                 VLEACH (Version 2.2a, 1996)                 |
|                                                             |
|                            By:                              |
|        Varadhan Ravi and Jeffrey A. Johnson                 |
|                  (USEPA Contractors)                        |
|        Center for Subsurface Modeling Support               |
|        Robert S. Kerr Environmental Research Laboratory     |
|        U.S. Environmental Protection Agency                 |
|        P.O. Box 1198                                        |
|        Ada, OK 74820                                        |
|                                                             |
|        Based on the original VLEACH (version 1.0)           |
|        developed by CH2M Hill, Redding, California          |
|        for USEPA Region IX                                  |
|-------------------------------------------------------------|
```

TACOMA METALS FACILITY, COPPER, TP-22.
1 polygons.
Timestep = 0.10 years. Simulation length = 500.00 years.
Printout every 50.00 years. Vertical profile stored every 50.00 years.
Koc = 22.000 ml/g, 0.77692E-03cu.ft./g
Kh = 0.00000 (dimensionless).
Aqueous solubility = 1000.0 mg/l, 28.317 g/cu.ft
Free air diffusion coefficient = .00000 sq. m/day, .00000 sq.ft./yr

Polygon 1
COPPER, TP-22
Polygon area = 1.0000 sq. ft.
20 cells, each cell 0.500 ft. thick.
Soil Properties:
Bulk density = 1.3500 g/ml, 38228. g/cu.ft.
Porosity = 0.4900 Volumetric water content = 0.2600
Organic carbon content = 1.00000000
Recharge Rate = 0.03000000 ft/yr
Conc. in recharge water = 0.00000 mg/l, 0.00000 g/cu.ft
Atmospheric concentration = 0.00000 mg/l, 0.00000 g/cu.ft
Water table has a fixed concentration of 0.00000 mg/l, 0.00000 g/cu.ft.
with respect to gas diffusion.

```
TACOMA METALS FACILITY, COPPER, TP-22.
  1
        .1       500.        50.        50.
       22.          0      1000          0
COPPER, TP-22
        1.        .5      0.030      1.35      .49        .26     1
       0.0         0.         0.
   20y       100.
    1    2 13000000.
    3    4 16600000.
    5    6 20200000.
    7   20        0.
```

```
|-------------------------------------------------------------|
|                 VLEACH (Version 2.2a, 1996)                 |
|                                                             |
|                            By:                              |
|        Varadhan Ravi and Jeffrey A. Johnson                 |
|                  (USEPA Contractors)                        |
|        Center for Subsurface Modeling Support               |
|        Robert S. Kerr Environmental Research Laboratory     |
|        U.S. Environmental Protection Agency                 |
|        P.O. Box 1198                                        |
|        Ada, OK 74820                                        |
|                                                             |
|        Based on the original VLEACH (version 1.0)           |
|        developed by CH2M Hill, Redding, California          |
|        for USEPA Region IX                                  |
|-------------------------------------------------------------|
```

```
TACOMA METALS FACILITY, CHROMIUM, TP-22.
  1 polygons.
Timestep =   0.10 years.  Simulation length =  500.00 years.
Printout every  50.00 years.  Vertical profile stored every  50.00 years.
Koc =     0.25000E+07ml/g,       88.286    cu.ft./g
Kh =     0.00000     (dimensionless).
Aqueous solubility =     1000.0     mg/l,      28.317     g/cu.ft
Free air diffusion coefficient = .00000     sq. m/day,  .00000     sq.ft./yr


Polygon   1
CHROMIUM, TP-22
Polygon area =      1.0000    sq. ft.
 20 cells, each cell  0.500 ft. thick.
Soil Properties:
 Bulk density =     1.3500    g/ml,       38228.    g/cu.ft.
 Porosity = 0.4900 Volumetric water content = 0.2600
 Organic carbon content = 0.03100000
Recharge Rate = 0.03000000 ft/yr
Conc. in recharge water =     0.00000    mg/l,      0.00000    g/cu.ft
Atmospheric concentration =     0.00000    mg/l,      0.00000    g/cu.ft
Water table has a fixed concentration of     0.00000    mg/l,      0.00000
g/cu.ft.
   with respect to gas diffusion.
```

```
TACOMA METALS FACILITY, CHROMIUM, TP-22.
  1
       0.1       500.        50.        50.
   2500000          0      1000          0
CHROMIUM, TP-22
        1.        .5      0.030      1.35      .49        .26   0.031
       0.0        0.         0.
   20y       100.
    1    2  2520000.
    3    4  1716500.
    5    6   913000.
    7    8   500000.
    9   10    47000.
   11   12    47000.
   13   20        0.
```

```
|-------------------------------------------------------------|
|                 VLEACH (Version 2.2a, 1996)                 |
|                                                             |
|                            By:                              |
|        Varadhan Ravi and Jeffrey A. Johnson                 |
|                  (USEPA Contractors)                        |
|        Center for Subsurface Modeling Support               |
|        Robert S. Kerr Environmental Research Laboratory     |
|        U.S. Environmental Protection Agency                 |
|        P.O. Box 1198                                        |
|        Ada, OK 74820                                        |
|                                                             |
|        Based on the original VLEACH (version 1.0)           |
|        developed by CH2M Hill, Redding, California          |
|        for USEPA Region IX                                  |
|-------------------------------------------------------------|
```

```
TACOMA METALS FACILITY, CHROMIUM, TP-46.
  1 polygons.
Timestep =   0.50 years.  Simulation length =  500.00 years.
Printout every  50.00 years.  Vertical profile stored every  50.00 years.
Koc =     0.25000E+07ml/g,       88.286    cu.ft./g
Kh =     0.00000     (dimensionless).
Aqueous solubility =     1000.0     mg/l,      28.317     g/cu.ft
Free air diffusion coefficient = .00000     sq. m/day,  .00000     sq.ft./yr


Polygon   1
CHROMIUM, TP-46
Polygon area =      1.0000    sq. ft.
 20 cells, each cell  0.500 ft. thick.
Soil Properties:
 Bulk density =     1.3500    g/ml,       38228.    g/cu.ft.
 Porosity = 0.4900 Volumetric water content = 0.2600
 Organic carbon content = 0.03100000
Recharge Rate = 0.03000000 ft/yr
Conc. in recharge water =     0.00000    mg/l,      0.00000    g/cu.ft
Atmospheric concentration =     0.00000    mg/l,      0.00000    g/cu.ft
Water table has a fixed concentration of     0.00000    mg/l,      0.00000
g/cu.ft.
   with respect to gas diffusion.
```

```
TACOMA METALS FACILITY, CHROMIUM, TP-46.
  1
       0.5       500.        50.        50.
   2500000          0      1000          0
CHROMIUM, TP-46
        1.        .5      0.030      1.35       .49         .26   0.031
       0.0        0.         0.
   20y       100.
    1    2   721000.
    3    4   412500.
    5    6   104000.
    7    8    98500.
    9   10    93000.
   11   12    93000.
   13   20      900.
```

```
|-------------------------------------------------------------|
|                 VLEACH (Version 2.2a, 1996)                 |
|                                                             |
|                            By:                              |
|        Varadhan Ravi and Jeffrey A. Johnson                 |
|                  (USEPA Contractors)                        |
|        Center for Subsurface Modeling Support               |
|        Robert S. Kerr Environmental Research Laboratory     |
|        U.S. Environmental Protection Agency                 |
|        P.O. Box 1198                                        |
|        Ada, OK 74820                                        |
|                                                             |
|        Based on the original VLEACH (version 1.0)           |
|        developed by CH2M Hill, Redding, California          |
|        for USEPA Region IX                                  |
|-------------------------------------------------------------|
```

```
TACOMA METALS FACILITY, ARSENIC, TP-43.
  1 polygons.
Timestep =   0.10 years.  Simulation length =  500.00 years.
Printout every  50.00 years.  Vertical profile stored every  50.00 years.
Koc =      29.000    ml/g,      0.10241E-02cu.ft./g
Kh =     0.00000     (dimensionless).
Aqueous solubility =     1000.0     mg/l,      28.317     g/cu.ft
Free air diffusion coefficient = .00000     sq. m/day,  .00000     sq.ft./yr


Polygon   1
ARSENIC, TP-43
Polygon area =      1.0000    sq. ft.
 20 cells, each cell  0.500 ft. thick.
Soil Properties:
 Bulk density =     1.3500    g/ml,       38228.    g/cu.ft.
 Porosity = 0.4900 Volumetric water content = 0.2600
 Organic carbon content = 1.00000000
Recharge Rate = 0.03000000 ft/yr
Conc. in recharge water =     0.00000    mg/l,      0.00000    g/cu.ft
Atmospheric concentration =     0.00000    mg/l,      0.00000    g/cu.ft
Water table has a fixed concentration of     0.00000    mg/l,      0.00000
g/cu.ft.
   with respect to gas diffusion.
```

```
TACOMA METALS FACILITY, ARSENIC, TP-43.
  1
        .1       500.        50.        50.
       29.          0      1000          0
ARSENIC, TP-43
        1.        .5      0.030      1.35      .49        .26     1
       0.0        0.         0.
   20y       100.
    1    2    90000.
    3    4    85000.
    5    6    80000.
    7   20        0.
```

Appendix O

BIOSCREEN Model Results

Hydraulic Conductivity Based on 1.1E-02

BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence — *Version 1.4*

Tacoma Metals
Total cPAHs - 2

Data Input Instructions:

115 ↑ or 0.02 — 1. Enter value directly....or 2. Calculate by filling in grey cells below. (To restore formulas, hit button below).

Variable*	
	▸ Data used directly in model.
20	▸ Value calculated by model. (Don't enter any data).

1. HYDROGEOLOGY

Seepage Velocity*	*Vs*	185.8	*(ft/yr)*
or		↑ or	
Hydraulic Conductivity	*K*	1.1E-02	*(cm/sec)*
Hydraulic Gradient	*i*	0.008	*(ft/ft)*
Porosity	*n*	0.49	*(-)*

2. DISPERSION

Longitudinal Dispersivity*	*alpha x*	13.8	*(ft)*
Transverse Dispersivity*	*alpha y*	1.4	*(ft)*
Vertical Dispersivity*	*alpha z*	0.0	*(ft)*
or		↑ or	
Estimated Plume Length	*Lp*	300	*(ft)*

3. ADSORPTION

Retardation Factor*	*R*	272756.1	*(-)*
or		↑ or	
Soil Bulk Density	*rho*	1.35	*(kg/l)*
Partition Coefficient	*Koc*	3.30E+06	*(L/kg)*
FractionOrganicCarbon	*foc*	3.0E-2	*(-)*

4. BIODEGRADATION

1st Order Decay Coeff*	*lambda*	4.6E+0	*(per yr)*
or		↑ or	
Solute Half-Life	*t-half*	0.15	*(year)*
or Instantaneous Reaction Model			
Delta Oxygen*	*DO*	1.65	*(mg/L)*
Delta Nitrate*	*NO3*	0.7	*(mg/L)*
Observed Ferrous Iron*	*Fe2+*	16.6	*(mg/L)*
Delta Sulfate*	*SO4*	22.4	*(mg/L)*
Observed Methane*	*CH4*	6.6	*(mg/L)*

5. GENERAL

Modeled Area Length*	300	*(ft)*
Modeled Area Width*	50	*(ft)*
Simulation Time*	30	*(yr)*

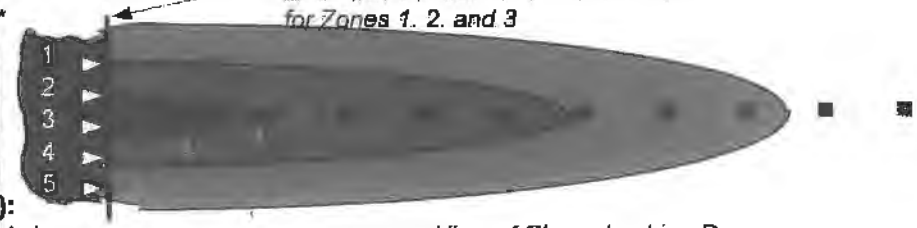
6. SOURCE DATA

Source Thickness in Sat.Zone* 10 *(ft)*

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3

Source Zones:

Width* (ft)	Conc. (mg/L)*
0	0
0	0
50	6.20E-04
0	0
0	0



View of Plume Looking Down

Source Halflife (see Help):

Infinite	Infinite	*(yr)*
Inst. React.	1st Order	
Soluble Mass In Source NAPL, Soil	infinite	*(Kg)*

Observed Centerline Concentrations at Monitoring Wells
If No Data Leave Blank or Enter "0"

7. FIELD DATA FOR COMPARISON

Concentration (mg/L)											
Dist. from Source (ft)											

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE — **View Output**

RUN ARRAY — **View Output**

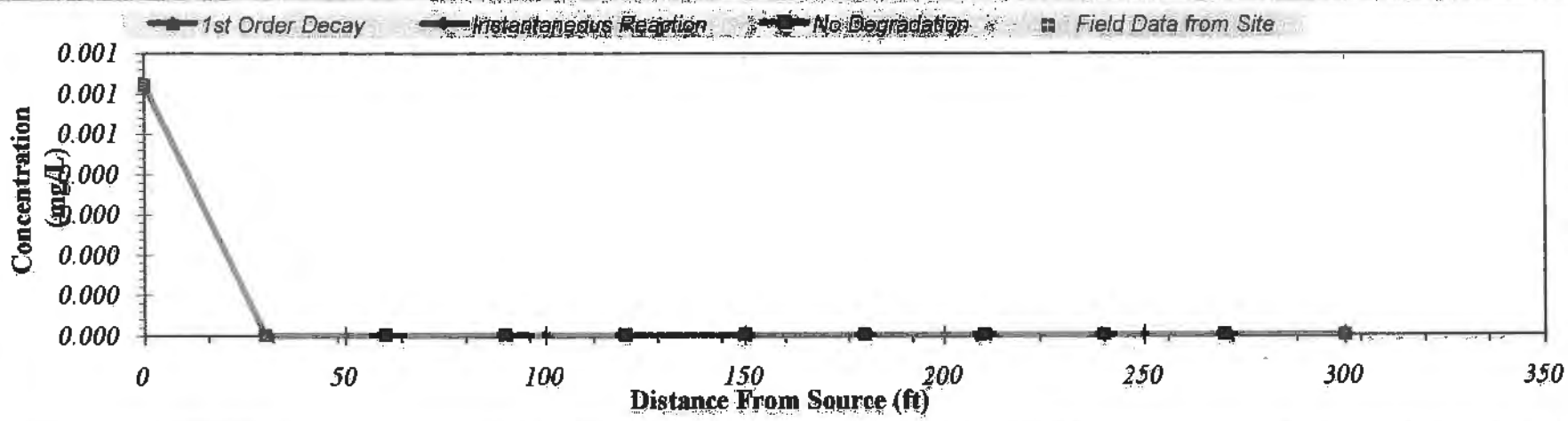
Help — **Recalculate This Sheet**

Paste Example Dataset

Restore Formulas for Vs, Dispersivities, R, lambda, other

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft)										
	0	30	60	90	120	150	180	210	240	270	300
No Degradation	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1st Order Decay	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Inst. Reaction	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site											



Calculate Animation

Time: 30 Years

Return to Input

Recalculate This Sheet

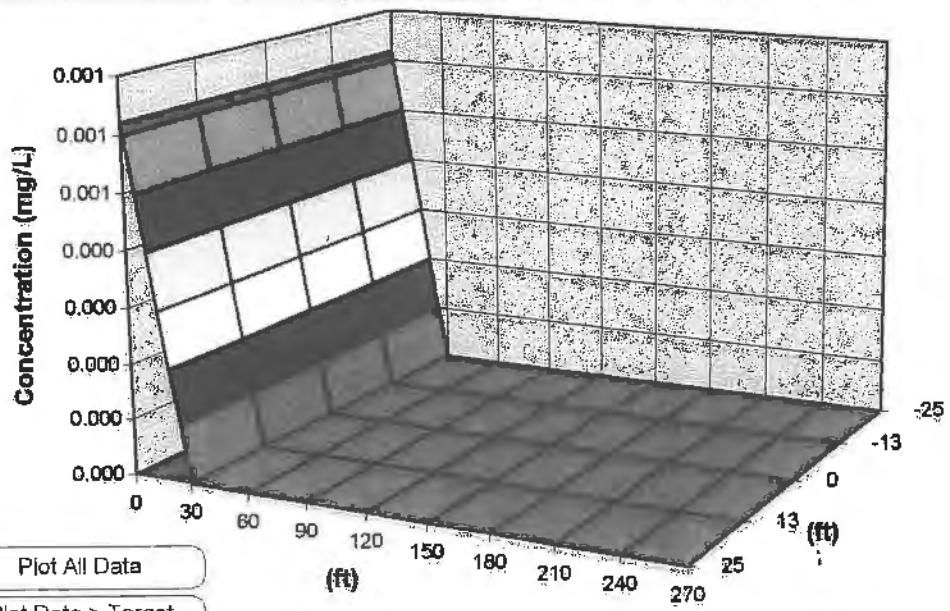
DISSOLVED HYDROCARBON CONCENTRATIONS IN PLUME (mg/L at Z=0)

Distance from Source (ft)

Transverse Distance (ft) ↓	0	30	60	90	120	150	180	210	240	270	300
25	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
13	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
-13	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
-25	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MASS FLUX (mg/day)	2.2E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0

Time: 30 Years Target Level: 0.005 mg/L Displayed Model: Inst. Reaction

Model to Display:
- No Degradation Model
- 1st Order Decay Model
- Instantaneous Reaction Model



Plot All Data

Plot Data > Target

Plume and Source Masses (Order-of-Magnitude Accuracy)

Plume Mass If No Biodegradation: Can't Calc. (Kg)

- Actual Plume Mass: Can't Calc. (Kg)

= Plume Mass Removed by Biodeg: - (Kg)

Change in Electron Acceptor/Byproduct Masses:

Oxygen	Nitrate	Iron II	Sulfate	Methane	
-	-	-	-	-	(Kg)

Contam. Mass in Source (t=0 Years): infinite (Kg)

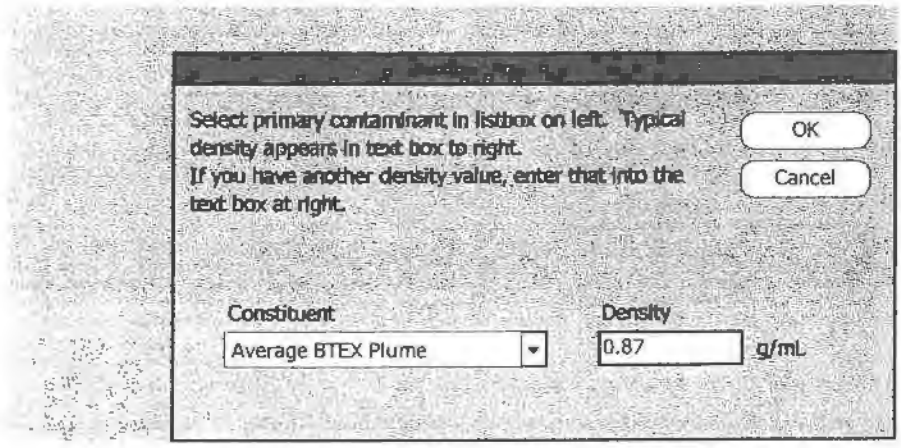
Contam. Mass in Source Now (t=30Years): infinite (Kg)

Current Volume of Groundwater in Plume: Can't Calc. (ac-ft)

Flowrate of Water Through Source Zone: Can't Calc. (ac-ft/yr)

Mass HELP

Recalculate


Select primary contaminant in listbox on left. Typical density appears in text box to right.
If you have another density value, enter that into the text box at right.
OK
Cancel
Constituent
Average BTEX Plume
Density
0.87
g/mL

BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence — *Version 1.4*

Tacoma Metals
Naphthalene - 2
Run Name

Data Input Instructions:

115	1. Enter value directly....or
or	2. Calculate by filling in grey
0.02	cells below. (To restore formulas, hit button below).
Variable*	Data used directly in model.
20	Value calculated by model. (Don't enter any data).

1. HYDROGEOLOGY

Seepage Velocity*	Vs	185.8	(ft/yr)
or		or	
Hydraulic Conductivity	K	1.1E-02	(cm/sec)
Hydraulic Gradient	i	0.008	(ft/ft)
Porosity	n	0.49	(-)

2. DISPERSION

Longitudinal Dispersivity*	alpha x	13.8	(ft)
Transverse Dispersivity*	alpha y	1.4	(ft)
Vertical Dispersivity*	alpha z	0.0	(ft)
or		or	
Estimated Plume Length	Lp	300	(ft)

3. ADSORPTION

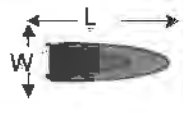
Retardation Factor*	R	4546.9	(-)
or		or	
Soil Bulk Density	rho	1.35	(kg/l)
Partition Coefficient	Koc	5.50E+04	(L/kg)
FractionOrganicCarbon	foc	3.0E-2	(-)

4. BIODEGRADATION

1st Order Decay Coeff*	lambda	4.6E+0	(per yr)
or		or	
Solute Half-Life	t-half	0.15	(year)
or Instantaneous Reaction Model			
Delta Oxygen*	DO	1.65	(mg/L)
Delta Nitrate*	NO3	0.7	(mg/L)
Observed Ferrous Iron*	Fe2+	16.6	(mg/L)
Delta Sulfate*	SO4	22.4	(mg/L)
Observed Methane*	CH4	6.6	(mg/L)

5. GENERAL

Modeled Area Length*	300	(ft)
Modeled Area Width*	50	(ft)
Simulation Time*	30	(yr)



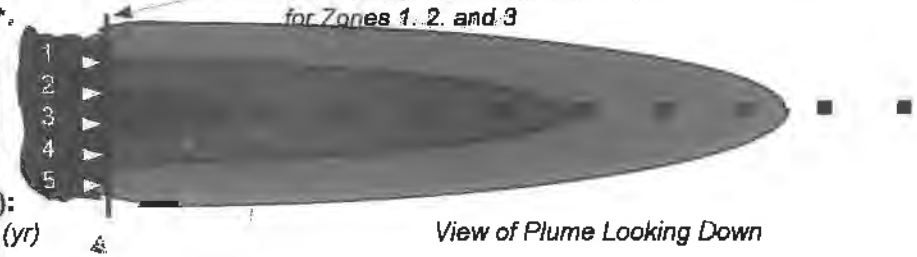
6. SOURCE DATA

Source Thickness In Sat.Zone* 10 (ft)

Source Zones:

Width* (ft)	Conc. (mg/L)*
0	0
0	0
50	6.825
0	0
0	0

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



View of Plume Looking Down

Source Halflife (see Help):

Infinite	infinite	(yr)
Inst. React.	1st Order	
Soluble Mass	infinite	(Kg)
In Source NAPL, Soil		

Observed Centerline Concentrations at Monitoring Wells
If No Data Leave Blank or Enter "0"

7. FIELD DATA FOR COMPARISON

Concentration (mg/L)											
Dist. from Source (ft)											

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE — View Output

RUN ARRAY — View Output

Help

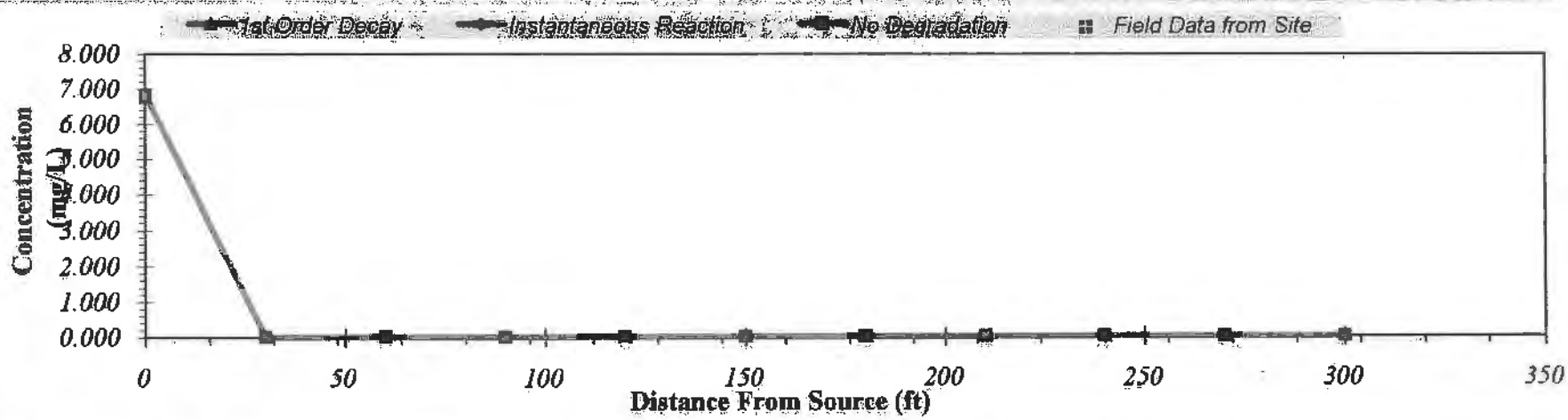
Recalculate This Sheet

Paste Example Dataset

Restore Formulas for Vs, Dispersivities, R, lambda, other

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft)										
	0	30	60	90	120	150	180	210	240	270	300
No Degradation	6.825	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1st Order Decay	6.825	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Inst. Reaction	6.825	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site											



Calculate Animation

Time: 30 Years

Return to Input

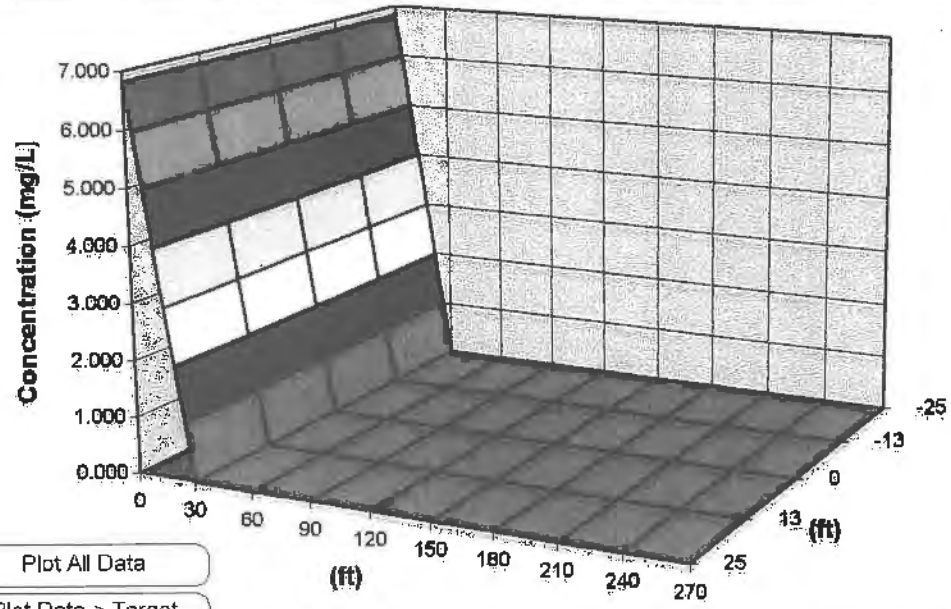
Recalculate This Sheet

DISSOLVED HYDROCARBON CONCENTRATIONS IN PLUME (mg/L at Z=0)

Transverse Distance (ft) ↓ / Distance from Source (ft) →	0	30	60	90	120	150	180	210	240	270	300
25	6.825	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
13	6.825	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0	6.825	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
-13	6.825	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
-25	6.825	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MASS FLUX (mg/day)	2.4E+4	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0

Time: 30 Years Target Level: 0.005 mg/L Displayed Model: Inst. Reaction

Model to Display:
- No Degradation Model
- 1st Order Decay Model
- Instantaneous Reaction Model



Plot All Data

Plot Data > Target

Plume and Source Masses (Order-of-Magnitude Accuracy)

Plume Mass if No Biodegradation	Can't Calc.	(Kg)
- Actual Plume Mass	Can't Calc.	(Kg)
= Plume Mass Removed by Biodeg	-	(Kg)

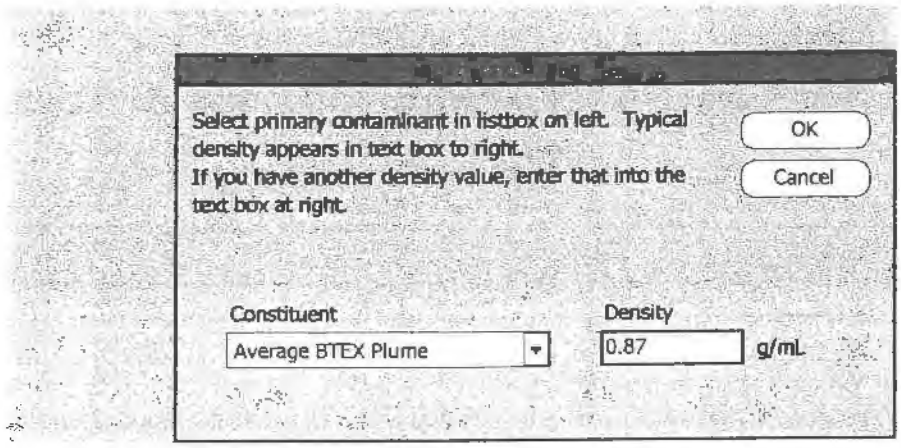
Change in Electron Acceptor/Byproduct Masses:

Oxygen	Nitrate	Iron II	Sulfate	Methane	
-	-	-	-	-	(Kg)

Contam. Mass in Source (t=0 Years)	infinite	(Kg)
Contam. Mass in Source Now (t=30Years)	Infinite	(Kg)
Current Volume of Groundwater in Plume	Can't Calc.	(ac-ft)
Flowrate of Water Through Source Zone	Can't Calc.	(ac-ft/yr)

Mass HELP

Recalculate


Select primary contaminant in listbox on left. Typical density appears in text box to right.
If you have another density value, enter that into the text box at right.
OK
Cancel
Constituent
Average BTEX Plume
Density
0.87
g/mL

BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence — *Version 1.4*

Tacoma Metals	
Benzene - 2	
Run Name	

Data Input Instructions:

115 ↑ or 0.02

1. Enter value directly....or
2. Calculate by filling in grey cells below. (To restore formulas, hit button below).

Variable*	
	▸ Data used directly in model.
20	▸ Value calculated by model. (Don't enter any data).

1. HYDROGEOLOGY

Seepage Velocity*	Vs	185.8	(ft/yr)
or		↑ or	
Hydraulic Conductivity	K	1.1E-02	(cm/sec)
Hydraulic Gradient	i	0.008	(ft/ft)
Porosity	n	0.49	(-)

2. DISPERSION

Longitudinal Dispersivity*	alpha x	13.8	(ft)
Transverse Dispersivity*	alpha y	1.4	(ft)
Vertical Dispersivity*	alpha z	0.0	(ft)
or		↑ or	
Estimated Plume Length	Lp	300	(ft)

3. ADSORPTION

Retardation Factor*	R	6.8	(-)
or		↑ or	
Soil Bulk Density	rho	1.35	(kg/l)
Partition Coefficient	Koc	70	(L/kg)
FractionOrganicCarbon	foc	3.0E-2	(-)

4. BIODEGRADATION

1st Order Decay Coeff*	lambda	4.6E+0	(per yr)
or		↑ or	
Solute Half-Life	t-half	0.15	(year)
or Instantaneous Reaction Model			
Delta Oxygen*	DO	1.65	(mg/L)
Delta Nitrate*	NO3	0.7	(mg/L)
Observed Ferrous Iron*	Fe2+	16.6	(mg/L)
Delta Sulfate*	SO4	22.4	(mg/L)
Observed Methane*	CH4	6.6	(mg/L)

5. GENERAL

Modeled Area Length*	300	(ft)
Modeled Area Width*	50	(ft)
Simulation Time*	30	(yr)

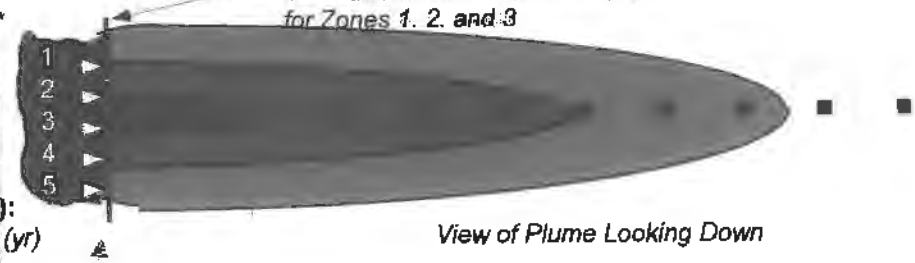
6. SOURCE DATA

Source Thickness in Sat.Zone* 10 (ft)

Source Zones:

Width* (ft)	Conc. (mg/L)*
0	0
0	0
50	2.40E-02
0	0
0	0

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



View of Plume Looking Down

Source Halflife (see Help):

Infinite	infinite	(yr)
Inst. React.	1st Order	
Soluble Mass In Source NAPL, Soil	infinite	(Kg)

Observed Centerline Concentrations at Monitoring Wells
If No Data Leave Blank or Enter "0"

7. FIELD DATA FOR COMPARISON

Concentration (mg/L)											
Dist. from Source (ft)											

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE — View Output

RUN ARRAY — View Output

Help

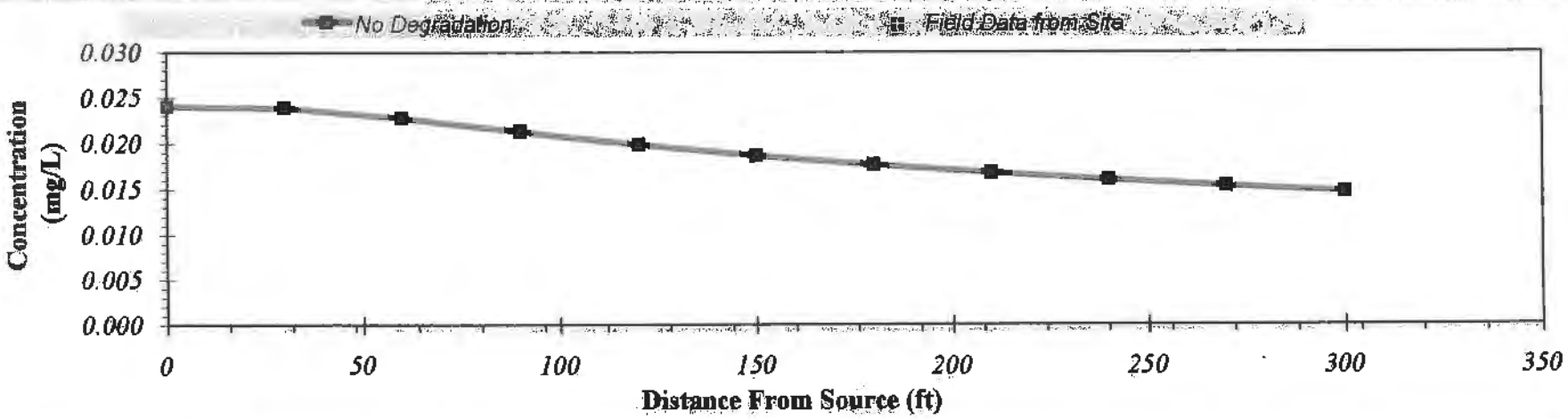
Recalculate This Sheet

Paste Example Dataset

Restore Formulas for Vs, Dispersivities, R, lambda, other

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft)										
	0	30	60	90	120	150	180	210	240	270	300
No Degradation	0.024	0.024	0.023	0.021	0.020	0.019	0.018	0.017	0.016	0.015	0.015
1st Order Decay	0.024	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Inst. Reaction	0.024	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site											



Calculate Animation

Time:
30 Years

Return to Input

Recalculate This Sheet

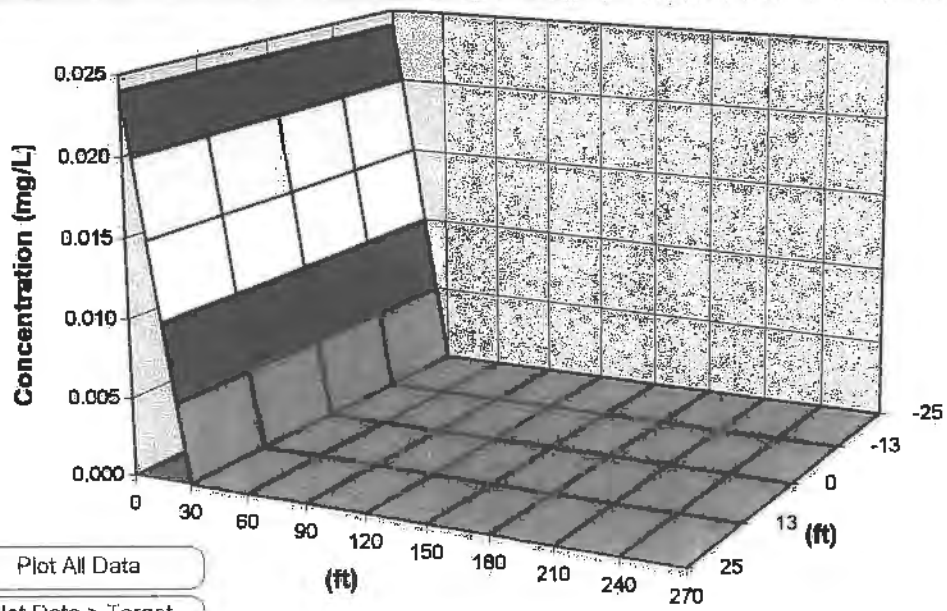
DISSOLVED HYDROCARBON CONCENTRATIONS IN PLUME (mg/L at Z=0)

Transverse Distance (ft) ↓ / Distance from Source (ft) →	0	30	60	90	120	150	180	210	240	270	300
25	0.024	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
13	0.024	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0	0.024	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
-13	0.024	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
-25	0.024	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MASS FLUX (mg/day)	8.5E+1	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0

Time: 30 Years Target Level: 0.005 mg/L Displayed Model: Inst. Reaction

Model to Display:

- No Degradation Model
- 1st Order Decay Model
- Instantaneous Reaction Model



Plot All Data

Plot Data > Target

Plume and Source Masses (Order of Magnitude Accuracy)

Plume Mass if No Biodegradation	Can't Calc.	(Kg)
- Actual Plume Mass	Can't Calc.	(Kg)
= Plume Mass Removed by Biodeg	-	(Kg)

Change in Electron Acceptor/Byproduct Masses:

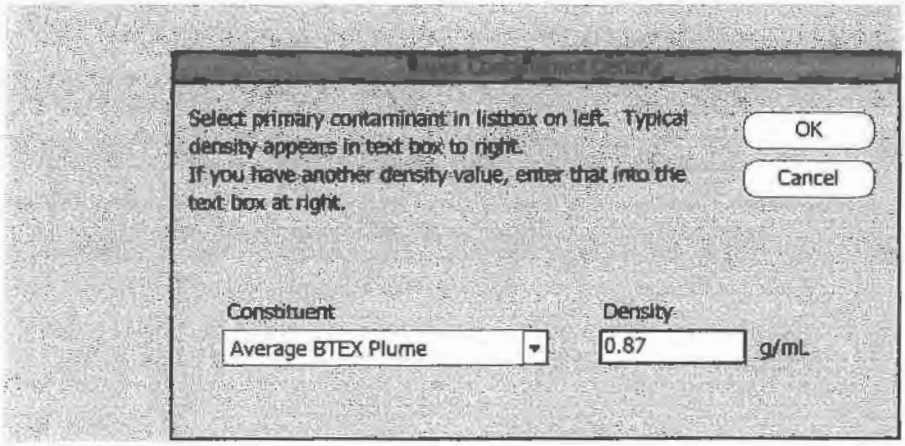
Oxygen	Nitrate	Iron II	Sulfate	Methane	
-	-	-	-	-	(Kg)

Contam. Mass in Source (t=0 Years)	infinite	(Kg)
Contam. Mass in Source Now (t=30Years)	Infinite	(Kg)
Current Volume of Groundwater in Plume	Can't Calc.	(ac-ft)
Flowrate of Water Through Source Zone	Can't Calc.	(ac-ft/yr)

Mass HELP

Recalculate

dlgDensity


Select primary contaminant in listbox on left. Typical density appears in text box to right.
If you have another density value, enter that into the text box at right.
OK
Cancel
Constituent
Average BTEX Plume
Density
0.87
g/mL

Hydraulic Conductivity Based on 5.0E-02

BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence

Version 1.4

Tacoma Metals
Total cPAHs

Run Name

Data Input Instructions:

115	1. Enter value directly....or
↑ or	2. Calculate by filling in grey
0.02	cells below. (To restore formulas, hit button below).
Variable*	▸ Data used directly in model.
20	▸ Value calculated by model. (Don't enter any data).

1. HYDROGEOLOGY

Seepage Velocity*	Vs	844.6	(ft/yr)
or		↑ or	
Hydraulic Conductivity	K	5.0E-02	(cm/sec)
Hydraulic Gradient	i	0.008	(ft/ft)
Porosity	n	0.49	(-)

2. DISPERSION

Longitudinal Dispersivity*	alpha x	13.8	(ft)
Transverse Dispersivity*	alpha y	1.4	(ft)
Vertical Dispersivity*	alpha z	0.0	(ft)
or		↑ or	
Estimated Plume Length	Lp	300	(ft)

3. ADSORPTION

Retardation Factor*	R	272756.1	(-)
or		↑ or	
Soil Bulk Density	rho	1.35	(kg/l)
Partition Coefficient	Koc	3.30E+06	(L/kg)
FractionOrganicCarbon	foc	3.0E-2	(-)

4. BIODEGRADATION

1st Order Decay Coeff*	lambda	4.6E+0	(per yr)
or		↑ or	
Solute Half-Life	t-half	0.15	(year)
or Instantaneous Reaction Model			
Delta Oxygen*	DO	1.65	(mg/L)
Delta Nitrate*	NO3	0.7	(mg/L)
Observed Ferrous Iron*	Fe2+	16.6	(mg/L)
Delta Sulfate*	SO4	22.4	(mg/L)
Observed Methane*	CH4	6.6	(mg/L)

5. GENERAL

Modeled Area Length*	300	(ft)
Modeled Area Width*	50	(ft)
Simulation Time*	30	(yr)

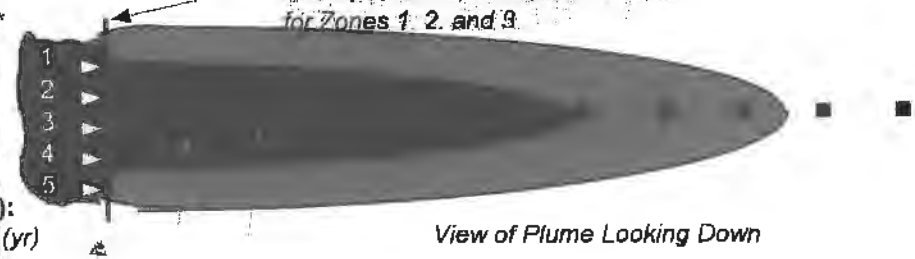
6. SOURCE DATA

Source Thickness in Sat.Zone* 10 (ft)

Source Zones:

Width* (ft)	Conc. (mg/L)*
0	0
0	0
50	6.20E-04
0	0
0	0

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



View of Plume Looking Down

Source Halflife (see Help):

Infinite	Infinite	(yr)
Inst. React.	↑ 1st Order	
Soluble Mass	infinite	(Kg)
In Source NAPL, Soil		

Observed Centerline Concentrations at Monitoring Wells
If No Data Leave Blank or Enter "0"

7. FIELD DATA FOR COMPARISON

Concentration (mg/L)											
Dist. from Source (ft)	0	30	60	90	120	150	180	210	240	270	300

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE

View Output

RUN ARRAY

View Output

Help

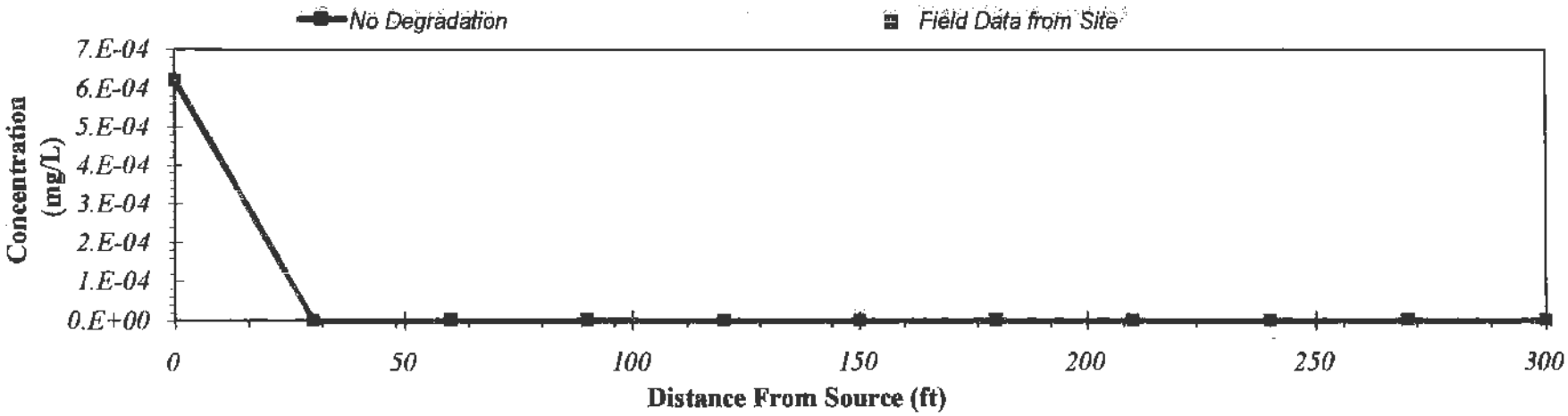
Recalculate This Sheet

Paste Example Dataset

Restore Formulas for Vs, Dispersivities, R, lambda, other

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft) 0	30	60	90	120	150	180	210	240	270	300
No Degradation	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1st Order Decay	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Inst. Reaction	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site											



Calculate Animation

Time: 3 Years

Return to Input

Recalculate This Sheet

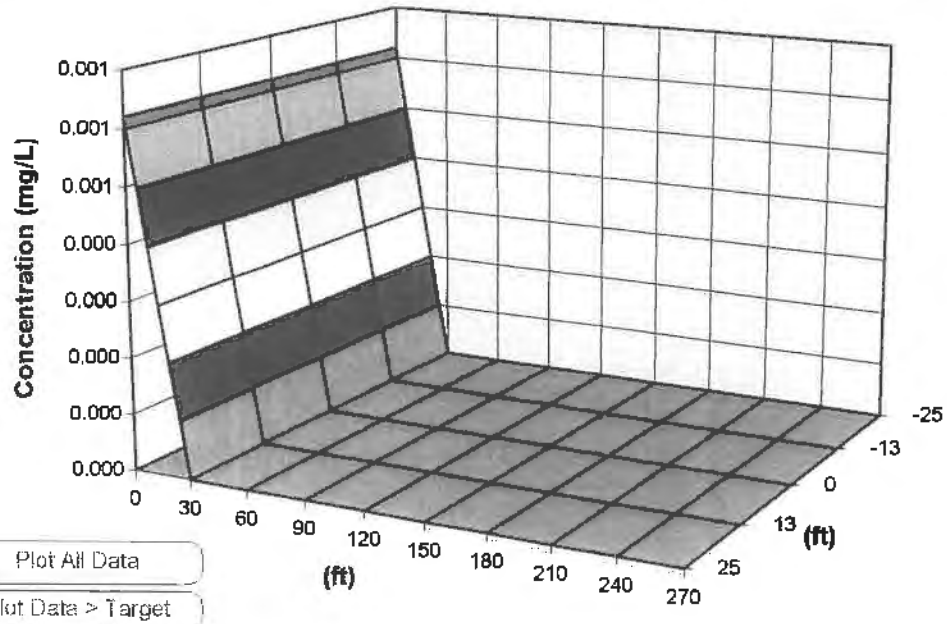
DISSOLVED HYDROCARBON CONCENTRATIONS IN PLUME (mg/L at Z=0)

Transverse Distance (ft) ↓ / Distance from Source (ft) →	0	30	60	90	120	150	180	210	240	270	300
25	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
13	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
-13	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
-25	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MASS FLUX (mg/day)	9.9E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0

Time: 30 Years Target Level: 0.005 mg/L Displayed Model: No Degradation

Model to Display:

- No Degradation Model
- 1st Order Decay Model
- Instantaneous Reaction Model



Plot All Data

Plot Data > Target

Plume and Source Masses (Order-of-Magnitude Accuracy)

Plume Mass if No Biodegradation	Can't Calc.	(Kg)
- Actual Plume Mass	Can't Calc.	(Kg)
= Plume Mass Removed by Biodeg	-	(Kg)

Change in Electron Acceptor/Byproduct Masses:

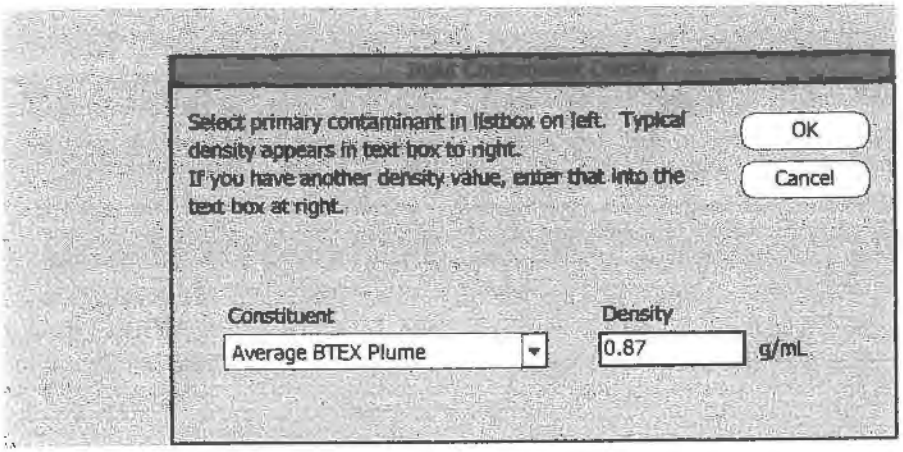
Oxygen	Nitrate	Iron II	Sulfate	Methane	
na	na	na	na	na	(Kg)

Contam. Mass in Source (t=0 Years)	infinite	(Kg)
Contam. Mass in Source Now (t=30Years)	Infinite	(Kg)
Current Volume of Groundwater in Plume	Can't Calc.	(ac-ft)
Flowrate of Water Through Source Zone	Can't Calc.	(ac-ft/yr)

Mass HELP

Recalculate

dlgDensity


Select primary contaminant in listbox on left. Typical density appears in text box to right.
If you have another density value, enter that into the text box at right.
OK
Cancel
Constituent
Average BTEX Plume
Density
0.87
g/mL

BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence

Version 1.4

Tacoma Metals
Naphthalene
Run Name

Data Input Instructions:

115	▷1. Enter value directly....or
or	2. Calculate by filling in grey
0.02	cells below. (To restore formulas, hit button below).
Variable*	▷ Data used directly in model.
20	▷ Value calculated by model. (Don't enter any data).

1. HYDROGEOLOGY

Seepage Velocity*	Vs	844.6	(ft/yr)
or		or	
Hydraulic Conductivity	K	5.0E-02	(cm/sec)
Hydraulic Gradient	i	0.008	(ft/ft)
Porosity	n	0.49	(-)

2. DISPERSION

Longitudinal Dispersivity*	alpha x	13.8	(ft)
Transverse Dispersivity*	alpha y	1.4	(ft)
Vertical Dispersivity*	alpha z	0.0	(ft)
or		or	
Estimated Plume Length	Lp	300	(ft)

3. ADSORPTION

Retardation Factor*	R	4546.9	(-)
or		or	
Soil Bulk Density	rho	1.35	(kg/l)
Partition Coefficient	Koc	5.50E+04	(L/kg)
FractionOrganicCarbon	foc	3.0E-2	(-)

4. BIODEGRADATION

1st Order Decay Coeff*	lambda	4.6E+0	(per yr)
or		or	
Solute Half-Life	t-half	0.15	(year)
or Instantaneous Reaction Model			
Delta Oxygen*	DO	1.65	(mg/L)
Delta Nitrate*	NO3	0.7	(mg/L)
Observed Ferrous Iron*	Fe2+	16.6	(mg/L)
Delta Sulfate*	SO4	22.4	(mg/L)
Observed Methane*	CH4	6.6	(mg/L)

5. GENERAL

Modeled Area Length*	300	(ft)
Modeled Area Width*	50	(ft)
Simulation Time*	30	(yr)

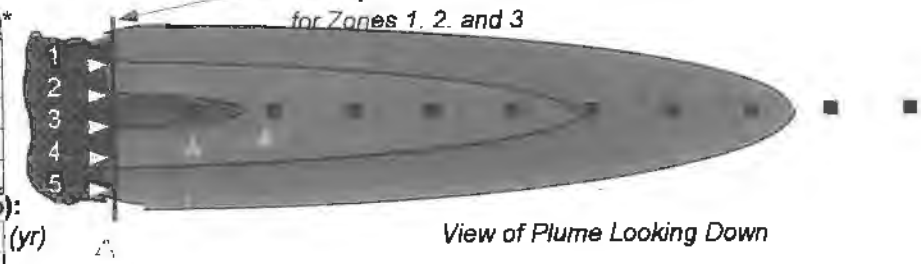
6. SOURCE DATA

Source Thickness in Sat.Zone* 10 (ft)

Source Zones:

Width* (ft)	Conc. (mg/L)*
0	0
0	0
50	6.825
0	0
0	0

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



View of Plume Looking Down

Source Halflife (see Help):

Infinite	Infinite	(yr)
Inst. React.	1st Order	
Soluble Mass	infinite	(Kg)
In Source NAPL, Soil		

Observed Centerline Concentrations at Monitoring Wells
If No Data Leave Blank or Enter "0"

7. FIELD DATA FOR COMPARISON

Concentration (mg/L)											
Dist. from Source (ft)	0	30	60	90	120	150	180	210	240	270	300

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE

View Output

RUN ARRAY

View Output

Help

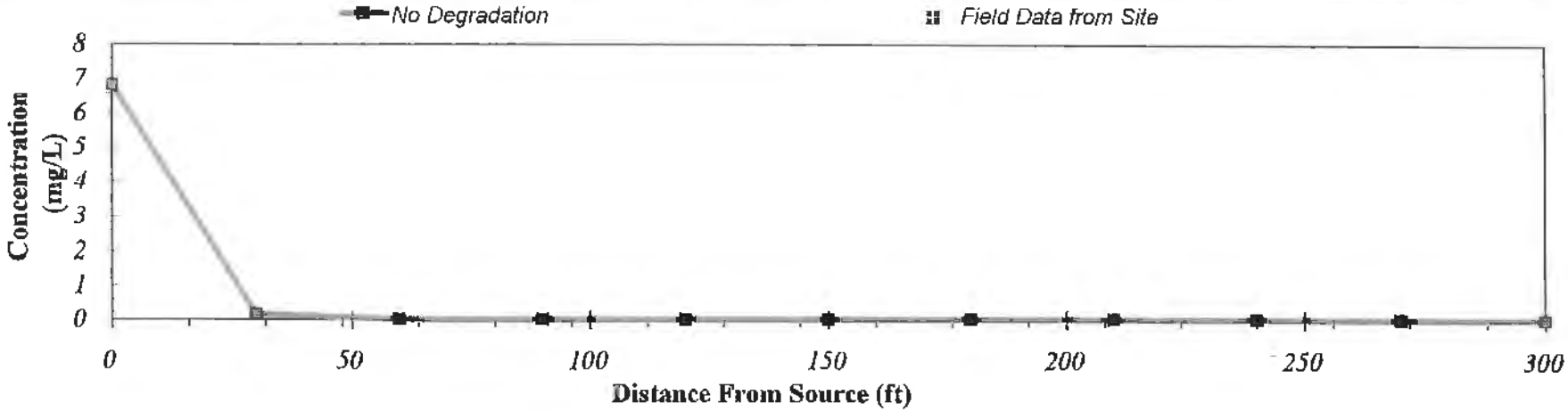
Recalculate This Sheet

Paste Example Dataset

Restore Formulas for Vs, Dispersivities, R, lambda, other

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft) 0	30	60	90	120	150	180	210	240	270	300
No Degradation	6.825	0.167	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1st Order Decay	6.825	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Inst. Reaction	6.825	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site											



Calculate Animation

Time:
30 Years

Return to Input

Recalculate This Sheet

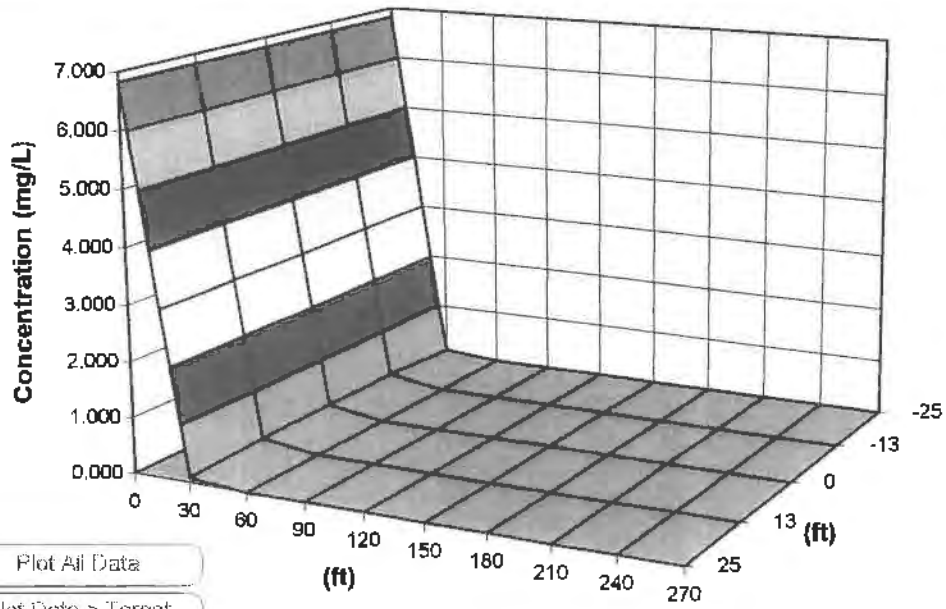
DISSOLVED HYDROCARBON CONCENTRATIONS IN PLUME (mg/L at Z=0)

Transverse Distance (ft) ↓	Distance from Source (ft): 0	30	60	90	120	150	180	210	240	270	300
25	6.825	0.084	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
13	6.825	0.154	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0	6.825	0.167	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
-13	6.825	0.154	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
-25	6.825	0.084	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MASS FLUX (mg/day)	1.1E+5	2.6E+3	5.8E-1	5.0E-7	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0

Model to Display:

- *No Degradation Model*
- *1st Order Decay Model*
- *Instantaneous Reaction Model*

Time: **30 Years** Target Level: **0.005** mg/L Displayed Model: **No Degradation**



Plot All Data

Plot Data > Target

Plume and Source Masses (Order-of-Magnitude Accuracy)

Plume Mass if No Biodegradation	Can't Calc.	(Kg)
- Actual Plume Mass	Can't Calc.	(Kg)
= Plume Mass Removed by Biodeg	-	(Kg)

Change in Electron Acceptor/Byproduct Masses:

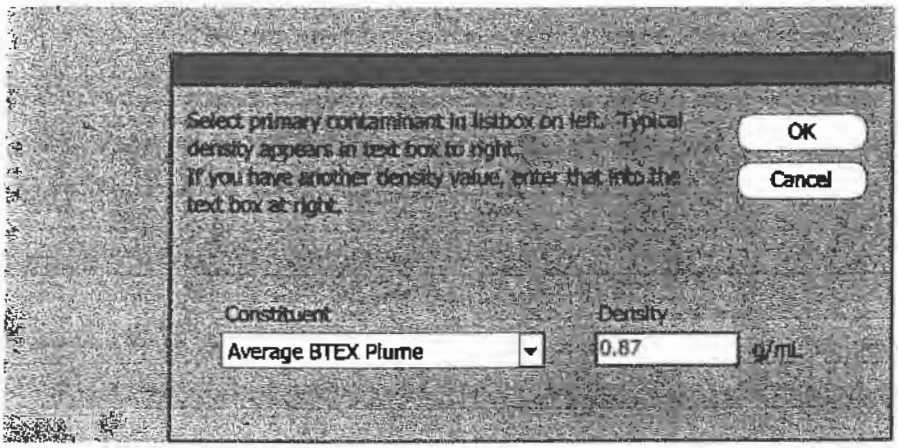
Oxygen	Nitrate	Iron II	Sulfate	Methane	
na	na	na	na	na	(Kg)

Contam. Mass in Source (t=0 Years)	infinite	(Kg)
Contam. Mass in Source Now (t=30Years)	Infinite	(Kg)
Current Volume of Groundwater in Plume	Can't Calc.	(ac-ft)
Flowrate of Water Through Source Zone	Can't Calc.	(ac-ft/yr)

Mass HELP

Recalculate

dlgDensity


Select primary contaminant in listbox on left. Typical density appears in text box to right.
If you have another density value, enter that into the text box at right.
OK
Cancel
Constituent
Average BTEX Plume
Density
0.87
g/mL

BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence — *Version 1.4*

Tacoma Metals
Benzene
Run Name

Data Input Instructions:

115 or 0.02 — 1. Enter value directly....or 2. Calculate by filling in grey cells below. (To restore formulas, hit button below).

Variable*	
	▷ Data used directly in model.
20	▷ Value calculated by model. (Don't enter any data).

1. HYDROGEOLOGY

Seepage Velocity*	Vs	844.6	(ft/yr)
or		or	
Hydraulic Conductivity	K	5.0E-02	(cm/sec)
Hydraulic Gradient	i	0.008	(ft/ft)
Porosity	n	0.49	(-)

2. DISPERSION

Longitudinal Dispersivity*	alpha x	13.8	(ft)
Transverse Dispersivity*	alpha y	1.4	(ft)
Vertical Dispersivity*	alpha z	0.0	(ft)
or		or	
Estimated Plume Length	Lp	300	(ft)

3. ADSORPTION

Retardation Factor*	R	6.8	(-)
or		or	
Soil Bulk Density	rho	1.35	(kg/l)
Partition Coefficient	Koc	7.00E+01	(L/kg)
FractionOrganicCarbon	foc	3.0E-2	(-)

4. BIODEGRADATION

1st Order Decay Coeff*	lambda	4.6E+0	(per yr)
or		or	
Solute Half-Life	t-half	0.15	(year)
or Instantaneous Reaction Model			
Delta Oxygen*	DO	1.65	(mg/L)
Delta Nitrate*	NO3	0.7	(mg/L)
Observed Ferrous Iron*	Fe2+	16.6	(mg/L)
Delta Sulfate*	SO4	22.4	(mg/L)
Observed Methane*	CH4	6.6	(mg/L)

5. GENERAL

Modeled Area Length*	300	(ft)
Modeled Area Width*	50	(ft)
Simulation Time*	30	(yr)

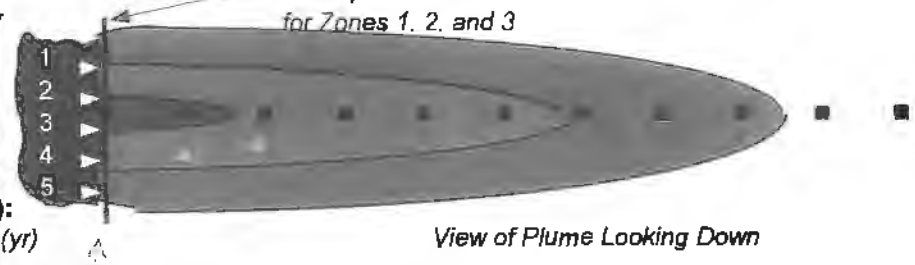
6. SOURCE DATA

Source Thickness in Sat.Zone* 10 (ft)

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3

Source Zones:

Width* (ft)	Conc. (mg/L)*
0	0
0	0
50	2.40E-02
0	0
0	0



View of Plume Looking Down

Source Halflife (see Help):

Infinite	Infinite	(yr)
Inst. React.	1st Order	
Soluble Mass	infinite	(Kg)
In Source NAPL, Soil		

Observed Centerline Concentrations at Monitoring Wells
If No Data Leave Blank or Enter "0"

7. FIELD DATA FOR COMPARISON

Concentration (mg/L)											
Dist. from Source (ft)	0	30	60	90	120	150	180	210	240	270	300

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE — View Output

RUN ARRAY — View Output

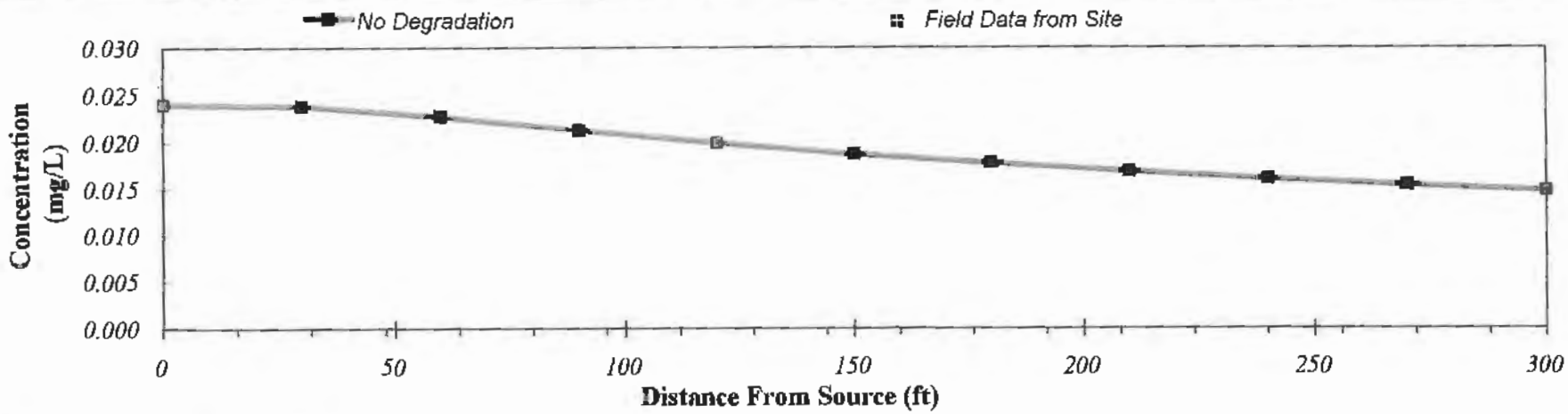
Help — Recalculate This Sheet

Paste Example Dataset

Restore Formulas for Vs, Dispersivities, R, lambda, other

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft) 0	30	60	90	120	150	180	210	240	270	300
No Degradation	0.024	0.024	0.023	0.021	0.020	0.019	0.018	0.017	0.016	0.015	0.015
1st Order Decay	0.024	0.011	0.004	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000
Inst. Reaction	0.024	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site											



Calculate Animation

Time:
30 Years

Return to Input

Recalculate This Sheet

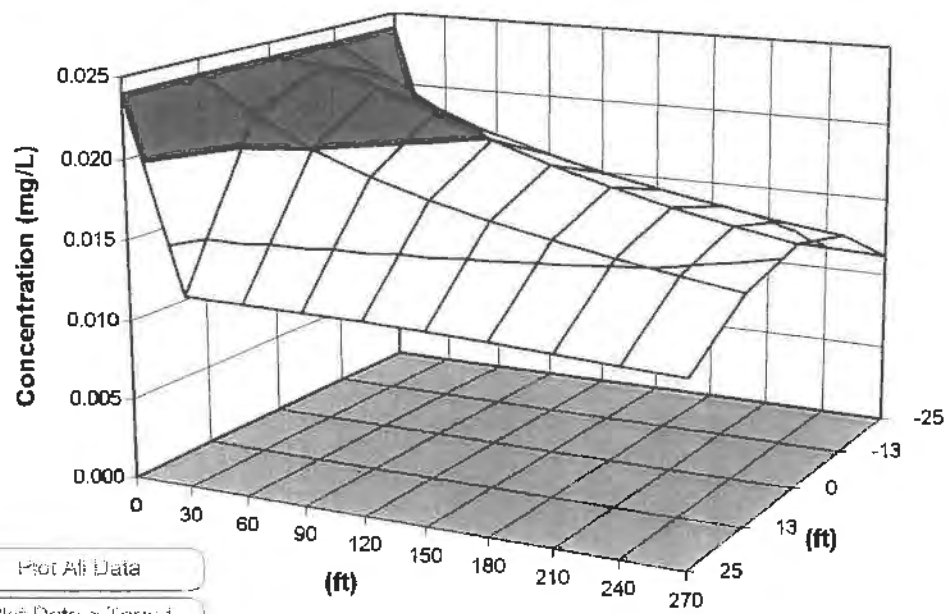
DISSOLVED HYDROCARBON CONCENTRATIONS IN PLUME (mg/L at Z=0)

Transverse Distance (ft) ↓ / Distance from Source (ft)	0	30	60	90	120	150	180	210	240	270	300
25	0.024	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.011	0.011	0.011
13	0.024	0.022	0.020	0.019	0.018	0.017	0.016	0.015	0.015	0.014	0.014
0	0.024	0.024	0.023	0.021	0.020	0.019	0.018	0.017	0.016	0.015	0.015
-13	0.024	0.022	0.020	0.019	0.018	0.017	0.016	0.015	0.015	0.014	0.014
-25	0.024	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.011	0.011	0.011
MASS FLUX (mg/day)	3.9E+2	3.7E+2	3.5E+2	3.3E+2	3.2E+2	3.0E+2	2.9E+2	2.8E+2	2.7E+2	2.7E+2	2.6E+2

Model to Display:

- No Degradation Model
- 1st Order Decay Model
- Instantaneous Reaction Model

Time: 30 Years Target Level: 0.005 mg/L Displayed Model: No Degradation



Plot All Data

Plot Data > Target

Plume and Source Masses (Order-of-Magnitude Accuracy)

Plume Mass if No Biodegradation	Can't Calc.	(Kg)
- Actual Plume Mass	Can't Calc.	(Kg)
= Plume Mass Removed by Biodeg	-	(Kg)

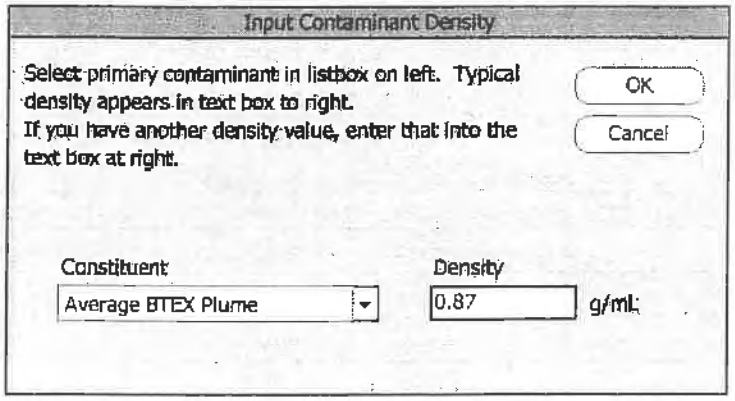
Change in Electron Acceptor/Byproduct Masses

Oxygen	Nitrate	Iron II	Sulfate	Methane	
na	na	na	na	na	(Kg)

Contam. Mass in Source (t=0 Years)	infinite	(Kg)
Contam. Mass in Source Now (t=30Years)	Infinite	(Kg)
Current Volume of Groundwater in Plume	Can't Calc.	(ac-ft)
Flowrate of Water Through Source Zone	Can't Calc.	(ac-ft/yr)

Mass HELP

Recalculate


Input Contaminant Density
Select primary contaminant in listbox on left. Typical density appears in text box to right.
If you have another density value, enter that into the text box at right.
OK
Cancel
Constituent
Average BTEX Plume
Density
0.87
g/mL

Appendix P

Cost Estimates

ALTERNATIVE 1

EXCAVATION / OFF-SITE DISPOSAL / ASPHALT CAP / INSTITUTIONAL CONTROLS

Task	Quantity	Unit	Material Unit Cost	Material Extension	Labor Unit Cost	Labor Extension	Lump Sum Price	Total Cost
REMEDIATION COSTS								
Excavate TPH / CPAH impacted soil	6424	CY			3.16	$ 20,300		$ 20,300
Oxygen-releasing compound - Phase I	3,000	LBS	9.00	$ 27,000	0.33	$ 1,000		$ 28,000
Oxygen-releasing compound - Phase II	8,775	LBS	8.00	$ 70,200	1.82	$ 16,000		$ 86,200
Import bank run soil, backfill, compact	8424	CY	14.20	$ 119,621	1.99	$ 16,764		$ 136,385
Import top course soil, grade, compact	2380	CY	20.25	$ 48,188	6.00	$ 14,278		$ 62,466
Pave asphalt cap, WSDOT Class B	28,556	SY	5.62	$ 160,485	1.04	$ 29,698		$ 190,183
Catch basins, WSDOT Type II	10	EA	939.00	$ 9,390	619.50	$ 6,195		$ 15,585
PVC stormwater conveyance pipe, 8"	1200	LF	7.73	$ 9,276	12.96	$ 15,552		$ 24,828
Oil / water separator, coalescing plate	1	EA	28,000.00	$ 28,000	1000.00	$ 1,000		$ 29,000
Dust control	4	WK	250.00	$ 1,000	1636.25	$ 6,545		$ 7,545
Install signs	10	EA	15.00	$ 150	30.00	$ 300		$ 450
Deed restrictions	1	LS					$ 2,750	$ 2,750
Subtotal Remediation Costs A (A)								**$ 603,692**
Contractor overhead and profit	15	% of A					$ 90,554	$ 90,554
Bond and insurance	3	% of A					$ 18,111	$ 18,111
Mobilization/demobilization	5	% of A					$ 30,185	$ 30,185
Sales Tax / Tacoma	8.5	% of A					$ 51,314	$ 51,314
Contingency	10	% of A					$ 60,369	$ 60,369
Subtotal Remediation Costs B (B)								**$ 854,224**
Engineering Services	15	% of B					$ 128,134	$ 128,134
Construction management	10	% of B					$ 85,422	$ 85,422
Mobile laboratory	10	DAY			1,500.00	$ 15,000		$ 15,000
Off-site soil transportation/disposal (C)	9,636	TON			32.54	$ 313,555		$ 313,555
Disposal contingency	10	% of C					$ 31,356	$ 31,356
Lead battery casing disposal	1	LS					$ 10,000	$ 10,000
TOTAL REMEDIATION COSTS								**$ 1,437,691**
O&M COSTS								
Semi-annual groundwater	2	EA			3,000.00	$ 6,000		$ 6,000
Semi-annual laboratory sample analysis	2	EA			11,000.00	$ 22,000		$ 22,000
Semi-annual reporting	2	EA			4,000.00	$ 8,000		$ 8,000
Annual cap inspection / reporting	1	EA			1,000.00	$ 1,000		$ 1,000
Annual well inspection / maintenance	1	EA			1,000.00	$ 1,000		$ 1,000
Subtotal O&M Costs (D)								**$ 38,000**
Project management	15	% of D					$ 5,700	$ 5,700
O&M Contingency	10	% of D					$ 3,800	$ 3,800
TOTAL O&M COSTS (5 YR)								$ 47,500
(present worth i=0.05, n=5, P/A=4.3295)								**$ 205,651**
ADDITIONAL SAMPLING COSTS - YEAR 1	1	EA					$ 36,000	**$ 36,000**
TOTAL								**$ 1,679,000**

ALTERNATIVE 2

EXCAVATION / BUFFER/ OFF-SITE DISPOSAL / ASPHALT CAP / INSTITUTIONAL CONTROLS

Task	Quantity	Unit	Material Unit Cost	Material Extension	Labor Unit Cost	Labor Extension	Lump Sum Price	Total Cost
REMEDIATION COSTS								
Excavate TPH / CPAH impacted soil	6424	CY			3.16	$ 20,300		$ 20,300
Excavate buffer, grade, compact	3667	CY			3.53	$ 12,946		$ 12,946
Oxygen-releasing compound - Phase I	3,000	LBS	9.00	$ 27,000	0.33	$ 1,000		$ 28,000
Oxygen-releasing compound - Phase II	8,775	LBS	8.00	$ 70,200	1.82	$ 16,000		$ 86,200
Import bank run soil, backfill, compact	10,091	CY	14.20	$ 143,292	1.99	$ 20,081		$ 163,373
Import top course soil, grade, compact	2380	CY	20.25	$ 48,188	6.00	$ 14,278		$ 62,466
Pave asphalt cap, WSDOT Class B	28,556	SY	5.62	$ 160,465	1.04	$ 29,698		$ 190,163
Catch basins, WSDOT Type II	10	EA	939.00	$ 9,390	619.50	$ 6,195		$ 15,585
PVC stormwater conveyance pipe, 8"	1200	LF	7.73	$ 9,276	12.96	$ 15,552		$ 24,828
Oil / water separator, coalescing plate	1	EA	28,000.00	$ 28,000	1000.00	$ 1,000		$ 29,000
Dust control	4	WK	250.00	$ 1,000	1636.25	$ 6,545		$ 7,545
Install signs	10	EA	15.00	$ 150	30.00	$ 300		$ 450
Deed restrictions	1	LS					$ 2,750	$ 2,750
Subtotal Remediation Costs A (A)								**$ 643,626**
Contractor overhead and profit	15	% of A					$ 96,544	$ 96,544
Bond and insurance	3	% of A					$ 19,309	$ 19,309
Mobilization/demobilization	5	% of A					$ 32,181	$ 32,181
Sales Tax / Tacoma	8.5	% of A					$ 54,708	$ 54,708
Contingency	10	% of A					$ 64,363	$ 64,363
Subtotal Remediation Costs B (B)								**$ 910,731**
Engineering Services	15	% of B					$ 136,610	$ 136,610
Construction management	10	% of B					$ 91,073	$ 91,073
Mobile laboratory	10	DAY			1,500.00	$ 15,000		$ 15,000
Off-site soil transportation/disposal (C)	9,636	TON			32.54	$ 313,555		$ 313,555
Disposal contingency	10	% of C					$ 31,356	$ 31,356
Lead battery casing disposal	1	LS					$ 10,000	$ 10,000
TOTAL REMEDIATION COSTS								**$ 1,508,325**
O&M COSTS								
Semi-annual groundwater	2	EA			3,000.00	$ 6,000		$ 6,000
Semi-annual laboratory sample analysis	2	EA			11,000.00	$ 22,000		$ 22,000
Semi-annual reporting	2	EA			4,000.00	$ 8,000		$ 8,000
Annual cap inspection / reporting	1	EA			1,000.00	$ 1,000		$ 1,000
Annual well inspection / maintenance	1	EA			1,000.00	$ 1,000		$ 1,000
Subtotal O&M Costs (D)								**$ 38,000**
Project management	15	% of D					$ 5,700	$ 5,700
O&M Contingency	10	% of D					$ 3,800	$ 3,800
TOTAL O&M COSTS (5 YR)								$ 47,500
(present worth i=0.05, n=5, P/A=4.3295)								**$ 205,651**
ADDITIONAL SAMPLING COSTS - YEAR 1	1	EA					$ 36,000	**$ 36,000**
TOTAL								**$ 1,750,000**

ALTERNATIVE 3

EXCAVATION / ONSITE TREATMENT / ASPHALT CAP / INSTITUTIONAL CONTROLS

Task	Quantity	Unit	Material Unit Cost	Material Extension	Labor Unit Cost	Labor Extension	Lump Sum Price	Total Cost
REMEDIATION COSTS								
Excavate TPH / CPAH impacted soil	6424	CY			3.16	$ 20,300		$ 20,300
Screen TPH / CPAH impacted soil	6424	CY			3.01	$ 19,334		$ 19,334
Thermal desorption of TPH / CPAH soil	6091	CY			82.50	$ 502,480		$ 502,480
Excavate lead impacted soil	11,047	CY			3.16	$ 34,909		$ 34,909
Screen lead impacted soil	11,047	CY			3.01	$ 33,247		$ 33,247
Stabilization of lead impacted soil	16,071	TON			21.00	$ 337,481		$ 337,481
Oxygen-releasing compound - Phase I	3,000	LBS	9.00	$ 27,000	0.33	$ 1,000		$ 28,000
Oxygen-releasing compound - Phase II	8,775	LBS	8.00	$ 70,200	1.82	$ 16,000		$ 86,200
Backfill and compact treated soil	16,804	CY			2.19	$ 36,801		$ 36,801
Import bank run soil, backfill, compact	667	CY	14.20	$ 9,467	1.99	$ 1,327		$ 10,793
Import top course soil, grade, compact	2380	CY	20.25	$ 48,188	6.00	$ 14,278		$ 62,466
Pave asphalt cap, WSDOT Class B	28,556	SY	5.62	$ 160,485	1.04	$ 29,698		$ 190,183
Catch basins, WSDOT Type II	10	EA	939.00	$ 9,390	619.50	$ 6,195		$ 15,585
PVC stormwater conveyance pipe, 8"	1200	LF	7.73	$ 9,276	12.96	$ 15,552		$ 24,828
Oil / water separator, coalescing plate	1	EA	28,000.00	$ 28,000	1000.00	$ 1,000		$ 29,000
Dust control	6	WK	250.00	$ 1,500	1636.25	$ 9,818		$ 11,318
Install signs	10	EA	15.00	$ 150	30.00	$ 300		$ 450
Deed restrictions	1	LS					$ 2,750	$ 2,750
Subtotal Remediation Costs A (A)								**$ 1,446,124**
Contractor overhead and profit	15	% of A					$ 216,919	$ 216,919
Bond and insurance	3	% of A					$ 43,384	$ 43,384
Mobilization/demobilization	5	% of A					$ 72,306	$ 72,306
Sales Tax / Tacoma	8.5	% of A					$ 122,921	$ 122,921
Contingency	10	% of A					$ 144,612	$ 144,612
Subtotal Remediation Costs B (B)								**$ 2,046,266**
Engineering Services	15	% of B					$ 306,940	$ 306,940
Construction management	10	% of B					$ 204,627	$ 204,627
Mobile laboratory	10	DAY			1,500.00	$ 15,000		$ 15,000
Off-site debris transportation/disposal (C)	1,000	TON			32.54	$ 32,540		$ 32,540
Disposal contingency	10	% of C					$ 3,254	$ 3,254
Lead battery casing disposal	1	LS					$ 10,000	$ 10,000
TOTAL REMEDIATION COSTS								**$ 2,618,626**
O&M COSTS								
Semi-annual groundwater	2	EA			3,000.00	$ 6,000		$ 6,000
Semi-annual laboratory sample analysis	2	EA			11,000.00	$ 22,000		$ 22,000
Semi-annual reporting	2	EA			4,000.00	$ 8,000		$ 8,000
Annual cap inspection / reporting	1	EA			1,000.00	$ 1,000		$ 1,000
Annual well inspection / maintenance	1	EA			1,000.00	$ 1,000		$ 1,000
Subtotal O&M Costs (D)								**$ 38,000**
Project management	15	% of D					$ 5,700	$ 5,700
O&M Contingency	10	% of D					$ 3,800	$ 3,800
TOTAL O&M COSTS (5 YR)								$ 47,500
(present worth i=0.05, n=5, P/A=4.3295)								**$ 205,651**
ADDITIONAL SAMPLING COSTS - YEAR 1	1	EA					$ 36,000	**$ 36,000**
TOTAL								**$ 2,860,000**

APPENDIX C

Revised Remedial Investigation/ Feasibility Study Report (Kennedy/ Jenks, 2014)

Kennedy/Jenks Consultants

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Federal Way, Washington 98001
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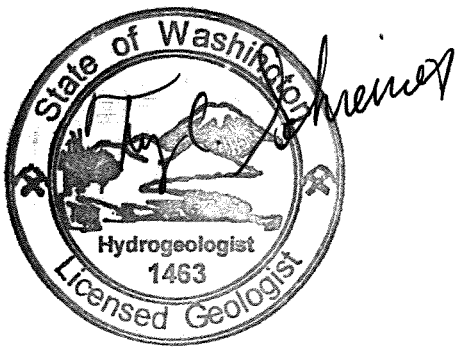
Revised Augmented Remedial Investigation and Feasibility Report Former Tacoma Metals Site Tacoma, Washington

September 2014

DEAN K. MALTE



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K/J Project No. 996098*00

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List of Acronyms

Acronym	Description
ARARs	applicable, relevant, and appropriate requirements
AST	aboveground storage tank
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and total xylenes
COC(s)	chemical(s) of concern
cPAH(s)	carcinogenic polycyclic aromatic hydrocarbon(s)
CPOC	conditional point of compliance
DNAPL	dense non-aqueous phase liquid
DPA	disproportionate cost analysis
Ecology	Washington State Department of Ecology
EODT	EOD Technology, Inc.
EPA(s)	extractable petroleum hydrocarbon(s)
FBI	Friedman & Bruya, Inc.
LNAPL	light non-aqueous phase liquid
MTCA	Model Toxics Control Act
NWTPH-Dx	Northwest Total Petroleum Hydrocarbons as Diesel and Oil Extended
ORC	oxygen release compound
PAH(s)	polycyclic aromatic hydrocarbon(s)
PCB(s)	polychlorinated biphenyl(s)
POC	point of compliance
PRSC	Puyallup River Side Channel
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
SIM	select ion monitoring
site	Former Tacoma Metals site
SPLP	Synthetic Precipitation Leaching Procedure
SVOC(s)	semi-volatile organic compound(s)

Acronym	Description
TCLP	Toxicity Characteristic Leaching Procedure
TCU	temporary containment unit
TEE	terrestrial ecological evaluation
TNT/DNT	trinitrotoluene/dinitrotoluene
USACE	United States Army Corps of Engineers
UXO	unexploded ordnance
VOC(s)	volatile organic compound(s)
WAC	Washington Administrative Code

Executive Summary

This report was prepared at the request of the Washington State Department of Ecology (Ecology) to augment the Remedial Investigation and Feasibility Study (RI/FS) originally prepared for the former Tacoma Metals site by Kennedy/Jenks Consultants in 2001. The site location is shown on Figure 1.

During the initial RI, impacts to environmental site media related to former site uses as a metals recycling facility (primary use 1950s through 1990s) and coke manufacturing plant (limited use 1940s) were evaluated and fully characterized. However, an additional historical site use as a creosoting plant (1910s to 1930s) was identified during the initial RI in the western portion of the site. Impacts to environmental media related to the creosoting plant were identified, but not fully characterized, during the initial RI.

A supplemental RI was performed between 2002 and 2011 to evaluate and characterize potential impacts to environmental site media related to the former creosoting plant. The supplemental RI work areas included the former Tacoma Metals property (western portion) and Off-Property areas to the north and west of the former Tacoma Metals property, collectively called the Creosoting Plant Area, and the bank area adjacent to the Puyallup River Side Channel (PRSC) to the north of the site. The supplemental RI work areas are depicted on Figure 2.

The supplemental RI was performed in phases, with each phase of work approved by Ecology prior to implementation. Impacts to environmental media related to the former creosoting plant were evaluated and fully characterized during the supplemental RI. Sample locations for the initial RI and supplemental RI are summarized on Figure 3.

Other work performed after the initial RI, at Ecology's request, included a terrestrial ecological evaluation (TEE), a cleanup level evaluation [including and assessment of the proposed remedial options with respect to the disproportionate cost analysis (DPA) framework], and a forensic evaluation of hydrocarbons to identity the appropriate cleanup standards for creosote-related compounds.

The forensic evaluation concluded that cleanup standards for petroleum-based hydrocarbons are inappropriate for creosote-related compounds because creosote is derived from coal tar (pyrogenic) rather than petroleum (petrogenic). The results of the TEE and cleanup level evaluation were incorporated into the FS update prepared for this report (discussed below).

In addition to the investigations and reports discussed above, two interim remedial actions have been performed at the site since completion of the initial RI. These interim remedial actions included an investigation and mitigation of potential unexploded ordnance (UXO) along the northern margin of the former Tacoma Metals property and onsite treatment of approximately 3,440 tons of lead-impacted soil excavated north of the site during construction of the PRSC by the City of Tacoma (the impacted soil was related to metals recycling activities).

For the initial (2001) FS, three remedial alternatives were evaluated and Alternative 2 was selected as the preferred alternative. Alternative 2 included excavation and offsite disposal of hydrocarbon-affected soil, excavation and onsite consolidation of metals-impacted soil from the perimeter of the site, installation of an asphalt cap with stormwater controls, *in situ* treatment of residual hydrocarbon impacts, institutional controls, and long-term monitoring.

The FS was updated for this report, and included updates to potential exposure pathways, the conceptual site model, proposed cleanup levels, potential costs for the three original remedial alternatives, and an evaluation of the appropriateness of the preferred cleanup alternative (Alternative 2) based on the findings of the supplemental RI (and other work performed since the initial RI).

The findings of the supplemental RI (and other work performed since the initial RI) and updated FS do not substantively alter the components of preferred cleanup Alternative 2, although the volume of potentially affected environmental media related to the former creosoting plant increased based on the results of the supplemental RI, an additional excavation area is proposed around boring location B-36 (located on the Simpson Property), and installation of a soil cap is proposed for the Off-Property 18th Street Right-of-Way area.

The findings of the supplemental RI and FS update confirm the appropriateness of Alternative 2, which is protective of human health and the environment under an industrial use scenario, as the preferred remedial alternative for the site.

Section 1: Introduction

This report was prepared at the request of the Washington State Department of Ecology (Ecology) and provides an augmentation to the Remedial Investigation and Feasibility Study (RI/FS) report for the former Tacoma Metals site (site). The RI/FS report was originally submitted to Ecology in June 2001 (Kennedy/Jenks Consultants 2001). Following submittal of the RI/FS report, a series of additional investigations were performed at the request of Ecology. The information presented herein provides a compilation of all relevant data for the site. The report then uses the available information to re-evaluate the preferred cleanup remedy selected for the site in the 2001 FS (Kennedy/Jenks Consultants 2001). As the information summarized herein has been previously submitted to Ecology in various other prior reports, the reader is referred to those reports for additional information.

1.1 Purpose and Regulatory Framework

The purpose of this document is to summarize current and available information regarding site conditions and re-evaluate whether or not the preferred cleanup remedy presented in the RI/FS Report (Kennedy/Jenks Consultants 2001) is protective of human health and the environment. This report is also intended to facilitate Ecology's review of current site conditions, and to facilitate review of site information during the public comment period that will precede the cleanup action by consolidating relevant information into a single document.

The investigation and remediation activities described in this report were performed under an Agreed Order (No. DE97-5435) between Ecology and Mr. and Mrs. Leslie Sussman (owners) through the entity Portland Avenue Associates, LLC (owner). Work was performed in accordance with Ecology's Model Toxics Control Act (MTCA) regulations published in Washington Administrative Code (WAC) 173-340 (Ecology 2001, updated October 2007). Each phase of work described in this report was performed under a separate Work Plan, which was submitted to Ecology for approval under the Agreed Order prior to the start of the work. The Work Plans and subsequent summary reports for individual phases of work are referenced as appropriate.

1.2 Site Location

The former Tacoma Metals site is located at 1919 Portland Avenue in Tacoma, Washington, in an industrial-zoned area within the Tacoma Tideflats (refer to Figure 1). The site is bounded to

the north by the Puyallup River, to the east by the Lincoln Avenue Bridge, which crosses the Puyallup River, to the south by Portland Avenue, and to the west by a City of Tacoma right-of-way and private properties. The former Tacoma Metals property is approximately 5.9 acres, but investigative work has also been performed at Off-Property locations adjoining the main property (refer to Figure 2). Section 1.3 provides an overview of different site areas and nomenclature.

Note on Directions: The site is geographically oriented with the long axis trending approximately northwest to southeast. To simplify descriptions of site locations for this report, the property boundary located along Portland Avenue will be considered the southern property boundary, and the property boundary along Lincoln Avenue will be considered the eastern property boundary.

1.3 Site Areas and Nomenclature

Work has been performed at different portions of the site, as depicted on Figure 2. The following terminology will be used herein to describe the different portions of the site:

- ***Site:*** Refers to the entire former Tacoma Metals site including On-Property and Off-Property areas.
- ***On-Property / Tacoma Metals Property:*** The actual former Tacoma Metals property only, corresponding to the relevant Pierce County tax parcels.
- ***Off-Property:*** Work areas located west to northwest of the On-Property area including the City of Tacoma 18th Street right-of-way and two private properties (Simpson and JJ Port properties).
- ***Creosoting Plant Area:*** That portion of the site affected by historical releases from a former creosoting plant, including the western portion of the On-Property area and the Off-Property areas.
- ***Puyallup River Side Channel (PRSC):*** The area where an estuary and wetland was constructed to the north of the site in 2005 by the City of Tacoma. The PRSC is not part of the site, although some investigation work has been performed by Kennedy/Jenks Consultants in PRSC bank areas since the PRSC was constructed in 2005. The PRSC adjoins both the On-Property and Off-property portions of the site and is separated from the site by an earthen levee maintained by the United States Army Corps of Engineers (USACE).

1.4 Previous Reports

As previously indicated, this report summarizes information previously submitted to Ecology in various site investigation, data transmittal, and site evaluation reports. The information summarized in this report includes that which is relevant to the preferred cleanup remedy presented in the RI/FS (Kennedy/Jenks Consultants 2001). While summarizing all relevant historical data for the site, this report includes only original data that has been previously provided to Ecology.

Because the purpose of this report is to provide a concise summary of site conditions, detailed discussion of the specific activities and findings for each individual phase of work is beyond the scope of this report. However, select information (i.e., tables, figures, maps, and other information) from previous reports is attached to this report for reference purposes, as appropriate. Additional information and discussion regarding the various phases of work performed at the site is available in the investigation and evaluation documents referenced below and cited as appropriate within this report.

Previous environmental investigation and data transmittal reports prepared by Kennedy/Jenks Consultants include the following:

- *Remedial Investigation / Feasibility Study Report, Former Tacoma Metals Facility* (Kennedy/Jenks Consultants 2001).
- *Supplemental Data Summary Report, Former Tacoma Metals Property* (Kennedy/Jenks Consultants 2007a).
- *Revised Soil and Groundwater Investigation Results – Data Transmittal, October 2007-April 2008 Investigation, Former Tacoma Metals Facility* (Kennedy/Jenks Consultants 2008b).
- *Groundwater Investigation Summary, Puyallup River Side Channel Investigation, Former Tacoma Metals Facility* (Kennedy/Jenks Consultants 2012).

Previous site evaluation reports prepared by Kennedy/Jenks Consultants include the following:

- *Cleanup Level Evaluation, Former Tacoma Metals Facility* (Kennedy/Jenks Consultants 2007c).

- *Response to Ecology Comments, Forensic Evaluation of Hydrocarbons, Former Tacoma Metals Facility* (Kennedy/Jenks Consultants 2009).
- *Terrestrial Ecological Evaluation, Former Tacoma Metals Facility* (Kennedy/Jenks Consultants 2010a).

Other work performed at the site by Kennedy/Jenks Consultants, including interim cleanup actions, is summarized in the reports referenced below, and discussed herein as appropriate:

- *Summary Report for Treating/Disposal of Lead-Containing Soil Materials, Former Tacoma Metals Site* (Kennedy/Jenks Consultants 2008a).
- *Final Letter Report for UXO Investigation Services at the Former Tacoma Metals Site* (EODT 2006).
- Limited investigation work was also performed at the site by others prior to the work performed by Kennedy/Jenks Consultants. Refer to the RI/FS (Kennedy/Jenks Consultants 2001) for a discussion of investigation work and findings performed by others prior the RI/FS.

In addition, investigation, remediation, and general construction activities were performed by others as part of the PRSC project, as referenced below and discussed herein as appropriate:

- *Soil and Groundwater Quality Testing Results, Puyallup River Site Channel and Tacoma Metals Site, Tacoma, Washington* (Hart-Crowser 2003).
- *Remedial Action Construction Report* (City of Tacoma 2006).

1.5 Report Organization

The remainder of this report is organized as follows.

- Section 2 provides a summary of background information regarding historical site uses, hydrogeologic setting, and work performed.
- Section 3 provides a summary of work performed for the initial RI (2001 RI) and FS.
- Section 4 provides a summary of supplemental RI activities performed at the site since completion of the 2001 RI/FS. This section also summarizes interim remedial actions, which have been performed at the site.

- Section 5 provides a discussion of the preferred cleanup alternative, including the site conceptual model, proposed cleanup levels, and proposed modifications based on the findings of investigation and evaluation activities performed for the supplemental RI.
- Section 6 provides a summary of the information presented in this report and conclusions.
- Section 7 provides a list of references cited in this document.

Section 2: Background

This section provides an overview of historical site uses, hydrogeologic conditions, and the main phases of work performed at the site by Kennedy/Jenks Consultants. Investigation results, current conditions, and impacts to environmental media are discussed in greater detail in subsequent sections of this report.

2.1 Historical Site Uses

Kennedy/Jenks Consultants' understanding of previous site uses is based on extensive historical research including review of aerial photographs, Sanborn Fire Insurance Maps, published accounts of site uses and activities (i.e., newspaper articles, trade publications, and historical summary texts), and other historical materials housed at the Tacoma Public Library (maps and ground-level photographs) and the Washington State Historical Society (historical ground-level photographs).

Three distinct phases of developed use were identified for the site during previous investigations. The primary uses associated with the three development phases include:

- Creosoting Plant (1900s to 1930s) (refer to Section 2.1.1)
- Coke Plant (early 1940s) (refer to Section 2.1.2)
- Metals Recycling Facility (1950s to 1990s) (refer to Section 2.1.3).

Metals recycling operations ceased in 1999 and the property was vacated. Site investigation remediation activities have been performed at the site by Kennedy/Jenks Consultants since 2000, and previous investigation activities were performed by others on a limited basis beginning in 1988 (refer to Section 2.3). In addition, the PRSC habitat was constructed to the north of the site by the City of Tacoma in 2005 (refer to Section 2.1.4).

Previous site uses are discussed in detail in the RI/FS Report (Kennedy/Jenks Consultants 2001) and the *Response to Ecology Comments* letter (Kennedy/Jenks Consultants 2009), and are summarized below.

2.1.1 Creosoting Plant

Facilities associated with a creosoting plant operated by the St. Paul and Tacoma Lumber Company were previously located on the western portion of the former Tacoma Metals Property and the Off-Property areas to the west (i.e., the Creosoting Plant Area, refer to Figure 2). The creosoting plant appears to have been constructed in the late 1900s to early 1910s, and appears to have been operational until the late 1920s to early 1930s.

The primary creosoting plant facilities included the main creosoting plant structure, which housed a 130-foot treatment retort and a 1,500-gallon aboveground storage tank (AST), and two separate ASTs (102,000-gallon and 450,000-gallon) located northwest of the main structure. Other associated facilities included an overhead crane, overhead tramways, a wharf, and several smaller structures. Boardwalks and storage areas were located to the north and east of the retort structure.

Based on the available information, the two large ASTs likely contained creosote and the smaller AST was possibly used to mix wood treatment materials prior to use. Kennedy/Jenks Consultants has previously reviewed information related to the storage tanks, including detailed summaries of site operation provided in the May 21, 1921 issue of *American Lumberman* and the book *Mill on the Boot* by Murray Morgan, multiple site and vicinity maps (Sanborn Maps, Metsker's Maps, St. Paul and Tacoma site map included in the May 21, 1921 *American Lumberman*), and St. Paul and Tacoma Lumber Company documents housed at the University of Washington Special Collections Library (Kennedy/Jenks Consultants 2009). Although the various information sources did not specifically list the product stored in the tanks as creosote (listed as "oil tanks" on the 1912 Sanborn Map), the facility associated with the tanks is referred to as a "creosoting plant" and creosoting operations are described in detail in the book *Mill on the Boot* and *American Lumberman*. The association of the storage tanks with the creosoting plant, and references to creosote oil in St. Paul and Tacoma company internal purchase documents, strongly suggests that the storage tanks were used to contain creosote product. Refer to the referenced February 17, 2009 *Response to Ecology Comments, Forensic Evaluation of Hydrocarbons* for additional information.

The wharf was located along the Puyallup River, which directly adjoined the site to the north during the time period in which the creosoting plant was operational, and appears to have been used as a dock and/or mooring location. A wooden bulkhead appears to have been located

along the approximate current northern Tacoma Metals Property margin, directly adjoining the Puyallup River. [Note: The course of the Puyallup River was shifted to the north, away from the northern site boundary, when an earthen levee was constructed by the USACE during the late 1940s and 1950s (refer to Section 2.1.4).]

2.1.2 Coke Plant

A coke manufacturing facility was constructed on the former Tacoma Metals Property during the early 1940s. The coke plant facility appears to have been used to produce metallurgical coke and coal gas (as a byproduct of the coke production process), and appears to have been operational for only a short time beginning in 1943.

The primary coke production structure was located in the central portion of the former Tacoma Metals Property. Other structures associated with the coke plant were located on the western portion of the former Tacoma Metals Property, in the vicinity of the former creosoting plant location, and appear to have been related to storage and distribution of coal gas.

The creosoting plant was demolished prior to construction of the coke plant, and approximately 3 to 5 feet of fill material was placed over the former Tacoma Metals Property area, including over the former creosoting plant. The coke plant structures were constructed after placement of the fill layer, which represents a “marker bed” associated with the particular time period between the abandonment of the creosoting plant and construction of the coke plant.

Most of the coke plant structures, except for part of the main building and several concrete foundation pads (three of which were located near former creosoting plant location), appear to have been demolished in the 1950s.

2.1.3 Metals Recycling

The former Tacoma Metals Property has been used for recycling ferrous and nonferrous metals since the early 1950s and was initially occupied by General Metals and subsequently by Tacoma Metals beginning in the early 1980s. Metals recycling does not appear to have been performed on Off-Property areas, although some debris and wastes from metal recycling may have accumulated to the north of the former Tacoma Metals Property (discussed in Section 4.3).

Metals recycling activities generally included the collection, storage, cutting, shredding, and bundling of various items including, but not limited to, aluminum cans and scrap, wheels, radiators, engine blocks, computer cases, and other scrap metal. Historical metals recycling activities also included dismantling and shredding of automobiles, motors, locomotives, and similar products.

Equipment used as part of the daily recycling operation included gasoline- and diesel-powered vehicles and equipment, as well as mobile and stationary hydraulic machinery. Stockpiles of various materials and associated processing machinery (balers, shears, etc.) were located throughout the former Tacoma Metals Property, although most of the machinery appears to have been located on the central and western portions of the former Tacoma Metals Property.

The remaining portion of the main coke plant structure appears to have been used as a processing and warehouse facility, although most of the materials were stored outside directly on the ground surface in piles or stacks. Most of the former Tacoma Metals Property appears to have been paved with asphalt by the 1970s, but an area along the northern property boundary remained unpaved throughout the time when metal recycling was performed (see Figure 3).

Other structures associated with metals recycling included small structures associated with the processing machinery referenced above, and a warehouse building constructed to the east of the main building during the 1980s. The aboveground portions of former metal recycling structures have been demolished and removed from the site, although most of the asphalt-paved areas and some concrete foundations remain.

2.1.4 Puyallup River Side Channel

As indicated above, the path of the Puyallup River was modified by construction of an earthen levee by the USACE in the late 1940s and 1950s. Prior to construction of the levee, the southern bank of the river adjoined the northern boundary of the site. During construction of the levee, the course of the river was shifted to the north, and a portion of the former Puyallup River channel located to the north of the western portion of former Tacoma Metals Property and the Off-Property areas was isolated from the main channel. The former channel area was gradually filled over time (by other property owners not associated with the former Tacoma Metals Property), primarily with wood-waste material. The site was separated from the Puyallup River by the former channel area and earthen levee until the levee was modified in 2005.

The original levee remained intact until 2005, when the PRSC estuary habitat was constructed by the City of Tacoma. The wood waste material that had accumulated in the former channel area was removed, and the original levee was breached to flood the former channel area. The course of the Puyallup River was not modified (portions of the original levee remained intact, but were lowered, to preserve the main channel), but an estuary habitat was created within the former channel area. A new levee was constructed immediately north of the former Tacoma Metals Property and Off-Property areas, between the site and the PRSC. PRSC construction activities are described in detail in the Remedial Action Construction Report (City of Tacoma 2006).

2.2 Hydrogeologic Setting

The current understanding of the site hydrogeology is based on observations of soil conditions in test pits and soil borings installed throughout the site, and water elevation monitoring of site groundwater monitoring wells performed during multiple phases of investigation.

The site is located in the Tacoma Tideflats physiographic area, which is part of the Puyallup River delta. Typical stratigraphy of the Tacoma Tideflats includes up to 10 feet of hydraulic fill (dredge) deposits of gravel, sand, silt, and organic debris underlain by silty and sandy deltaic sediments deposited by the Puyallup River. Glacial deposits typically underlie the Puyallup River sediments (Hart-Crowser 1975). Refer to the RI/FS report (Kennedy/Jenks Consultants 2001) for additional discussion of the regional geologic setting.

Our current understanding of the site-specific soil stratigraphy and hydraulic gradient is summarized below and discussed in more detail in subsequent sections of this report.

2.2.1 Soil Stratigraphy

Soil materials encountered during the investigation activities described above have included sandy and gravelly fill materials (typically with varying quantities of wood, metal, or other debris), woody debris with and without matrix material (typically silt and sand), and native materials including sand, silt, and clay.

Table 1 provides a detailed description of the stratigraphic units encountered at the site including lithologic composition, relative stratigraphic position, and typical thicknesses and depths at which the stratigraphic units are typically encountered.

Representative geologic cross-sections are provided in Appendix A and include cross-sections originally prepared for the 2001 RI/FS report for the former Tacoma Metals Property (Kennedy/Jenks Consultants 2001), and originally prepared for the October 2007 to April 2008 investigation letter report (Kennedy/Jenks Consultants 2008b) for the Creosoting Plant Area.

2.2.2 Groundwater Gradient

The direction of the hydraulic gradient in shallow groundwater at the site is influenced by tidal fluctuations in the Puyallup River and varies between high and low tidal cycles. At low tide, the hydraulic gradient is generally toward the Puyallup River, and at high tide, the gradient is generally toward the site, away from the Puyallup River. A localized stagnation zone is observed in the central portions of the site at high tide, primarily at the On-Property portion of the Creosoting Plant Area where accumulation of wood debris is greatest.

As previously indicated, depth to shallow groundwater varies with tidal levels. Saturated conditions are generally encountered at approximately 10 feet below ground surface (bgs) on the former Tacoma Metals Property, but the depth to groundwater varies for the Off-Property areas based on differing surface elevations which are generally higher on the 18th Street right-of-way and Simpson Property and lower on the JJ Port Property.

No seep discharges have been identified along the portion of the PRSC bank areas located north of the site.

Representative groundwater gradient maps for high and low tidal conditions are provided in Appendix B, including maps prepared for the two most recent site-wide water level monitoring events (2006 and 2008) that were performed after construction of the PRSC habitat area. Previous groundwater gradient maps are not included because the monitoring well network in the Off-Property areas was less extensive prior to 2006, and water elevation measurements made prior to 2006 may not be representative of current conditions (i.e., prior to construction of the PRSC). Refer to the RI/FS (Kennedy/Jenks Consultants 2001) and Supplemental Data Summary Report (Kennedy/Jenks Consultants 2007a) for gradient maps based on monitoring events prior to 2006.

2.3 Phases of Work Performed

Work was performed at the site by Kennedy/Jenks Consultants in three general phases listed below. The rationale, purpose, and overall scope of the work performed during each phase are

summarized below. The specific work and findings associated with each phase are discussed in Sections 3 (initial RI/FS) and 4 (supplemental RI) of this report.

2.3.1 Initial RI/FS

The initial RI/FS was performed between 2000 and 2001, with most of the onsite work completed during 2000. The RI/FS included only the On-Property portion of the site (the former Tacoma Metals Property only). The purpose of the RI/FS was to characterize the nature and extent of impacts to environmental media, including confirmation of the results of several limited investigations performed prior to the RI/FS between 1988 and 1995, develop a site model, and evaluate remedial options based on findings of the investigation. The RI/FS also included remedial activities related to demolition of buildings and disposal of waste material associated with site structures including building materials, liquid materials accumulated in subsurface vaults, and general refuse.

The RI/FS focused primarily on potential impacts to environmental media related to metals recycling and coke plant site uses (refer to Sections 2.1.2 and 2.1.3). Impacts to environmental media related to metals recycling and coke plant operations were fully characterized, defined, and evaluated during the RI/FS.

The former creosoting plant (refer to Section 2.1.1) was identified during the RI/FS and investigation activities were performed in the On-Property portion of the Creosoting Plant Area, but the Off-Property environmental impacts related to the creosoting plant were not fully defined.

Work performed and findings for the initial RI/FS are described in greater detail in Section 3. Site and sample location maps prepared for the initial RI/FS are included in Appendix C for reference.

2.3.2 Supplemental RI

Supplemental RI activities are summarized below. Additional description of work performed for each phase of Supplemental RI activities is provided in Table 2.

2.3.2.1 Creosoting Plant Area

The Creosoting Plant Area includes the western portion of the former Tacoma Metals Property, and the Off-Property area to the west (Figure 2). As indicated above, the former creosoting plant was identified during the RI/FS, but the extent of related impacts to soil and groundwater,

particularly in off-property areas, was not fully defined. Supplemental RI activities related to the Creosoting Plant Area were performed between 2002 and 2008 and included multiple phases of investigation which are summarized in Table 2.

Creosoting Plant Area investigation activities were performed in phases, beginning at On-Property areas (beginning in 2002) and progressing to Off-Property areas (beginning in 2004) iteratively until the extent of impacts was defined to Ecology's satisfaction. Supplemental RI activities were initially performed at On-Property areas in the immediate vicinity of the former creosoting plant location. Based on the initial findings, supplemental RI activities were performed on the City of Tacoma 18th Street right-of-way, which adjoins the former Tacoma Metals Property to the west, and subsequently progressed westward onto two private properties, the Simpson Property and the JJ Port Property (refer to Figures 2 and 3).

The supplemental RI fully characterized and defined the extent of impacts to environmental media related to the former creosoting plant facility. Work performed and findings for the supplemental RI are described in greater details in Section 4. Maps showing site features and sampling locations for the Creosoting Plant Area are included in Appendix D for reference.

2.3.2.2 PRSC and Conditional Point of Compliance Wells

Following review of data summary documents for supplemental RI activities performed in the Creosoting Plant Area, Ecology requested further investigation be performed along the conditional point of compliance (CPOC) adjacent to the PRSC.

The PRSC investigation was performed between October 2010 and February 2011. The purpose of the investigation was to evaluate groundwater conditions at the southern margin of the PRSC, specifically in the area to the north of monitoring well MW-8R, which is located near the northwestern corner of the former Tacoma Metals Property (refer to Figure 3) within the Creosoting Plant Area. The PRSC investigation also included evaluation of groundwater conditions in several proposed point of compliance (POC) monitoring wells located along the northern margin of the Creosoting Plant Area (refer to Figure 3). Work performed for the PRSC investigation summarized in Table 2.

The results of the PRSC investigation did not identify impacts to groundwater beyond those previously documented during the supplemental RI. Work performed and findings for the PRSC investigation are discussed in Section 4.

2.3.2.3 Interim Remedial Actions

In addition to the investigation activities described above, interim remedial actions have been performed at the site since completion of the initial RI. These have included an investigation and mitigation of potential unexploded ordnance (UXO) performed along the northern margin of the former Tacoma Metals Property in 2006, and onsite remediation of approximately 3,440 tons of lead-impacted soil material excavated from north of the former Tacoma Metals Property during construction of the PRSC by the City of Tacoma. These interim remedial actions are discussed in greater detail in Section 3.4.

Section 3: Initial RI/FS (2000-2001)

This section provides a summary of the findings of the initial RI and associated FS. Refer to the RI/FS report (Kennedy/Jenks Consultants 2001) for additional information.

3.1 Initial RI Work Performed

Work performed during the initial RI (March 2000 to May 2001) included both sampling and characterization of potentially impacted environmental media (soil, groundwater, and surface water) and demolition of existing site structures, including disposal of building materials and other associated waste materials. This section provides a general overview of the RI work performed at the site. Refer to the RI/FS report (Kennedy/Jenks Consultants 2001) for additional information regarding investigation activities and methods.

Sampling and characterization activities generally included the following:

- Excavation of 65 test pit trenches (TP-1 through TP-65) to depths of up to 12 feet bgs, and collection and laboratory analysis of soil samples. Test pits included both grid-based locations for general site-wide assessment, and additional test pits at specific locations based on historical site uses, previous investigation results, and grid-based test pit findings. Test pit locations are shown on Figure 3 and on the sample location summary map (Figure 2-1) included in Appendix C.
- Advancement of 18 soil borings (RGW-1 through RGW-18) to shallow groundwater depths (typically 10 to 15 feet bgs), and collection of reconnaissance groundwater samples for laboratory analysis. Soil boring locations are shown on the sample location summary map (Figure 2-1) included in Appendix C.
- Replacement of two previously existing shallow monitoring wells (MW-4 and MW-8) with new wells at the same locations [MW-4(R) and MW-8(R)] and installation of four new monitoring wells (MW-9 through MW-12). During monitoring well installation, soil samples were collected from soil borings for laboratory analyses. Monitoring well locations are shown on Figure 3 and on the sample location summary map (Figure 2-1) included in Appendix C.

- Collection of groundwater samples from 11 existing, replaced, and new shallow groundwater monitoring wells [MW-1, MW-2, and MW-4(R) through MW-12] for laboratory analysis.
- Sampling and analyzing surface water runoff from two locations (SW-1 and SW-2), and mapping of primary surface water flow pathways. Surface water sampling locations are shown on Figure 3 and on the sample location summary map (Figure 2-1) included in Appendix C.
- Hydraulic investigations, including water level monitoring, performing slug tests, and testing selected soil samples for geotechnical parameters.

Specific laboratory analyses performed for soil, groundwater, and surface water samples are summarized in the data tables prepared for the RI/FS report (Kennedy/Jenks Consultants 2001) and included in Appendix C for reference.

[Note: The cleanup levels listed in the data tables from the RI/FS report (Appendix C) may not necessarily be the current cleanup levels. Refer to Table 3 for a summary of the cleanup levels currently applicable to the site.]

Analyses typically included one or more of the following:

- Diesel- and oil-range petroleum hydrocarbons by Ecology Method Northwest Total Petroleum Hydrocarbons as Diesel and Oil Extended (NWTPH-Dx) (all media)
- Resource Conservation and Recovery Act (RCRA) eight metals (total and/or dissolved) plus copper by EPA 6010/7000 Series methods (all media)
- Volatile organic compounds (VOCs) by EPA Method 8260 (soil and groundwater only)
- Polychlorinated biphenyls (PCBs) by EPA Method 8082 (all media)
- Polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270B using select ion monitoring (SIM) (all media)
- Extractable petroleum hydrocarbons (EPHs) by using Ecology methods (select soil samples only)
- Trinitrotoluene/dinitrotoluene (TNT/DNT) by EPA Method 8330 (select soil samples only)

- Toxicity Characteristic Leaching Procedure (TCLP) and Synthetic Precipitation Leaching Procedure (SPLP) analysis for metals and PAH analytes for waste characterization (select soil samples only).

Prior to the initial RI sampling and characterization activities, existing site structures (excluding one storage building which was subsequently demolished in 2011) and approximately 1,800 feet of railroad track were demolished. The demolished structures included the main warehouse and office building, the red brick building, concrete foundations likely associated with the former coke plant (refer to Section 2.1.2) and various equipment and storage structures (refer to Figure 1-2 in Appendix C) associated with metals recycling. Solid waste materials generated from demolition activities included concrete, brick, glass, metal, wood, and other debris. In addition, liquid wastes were removed from two vault structures located below or in the vicinity of the red brick building. Solid and liquid wastes were disposed offsite as both hazardous and non-hazardous wastes. Refer to the RI/FS report (Kennedy/Jenks Consultants 2001) for additional information.

3.2 Initial RI Findings

The primary chemicals of concern (COCs) identified during the initial RI included metals, carcinogenic PAHs (cPAHs), naphthalene, PCBs, and diesel- and oil-range petroleum hydrocarbons. The COCs identified during the initial RI appear to be primarily related to metals recycling activities. Some COC impacts could also be related to coke plant operations, but there is no specific indication of such.

The identified soil impacts related to metals recycling occur primarily in the upper fill material, typically at depths of less than 5 feet bgs. Most of the locations where deeper soil impacts were identified during the initial RI are within the Creosoting Plant Area (see Section 2.3.2.1) and do not appear to be related to the metals recycling or coke plant site uses. The metals COCs in soil generally occur throughout the former Tacoma Metals property, but other COC impacts are more localized (see Section 3.2.1).

The primary COC impacts to groundwater identified during the initial RI were located in the western portion of the former Tacoma Metals Property and appear to be attributable to the former creosoting plant. However, COCs including cPAHs and metals were also detected sporadically in groundwater samples collected from other parts of the former Tacoma Metals property (See Section 3.2.2).

3.2.1 Soil

For comparison purposes, MTCA Method C Industrial soil cleanup levels (as defined in WAC 173-340-745) are used to assess compliance with regulatory standards. When Method C cleanup values are not available, MTCA Method A values are used (e.g., lead). Cleanup levels are summarized in Table 3.

The COC impacts to soil identified at the site occur in two distinct zones related to the source of the impacts. COC soil impacts related to the metals recycling (and possibly coke plant) site uses occur primarily within the upper fill layer throughout the former Tacoma Metals Property. COC soil impacts related to the former creosoting plant occur beneath the upper fill layer in the Creosoting Plant Area (On-Property and Off-Property areas).

COC impacts related to metals recycling, and possibly coke plant operations, occur primarily within the layer of fill material that was installed on the former Tacoma Metals Property following demolition of the former creosoting plant and related structures, and prior to construction of the coke plant and related facilities (late 1930s to early 1940s). The extent of COC impacts within the shallow fill material was identified and characterized during the 2001 RI, as shown on the soil concentration contour and data flag maps originally prepared for the RI/FS report (Kennedy/Jenks Consultants 2001) and included in Appendix C (Figures 4-1 through 4-4).

COCs were identified at concentrations above the proposed soil cleanup levels (refer to Table 3) mainly within the uppermost 3 feet of fill material (i.e., to depths of approximately 3 feet bgs), but were identified locally to depths of up to 10 feet bgs [Note: The deeper COC impacts in the Creosoting Plant Area shown on the initial RI maps in Appendix C (Figures 4-3 and 4-4) are associated with the former creosoting plant (refer to Section 4.2) and are separate from the metals recycling related impacts]. The COC soil impacts related to metals recycling are discussed in greater detail in the RI/FS report (Kennedy/Jenks Consultants 2001), and summarized below:

- Metals, primarily lead but also chromium, were identified in shallow soil at concentrations above the proposed MTCA Method A/C industrial soil cleanup levels (refer to Table 3) throughout the former Tacoma Metals Property. The metals impacts occur primarily at depths of less than 3 feet bgs, but were identified at two locations in the eastern portion of the former Tacoma Metals Property at depths of up to 6 feet bgs (refer to RI/FS Map Figure 4-1 in Appendix C). The lead impacts identified at one location [TP-16 located

south of the former red brick building location (refer to Figures 1-2 and 4-1 in Appendix C)] appear to be related to the presence of buried lead-acid battery casings. Initial RI analytical results for metals are summarized in Table 4-1 in Appendix C.

- PCBs were identified in shallow soil at concentrations above the proposed MTCA Method A industrial soil cleanup level (refer to Table 3) in the easternmost portion of the former Tacoma Metals Property. The PCB impacts occur at depths of less than 3 feet bgs (refer to RI/FS Map Figure 4-2 in Appendix C). Initial RI analytical results for PCBs are summarized in Table 4-2 in Appendix C.

- CPAHs were identified in shallow soil at concentrations above the proposed cleanup level (refer to Table 3) at one location in the eastern portion the former Tacoma Metals Property at a depth of less than 1 foot bgs (refer to RI/FS Map Figure 4-3 in Appendix A). CPAH impacts were also identified near the southwestern corner of the former Tacoma Metals Property (i.e. in the Creosoting Plant Area) at depths of 6 to 10 feet bgs, and appear to be associated with the former creosoting plant rather than metals recycling site uses. Initial RI analytical results for PAHs are summarized in Table 4-3 in Appendix C.

- Hydrocarbon compounds were identified in shallow soil at concentrations above the proposed cleanup level (refer to Table 3) at multiple locations on the former Tacoma Metals Property, typically at depths of less than 3 feet bgs (refer to RI/FS Map Figure 4-4 in Appendix C), but were identified at greater depths at two locations. Hydrocarbon impacts to depths of 10 feet bgs were identified in the west-central portion of the former Tacoma Metals Property, and appear to be related to a former hydraulic sheer (associated with metals recycling) at that location. Hydrocarbon impacts identified near the southwestern corner of the former Tacoma Metals Property to depths of 10 feet bgs are associated with the former creosoting plant rather than metals recycling site uses, as previously discussed. Initial RI analytical results for hydrocarbons are summarized in Table 4-4 in Appendix C. [Note: During performance of the Supplemental RI, extensive forensic evaluations were conducted to evaluate the nature of hydrocarbon compounds detected in the Creosoting Plant Area (Kennedy/Jenks Consultants 2009). The results of this investigation, which are discussed later, indicated that hydrocarbons associated with the creosoting plant are derived from pyrogenic source (i.e., creosote) and are not

petrogenic in nature. Consequently, MTCA petroleum hydrocarbon cleanup standards were not used to evaluate hydrocarbon detections in the Creosoting Plant Area.]

3.2.2 Groundwater

As previously indicated, the groundwater impacts identified in the western portion of the former Tacoma Metals Property appear to be primarily related to the former creosoting plant and are discussed in Section 4.2.

During the initial RI, COCs including naphthalene, hydrocarbons, PCBs, total and individual cPAHs, and metals (selenium, cadmium, lead, mercury, and copper) were detected at concentrations above the proposed cleanup levels (refer to Table 3) in monitoring well and reconnaissance groundwater samples collected from the Former Tacoma Metals Property [refer to the groundwater results data flag map (Figure 5-1) provided in Appendix C]. Naphthalene and hydrocarbon concentrations detected in the Creosoting Plant Area are related to the former creosoting plant, as previously discussed, and were further evaluated in the Supplemental RI (refer to Section 4). Metals analytes were detected sporadically and were not suspected to be representative of site groundwater conditions (Kennedy/Jenks Consultants 2001). Additional testing for metals was performed as part of the Supplemental RI (Section 4). The detection of PCBs was considered to be anomalous based on the low solubility and mobility of PCBs in the environment, and not representative of groundwater conditions (Kennedy/Jenks Consultants 2001). Analytical data tables prepared for the RI/FS report are also included in Appendix C for reference (Tables 5-1 through 5-9).

3.2.3 Surface Water

Two surface water sampling events were performed during the RI/FS at two locations where surface water discharges from the former Tacoma Metals Property were observed [refer to the surface water flow and samples map (Figure 3-8) provided in Appendix C]. Metals, PCBs, and cPAHs were identified in surface water samples at samples above surface water cleanup levels. Analytical results for surface water samples are summarized in the data table provided in Appendix C (Table 6-1).

The surface water sampling events were performed soon after Tacoma Metals vacated the property and although the paved surfaces at the site were cleaned as part of the RI, entrainment of residual particles associated with metals recycling may have contributed to the detected COC

concentrations and the results are therefore not necessarily indicative of current conditions. Following collection surface water samples, all storm lines at the site were cleaned and waste materials were transported offsite for disposal. Installation of a surface cap and surface water discharge management are included in the preferred remedial option (refer to Section 5.4).

3.3 Initial FS

The initial FS was performed in 2001 and the findings were reported to Ecology in the 2001 RI/FS report (Kennedy/Jenks Consultants 2001). The initial FS findings are summarized below, including an overview of the preferred cleanup alternative based on the initial FS.

3.3.1 Initial FS Summary

The initial FS included an evaluation of chemical fate and transport for the site, including a conceptual site model, and evaluation of potential exposure routes and receptors. The initial FS also included an evaluation of potential cleanup standards and other applicable, relevant, and appropriate requirements (ARARs), potential points of compliance, and an estimate of the extent of affected site media. The initial FS evaluated three cleanup alternatives and selected a preferred alternative based on evaluation of criteria including protectiveness to human health and the environment, compliance with cleanup levels and ARARs, effectiveness, permanence, practicality of implementation, and cost (refer to the 2001 FS for additional information).

The cleanup alternatives presented in the initial FS included the following:

- **Alternative 1:** Source Control (Free Product Removal and Petroleum Hydrocarbon-Impacted Soil Excavation with Offsite Disposal), Asphalt Cap with Stormwater Control, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater/Surface Water Compliance Monitoring, and Periodic Review.

- **Alternative 2:** Source Control (Free Product Removal and Petroleum Hydrocarbon-Impacted Soil Excavation with Offsite Disposal), Limited Metals-Impacted Soil Excavation with Onsite Consolidation, Asphalt Cap with Stormwater Control, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater/Surface Monitoring, and Periodic Review.

- **Alternative 3:** Source Control (Free Product Removal and Petroleum Hydrocarbon-Impacted Soil Excavation), Limited Metals-Impacted Soil Excavation, Onsite Treatment

& Reuse of Excavated Soil, Cap, Enhanced Groundwater Biodegradation, Institutional Controls, Groundwater/Surface Monitoring, and Periodic Review.

The preferred cleanup alternative (Alternative 2) is summarized in greater detail in Section 3.3.2.

Because the initial FS was completed prior to Supplemental RI activities, Ecology requested that the initial FS be updated to reflect the findings of the Supplemental RI and to verify the adequacy of the preferred cleanup alternative. Ecology's request also included additional evaluation of potential exposure pathways and cleanup standards primarily for impacts to wildlife and aquatic organisms and for consumption of fish (Ecology 2009b).

The updated FS is discussed in Section 5.

3.3.2 Preferred Cleanup Alternative

The initial FS included an evaluation of three potential cleanup alternatives for the site. The preferred cleanup alternative, Alternative 2, is summarized below. Refer to the RI/FS (Kennedy/Jenks Consultants 2001) and Section 5.4 of this report for additional information regarding the cleanup alternatives and evaluation criteria. The preferred cleanup alternative (Alternative 2) presented in the initial FS included the following general elements:

- Source control (free product removal and petroleum hydrocarbon-impacted soil excavation with offsite disposal).
- Localized removal and consolidation of metals-impacted soils along the northern portion of the Tacoma Metals Property.
- Installation of an asphalt cap with stormwater controls on the former Tacoma Metals Property.
- Enhanced groundwater biodegradation [i.e., application of oxygen release compound (ORC) or similar material to enhance natural biodegradation of COCs] and monitored natural attenuation.
- Institutional controls.
- Groundwater monitoring.
- Periodic review.

Kennedy/Jenks Consultants proposed removal of the ORC application (for the Creosoting Plant Area only) from Alternative 2 in the Cleanup Level Evaluation report (Kennedy/Jenks Consultants 2007c) as ORC is not expected to be effective for the treatment of creosote-related COCs because they are pyrogenic (coal tar based) rather the petrogenic (petroleum based) in origin (Kennedy/Jenks Consultants 2009). Additional discussion of the preferred cleanup alternative, including other proposed modifications, is presented in Section 5.4.

Section 4: Supplemental RI

This section provides a summary of the work performed and findings of the Supplemental RI, including interim remedial actions, performed between October 2001 and February 2011.

4.1 Supplemental RI Work Performed

Work performed for the Supplemental RI is described below.

4.1.1 Creosoting Plant Area

Investigation work was performed at the Creosoting Plant Area between October 2001 and February 2011 and included sampling and characterization of potentially impacted environmental media (soil and groundwater) associated with the former creosoting plant. Work was performed in multiple phases at On-Property and Off-Property locations. Soil boring and monitoring well locations associated with the Creosoting Plant Area are shown on the site maps included in Appendix D.

Each phase of work performed at the Creosoting Plant Area was performed under an Ecology-approved Work Plan. Subsequent phases of work were performed at Ecology's request based on the results of the previous phase of work. The specific work performed during each phase of Creosoting Plant Area investigation, including report and Work Plan references, is summarized in Table 2. The specific work for each phase varied, but generally included the following elements:

- Advancement of direct-push soil borings and collection and laboratory analysis of soil samples and/or reconnaissance groundwater samples.
- Installation, development, and sampling of groundwater monitoring wells. Well locations were typically based on the findings of the direct-push soil borings and the finding of preceding investigations.
- Laboratory analysis of groundwater samples collected from monitoring wells.
- Elevation surveying of new monitoring wells.

- Water level monitoring in new and existing monitoring wells (including all site wells both On-Property and Off-Property).
- Monitoring of light and dense non-aqueous phase liquid (LNAPL and DNAPL) in Creosoting Plant Area wells.
- Evaluation of the depth, lithology, and stratigraphy of a silt/clay layer which appears to be acting as a confining layer (discussed in greater detail in Section 5.2).

Specific laboratory analyses performed for soil and groundwater samples are summarized in the data tables provided in Appendix D. Analyses typically included one or more of the following:

- Diesel- and oil-range petroleum hydrocarbons by Ecology Method NWTPH-Dx (all media). [Note: Although petroleum hydrocarbon analyses were performed for samples collected in the Creosoting Plant Area, they are not a COC for impacts related to the former creosoting plant (Kennedy/Jenks Consultants 2009; Ecology 2009a).]
- PAHs or semi-volatile organic compounds (SVOCs) by EPA Method 8270 (all media).
- RCRA eight metals (total and/or dissolved) plus copper by EPA 6010/7000 Series methods (groundwater only, limited number of samples).
- VOCs by EPA Method 8260 (all media, limited number of samples).
- PCBs by EPA Method 8082 (groundwater only, limited number of samples).

Refer to the previously prepared reports (Kennedy/Jenks Consultants 2007a, 2008b) for additional information regarding the Creosoting Plant Area investigations. Data tables originally prepared for the above-referenced reports are included in Appendix D for reference. In addition, analytical data for the COCs associated with the Creosoting Plant Area [naphthalene, cPAHs, and benzene, toluene, ethylbenzene, and total xylenes (BTEX)] are summarized in Table 4 (soil samples), Table 5 (reconnaissance groundwater samples), and Table 6 (monitoring well groundwater samples).

[Note: The cleanup levels listed in the data tables from previous reports (Appendix D) may not be the current proposed cleanup levels. Refer to Table 3 for a summary of the cleanup levels currently applicable to the site.]

4.1.2 Forensic Evaluation of Hydrocarbons

The Forensic Evaluation of Hydrocarbons study was performed between 2007 and 2009 to demonstrate that the impacts to soil and groundwater associated with the former creosoting plant should be evaluated using cleanup standards based on the components of creosote (PAHs, naphthalene, BTEX) rather than petroleum hydrocarbons.

The initial evaluation included forensic analysis of soil and groundwater samples for PAHs and review of previous site data by Friedman & Bruya, Inc. (FBI) of Seattle, Washington. FBI concluded that the contaminants were indicative of a pyrogenic (e.g., coal-tar creosote) origin rather that a petrogenic (e.g., petroleum hydrocarbon) source [submitted to Ecology by Kennedy/Jenks Consultants (Kennedy/Jenks Consultants 2007b)]. In response to this report, Ecology provided a letter indicating it did not agree with the FBI's conclusions, and suggested that a gasoline source may have contributed to the observed impacts to soil and groundwater.

In response to Ecology's comments, Kennedy/Jenks Consultants prepared a summary of historical site uses, field observations, and case studies to supplement FBI's separate response to Ecology's comments, and to demonstrate that no potential gasoline sources existed historically at the Creosoting Plant Area (Kennedy/Jenks Consultants 2009). Ecology subsequently agreed that the use of petroleum hydrocarbon cleanup standards for impacts related to the former creosoting plant were inappropriate (Ecology 2009a).

4.1.3 PRSC

Work for the PRSC investigation was performed between October 2010 and February 2011 and included sampling and characterization of potentially impacted environmental media, including groundwater from reconnaissance borings and proposed POC monitoring wells, along the southern margin of the PRSC and northern site boundary. The PRSC investigation was performed at Ecology's request under an Ecology-approved Work Plan (Kennedy/Jenks Consultants 2010b).

Work performed for the PRSC investigation included the following:

- Installation of three temporary piezometers adjacent to the PRSC (two sampling events).

- Collection of reconnaissance groundwater samples from the three piezometers and laboratory analysis of PAHs and BTEX (two sampling events).
- Collection of groundwater samples from six proposed POC monitoring wells (MW-19, MW-20, MW-23, MW-26, MW-29, and MW-35) and laboratory analysis of PAHs and BTEX (two sampling events).

Data tables and maps associated with the PRSC investigation are provided in Appendix E for reference. Refer to the letter report for the PRSC investigation (Kennedy/Jenks Consultants 2012) for additional information.

4.2 Supplemental RI Findings

The primary COCs associated with the former creosoting plant include various chemical components of creosote, which is derived from the distillation of coal tar. The COCs relevant to the characterization of creosote impacts at the Creosoting Plant Area include naphthalene, cPAHs, and BTEX. Refer to the 2009 Response to Ecology Comments letter (Kennedy/Jenks Consultants 2009) for additional information regarding the origin and composition of creosote. Creosote-related COCs have been delineated in both soil and groundwater at the Creosoting Plant Area (both On-Property and Off-Property Areas).

The potential COCs for the PRSC investigation included the creosote-related compounds listed above for the Creosoting Plant Area. The results of the PRSC investigation did not indicate the migration of COCs from the Creosoting Plant Area to the PRSC habitat area (Kennedy/Jenks Consultants 2012).

4.2.1 Soil

COC impacts related to the former creosoting plant occur in the western portion of the former Tacoma Metals Property and at Off-Property areas to the west (i.e., the Creosoting Plant Area). Soil impacts related to the former creosoting plant are initially encountered at approximately 5 feet bgs at the former creosoting plant location, corresponding to the approximate base of the fill material installed after demolition of the former creosoting plant, and are evident to depths of approximately 25 feet bgs. Creosote-related impacts to soil extend away for the former creosoting plant location primarily to the north and west, with impacts to the south and east diminishing over a relatively short distance.

The depth to the top of creosote-impacted soil increases with distance away from the former creosoting plant location, primarily to the north and west, to approximately 10 feet bgs, which corresponds with the typical depth to shallow groundwater (refer to Section 2. 2). The maximum depth of creosote-impacted soil is approximately 25 feet bgs for the On-Property areas, but increases to over 30 feet bgs in Off-Property areas to the west and northwest, corresponding to the depth of a silty confining layer (refer to Section 5.2). Geologic cross-sections depicting the lateral and vertical distribution of creosote-related impacts to soil, originally prepared for the Forensic Evaluation of Hydrocarbons (Kennedy/Jenks Consultants 2009), are included in Appendix A. In addition, maps showing the distribution of creosote-impacted soil and the depth to the silty confining layer (discussed in greater detail in Section 5.2) are included in Appendix F.

Soil samples with cPAH concentrations above the proposed cleanup level (refer to Table 3) are typically associated with the areas of heavily stained soil (e.g., areas where NAPL was typically observed in the soil samples). The thickness of the areas of heavy soil impact decreases away from the former creosoting plant location, occurring in thin layers at the base of the wood-fill unit and just above the silty confining layer at some Off-Property locations (refer to the maps and cross sections in Appendix F which illustrate the distribution of subsurface soils affected by creosote-related compounds).

Other creosote-related COCs (naphthalene and BTEX) were not detected in soil samples at concentrations above the proposed cleanup levels (refer to Table 3).

Areas with COC concentrations in soil above the proposed cleanup levels (see Table 3) and at depths above the direct contact standard point of compliance (15 feet bgs) and the TEE conditional point of compliance (6 feet bgs) and are illustrated on Figure 3 for the entire site (On-Property and Off-Property areas).

Most of the affected soil on the former Tacoma Metals Property occurs within the uppermost 6 feet of the soil sequence, extending to depths between 6 and 15 feet at only three locations, including the former hydraulic shear area (west of the former main structure/warehouse building), the former creosoting plant area, and the area around well MW-8(R).

As discussed above, the depth to creosote-affected soil generally increases with depth away from the former creosoting plant location. As a result, COC-affected soil at Off-Property locations does not occur in the uppermost 6 feet of the soil sequence, but is present above 15 feet bgs at two locations (see Figure 3).

COC-affected soil was identified between 6 and 15 feet below grade in the central portion of the 18th Street Right-of-Way and at boring B-36 on the Simpson Property. The affected soil in the 18th Street Right-of-Way correlates laterally with the COC-affected soil identified at the former creosoting plant area (see Figure 6). However, the affected soil identified at boring B-36 from approximately 8 to 10 feet bgs does not appear to correlate directly with the creosote-affected soil at the creosoting plant area or with that identified on the 18th Street Right-of-Way (see Figure 6).

While the source of elevated cPAHs identified at the 8 to 10 foot depth interval is uncertain, it does not appear to be associated with lateral migration of oil contamination beneath the footprint of the former retort or former Creosoting Plant due to its horizontal and vertical location. Therefore, the COC-affected soil in boring B-36 (above 15 feet bgs) appears to be from a source separate from the release associated with the former creosoting plant retort area.

4.2.2 Groundwater

Groundwater COCs at concentrations above the proposed cleanup levels (refer to Table 3) were initially identified during the RI for the On-Property portion of the Creosoting Plant Area, and included cPAHs, naphthalene, gasoline-range petroleum hydrocarbons, and PCBs. [Note: Cleanup levels based on gasoline-range hydrocarbons were subsequently determined to be not applicable for the Creosoting Plant Area due to the pyrogenic nature of the hydrocarbon compounds, as discussed in Section 4.1.1 and 4.1.2.] Data tables for groundwater samples and data flag maps for COCs detected at concentrations above proposed cleanup levels during the RI are provided in Appendix C.

PCBs were detected at concentrations above the proposed cleanup level (refer to Table 3) in two wells [MW-8(R) and MW-11] during one monitoring event performed during the initial RI, but not during previous monitoring events or in reconnaissance groundwater samples collected in the same area. Based on previous analytical findings and potential matrix interference reported by the analytical laboratory ("Y" data flag), the detected PCB concentrations did not appear to be representative of actual PCB concentrations in groundwater (Kennedy/Jenks Consultants 2001). In addition, PCBs were not detected in a subsequent sample collected from MW-8(R) in August 2002, consistent with the conclusions of the 2001 RI/FS. Based on these data, it was concluded that PCBs were a laboratory artifact and not indicative of site conditions.

Groundwater impacts related to other Creosoting Plant Area COCs (cPAHs, naphthalene, BTEX) were further characterized during subsequent investigations performed at On-Property and Off-Property portions of the Creosoting Plant Area (refer to Section 3.2). Petroleum hydrocarbon (gasoline-, diesel-, and oil-range) results are not discussed herein because these compounds are not applicable for the Creosoting Plant Area (Kennedy/Jenks Consultants 2009; Ecology 2009a), but historical data are included on the tables presented in Appendix D.

Naphthalene was detected at concentrations above the proposed cleanup level in groundwater samples collected from monitoring wells installed at On-Property and Off-Property locations. Naphthalene was identified in samples collected from On-Property wells located north of the former creosoting plant location [MW-8(R), MW-18, and MW-22] at concentrations above the proposed cleanup level (refer to Table 3) during at least one monitoring event, but only at well MW-18 for all monitoring events. Naphthalene was also detected in Off-Property wells MW-24 and MW-28(R), west to northwest of the former creosoting plant location, at concentrations above the proposed cleanup level, but not for all monitoring events. Naphthalene was also detected at concentrations above the proposed cleanup level in three reconnaissance groundwater samples collected from soil boring located in the 18th Street right-of-way (B-19, B-21, and B-31, refer to sample maps included in Appendix D). Historical analytical results for naphthalene are included in Table 5 (reconnaissance groundwater samples) and Table 6 (monitoring well samples). Concentration contour maps for naphthalene for the two most recent monitoring events (February 2006 and March 2008) are included in Appendix D.

Total cPAHs were detected in groundwater samples collected from On-Property and Off-Property locations at concentrations above the proposed cleanup level (refer to Table 3) during each phase of Creosote Plant Area investigation. Groundwater samples in which the total cPAH concentration was above the proposed cleanup level were collected from wells and reconnaissance borings located at the former creosoting plant location, and to the north and west. Based on the results of the PRSC investigation, cPAHs in groundwater have not migrated to the PRSC area (Kennedy/Jenks Consultants 2012).

Historical analytical results for cPAHs are included in Table 5 (reconnaissance groundwater samples) and Table 6 (monitoring well samples). Concentration contour maps for total cPAHs for the two most recent monitoring events (February 2006 and March 2008) are included in Appendix D.

Analysis of BTEX was typically not included in the Creosoting Plant Area monitoring events because it was not identified as a specific COC prior to 2009 (Kennedy/Jenks Consultants 2009, Ecology 2009a), but BTEX analysis was performed during the initial RI and the 2003 investigation performed for On-Property portions of the Creosoting Plant Area. BTEX analysis was also included for the samples collected from potential POC wells and reconnaissance groundwater samples during the PRSC investigation (Kennedy/Jenks Consultants 2012). BTEX analytes were not identified at concentrations above the proposed cleanup level (refer to Table 3) during the initial RI or 2003 investigation. Benzene was detected at one potential POC well (MW-23) located Off-Property at a concentration of 56 micrograms per liter (µg/l), above the proposed cleanup level of 23 µg/l, (refer to Table 1 in Appendix E) during the PRSC investigation (Kennedy/Jenks Consultants 2012). Data tables from the RI are provided in Appendix C, for the 2003 investigation in Appendix D, and for the PRSC investigation in Appendix E.

4.2.3 Additional Groundwater Metals Analyses

Analysis of groundwater samples for total and dissolved metals was performed in 2001 (dissolved lead only), 2002 (MW-13 only) and 2003 (21 On-Property wells). Total arsenic, total lead, total and dissolved mercury, and total and dissolved selenium were detected at concentrations above the proposed cleanup levels (refer to Table 3) in samples collected from wells for the 2003 sampling event. Data tables for metals analyses are provided in Appendix D (Tables 5D, 5E, 7F, and 8).

4.2.4 LNAPL and DNAPL

Monitoring for LNAPL and DNAPL was performed during the initial RI and subsequent Creosoting Plant Area investigation. In the Creosoting Plant Area, DNAPL accumulation was identified in Off-Property well MW-28(R), and LNAPL accumulation was intermittently identified in On-Property well MW-8(R). Although DNAPL was identified in well MW-28(R), it was not identified in well MW-28, which was located less than 5 feet from the location of well MW-28(R) Well MW-28(R) was installed in February 2006 as a replacement for MW-28, which was originally installed in April 2005 and subsequently damaged by a contractor during PRSC construction activities. The presence of DNAPL in well MW-28(R), and not in any other wells including the original MW-28, may indicate a localized topographic low in the upper surface of the silt/clay confining layer previously described.

The LNAPL and DNAPL identified in the Creosoting Plant Area appear to be creosote product. Samples of both LNAPL [from MW-8(R)] and DNAPL [from MW-28(R)] were evaluated by Friedman & Bruya, Inc. of Seattle, Washington and found to contain only creosote product (Kennedy/Jenks Consultants 2007b). LNAPL accumulation was also identified in well MW-12, near the former location a hydraulic shear, and appears to be a petroleum hydrocarbon product (hydraulic oil). Monitoring well locations are shown on Figure 3. Historical LNAPL and DNAPL measurements for wells MW-8(R) and MW-28(R) are included in Appendix B (Table 10).

4.3 Interim Remedial Actions

As previously indicated, in addition to the investigation activities described above, interim remedial actions have been performed at the site since completion of the initial RI. These have included the following:

- Containment, onsite treatment, and subsequent offsite disposal of approximately 3,440 tons of lead-impacted soil material excavated from north of the former Tacoma Metals Property during construction of the PRSC was performed between 2005 and 2007 (the material was suspected to have originated from the former Tacoma Metals Property). The soil material was placed in a lined temporary containment unit (TCU) enclosure for treatment to reduce the lead concentration to levels below the threshold, requiring disposal as hazardous waste. The work was performed under an Ecology-approved Work Plan (Kennedy/Jenks Consultants 2007d) and the results of

the soil treatment, verification sampling, and disposal activities were reported to Ecology following completion of the project work (Kennedy/Jenks Consultants 2008a).

- An investigation of potential UXO was performed along the northern margin of the former Tacoma Metals Property in 2006 by EOD Technology, Inc. (EODT) based on an Ecology-approved Work Plan (Kennedy/Jenks Consultants 2006). The investigation was performed to determine if UXO materials, which were identified by the City of Tacoma in 1995 to the north of the former Tacoma Metals Property, were also present on the Tacoma Metals Property. Eleven test pits were excavated by EODT along the northern margin of the Tacoma Metals Property, and no UXO materials were identified (EODT 2006). In addition, two test pits were excavated in the vicinity of monitoring well MW-8(R) to identify potential sources of LNAPL periodically observed in the well. No obvious sources of LNAPL were observed in the two test pits.

- Cleaning of the onsite storm sewer lines to remove sediment that had accumulated during the operational history of site use.

- Demolition of site buildings and removal and disposal of wastes associated with these activities.

Section 5: FS Update and Preferred Cleanup Alternative

This section provides an update to the initial (2001) FS including a description of additional work performed, an updated site conceptual model, proposed cleanup levels, and an update to the preferred remedial alternative (Alternative 2) originally presented in the initial RI/FS report (Kennedy/Jenks Consultants 2001) and summarized in Section 3.3 above.

5.1 Work Performed

5.1.1 Cleanup Level Evaluation

The Cleanup Level Evaluation was performed by Kennedy/Jenks Consultants in 2007 to provide updated cleanup levels based on the results of investigations performed subsequent to the 2001 RI/FS and to evaluate cleanup levels and the preferred remedial alternative presented in the 2001 RI/FS with respect to the 2001 revision (updated October 2007) of Ecology's MTCA Cleanup Regulation [the RI/FS was originally performed under the previous (1996) MTCA revision].

The Cleanup Level Evaluation report (Kennedy/Jenks Consultants 2007c) submitted to Ecology included a human health risk evaluation, proposed cleanup levels based on the risk evaluation and 2001 MTCA Cleanup Regulation revision, proposed POC wells, and an evaluation of the selected remedial alternative from the RI/FS (Kennedy/Jenks Consultants 2001; refer to Section 2.5), including an evaluation based on the disproportionate cost analysis (DCA) framework introduced in the 2001 MTCA Cleanup Regulation revision (Ecology 2001, updated October 2007).

Ecology provided comments on the Cleanup Level Evaluation in a letter dated 4 May 2009 (Ecology 2009b). Ecology expressed concerns regarding the effectiveness of the preferred cleanup alternative presented in the initial RI/FS report (Kennedy/Jenks Consultants 2001) (refer to Section 3.3.1), primarily with respect to protectiveness of aquatic and terrestrial organisms. Ecology requested that a TEE be performed and that the site model presented in the 2001 RI/FS be updated to reflect potential exposure pathways for aquatic and terrestrial organisms.

Ecology's comments regarding the findings of the Cleanup Level Evaluation are addressed in the PRSC Investigation (refer to Section 4.1.3), the TEE (see Section 5.1.2 below) and in

subsequent sections of this report. The updated site conceptual model is discussed in Section 5.2.

5.1.2 Terrestrial Ecological Evaluation

A TEE was performed in accordance with MTCA regulations (WAC 173-340-7493) to evaluate the potential for adverse impacts to land-based ecological receptors from exposure to potentially impacted soil. The site was evaluated under an industrial use scenario, at Ecology's direction, and only the TEE screening values for wildlife protection were evaluated (Kennedy/Jenks Consultants 2010a).

Potential COCs concentrations identified in soil samples were compared to the wildlife protection screening values for soil provided in MTCA Table 749-3. COC concentrations exceeded the TEE screening values for metals, PCBs, PAHs, and diesel-range petroleum hydrocarbons for some soil samples (Kennedy/Jenks Consultants 2010a). However, because the preferred cleanup alternative includes installation of a pavement cap, the potential wildlife exposure pathways will be eliminated.

Ecology accepted the conclusions of the TEE, including a determination that no further TEE activities are necessary for the site, in an opinion letter dated July 7, 2010.

5.2 Site Conceptual Model

This section provides a summary of our current site conceptual model based on the model presented in the initial RI/FS report (Kennedy/Jenks Consultants 2001) and updated to reflect the results of work performed for the supplemental RI. The updated site conceptual model also incorporates the findings of the Cleanup Level Evaluation report (Kennedy/Jenks Consultants 2007c), including Ecology's comments (Ecology 2009b), and the TEE (Kennedy/Jenks Consultants 2010a).

5.2.1 Background

A conceptual site model based on the findings of the RI was originally presented in the initial RI/FS report (Kennedy/Jenks Consultants 2001) and included an evaluation of chemical fate and transport for unsaturated soil and shallow groundwater. Surface water pathways were not evaluated because surface runoff does not interact with the Puyallup River (or PRSC) due to the man-made levee located north of the site. The 2001 RI/FS report also included an evaluation of cleanup levels and other ARARs for the site.

Potential chemical migration pathways identified in the RI/FS report included vertical migration through the vadose zone to shallow groundwater, and horizontal migration in the shallow groundwater zone both towards and away from Puyallup River (tidal fluctuation). The 2001 RI/FS report concluded that COCs in shallow groundwater are unlikely to migrate beyond the northern Tacoma Metals Property boundary based on site-specific modeling results. A depiction of the conceptual site model presented in the RI/FS report is included in Appendix G (Figure 8-1).

The Cleanup Level Evaluation report (Kennedy/Jenks Consultants 2007c) provided additional evaluation of potential pathways and cleanup levels protective of human health based on the findings of investigations performed since the RI. The TEE provided an evaluation of potential exposure pathways and protective cleanup levels for ecological receptors. The PRSC investigation provided analytical data relevant to assessment of potential groundwater to surface water and sediments pathway at the southern margin of the PRSC to the north of the site.

Based on the findings of the studies listed above, the conceptual site model was updated and is summarized below.

5.2.2 Updated Site Conceptual Model

A discussion of potential exposure pathways in the context of updated site conceptual model and hydrogeologic setting is presented below. The updated site conceptual model is depicted on Figure 4.

5.2.2.1 Site Stratigraphy

As discussed in Section 2.2.1, soil materials encountered at the site have included both native and fill materials (refer to Table 1). Fill materials include an upper gravel layer installed prior to

coke plant and metals recycling site operations, and wood waste material, which likely accumulated at the site prior to construction of the former creosoting plant. Native materials encountered beneath the fill layers include sand and fine-grained (silt and clay). Typically, sand or silty sand is encountered directly beneath the fill materials and a layer of fine-grained material (silt and clay) is encountered beneath the sand. Where the fine-grained material was penetrated by soil borings, sand and silty sand were encountered beneath.

The fine-grained materials were identified in soil borings throughout the site and appear to form a roughly continuous layer beneath the site. The upper surface of the fine-grained unit occurs at depths of 20 to 25 feet bgs in soil borings installed on the former Tacoma Metals Property and on the western and southern portions of the Off-Property Areas. Beneath the central and northern portion of the Simpson and JJ Port portion of the Off-Property Areas, the upper surface of the fine-grained unit slopes downwards to a depth of over 40 feet bgs beneath the north-central portion of the JJ Port property, forming a trough-shaped feature, which might represent a former drainage channel (refer to the maps provided in Appendix F).

The fine-grained unit appears to have acted as a barrier to downward migration of creosote-related COCs in the Creosoting Plant Area and also appears to have influenced the lateral migration of creosote-related COCs components. Creosote-related COCs appear to generally follow the slope of the upper surface of the fine-grained materials away from the former creosoting plant. As predicted by modeling performed during the initial RI, creosote-related impacts to not appear to have migrated to the PRSC or Puyallup River (see Section 5.2.3) although creosote was last used at the site during the 1930s.

Maps and geologic cross sections prepared as part of the Forensic Evaluation of Hydrocarbons (Kennedy/Jenks Consultants 2009) illustrate the lateral and vertical distribution of creosote-related impacts identified in the Creosoting Plant Area (copies provided in Appendix F).

5.2.2.2 Site Hydrogeology

As discussed in Section 2.2.2, the shallow groundwater gradient at the site is tidally influenced. Based on historical groundwater elevation monitoring results, the tidally influenced variation in shallow groundwater elevation is greatest for monitoring wells located along the northern site margin and in the western portion of the site, and decreases to the south and, to a lesser extent, to the east.

The direction of the hydraulic gradient is dependent upon tidal conditions, and location within the site. In the eastern portion of the site (eastern portion of the former Tacoma Metals Property), the shallow groundwater gradient in generally to the east during both high and low tidal conditions, but may be more northerly during low tidal conditions. In the western portion of the site (western portion of the former Tacoma Metals Property and the Off-Property areas), the shallow groundwater gradient is generally towards the PRSC during low tidal conditions and away from the PRSC during high tidal conditions. The magnitude of the shallow groundwater gradient is greater during low tidal conditions than during high tidal conditions, resulting in an overall net gradient towards the PRSC.

The hydraulic gradient also appears to be affected by the presence of wood waste material identified in soil borings and test pits at locations throughout the site, primarily in the vicinity of the former creosoting plant location. The wood debris layer in the vicinity of the former creosoting plant is generally thicker than other parts of the site, and may contribute to the localized hydraulic stagnation zone during high tidal conditions, and localized hydraulic mounding in low tidal conditions.

Groundwater gradient maps for the 2006 and 2008 monitoring events are included in Appendix B. As previously indicated, these monitoring events are most representative of current site conditions because they were conducted after construction of the PRSC habitat area.

5.2.3 Potential Exposure Pathways

The conceptual model for chemical migration presented in the RI/FS (Kennedy/Jenks Consultants 2001) has been updated to reflect the findings of investigation activities performed since the completion of the initial RI, and to address Ecology's comments (Ecology 2009b).

The findings of the Creosoting Plant Area investigations are consistent with the conceptual model presented in the RI/FS report (Kennedy/Jenks Consultants 2001) but also indicate the lateral migration of denser creosote components away from the former creosoting plant location the north and west along the upper surface of the fine-grained unit, as previously described (refer to Figure 4). The denser creosote components appear to be associated with NAPL observed in wood waste fill and native soil materials as small blebs, mainly at locations at or near the former creosoting plant location, but also in thin stringers along the base of the wood

waste fill and along the upper surface of the fine-grained unit (refer to Figure 4 and to the maps and cross sections provided in Appendix F).

Creosote-related COCs do not appear to have migrated northward significantly beyond the northern site boundary, and creosote-related impacts to shallow groundwater were not identified along the southern margin of the PRSC in the 2010/2011 PRSC Investigation (Kennedy/Jenks Consultants 2012). These findings indicate that the potential groundwater to surface water and groundwater to sediment pathways are incomplete for the site. The protectiveness of the proposed remedial alternative with respect to these potential exposure pathways will be addressed in the long-term monitoring component of the proposed remedial alternative (discussed in Section 5.4).

Potential exposure pathways for terrestrial organisms were evaluated in the TEE (Kennedy/Jenks Consultants 2010a). The TEE concluded that potential exposure pathways for wildlife include direct contact only. The direct contact pathway is currently limited to unpaved portions of the former Tacoma Metals Property and Off-Property areas (Simpson Property, 18th Street Right-of-Way, and back (northern) portion of the JJ Port Property). The On-Property areas will be paved as part of the preferred remedial action (refer to Section 5.4) and the direct contact pathway for wildlife will be eliminated because shallow soil impacted by COCs will become inaccessible. In addition, a soil cap will be installed on the 18th Street Right-of-Way to extend the depth to soil impacted by COCs to 15 feet (or more) below grade; the point of compliance for the direct contact pathway.

The proposed cleanup alternative also addresses the potential soil to groundwater pathway by removal of potential sources of petroleum-hydrocarbon and creosote-related impacts in shallow soil, and elimination of direct infiltration by stormwater at currently unpaved areas where shallow soil is affected by COCs. Mitigation of the potential soil to groundwater exposure pathway is accomplished by installation of a low-permeability pavement cap and stormwater controls (discussed in greater detail in Section 5.5.4). In addition, institutional controls for soil and groundwater uses will mitigate the potential for exposure to environmental media affected by COCs.

In addition to the potential exposure pathways described above, the vapor intrusion pathway may potentially be completed if structures are built in the future over portions of the site where VOCs exist and vapors from the site migrate into structures at concentrations exceeding MTCA

Method C indoor air cleanup levels. However, VOC concentrations are generally low and would not be expected to pose a threat to human health at the current concentrations, and a significant portion of the impacted soil materials will be removed from the primary source area during the remedial action, decreasing the potential vapor intrusion risk.

Future potential risks from the vapor intrusion pathway will be managed using property deed restrictions (for the former Tacoma Metals property and Off-Property parcels) and engineering controls, as appropriate. Deed restrictions will require that future development in this area includes an evaluation of potential vapor intrusion. If a possible adverse risk is identified, deed restrictions will require that mitigation measure are installed with new building construction.

5.3 Cleanup Levels

Proposed cleanup levels are based on those originally identified in the initial RI/FS report (Kennedy/Jenks Consultants 2001) and by the findings of the Cleanup Level Evaluation (Kennedy/Jenks Consultants 2007c) and TEE (Kennedy/Jenks Consultants 2010a). The Cleanup Level Evaluation included a human health risk evaluation, which incorporated the findings of investigation activities performed since completion of the RI. The TEE included an assessment of potential exposure to wildlife including risk-based screening against the ecological indicator soil concentrations for protection of wildlife in MTCA Table 749-3. The proposed cleanup levels listed in Table 3 also reflect comments from Ecology regarding comparison of cleanup levels to potential surface water quality standards (Ecology 2009b). The proposed cleanup levels are based on an industrial use scenario and are applicable to the preferred remedial alternative discussed in Section 5.4.

5.4 Cleanup Alternatives

As previously discussed in Section 3.3, three cleanup alternatives were evaluated for the initial FS. The three alternatives were evaluated for various criteria including overall (short term and long term) protectiveness, effectiveness, compliance with cleanup standards, permanence, restoration time frame, ability to be implemented, possible community concerns, and potential cost. The three cleanup alternatives, as presented in the RI/FS report, are depicted on Figure 9-1 in Appendix G and described in Section 3.3.

Alternative 2 was selected as the preferred cleanup alternative for the site in the 2001 RI/FS report (Kennedy/Jenks Consultants 2001), and includes the elements listed in Section 3.3.2.

Based on the findings of the Supplemental RI, Alternative 2 remains the preferred alternative. The findings of the Supplemental RI did not indicate any substantive differences that might require modification of the evaluation criteria presented in the initial RI for the cleanup alternatives.

The additional characterization of site conditions provided by the Supplemental RI expanded, but did not fundamentally alter, our understanding of site conditions, and necessitated changes for On-Property areas only in the quantity of impacted soil to be removed in the Creosoting Plant Area (discussed in Section 5.5).

For Off-Property areas, the additional characterization of site conditions identified areas on the 18th Street Right-of-Way and Simpson Property with soil impacts above the proposed cleanup levels. As previously discussed, the affected soil occurs below a depth of 6 feet bgs for all Off-Property areas and below 15 feet for most Off-Property areas (refer to Section 4.2.1 and Figures 3 and 6).

Based on Supplemental RI findings, installation of a soil cap on the 18th Street Right-of-Way is proposed to raise the ground surface to an elevation sufficient to provide a depth of at least 15 feet from ground surface to the affected soil. The elevation for the top surface of the affected soil currently located less than 15 feet below grade will be identified based on analytical results and field observations. The final soil cap elevation will be 15 feet above the top surface of the affected soil. Kennedy/Jenks Consultants anticipates that the final grade for the 18th Street Right-of-Way will approximately match the final grade of the asphalt cap on the Tacoma Metals property, creating a level transition between the two properties.

Excavation of affected soil at Off-Property location B-36 will also be performed; however, the lateral and vertical extent of shallow (i.e. less than 15 feet below grade) soil impacts in the B-36 area are not fully characterized. To evaluate the extent of shallow soil impacts at B-36, a supplemental field investigation will be performed to prior to performing remedial excavation. The supplemental field investigation is anticipated to include advancement of soil borings on the Simpson and JJ Port properties, including chemical analysis of soil samples for site COCs. The scope of work and anticipated boring locations will be submitted to Ecology for review prior to performing any field investigation activities.

For the purposes of cost estimation for this report, an excavation area of 30 feet by 30 feet and 10 feet deep was assumed for the B-36 area. This volume may increase or decrease based on the findings of the additional B-36 area investigation.

Impacts to groundwater identified at Off-Property locations (Simpson Property and 18th Street Right-of-Way) are consistent with those identified on On-Property locations and do not warrant active remedial actions in addition to the long-term monitoring at proposed CPOC wells described in Section 5.5.2.

Based on the increased volume of soil removal proposed for excavation at the Creosoting Plant Area and boring B-36 area, and the addition of the soil cap proposed for the 18th Street Right-of-Way, the estimated costs for the remedial alternatives were updated. The updated cost estimates for each of the three alternatives discussed in the initial FS (Kennedy/Jenks Consultants 2001), based on the increased excavation volume and soil cap and adjusted for 2014 pricing, are provided in Appendix H for reference. Although the current costs are increased for each alternative, the relative cost difference between the three alternatives is similar to those presented in the initial FS.

5.5 Cleanup Alternative 2 Update

The findings of the investigations and evaluations performed since the completion of the RI/FS did not indicate the need for significant substantive changes to Alternative 2, but revision of the scope of some components of Alternative 2 appears appropriate. Proposed revisions to Alternative 2 are described below and depicted on Figure 5.

5.5.1 Source Control Excavation Areas

The cleanup alternatives presented in the RI/FS report (Kennedy/Jenks Consultants 2001), including Alternative 2, included excavation and offsite disposal of soil materials identified as potential sources for impacts to groundwater. These included soil materials in which NAPL was observed and/or COCs at concentrations above proposed site cleanup levels were identified. Excavation of soil materials to the approximate depth of the shallow saturated zone (approximately 10 feet bgs on the former Tacoma Metals Property) was proposed at three locations designated areas “A”, “B”, and “C” as depicted on Figure 9-1 in Appendix G.

The results of the investigation and evaluation activities performed since completion of the initial RI/FS indicate that proposed excavation area “B”, located at the approximate former location of

the creosoting plant, did not include areas of shallow soil impacts identified to the north of the former creosoting plant location. Therefore, excavation area "B" was expanded approximately 40 feet to the north to include shallow COC impacts identified in soil borings B-14 and B-12, corresponding to an increase in the estimated excavation volume from approximately 3,333 cubic yards (yd^3) to approximately 5,444 yd^3 (refer to Figure 5). Excavation area "B" includes the area where creosote-related impacts occur at less than 6 feet bgs (i.e., TEE conditional point of compliance).

In addition, excavation area "D" was added in the vicinity of well MW-8(R) based on the intermittent occurrence of LNAPL identified at that location. Excavation area "D" includes an approximately 30-foot by 30-foot area around well MW-8(R) with an estimated volume of 333 yd^3 (refer to Figure 5). The proposed depths for excavation areas "B" and "D" are the same as proposed in the RI/FS, approximately 10 feet bgs (top of the saturated zone). No changes for excavation areas "A" and "C" are proposed.

Excavation at Area "E" was added at the Off-Property B-36, as discussed in Section 5.4. The preliminary estimated excavation volume at Area "E" is 333 yd^3 (see Figure 5). However, as previously discussed, the extent of soil impacts has not been fully characterized in the B-36 area and the actual volume may vary. The extent of soil impacts will be evaluated in a supplemental field investigation prior to performing the remedial excavation as discussed in Section 5.4.

Cleanup Alternative 2, as described in the initial RI/FS report (Kennedy/Jenks Consultants 2001) included placement of ORC in excavation areas to enhance the natural biodegradation of potential COCs in the shallow saturated zone. In the Cleanup Level Evaluation (Kennedy/Jenks Consultants 2007c), Kennedy/Jenks Consultants recommended that ORC not be used in excavation areas located in the Creosoting Plant Area (excavation areas "B" and "D" described herein) because ORC is not expected to be an effective treatment for COCs of pyrogenic (e.g., creosote derived from coal tar) origin (refer to Section 3.5.1). Therefore, the application of ORC is proposed only for excavation area "C", where COCs include petroleum hydrocarbon compounds.

Cleanup Alternative 2, as described in the initial RI/FS report (Kennedy/Jenks Consultants 2001) also included "buffer-zone" excavation of shallow soil to depths of 1 to 3 feet bgs at locations around the margins of the former Tacoma Metals Property (refer to Figure 9-1 in

Appendix G), and consolidation of the excavated soil onsite. No changes to the buffer zone excavation areas are proposed, although a portion of the proposed buffer zone is included in the expanded portion of excavation area "B" described above.

5.5.2 Soil Cap Installation

Installation of a soil cap on the 18th Street Right-of-Way is proposed for Cleanup Alternative 2 to raise the ground surface to an elevation sufficient to provide a depth of at least 15 feet from ground surface to the affected soil. The final grade for the 18th Street Right-of-Way will approximately match the final grade of the asphalt cap on the Tacoma Metals property. The fill material placed at this location will include pit-run type material compacted to approximately 90% relative density with crushed rock for the uppermost 6 inches.

5.5.3 Long-Term Monitoring

Cleanup Alternative 2, as described in the initial RI/FS report (Kennedy/Jenks Consultants 2001) also included long-term monitoring of shallow groundwater to confirm the effectiveness of the source control measures described in Section 5.4.3. No changes to this approach are proposed.

Specific wells to be included in the groundwater monitoring program as CPOCs for shallow groundwater were identified in the Cleanup Level Evaluation report (Kennedy/Jenks Consultants 2007c) and are shown on Figures 3 and 5. Before approving the conditional point of compliance, a notice of the proposal (and invitation for comment) will be submitted to the natural resources trustees, the USACE, and the Washington State Department of Natural Resources (WADNR) per WAC 173-340-720(8)(d)(i) and (ii). This notice shall be in addition to any notice provided under WAC 173-340-600. In addition, any affected property owners between the source of contamination and the Puyallup River (i.e., the City of Tacoma and USACE) must agree in writing to the use of the CPOCs.The proposed CPOC wells include those located along the northern site boundary including On-Property wells MW-2, MW-4(R), MW-5, MW-6, MW-9, MW-19, and MW-20 and Off-Property wells MW-23 and MW-29 (refer to Figures 3 and 5). At Ecology's request, Off-Property wells MW-26 and MW-35 and piezometer locations P-1, P-2, and P-3 were added. If approved by USACE, permanent monitoring wells will be installed at the piezometer locations. If installation of permanent wells is not approved by USACE, temporary piezometers will be installed for each sampling event (Note: Permanent wells, if approved, may

need to be installed higher on the bank adjacent to the PRSC than the piezometers to avoid inundation under high-tide conditions).

Monitoring at Off-Property locations should include only the COCs identified for creosote-related site impacts (cPAHs, naphthalene, and BTEX). Monitoring at On-Property locations should include COCs related to metals recycling including metals, PAHs, PCBs, and petroleum hydrocarbons (except for Creosoting Plant Area well MW-20, which should exclude petroleum hydrocarbons and include BTEX).

5.5.4 Capping and Institutional Controls

Cleanup Alternative 2, as described in the RI/FS report (Kennedy/Jenks Consultants 2001) includes installation of a pavement cap, stormwater runoff controls, and institutional controls (i.e., deed restrictions and covenants as appropriate). No changes to these components of Alternative 2 are proposed.

The engineering design for the remedial action will specify a low permeability asphalt pavement cap. We understand Ecology expects the asphalt cap to be essentially impermeable (i.e., hydraulic conductivity of $5x10^{-7}$); however, such a low hydraulic conductivity cap may not be technically achievable. In coordination with Ecology, the engineering design will specify a hydraulic conductivity range that is technically achievable, practicable, and meets Ecology's expectations for pavement permeability at the site.

The proposed capping, stormwater controls, and institutional controls will eliminate potential exposure pathways associated with the impacted shallow soil remaining onsite. Final design details for the cap, stormwater controls, and institutional controls, will be included in a Cleanup Action Plan under separate cover. Refer to the RI/FS report (Kennedy/Jenks Consultants 2001) for additional details.

5.5.5 Points of Compliance

The proposed point of compliance for soil is throughout the site. The proposed point of compliance for shallow groundwater includes the CPOC groundwater monitoring wells and piezometers indicated in Section 5.4.2 and shown on Figures 3 and 5.

5.5.6 Disproportionate Cost Analysis

A DCA was not specifically performed for the proposed site cleanup alternatives in the initial FS, because DCA was not part of the 1996 MTCA revision under which the RI/FS was performed (DCA was introduced in the 2001 MTCA revision); however, the substantive requirements of DCA were addressed in the RI/FS report (Kennedy/Jenks Consultants 2001), as discussed in the Cleanup Level Evaluation (Kennedy/Jenks Consultants 2007c). Kennedy/Jenks Consultants concluded that cleanup Alternative 2 would likely have been selected as the most practicable cleanup alterative under the DCA methodology in the 2001 MTCA revision (updated October 2007), as it was under the methodology of the 1996 MTCA revision (Kennedy/Jenks Consultants 2007c).

Section 6: Summary

Kennedy/Jenks Consultants performed an initial RI/FS at the Former Tacoma Metals Site between 2000 and 2001. Impacts to soil and groundwater, primarily related to previous site uses as a metals recycling facility but also as a coke manufacturing plant, were identified and the extent of impacts to site media from these site uses was fully characterized.

During RI, an additional previous site use was identified as a creosoting plant located in the southwestern portion of the site (designated as the Creosoting Plant Area). The extent of potential impacts to environmental media related to the former creosoting plant were not fully addressed in the initial RI; therefore supplemental RI activities were performed in the Creosoting Plant Area between 2002 and 2011 and the extent of creosote-related impacts to soil and groundwater was identified and characterized.

The cleanup alternative selected in the initial FS (Alternative 2) included excavation and offsite disposal of hydrocarbon and creosote impacted soil, excavation and onsite consolidation of metals-impacted soil from the perimeter of the site, installation of an asphalt cap with stormwater controls, *in situ* treatment of residual hydrocarbon impacts, institutional controls, and long-term monitoring.

The findings of the Supplemental RI did not substantively alter the appropriateness of the selected remedial alternative. Based on our understanding of site conditions, results of the Supplemental RI, and evaluation of the proposed cleanup alternative, Alternative 2 as described in the RI/FS report (Kennedy/Jenks Consultants 2001) and modified herein, is protective of human health and the environment under an industrial use scenario.

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Tables

TABLE 1

GENERALIZED SUMMARY OF STRATIGRAPHIC UNITS
Former Tacoma Metals Site
Tacoma, Washington

Approximate Depths (feet bgs)[a]		Approximate Thickness (feet)[a]	Generalized Description[b]
Top	Bottom		
0	1 to 8	1 to 8	**Gravelly and sandy fill materials.** This material is located throughout the former Tacoma Metals Property. Metal, wood, and miscellaneous debris are typically mixed with the gravel and sand on the former Tacoma Metals Property, primarily in the central and eastern portions. This unit includes the 3 to 5 feet of fill material installed on the former creosoting plant area prior to construction of the coke plant.
0 to 4	5 to 6	2 to 5	**Wood fill material with no evident soil material.** This material is primarily located beneath Off-Property areas including the Simpson Property and 18th Street Right-of-Way.
5 to 6	7 to 13	1 to 8	**Silty sand material locally mixed with gravel, coarse sand, and/or woody material.** Silty sand is also observed at greater depths, but typically does not include gravel and woody material.
3 to 13	7 to 26	1 to 18	**Wood fill material typically mixed with 5-30% sandy, silty, and/or clayey soil.** This material is encountered throughout the former Tacoma Metals Property, but is generally thickest in the Creosoting Plant Area.
10 to 19	22 to 30	2 to 15	**Sandy material, typically poorly graded, locally with some silt and/or fine gravel.** Sand is also encountered locally at shallower depths and at deeper depths beneath the silt/clay described below.
22 to >40	>22 to >40	see description	**Silty/clayey material.** This material is typically several inches to several feet in thickness and is encountered throughout the former Tacoma Metals Site.

Notes:

(a) Depths are given in feet below ground surface (bgs) relative to the exiting surface elevation at the former wood treatment facility, approximately 10 feet above mean sea level. Depth and thickness values indicate the ranges at which the stratigraphic units have typically been observed during our investigation activities. Generalized site soil stratigraphy is shown on the cross sections in Appendices A and F.

(b) Generalized descriptions based on previous field investigations performed by Kennedy/Jenks Consultants. Refer to the Remedial Investigation/Feasibility Study (RI/FS) Report (2001), Site Supplemental Data Summary (2007), and Soil and Groundwater Investigation Results (2008) for additional information.

TABLE 2

SUMMARY OF WORK PERFORMED FOR THE SUPPLEMENTAL REMEDIAL INVESTIGATION
Former Tacoma Metals Site, Tacoma, Washington

Investigation Date	Investigation Objectives	Scope of Work Performed	Results Summary References
October 2010 – February 2011 Investigation Puyallup River Side Channel Creosoting Plant Area On-Property and Off-Property	• Implement the *Revised Groundwater Investigation Work Plan, Puyallup River Site Channel Investigation* submitted to Ecology on 3 September 2010. • Evaluate groundwater conditions along the Puyallup River Side Channel to the north-northeast of well MW-8(R), located in the Creosoting Plant Area.	• Installed three temporary piezometers at locations north-northeast of the Creosoting Plant Area and adjacent to the Puyallup River Side Channel. Groundwater samples were collected from each piezometer for laboratory analysis of applicable chemicals of concern (COCs). The three piezometers were installed and sampled at the same locations during two separate events conducted in October 2010 and again in February 2011. • Performed groundwater sampling and laboratory analysis for applicable COCs at six conditional point of compliance On-Property and Off-Property monitoring wells. Two rounds of sampling were performed in October 2010 and February 2011 coincident with the temporary piezometer installation and sampling.	• *Revised Groundwater Investigation Summary, Puyallup River Side Channel Investigation* (Kennedy/Jenks Consultants 2012) includes data tables, sample location maps, field sampling documents, and analytical reports. Select materials are included in this report for reference as listed below. • A boring and well location map and analytical data tables for groundwater (well and piezometer) samples provided in Appendix E.
October 2007 – April 2008 Investigation Creosoting Plant Area On-Property and Off-Property	• Implement the *Soil and Groundwater Investigation Work Plan* submitted to Ecology dated 12 March 2007. • Further define lateral limits of impacts to soil and groundwater in the western portion of the Creosoting Plant Area.	• Advanced 13 soil borings (B-37 through B-47) to the first encountered silt/clay layer and collected continuous soil samples from each boring for lithologic logging, field screening for indications of COCs and potential presence of dense non-aqueous phase liquid (DNAPL); collected soil and reconnaissance groundwater samples. • Installed and developed four new Off-Property groundwater monitoring wells (MW-32 through MW-35). • Performed groundwater sampling and laboratory analysis for applicable COCs at 25 On-Property and Off-Property monitoring wells, including new and existing wells. • Performed groundwater elevation monitoring for low- and high- tidal conditions at all Site monitoring wells, including new and existing wells, and light non-aqueous phase liquid (LNAPL)/DNAPL screening for Creosoting Plant Area wells.	• *Soil and Groundwater Investigation Results-Data Transmittal* (Kennedy/Jenks 2008b) includes data tables, data maps, gradient maps, cross sections, soil boring and well construction logs, and analytical reports. Select materials are included in this report for reference as listed below. • Boring and well location map provided in Appendix D. • Analytical data tables for soil, reconnaissance groundwater, and groundwater monitoring wells provided in Appendix D. • Concentration contour maps for carcinogenic polycyclic aromatic hydrocarbons (cPAHs) and naphthalene provided in Appendix D • Geologic cross sections for the Creosoting Plant Area showing the depth to the first encountered silt layer included in Appendices A and F. • Groundwater gradient maps and tabulated water elevation measurements for low- and high- tidal conditions provided in Appendix B.
February 2006 Investigation Creosoting Plant Area On-Property and Off- Property	• Implement the *Soil and Groundwater Investigation Work Plan* submitted to Ecology dated 15 December 2005. • Further define lateral limits of impacts to soil and groundwater in the Off-Property portion of the Creosoting Plant Area.	• Advanced three soil borings (B-34 through B-36) to the first encountered silt/clay layer and collected continuous soil samples from each boring for lithologic logging, field screening for indications of COCs and potential presence of DNAPL; collected soil and reconnaissance groundwater samples for laboratory analysis of applicable COCs. • Installed and developed three new Off-Property groundwater monitoring wells (MW-29 through MW-31). • Abandoned and replaced one damaged monitoring well (MW-28) with a new monitoring well [MW-28(R)] installed at the same location. • Performed groundwater sampling and laboratory analysis for applicable COCs at 21 On-Property and Off-Property monitoring wells, including the three new wells and one replacement well. • Performed groundwater elevation monitoring for low- and high- tidal conditions at all Site monitoring wells, including new and existing wells, and LNAPL/DNAPL screening for Creosoting Plant Area wells.	• *Supplemental Data Summary Report* (Kennedy/Jenks 2007a) includes data tables, data maps, gradient maps, cross sections, soil boring and well construction logs, and analytical reports. Select materials are included in this report for reference as listed below. • Boring and well location map provided in Appendix D. • Analytical data tables for soil, reconnaissance groundwater, and groundwater monitoring wells provided in Appendix D. • Concentration contour maps for cPAHs and naphthalene provided in Appendix D. • Geologic cross sections for the Creosoting Plant Area showing the depth to the first encountered silt layer included in Appendices A and F. • Groundwater gradient maps and tabulated water elevation measurements for low- and high- tidal conditions provided in Appendix B.

TABLE 2

SUMMARY OF WORK PERFORMED FOR THE SUPPLEMENTAL REMEDIAL INVESTIGATION
Former Tacoma Metals Site, Tacoma, Washington

Investigation Date	Investigation Objectives	Scope of Work Performed	Results Summary References
March 2005 Investigation Creosoting Plant Area Off-Property	• Implement the *Soil and Groundwater Investigation Work Plan – Off-Property Investigation* submitted to Ecology dated 2 July 2004, including modifications to the Work Plan described in the *Responses to Ecology Comments on Soil and Groundwater Investigation Work Plan Off-Property Investigation* letter to Ecology dated 2 December 2004 and the *Addendum Letter* dated 24 February 2005. • Further define lateral limits of impacts to soil and groundwater at Off-Property areas west of the former creosoting plant location.	• Advanced ten soil borings (B-24 through B-33) to the first encountered silt/clay layer and collected continuous soil samples from each boring for lithologic logging, field screening for indications of COCs and potential presence of DNAPL; collected soil and reconnaissance groundwater samples for laboratory analysis of applicable COCs. • Installed and developed three new Off-Property groundwater monitoring wells (MW-26 through MW-28). • Performed groundwater sampling and laboratory analysis for applicable COCs at the three new Off-Property monitoring wells. • Performed groundwater elevation monitoring for low- and high- tidal conditions at all Site monitoring wells, including new and existing wells, and LNAPL/DNAPL screening for Creosoting Plant Area wells.	• *Supplemental Data Summary Report* (Kennedy/Jenks 2007a) includes data tables, data maps, gradient maps, cross sections, soil boring and well construction logs, and analytical reports. Select materials are included in this report for reference as listed below. • Boring and well location map provided in Appendix D. • Analytical data tables for soil, reconnaissance groundwater, and groundwater monitoring wells provided in Appendix D. • Geologic cross sections for the Creosoting Plant Area showing the depth to the first encountered silt layer included in Appendices A and F. • Tabulated water elevation measurements for low- and high- tidal conditions provided in Appendix B.
March 2004 Investigation Creosoting Plant Area On-Property and Off-Property	• Investigate the area beyond the western former Tacoma Metals Property boundary to evaluate potential Off-Property sources and evaluate the lateral extent of COCs in soil groundwater north and west of the former creosoting plant location.	• Advanced six soil borings (B-18 through B-23) to the first encountered silt/clay layer and collected continuous soil samples from each boring for lithologic logging, field screening for indications of COCs and potential presence of DNAPL; collected soil and reconnaissance groundwater samples for laboratory analysis of applicable COCs. • Installed and developed three new Off-Property groundwater monitoring wells (MW-23 through MW-25) based on reconnaissance groundwater analytical results. • Performed groundwater sampling and laboratory analysis for applicable COCs at the three newly installed Off-Property Monitoring and On-Property well MW-18. • Performed groundwater elevation monitoring for low- and high- tidal conditions at all Site monitoring wells, including new and existing wells, and LNAPL/DNAPL screening for Creosoting Plant Area wells.	• *Supplemental Data Summary Report* (Kennedy/Jenks 2007a). Includes data tables, data maps, gradient maps, cross sections, soil boring and well construction logs, and analytical reports. Select materials are included in this report for reference as listed below. • Boring and well location map provided in Appendix D. • Analytical data tables for soil, reconnaissance groundwater, and groundwater monitoring wells provided in Appendix D. • Geologic cross sections for the Creosoting Plant Area showing the depth to the first encountered silt layer included in Appendices A and F. • Tabulated water elevation measurements for low- and high- tidal conditions provided in Appendix B.
November - December 2003 Investigation Former Tacoma Metals Property Creosoting Plant Area On-Property	• Implement the *Additional Soil and Groundwater Investigation Work Plan* submitted to Ecology dated 19 September 2003. • Investigate potential On-Property source(s) other than the former creosoting plant retort area that may have contributed to COC concentrations detected in groundwater samples collected from well MW-18. • Evaluate metals concentrations in On-Property monitoring wells (entire former Tacoma Metals Property).	• Advanced two deep borings (B-12 and B-13) at the location of a proposed new monitoring well (MW-22) and adjacent to monitoring well MW-18 and collected soil samples for lithologic logging, field screening for indications of COCs and potential presence of DNAPL; collected soil samples for laboratory analysis of applicable COCs. • Advanced four shallow soil borings (B-14 through B-17) in the vicinity of well MW-18 to evaluate other potential On-Property sources that might have contributed to the COC concentrations detected at well MW-18; collected soil samples for laboratory analysis of applicable COCs. • Installed and developed one new groundwater monitoring well (MW-22) at a location approximately equidistant between existing monitoring wells MW-18 and MW-21. • Performed groundwater sampling and laboratory analysis for applicable COCs at 14 monitoring wells on the On-Property portion of the Creosoting Plant Area, including the newly installed MW-22. • Performed groundwater elevation monitoring for low- and high- tidal conditions at all Site monitoring wells, including new and existing wells, and LNAPL/DNAPL screening for Creosoting Plant Area wells.	• *Supplemental Data Summary Report* (Kennedy/Jenks 2007a). Includes data tables, data maps, gradient maps, cross sections, soil boring and well construction logs, and analytical reports. Select materials are included in this report for reference as listed below. • Boring and well location map provided in Appendix D. • Analytical data tables for soil and groundwater monitoring wells provided in Appendix D. • Geologic cross sections for the Creosoting Plant Area showing the depth to the first encountered silt layer included in Appendices A and F. • Tabulated water elevation measurements for low- and high- tidal conditions provided in Appendix B.

TABLE 2

SUMMARY OF WORK PERFORMED FOR THE SUPPLEMENTAL REMEDIAL INVESTIGATION
Former Tacoma Metals Site, Tacoma, Washington

Investigation Date	Investigation Objectives	Scope of Work Performed	Results Summary References
February – March 2003 Investigation Creosoting Plant Area On-Property	• Implement the *Revised DNAPL Investigation Work Plan* submitted to Ecology dated 20 February 2003. • Further assess the potential presence of DNAPL in the vicinity of the former creosoting plant. • Evaluate the extent and topography of the silt and/or clay confining layer(s) encountered during the June-August 2002 investigation. • Install a deeper well (designated MW-20) at the location of MW-13, at the request of Ecology.	• Advanced eight deep borings (MW-14 through MW-21) in the to the first encountered silt/clay layer and collected continuous soil samples from each boring for lithologic logging, field screening for indications of COCs and potential presence of DNAPL; collected soil samples for laboratory analysis of applicable COCs. • Advanced eight supplemental borings (B-4 through B-11) to assist in the evaluation of the first encountered silt/clay layer. • Installed eight new groundwater monitoring wells (MW-14 through MW-21) in the deep soil borings to monitor for visual indications of DNAPL. • Performed groundwater sampling and laboratory analysis for applicable COCs at the eight new monitoring wells.	• *Supplemental Data Summary Report* (Kennedy/Jenks 2007a) includes data tables, data maps, gradient maps, cross sections, soil boring and well construction logs, and analytical reports. Select materials are included in this report for reference as listed below. • Boring and well location map provided in Appendix D. • Analytical data tables for soil and groundwater monitoring wells provided in Appendix D. • Geologic cross sections for the Creosoting Plant Area showing the depth to the first encountered silt layer included in Appendices A and F.
June – August 2002 Investigation Creosoting Plant Area On-Property	• Implement the *DNAPL and Groundwater Investigation Work Plan* submitted to Ecology, dated 20 June 2002 • Advance deep borings at former creosoting plant retort location to assess the potential for DNAPL near the source area. • Identify silt and/or clay horizons located beneath the wood debris layer that may act as “confining layers” and potentially result in the accumulation of DNAPL.	• Advanced two deep borings (B-1 and B-2) with a hollow-stem auger drill rig to assess the potential presence of DNAPL at the former creosoting plant retort location. • Advanced one deep boring (B-3) adjacent to existing well MW-8(R) to assess whether shallow soil in this area contains hydrocarbons contributing to periodic LNAPL accumulation observed in well MW-8(R). • Collected soil samples from each boring for lithologic logging, field screening for indications of COCs and potential presence of DNAPL; collected soil samples for laboratory analysis of applicable COCs. • Installed one new On-Property groundwater monitoring well (MW-13) at the northern property boundary, downgradient of well MW-8(R), and collected one groundwater sample from well MW-13.	• *Supplemental Data Summary Report* (Kennedy/Jenks 2007a) includes data tables, data maps, gradient maps, cross sections, soil boring and well construction logs, and analytical reports. Select materials are included in this report for reference as listed below. • Boring and well location map provided in Appendix D. • Analytical data tables for soil and groundwater monitoring well MW-13 provided in Appendix D. • Geologic cross sections for the Creosoting Plant Area showing the depth to the first encountered silt layer included in Appendices A and F.
October 2001 Investigation Former Tacoma Metals Property Creosoting Plant Area On-Property	• Additional groundwater sampling for metals (lead) analysis on the former Tacoma Metals Property, including the Creosoting Plant Area.	• Collected groundwater samples from 11 On-Property monitoring wells for laboratory analysis of total lead.	• *Supplemental Data Summary Report* (Kennedy/Jenks 2007a) includes data tables, data maps, gradient maps, cross sections, soil boring and well construction logs, and analytical reports. Select materials are included in this report for reference as listed below. • Boring and well location map and analytical data table provided in Appendix D.

TABLE 3

SUMMARY OF PROPOSED CLEANUP LEVELS

Former Tacoma Metals Site
Tacoma, Washington

SOIL (mg/kg)	MTCA Method A Industrial Soil Cleanup Level (WAC 173-340)	MTCA Method C Industrial Soil Cleanup Level (WAC 173-340)	Protection of Wildlife (TEE)[a]	Proposed Cleanup Levels	
				Direct Contact Human Exposure	Ecological Exposure (uppermost 6 feet)
Arsenic	20	88	132	88	132
Barium	na	700,000	102	700,000	102
Cadmium	2	na	14	2	14
Chromium (III)	2,000	5,300,000	67[b]	5,300,000	67[b]
Chromium (VI)	19	11,000	na	11,000	na
Copper	na	140,000	217	140,000	217
Lead	1,000	na	118	1,000	118
Mercury	2	na	5.5	2	5.5
Selenium	na	18,000	0.3	18,000	0.3
Silver	na	18,000	na	18,000	na
Total PCBs	10	66	0.65	66	0.65
Naphthalene	5	70,000	na	70,000	na
Total cPAHs	2	18	12[c]	18	12[c]
Benzene	0.03	2,400	na	2,400	na
Toluene	7	280,000	na	280,000	na
Ethylbenzene	6	350,000	na	350,000	na
Xylenes	9	700,000	na	700,000	na
TPH-Diesel Range	2,000	na	6,000	2,000	5,000
TPH-Oil Range	2,000	na	na	2,000	na

GROUNDWATER (µg/l)	MTCA Method B Surface Water Cleanup Level (WAC 173-340)	Ecology Freshwater Chronic AWQC (WAC 173-201A)	NRWQC for Human Health Consumption or Organisms (Clean Water Act Section 304)	National Toxics Rule Consumption of Organisms (40 CFR 131.36)	Proposed Cleanup Levels
Arsenic	0.098	190	0.14	0.14	0.098
Lead	na	4.74[d]	na	na	4.74[d]
Mercury	na	0.012	na	0.15	0.012 / PQL[e]
Cadmium	41	1.59[d]	na	na	1.59[d]
Chromium (III)	240,000	288[d]	na	na	288[d]
Chromium (VI)	490	10	na	na	10
Copper	2,900	18.76[d]	na	na	18.76[d]
Selenium	2,700	5	4,200	na	5
Total PCBs	0.0001	0.014	0.000064	0.00017	0.000064 / PQL[e]
Naphthalene	4,940	na	na	na	4,940
Total cPAHs	0.03	na	0.018	0.031	0.03
Benzene	23	na	51	71	23
Toluene	19,000	na	15,000	200,000	15,000
Ethylbenzene	6,900	na	2,100	29,000	2,100
Xylenes	1,000[f]	na	na	na	1,000
TPH-Diesel Range	10,000 (NPDES Industrial Stormwater General Permit Benchmark)	na	na	na	10,000
TPH-Oil Range	10,000 (NPDES Industrial Stormwater General Permit Benchmark)	na	na	na	10,000

Notes:

(a) Direct contact for protection of wildlife based on the Terrestrial Ecological Evaluation (TEE) (Kennedy/Jenks Consultants 2010).
(b) Cleanup level is for total chromium.
(c) Cleanup level is for benzo(a)pyrene.
(d) Cleanup level based on an average hardness of 180 mg/l.
(e) Cleanup level is equal to the Practical Quantitation Limit (PQL).
(f) MTCA Method A Groundwater clenaup level (Method B surface water clenaup level not available).

PCBs = Polychlorinated biphenyls
cPAHs = Carcingenic polycyclic aromatic hydrocarbons
TPH = Total petroleum hydrocarbons
NPDES = National pollutant dischage elimiation system
na = not available
mg/kg = milligrams per kilogram
µg/l = micrograms per liter

NOTE: Soil and groundwater cleanup levels shown above may not be protective of the indoor air pathway. Refer to Section 5 of the main text.

TABLE 4

SUPPLEMENTAL REMEDIAL INVESTIGATION SUMMARY OF ANALYTICAL RESULTS FOR SOIL
CREOSOTING PLANT AREA
Former Tacoma Metals Site, Tacoma, Washngton

			BTEX (µg/kg)						PAHs (mg/kg)	cPAHs (mg/kg)							
INVESTIGATION DATE	SAMPLE NAME	SAMPLE DEPTH	Benzene	Toluene	Ethyl-benzene	m,p-Xylene	o-Xylene	Total xylenes	Naphthalene	Benzo(a) anthracene	Chrysene	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Indeno(1,2,3-cd) pyrene	Dibenz(a,h) anthracene	Total cPAHs[a]
Jun-02	MW-13	17.5	--[b]	--	--	--	--	--	14	0.022	0.029	0.010	<0.0086[c]	0.010	<0.0086	<0.0086	0.01
	B-1	10.5	<5,900	<5,900	<5,900	<5,900	<5,900	<11,800	300 B	79	100	53	34	52	17	8.1	***73.0***
		20.5	<310	<310	<310	<310	<310	<620	110 B	18	18	8.8	7.5	8.9	3.4	1.3	12.9
		26	<780	<780	<780	<780	<780	<1,560	300 B	43	51	22	17	20	7.9	4.2	***31.7***
	B-2	21	<340	<340	<340	<340	<340	<680	58 B	9.7	11	5.8	4.7	5.1	2.2	1.1	8.2
	B-3	10	<11	<11	59	130	160	290	5.6 B	0.046	0.059	0.032	0.035	0.037	0.033	<0.017	0.05
		21.5	<760	<760	<760	<760	<760	<1,520	26 B	1.2	1.1	0.25	0.330	0.260	0.059	0.028	0.45
Feb-03	MW-14	14-14.5	--	--	--	--	--	--	0.980	0.444	0.578	0.620	0.507	0.634	0.451	<0.0222	0.83
		22-22.3	--	--	--	--	--	--	54.1	9.43	8.62	3.25	3.41	2.44	0.925	0.268	5.0
		23.8-24	--	--	--	--	--	--	25.8	3.92	3.41	1.88	0.783	0.940	0.862	<0.500	2.6
		26-26.5	--	--	--	--	--	--	1.03	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.01
	MW-15	11-11.5	--	--	--	--	--	--	0.695	0.0799	0.0719	0.0739	<0.0304	0.0319	<0.0304	<0.0304	0.09
		25-26	--	--	--	--	--	--	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.01
	MW-16	7.5-8	--	--	--	--	--	--	40.1	1.64	1.56	1.14	0.864	1.13	0.513	<0.0586	1.6
		25-26	--	--	--	--	--	--	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.01
	MW-17	12-16	--	--	--	--	--	--	0.375	0.146	0.111	0.0874	0.0185	0.0387	0.0454	<0.0148	0.11
		20.5-22	--	--	--	--	--	--	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.01
	MW-18	11.5-12	--	--	--	--	--	--	326	27.5	27.9	17.9	6.37	7.96	2.10	1.39	***22.7***
		21.5-21.9	--	--	--	--	--	--	1,750	83.2	75.4	42.8	43.8	42.3	5.25	3.54	***61.4***
	MW-19	16-18	--	--	--	--	--	--	0.0798	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.01
		23.5-24	--	--	--	--	--	--	<0.0100	0.0125	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.01
	MW-20	24-24.3	--	--	--	--	--	--	0.631	0.0323	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.01
	MW-21	20.5-21.4	--	--	--	--	--	--	100	170	130	59.5	59.0	60.5	24.4	4.34	***92.6***
		22.5-23.3	--	--	--	--	--	--	0.664	0.312	0.357	0.189	0.129	0.162	0.0684	<0.0100	0.26
	B-6	23-23.2	--	--	--	--	--	--	1,850	128	111	65.8	30.7	65.8	18.7	8.28	***92.1***
	B-8	23.5-24	--	--	--	--	--	--	103	50.5	52.1	21.1	21.0	24.8	7.91	3.86	***32.4***
		26.5-27	--	--	--	--	--	--	0.432	0.0165	0.0107	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.01
Nov-03	B-12	4-5	--	--	--	--	--	--	3.48	15.9	17.7	19.5	12.7	19.0	12.8	5.83	***26.3***
		6.5-7.5	--	--	--	--	--	--	0.191	0.0843	0.115	0.271	0.177	0.120	0.226	0.0799	0.34
		9-10	--	--	--	--	--	--	3.28	4.26	3.32	2.13	1.28	2.16	0.882	0.382	3.1
	B-13	1-3	--	--	--	--	--	--	1.44	7.32	7.21	6.64	6.44	7.79	4.74	2.17	9.6
		5-6	--	--	--	--	--	--	0.218	4.65	4.70	5.90	3.53	3.72	3.47	1.09	7.6
		14-15	--	--	--	--	--	--	826	21.2	1.98	6.95	7.48	10.7	2.22	1.18	11.2
	B-14	1-2	--	--	--	--	--	--	0.713	2.50	3.11	2.78	1.99	3.33	2.13	0.966	3.9
		5-6	--	--	--	--	--	--	1.63	22.2	29.6	22.7	18.9	13.4	13.0	5.18	***30.3***
		9-10	--	--	--	--	--	--	4.52	1.38	2.25	1.75	1.27	1.16	0.994	0.403	2.3
	B-15	5-6	--	--	--	--	--	--	0.421	0.474	1.12	1.14	0.788	0.941	0.711	0.329	1.5
		7-8	--	--	--	--	--	--	0.0605	<0.0100	0.0526	<0.0100	<0.0100	0.0307	0.0123	<0.0100	0.01
		10-11	--	--	--	--	--	--	0.0167	0.0376	0.0843	0.104	0.0826	0.0868	0.108	0.0384	0.14
	B-16	3-4	--	--	--	--	--	--	0.0725	0.0156	0.0206	0.0320	0.0320	0.0156	0.0327	<0.0100	0.04
		5-6	--	--	--	--	--	--	11.0	0.221	0.911	0.143	0.130	0.494	0.104	<0.100	0.25
		10-11	--	--	--	--	--	--	22.3	0.264	1.10	<0.200	<0.200	0.512	<0.200	<0.200	0.22
	B-17	3-4	--	--	--	--	--	--	0.0258	0.0301	0.0387	0.0494	0.0444	0.0279	0.0444	0.150	0.08
		5-6	--	--	--	--	--	--	0.353	1.65	2.76	1.66	2.35	1.36	0.888	0.406	2.4
		7-8	--	--	--	--	--	--	0.535	0.171	0.774	0.250	0.375	0.444	0.182	<0.168	0.38
Proposed Cleanup Level[d]			2,400	280,000	350,000	700,000	700,000	700,000	70,000	NA	NA	NA	NA	NA	NA	NA	18

TABLE 4

SUPPLEMENTAL REMEDIAL INVESTIGATION SUMMARY OF ANALYTICAL RESULTS FOR SOIL
CREOSOTING PLANT AREA
Former Tacoma Metals Site, Tacoma, Washngton

			BTEX (µg/kg)						PAHs (mg/kg)	cPAHs (mg/kg)							
INVESTIGATION DATE	SAMPLE NAME	SAMPLE DEPTH	Benzene	Toluene	Ethyl-benzene	m,p-Xylene	o-Xylene	Total xylenes	Naphthalene	Benzo(a) anthracene	Chrysene	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Indeno(1,2,3-cd) pyrene	Dibenz(a,h) anthracene	Total cPAHs[a]
Mar-04	B-18	6-6.5	--[b]	--	--	--	--	--	0.0872	0.0208	0.0325	0.0286	0.0521	0.0299	0.0156	0.0456	0.05
		12-13	--	--	--	--	--	--	0.873	2.23	2.02	1.74	2.10	0.597	0.867	0.319	2.4
		24-25	--	--	--	--	--	--	0.332	<0.0100[c]	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.01
	B-19	9-10	--	--	--	--	--	--	8.66	0.189	0.142	0.186	0.194	0.0939	0.115	0.0678	0.25
		14-15	--	--	--	--	--	--	0.375	0.0482	0.0412	0.043	0.057	0.0245	0.0167	0.0324	0.06
		21-22	--	--	--	--	--	--	1,160	87.2	76.2	48.3	68.6	25.4	15.2	31.3	***71.8***
	B-20	7-8	--	--	--	--	--	--	0.235	<0.204	<0.204	<0.204	<0.204	<0.204	<0.204	<0.204	0.15
		10-11	--	--	--	--	--	--	17.2	0.259	0.206	0.166	0.192	0.0557	0.0633	0.0544	0.23
		19-20	--	--	--	--	--	--	7.89	0.228	0.144	0.075	0.0967	0.0533	0.0175	0.0317	0.12
	B-21	8-9	--	--	--	--	--	--	0.402	0.104	0.146	0.118	0.181	0.0709	0.0732	0.0488	0.17
		13-15	--	--	--	--	--	--	0.234	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.01
		18-19	--	--	--	--	--	--	45.2	6.93	4.10	3.51	5.00	2.72	0.711	0.317	5.1
	B-22	6-7	--	--	--	--	--	--	0.731	3.40	4.68	8.26	9.09	3.64	5.05	1.87	10.6
		11-12	--	--	--	--	--	--	0.918	1.99	1.77	1.34	1.55	0.319	0.961	0.299	1.9
		19-20	--	--	--	--	--	--	<0.100	2.06	1.71	0.679	0.959	0.340	0.195	0.314	1.1
	B-23	6.5-7.5	--	--	--	--	--	--	0.120	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	0.08
		9-10	--	--	--	--	--	--	1.78	12.8	23.0	15.8	16.2	7.69	17.6	<0.266	***21.5***
		18-20	--	--	--	--	--	--	<0.100	<0.100	<0.100	0.122	0.226	<0.100	<0.100	<0.100	0.17
Mar-05	B-24	9-10	--	--	--	--	--	--	<0.0100	<0.0100	0.0280	0.0143	0.0239	0.0299	0.0174	<0.0100	0.02
		15-16	--	--	--	--	--	--	50.9	1.41	1.27	0.501	0.366	0.383	<0.330	<0.330	0.76
		30.5-31.5	--	--	--	--	--	--	0.239	0.264	0.262	0.0951	0.118	0.151	<0.0500	<0.0500	0.16
	B-25	14-15	--	--	--	--	--	--	0.344	<0.0100	0.0190	<0.0100	<0.0100	0.0203	<0.0100	<0.0100	0.01
		30-31	--	--	--	--	--	--	25.7	36.9	35.5	21.1	15.6	17.9	6.64	3.11	***29.5***
	B-26	6.5-7.5	--	--	--	--	--	--	0.181	0.0595	0.148	0.0668	0.116	0.0939	0.0341	0.0131	0.10
		18-19	--	--	--	--	--	--	7.63	34.6	48.7	20.3	15.9	17.1	7.90	3.44	***28.7***
		25-26	--	--	--	--	--	--	13.7	0.539	0.531	<0.330	<0.330	<0.330	<0.330	<0.330	0.29
	B-27	7-8	--	--	--	--	--	--	0.0910	0.300	0.505	0.409	0.447	0.471	0.253	0.112	0.57
		22-23	--	--	--	--	--	--	0.561	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.01
		24.5-25.5	--	--	--	--	--	--	2,410	102	92.8	37.3	33.1	34.0	10.8	4.86	***56.7***
	B-28	6-7	--	--	--	--	--	--	<0.330	0.711	1.05	1.58	0.759	0.883	1.04	<0.330	1.9
		11-12	--	--	--	--	--	--	1.16	0.0182	0.0248	0.0153	0.0134	0.0229	<0.0100	<0.0100	0.02
		23.5-24.5	--	--	--	--	--	--	33.5	3.91	3.53	0.824	0.915	0.858	<0.656	<0.656	1.5
	B-29	6.5-7.5	--	--	--	--	--	--	<0.330	0.723	1.17	0.832	0.896	0.657	0.520	<0.330	1.1
		11-12	--	--	--	--	--	--	1.20	4.33	7.10	4.79	3.57	3.57	2.11	0.808	6.3
		22.5-23.5	--	--	--	--	--	--	415	25.1	23.2	8.18	7.83	7.32	<6.51	<6.51	13.1
	B-30	5.5-6.5	--	--	--	--	--	--	0.0297	0.0423	0.0689	0.0383	0.0533	0.0652	0.0298	<0.0211	0.06
		11-12	--	--	--	--	--	--	0.188	0.0154	0.0244	0.0119	0.0125	0.0249	<0.0100	<0.0100	0.02
		22-23	--	--	--	--	--	--	<0.643	4.47	4.26	2.20	1.72	1.82	0.698	<0.643	3.1
	B-31	6-7	--	--	--	--	--	--	<0.330	3.69	7.16	6.37	5.85	4.65	3.84	1.53	8.4
		19-20	--	--	--	--	--	--	9.29	19.2	18.1	10.6	8.02	8.36	3.44	1.70	14.9
		24-25	--	--	--	--	--	--	17.7	2.72	2.93	1.69	1.30	1.35	0.542	<0.330	2.3
	B-32	6-7	--	--	--	--	--	--	0.0741	0.0156	0.0273	0.0184	0.0240	0.0345	0.0166	<0.0100	0.03
		11-12	--	--	--	--	--	--	0.327	0.171	0.369	0.241	0.350	0.248	0.371	0.0990	0.37
		19-20	--	--	--	--	--	--	8.27	279	318	202	153	170	76.2	32.2	***276.2***
	B-33	6-7	--	--	--	--	--	--	0.0454	0.0211	0.0323	0.0227	0.0243	0.0340	0.0144	<0.0100	0.03
		18-19	--	--	--	--	--	--	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.01
		20.5-21.5	--	--	--	--	--	--	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.01
Proposed Cleanup Level[d]			2,400	280,000	350,000	700,000	700,000	700,000	70,000	NA	NA	NA	NA	NA	NA	NA	18

TABLE 4

SUPPLEMENTAL REMEDIAL INVESTIGATION SUMMARY OF ANALYTICAL RESULTS FOR SOIL
CREOSOTING PLANT AREA
Former Tacoma Metals Site, Tacoma, Washngton

			BTEX (µg/kg)						PAHs (mg/kg)	cPAHs (mg/kg)							
INVESTIGATION DATE	SAMPLE NAME	SAMPLE DEPTH	Benzene	Toluene	Ethyl-benzene	m,p-Xylene	o-Xylene	Total xylenes	Naphthalene	Benzo(a) anthracene	Chrysene	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Indeno(1,2,3-cd) pyrene	Dibenz(a,h) anthracene	Total cPAHs[a]
Feb-06	B-34	7-8	--[b]	--	--	--	--	--	<0.118	0.448	0.519	0.491	0.474	0.481	0.330	0.229	0.69
		18-19	--	--	--	--	--	--	0.00992 J	0.0217	0.0300	0.0158	0.0217	0.0225	0.0215	0.0154	0.03
		30-31	--	--	--	--	--	--	0.0539	0.0284	0.0154	0.0102 J	0.00491 J	0.00169 J	<0.0127[c]	<0.0127	0.02
	B-35	6-7	--	--	--	--	--	--	0.0504 J	0.332	0.993	0.755	0.752	0.631	0.550	0.343	1.0
		32-33	--	--	--	--	--	--	1.93	<0.0588	<0.0588	<0.0588	<0.0588	<0.0588	<0.0588	<0.0588	0.04
		39-40	--	--	--	--	--	--	0.658	<0.0600	<0.0600	<0.0600	<0.0600	<0.0600	<0.0600	<0.0600	0.05
	B-36	8-10	--	--	--	--	--	--	1.62 J	71.7	114	88.8	73.2	78.0	31.7	22.1	***117.6***
		23-24	--	--	--	--	--	--	204	403	281	271	215	245	82.7	58.3	***374.2***
		31-32	--	--	--	--	--	--	296	296	507	151	145	135	101	97.7	***233.5***
Oct-07	B-37	5-6	--	--	--	--	--	--	0.020	<0.01	0.016	<0.01	0.018	<0.01	0.011	<0.01	0.01
		14-15	--	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
		21-22	--	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
	B-38	5-6	--	--	--	--	--	--	0.015	0.18	0.27	0.24	0.33	0.13	0.12	0.022	0.32
		14.5-15.5	--	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
		22.5-23.5	--	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
	B-39	5.5-6.5	--	--	--	--	--	--	1.8	0.99	1.7	1.3	2.0	0.62	1.0	0.24	1.8
		10-11	--	--	--	--	--	--	0.24	0.019	0.012	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
		21-22	--	--	--	--	--	--	<0.01	6.7	9.4	4.2	5.0	1.9	1.9	0.58	5.9
	B-40	6.5-7.5	--	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
		14-15	--	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
		21.5-22.5	--	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
	B-41	7-8	--	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
		11-12	--	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
		24.5-25.5	--	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
	B-42	5-6	--	--	--	--	--	--	0.028	0.11	0.23	0.25	0.36	0.12	0.17	0.040	0.33
		22-23	--	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
		24.5-25.5	--	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
	B-43	6-7	--	--	--	--	--	--	0.028	0.024	0.036	0.010	0.013	<0.01	<0.01	<0.01	0.02
		14.5-15.5	--	--	--	--	--	--	0.26	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
		28.5-29.5	--	--	--	--	--	--	0.91	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
		34.5-35.5	--	--	--	--	--	--	0.43	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
	B-44	2-3	--	--	--	--	--	--	0.045	0.36	0.67	0.73	0.96	0.25	0.49	0.14	0.96
		14-15	--	--	--	--	--	--	<0.01	0.015	0.013	0.014	0.015	<0.01	0.010	<0.01	0.02
		31.5-32.5	--	--	--	--	--	--	0.052	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
	B-45	6.5-7.5	--	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
		11-12	--	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
		21-22	--	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
	B-46	6-7	--	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
		13-14	--	--	--	--	--	--	0.022	0.011	0.024	0.014	0.019	<0.01	0.011	<0.01	0.02
		21-22	--	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
	B-47	6-7	--	--	--	--	--	--	0.038	0.37	0.73	0.62	0.81	0.22	0.36	0.095	0.81
		13-14	--	--	--	--	--	--	<0.01	0.011	0.013	<0.01	0.011	<0.01	<0.01	<0.01	0.01
		30.5-31.5	--	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Proposed Cleanup Level[d]			2,400	280,000	350,000	700,000	700,000	700,000	70,000	NA	NA	NA	NA	NA	NA	NA	18

Notes:

(a) Total cPAHs were calculated using the toxicity equivalency factor (TEF) methodology described in MTCA [WAC 173-340-708(8)(e)].
For non-detected cPAH analytes, the TEF factor (listed below) was applied to a value of one-half the laboratory reporting limit prior to summation.
TEF = 1.0 for benzo(a)pyrene
TEF = 0.1 for benzo(a)anthracene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, benzo(a)-fluoranththene, and benzo(k)- fluoranththene
TEF = 0.01 for chrysene

(b) "--" denotes that the sample was not analyzed for the indicated analyte.

(c) "<" denotes that the analyte was not detected at a concentration above the indicated laboratory reporting limit.

(d) Refer to Table 3 for a summary of proposed cleanup levels. Ceanup levels for soil are based on MTCA Method C cleanup levels for industrial site uses

Bold and italics indicate an analyte concentration above the proposed cleanup level.

BTEX = Benzene, toluene, ethylbenzene, and xylenes
PAHs = Polycyclic aromatic hydrocarbons
cPAHs = Carcinogenic PAHs
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
B = Laboratory data flag indicating that the analytes was also identified in the method blank
J = Laboratory data flag indicating that the result is an esimated value less than the method reporting limit
NA = Cleanup level is not available for the indicated analyte

TABLE 5

SUPPLEMENTAL REMEDIAL INVESTIGATION SUMMARY OF ANALYTICAL RESULTS FOR RECONNAISSANCE GROUNDWATER
CREOSOTING PLANT AREA
Former Tacoma Metals Site - Tacoma, Washington

SAMPLE LOCATION	INVESTIGATION DATE	PAHs (µg/L)	cPAHs (µg/L)							Total cPAHs[a]	
		Naphthalene	Benzo(a)anthracene	Chrysene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Indeno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	Non-detect values included[b]	Non-detect values excluded[c]
B-18	March-04	36.0	<10.0[d]	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	***7.6***	ND
B-19		***5,870***	<500	<500	<500	<500	<500	<500	<500	***378***	ND
B-20		***22,900***	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	***755***	ND
B-21		4,330	<500	<500	<500	<500	<500	<500	<500	***378***	ND
B-22		1,100	<200	<200	<200	<200	<200	<200	<200	***378***	ND
B-23		74.0	0.306	0.253	0.122	0.0906	0.103	0.0372	0.0180	***0.18***	***0.18***
B-24	March-05	2.98	3.52	3.26	1.11	1.39	2.48	<0.500	<0.500	***1.9***	***1.9***
B-25		39.8	9.89	12.3	3.96	7.03	8.13	1.32	<1.00	***6.7***	***6.7***
B-26		17.7	3.92	6.86	2.65	3.53	2.16	1.08	0.784	***3.9***	***3.9***
B-27		4,310	2.06	5.98	<1.00	2.06	1.03	<1.00	<1.00	***0.57***	***0.57***
B-28		1,070	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	***7.6***	ND
B-29		2,730	2.83	2.93	<1.00	<1.00	<1.00	<1.00	<1.00	***1.0***	***0.31***
B-30		3.33	0.882	2.75	<0.500	1.08	0.686	<0.500	<0.500	***0.59***	***0.29***
B-31		***17,400***	1,090	928	654	510	519	246	100	***910***	***910***
B-32		6.83	11.3	12.7	8.12	8.71	8.22	2.67	1.39	***11***	***11***
B-33		1.52	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	***0.38***	ND
B-37	October-07	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	***0.076***	ND
B-37A		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	***0.076***	ND
B-38		0.17	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	***0.076***	ND
B-39		4.2	0.20	0.28	<0.1	<0.1	<0.1	<0.1	<0.1	***0.093***	0.023
B-39A		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	***0.076***	ND
B-40		0.36	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	***0.076***	ND
B-41		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	***0.076***	ND
B-42		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	***0.076***	ND
B-43		0.96	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	***0.076***	ND
B-44		2.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	***0.076***	ND
B-45		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	***0.076***	ND
B-46		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	***0.076***	ND
B-47		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	***0.076***	ND
Proposed Cleanup Level[f]		**4,940**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**0.030**	**0.030**

NOTES:

(a) Total cPAHs were calculated using the toxicity equivalency factor (TEF) methodology described in MTCA [WAC 173-340-708(8)(e)]. TEFs are listed below.
TEF = 1.0 for benzo(a)pyrene
TEF = 0.1 for benzo(a)anthracene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, benzo(a)-fluoranththene, and benzo(k)- fluoranththene
TEF = 0.01 for chrysene

(b) Non-detected cPAH analytes were included in the summation. The TEF factor was applied to a value of one-half the laboratory reporting limit prior to summation.

(c) Non-detected cPAH analytes were not included in the summation.

(d) "<" denotes that the analyte was not detected at a concentration above the indicated laboratory reporting limit.

(e) "ND" indicates that no individual cPAH analytes were detected at a concentration above the laboratory reporting limit.

(f) Refer to Table 3 for a summary of proposed cleanup levels for groundwater.

Bold and italics indicate an analyte concentration above the proposed cleanup level.

PAHs = Polycyclic aromatic hydrocarbons
cPAHs = Carcinogenic PAHs
µg/L = micrograms per liter
NA = Cleanup level is not available for the indicated analyte

TABLE 6

SUPPLEMENTAL REMEDIAL INVESTIGATION SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER
CREOSOTING PLANT AREA
Former Tacoma Metals Site - Tacoma, Washington

WELL	DATE	BTEX (µg/L)				Filtering (PAHs and cPAHs)	PAHs (µg/L)	cPAHs (µg/L)							Total cPAHs[a]	
		Benzene	Toluene	Ethyl-benzene	Total Xylenes		Naphthalene	Benzo(a)anthracene	Chrysene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Indeno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	Non-detect values included[b]	Non-detect values excluded[c]
MW-8(R)	Mar-08	---[d]	---	---	---	filtered	2,900	0.072	0.072	<0.02[e]	<0.02	<0.02	<0.02	<0.02	0.022	0.0079
						unfiltered	3,600	0.59	0.56	<0.2	0.24	<0.2	<0.2	<0.2	***0.22***	***0.089***
	Feb-06	---	---	---	---	filtered	2,370	<0179	<0.107	<0.155	<0.482	<0.125	<0.167	<0.173	***0.13***	ND[f]
						unfiltered	***6,810***	6.00	6.52	2.48	2.12	2.52	<0.333	<0.345	***3.6***	***3.6***
	Dec-03	---	---	---	---	filtered	***6,770***	0.710	0.646	0.292	0.277	0.219	0.126	0.0635	***0.44***	***0.44***
						unfiltered	***8,710***	3.09	2.90	1.11	0.841	0.885	0.363	0.186	***1.7***	***1.7***
MW-10	Mar-08	---	---	---	---	filtered	1.3	0.40	0.37	0.18	0.21	0.09	0.037	<0.02	***0.26***	***0.26***
						unfiltered	1.6	0.41	0.37	0.16	0.21	0.069	0.035	<0.02	***0.24***	***0.24***
	Feb-06	---	---	---	---	filtered	1.37	0.105 J	0.0953 J	<0.0302	<0.0942	<0.0244	<0.0326	<0.0337	***0.036***	0.011
						unfiltered	3.38	0.320	0.353	0.104 J	0.0988 J	0.0941 J	<0.0329	<0.0341	***0.16***	***0.16***
	Dec-03	---	---	---	---	filtered	6.68	0.164	0.114	0.0787	0.0753	0.0398	0.0320	0.0168	***0.11***	***0.11***
						unfiltered	6.55	0.533	0.403	0.110	0.109	0.0772	0.0292	0.0118	***0.19***	***0.19***
MW-11	Mar-08	---	---	---	---	filtered	13	0.50	0.39	0.18	0.22	0.089	0.068	<0.02	***0.27***	***0.27***
						unfiltered	18	0.68	0.48	<0.2	0.23	<0.2	<0.2	<0.2	***0.23***	***0.10***
	Feb-06	---	---	---	---	filtered	1.49	0.455	0.450	0.125	0.148	0.145	<0.0318	<0.0330	***0.21***	***0.20***
						unfiltered	5.47	0.739	0.678	0.159	0.137	0.161	<0.0304	<0.0315	***0.27***	***0.27***
	Dec-03	---	---	---	---	filtered	41.7	0.892	0.925	0.442	0.387	0.347	0.185	0.128	***0.65***	***0.65***
						unfiltered	89.3	0.851	0.615	0.226	0.209	0.169	0.119	0.0661	***0.37***	***0.37***
MW-12	Dec-03	---	---	---	---	filtered	1.00	0.0389	0.0240	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.011	0.0041
						unfiltered	1.07	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.0076	ND
MW-13	Dec-03	---	---	---	---	filtered	1.01	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.0076	ND
						unfiltered	1.27	0.0439	0.0308	<0.0100	0.0175	0.0186	<0.0100	<0.0100	0.013	0.0083
	Aug-02	7	<1.0	1.4	2.8	unfiltered	11	0.05 J	0.05 MJ	<0.11	<0.11	<0.11	<0.11	<0.11	***0.083***	0.0055
						unfiltered	---	---	---	---	---	---	---	---	---	---
MW-14	Mar-08	---	---	---	---	filtered	0.18	0.052	0.049	<0.02	<0.02	<0.02	<0.02	<0.02	0.020	0.0057
						unfiltered	0.26	0.067	0.065	<0.02	<0.02	<0.02	<0.02	<0.02	0.021	0.0074
	Feb-06	---	---	---	---	filtered	1.02	<0.00427	<0.00305	<0.00226	<0.00331	<0.00380	<0.00258	<0.00295	0.0020	ND
						unfiltered	1.11	0.110 J	0.115	0.0460 J	<0.0931	0.0437 J	<0.0322	<0.0333	***0.070***	***0.063***
	Dec-03	---	---	---	---	filtered	4.35	0.0624	0.0536	0.0185	0.0154	0.0161	<0.0100	<0.0100	0.029	0.028
						unfiltered	10.1	0.446	0.395	0.148	0.144	0.118	0.109	0.0705	***0.24***	***0.24***
	Feb-03	<10.0	<10.0	<10.0	<20.0	filtered	66.4	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	***0.076***	ND
						unfiltered	28.3	1.10	1.08	0.385	0.308	0.423	0.135	<0.100	***0.60***	***0.59***
Proposed Cleanup Level[g]		23	19,000	6,900	1,000	---	4,940	NA	NA	NA	NA	NA	NA	NA	0.030	0.030

TABLE 6

SUPPLEMENTAL REMEDIAL INVESTIGATION SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER
CREOSOTING PLANT AREA
Former Tacoma Metals Site - Tacoma, Washington

WELL	DATE	BTEX (µg/L)				Filtering (PAHs and cPAHs)	PAHs (µg/L)	cPAHs (µg/L)							Total cPAHs[a]	
		Benzene	Toluene	Ethyl-benzene	Total Xylenes		Naphthalene	Benzo(a)anthracene	Chrysene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Indeno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	Non-detect values included[b]	Non-detect values excluded[c]
MW-15	Mar-08	---[d]	---	---	---	filtered	0.036	<0.02[e]	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.015	0.000
						unfiltered	0.036	0.026	0.027	<0.02	0.021	<0.02	<0.02	<0.02	0.018	0.0050
	Feb-06	---	---	---	---	filtered	0.334	<0.0353	<0.0212	<0.0306	<0.0953	<0.0247	<0.0329	<0.0341	0.027	ND[f]
						unfiltered	0.0636 J	<0.00427	<0.00305	<0.00226	<0.00331	<0.00380	<0.00258	<0.00295	0.0020	ND
	Dec-03	---	---	---	---	filtered	0.186	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.0076	ND
						unfiltered	<0.100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.0076	ND
	Feb-03	<0.200	<0.200	<0.200	<0.750	filtered	1.720	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.0076	ND
						unfiltered	0.235	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	***0.076***	ND
MW-16	Mar-08	---	---	---	---	filtered	0.026	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.015	ND
						unfiltered	0.023	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.015	ND
	Feb-06	---	---	---	---	filtered	0.236	<0.00412	<0.00294	<0.00218	<0.00320	<0.00367	<0.00249	<0.00285	0.0019	ND
						unfiltered	0.0233 J	<0.00417	<0.00298	<0.00220	<0.00324	<0.00372	<0.00252	<0.00289	0.0019	ND
	Dec-03	---	---	---	---	filtered	<0.100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.0076	ND
						unfiltered	<0.100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.0076	ND
	Feb-03	<0.200	<0.200	<0.200	<0.750	filtered	0.194	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.0076	ND
						unfiltered	0.877	0.131	0.0812	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.021	0.014
MW-17	Mar-08	---	---	---	---	filtered	0.21	0.042	0.032	<0.02	<0.02	<0.02	<0.02	<0.02	0.019	0.0045
						unfiltered	0.24	0.049	0.043	<0.02	<0.02	<0.02	<0.02	<0.02	0.019	0.0053
	Feb-06	---	---	---	---	filtered	0.366	0.0494 J	0.0517 J	<0.0292	<0.0910	<0.0236	<0.0315	<0.0326	0.029	0.0055
						unfiltered	0.180 J	<0.0211	<0.0151	<0.0111	<0.0164	<0.0188	<0.0128	<0.0146	0.010	ND
	Dec-03	---	---	---	---	filtered	0.195	0.0335	0.0207	<0.0100	0.0163	0.0140	<0.0100	<0.0100	0.013	0.0066
						unfiltered	0.346	0.0297	0.0157	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.010	0.0031
	Feb-03	<0.200	0.448	<0.200	<0.750	filtered	0.157	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.0076	ND
						unfiltered	0.793	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	***0.038***	ND
MW-18	Mar-08	---	---	---	---	filtered	4,400	0.048	0.036	<0.02	<0.02	<0.02	<0.02	<0.02	0.019	0.0052
						unfiltered	***5,800***	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	***0.15***	ND
	Feb-06	---	---	---	---	filtered	***6,280***	<0.169	<0.101	<0.146	<0.455	<0.118	<0.157	<0.163	***0.13***	ND
						unfiltered	***7,650***	<0.174	<0.105	<0.151	<0.471	<0.122	<0.163	<0.169	***0.13***	ND
	Mar-04	---	---	---	---	filtered	***5,360***	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	***0.076***	ND
						unfiltered	***7,490***	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	***0.076***	ND
	Dec-03	---	---	---	---	filtered	***6,690***	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	***0.076***	ND
						unfiltered	***5,970***	0.192	0.162	<0.100	<0.100	<0.100	<0.100	<0.100	***0.091***	0.021
	Feb-03	<100	<100	246	500	filtered	***4,990***	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	***0.76***	ND
						unfiltered	***9,840 E***	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	***7.6***	ND
Proposed Cleanup Level[g]		23	19,000	6,900	1,000	---	4,940	NA	NA	NA	NA	NA	NA	NA	0.030	0.030

TABLE 6

SUPPLEMENTAL REMEDIAL INVESTIGATION SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER
CREOSOTING PLANT AREA
Former Tacoma Metals Site - Tacoma, Washington

WELL	DATE	BTEX (µg/L)				Filtering (PAHs and cPAHs)	PAHs (µg/L)	cPAHs (µg/L)							Total cPAHs[a]	
		Benzene	Toluene	Ethyl-benzene	Total Xylenes		Naphthalene	Benzo(a)anthracene	Chrysene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Indeno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	Non-detect values included[b]	Non-detect values excluded[c]
MW-19	Feb-11	<0.35	<1	<1	<3	filtered	<0.025[e]	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.019	ND[f]
						unfiltered	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.019	ND
	Oct-10	<0.35 [d]	<1	<1	<3	filtered	0.02 J	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	***0.076***	ND
						unfiltered	0.01 J	<0.10 J	0.01 J	<0.10 J	<0.10 J	<0.10 J	<0.10 J	<0.10 J	***0.075***	0.00010
	Mar-08	---[d]	---	---	---	filtered	0.042	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.015	ND
						unfiltered	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.015	ND
	Feb-06	---	---	---	---	filtered	0.629	<0.00437	<0.00312	<0.00231	<0.00339	<0.00389	<0.00264	<0.00302	0.0021	ND
						unfiltered	0.0569 J	<0.00432	<0.00308	<0.00228	<0.00335	<0.00385	<0.00261	<0.00299	0.0020	ND
	Dec-03	---	---	---	---	filtered	0.270	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.0076	ND
						unfiltered	<0.100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.0076	ND
	Feb-03	<0.200	<0.200	<0.200	<0.750	filtered	<0.100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.0076	ND
						unfiltered	<0.100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.0076	ND
MW-20	Feb-11	5.0	<1	2	3.8	filtered	3.2	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.019	ND
						unfiltered	3.4	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.019	ND
	Oct-10	3.6	<1	3.0	4.7	filtered	6.2	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	***0.076***	ND
						unfiltered	7.4 J	0.02 J	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	***0.073***	0.0020
	Mar-08	---	---	---	---	filtered	5.8	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.015	ND
						unfiltered	7.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	***0.15***	ND
	Feb-06	---	---	---	---	filtered	658	<0.170	<0.102	<0.148	<0.460	<0.119	<0.159	<0.165	***0.13***	ND
						unfiltered	734	<0.172	<0.103	<0.149	<0.466	<0.121	<0.161	<0.167	***0.13***	ND
	Dec-03	---	---	---	---	filtered	3.76	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.0076	ND
						unfiltered	13.6	0.0415	0.0255	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.011	0.0044
	Feb-03	3.29 / 3.69[h]	<1.00 / <1.00	11.8 / 14.0	16.2 / 16.9	filtered	24.3 / 14.2	<0.500 / <1.0	<0.500 / <1.0	<0.500 / <1.0	<0.500 / <1.0	<0.500 / <1.0	<0.500 / <1.0	<0.500 / <1.0	***0.38 / 0.76***	ND / ND
						unfiltered	27.9 / 31.2	<0.500 / <0.500	<0.500 / <0.500	<0.500 / <0.500	<0.500 / <0.500	<0.500 / <0.500	<0.500 / <0.500	<0.500 / <0.500	***0.38 / 0.38***	ND / ND
MW-21	Mar-08	---	---	---	---	filtered	560	0.52	0.39	0.13	0.18	0.055	0.028	<0.02	***0.21***	***0.21***
						unfiltered	730	1.3	1.0	0.50	0.66	0.26	<0.2	<0.2	***0.75***	***0.73***
	Feb-06	---	---	---	---	filtered	202	0.274	0.280	0.109	0.101 J	0.105	<0.0295	<0.0305	***0.16***	***0.16***
						unfiltered	139	0.930	0.877	0.291	0.249	0.279	0.0744 J	0.667	***0.52***	***0.52***
	Dec-03	---	---	---	---	filtered	241	0.222	0.174	0.0891	0.0650	0.0708	0.0231	<0.0100	***0.13***	***0.13***
						unfiltered	678	2.52	2.04	1.25	1.16	0.999	0.424	0.231	***1.8***	***1.8***
	Feb-03	<100	<100	<100	<200	filtered	1,290	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	***3.8***	ND
						unfiltered	1,740	0.981	0.654	0.212	0.154	0.212	<0.100	<0.100	***0.36***	***0.35***
MW-22	Mar-08	---	---	---	---	filtered	990	0.36	0.35	0.079	0.099	0.036	<0.02	<0.02	***0.13***	***0.13***
						unfiltered	1,200	0.49	0.47	0.094	0.13	0.041	<0.02	<0.02	***0.17***	***0.16***
	Feb-06	---	---	---	---	filtered	301	0.0966 J	0.0989 J	<0.0292	<0.0910	<0.0236	<0.0315	<0.0326	***0.034***	0.011
						unfiltered	883	0.455	0.505	0.102 J	0.0955 J	0.105 J	<0.0318	<0.0330	***0.18***	***0.17***
	Dec-03	---	---	---	---	filtered	752 / 1,970	0.144 / 0.190	0.121 / 0.150	0.0665 / 0.0536	0.0562 / 0.0489	0.0421 / 0.0212	0.0169 / 0.0149	<0.0100 / <0.0100	***0.094 / 0.083***	***0.094 / 0.083***
						unfiltered	1,940 / 2,170	0.521 / 0.498	0.443 / 0.410	0.117 / 0.134	0.0863 / 0.103	0.0996 / <0.100	0.0303 / <0.100	0.0123 / <0.100	***0.20 / 0.21***	***0.20 / 0.20***
Proposed Cleanup Level[g]		23	19,000	6,900	1,000	---	4,940	NA	NA	NA	NA	NA	NA	NA	0.030	0.030

TABLE 6

SUPPLEMENTAL REMEDIAL INVESTIGATION SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER
CREOSOTING PLANT AREA
Former Tacoma Metals Site - Tacoma, Washington

WELL	DATE	BTEX (µg/L)				Filtering (PAHs and cPAHs)	PAHs (µg/L)	cPAHs (µg/L)							Total cPAHs[a]	
		Benzene	Toluene	Ethyl-benzene	Total Xylenes		Naphthalene	Benzo(a)anthracene	Chrysene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Indeno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	Non-detect values included[b]	Non-detect values excluded[c]
MW-23	Feb-11	***53***	1.2	52	18.7	filtered	44	0.15	0.15	<0.025[e]	<0.025	<0.025	<0.025	<0.025	***0.034***	0.017
						unfiltered	50	0.28	0.21	0.029	0.036	<0.025	<0.025	<0.025	***0.066***	***0.063***
	Oct-10	***56***	1.4	56	22	filtered	54	0.20 J	0.17 J	<0.10 J	<0.10 J	<0.10 J	<0.10 J	<0.10 J	***0.092***	0.022
						unfiltered	59	0.30	0.26	0.015 J	0.02 J	<0.10	<0.10	<0.10	***0.065***	***0.050***
	Mar-08	---[d]	---	---	---	filtered	26	0.220	0.21	<0.02	<0.02	<0.02	<0.02	<0.02	***0.038***	0.024
						unfiltered	32	0.32	0.30	0.022	0.031	<0.02	<0.02	<0.02	***0.063***	***0.060***
	Feb-06	---	---	---	---	filtered	191	0.0391 J	0.0391 J	<0.0299	<0.0931	<0.0241	<0.0322	<0.0333	0.028	0.0043
						unfiltered	799	0.200	0.214	<0.0295	<0.0920	<0.0239	<0.0318	<0.0330	***0.046***	0.022
	Mar-04	---	---	---	---	filtered	742	<0.100	<0.100	<0.100	0.194	<0.100	<0.100	<0.100	***0.090***	0.019
						unfiltered	972	0.577	0.442	<0.100	0.327	<0.100	<0.100	<0.100	***0.16***	***0.095***
MW-24	Mar-08	---	---	---	---	filtered	18	0.31	0.31	0.023	0.038	<0.02	<0.02	<0.02	***0.064***	***0.061***
						unfiltered	19	0.42	0.34	0.043	0.061	0.025	<0.02	<0.02	***0.099***	***0.097***
	Feb-06	---	---	---	---	filtered	18.0	0.0344 J	0.0301 J	<0.0280	<0.0871	<0.0226	<0.0301	<0.0312	0.026	0.0037
						unfiltered	133	0.272	0.288	<0.0292	<0.0910	<0.0236	<0.0315	<0.0326	***0.054***	***0.030***
	Mar-04	---	---	---	---	filtered	4,240	<0.100	<0.100	<0.100	0.231	<0.100	<0.100	<0.100	***0.094***	0.023
						unfiltered	***6,600***	0.800	0.667	<0.100	0.419	0.152	<0.100	<0.100	***0.20***	***0.14***
MW-25	Mar-08	---	---	---	---	filtered	0.21	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.015	ND[f]
						unfiltered	0.29	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.015	ND
	Feb-06	---	---	---	---	filtered	0.536	<0.0345	<0.0207	<0.0299	<0.0931	<0.0241	<0.0322	<0.0333	0.027	ND
						unfiltered	0.640	<0.0316	<0.0189	<0.0274	<0.0853	<0.0221	<0.0295	<0.0305	0.024	ND
	Mar-04	---	---	---	---	filtered	1.60	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.0076	ND
						unfiltered	1.34	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.0076	ND
MW-26	Feb-11	<0.35	<1	<1	<3	filtered	44	0.11	0.089	<0.025	<0.025	<0.025	<0.025	<0.025	0.029	0.012
						unfiltered	47	0.12	0.094	<0.025	<0.025	<0.025	<0.025	<0.025	0.030	0.013
	Oct-10	<0.35	<1	1.1	<3	filtered	120 E	0.12	0.09 J	<0.10	<0.10	<0.10	<0.10	<0.10	***0.078***	0.013
						unfiltered	140	0.16	0.13	0.01 J	0.03 J	<0.10	<0.10	<0.10	***0.045***	***0.030***
	Mar-08	---	---	---	---	filtered	74.0	0.12	0.11	<0.02	<0.02	<0.02	<0.02	<0.02	0.027	0.013
						unfiltered	91	0.16	0.15	<0.02	0.026	<0.02	<0.02	<0.02	***0.033***	0.020
	Feb-06	---	---	---	---	filtered	125	<0.00417	<0.00298	<0.00220	<0.00324	<0.00372	<0.00252	<0.00289	0.0019	ND
						unfiltered	501	0.157	0.103	<0.00234	0.0327	0.0142	<0.00267	<0.00306	0.023	0.021
	Mar-05	---	---	---	---	filtered	990	0.122	0.109	<0.100	<0.100	<0.100	<0.100	<0.100	***0.083***	0.013
						unfiltered	987	0.602	0.610	0.127	0.121	0.437	<0.100	<0.100	***0.26***	***0.25***
MW-27	Mar-08	---	---	---	---	filtered	0.22	0.047	0.035	<0.02	<0.02	<0.02	<0.02	<0.02	0.019	0.0051
						unfiltered	0.26	0.066	0.061	<0.02	<0.02	<0.02	<0.02	<0.02	0.021	0.0072
	Feb-06	---	---	---	---	filtered	2.05	<0.00427	<0.00305	<0.00226	<0.00331	<0.00380	<0.00258	<0.00295	0.0020	ND
						unfiltered	1.64	<0.00432	<0.00308	<0.00228	<0.00335	<0.00385	<0.00261	<0.00299	0.0020	ND
	Mar-05	---	---	---	---	filtered	1.33	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	***0.076***	ND
						unfiltered	1.58	0.105	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	***0.081***	0.011
Proposed Cleanup Level[g]		23	19,000	6,900	1,000	---	4,940	NA	NA	NA	NA	NA	NA	NA	0.030	0.030

TABLE 6

SUPPLEMENTAL REMEDIAL INVESTIGATION SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER
CREOSOTING PLANT AREA
Former Tacoma Metals Site - Tacoma, Washington

WELL	DATE	BTEX (µg/L)				Filtering (PAHs and cPAHs)	PAHs (µg/L)	cPAHs (µg/L)							Total cPAHs[a]	
		Benzene	Toluene	Ethyl-benzene	Total Xylenes		Naphthalene	Benzo(a)anthracene	Chrysene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Indeno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	Non-detect values included[b]	Non-detect values excluded[c]
MW-28 / 28(R)	Mar-08	---[d]	---	---	---	filtered	160	0.49	0.36	0.067	0.069	0.035	<0.02[e]	<0.02	***0.132***	***0.13***
						unfiltered	370	0.77	0.56	0.17	0.21	0.077	0.036	<0.02	***0.29***	***0.28***
	Feb-06	---	---	---	---	filtered	4,260	<0.659	<0.396	<0.571	<1.78	<0.462	<0.615	<0.637	***0.496***	ND[f]
						unfiltered	***5,900***	11.0	10.6	6.51	5.58	6.02	1.89	6.79	***9.7***	***9.7***
	Mar-05	---	---	---	---	filtered	14.8	0.140	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	***0.085***	0.014
						unfiltered	23.1	0.480	0.447	<0.100	<0.100	<0.100	<0.100	<0.100	***0.12***	***0.052***
MW-29	Feb-11	<0.35	<1	<1	<3	filtered	0.31	0.17	0.15	<0.025	<0.025	<0.025	<0.025	<0.025	***0.036***	0.019
						unfiltered	0.56 J	0.28 J	0.25 J	0.049 J	0.062 J	<0.025 J	<0.025 J	<0.025 J	***0.089***	***0.086***
	Oct-10	<0.35	<1	<1	<3	filtered	0.39	0.16	0.14	0.01 J	0.01 J	<0.10	<0.10	<0.10	***0.043***	0.028
						unfiltered	0.25	0.23 J	0.20 J	0.04 J	0.05 J	0.02 J	<0.10 J	<0.10 J	***0.082***	***0.072***
	Mar-08	---	---	---	---	filtered	0.34	0.18	0.18	<0.02	<0.02	<0.02	<0.02	<0.02	***0.034***	0.020
						unfiltered	0.46	0.26	0.25	0.048	0.057	0.025	<0.02	<0.02	***0.087***	***0.085***
	Feb-06	---	---	---	---	filtered	0.507	<0.00408	<0.00291	<0.00216	<0.00317	<0.00363	<0.00247	<0.00282	0.0019	ND
						unfiltered	2.14	0.392	0.265	0.0698	0.0951	0.0387	0.0641	<0.00254	***0.13***	***0.13***
MW-30	Mar-08	---	---	---	---	filtered	630	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.015	ND
						unfiltered	790	<0.2	<0.2	<0.02	<0.02	<0.02	<0.02	<0.02	***0.15***	ND
	Feb-06	---	---	---	---	filtered	3.59	0.134	0.0853	0.0267	0.0558	0.0170	<0.00241	<0.00276	***0.048***	***0.048***
						unfiltered	8.13	<0.00403	<0.00288	<0.00213	<0.00313	<0.00359	<0.00244	<0.00279	0.0019	ND
MW-31	Mar-08	---	---	---	---	filtered	0.56 / 0.54[h]	0.57 / 0.62	0.37 / 0.39	0.082 / 0.11	0.10 / 0.15	0.038 / 0.045	<0.02 / <0.02	<0.02 / <0.02	***0.16 / 0.20***	***0.16 / 0.20***
						unfiltered	<2 / <2	0.77 / 0.87	0.46 / 0.55	0.11 / 0.16	0.15 / 0.22	0.052 / 0.073	<0.02 / <0.02	<0.02 / <0.02	***0.21 / 0.28***	***0.21 / 0.28***
	Feb-06	---	---	---	---	filtered	61.7	0.336	0.187	0.105	0.160	0.0795	<0.00252	<0.00289	***0.16***	***0.16***
						unfiltered	57.5	3.87	3.76	1.83	1.30	1.96	0.472 J	3.27	***3.0***	***3.0***
MW-32	Mar-08	---	---	---	---	filtered	0.12	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.015	ND
						unfiltered	0.16	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.015	ND
MW-33	Mar-08	---	---	---	---	filtered	0.041	<0.02	0.032	<0.02	<0.02	<0.02	<0.02	<0.02	0.015	0.00032
						unfiltered	0.036	0.031	0.040	<0.02	<0.02	<0.02	<0.02	<0.02	0.018	0.004
MW-34	Mar-08	---	---	---	---	filtered	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.015	ND
						unfiltered	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.015	ND
MW-35	Feb-11	<0.35	<1	<1	<3	filtered	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.019	ND
						unfiltered	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.019	ND
	Oct-10	<0.35[d]	<1	<1	<3	filtered	0.01 J	<0.10	0.01 J	<0.10	<0.10	<0.10	<0.10	<0.10	***0.075***	0.00010
						unfiltered	0.02 J	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	***0.076***	ND
	Mar-08	---	---	---	---	filtered	0.053	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.015	ND
						unfiltered	0.059	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.015	ND
Proposed Cleanup Level[g]		23	19,000	6,900	1,000	---	4,940	NA	NA	NA	NA	NA	NA	NA	0.030	0.030

TABLE 6

SUPPLEMENTAL REMEDIAL INVESTIGATION SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER
CREOSOTING PLANT AREA
Former Tacoma Metals Site - Tacoma, Washington

WELL	DATE	BTEX (µg/L)				Filtering (PAHs and cPAHs)	PAHs (µg/L)	cPAHs (µg/L)							Total cPAHs[a]	
		Benzene	Toluene	Ethyl-benzene	Total Xylenes		Naphthalene	Benzo(a)anthracene	Chrysene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Indeno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	Non-detect values included[b]	Non-detect values excluded[c]
Puyallup River Side Channel Temporary Piezometers																
P-1 / P-1R	**Feb-11**	<0.35	<1	<1	<3	filtered	0.081	<0.025[e]	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.019	ND[f]
						unfiltered	0.12	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.019	ND
	Oct-10	<0.35	<1	<1	<3	filtered	0.10 J	<0.10	0.01 J	<0.10	<0.10	<0.10	<0.10	<0.10	***0.075***	0.00010
						unfiltered	0.14 J	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	***0.076***	ND
P-2 / P-2R	**Feb-11**	<0.35	<1	<1	<3	filtered	0.032	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.019	ND
						unfiltered	0.069	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.019	ND
	Oct-10	<0.35 / <0.35	<1 / <1	<1 / <1	<3 / <3	filtered	0.01 J / <0.10[h]	<0.10 / <0.10	<0.10 / <0.10	<0.10 / <0.10	<0.10 / <0.10	<0.10 / <0.10	<0.10 / <0.10	<0.10 / <0.10	***0.076 / 0.076***	ND / ND
						unfiltered	0.01 J / <0.10	<0.10 / <0.10	0.01 J / <0.10	<0.10 / <0.10	<0.10 / <0.10	<0.10 / <0.10	<0.10 / <0.10	<0.10 / <0.10	***0.075 / 0.076***	ND / ND
P-3 / P-3R	**Feb-11**	2.2 / 2.1	<1 / <1	<1 / <1	<3 / 2.0	filtered	0.28 / 0.58	<0.025 / <0.025	<0.025 / <0.025	<0.025 / <0.025	<0.025 / <0.025	<0.025 / <0.025	<0.025 / <0.025	<0.025 / <0.025	0.019 / 0.019	ND / ND
						unfiltered	0.44 / 0.46	<0.025 / <0.025	<0.025 / <0.025	<0.025 / <0.025	<0.025 / <0.025	<0.025 / <0.025	<0.025 / <0.025	<0.025 / <0.025	0.019 / 0.019	ND / ND
	Oct-10	<0.35	<1	<1	<3	filtered	<0.10	<0.10	0.01 J	<0.10	<0.10	<0.10	<0.10	<0.10	***0.075***	0.00010
						unfiltered	0.01 J	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	***0.076***	ND
Proposed Cleanup Level[g]		23	19,000	6,900	1,000	---	4,940	NA	NA	NA	NA	NA	NA	NA	0.030	0.030

Notes:

(a) Total cPAHs were calculated using the toxicity equivalency factor (TEF) methodology described in MTCA [WAC 173-340-708(8)(e)]. TEFs are listed below.
TEF = 1.0 for benzo(a)pyrene
TEF = 0.1 for benzo(a)anthracene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, benzo(a)-fluoranththene, and benzo(k)- fluoranththene
TEF = 0.01 for chrysene

(b) Non-detected cPAH analytes were included in the summation. The TEF factor was applied to a value of one-half the laboratory reporting limit prior to summation.

(c) Non-detected cPAH analytes were not included in the summation.

(d) "--" denotes that the sample was not analyzed for the indicated analyte.

(e) "<" denotes that the analyte was not detected at a concentration above the indicated laboratory reporting limit.

(f) "ND" indicates that no individual cPAH analytes were detected at a concentration above the laboratory reporting limit.

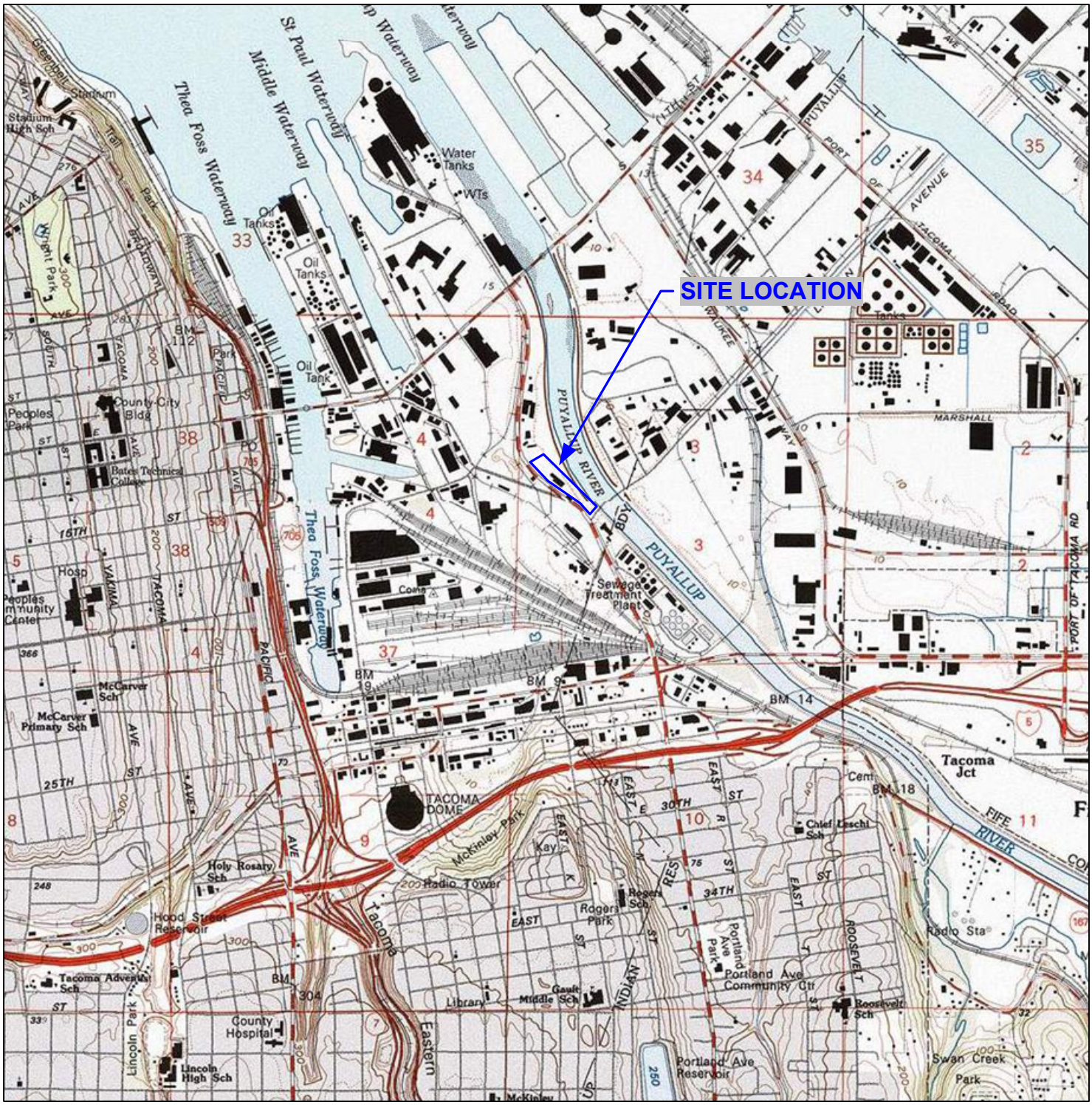
(g) Refer to Table 3 for a summary of proposed cleanup levels for groundwater.

(h) Where two values are displayed, the second is the analytical result for a field blind duplicate sample.

Bold and italics indicate an analyte concentration above the proposed cleanup level.

BTEX = Benzene, toluene, ethylbenzene, and xylenes
PAHs = Polycyclic aromatic hydrocarbons
cPAHs = Carcinogenic PAHs
µg/L = micrograms per liter
M = Laboratory note indicating an estimated value found and confirmed by analyst but with low spectral match
J = Laboratory data flag indicating that the result is an esimated value less than the method reporting limit
E = Laboratory note indicating an estimated result outside the calibration range of the analysis.
NA = Cleanup level is not available for the indicated analyte

Figures



Kennedy/Jenks Consultants

FORMER TACOMA METALS SITE
TACOMA, WA

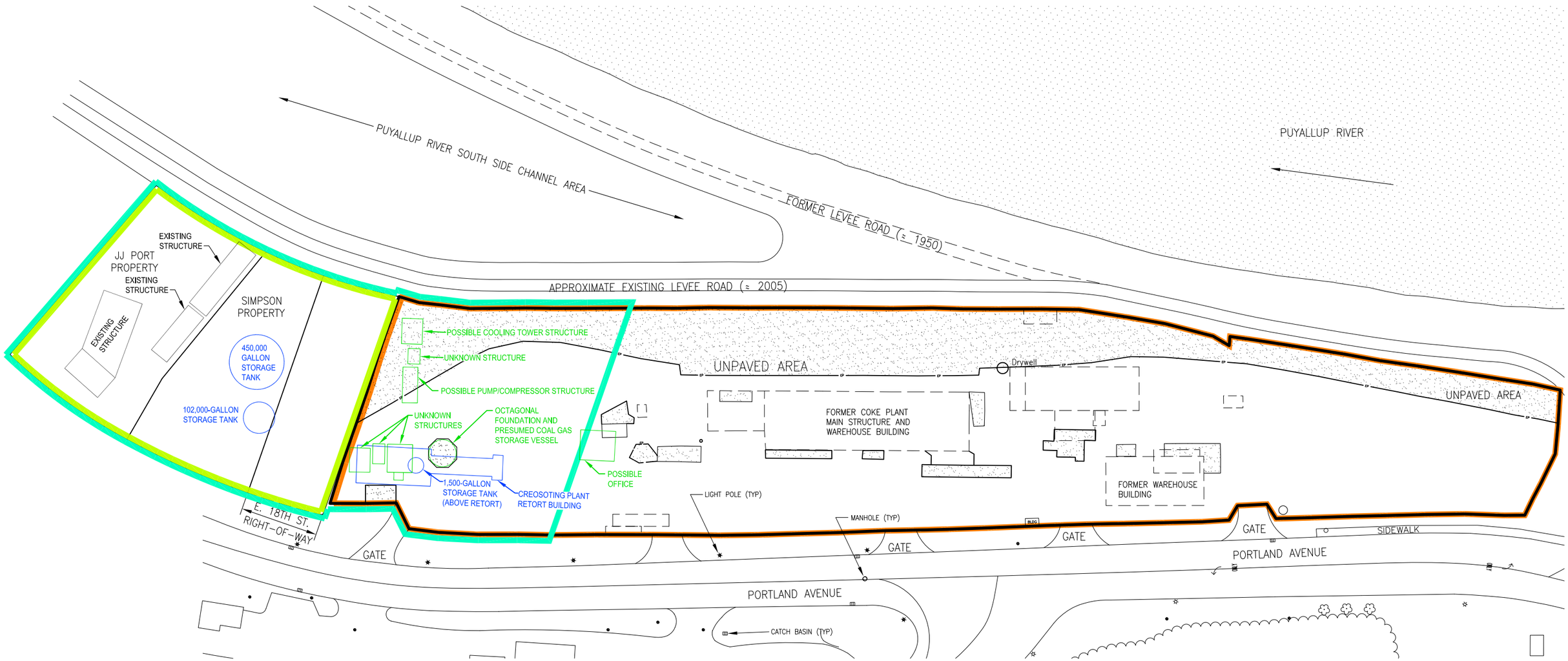
SITE LOCATION MAP

996098.00/Location.VSD

FIGURE 1

N

0 1/2 1
Approximate Scale in Miles



LEGEND:

- FORMER TACOMA METALS PROPERTY/ON PROPERTY AREA
- OFF PROPERTY AREA
- FORMER CREOSOTING PLANT AREA
- UNPAVED AREA
- APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS) REFER TO FIGURE 1-2 IN APPENDIX C FOR ADDITIONAL INFORMATION
- FORMER CREOSOTING PLANT FEATURES (APPROXIMATE)
- FORMER COKE PLANT GAS DISTRIBUTION FEATURES (APPROXIMATE) (3-5' ABOVE FORMER CREOSOTING PLANT FEATURES)

NOTE:

HISTORICAL FEATURE LOCATIONS ARE BASED ON HISTORICAL AERIAL AND GROUND-LEVEL PHOTOGRAPHS AND HISTORICAL MAPS. LOCATIONS ARE APPROXIMATE.

N

0 50 100

APPROX. SCALE: 1=100

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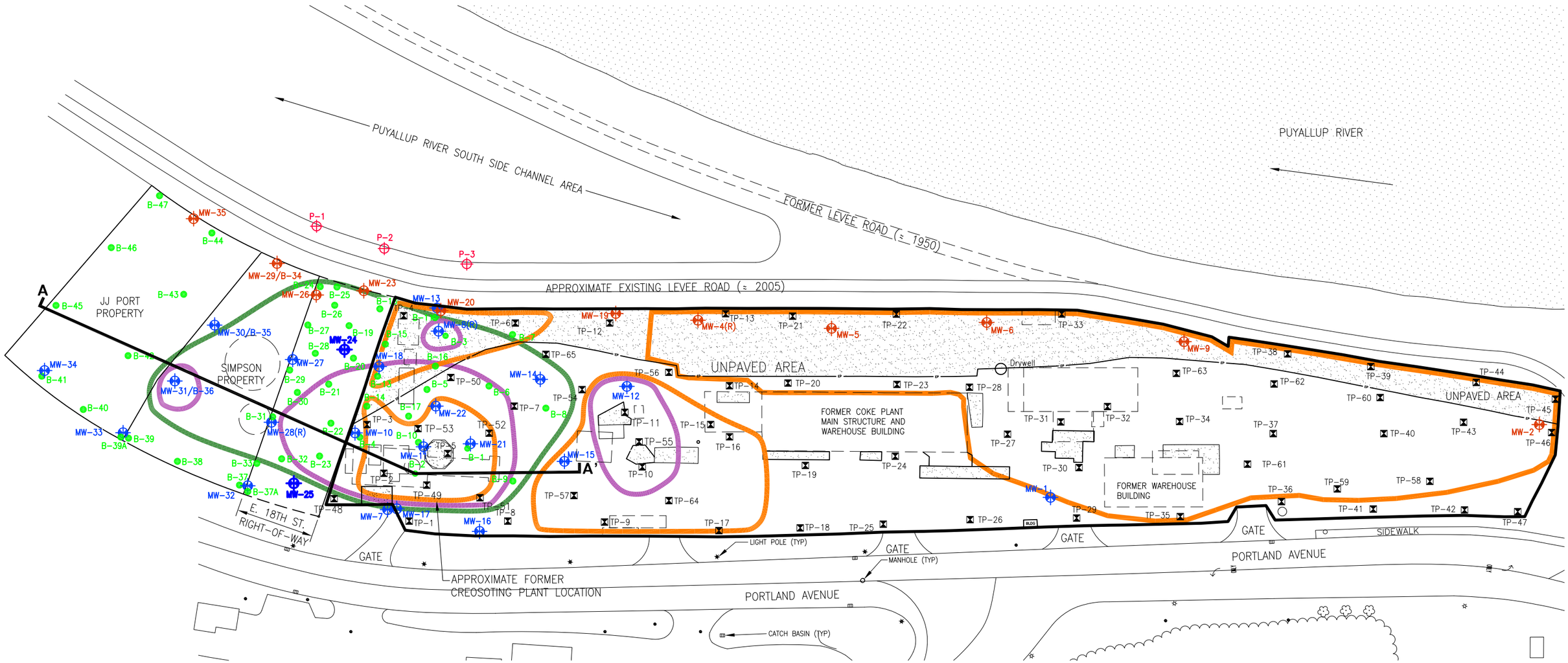
FORMER TACOMA METALS FACILITY
TACOMA, WA

SITE AREA OVERVIEW

996098.00\2013 RI UPDATE\FIG_02

FIGURE 2



LEGEND:

B-1	SOIL BORING LOCATION
MW-26	PROPOSED POINT OF COMPLIANCE MONITORING WELLS AND PIEZOMETERS
P-1	
MW-26	OTHER MONITORING WELL LOCATION
TP-26	TEST PIT LOCATION
	UNPAVED AREA
	APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS) REFER TO FIGURE 1-2 IN APPENDIX C FOR ADDITIONAL INFORMATION
A A'	GENERALIZED CROSS-SECTION LOCATION (SEE FIGURE 6)

ESTIMATED EXTENT OF AFFECTED SOIL:

- AFFECTED SOIL LESS THAN 6' bgs
- AFFECTED SOIL 6 TO 15' bgs
- AFFECTED SOIL GREATER THAN 15' bgs

NOTES:

1. WELL LOCATIONS ARE BASED ON SITE SURVEY BY EARTH TECH, INC. ON 28 MARCH 2000, 13 MARCH 2003, 31 DECEMBER 2003, 14 APRIL 2004, 21 APRIL 2005, 29 MARCH 2006, AND 11 APRIL 2008.
2. bgs = BELOW GROUND SURFACE.
3. AFFECTED SOIL = SOIL WITH CONTAMINANTS AT CONCENTRATIONS ABOVE PROPOSED SITE CLEANUP LEVELS.
4. REFER TO FIGURES 4-1 THROUGH 4-4 IN APPENDIX C FOR DISTRIBUTION OF SPECIFIC CONTAMINANTS IN SOIL.
5. ALL LOCATIONS AND AREAS ARE APPROXIMATE.

N

0 50 100

APPROX. SCALE: 1=100

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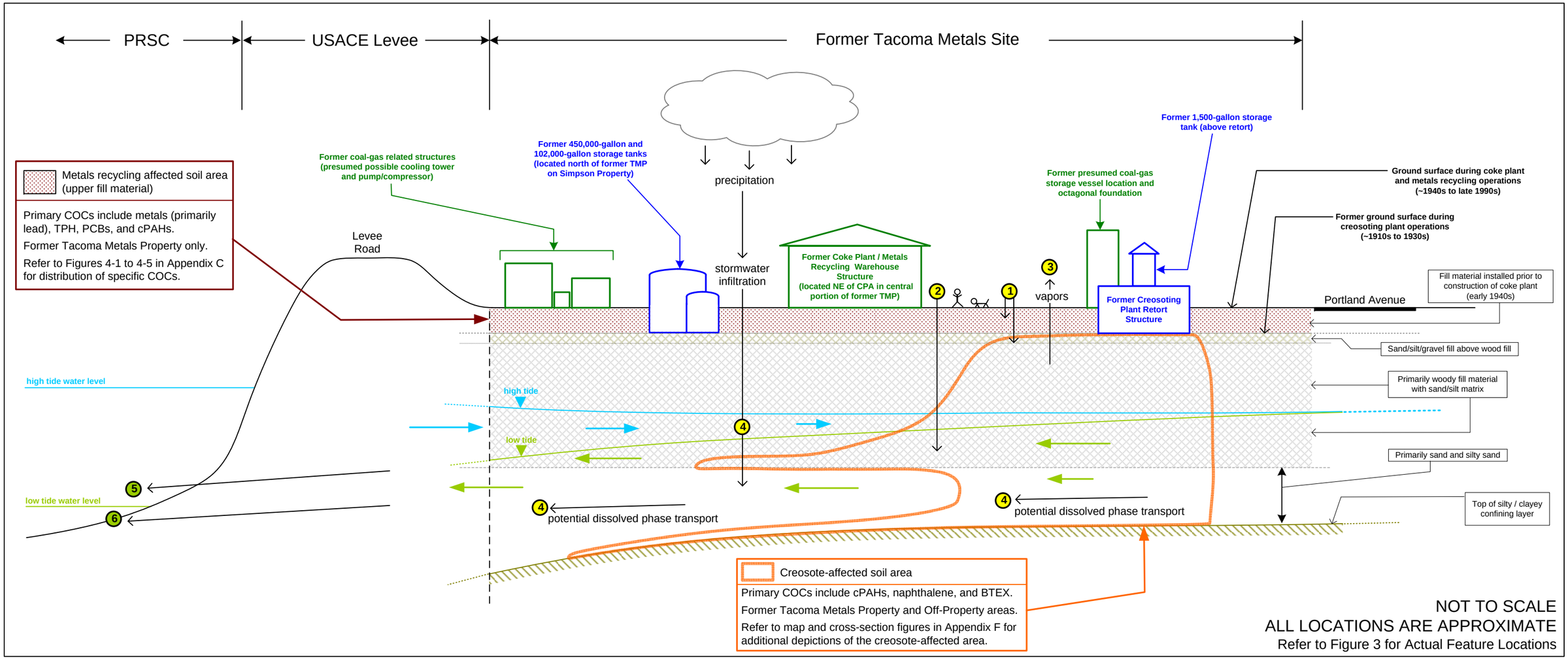
FORMER TACOMA METALS FACILITY
TACOMA, WA

SAMPLE LOCATION AND AFFECTED SOIL AREA MAP

996098.00\2013 RI UPDATE\FIG_03

FIGURE 3



Summary of Potential Exposure Pathways

	Potential Pathway	Potential Receptors	Exposure Scenarios
1	Direct Contact Soil	Workers, Ecological Receptors	Possible direct contact/ingestion by workers doing invasive work; direct contact/ ingestion by wildlife.
2	Direct Contact Groundwater	Workers	Possible direct contact by workers doing invasive work; ingestion pathway incomplete because shallow groundwater is not a potable water source.
3	Vapor Inhalation	Workers	Possible inhalation by workers; vapor migration upward through unpaved surfaces and possibly through building foudations/slabs.
4	Soil to Groundwater Leaching	Aquatic Organisms in PRSC	Infiltration of stormwater through unpaved site surfaces; transport toward PRSC. Infiltration pathway will be eliminated by cleanup action.
5	Groundwater to Surface Water	Aquatic Organisms in PRSC	Incomplete Pathway. Groundwater discharge to surface water in PRSC; possible ingestion by aquatic organisms; possible ingestion or aquatic organisms by recreational users.
6	Groundwater to Sediment	Aquatic Organisms in PRSC	Incomplete Pathway. Groundwater discharge through to sediment in PRSC; possible ingestion by aquatic organisms; possible ingestion by aquatic organisms; possible ingestion or aquatic organisms by recreational users.

Legend:

- Shallow groundwater gradient (high tide)
- Shallow groundwater gradient (low tide)
- Shallow groundwater potentiometric surface (high tide)
- Shallow groundwater potentiometric surface (low tide)
- (1) Potential exposure pathways (complete) (summarized in table)
- (5) Potential exposure pathways (incomplete) (summarized in table)
- Former creosoting plant features (generalized approximate locations)
- Former coke plant and coal gas features (generalized approximate locations)

Acronyms:

BTEX – Benzene, Toluene, Ethylbenzene, and Xylenes
COCs – Contaminants of Concern
CPA – Creosoting Plant Area
cPAHs – Carcinogenic Polycylclic Aromatic Hydrocarbons
PCBs – Polychlorinated Biphenyls
PRSC – Puyallup River Side Channel
TMP – Tacoma Metals Property
TPH – Total Petroleum Hydrocarbons
USACE – United States Army Corps of Engineers

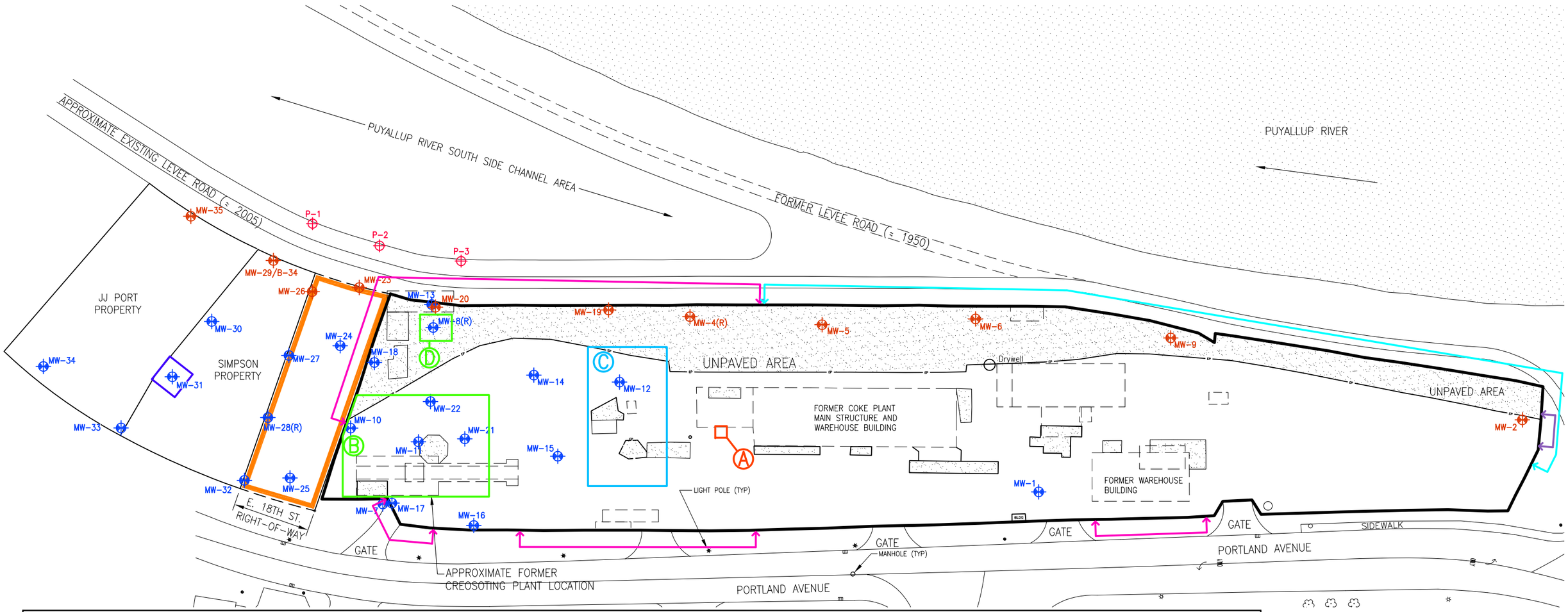
Kennedy/Jenks Consultants

FORMER TACOMA METALS SITE
TACOMA, WA

GENERALIZED CONCEPTUAL SITE MODEL

996098*00/SiteModel.VSD

FIGURE 4



SOURCE CONTROL EXCAVATION AREAS (APPROXIMATE)

- **A** LEAD–ACID BATTERY CASINGS AND ASSOCIATED IMPACTED SOIL (10 CU YD APPROXIMATE) APPROXIMATELY 10 FT LONG X 10 FT WIDE X 3 FT DEEP.
- **B** CREOSOTE IMPACTED SOIL (5,444 CU YD APPROXIMATE) APPROXIMATELY 150 FT LONG X 100 FT WIDE X 10 FT DEEP.
- **C** PETROLEUM–HYDROCARBON IMPACTED SOIL (4,444 CU YD APPROXIMATE) APPROXIMATELY 150 FT LONG X 80 FT WIDE X 10 FT DEEP.
- **D** CREOSOTE IMPACTED SOIL (333 CU YD APPROXIMATE) APPROXIMATELY 30 FT LONG X 30 FT WIDE.
- **E** PETROLEUM–HYDRO CARBON IMPICTED SOIL. ESTIMATED 30 FT LONG X 30 FT WIDE x 10 FT DEEP (333 CU YD) ACTUAL EXTENT TO BE DETERMINED.

FORMER TACOMA METALS PROPERTY BOUNDARY METALS – IMPACTED SOIL EXCAVATION AREAS (BUFFER ZONE)

- 5 FT WIDE X 1 FT DEEP (APPROXIMATE)(172 CU YD APPROXIMATE)
- 5 FT WIDE X 3 FT DEEP (APPROXIMATE)(511 CU YD APPROXIMATE)
- 5 FT WIDE X ADDITIONAL 3 FT DEEP (APPROXIMATE)(17 CU YD APPROXIMATE)

APPROXIMATE AREA TO BE BACKFILLED TO 15' ABOVE AFFECTED SOIL (TYPICALLY 2–4' OF FILL DEPENDING ON EXISTING SURFACE ELEVATION BUT MAY EXCEED 4' LOCALLY) (UP TO 80'x240')

LEGEND:

- MW-26 / P-1 — PROPOSED POINT OF COMPLIANCE MONITORING WELLS AND PIEZOMETERS
- MW-26 — OTHER MONITORING WELL LOCATION
- UNPAVED AREA
- APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS) REFER TO FIGURE 1–2 IN APPENDIX C FOR ADDITIONAL INFORMATION

NOTES:

1. WELL LOCATIONS ARE BASED ON SITE SURVEY BY EARTH TECH, INC. ON 28 MARCH 2000, 13 MARCH 2003, 31 DECEMBER 2003, 14 APRIL 2004, 21 APRIL 2005, 29 MARCH 2006, AND 11 APRIL 2008.
2. BASED ON REVISED REMEDIAL ALTERNATIVE #2.
3. PROPOSED EXCAVATION AREAS FROM RI/FS ARE SHOWN ON FIGURE 9–1 IN APPENDIX G.

N

0 50 100
SCALE: 1=100

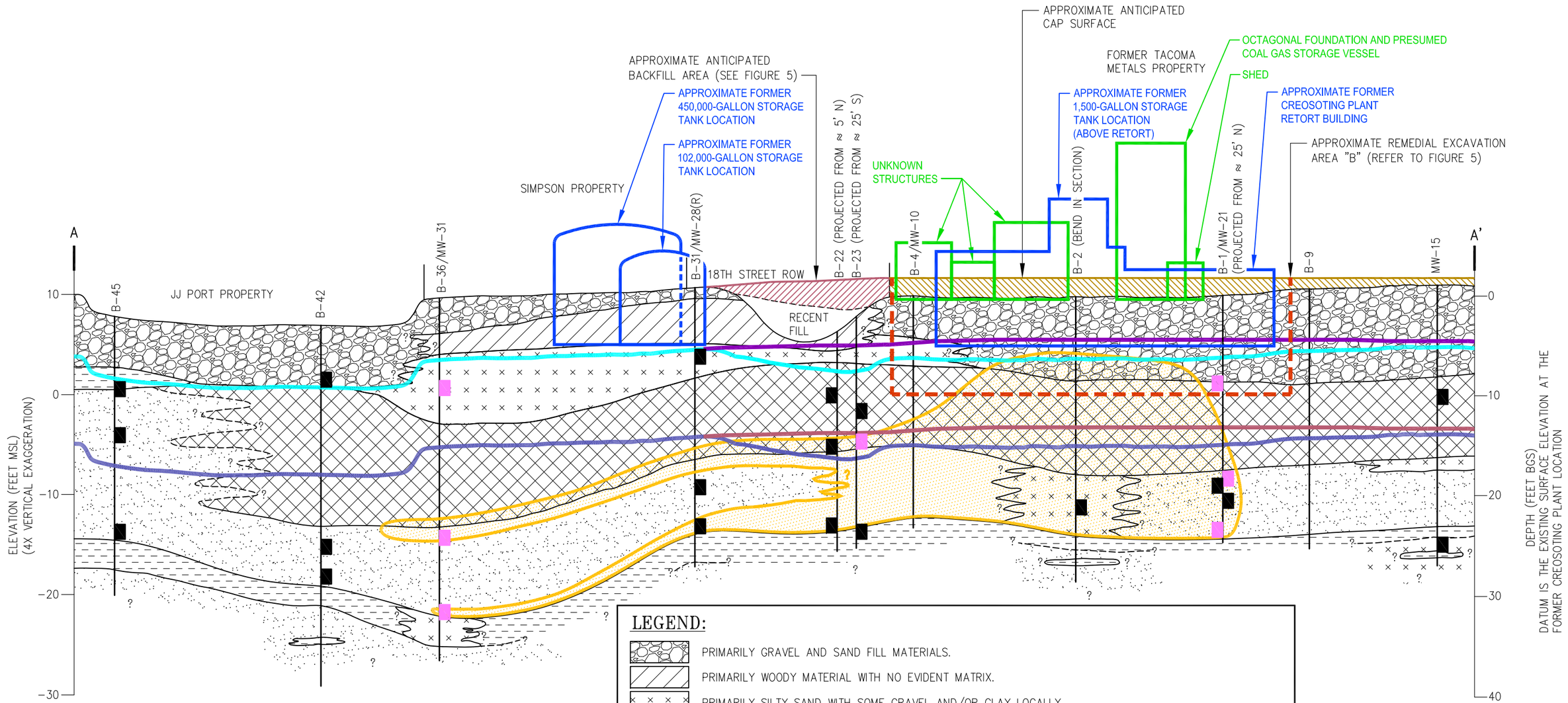
Kennedy/Jenks Consultants

FORMER TACOMA METALS FACILITY
TACOMA, WA

REVISED PROPOSED REMEDIAL ACTION EXCAVATION AND BACKFILL AREAS

996098.00\2013 RI UPDATE\FIG_05

FIGURE 5



NOTES:

1. REFER TO FIGURE 3 FOR CROSS SECTION LOCATION.
2. ALL LOCATIONS AND DEPTHS ARE APPROXIMATE.
3. MSL = FEET ABOVE MEAN SEA LEVEL (NGVD 1929).
4. BGS = BELOW GROUND SURFACE.

0 20 40
APPROX. SCALE: 1=40 HORIZONTAL

0 5 10
APPROX. SCALE: 1=10 VERTICAL

LEGEND:

- PRIMARILY GRAVEL AND SAND FILL MATERIALS.
- PRIMARILY WOODY MATERIAL WITH NO EVIDENT MATRIX.
- PRIMARILY SILTY SAND WITH SOME GRAVEL AND/OR CLAY LOCALLY.
- PRIMARILY WOODY MATERIAL WITH SAND, SILT, AND/OR CLAY MATRIX.
- PRIMARILY SAND WITH SOME SILT LOCALLY.
- PRIMARILY CLAY AND SILT WITH SOME SAND LOCALLY.
- APPROXIMATE AREA OF FIELD INDICATION OF HEAVY SOIL IMPACTS.
- 6 FEET BELOW EXISTING GRADE.
- 6 FEET BELOW ANTICIPATED FINAL GRADE (WHERE DIFFERENT FROM EXISTING).
- 15 FEET BELOW EXISTING GRADE.
- 15 FEET BELOW ANTICIPATED FINAL GRADE (WHERE DIFFERENT FROM EXISTING).
- APPROXIMATE SOIL SAMPLE LOCATION WITH TOTAL CPAH CONCENTRATION BELOW PROPOSED CLEANUP LEVEL.
- APPROXIMATE SOIL SAMPLE LOCATION WITH TOTAL CPAH CONCENTRATION ABOVE PROPOSED CLEANUP LEVEL.
- FORMER CREOSOTING PLANT FEATURES (APPROXIMATE)
- FORMER COKE PLANT GAS DISTRIBUTION FEATURES (APPROXIMATE) (3-5' ABOVE FORMER CREOSOTING PLANT FEATURES)

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FORMER TACOMA METALS SITE
TACOMA, WA

FORMER CREOSOTING PLANT AREA GENERALIZED CROSS SECTION A-A' DEPTH OF SOIL IMPACTS AND REMEDIATION AREAS

996098.00\2013 RI UPDATE\FIG_06

FIGURE 6

Appendix A

Generalized Geologic Cross Sections, RI/FS and Creosoting Plant Area Investigation

Appendix A: Generalized Geologic Cross Sections, RI/FS and Creosoting Plant Area Investigation

Table of Contents

(NOTE: Figure and table designations are from multiple previous reports and may be duplicated. Figures and tables are presented in the order listed below)

1) Figure 3-1 Geologic Cross Section Locations and Legend *(2001)*

2) Figure 3-2 Geologic Cross Sections A-A' and B-B' *(2001)*

3) Figure 3-3 Geologic Cross Sections C-C', D-D', E-E', F-F' and G-G' *(2001)*

4) Figure 4 Approximate Topography of First Encountered Silt/Clay Layer *(2008)*

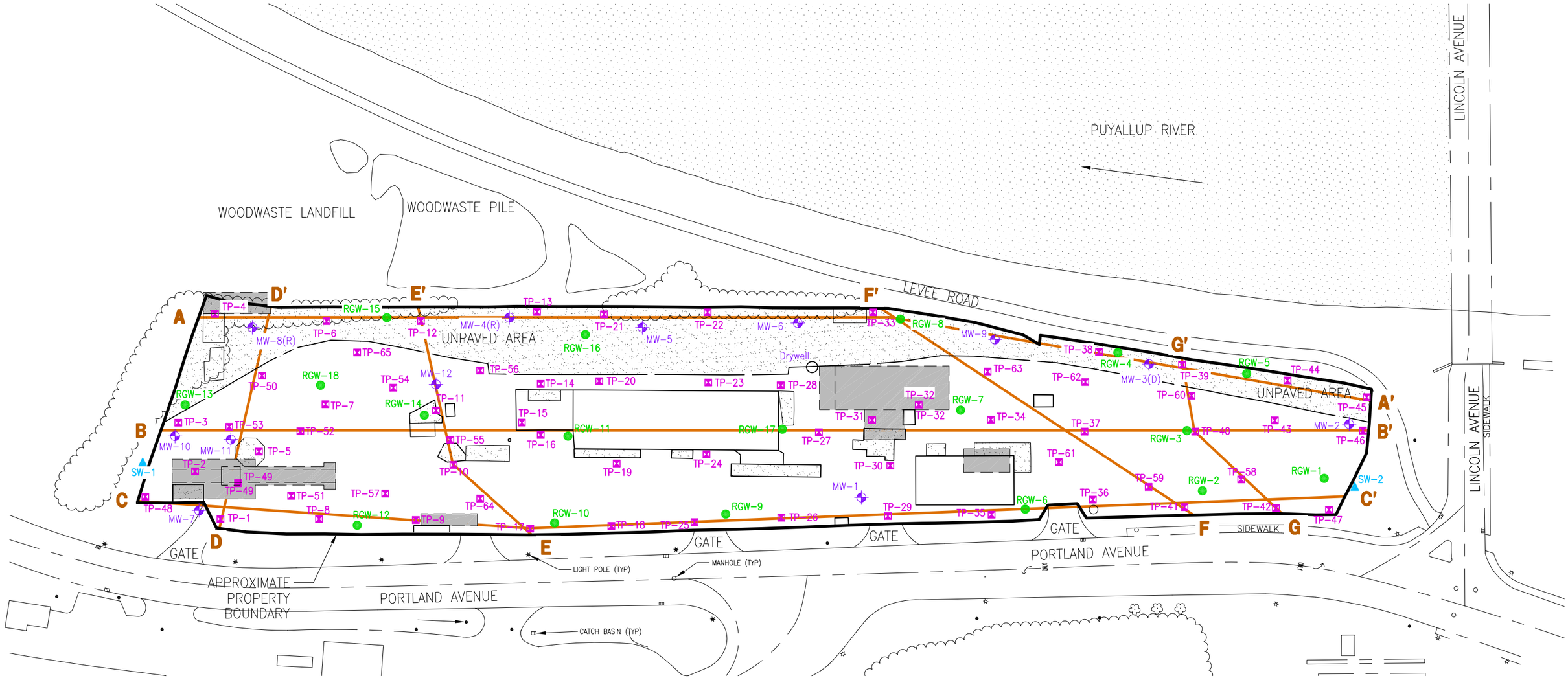
5) Figure 5 Generalized Geologic Cross Section A-A' *(2008)*

6) Figure 6 Generalized Geologic Cross Sections B-B', C-C' *(2008)*

Materials included in Appendix A are from the following reports (as indicated in parentheses following the title for each item):

2001 = Remedial Investigation / Feasibility Study Report (Kennedy/Jenks Consultants 2001)

2008 = *Soil and Groundwater Investigation Results – Data Transmittal; October 2007-April 2008 Investigation* (Kennedy/Jenks Consultants 2008)



LEGEND:

MW-10	MONITORING WELL LOCATIONS (R) = REPLACEMENT (D) = DEMOLISHED
RGW-12	RECONNAISSANCE GROUNDWATER SAMPLING LOCATIONS
TP-64	TEST PIT SAMPLING LOCATIONS
SW-1	SURFACE WATER SAMPLING LOCATIONS
	CROSS SECTION LINES
	UNPAVED AREA
	APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)

METAL DEBRIS FILL – ABUNDANT MIXED METAL AND OTHER DEBRIS WITH SOIL MATRIX. DEBRIS INCLUDES CABLE, WIRE, SHEET METAL, SPRINGS, MACHINE PARTS, SCRAP METAL, RUBBER, GLASS, BRICK, CONCRETE, AND OTHER MATERIAL. MATRIX MATERIAL IS TYPICALLY SAND AND GRAVEL MIXTURE.

MIXED FILL – VARIABLE FILL MATERIAL TYPICALLY INCLUDING WELL GRADED SAND AND GRAVEL, POORLY GRADED SAND, SILTY SAND AND GRAVEL, AND SOME SILT AND CLAY. COMMONLY CONTAINS SOME METAL, GLASS, BRICK, CONCRETE, AND OTHER DEBRIS.

WOOD FILL – MIXED WOOD DEBRIS INCLUDES LOGS, BOARDS, BARK, CHIPS, WOOD DUST, PLANKS, AND PILINGS. MATRIX MATERIAL INCLUDES MEDIUM TO FINE, SAND, SILT, AND CLAY MIXTURES. MATRIX CONTENT IS TYPICALLY 0–20%.

NATIVE MATERIAL – APPARENTLY NATIVE DELTAIC AND ALLUVIAL DEPOSITS INCLUDING CLAYEY SANDY SILT WITH ORGANIC PLANT MATERIAL, AND POORLY GRADED SAND WITH FINE GRAVEL MATERIAL.

N

0 50 100
SCALE: 1=100

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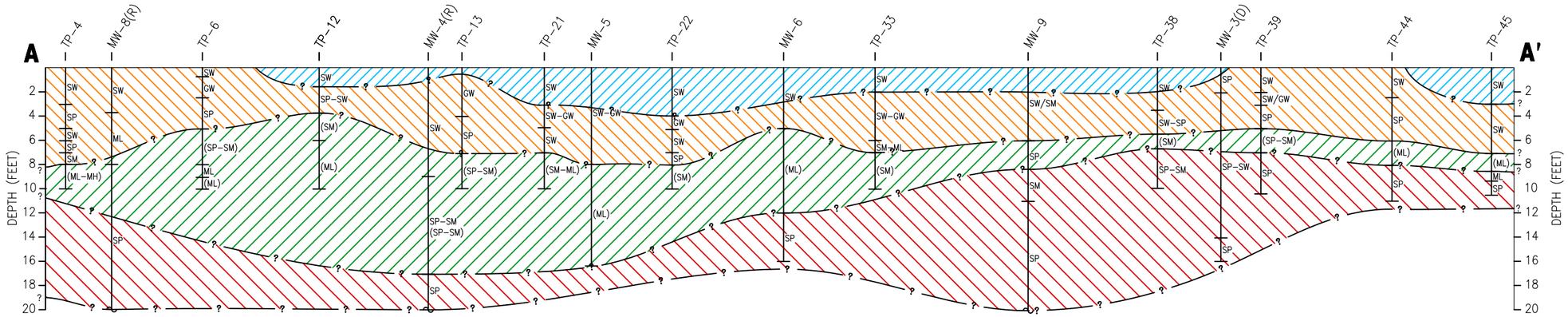
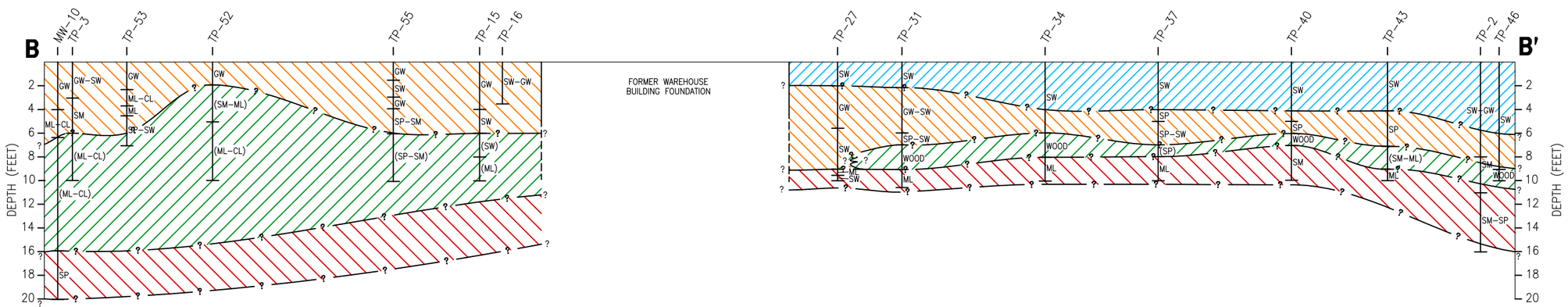
FORMER TACOMA METALS FACILITY
TACOMA, WA

GEOLOGIC CROSS SECTION LOCATIONS AND LEGEND

996098.00/P01SK003-1

FIGURE 3-1





NOTES:

1. REFER TO FIGURE 3-1 FOR LEGEND AND NOTES.
2. SOIL CLASSIFICATIONS IN PARENTHESES INDICATE THE MATRIX MATERIAL IN THE WOOD FILL UNIT.

USCS SOIL CLASSIFICATION

SP	POORLY-GRADED SAND
SW	WELL-GRADED SAND
GW	WELL-GRADED GRAVEL
ML	SILT
SM	SILTY SAND
CL	LEAN CLAY

N

0 50 100
HORIZONTAL SCALE: 1=100

0 5 10
VERTICAL SCALE: 1=10

VERTICAL EXAGGERATION 10x

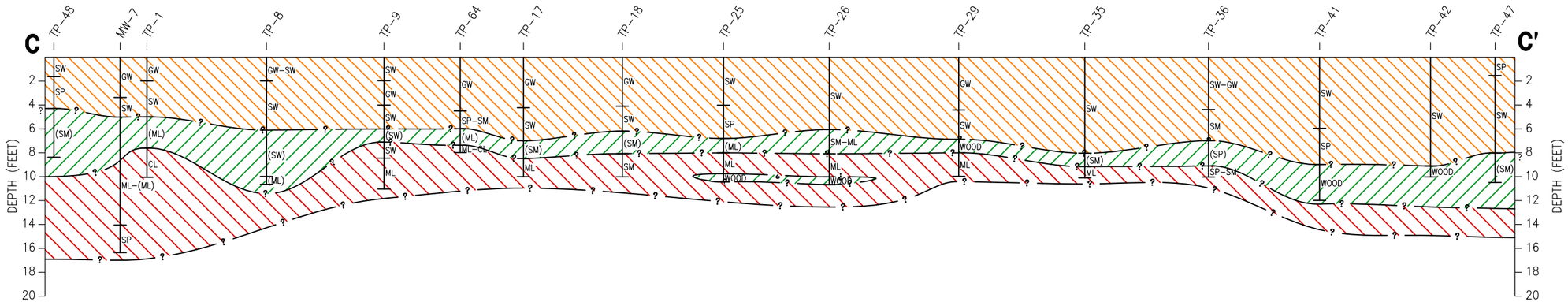
Kennedy/Jenks Consultants

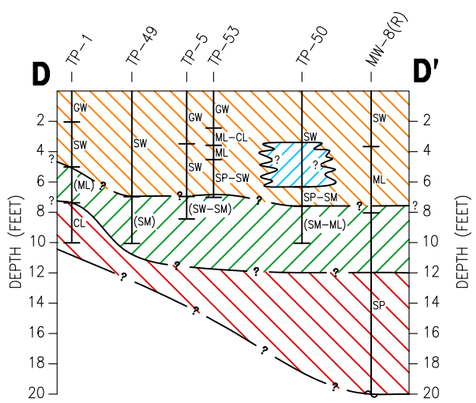
FORMER TACOMA METALS FACILITY
TACOMA, WA

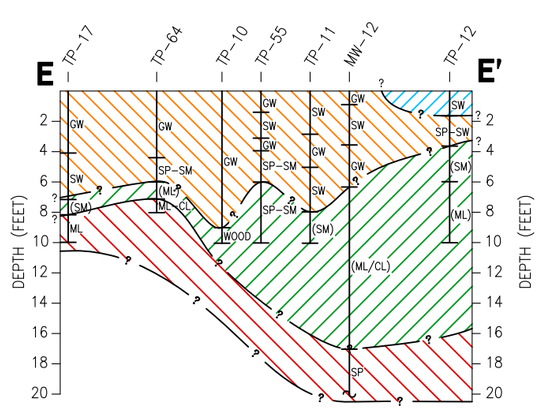
GEOLOGIC CROSS SECTIONS
A-A' AND B-B'

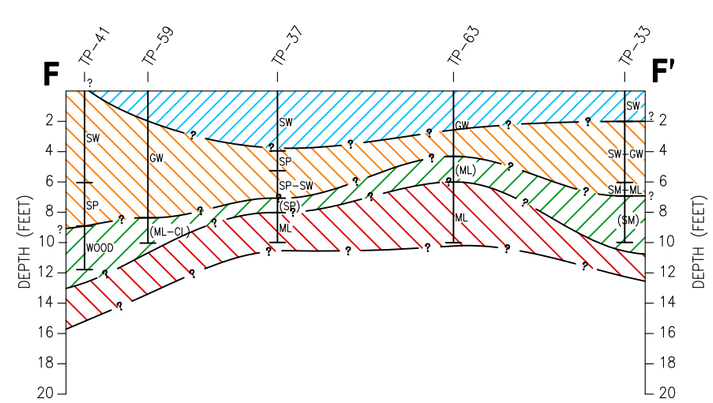
996098.00/P01SK003-2

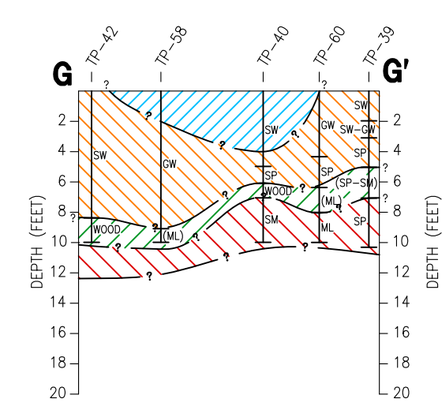
FIGURE 3-2











NOTES:

1. REFER TO FIGURE 3-1 FOR LEGEND AND NOTES.
2. SOIL CLASSIFICATIONS IN PARENTHESES INDICATE THE MATRIX MATERIAL IN THE WOOD FILL UNIT.

USCS SOIL CLASSIFICATION

SP	POORLY-GRADED SAND
SW	WELL-GRADED SAND
GW	WELL-GRADED GRAVEL
ML	SILT
SM	SILTY SAND
CL	LEAN CLAY

N

0 50 100
HORIZONTAL SCALE: 1=100

0 5 10
VERTICAL SCALE: 1=10

VERTICAL EXAGGERATION 10x

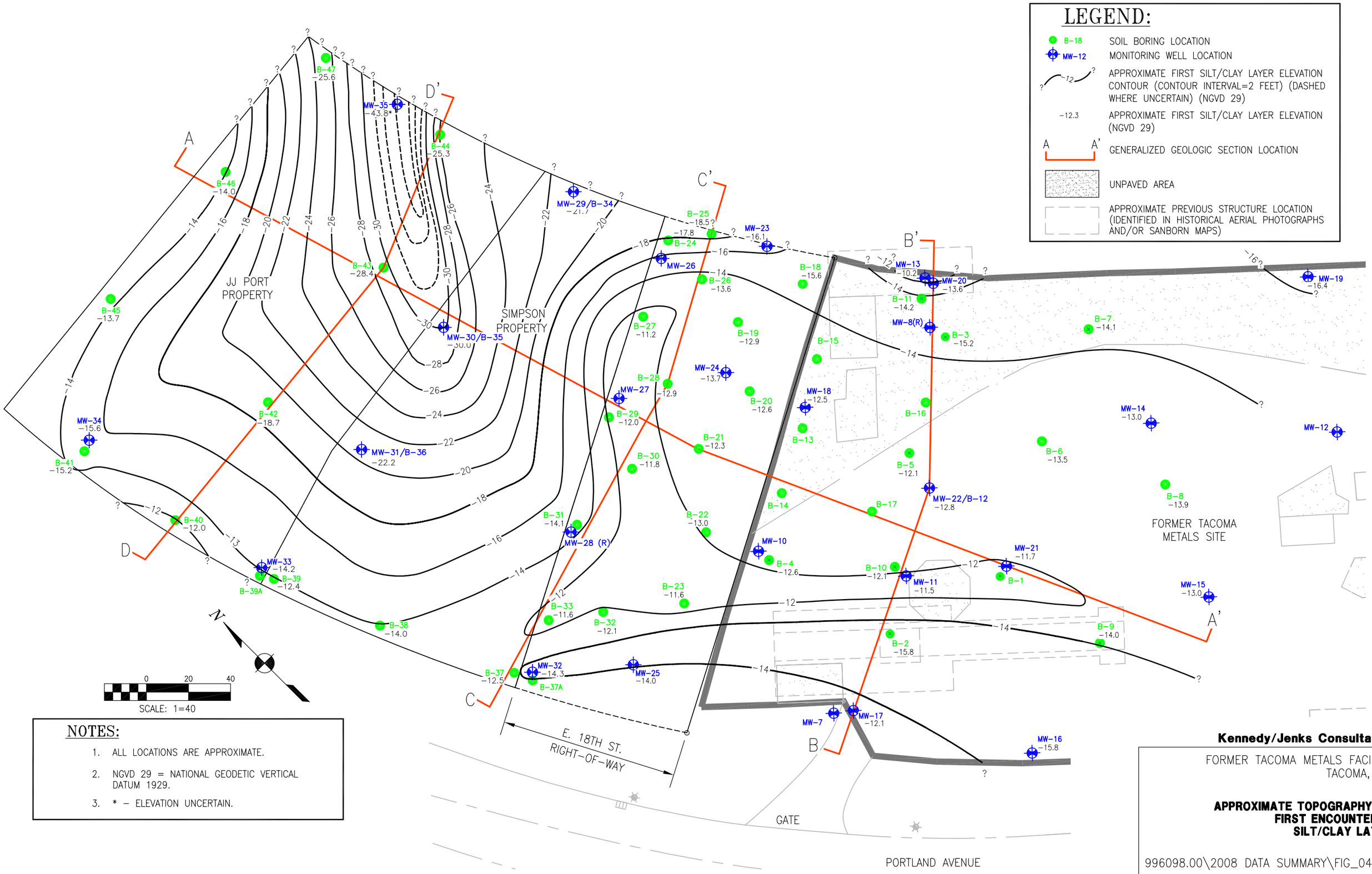
Kennedy/Jenks Consultants

FORMER TACOMA METALS FACILITY
TACOMA, WA

GEOLOGIC CROSS SECTIONS
C-C′, D-D′, E-E′, F-F′ AND G-G′

996098.00/P01SK003-3

FIGURE 3-3



NOTES:

1. ALL LOCATIONS ARE APPROXIMATE.
2. NGVD 29 = NATIONAL GEODETIC VERTICAL DATUM 1929.
3. * – ELEVATION UNCERTAIN.

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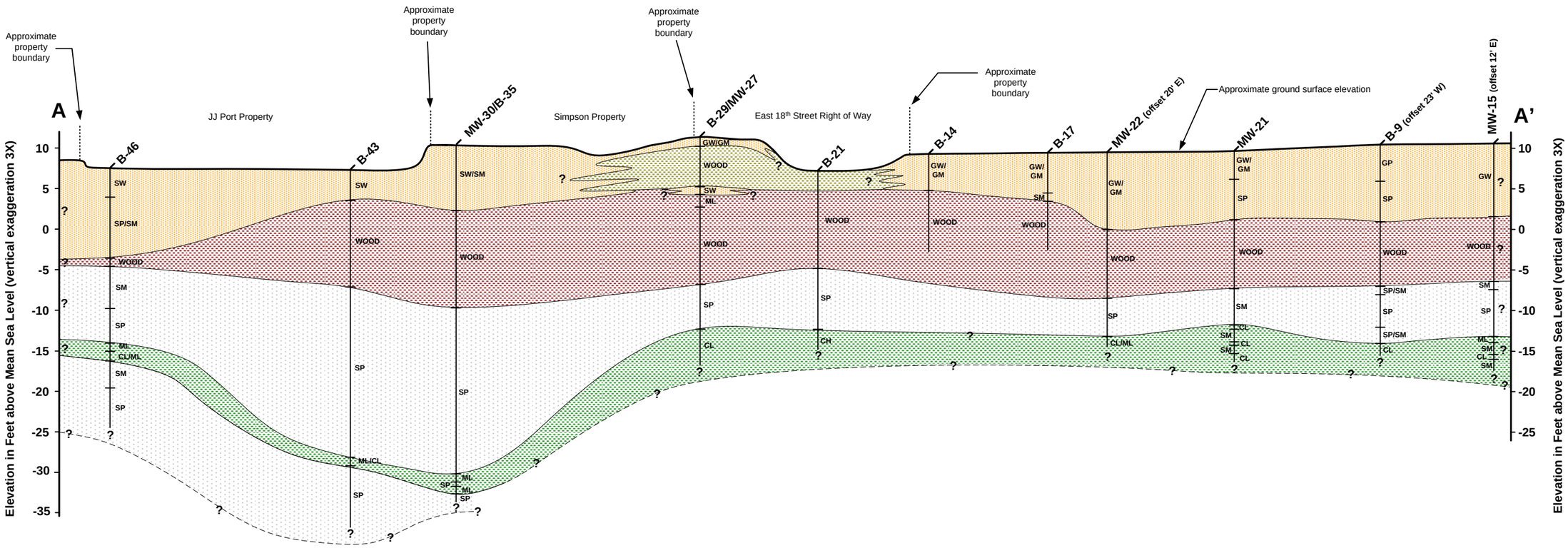
FORMER TACOMA METALS FACILITY
TACOMA, WA

APPROXIMATE TOPOGRAPHY OF FIRST ENCOUNTERED SILT/CLAY LAYER

996098.00\2008 DATA SUMMARY\FIG_04dwg

FIGURE 4

Generalized North-South Geologic Cross Section A-A’

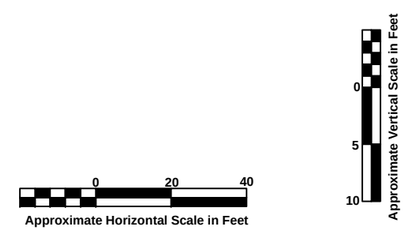


LEGEND:

- Primarily gravely and sandy fill material, some silt
- Primarily woody material (wood chips with no evident matrix)
- Primarily woody material (woody material typically with sand, silt, and/or clay matrix)
- Primarily sand and silty sand material
- Primarily clay, silt, and fine sand material, typically layered

NOTES:

1. All locations and depths are approximate.
2. Offset directions indicate the offset of the boring from the cross section line.



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FORMER TACOMA METALS FACILITY
TACOMA, WA

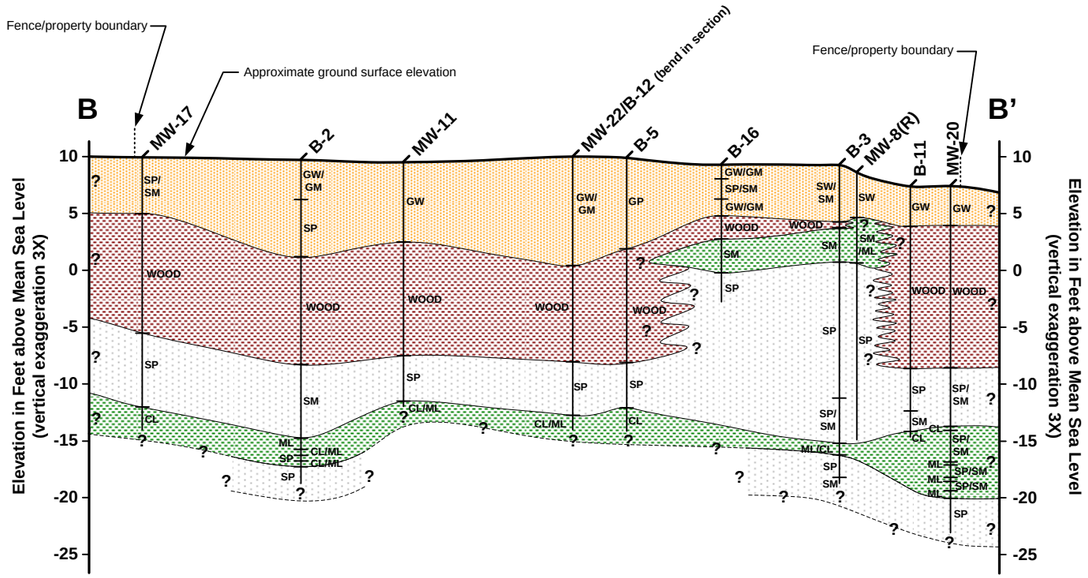
GENERALIZED GEOLOGIC CROSS SECTION A-A’

996098.00/2008/FIGURE5.VSD

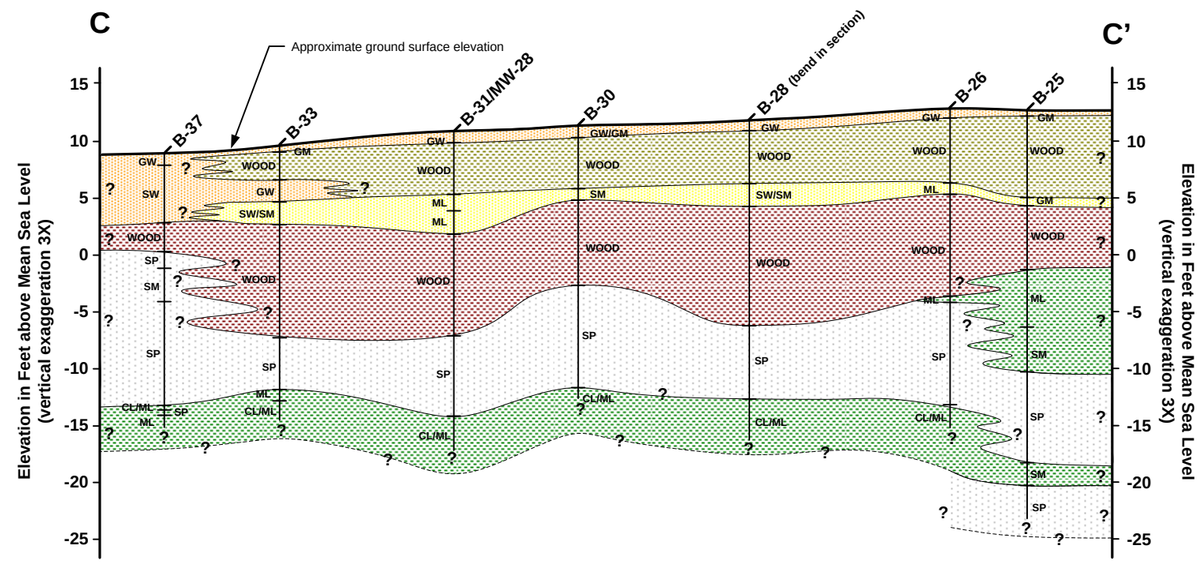
FIGURE 5

Generalized West-East Geologic Cross Sections

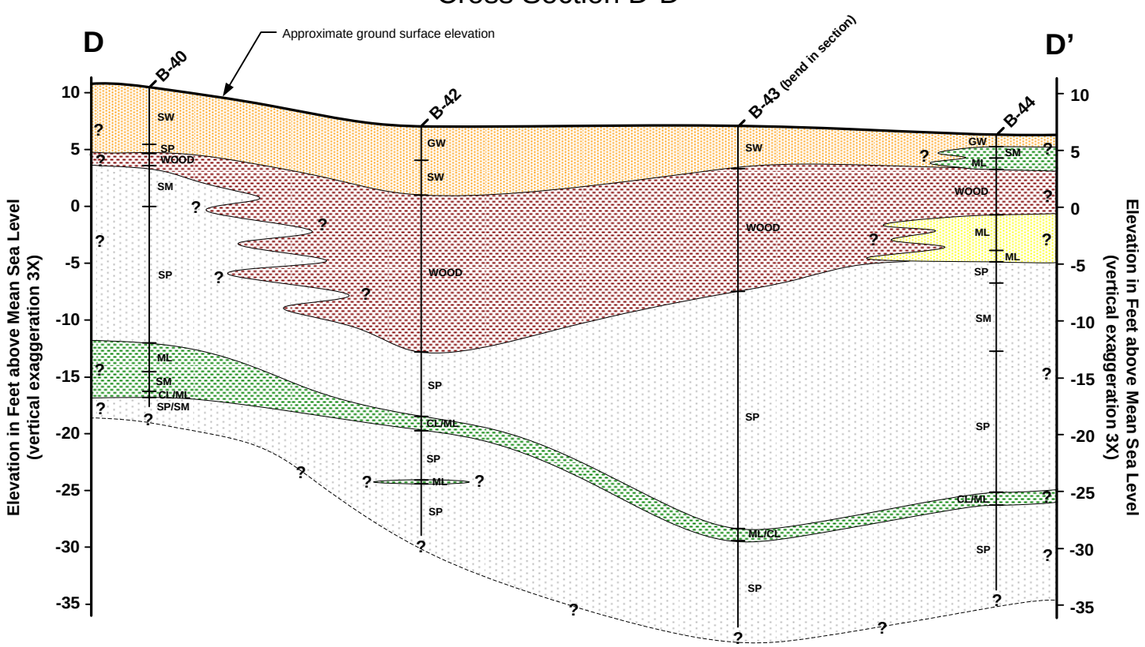
Cross Section B-B'



Cross Section C-C'



Cross Section D-D'

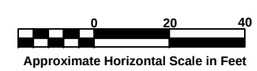


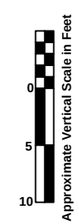
LEGEND:

- Primarily gravely and sandy fill material, some silt
- Primarily woody material (wood chips with no evident matrix)
- Primarily silty material mixed with sand and gravel, some woody material
- Primarily woody material (woody material typically with sand, silt, and/or clay matrix)
- Primarily sand and silty sand material
- Primarily clay, silt, and fine sand material, typically layered

NOTES:

1. All locations and depths are approximate.





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FORMER TACOMA METALS FACILITY
TACOMA, WA

GENERALIZED GEOLOGIC CROSS SECTIONS B-B' AND C-C'

996098.00/2008/FIGURE6.VSD

FIGURE 6

Appendix B

Groundwater Gradient Maps and Elevation Data Tables
for 2006 and 2008

Appendix B: Groundwater Gradient Maps and Elevation Data Tables for 2006 and 2008

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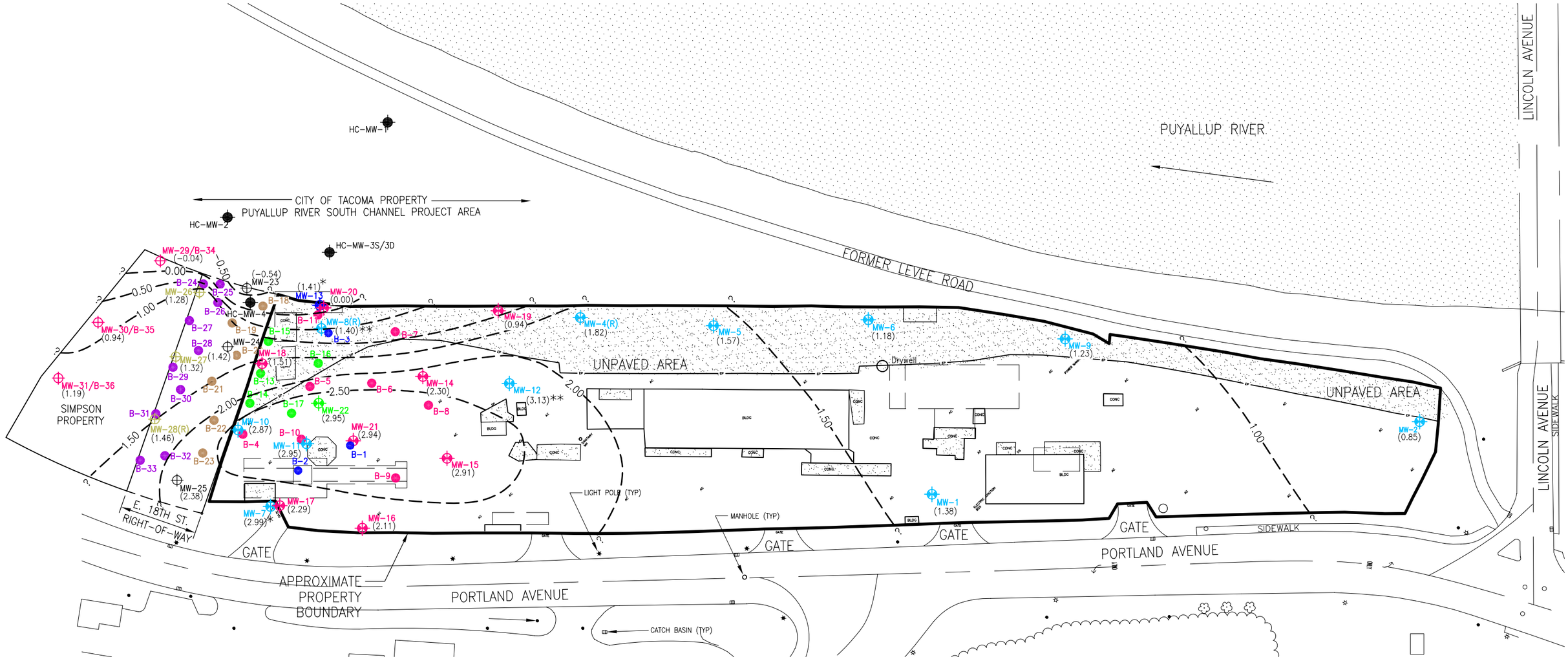
(NOTE: Figure and table designations are from multiple previous reports and may be duplicated. Figures and tables are presented in the order listed below)

1) Figure 5 Potentiometric Surface Contour Map Low Tide – 18 April 2006 *(2007)*
2) Figure 6 Potentiometric Surface Contour Map High Tide – 18 April 2006 *(2007)*
3) Figure 7 Potentiometric Surface Contour Map Low Tide – 11 April 2008 *(2008)*
4) Figure 8 Potentiometric Surface Contour Map High Tide – 11 April 2008 *(2008)*
5) Table 4 Groundwater Elevation Monitoring – 11 April 2008 *(2008)*
6) Table 9 Groundwater Elevation Monitoring Summary*(2007)*
7) Table 10 Summary of LNAPL and DNAPL Monitoring-Wells MW-8(R) and MW-28(R) *(2007)*

Materials included in Appendix B are from the following reports (as indicated in parentheses following the title for each item):

2007 = *Supplemental Data Summary Report* (Kennedy/Jenks Consultants 2007a)

2008 = *Soil and Groundwater Investigation Results – Data Transmittal; October 2007-April 2008 Investigation* (Kennedy/Jenks Consultants 2008)



LEGEND:

MW-29/B-34	OFF-PROPERTY MONITORING WELL AND SOIL BORING LOCATION (FEBRUARY 2006)
MW-26	OFF-PROPERTY MONITORING WELL LOCATION (MARCH 2005)
B-24	OFF-PROPERTY GEOPROBE BORING LOCATION (MARCH 2005)
MW-23	OFF-PROPERTY MONITORING WELL LOCATION (MARCH 2004)
B-18	OFF-PROPERTY GEOPROBE BORING LOCATION (MARCH 2004)
MW-12	MONITORING WELL LOCATION (REMEDIAL INVESTIGATION 2000-2001)
MW-13	MONITORING WELL LOCATION (JUNE – AUGUST 2002 INVESTIGATION)
MW-14	MONITORING WELL LOCATION (FEBRUARY – MARCH 2003 INVESTIGATION)
MW-22	MONITORING WELL LOCATION (NOVEMBER – DECEMBER 2003 INVESTIGATION)
HC-MW-4	FORMER OFF-PROPERTY MONITORING WELL LOCATION INSTALLED BY HART-CROWSER (JUNE 2003)
B-1	HOLLOW-STEM AUGER BORING LOCATION (JUNE – AUGUST 2002 INVESTIGATION)
B-4	GEOPROBE BORING LOCATION (FEBRUARY – MARCH 2003 INVESTIGATION)
B-12	GEOPROBE BORING LOCATION (NOVEMBER – DECEMBER 2003 INVESTIGATION)
	UNPAVED AREA
	APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)
(1.32)	GROUDWATER ELEVATION IN MONITORING WELLS (FEET NGVD)
2.50	POTENTIOMETRIC SURFACE CONTOURS (FEET NGVD) CONTOUR INTERVAL IS 0.50 FEET.

NOTES:

1. ALL LOCATIONS ARE APPROXIMATE.
3. WATER LEVELS MEASURED ON 18 APRIL 2006 DURING LOW TIDAL CONDITIONS.
4. * WATER LEVELS IN WELLS NOT INCLUDED IN POTENTIOMETRIC CONTOUR MAP BASED ON SCREENED INTERVALS PRIMARILY IN THE WOOD DEBRIS MATERIAL.
5. ** WATER LEVELS IN WELLS NOT INCLUDED IN POTENTIOMETRIC CONTOUR MAP BASED

N

0 50 100
SCALE: 1=100

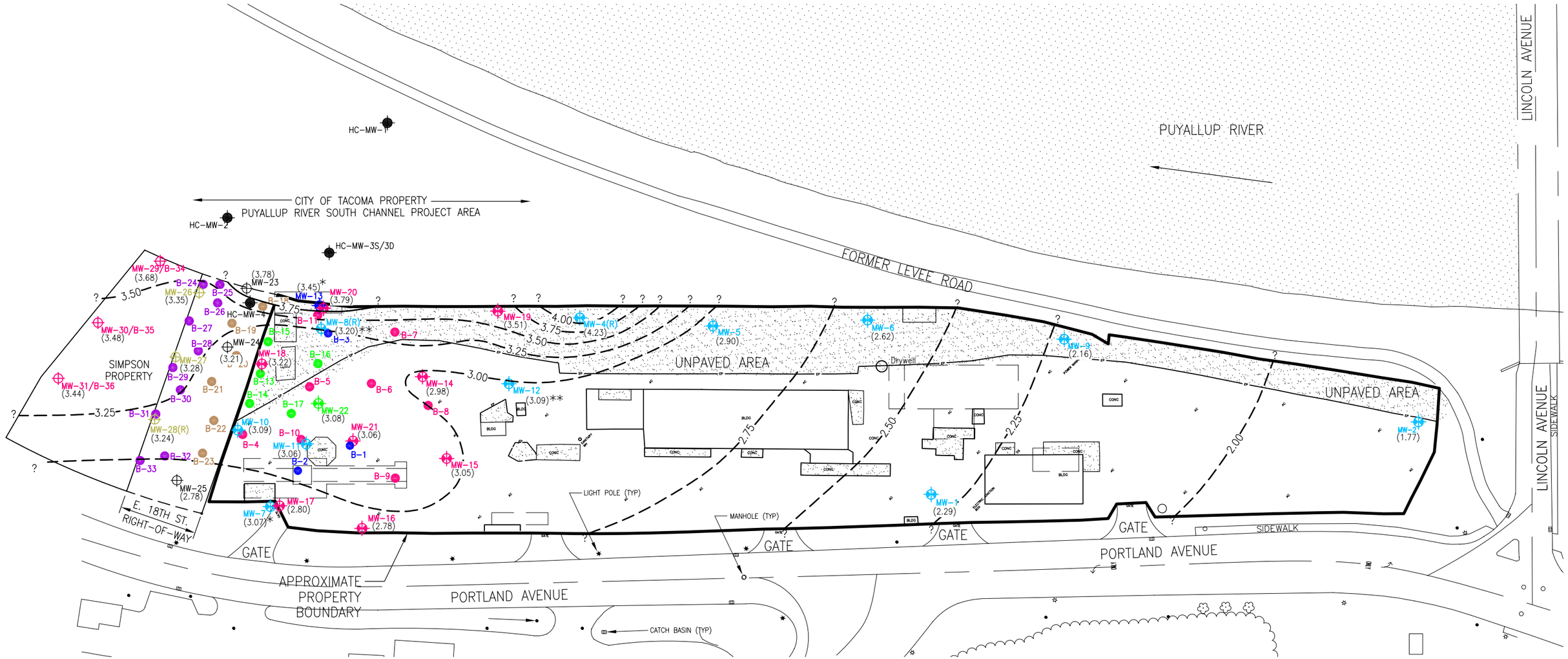
Kennedy/Jenks Consultants

FORMER TACOMA METALS FACILITY
TACOMA, WA

POTENTIOMETRIC SURFACE
℄
Ξ - 18 APRIL 2006

996098.00\2006 DATA SUMMARY\FIG_5

FIGURE 5



LEGEND:

MW-29/B-34	OFF-PROPERTY MONITORING WELL AND SOIL BORING LOCATION (FEBRUARY 2006)
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B-4	GEOPROBE BORING LOCATION (FEBRUARY – MARCH 2003 INVESTIGATION)
B-12	GEOPROBE BORING LOCATION (NOVEMBER – DECEMBER 2003 INVESTIGATION)
	UNPAVED AREA
	APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)
(2.29)	GROUDWATER ELEVATION IN MONITORING WELLS (FEET NGVD)
2.25	POTENTIOMETRIC SURFACE CONTOURS (FEET NGVD) CONTOUR INTERVAL IS 0.25 FEET.

NOTES:

1. ALL LOCATIONS ARE APPROXIMATE.
3. WATER LEVELS MEASURED ON 18 APRIL 2006 DURING LOW TIDAL CONDITIONS.
4. * WATER LEVELS IN WELLS NOT INCLUDED IN POTENTIOMETRIC CONTOUR MAP BASED ON SCREENED INTERVALS PRIMARILY IN THE WOOD DEBRIS MATERIAL.
5. ** WATER LEVELS IN WELLS NOT INCLUDED IN POTENTIOMETRIC CONTOUR MAP BASED

N

0 50 100
SCALE: 1=100

Kennedy/Jenks Consultants

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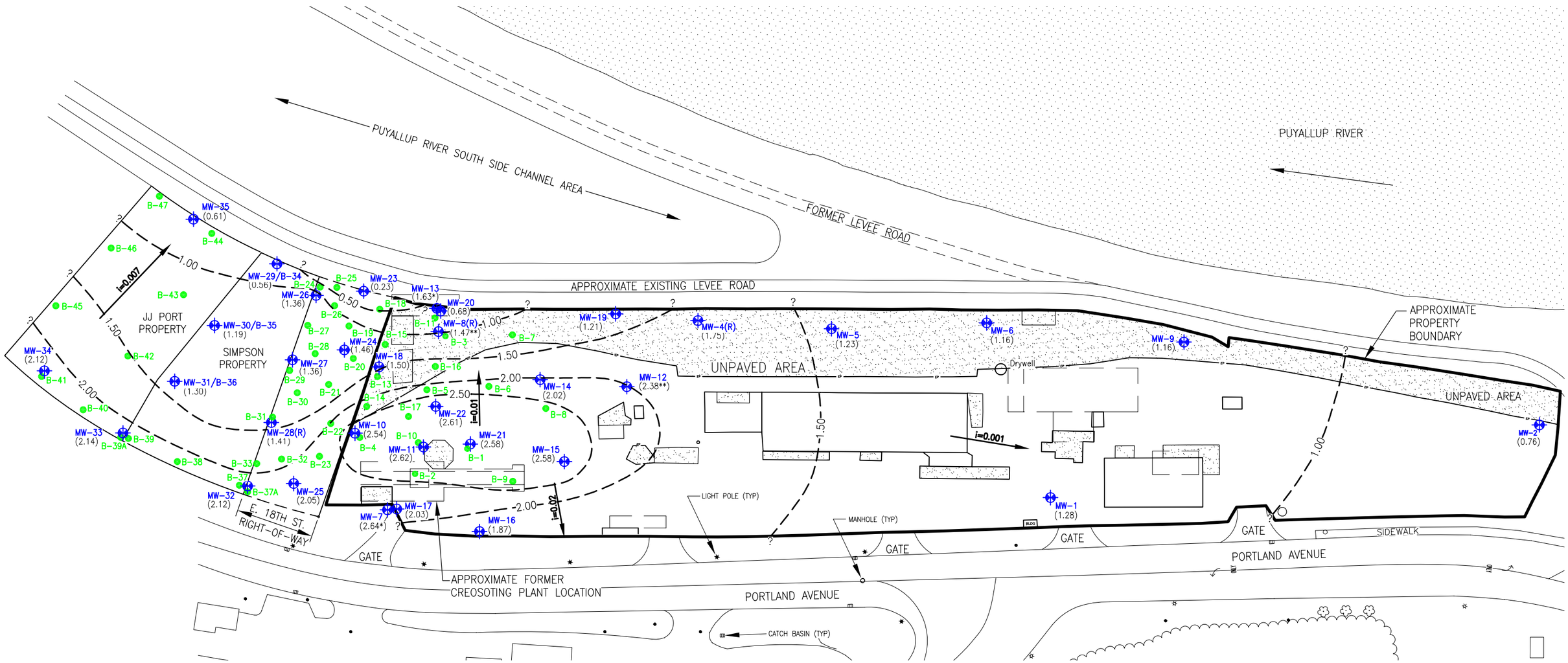
TACOMA, WA

POTENTIOMETRIC SURFACE CONTOUR MAP
HIGH TIDE - 18 APRIL 2006

996098.00\2006 DATA SUMMARY\FIG_6

FIGURE 6



LEGEND:

B-1	SOIL BORING LOCATION
MW-26	MONITORING WELL LOCATION
	UNPAVED AREA
	APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)
(1.32)	GROUDWATER ELEVATION IN MONITORING WELLS (FEET NGVD)
2.50	POTENTIOMETRIC SURFACE CONTOURS (FEET NGVD) CONTOUR INTERVAL IS 0.50 FEET.
i=0.004	APPROXIMATE GROUNDWATER GRADIENT DIRECTION AND MAGINTUDE (FEET PER FOOT)

NOTES:

1. BORING AND WELL LOCATIONS ARE BASED ON SITE SURVEY BY EARTH TECH, INC. ON 28 MARCH 2000, 13 MARCH 2003, 31 DECEMBER 2003, 14 APRIL 2004, 21 APRIL 2005, 29 MARCH 2006, AND 11 APRIL 2008.
2. ALL LOCATIONS ARE APPROXIMATE.
3. WATER LEVELS MEASURED ON 11 APRIL 2008 DURING LOW TIDAL CONDITIONS.
4. * WATER LEVELS IN WELLS NOT INCLUDED IN POTENTIOMETRIC CONTOUR MAP BASED ON SCREENED INTERVALS PRIMARILY IN THE WOOD DEBRIS MATERIAL.
5. ** WATER LEVELS IN WELLS NOT INCLUDED IN POTENTIOMETRIC CONTOUR MAP BASED ON THE PRESENCE OF LNAPL.

N

0 50 100
SCALE: 1=100

Kennedy/Jenks Consultants

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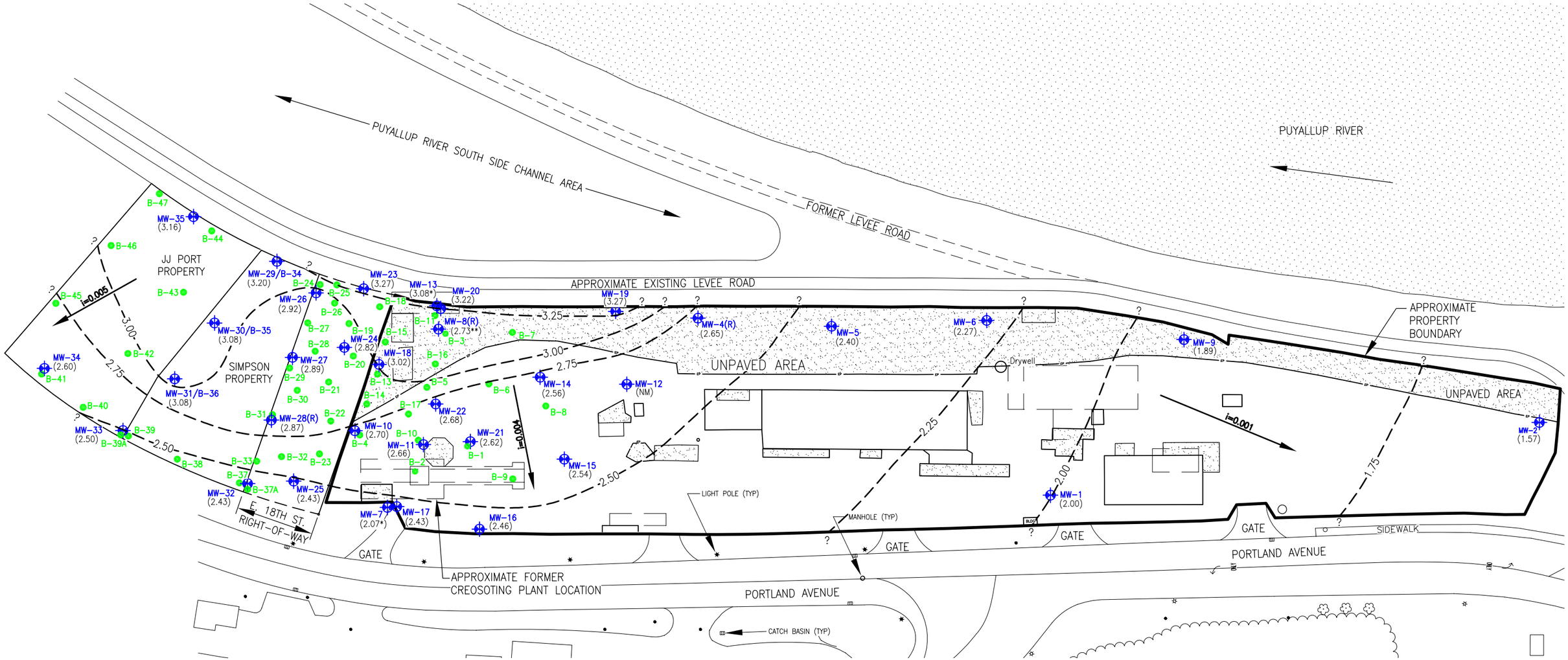
TACOMA, WA

POTENTIOMETRIC SURFACE CONTOUR MAP
LOW TIDE - 11 APRIL 2008

996098.00\2008 DATA SUMMARY\FIG_07

FIGURE 7



LEGEND:

B-1	SOIL BORING LOCATION
MW-26	MONITORING WELL LOCATION
	UNPAVED AREA
	APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)
(1.32)	GROUDWATER ELEVATION IN MONITORING WELLS (FEET NGVD)
2.50	POTENTIOMETRIC SURFACE CONTOURS (FEET NGVD) CONTOUR INTERVAL IS 0.25 FEET.
i=0.004	APPROXIMATE GROUNDWATER GRADIENT DIRECTION AND MAGINTUDE (FEET PER FOOT)

NOTES:

1. BORING AND WELL LOCATIONS ARE BASED ON SITE SURVEY BY EARTH TECH, INC. ON 28 MARCH 2000, 13 MARCH 2003, 31 DECEMBER 2003, 14 APRIL 2004, 21 APRIL 2005, 29 MARCH 2006, AND 11 APRIL 2008.
2. ALL LOCATIONS ARE APPROXIMATE.
3. WATER LEVELS MEASURED ON 11 APRIL 2008 DURING LOW TIDAL CONDITIONS.
4. * WATER LEVELS IN WELLS NOT INCLUDED IN POTENTIOMETRIC CONTOUR MAP BASED ON SCREENED INTERVALS PRIMARILY IN THE WOOD DEBRIS MATERIAL.
5. ** WATER LEVELS IN WELLS NOT INCLUDED IN POTENTIOMETRIC CONTOUR MAP BASED ON THE PRESENCE OF LNAPL.
6. NM INDICATES THAT THE WATER LEVEL WAS NOT MEASURED.

N

0 50 100
SCALE: 1=100

Kennedy/Jenks Consultants

FORMER TACOMA METALS FACILITY
TACOMA, WA

POTENTIOMETRIC SURFACE CONTOUR MAP
HIGH TIDE - 11 APRIL 2008

996098.00\2008 DATA SUMMARY\FIG_08

FIGURE 8

TABLE 4

GROUNDWATER ELEVATION MONITORING - 11 APRIL 2008
Former Tacoma Metals Facility

Well Number	Top of Well Casing Elevation (feet)[a]	Depth to Groundwater at Low-Tide (feet)	Groundwater Elevation Low-Tide (feet)	Depth to Groundwater at High-Tide (feet)	Groundwater Elevation High-Tide (feet)
MW-1	12.23	10.95	1.28	10.23	2.00
MW-2	12.04	11.28	0.76	10.47	1.57
MW-4(R)	12.55	10.80	1.75	9.90	2.65
MW-5	10.90	9.67	1.23	8.50	2.40
MW-6	10.07	8.91	1.16	7.80	2.27
MW-7	9.45	6.81	2.64	6.78	2.67
MW-8(R)[b]	11.12	9.65	1.47	8.39	2.73
MW-9	13.61	12.45	1.16	11.72	1.89
MW-10	9.39	6.85	2.54	6.69	2.70
MW-11	9.47	6.85	2.62	6.81	2.66
MW-12[b]	10.80	8.42	2.38	NM[d]	NM
MW-13	9.84	8.21	1.63	6.76	3.08
MW-14	9.77	7.75	2.02	7.21	2.56
MW-15	10.49	7.91	2.58	7.95	2.54
MW-16	9.72	7.85	1.87	7.26	2.46
MW-17	9.57	7.54	2.03	7.14	2.43
MW-18	11.79	10.29	1.50	8.77	3.02
MW-19	10.78	9.57	1.21	7.51	3.27
MW-20	10.21	9.53	0.68	6.99	3.22
MW-21	9.47	6.89	2.58	6.85	2.62
MW-22	9.51	6.90	2.61	6.83	2.68
MW-23	14.35	14.12	0.23	11.08	3.27
MW-24	10.58	9.12	1.46	7.76	2.82
MW-25	11.24	9.19	2.05	8.81	2.43
MW-26	12.52	11.16	1.36	9.60	2.92
MW-27	11.06	9.70	1.36	8.17	2.89
MW-28(R)[c]	10.42	9.01	1.41	7.55	2.87
MW-29	11.12	10.56	0.56	7.92	3.20
MW-30	10.05	8.86	1.19	6.97	3.08
MW-31	9.38	8.08	1.30	6.30	3.08
MW-32	9.26	7.14	2.12	6.83	2.43
MW-33	9.24	7.10	2.14	6.74	2.50
MW-34	9.62	7.50	2.12	7.02	2.60
MW-35	7.95	7.34	0.61	4.79	3.16

Notes:

(a) Vertical elevation (NGVD 29) is based on well surveys performed by Earth Tech, Inc. on 28 March 2000, 21 November 2000, 13 March 2003, 31 December 2003, 14 April 2004, 21 April 2005, 29 March 2006, and 11 April 2008.

(b) Free product [light non-aqueous phase liquid (LNAPL)] present on water table.

(c) MW-28 was abandoned and replaced with MW-28(R) in February 2006.

(d) "NM" denotes that the water level was not measured in the indicated well.

TABLE 9

GROUNDWATER ELEVATION MONITORING SUMMARY
Former Tacoma Metals Facility

Well Number	Top of Well Casing Elevation (feet)[a]	Depth to Groundwater at Low-Tide (feet)	Groundwater Elevation Low-Tide (feet)	Depth to Groundwater at High-Tide (feet)	Groundwater Elevation High-Tide (feet)
30 December 2003					
MW-1	12.23	10.86	1.37	9.87	2.36
MW-2	12.04	11.42	0.62	10.19	1.85
MW-4(R)	12.55	10.83	1.72	9.22	3.33
MW-5	10.90	9.13	1.77	7.62	3.28
MW-6	10.07	9.02	1.05	7.05	3.02
MW-7	9.45	5.91	3.54	5.82	3.63
MW-8(R)[b]	11.12	9.23	1.89	7.75	3.37
MW-9	13.61	12.48	1.13	11.31	2.30
MW-10	9.39	6.09	3.30	5.76	3.63
MW-11	9.47	5.94	3.53	5.87	3.60
MW-12[b]	10.80	7.33	3.47	7.32	3.48
MW-13	9.84	7.38	2.46	5.99	3.85
MW-14	9.77	6.88	2.89	6.45	3.32
MW-15	10.49	7.15	3.34	7.00	3.49
MW-16	9.72	7.46	2.26	6.82	2.90
MW-17	9.57	7.10	2.47	6.63	2.94
MW-18	11.79	9.90	1.89	8.27	3.52
MW-19	10.78	9.32	1.46	7.04	3.74
MW-20	10.21	8.89	1.32	6.15	4.06
MW-21	9.47	6.26	3.21	5.89	3.58
MW-22	9.51	6.00	3.51	5.90	3.61
1 June 2004					
MW-1	12.23	10.75	1.48	9.96	2.27
MW-2	12.04	8.56	3.48	10.03	2.01
MW-4(R)	12.55	10.65	1.90	9.34	3.21
MW-5	10.90	9.22	1.68	8.01	2.89
MW-6	10.07	8.59	1.48	7.17	2.90
MW-7	9.45	6.70	2.75	6.74	2.71
MW-8(R)[b]	11.12	9.16	1.96	8.16	2.96
MW-9	13.61	12.19	1.42	11.35	2.26
MW-10	9.39	6.70	2.69	6.55	2.84
MW-11	9.47	6.73	2.74	6.72	2.75
MW-12[b]	10.80	8.07	2.73	8.04	2.76
MW-13	9.84	7.68	2.16	6.45	3.39
MW-14	9.77	7.55	2.22	6.92	2.85
MW-15	10.49	6.72	3.77	7.69	2.80
MW-16	9.72	7.46	2.26	7.23	2.49
MW-17	9.57	7.16	2.41	7.11	2.46
MW-18	11.79	9.70	2.09	8.69	3.10
MW-19	10.78	8.89	1.89	7.18	3.60
MW-20	10.21	8.65	1.56	6.46	3.75
MW-21	9.47	6.83	2.64	6.69	2.78
MW-22	9.51	6.77	2.74	6.74	2.77
MW-23	14.39	12.82	1.57	10.76	3.63
MW-24	10.67	8.42	2.25	7.55	3.12
MW-25	11.26	8.78	2.48	8.62	2.64

TABLE 9

GROUNDWATER ELEVATION MONITORING SUMMARY
Former Tacoma Metals Facility

Well Number	Top of Well Casing Elevation (feet)[a]	Depth to Groundwater at Low-Tide (feet)	Groundwater Elevation Low-Tide (feet)	Depth to Groundwater at High-Tide (feet)	Groundwater Elevation High-Tide (feet)
12 May 2005					
MW-1	12.23	10.67	1.56	10.00	2.23
MW-2	12.04	10.96	1.08	10.27	1.77
MW-4(R)	12.55	10.55	2.00	9.57	2.98
MW-5	10.90	9.38	1.52	8.19	2.71
MW-6	10.07	8.62	1.45	7.58	2.49
MW-7	9.45	6.51	2.94	6.46	2.99
MW-8(R)[b]	11.12	9.04	2.08	8.06	3.06
MW-9	13.61	12.22	1.39	11.48	2.13
MW-10	9.39	6.47	2.92	6.38	3.01
MW-11	9.47	6.54	2.93	6.49	2.98
MW-12[b]	10.80	7.89	2.91	7.84	2.96
MW-13	9.84	7.51	2.33	6.72	3.12
MW-14	9.77	7.31	2.46	6.84	2.93
MW-15	10.49	7.80	2.69	7.55	2.94
MW-16	9.72	7.49	2.23	6.96	2.76
MW-17	9.57	7.20	2.37	6.81	2.76
MW-18	11.79	9.72	2.07	8.73	3.06
MW-19	10.78	8.94	1.84	7.61	3.17
MW-20	10.21	8.75	1.46	6.87	3.34
MW-21	9.47	6.63	2.84	6.48	2.99
MW-22	9.51	6.57	2.94	6.53	2.98
MW-23	14.39	13.18	1.21	11.13	3.26
MW-24	10.67	8.71	1.96	7.63	3.04
MW-25	11.26	8.86	2.40	8.51	2.75
MW-26	12.49	10.60	1.89	9.43	3.06
MW-27	11.15	9.22	1.93	8.09	3.06
MW-28	10.43	8.46	1.97	7.37	3.06

TABLE 9

GROUNDWATER ELEVATION MONITORING SUMMARY
Former Tacoma Metals Facility

Well Number	Top of Well Casing Elevation (feet)[a]	Depth to Groundwater at Low-Tide (feet)	Groundwater Elevation Low-Tide (feet)	Depth to Groundwater at High-Tide (feet)	Groundwater Elevation High-Tide (feet)
18 April 2006					
MW-1	12.23	10.85	1.38	9.94	2.29
MW-2	12.04	11.19	0.85	10.27	1.77
MW-4(R)	12.55	10.73	1.82	8.32	4.23
MW-5	10.90	9.33	1.57	8.00	2.90
MW-6	10.07	8.89	1.18	7.45	2.62
MW-7	9.45	6.46	2.99	6.38	3.07
MW-8(R)[b]	11.12	9.72	1.40	7.92	3.20
MW-9	13.61	12.38	1.23	11.45	2.16
MW-10	9.39	6.52	2.87	6.30	3.09
MW-11	9.47	6.52	2.95	6.41	3.06
MW-12[b]	10.80	7.67	3.13	7.71	3.09
MW-13	9.84	8.43	1.41	6.39	3.45
MW-14	9.77	7.47	2.30	6.79	2.98
MW-15	10.49	7.58	2.91	7.44	3.05
MW-16	9.72	7.61	2.11	6.94	2.78
MW-17	9.57	7.28	2.29	6.77	2.80
MW-18	11.79	10.28	1.51	8.57	3.22
MW-19	10.78	9.84	0.94	7.27	3.51
MW-20	10.21	10.21	0.00	6.42	3.79
MW-21	9.47	6.53	2.94	6.41	3.06
MW-22	9.51	6.56	2.95	6.43	3.08
MW-23	14.35	14.89	-0.54	10.57	3.78
MW-24	10.58	9.16	1.42	7.37	3.21
MW-25	11.24	8.86	2.38	8.46	2.78
MW-26	12.52	11.24	1.28	9.17	3.35
MW-27	11.06	9.74	1.32	7.78	3.28
MW-28(R)[c]	10.42	8.96	1.46	7.18	3.24
MW-29	11.12	11.16	-0.04	7.44	3.68
MW-30	10.05	9.11	0.94	6.57	3.48
MW-31	9.38	8.19	1.19	5.94	3.44

Notes:

(a) Vertical elevation (NGVD 29) is based on well surveys performed by Earth Tech, Inc on 28 March 2000, 21 November 2000, 13 March 2003, 31 December 2003, 14 April 2004, 21 April 2005, and 29 March 2006.

(b) Free product [light non-aqueous phase liquid (LNAPL)] present on water table.

(c) MW-28 was abandoned and replaced with MW-28(R) in February 2006.

TABLE 10

SUMMARY OF LNAPL[a] AND DNAPL[b] MONITORING WELLS MW-8(R) AND MW-28(R)
Former Tacoma Metals Facility

MW-8(R) LNAPL Measurement History		MW-28(R) DNAPL Measurement History	
Date	**LNAPL Thickness (feet)**	**Date**	**DNAPL Thickness (feet)**
16-Dec-03	1.15[c]	---	---
8-Jan-04	0.01	---	---
16-Jan-04	0.07	---	---
28-Jan-04	0.07	---	---
20-Feb-04	0.40	---	---
10-Mar-04	0.25	---	---
10-Jun-04	0.12	---	---
17-Sep-04	<0.01[d]	24-Feb-06	0.46[c]
10-Dec-04	0.08	1-Mar-06	0.49
30-Mar-05	0.03	29-Mar-06	0.63
9-Jun-05	0.90	18-Apr-06	0.60
23-Oct-05	<0.01	22-Jun-06	0.61
2-Feb-06	0.22	5-Oct-06	0.61
12-Dec-06	0.18	12-Dec-06	0.59

Notes:

(a) LNAPL = Light non-aqueous phase liquid.
(b) DNAPL = Dense non-aqueous phase liquid.
(c) LNAPL / DNAPL bailed or pumped from well after measurement.
(d) "<" denotes that LNAPL was not detected.

Appendix C

RI/FS Site Maps, Sample Maps, and Data Tables

Appendix C: RI/FS Site and Sample Maps and Data Tables

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19) Table 5-1 Reconnaissance Groundwater Analytical Results – Dissolved Metals
20) Table 5-2 Reconnaissance Groundwater Analytical Results – PCBs
21) Table 5-3 Reconnaissance Groundwater Analytical Results – PAHs
22) Table 5-4 Reconnaissance Groundwater Analytical Results – TPHs and VOCs
23) Table 5-5 Groundwater Analytical Results – Total Metals
24) Table 5-6 Groundwater Analytical Results – Dissolved Metals
25) Table 5-7 Groundwater Analytical Results – PCBs
26) Table 5-8 Groundwater Analytical Results – PAHs
27) Table 5-9 Groundwater Analytical Results – TPHs and VOCs
28) Table 6-1 Remedial Investigation Surface Water Analytical Results

All materials included in Appendix C are from *Remedial Investigation / Feasibility Study Report* (Kennedy/Jenks Consultants 2001)

PUYALLUP RIVER

WOODWASTE LANDFILL

WOODWASTE PILE

PILE

FORMER FOUNDATION

APPROXIMATE FORMER UST LOCATION

FORMER BUNKHOUSE EXISTING CONCRETE PAD 2' BGS

LEVEE ROAD

CONCRETE FOUNDATION (FURNACE BUILDING)

PREVIOUS BALER

APPROXIMATE PROPERTY BOUNDARY

450,000 GALLON STORAGE TANK

102,000-GALLON STORAGE TANK

POSSIBLE COOLING TOWER STRUCTURE

UNKNOWN STRUCTURE

POSSIBLE PUMP/COMPRESSOR STRUCTURE

UNKNOWN STRUCTURES

OCTAGONAL FOUNDATION AND PRESUMED COAL GAS STORAGE VESSEL

POSSIBLE OFFICE

1,500-GALLON STORAGE TANK (ABOVE RETORT)

CREOSOTING PLANT RETORT BUILDING

FENCE & BRINK (CONCRETE PAD + 1 CINDERBLOCK WALL)

FORMER CREOSOTING PLANT

GATE

FORMER RAILROAD TRACKS

FORMER EQUIPMENT BUILDING

FORMER BUNKER

UNPAVED AREA

FORMER MACHINE SHED

VAULT

FORMER MAIN WAREHOUSE BUILDING

OFFICE AREA

CONCRETE VAULT

FORMER RED BRICK BUILDING

GATE

SEGMENTAL BLOCK WALL (CONCRETE)

LIGHT POLE (TYP)

MANHOLE (TYP)

POLE (TYP)

CATCH BASIN (TYP)

PORTLAND AVENUE

FORMER POWER BUILDING

FORMER SCALE

UNPAVED AREA

SD

SIDEWALK

PORTLAND AVENUE

COUNTER WEIGHT (STEEL/CONCRETE BLOCK)

12" CMP CULVERT

EXISTING STORAGE BUILDING (TO REMAIN)

FORMER BOARDING HOUSE

LINCOLN AVENUE

SIDEWALK

LEGEND:

- CATCHBASIN
- SD — STORMDRAIN LINES
- 8' CHAINLINK FENCE W/BARBED WIRE
- FORMER RAILROAD TRACK LOCATION
- EXISTING RAILROAD TRACK LOCATION
- UNPAVED AREA
- CONCRETE
- APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)
- FORMER CREOSOTING PLANT FEATURES (APPROXIMATE)
- FORMER COKE PLANT GAS DISTRIBUTION FEATURES (APPROXIMATE) (3–5' ABOVE FORMER CREOSOTING PLANT FEATURES)

NOTES:

1. LOCATIONS SHOWN WITHIN PROPERTY BOUNDARIES ARE BASED ON SITE SURVEY BY EARTH TECH INC., ON 28 MARCH 2000.
2. INFORMATION SHOWN OUTSIDE OF PROPERTY BOUNDARIES IS BASED ON 1993 CITY OF TACOMA GEOGRAPHIC INFORMATION SYSTEM, TACOMA AREA MAPS.
3. PREVIOUS TRUNCATED RAILROAD SPUR LOCATION IS APPROXIMATE.
4. PROPERTY AREA = 249,223± sq.ft. (5.72± AC.)
5. THIS FIGURE WAS MODIFIED FROM THE ORIGINAL (2001) RI AT ECOLOGY'S REQUEST.

N

0 50 100

APPROX. SCALE: 1=100

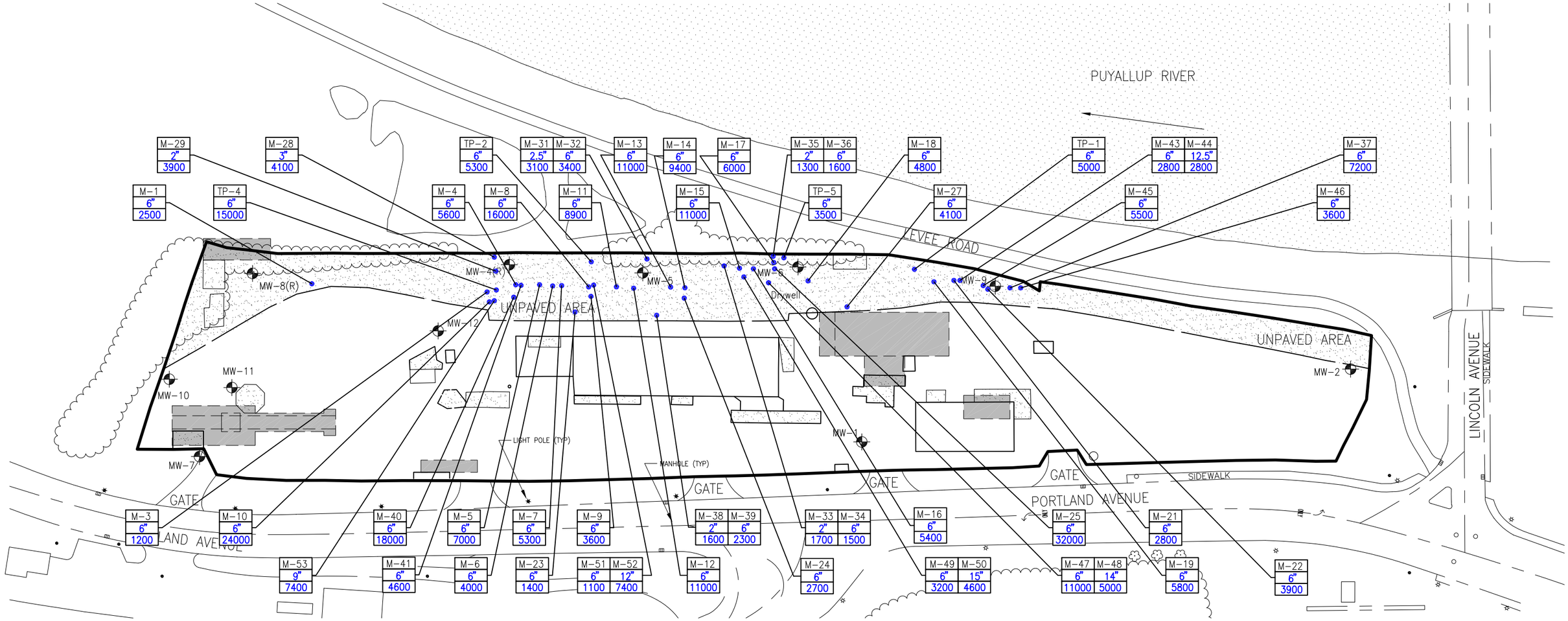
Kennedy/Jenks Consultants

FORMER TACOMA METALS FACILITY
TACOMA, WA

SITE OVERVIEW MAP

996098.00/P01SK001–2

FIGURE 1-2



LEGEND:

MW-1 MONITORING WELL LOCATION
(R) = REPLACEMENT

● SOIL CONCENTRATIONS EXCEEDING MTCA METHOD A INDUSTRIAL SOIL CLEANUP LEVEL (LEAD 1000 mg/kg).

HART-CROWSER SURFACE SOIL SAMPLES (1990)

MORRIS ENVIRONMENTAL SERVICES SURFACE SOIL SAMPLES (1991)

TP-4	M-1
6"	6"
15000	2500

DEPTH(ft)

CONCENTRATION(mg/kg)

UNPAVED AREA

APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)

NOTES:

1. MAP IS BASED ON SITE SURVEY BY EARTH TECH INC., ON 28 MARCH 2000.
2. FIGURE SHOWS LEAD CONCENTRATIONS GREATER THAN OR EQUAL TO 1000 mg/kg.

N

0 50 100
SCALE: 1=100

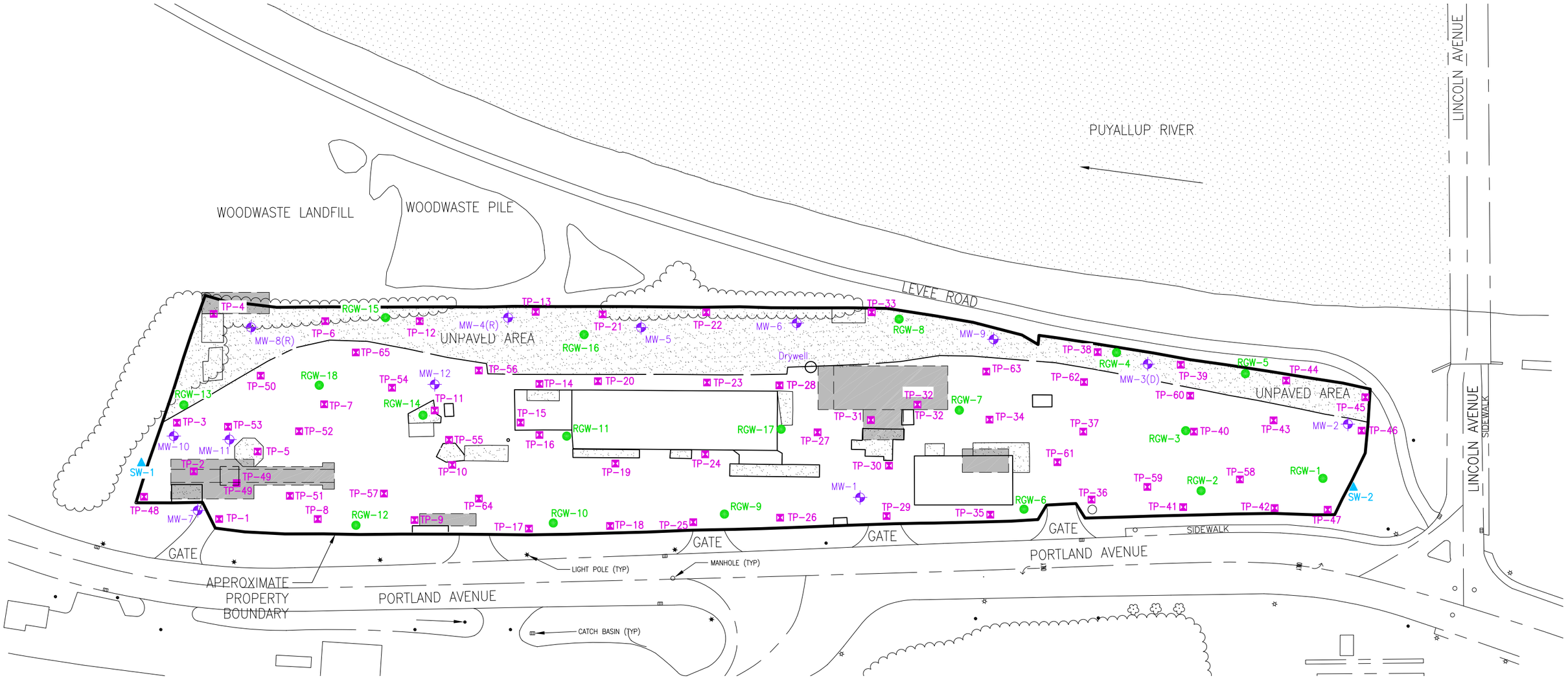
Kennedy/Jenks Consultants

FORMER TACOMA METALS FACILITY
TACOMA, WA

PREVIOUS INVESTIGATIONS LEAD CONCENTRATIONS IN SOIL

996098.00/P01SK001-3

FIGURE 1-3



LEGEND:

MW-10	MONITORING WELL LOCATIONS (R) = REPLACEMENT (D) = DEMOLISHED
RGW-12	RECONNAISSANCE GROUNDWATER SAMPLING LOCATIONS
TP-64	TEST PIT SAMPLING LOCATIONS
SW-1	SURFACE WATER SAMPLING LOCATIONS
	UNPAVED AREA
	APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)

NOTES:

1. LOCATIONS SHOWN WITHIN PROPERTY BOUNDARIES ARE BASED ON SITE SURVEY BY EARTH TECH INC., ON 28 MARCH 2000.
2. INFORMATION SHOWN OUTSIDE OF PROPERTY BOUNDARIES IS BASED ON 1993 CITY OF TACOMA GEOGRAPHIC INFORMATION SYSTEM, TACOMA AREA MAPS.
3. PROPERTY AREA = 249,223± sq.ft. (5.72± AC.)

N

0 50 100

SCALE: 1=100

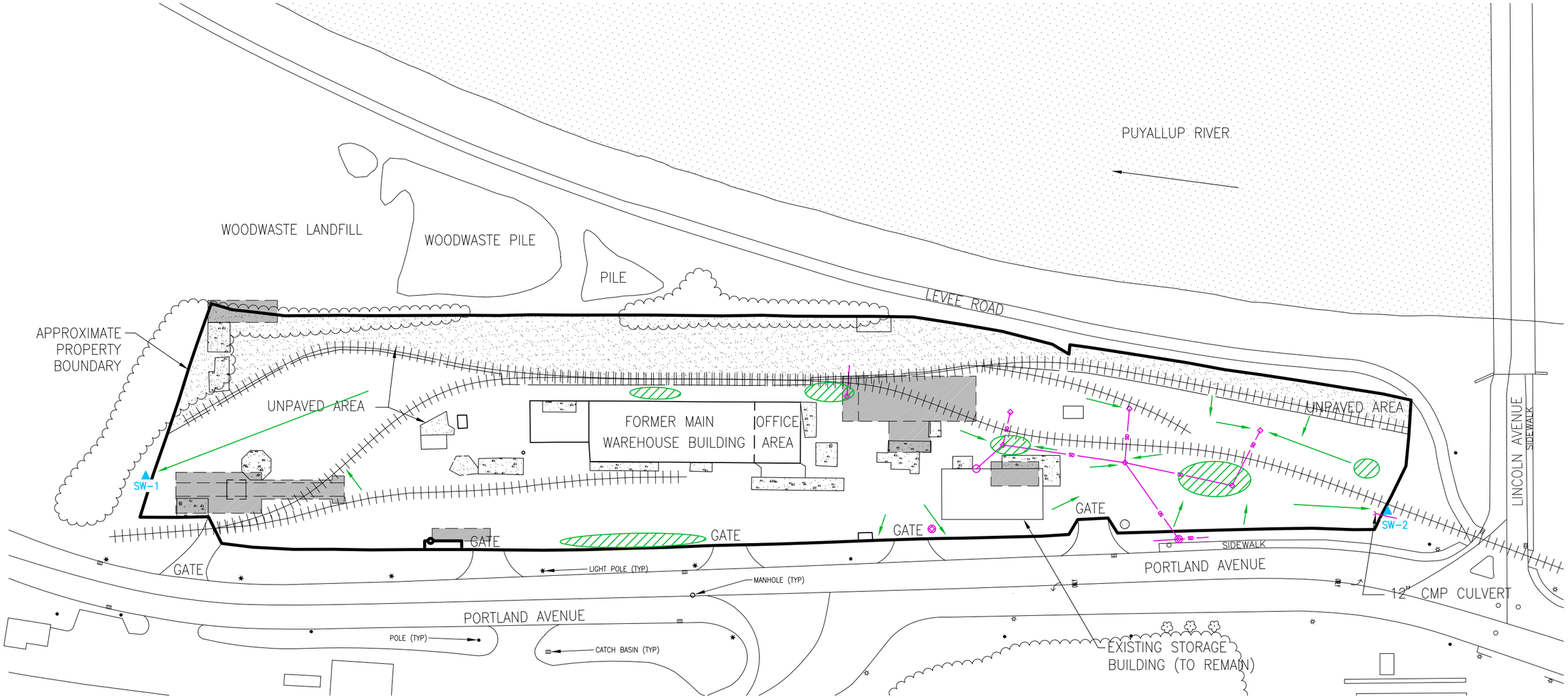
Kennedy/Jenks Consultants

FORMER TACOMA METALS FACILITY
TACOMA, WA

SAMPLE LOCATION SUMMARY MAP

996098.00/P01SK002-1

FIGURE 2-1



LEGEND:

- CATCHBASIN
- SD — STORM DRAIN LINES
- SW-1 — SURFACE WATER SAMPLING LOCATIONS
- APPROXIMATE SURFACE DRAINAGE FLOWLINES
- APPROXIMATE SURFACE WATER PONDING AREAS
- FORMER RAILROAD TRACK LOCATION
- UNPAVED AREA
- APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)

NOTES:

1. LOCATIONS SHOWN WITHIN PROPERTY BOUNDARIES ARE BASED ON SITE SURVEY BY EARTH TECH INC., ON 28 MARCH 2000.
2. INFORMATION SHOWN OUTSIDE OF PROPERTY BOUNDARIES IS BASED ON 1993 CITY OF TACOMA GEOGRAPHIC INFORMATION SYSTEM, TACOMA AREA MAPS.

N

0 50 100

SCALE: 1=100

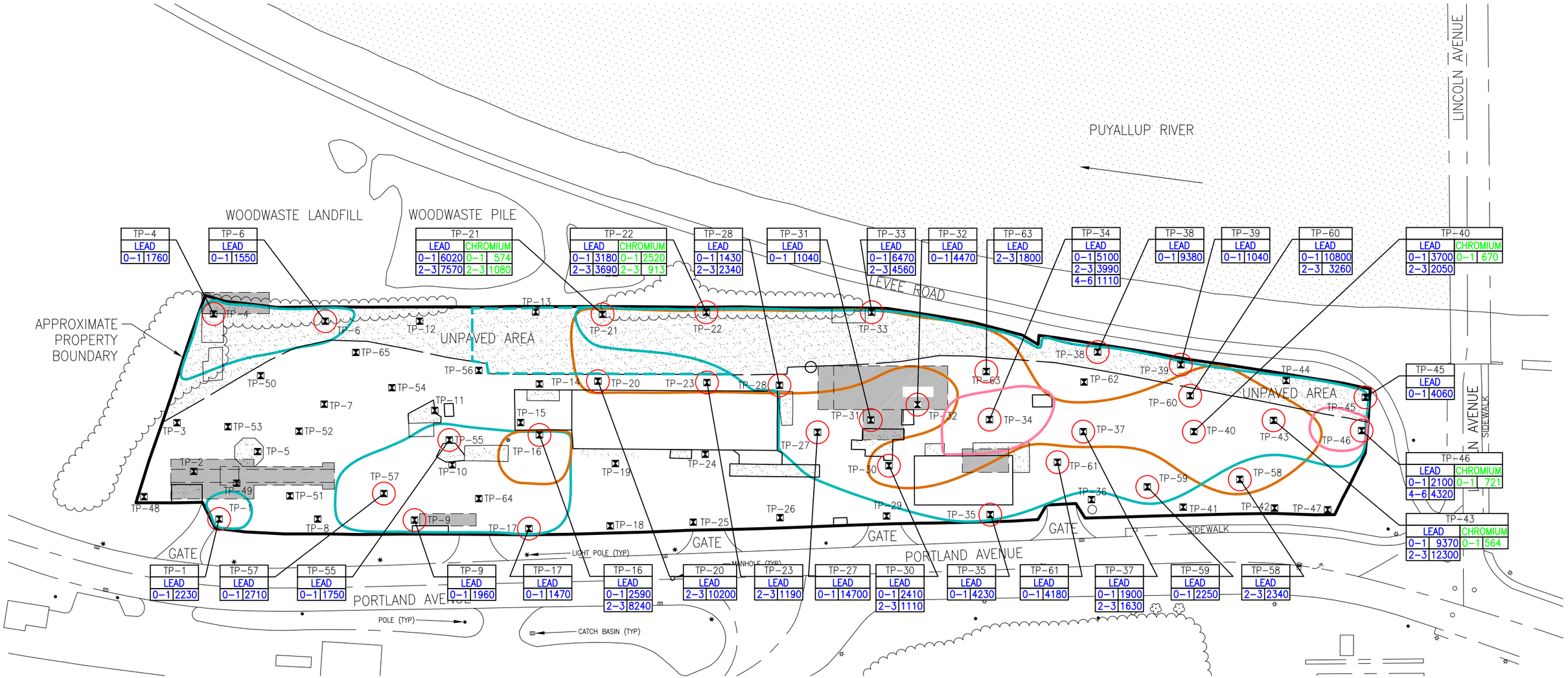
Kennedy/Jenks Consultants

FORMER TACOMA METALS FACILITY
TACOMA, WA

SURFACE WATER FLOW AND SAMPLING MAP

996098.00/P01SK003-8

FIGURE 3-8



LEGEND:

TP-1 TEST PIT LOCATION

SOIL CONCENTRATIONS EXCEEDING MTCA METHOD A INDUSTRIAL SOIL CLEANUP LEVELS (LEAD 1000 mg/kg, CHROMIUM 500 mg/kg).

TP-43			
LEAD		CHROMIUM	
0-1	9370	6-10	564

TEST PIT DESIGNATION

ANALYTE

DEPTH(ft)

CONCENTRATION(mg/kg)

UNPAVED AREA

APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)

0-1 ft bgs

0-1 ft bgs (previous investigations)

2-3 ft bgs

4-6 ft bgs

APPROXIMATE LEAD CLEANUP LEVEL EXCEEDANCE AREAS. (MTCA METHOD A, 1000 mg/kg)

NOTES:

1. MAP IS BASED ON SITE SURVEY BY EARTH TECH INC., ON 28 MARCH 2000.
2. FIGURE SHOWS LEAD CONCENTRATIONS GREATER THAN OR EQUAL TO 1000 mg/kg AND CHROMIUM CONCENTRATIONS GREATER THAN OR EQUAL TO 500 mg/kg.
3. SOIL SAMPLES WERE ANALYZED FOR RCRA METALS AND COPPER BY EPA METHODS 6010/7000 SERIES.
4. WHERE DUPLICATE SAMPLES WERE ANALYZED, THE HIGHER CONCENTRATION IS SHOWN.

N

0 50 100

SCALE: 1=100

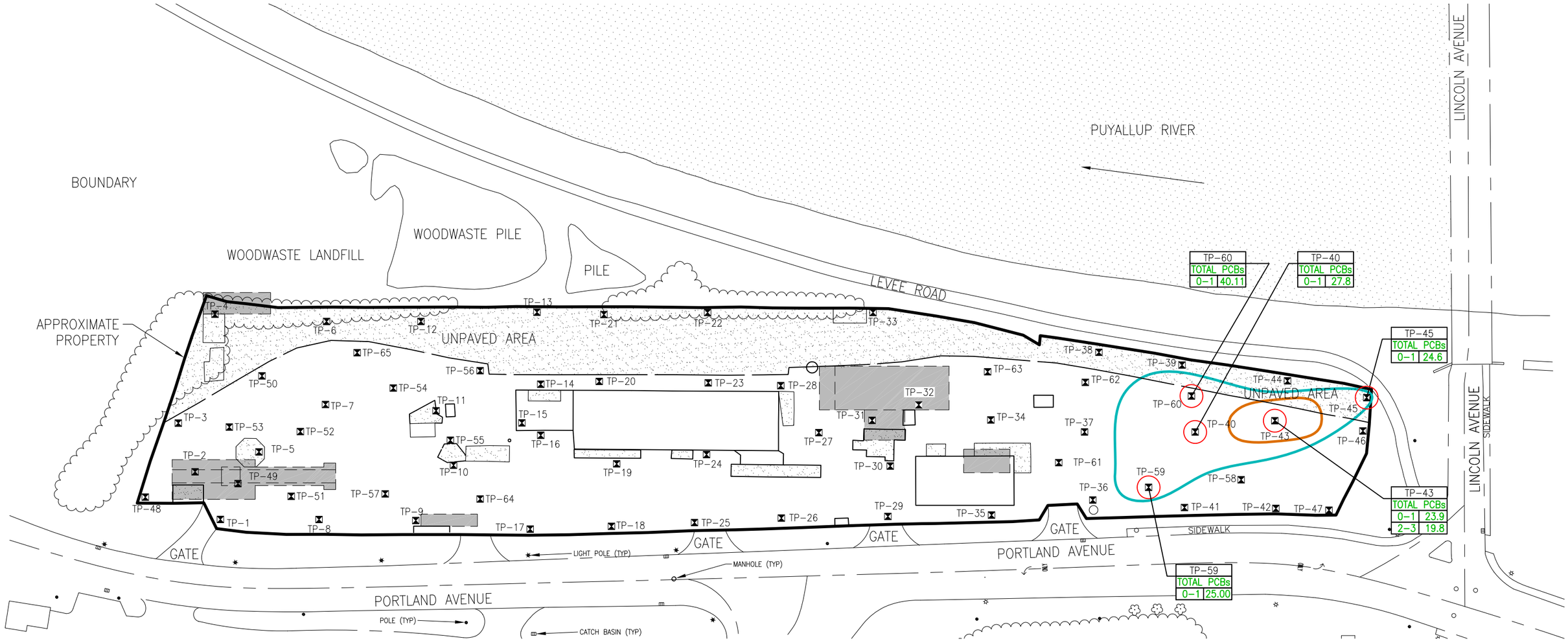
Kennedy/Jenks Consultants

FORMER TACOMA METALS FACILITY
TACOMA, WA

METAL CONCENTRATIONS IN SOIL

996098.00/P01SK004-1

FIGURE 4-1



LEGEND:

- TP-1 — TEST PIT LOCATION
- TOTAL PCB CONCENTRATIONS EXCEEDING THE MTCA METHOD C INDUSTRIAL SOIL CLEANUP LEVEL OF 17 mg/kg
- 0-1 ft bgs — APPROXIMATE TOTAL PCB CLEANUP LEVEL EXCEEDANCE AREAS. (MTCA METHOD C, 17 mg/kg)
- 2-3 ft bgs
- UNPAVED AREA
- APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)

TP-59	TEST PIT DESIGNATION
TOTAL PCBs	ANALYTE
0-1 25.00	DEPTH(ft) / CONCENTRATION(mg/kg)

NOTES:

1. MAP IS BASED ON SITE SURVEY BY EARTH TECH INC., ON 28 MARCH 2000.
2. FIGURE SHOWS PCB CONCENTRATIONS GREATER THAN OR EQUAL TO 17 mg/kg.
3. PCBs WERE ANALYZED BY EPA METHOD 8082.
4. WHERE DUPLICATE SAMPLES WERE ANALYZED, THE HIGHER CONCENTRATION IS SHOWN.

N

0 50 100

SCALE: 1=100

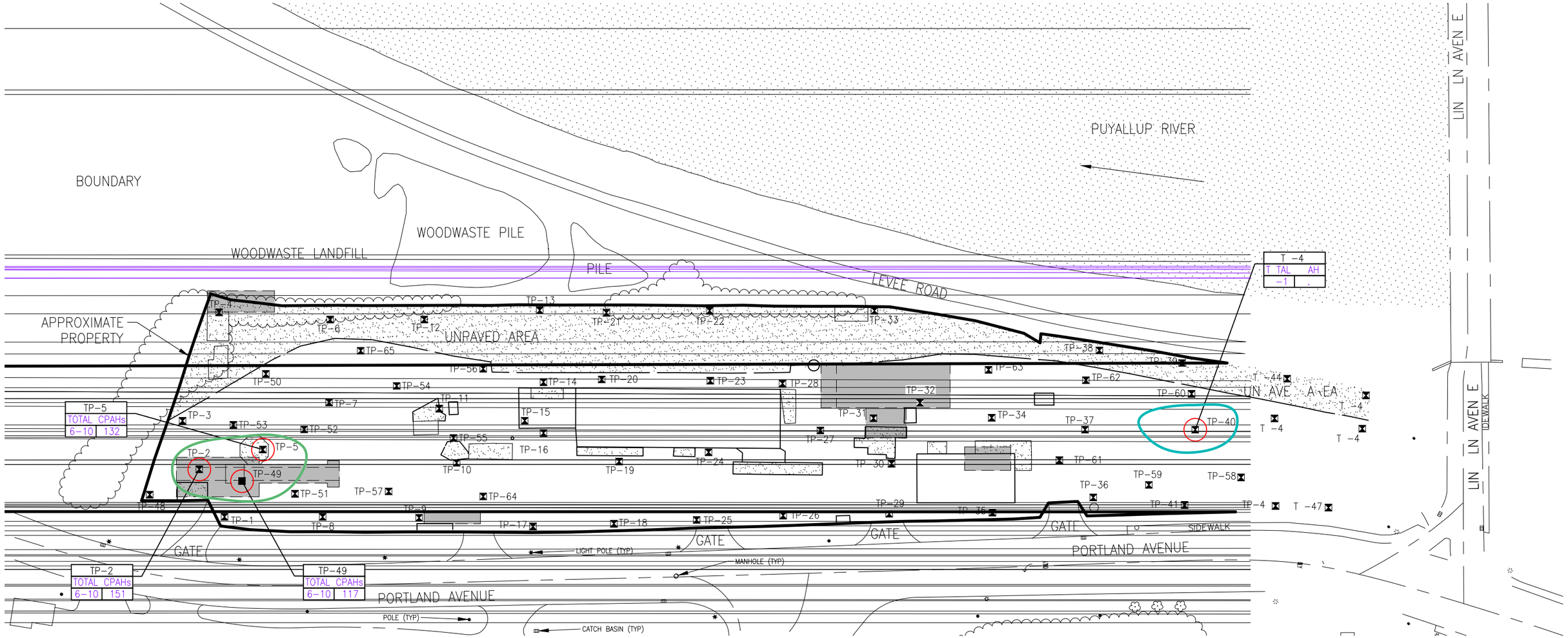
Kennedy/Jenks Consultants

FORMER TACOMA METALS FACILITY
TACOMA, WA

TOTAL PCB CONCENTRATIONS IN SOIL

996098.00/P01SK004-2

FIGURE 4-2



LEGEND:

- TP-1 — TEST PIT LOCATION
- TOTAL CPAHs CONCENTRATIONS EXCEEDING MTCA METHOD C INDUSTRIAL SOIL CLEANUP LEVEL OF 18 mg/kg
- TP-49 — TEST PIT DESIGNATION
- TOTAL CPAHs — ANALYTE
- 6-10 — DEPTH(ft)
- 117 — CONCENTRATION(mg/kg)
- UNPAVED AREA
- APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)
- ~~0-1 ft bgs~~ ~~6-10 ft bgs~~ APPROXIMATE TOTAL CPAH CLEANUP LEVEL ~~18 mg/kg)~~

NOTES:

1. ~~MAP IS BASED ON SITE SURVEY BY EARTH TECH INC., ON 28 MARCH 2000.~~
2. FIGURE SHOWS TOTAL CPAH CONCENTRATIONS GREATER THAN OR EQUAL TO 18 mg/kg.
3. SAMPLES WERE ANALYZED FOR POLYCYCLIC AROMATIC HYDROCARBONS (PAHS) BY EPA METHOD 8270B GC/MS-SIM. TOTAL CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS (CPAHs) WERE CALCULATED BY SUMMING THE CONCENTRATIONS OF ALL PROBABLE CPAHs USING TEF METHODOLOGY. IF A ~~PROBABLE CPAH WAS NOT DETECTED IN THE SAMPLE, A VALUE EQUAL TO 1/2~~ THE DETECTION LIMIT WAS USED.
4. WHERE DUPLICATE SAMPLES WERE ANALYZED, THE HIGHER CONCENTRATION IS SHOWN.
5. THIS MAP WAS UPDATED IN JULY 2013 AT ECOLOGY'S REQUEST BASED ON ~~REVISED TOTAL CPAH VALUES CALCULATED USING TEF METHODOLOGY [WAC~~ 173-340-708(8)(e)] WHICH WAS NOT REQUIRED WHEN THE ORIGINAL RI\FI WAS PERFORMED.

N

1

ALE: 1=1

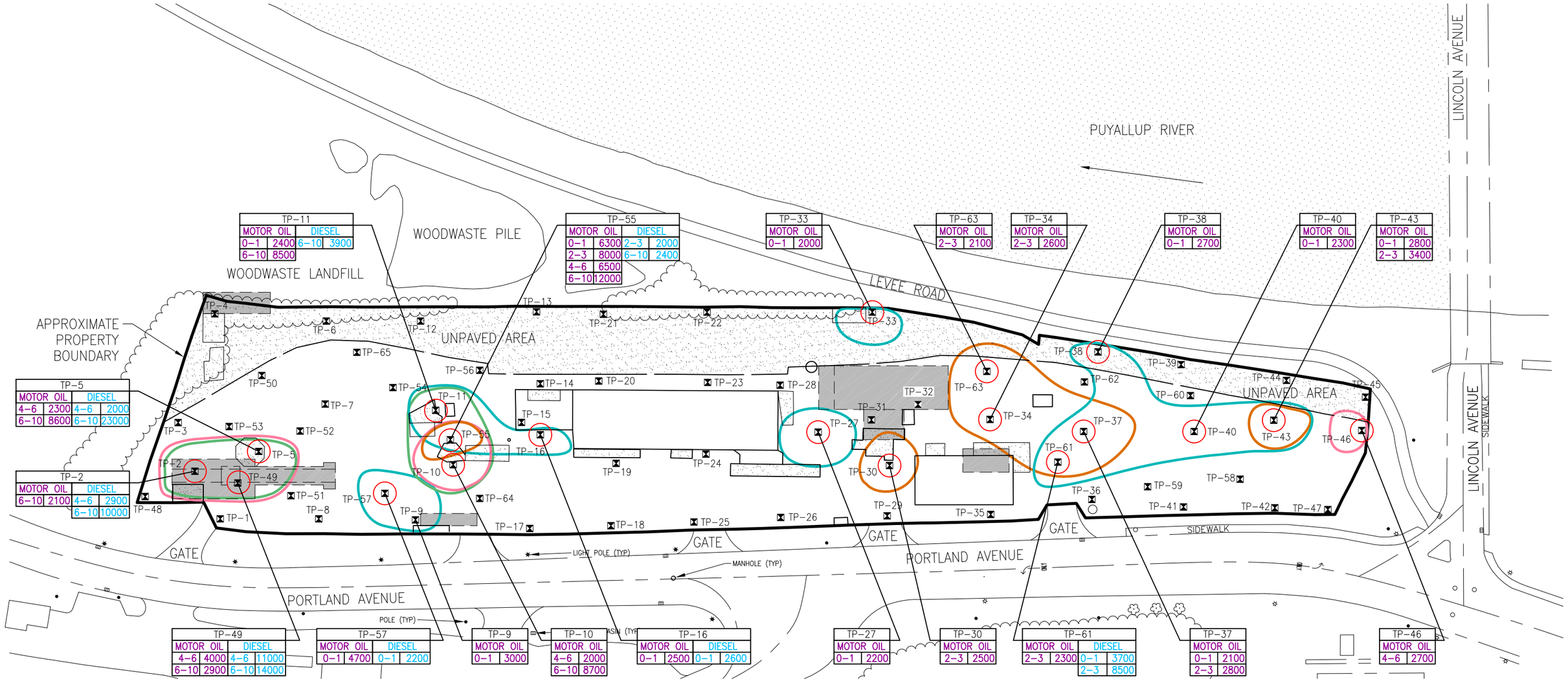
Kennedy/Jenks Consultants

F \ME \ TA MA METAL FA ILITY
TA MA, WA

TOTAL CPAH CONCENTRATIONS IN SOIL

. \ 1 \I U ATE\FI _ 4-

FIGURE 4-3



LEGEND:

TP–1 TEST PIT LOCATION

CONCENTRATIONS EXCEEDING THE TPH SCREENING LEVEL CONCENTRATION OF 2000 mg/kg

TP–57 — TEST PIT DESIGNATION

MOTOR OIL		DIESEL	
0–1	4700	0–1	2200

ANALYTE — DEPTH(ft) — CONCENTRATION(mg/kg)

ANALYTE — DEPTH(ft) — CONCENTRATION(mg/kg)

UNPAVED AREA

APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)

0–1 ft bgs

2–3 ft bgs

4–6 ft bgs

6–10 ft bgs

APPROXIMATE TPH SCREENING LEVEL EXCEEDANCE AREAS. (2000 mg/kg)

NOTES:

1. MAP IS BASED ON SITE SURVEY BY EARTH TECH INC., ON 28 MARCH 2000.
2. FIGURE SHOWS TPH CONCENTRATIONS GREATER THAN OR EQUAL 2000 mg/kg.
3. WHERE DUPLICATE SAMPLES WERE ANALYZED, THE HIGHER CONCENTRATION IS SHOWN.
4. SAMPLES WERE ANALYZED FOR DIESEL– AND OIL–RANGE PETROLEUM HYDROCARBONS BY ECOLOGY METHOD NWTPH–DIESEL (EXTENDED).

N

0 50 100

SCALE: 1=100

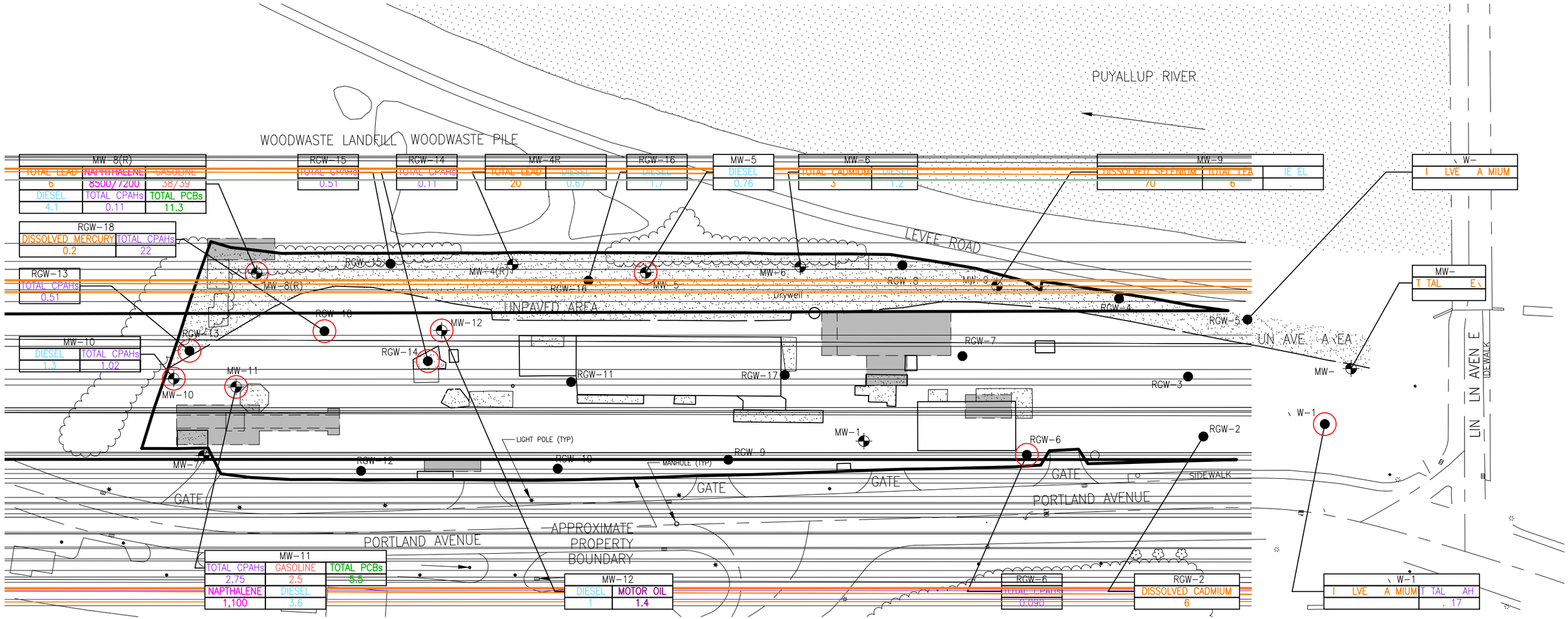
Kennedy/Jenks Consultants

FORMER TACOMA METALS FACILITY
TACOMA, WA

PETROLEUM HYDROCARBON CONCENTRATIONS IN SOIL

996098.00/P01SK004–4

FIGURE 4-4



LEGEND:

MW-1 MONITORING WELL LOCATION
(R) = REPLACEMENT

RECONNAISSANCE GROUNDWATER SAMPLING LOCATION

GROUNDWATER CONCENTRATIONS EXCEEDING CLEANUP LEVELS (MTCA METHOD B, ECOLOGY'S TPH SURFACE WATER AND/OR OTHER ARAR)

WELL DESIGNATION: MW-8(R)

ANALYTE	ANALYTE	ANALYTE	ANALYTE	ANALYTE	ANALYTE
NAPHTHALENE	PCBs	METALS	TOTAL CPAHs	GASOLINE	DIESEL
8500/7200	11.3	6	0.81	38/39	4.1
CONCENTRATION(µg/l)	CONCENTRATION(µg/l)	CONCENTRATION(µg/l)	CONCENTRATION(µg/l)	CONCENTRATION(mg/l)	CONCENTRATION(mg/l)

UNPAVED AREA

APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)

NOTES:

1. MAP IS BASED ON SITE SURVEY BY EARTH TECH INC., ON 28 MARCH 2000.
2. WHERE TWO RESULTS ARE PRESENTED, THE SECOND VALUE IS A DUPLICATE SAMPLE. (FIGURE SHOWS ONLY CONCENTRATIONS EXCEEDING CLEANUP LEVELS.)
3. ANALYTE CONCENTRATIONS REPRESENT THE MAXIMUM DETECTED VALUE REPORTED DURING THE MONITORING EVENTS.
4. THIS MAP WAS UPDATED IN JULY 2013 AT ECOLOGY'S REQUEST BASED ON REVISED TOTAL CPAH VALUES CALCULATED USING TEF METHODOLOGY [WAC 173-340-708(8)(E)] WHICH WAS NOT REQUIRED WHEN THE ORIGINAL RI/FS WAS PERFORMED.

N

1
ALE: 1=1

Kennedy/Jenks Consultants

F ME TA MA METAL FA ILITY
TA MA, WA

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS (WELLS AND RECONNAISSANCE SAMPLES)

. 1 U ATE FI -1

FIGURE 5-1

TABLE 4-1
REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS - METALS
Former Tacoma Metals Facility

Sample Designation	Sample Depth	Sample Date	Total Metals (mg/kg)[a]								
			Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver
TP-1	0-1'	9/27/2000	40	290	8.5	76	873	***2,230***	1.53	<10	1.4
	2-3'	9/27/2000	---[b]	---	---	---	---	120	0.11	---	---
	4-6'	9/27/2000	---	---	---	---	---	90	---	---	---
	6-10'	9/27/2000	---	---	---	---	---	30	---	---	---
TP-2	0-1'	9/27/2000	<10[c]	404	18.2	67	1,090	831	0.88	<10	0.9
	2-3'	9/27/2000	<5	47.2	<0.2	18.6	20	10	0.04	<5	<0.3
	4-6'	9/27/2000	<6	58.1	<0.2	15.4	35.2	85	<0.06	<6	0.4
	6-10'	9/27/2000	<6	53.8	1.1	18.6	79.6	72	0.13	<6	<0.4
TP-3	0-1'	9/27/2000	<5	63.5	2.7	26.9	44.1	46	0.13	<5	<0.3
	2-3'	9/27/2000	---	---	---	---	---	---	---	---	---
	4-6'	9/27/2000	7	63.8	0.4	15.4	33.2	106	0.21	<7	<0.4
	6-10'	9/27/2000	<10	110	<0.5	18	42.4	93	0.13	<10	<0.7
TP-4	0-1'	9/27/2000	30	609	21.6	82	4,650	***1,760***	0.55	<10	1.2
	2-3'	9/27/2000	---	---	8	---	---	443	---	---	---
	4-6'	9/27/2000	---	---	---	---	---	160	---	---	---
	6-10'	9/27/2000	<7	60.1	<0.3	16.9	24.6	9	<0.06	<7	<0.4
TP-5	0-1'	10/4/2000	<5	59.4	<0.2	59.9	28	8	<0.05	5	0.4
	2-3'	10/4/2000	---	---	---	---	---	---	---	---	---
	4-6'	10/4/2000	<6	67.7	<0.3	38.2	37.3	56	0.20	<6	<0.4
	6-10'	10/4/2000	<10	52.3	<0.5	24	56.1	248	0.3	<10	<0.8
TP-6/600[d]	0-1'	10/4/2000	30/30	196/208	5.6/4.9	92/59	711/237	***1,550/*** 867	0.5/0.45	20/20	1.9/2.1
	2-3'	10/4/2000	---	---	---	---	---	54	---	---	---
	4-6'	10/4/2000	---	---	---	---	---	40	---	---	---
	6-10'	10/4/2000	---	---	---	---	---	60	---	---	---
TP-7	0-1'	10/4/2000	10	697	12.3	103	361	796	0.88	8	1.5
	2-3'	10/4/2000	---	---	9	---	---	---	---	---	---
	4-6'	10/4/2000	---	---	---	---	---	---	---	---	---
	6-10'	10/4/2000	---	---	---	---	---	---	---	---	---
TP-8	0-1'	10/4/2000	<5	235	0.9	33.9	41	31	<0.05	<5	0.3
	2-3'	10/4/2000	---	---	---	---	---	---	---	---	---
TP-8/800	4-6'	10/4/2000	<6/<5	38.4/42.1	0.3/<0.2	17.5/15.7	29.6/47.8	25/26	<0.06/<0.05	<6/<5	<0.4/0.7
	6-10'	10/4/2000	---	---	---	---	---	---	---	---	---
TP-9	0-1'	10/5/2000	40	1,990	59	132	1,260	***1,960***	0.90	<30	<2
	2-3'	10/5/2000	---	---	---	---	---	20	---	---	---
	4-6'	10/5/2000	<6	224	2.1	24.2	59.9	93	<0.05	<6	<0.4
	6-10'	10/5/2000	---	---	---	---	---	---	---	---	---
TP-10	0-1'	10/5/2000	<5	218	4.2	49.2	217	460	0.54	7	0.5
	2-3'	10/5/2000	---	---	---	---	---	---	---	---	---
	4-6'	10/5/2000	<5	61	0.7	32.2	60.3	72	0.07	<5	0.3
	6-10'	10/5/2000	<6	49.5	0.4	28.8	29.3	15	<0.06	<6	<0.4
MTCA Method C Industrial Soil Cleanup Levels [e]			219	245,000	3,500	500[f]	130,000	1,000[f]	1,050	17,500	17,500

Analytes detected in samples at concentrations exceeding respective cleanup levels are shown in bold and italics.

TABLE 4-1
REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS - METALS
Former Tacoma Metals Facility

Sample Designation	Sample Depth	Sample Date	Total Metals (mg/kg)[a]								
			Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver
TP-11	0-1'	10/5/2000	<5	254	5.7	54.4	157	202	0.27	5	0.3
	2-3'	10/5/2000	---	---	---	---	---	---	---	---	---
	4-6'	10/5/2000	---	---	---	---	---	---	---	---	---
	6-10'	10/5/2000	<9	164	<0.3	18.4	31.5	57	0.1	<9	<0.5
TP-12	0-1'	10/5/2000	<5	37.5	3.3	19.4	21.3	17	<0.04	<5	<0.3
	2-3'	10/5/2000	---	---	---	---	---	---	---	---	---
	4-6'	10/5/2000	---	---	---	---	---	---	---	---	---
	6-10'	10/5/2000	---	---	---	---	---	---	---	---	---
TP-13	0-1'	10/5/2000	<5	96	3	49.3	266	167	0.71	<5	1
	2-3'	10/5/2000	---	---	---	---	---	---	---	---	---
	4-6'	10/5/2000	---	---	---	---	---	---	---	---	---
	6-10'	10/5/2000	---	---	---	---	---	---	---	---	---
TP-14	0-1'	10/6/2000	<5	41.8	<0.2	22.2	13	8	<0.05	<5	<0.3
	2-3'	10/6/2000	---	---	---	---	---	560	---	---	---
	4-6'	10/6/2000	---	---	---	---	---	20	---	---	---
	6-10'	10/6/2000	<6	84.9	2.3	35.3	78.6	152	0.07	<6	<0.4
TP-15	0-1'	10/6/2000	<5	42.6	<0.2	32.8	29.4	79	<0.04	<5	0.3
	2-3'	10/6/2000	---	---	---	---	---	---	---	---	---
	4-6'	10/6/2000	---	---	---	---	---	---	---	---	---
	6-10'	10/6/2000	---	---	---	---	---	---	---	---	---
TP-16/160	0-1'	10/6/2000	40/30	999/592	45/22	105/85	804/1,210	***2,590/2,040***	1.82/2.19	<30/<30	2/2
	2-3'	10/6/2000	---	---	68	---	---	***8,240***	---	---	---
TP-17	0-1'	10/6/2000	60	272	15	120	2,930	***1,470***	0.4	<50	<3
	2-3'	10/6/2000	---	---	---	---	---	30	---	---	---
	4-6'	10/6/2000	---	---	---	---	---	30	---	---	---
	6-10'	10/6/2000	---	---	---	---	---	20	---	---	---
TP-18	0-1'	10/10/2000	8	107	3.3	26.3	451	311	0.88	<5	0.9
	2-3'	10/10/2000	---	---	---	---	---	---	---	---	---
	4-6'	10/10/2000	---	---	---	---	---	---	---	---	---
	6-10'	10/10/2000	---	---	---	---	---	---	---	---	---
TP-19	0-1'	10/10/2000	20	111	4	46	1,060	204	1.35	<10	3.4
	2-3'	10/10/2000	---	---	---	---	---	---	---	---	---
	4-6'	10/10/2000	---	---	---	---	---	---	---	---	---
	6-10'	10/10/2000	---	---	---	---	---	---	---	---	---
TP-20	0-1'	10/10/2000	<6	35.9	<0.2	22	17.2	6	<0.06	6	<0.3
TP-20/2000[g]	2-3'	10/10/2000	20/<10	304/292	17/26.2	84/83	6,970/4,350	***6,790/10,200***	0.94/0.95	<30/<10	<2/2.8
	4-6'	10/10/2000	---	---	1	---	---	540	---	---	---
	6-10'	10/10/2000	---	---	---	---	---	230	---	---	---
MTCA Method C Industrial Soil Cleanup Levels [e]			219	245,000	3,500	500[f]	130,000	1,000[f]	1,050	17,500	17,500

Analytes detected in samples at concentrations exceeding respective cleanup levels are shown in bold and italics.

TABLE 4-1
REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS - METALS
Former Tacoma Metals Facility

Sample Designation	Sample Depth	Sample Date	Total Metals (mg/kg)[a]								
			Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver
TP-21	0-1'	10/10/2000	70	1,580	66	***574***	12,800	***6,020***	22.4	<30	31
	2-3'	10/10/2000	<300	4,190	130	***1,080***	13,200	***7,570***	10.2	<300	90
	4-6'	10/10/2000	---	---	<1	42	---	20	---	---	---
	6-10'	10/10/2000	---	---	---	---	---	50	---	---	---
TP-22	0-1'	10/10/2000	30	372	51	***2,520***	13,000	***3,180***	5.3	<30	36
	2-3'	10/10/2000	<60	464	52	***913***	20,200	***3,690***	5.1	<60	198
	4-6'	10/10/2000	---	---	---	47	---	360	---	---	---
	6-10'	10/10/2000	---	---	---	---	---	80	---	---	---
TP-23	0-1'	10/11/2000	<5	40.4	<0.2	25.1	21.9	11	<0.04	<5	<0.3
	2-3'	10/11/2000	30	376	15.3	127	1,560	***1,190***	1.21	<10	1.4
	4-6'	10/11/2000	---	---	---	---	---	140	0.19	---	---
	6-10'	10/11/2000	---	---	---	---	---	130	---	---	---
TP-24	0-1'	10/11/2000	6	105	2.3	34.3	539	438	0.7	6	0.5
	2-3'	10/11/2000	---	---	---	---	---	---	---	---	---
	4-6'	10/11/2000	---	---	---	---	---	---	---	---	---
	6-10'	10/11/2000	---	---	---	---	---	---	---	---	---
TP-25	0-1'	10/11/2000	<5	52.5	0.3	28.4	151	48	0.14	<5	<0.3
	2-3'	10/11/2000	---	---	---	---	---	---	---	---	---
	4-6'	10/11/2000	---	---	---	---	---	---	---	---	---
	6-10'	10/11/2000	---	---	---	---	---	---	---	---	---
TP-26	0-1'	10/11/2000	<5	47.4	0.3	30.3	21.6	9	<0.05	<5	<0.3
	2-3'	10/11/2000	---	---	---	---	---	---	---	---	---
	4-6'	10/11/2000	<6	272	0.2	20.8	40.9	17	<0.05	<6	<0.3
	6-10'	10/11/2000	<7	80.1	<0.3	17.3	31.1	13	<0.06	<7	<0.4
TP-27/270	0-1'	10/11/2000	30/40	261/259	6.8/8.4	99/119	577/806	***5,000/14,700***	1.83/1.62	<10/<10	1.2/1.7
	2-3'	10/11/2000	<10	217	6.2	49	3,130	575	1.82	<10	1.3
	4-6'	10/11/2000	---	---	---	---	---	---	<0.06	---	---
	6-10'	10/11/2000	---	---	---	---	---	---	---	---	---
TP-28	0-1'	10/11/2000	20	382	16.5	91	789	***1,430***	1.56	10	1.5
	2-3'	10/11/2000	20	444	16.5	88	3,000	***2,340***	1.12	<10	1.8
	4-6'	10/11/2000	---	---	<1	---	---	<10	<0.05	---	---
	6-10'	10/11/2000	---	---	---	---	---	7	---	---	---
TP-29	0-1'	10/12/2000	5	67.9	0.2	29.7	24.6	16	<0.04	<5	<0.3
	2-3'	10/12/2000	---	---	---	---	---	---	---	---	---
	4-6'	10/12/2000	---	---	---	---	---	---	---	---	---
	6-10'	10/12/2000	---	---	---	---	---	---	---	---	---
TP-30	0-1'	10/12/2000	30	733	59.5	108	1,960	***2,410***	2.06	<10	2.6
	2-3'	10/12/2000	20	805	21.2	90	540	***1,110***	0.57	<10	1.4
	4-6'	10/12/2000	---	---	<1	---	---	<10	---	---	---
	6-10'	10/12/2000	---	---	---	---	---	50	---	---	---
MTCA Method C Industrial Soil Cleanup Levels [e]			219	245,000	3,500	500[f]	130,000	1,000[f]	1,050	17,500	17,500

Analytes detected in samples at concentrations exceeding respective cleanup levels are shown in bold and italics.

TABLE 4-1
REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS - METALS
Former Tacoma Metals Facility

Sample Designation	Sample Depth	Sample Date	Total Metals (mg/kg)[a]								
			Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver
TP-31	0-1'	10/12/2000	<10	558	19.3	58	417	***1,040***	0.63	<10	1
	2-3'	10/12/2000	<10	189	6.4	40	182	387	0.42	<10	0.7
	4-6'	10/12/2000	---	---	---	---	---	---	---	---	---
	6-10'	10/12/2000	---	---	---	---	---	---	---	---	---
TP-32	0-1'	10/12/2000	30	2,010	84	271	3,720	***4,470***	2.36	<30	3
TP-33	0-1'	10/12/2000	40	3,070	89	353	2,970	***6,470***	2.91	<30	5
	2-3'	10/12/2000	---	---	---	---	---	***4,560***	1.69	---	---
	4-6'	10/12/2000	---	---	---	---	---	10	---	---	---
	6-10'	10/12/2000	---	---	---	---	---	70	---	---	---
TP-34/340	0-1'	10/12/2000	<10/<30	196/1,740	4/42	65.6/92	4,030/1,640	***1,530/5,100***	0.93/1.23	<10/<30	1.6/<2
	2-3'	10/12/2000	30	1,400	52	91	1,570	***3,990***	1.08	<30	<2
	4-6'	10/12/2000	---	---	---	---	---	***1,110***	<0.05	---	---
	6-10'	10/12/2000	---	---	---	---	---	40	---	---	---
TP-35	0-1'	10/13/2000	<10	290	8.4	153	1,260	***4,230***	0.52	<10	2.2
	2-3'	10/13/2000	---	---	---	---	---	240	---	---	---
	4-6'	10/13/2000	---	---	---	---	---	30	---	---	---
	6-10'	10/13/2000	---	---	---	---	---	20	---	---	---
TP-36	0-1'	10/13/2000	<10	54.5	0.9	31	39.3	36	0.12	<10	<0.6
	2-3'	10/13/2000	---	---	---	---	---	---	---	---	---
	4-6'	10/13/2000	---	---	---	---	---	---	---	---	---
	6-10'	10/13/2000	<10	31.7	0.5	19	25.3	15	0.06	<10	<0.8
TP-37	0-1'	10/13/2000	30	979	26.6	124	625	***1,900***	4.18	10	1.1
	2-3'	10/13/2000	20	1,630	24.7	112	483	***1,630***	2.66	<10	<0.6
	4-6'	10/13/2000	---	---	<1	---	---	20	<0.05	---	---
	6-10'	10/13/2000	---	---	---	---	---	30	---	---	---
TP-38	0-1'	10/13/2000	60	2,710	125	263	3,320	***9,380***	14.3	30	6
	2-3'	10/13/2000	---	---	---	---	---	70	0.12	---	---
	4-6'	10/13/2000	---	---	---	---	---	50	---	---	---
	6-10'	10/13/2000	---	---	---	---	---	11	---	---	---
TP-39/390	0-1'	10/13/2000	10/<10	110/134	13.2/16.8	30/27	1,100/107	***1,040/*** 374	0.21/0.24	<10/<10	<0.8/<0.7
	2-3'	10/13/2000	---	---	10.4	---	---	---	---	---	---
	4-6'	10/13/2000	---	---	---	---	---	---	---	---	---
	6-10'	10/13/2000	---	---	---	---	---	---	---	---	---
TP-40	0-1'	10/13/2000	60	738	36	***670***	2,530	***3,700***	15	<50	4
	2-3'	10/13/2000	<30	851	40	212	1,240	***2,050***	3.19	<30	3
	4-6'	10/13/2000	<10	126	3.7	31	94	192	0.22	<10	<0.7
	6-10'	10/13/2000	---	---	---	---	---	---	---	---	---
MTCA Method C Industrial Soil Cleanup Levels [e]			219	245,000	3,500	500[f]	130,000	1,000[f]	1,050	17,500	17,500

Analytes detected in samples at concentrations exceeding respective cleanup levels are shown in bold and italics.

TABLE 4-1
REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS - METALS
Former Tacoma Metals Facility

Sample Designation	Sample Depth	Sample Date	Total Metals (mg/kg)[a]								
			Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver
TP-41	0-1'	10/16/2000	<30	38	<1	39	20	20	5.5	<30	<2
	2-3'	10/16/2000	---	---	---	---	---	---	---	---	---
	4-6'	10/16/2000	---	---	---	---	---	---	---	---	---
	6-10'	10/16/2000	---	---	---	---	---	---	---	---	---
TP-42	0-1'	10/16/2000	<30	78	2	31	98	130	4.33	<30	<2
	2-3'	10/16/2000	---	---	---	---	---	---	---	---	---
	4-6'	10/16/2000	---	---	---	---	---	---	---	---	---
	6-10'	10/16/2000	---	---	---	---	---	---	---	---	---
TP-43/430	0-1'	10/16/2000	90/80	1,620/1,400	53/54	***564/566***	5,620/5,000	***5,840/9,370***	47/41	<30/<30	5/6
	2-3'	10/16/2000	80	1,280	46	259	2,520	***12,300***	21	<30	5
	4-6'	10/16/2000	---	---	<1	---	---	10	<0.04	---	---
	6-10'	10/16/2000	---	---	---	---	---	70	---	---	---
TP-44	0-1'	10/13/2000	<10	27.2	0.4	17.2	21.5	13	<0.05	<10	<0.6
	2-3'	10/13/2000	---	---	---	---	---	---	---	---	---
	4-6'	10/13/2000	---	---	---	---	---	---	---	---	---
	6-10'	10/13/2000	---	---	---	---	---	---	---	---	---
TP-45	0-1'	10/16/2000	100	774	30	368	3,560	***4,060***	47	30	7
	2-3'	10/16/2000	---	---	15	---	---	950	16	---	---
	4-6'	10/16/2000	---	---	---	---	---	180	---	---	---
	6'-10'	10/16/2000	---	---	---	---	---	80	---	---	---
TP-46	0-1'	10/16/2000	40	302	15	***721***	1,820	***2,100***	10.6	<30	69
	2-3'	10/16/2000	---	---	9	104	---	970	2.88	---	---
	4-6'	10/16/2000	50	1,910	93	93	1,180	***4,320***	0.83	<30	2
	6'-10'	10/16/2000	---	---	---	0.9	---	82	---	---	---
TP-47	0-1'	10/16/2000	<30	33	<1	25	13	<10	<0.05	<30	<2
	2-3'	10/16/2000	---	---	---	---	---	---	---	---	---
	4-6'	10/16/2000	---	---	---	---	---	---	---	---	---
	6'-10'	10/16/2000	---	---	---	---	---	---	---	---	---
TP-48	0-1'	10/17/2000	40	232	8	52	588	630	0.45	<30	<2
	2-3'	10/17/2000	---	---	---	---	---	---	---	---	---
	4-6'	10/17/2000	---	---	---	---	---	---	---	---	---
	6'-8.5'	10/17/2000	<70	67	<3	18	45	40	<0.1	<70	<4
TP-49	0-1'	10/17/2000	<30	71	1	33	78	150	0.13	<30	<2
	2-3'	10/17/2000	<30	64	<1	20	20	10	<0.05	<30	<2
	4-6'	10/17/2000	<30	78	<1	15	20	150	0.44	<30	<2
	6'-10'	10/17/2000	<50	51	<2	23	942	430	0.12	<50	<3
MTCA Method C Industrial Soil Cleanup Levels [e]			219	245,000	3,500	500[f]	130,000	1,000[f]	1,050	17,500	17,500

Analytes detected in samples at concentrations exceeding respective cleanup levels are shown in bold and italics.

TABLE 4-1
REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS - METALS
Former Tacoma Metals Facility

Sample Designation	Sample Depth	Sample Date	Total Metals (mg/kg)[a]								
			Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver
TP-50/500	0-1'	10/17/2000	<30/<30	208/293	8/18	37/55	1,100/530	380/570	0.49/0.61	<30/<30	<2/<2
	2-3'	10/17/2000	<30	69	<1	44	29	150	<0.05	<30	<2
	4-6'	10/17/2000	---	---	---	---	---	---	---	---	---
	6'-10'	10/17/2000	---	---	---	---	---	---	---	---	---
TP-51	0-1'	11/14/2000	<30	73	<1	34	61	100	0.05	<30	<2
	2-3'	11/14/2000	---	---	---	---	---	---	---	---	---
	4-6'	11/14/2000	---	---	---	---	---	---	---	---	---
	6'-10'	11/14/2000	---	---	---	---	---	---	---	---	---
TP-52	0-1'	11/14/2000	<20	50	<1.0	27	38.2	38	0.06	<20	<1
	2-3'	11/14/2000	---	---	---	---	---	---	---	---	---
	4-6'	11/14/2000	---	---	---	---	---	---	---	---	---
	6'-10'	11/14/2000	---	---	---	---	---	---	---	---	---
TP-53	0-1'	11/14/2000	<30	63	<1	31	40	20	0.05	<30	<2
	2-3'	11/14/2000	---	---	---	---	---	---	---	---	---
	4-6'	11/14/2000	---	---	---	---	---	---	---	---	---
	6'-10'	11/14/2000	---	---	---	---	---	---	---	---	---
TP-54	0-1'	11/14/2000	<30	242	8	48	273	410	0.98	<30	<2
	2-3'	11/14/2000	---	---	---	---	---	---	---	---	---
	4-6'	11/14/2000	---	---	---	---	---	---	---	---	---
	6'-10'	11/14/2000	---	---	---	---	---	---	---	---	---
TP-55	0-1'	11/14/2000	<30	1,080	29	117	465	***1,750***	0.83	<30	<2
	2-3'	11/14/2000	---	---	21.1	---	---	772	---	---	---
	4-6'	11/14/2000	---	---	---	---	---	106	---	---	---
	6'-10'	11/14/2000	---	---	---	---	---	70	---	---	---
TP-56	0-1'	11/14/2000	<30	63	2	31	88	70	0.12	<30	<2
	2-3'	11/14/2000	---	---	---	---	---	---	---	---	---
	4-6'	11/14/2000	---	---	---	---	---	---	---	---	---
	6'-10'	11/14/2000	---	---	---	---	---	---	---	---	---
TP-57	0-1'	11/14/2000	60	2,740	70	145	7,410	***2,710***	0.6	40	<2
	2-3'	11/14/2000	---	---	1.7	---	---	28	---	---	---
	4-6'	11/14/2000	---	---	---	---	---	80	---	---	---
	6'-10'	11/14/2000	---	---	---	---	---	23	---	---	---
TP-58	0-1'	11/15/2000	<30	45	<1	29	21	<10	0.06	<30	<2
	2-3'	11/15/2000	<30	602	17	105	2,070	***2,340***	62	<30	<2
	4-6'	11/15/2000	---	---	<0.5	---	---	9	---	---	---
	6'-10'	11/15/2000	---	---	---	---	---	70	---	---	---
TP-59	0-1'	11/15/2000	40	871	34	173	3,010	***2,250***	1.55	<30	2
	2-3'	11/15/2000	<30	194	9	35	388	350	0.22	<30	<2
	4-6'	11/15/2000	---	---	---	---	---	---	---	---	---
	6-10'	11/15/2000	---	---	---	---	---	---	---	---	---
MTCA Method C Industrial Soil Cleanup Levels [e]			219	245,000	3,500	500[f]	130,000	1,000[f]	1,050	17,500	17,500

Analytes detected in samples at concentrations exceeding respective cleanup levels are shown in bold and italics.

TABLE 4-1
REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS - METALS
Former Tacoma Metals Facility

Sample Designation	Sample Depth	Sample Date	Total Metals (mg/kg)[a]								
			Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver
TP-60	0-1'	11/15/2000	50	1,050	30	225	2,330	***10,800***	77	40	2
	2-3'	11/15/2000	<30	1,410	20	99	773	***3,260***	1.41	<30	<2
	4-6'	11/15/2000	---	---	0.9	---	---	116	0.08	---	---
	6-10'	11/15/2000	---	---	---	---	---	49	---	---	---
TP-61	0-1'	11/15/2000	<30	377	10	53	356	***4,180***	0.76	<30	<2
	2-3'	11/15/2000	<30	352	1	25	40	80	0.23	<30	<2
	4-6'	11/15/2000	---	---	---	---	---	---	---	---	---
	6-10'	11/15/2000	---	---	---	---	---	---	---	---	---
TP-62	0-1'	11/15/2000	<30	201	5	72	208	420	0.92	<30	2
	2-3'	11/15/2000	<30	265	11	283	407	800	2.05	<30	<2
	4-6'	11/15/2000	---	---	<0.5	---	---	---	<0.04	---	---
	6-10'	11/15/2000	---	---	---	---	---	---	---	---	---
TP-63	0-1'	11/15/2000	<30	584	38	61	304	700	0.37	<30	<2
	2-3'	11/15/2000	<30	637	50	64	299	***1,800***	0.24	30	<2
	4-6'	11/15/2000	---	---	0.7	---	---	123	---	---	---
	6-10'	11/15/2000	---	---	---	---	---	102	---	---	---
TP-64	0-1'	11/15/2000	<30	163	5	31	459	450	0.98	<30	<2
	2-3'	11/15/2000	---	---	---	---	---	---	---	---	---
	4-6'	11/15/2000	---	---	---	---	---	---	---	---	---
	6-10'	11/15/2000	---	---	---	---	---	---	---	---	---
TP-65	0-1'	11/15/2000	<30	58	<1	28	19	<10	0.05	<30	<2
	2-3'	11/15/2000	---	---	---	---	---	---	---	---	---
	4-6'	11/15/2000	---	---	---	---	---	---	---	---	---
	6-10'	11/15/2000	---	---	---	---	---	---	---	---	---
MTCA Method C Industrial Soil Cleanup Levels [e]			219	245,000	3,500	500[f]	130,000	1,000[f]	1,050	17,500	17,500

Analytes detected in samples at concentrations exceeding respective cleanup levels are shown in bold and italics.

Notes
(a) Soil samples were analyzed for total metals by EPA Methods 6010/7000 series.
(b) "---" Sample not tested for selected analyte.
(c) "<" denotes analyte was not detected at the indicated reporting limit.
(d) Second number signifies analysis of duplicate sample.
(e) MTCA Method C industrial soil cleanup levels are based on CLARC II, dated February 1996.
(f) Method A industrial soil cleanup levels (WAC 173-340-745) used where Method C soil industrial cleanup levels are not available.
(g) TP-20/2000-2-3 was re-analyzed for lead and arsenic due to suspected sample homogeneity issues. (The re-analysis result is presented in this table).

mg/kg - milligrams per kilogram

TABLE 4-2
REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS - PCBs
Former Tacoma Metals Facility

Sample Designation	Sample Depth	PCBs (mg/kg)[a]							Total PCBs[b]
		Aroclor 1016	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1221	Aroclor 1232	
TP-1	0-1'	<0.036[c]	<0.036	<0.036	0.64	0.50	<0.073	<0.036	1.25
TP-3	0-1'	<0.035	<0.035	<0.035	0.17	0.061	<0.070	<0.035	0.336
TP-4	0-1'	<0.037	<0.037	1.1	4.7	2.4	<0.073	<0.037	8.3
	2-3'	<0.035	<0.035	0.390	1.4	0.970	<0.071	<0.035	2.85
TP-5	0-1'	<0.036	<0.036	<0.036	<0.036	<0.036	<0.073	<0.036	0.145
TP-6	0-1'	<0.036	<0.036	0.110	0.360	0.300	<0.073	<0.036	0.86
	2-3'	<0.035	<0.035	0.018J	0.050	0.028J	<0.069	<0.035	0.183
TP-7	0-1'	<0.370	<0.370	4.3	7.7	2.7	<0.740	<0.370	0.186
	2-3'	<0.036	<0.036	2.1	5.2	1.9	<0.071	<0.036	9.28
TP-9	0-1'	<0.040	0.53	<0.040	0.87	1.1	<0.081	<0.040	2.6
TP-10	0-1'	<0.037	<0.037	0.56	0.65	0.29	<0.073	<0.037	1.6
	2-3'	<0.037	<0.037	<0.037	0.045	<0.037	<0.074	<0.037	0.17
TP-11	0-1'	<0.036	<0.036	0.52	1.5Y	1.1	<0.073	<0.036	3.21
TP-12	0-1'	<0.035	<0.035	0.031J	0.063	0.030J	<0.069	<0.035	0.211
	2-3'	<0.034	<0.034	0.150	0.430	0.170	<0.068	<0.034	0.835
TP-13	0-1'	<0.034	<0.034	<0.034	1	2	<0.069	<0.034	3.1
TP-14	0-1'	<0.034	<0.034	<0.034	<0.034	<0.034	<0.069	<0.034	0.14
	2-3'	<0.037	<0.037	0.098Y	0.60	0.26	<0.073	<0.037	1.05
TP-15	0-1'	<0.035	<0.035	<0.035	0.043	0.058	<0.070	<0.035	0.206
TP-16/160[d]	0-1'	<1.1/<0.040	<1.1/<0.040	1.0J/0.39	3.1/1.9	4.6/2.7	<2.3/<0.080	<1.1/<0.040	11.5/5.09
TP-17	0-1'	<0.035	<0.035	0.43	0.67	1.6	<0.071	<0.035	2.79
TP-19	0-1'	<0.038	<0.038	<0.038	0.057	0.060	<0.076	<0.038	0.231
TP-20	0-1'	<0.035	<0.035	<0.035	0.020J	0.023J	<0.070	<0.035	0.148
	2-3'	<0.036	<0.036	0.180Y	0.970	0.320	<0.072	<0.036	1.56
TP-21	0-1'	<0.041	<0.041	1.4	6.9	5.2	<0.082	<0.041	13.6
	2-3'	<0.040	0.088	<0.040	2.3	1.1	<0.080	<0.040	3.6
TP-22	0-1'	<0.042	<0.042	0.43Y	1.4	0.66	<0.083	<0.042	2.59
	2-3'	<0.041	<0.041	0.520Y	1.3	0.990	<0.083	<0.041	2.91
TP-23	0-1'	<0.035	<0.035	<0.035	0.019J	0.020J	<0.070	<0.035	0.144
TP-25	0-1'	<0.036	<0.036	0.042	0.043	0.048	<0.072	<0.036	0.223
TP-27/270[d]	0-1'	<0.038/<0.039	<0.038/<0.039	0.14/0.14	0.53/0.49	0.94/0.93	<0.077/<0.077	<0.038/<0.039	1.7/1.66
TP-29	0-1'	<0.036	<0036	<0.036	<0.036	0.024J	<0.071	<0.036	0.15
TP-31	0-1'	<0.037	<0.037	0.15	0.71	0.76	<0.074	<0.037	1.71
TP-33	0-1'	<0.037	<0.037	0.52	1.7	1.2	<0.075	<0.037	3.51
TP-34[e]	0-1'	<0.040	<0.040	0.12	0.57	0.5	<0.080	<0.040	1.3
	2-3'	<0.041	<0.041	0.11	0.51	0.40	<0.081	<0.041	1.12
TP-35	0-1'	<0.036	<0.036	<0.036	0.21	0.30	<0.073	<0.036	0.619
TP-36	0-1'	<0.037	<0.037	0.031J	0.056	0.060	<0.074	<0.037	0.24
TP-37	0-1'	<0.037	<0.037	0.46	1.5	1.3	<0.074	<0.037	3.35
TP-39/390[d]	0-1'	<0.035/<0.042	<0.035<0.042	<0.035<0.042	2.7/1.5	<0.035/<0.042	<0.069/<0.084	<0.035/<0.042	2.82/1.65
TP-40	0-1'	<0.038	<0.038	3.7Y	18	6	<0.077	<0.038	***27.8***
	2-3'	<0.038	<0.038	0.600Y	3.2	1.7	<0.076	<0.038	5.6
MTCA Method C Industrial Soil Cleanup Levels[f]		NA[g]	NA	NA	NA	NA	NA	NA	**17**

Analytes detected in samples at concentrations exceeding cleanup levels or comparison values are shown in bold and italics.

TABLE 4-2
REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS - PCBs
Former Tacoma Metals Facility

Sample Designation	Sample Depth	PCBs (mg/kg)[a]							Total PCBs[b]
		Aroclor 1016	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1221	Aroclor 1232	
TP-41	0-1'	<0.035	<0.035	<0.035	0.049	0.021J	<0.070	<0.035	0.175
TP-43/430[d]	0-1'	<0.48/<0.46	<0.48/<0.46	2.6Y/2.2Y	14/11	6.8/5.8	<0.95/<0.92	<0.48/<0.46	***23.9/20.2***
	2-3'	<0.47	<0.47	1.9Y	8.1	8.6	<0.93	<0.47	***19.8***
	4-6'	<0.036	<0.036	<0.036	0.036J	<0.036	<0.072	<0.036	0.162
TP-44	0-1'	<0.035	<0.035	<0.035	<0.035	<0.035	<0.070	<0.035	0.14
TP-45	0-1'	<0.46	<0.46	1.9Y	12	9.5	<0.92	<0.46	***24.6***
	2-3'	<0.88	<0.88	<0.88	7	4.6	<1.8	<0.88	14.26
TP-46	0-1'	<0.036	<0.036	0.90Y	8.3	4.3	<0.073	<0.036	13.6
	2-3'	<0.038	<0.038	<0.038	0.051	<0.038	<0.076	<0.038	0.184
TP-47	0-1'	<0.037	<0.037	<0.037	<0.037	<0.037	<0.075	<0.037	0.149
TP-49	0-1'	<0.035	<0.035	<0.035	0.190	0.130	<0.070	<0.035	0.425
TP-50	0-1'	<0.036	<0.036	0.87	5.3	1.3	<0.071	<0.036	7.6
	2-3'	<0.037	<0.037	<0.037	0.036J	<0.037	<0.073	<0.037	0.165
TP-51	0-1'	<0.036	<0.036	0.043	0.14	0.14	<0.072	<0.036	0.413
TP-53	0-1'	<0.035	<0.035	<0.035	0.054	0.046	<0.070	<0.035	0.205
TP-55	0-1'	<0.036	<0.036	0.83	3	1.5	<0.073	<0.036	5.42
TP-57	0-1'	0.71Y	<0.041	1.4	1.2	0.29	<0.082	<0.041	3.68
TP-59	0-1'	<0.038	<0.038	13	9.8	2.1	<0.076	<0.038	***25***
	2-3'	<0.036	<0.036	0.38	0.55	0.20	<0.072	<0.036	1.22
TP-60	0-1'	<0.93	<0.93	<0.93	29	8.3	<1.9	<0.93	***40.11***
	2-3'	<0.045	<0.045	0.12Y	1.1	0.58	<0.090	<0.045	1.913
TP-61	0-1'	<0.036	<0.036	0.71	1.9	0.83	<0.072	<0.036	3.53
TP-63	0-1'	<0.036	<0.036	0.33Y	2.6	0.35	<0.072	<0.036	3.37
TP-65	0-1'	<0.036	<0.036	<0.036	0.020J	<0.036	<0.071	<0.036	0.146
MTCA Method C Industrial Soil Cleanup Level[f]		NA[g]	NA	NA	NA	NA	NA	NA	**17**

Analytes detected in samples at concentrations exceeding cleanup levels or comparison values are shown in bold and italics.

Notes:
(a) Samples were analyzed for polychlorinated biphenyls (PCBs) by EPA Method 8082.
(b) The total PCBs were calculated by summing the concentrations of all the probable PCBs. If a probable PCB was not detected, a value equal to one-half the reporting limit was used.
(c) "<" denotes analyte was not detected at the indicated reporting limit.
(d) Duplicate sample.
(e) Analytical report reads TP-34 as TP-340.
(f) MTCA Method C industrial soil cleanup levels based on CLARC II, dated February 1996.
(g) "NA" = No cleanup level available.

Qualifiers:
J - Indicates as estimated value of analyte found and confirmed by analyst but with low spectral match.
Y - Indicates raised reporting limit due to background interference.

mg/kg - milligrams per kilogram

TABLE 4-3

REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS - PAHs
Former Tacoma Metals Facility

Sample Designation	Sample Date	PAHs (mg/kg)[a]									cPAHs(mg/kg)[a][b]							
		Naphth-alene	Acenaph-thlyene	Acenaph-thene	Fluorene	Phenan-threne	Anth-racene	Fluoran-thene	Pyrene	Benzo (g,h,i) perylene	Chrysene	Benzo (b)-fluoranthene	Benzo (k)-fluoranthene	Benzo (a)-pyrene	Indeno (1,2,3-cd) pyrene	Dibenz (a,h)-anthracene	Benzo (a)-anthracene	Total cPAHs[b]
TP-2-6-10	9/27/2000	440	7.1	240	200	460	380	370	430	34	***230***	***90***	***110***	***110***	***33***	17	***140***	***151***
TP-5-6-10	10/4/2000	41	19	260	360	750	750	470	400	39	***190***	***93***	***80***	***95***	***35***	16	***130***	***132***
TP-9-0-1	10/4/2000	0.35	0.014J	0.028	0.028	0.16	0.067	0.27	0.24	0.17	0.28	0.17	0.12	0.14	0.094	0.035	0.15	0.200
TP-10-6-10	10/5/2000	0.011J	0.0068J	0.023	0.014J	0.023	0.014J	0.032M	0.018J	0.041M	0.038	0.036M	0.023MJ	0.025	0.018JM	0.0091MJ	0.020MJ	0.0360
TP-11-6-10	10/5/2000	0.7J	0.16J	1.6	1.4	2.7	0.86M	4.6	2.8	0.55J	1.8	1	0.78J	0.94	0.55J	0.16MJ	1.2	1.33
TP-16-0-1	10/6/2000	0.99	18	1.8	1	2.2	1.8	6.9	6.2	3.5	4.3	4.5	5.6	7	3.8	1.4	3.8	8.95
TP-27-0-1	10/11/2000	0.08	0.025	0.011MJ	0.011J	0.13	0.034	0.15	0.19	0.22	0.27	0.19	0.12	0.14	0.16	0.048	0.11	0.206
TP-30-2-3	10/12/2000	0.14	0.11	0.053J	0.091	0.5	0.2	0.84	0.95	0.49	1.9	0.82	0.44	0.52	0.38	0.12	0.5	0.765
TP-33-0-1	10/12/2000	0.31	0.067J	0.075	0.097	0.51	0.17	0.6	0.94	0.49	0.65	0.46	0.39	0.49	0.34	0.12	0.36	0.664
TP-34-2-3	10/12/2000	0.95	0.1	1.9	0.91	4.3	1.3	4.7	4	0.93	4.2	2	1.1	1.3	0.79	0.24	1.9	1.95
TP-37-2-3	10/13/2000	0.3	0.094	0.078	0.2	1.1	0.34	1.9	2	1.2	1.2	1.1	0.75	1	0.87	0.27	0.81	1.39
TP-38-0-1	10/13/2000	0.3	0.24	0.59	0.51	4.2	1	5.1	4.9	2	3.2	2	2.1	2.4	2	0.59	2.5	3.35
TP-40-0-1	10/13/2000	0.98	3.8	0.74	1.4	17	4.7	43	51	13	***41***	***24***	***23***	***28***	14	4.8	***33***	***38.3***
TP-43-2-3	10/16/2000	0.29	0.34	0.31	0.25	2.3	0.83	3.6	2.6	1.3	2.2	1.5M	1.4	1.7	1.1	0.44	1.6	2.33
TP-46-4-6	10/16/2000	0.21	0.055J	0.055J	0.063J	0.35	0.11	0.62	0.43	0.35	0.45	0.3M	0.3M	0.31M	0.2	0.094	0.25	0.429
TP-49-6-10	10/17/2000	8.4	16	440	390	1,300	250	810	620	38	***230***	***73***	***54***	***82***	***31***	14M	***150***	***117***
TP-55-6-10	11/14/2000	<1.3[c]	<1.3	3.9	3.6	7.0	1.4	4.6	3.1	<1.3	1.7M	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	0.992
TP-57-0-1	11/14/2000	0.68	<0.081	<0.081	<0.081	0.26	<0.081	0.53	0.63	0.31M	0.32M	0.31M	0.22	0.25	0.19	<0.081	0.22	0.351
TP-61-2-3	11/15/2000	2.8	0.67	0.68M	1.7	7.2	2.5M	9.3	7.8	1.1	4.9	2.9	2.7	2.9	1.6	0.61M	4.1	4.14
MTCA Method C Industrial Soil Cleanup Level[d]		1.40E+05	NA[e]	2.10E+05	1.40E+05	NA	1.05E+06	1.40E+05	1.05E+05	NA	18	18	18	18	18	18	18	18

Analytes detected in samples at concentrations exceeding cleanup levels or comparison values are shown in bold and italics.

Notes:
(a) Samples were analyzed for polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270B GC/MS-SIM.
(b) Total cPAHs were calculated using the toxicity equivalency factor (TEF) methodology described in MTCA [WAC 173-340-708(8)(e)].
For non-detected cPAH analytes, the TEF factor (listed below) was applied to a value of one-half the laboratory reporting limit prior to summation.
TEF = 1.0 for benzo(a)pyrene
TEF = 0.1 for benzo(a)anthracene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, benzo(a)-fluoranththene, and benzo(k)- fluoranththene
TEF = 0.01 for chrysene
(c) "<" denotes analyte was not detected at the indicated reporting limit.
(d) MTCA Method C industrial soil cleanup levels based on CLARC II, dated February 1996.
(e) "NA" = No cleanup level is available.
mg/kg = milligrams per kilogram

Qualifiers:
M - Indicates an estimated value of analyte found and confirmed by analyst but with low spectral match.
J - Indicates an estimated concentration when the value is less than the calculated reporting limit.

NOTE: This table was upated in July 2013 at Ecology's request based on the revised methodology (i.e., TEF summation) for calculation of total cPAHs which was not required when the original RI/FS was performed. No values other than total cPAHs were revised from the orginal table produced in October 2001.

TABLE 4-4

REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS - TPHs AND VOCs
Former Tacoma Metals Facility

			TPHs (mg/kg)[a]		Volatile Organic Compounds (µg/kg)[b]																				
Sample Designation	Sample Depth (ft)	Collection Date	TPH-Diesel	TPH-motor oil	Benzene	Toluene	Ethyl-benzene	Total[c] Xylenes	Acetone	1,1-Di-chloro-ethene	1,1-Di-chloro-ethane	Cis-1,2-di-chloro-ethene	Chloro-form	2-Butanone	1,1,1-Tri-chloro-ethane	Trichloro-ethene	Tetrachloro-ethene	1,1,2-Tri-chloro-fluoroethane	1,3,5-Tri-methyl-benzene	1,2,4-Tri-methyl-benzene	Hexa-chlorobut-adiene	4-Isopropyl-toluene	Styrene	Naphthalene	Isopropy-benzene
TP-1	0-1'	9/27/2000	560	1,200	---[d]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	9/27/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	9/27/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	9/27/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-2	0-1'	9/27/2000	130	400	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	9/27/2000	1,700	1,200	3.6	120	6	14.4	200B	<1.2[e]	<1.2	<1.2	<1.2	47	<1.2	<1.2	<1.2	<1.2	3	7.1	<6	<1.2	2.4	120	<1.2
	4-6'	9/27/2000	***2,900***	1,700	58	850	140	410	460B	<1.5	<1.5	<1.5	<1.5	120	<1.5	<1.5	<1.5	<1.5	520	1,400	<7.3	91	12M	120,000	55
	6-10'	9/27/2000	***10,000***	***2,100***	73	430	870	3,600	940J	<1.6	<1.6	<1.6	<1.6	110	<1.6	<1.6	<1.6	<1.6	2,800	6,200	<7.9	1,600	<1.6	390,000	480
TP-3	0-1'	9/27/2000	14	26	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	9/27/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	9/27/2000	1,300	1,200	<1.8	830	<1.8	<38	530	<1.8	<1.8	<1.8	<1.8	73	<1.8	<1.8	<1.8	<1.8	<19	<19	<9.2	<1.8	<19	130	<1.8
	6-10'	9/27/2000	280	240	<3.3	8	4.60	27	200	<3.3	<3.3	<3.3	<3.3	27	<3.3	<3.3	<3.3	<3.3	18	42	<17	27	<3.3	210	12
TP-4	0-1'	9/27/2000	270	530	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	9/27/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	9/27/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	9/27/2000	67	31	<1.7	7.30	<1.7	<3.4	<8.6	<1.7	<1.7	<1.7	<1.7	<8.6	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<8.6	<1.7	<1.7	8.60	<1.7
TP-5	0-1'	10/4/2000	18	21	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/4/2000	81	75	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/4/2000	***2,000***	***2,300***	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/4/2000	***23,000***	***8,600***	<230	1,200	<230	<230	<1,200	<230	<230	<230	<230	<1,200	<230	<230	<230	<230	360	660	<1,200	750	<230	26,000	<230
TP-6/600[f]	0-1'	10/4/2000	160/190	210/220	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/4/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/4/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/4/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-7	0-1'	10/4/2000	330	760	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/4/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/4/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/4/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-8	0-1'	10/4/2000	440	1,200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/4/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-8/800[f]	4-6'	10/4/2000	32/34	49/70	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/4/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-9	0-1'	10/4/2000	1,900	***3,000***	<140	98J	<140	<140	<700	<140	<140	<140	<140	<700	<140	<140	<140	<140	490	220	<700	74J	<140	710	<140
	2-3'	10/4/2000	54	72	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/4/2000	160	250	<7.0	130	<7.0	<7.0	<35	<7.0	<7.0	<7.0	<7.0	<35	<7.0	<7.0	<7.0	<7.0	6.9J	6.8J	<35	<7.0	<7.0	<35	<7.0
	6-10'	10/4/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-10	0-1'	10/4/2000	64	260	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/5/2000	43	280	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/5/2000	440	***2,000***	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/5/2000	1,400	***8,700***	<150	1,800	<150	<150	<770	<150	<150	<150	<150	<770	<150	<150	<150	<150	<150	<150	<770	<150	<150	<770	<150
TP-11	0-1'	10/5/2000	800	***2,400***	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/5/2000	440	540	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/5/2000	870	610	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/5/2000	***3,900***	***8,500***	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-12	0-1'	10/5/2000	17	17	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/5/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/5/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/5/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MTCA Method C Industrial[g] Soil Cleanup Levels			2,000[h]	2,000[h]	4.53E+06	7.00E+08	3.50E+08	7.00E+09	3.50E+08	2.19E+05	3.50E+08	3.50E+07	2.15E+07	NA[i]	3.15E+09	1.19E+04	2.57E+06	NA	NA	NA	7.00E+05	NA	4.38E+06	1.40E+05	NA

Analytes detected in samples at concentrations exceeding cleanup levels or comparison values are shown in bold and italics.

TABLE 4-4

REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS - TPHs AND VOCs
Former Tacoma Metals Facility

			TPHs (mg/kg)[a]		Volatile Organic Compounds (µg/kg)[b]																				
Sample Designation	Sample Depth (ft)	Collection Date	TPH-Diesel	TPH-motor oil	Benzene	Toluene	Ethyl-benzene	Total[c] Xylenes	Acetone	1,1-Di-chloro-ethene	1,1-Di-chloro-ethane	Cis-1,2-di-chloro-ethene	Chloro-form	2-Butanone	1,1,1-Tri-chloro-ethane	Trichloro-ethene	Tetrachloro-ethene	1,1,2-Tri-chloro-fluoroethane	1,3,5-Tri-methyl-benzene	1,2,4-Tri-methyl-benzene	Hexa-chlorobut-adiene	4-Isopropyl-toluene	Styrene	Naphthalene	Isopropy-benzene
TP-13	0-1'	10/5/2000	27	59	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/5/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/5/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/5/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-14	0-1'	10/6/2000	<5.2	15	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/6/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/6/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/6/2000	48	110	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-15	0-1'	10/6/2000	13	30	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/6/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/6/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/6/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-16/160[f]	0-1'	10/6/2000	***2,600/*** 300	***2,500/*** 890	<9.9/<9.1	720/380	15/<9.1	20/<9.1	140B/<45	<9.9/<9.1	<9.9/<9.1	<9.9/<9.1	<9.9/<9.1	<49/<45	<9.9/<9.1	<9.9/<9.1	<9.9/<9.1	<9.9/<9.1	83/<9.1	90/<9.1	<49/<45	44/<9.1	<9.9/<9.1	400Y/<45	<9.9/<9.1
	2-3'	10/6/2000	940	1,400	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-17	0-1'	10/6/2000	300	1,200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/6/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/6/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/6/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-18	0-1'	10/10/2000	55	160	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/10/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/10/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/10/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-19	0-1'	10/10/2000	75	220	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/10/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/10/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/10/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-20	0-1'	10/10/2000	<5.2	<10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-20/2000[f]	2-3'	10/10/2000	130/140	380/410	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/10/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/10/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-21	0-1'	10/10/2000	200	660	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/10/2000	100	240	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/10/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/10/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-22	0-1'	10/10/2000	60	250	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/10/2000	48	170	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/10/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/10/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-23	0-1'	10/11/2000	<5.2	17	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/11/2000	260	970	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/11/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/11/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-24	0-1'	10/11/2000	28	130	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/11/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/11/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/11/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MTCA Method C Industrial[g] Soil Cleanup Levels			2,000[h]	2,000[h]	4.53E+06	7.00E+08	3.50E+08	7.00E+09	3.50E+08	2.19E+05	3.50E+08	3.50E+07	2.15E+07	NA[i]	3.15E+09	1.19E+04	2.57E+06	NA	NA	NA	7.00E+05	NA	4.38E+06	1.40E+05	NA

Analytes detected in samples at concentrations exceeding cleanup levels or comparison values are shown in bold and italics.

TABLE 4-4

REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS - TPHs AND VOCs
Former Tacoma Metals Facility

			TPHs (mg/kg)[a]		Volatile Organic Compounds (µg/kg)[b]																				
Sample Designation	Sample Depth (ft)	Collection Date	TPH-Diesel	TPH-motor oil	Benzene	Toluene	Ethyl-benzene	Total[c] Xylenes	Acetone	1,1-Di-chloro-ethene	1,1-Di-chloro-ethane	Cis-1,2-di-chloro-ethene	Chloro-form	2-Butanone	1,1,1-Tri-chloro-ethane	Trichloro-ethene	Tetrachloro-ethene	1,1,2-Tri-chloro-fluoroethane	1,3,5-Tri-methyl-benzene	1,2,4-Tri-methyl-benzene	Hexa-chlorobut-adiene	4-Isopropyl-toluene	Styrene	Naphthalene	Isopropy-benzene
TP-25	0-1'	10/11/2000	58	380	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/11/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/11/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/11/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-26	0-1'	10/11/2000	6.4	15	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/11/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/11/2000	120	470	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/11/2000	26	78	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-27/270[f]	0-1'	10/11/2000	610/670	***2,000/2,200***	<5.7/<5.0	320/270	<5.7/<5.0	<11.4/<10	<28/<25	<5.7/<5.0	<5.7/<5.0	<5.7/<5.0	<5.7/<5.0	<28/<25	<5.7/<5.0	<5.7/<5.0	<5.7/<5.0	<5.7/<5.0	<5.7/<5.0	<5.7/<5.0	<28/<25	<5.7/<5.0	<5.7/<5.0	<28/<25	<5.7/<5.0
	2-3'	10/11/2000	120	430	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/11/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/11/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-28	0-1'	10/11/2000	190	940	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/11/2000	930	1,000	<5.5	150	<5.5	<11	<28	<5.5	<5.5	<5.5	<5.5	<28	<5.5	<5.5	<5.5	<5.5	<5.5	<5.5	<28	<5.5	<5.5	<28	<5.5
	4-6'	10/11/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/11/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-29	0-1'	10/12/2000	39	320	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/12/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/12/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/12/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-30	0-1'	10/12/2000	330	1,800	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/12/2000	700	***2,500***	<4.8	640	<4.8	16.4	130	<4.8	<4.8	<4.8	<4.8	<24	<4.8	<4.8	<4.8	<4.8	150	180	<24	<4.8	<4.8	<24	35
	4-6'	10/12/2000	8.5	15	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/12/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-31	0-1'	10/12/2000	490	1,300	<4.7	640	<4.7	<9.4	92	<4.7	<4.7	<4.7	<4.7	<23	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<23	7.6	<4.7	<23	<4.7
	2-3'	10/12/2000	290	610	<5.5	170	<5.5	6.6	76	<5.5	<5.5	<5.5	<5.5	<27	<5.5	<5.5	<5.5	<5.5	14	22	<27	<5.5	<5.5	<27	<5.5
	4-6'	10/12/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/12/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-32	0-1'	10/12/2000	450	1,700	<5.1	780	<5.1	13.7	300	<5.1	<5.1	<5.1	<5.1	45	<5.1	<5.1	<5.1	<5.1	9	12	<25	<5.1	<5.1	<25	<5.1
TP-33	0-1'	10/12/2000	970	***2,000***	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/12/2000	420	1,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/12/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/12/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-34/340[f]	0-1'	10/12/2000	350/460	1,100/1,400	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/12/2000	710	***2,600***	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/12/2000	59	160	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/12/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-35	0-1'	10/13/2000	190	350	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/13/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/13/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/13/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-36	0-1'	10/13/2000	15	56	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/13/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/13/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/13/2000	280	220	<4.3	84	3.0J	<8.6	30B	<4.3	<4.3	<4.3	<4.3	<22	<4.3	<4.3	<4.3	<4.3	10	6.2	<22	7.4	<4.3	150	2.2J
MTCA Method C Industrial[g] Soil Cleanup Levels			2,000[h]	2,000[h]	4.53E+06	7.00E+08	3.50E+08	7.00E+09	3.50E+08	2.19E+05	3.50E+08	3.50E+07	2.15E+07	NA[i]	3.15E+09	1.19E+04	2.57E+06	NA	NA	NA	7.00E+05	NA	4.38E+06	1.40E+05	NA

Analytes detected in samples at concentrations exceeding cleanup levels or comparison values are shown in bold and italics.

TABLE 4-4

REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS - TPHs AND VOCs
Former Tacoma Metals Facility

			TPHs (mg/kg)[a]		Volatile Organic Compounds (µg/kg)[b]																				
Sample Designation	Sample Depth (ft)	Collection Date	TPH-Diesel	TPH-motor oil	Benzene	Toluene	Ethyl-benzene	Total[c] Xylenes	Acetone	1,1-Di-chloro-ethene	1,1-Di-chloro-ethane	Cis-1,2-di-chloro-ethene	Chloro-form	2-Butanone	1,1,1-Tri-chloro-ethane	Trichloro-ethene	Tetrachloro-ethene	1,1,2-Tri-chloro-fluoroethane	1,3,5-Tri-methyl-benzene	1,2,4-Tri-methyl-benzene	Hexa-chlorobut-adiene	4-Isopropyl-toluene	Styrene	Naphthalene	Isopropy-benzene
TP-37	0-1'	10/13/2000	810	***2,100***	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/13/2000	970	***2,800***	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/13/2000	60	84	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/13/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-38	0-1'	10/13/2000	1,400	***2,700***	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/13/2000	68	88	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/13/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/13/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-39/390[f]	0-1'	10/13/2000	81/83	340/350	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/13/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/13/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/13/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-40	0-1'	10/13/2000	1,100	***2,300***	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/13/2000	670	1,600	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/13/2000	100	230	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/13/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-41	0-1'	10/13/2000	<5.2	16	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/13/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/13/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/13/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-42	0-1'	10/13/2000	42	130	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/13/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/13/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/13/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-43/430[f]	0-1'	10/13/2000	1,000/1,000	***2,500/2,800***	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/13/2000	1,500	***3,400***	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/13/2000	<5.3	<11	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/13/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
TP-44	0-1'	10/13/2000	19	28	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/13/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/13/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/13/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-45	0-1'	10/16/2000	450	1,100	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/16/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/16/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/16/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-46	0-1'	10/16/2000	140	450	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/16/2000	170	510	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/16/2000	1,000	***2,700***	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/16/2000	45	150	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-47	0-1'	10/16/2000	6.2	<11	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/16/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/16/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/16/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MTCA Method C Industrial[g] Soil Cleanup Levels			2,000[h]	2,000[h]	4.53E+06	7.00E+08	3.50E+08	7.00E+09	3.50E+08	2.19E+05	3.50E+08	3.50E+07	2.15E+07	NA[i]	3.15E+09	1.19E+04	2.57E+06	NA	NA	NA	7.00E+05	NA	4.38E+06	1.40E+05	NA

Analytes detected in samples at concentrations exceeding cleanup levels or comparison values are shown in bold and italics.

TABLE 4-4

REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS - TPHs AND VOCs
Former Tacoma Metals Facility

			TPHs (mg/kg)[a]		Volatile Organic Compounds (µg/kg)[b]																				
Sample Designation	Sample Depth (ft)	Collection Date	TPH-Diesel	TPH-motor oil	Benzene	Toluene	Ethyl-benzene	Total[c] Xylenes	Acetone	1,1-Di-chloro-ethene	1,1-Di-chloro-ethane	Cis-1,2-di-chloro-ethene	Chloro-form	2-Butanone	1,1,1-Tri-chloro-ethane	Trichloro-ethene	Tetrachloro-ethene	1,1,2-Tri-chloro-fluoroethane	1,3,5-Tri-methyl-benzene	1,2,4-Tri-methyl-benzene	Hexa-chlorobut-adiene	4-Isopropyl-toluene	Styrene	Naphthalene	Isopropy-benzene
TP-48	0-1'	10/17/2000	130	290	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/17/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	10/17/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-8.5'	10/17/2000	630	870	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-49	0-1'	10/17/2000	220	1,500	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	10/17/2000	29	50	<1.1	3.7	<1.1	<2.2	<5.7	<1.1	<1.1	<1.1	<1.1	<5.7	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<5.7	<1.1	<1.1	<5.7	<1.1
	4-6'	10/17/2000	***11,000***	***4,000***	<9.0	1,600	27	78	510	<9.0	<9.0	<9.0	<9.0	120	<9.0	<9.0	<9.0	<9.0	580	950	<45	200	<7.8	16,000	17
	6-10'	10/17/2000	***14,000***	***2,900***	<22	270	24	142	530	<22	<22	<22	<22	120	<22	<22	<22	<22	490	820	<110	250	<22	8,800	39
TP-50/500[f]	0-1'	10/17/2000	90/110	190/230	1.2/1.3	430/610	<1.1/<1.1	<2.2/<2.2	90/94	<1.1/<1.1	<1.1/<1.1	<1.1/<1.1	<1.1/<1.1	12/12	<1.1/<1.1	<1.1/<1.1	<1.1/<1.1	<1.1/<1.1	<1.1/<1.1	<1.1/<1.1	<5.4/<5.7	<1.1/<1.1	<1.1/<1.1	<5.4/<5.7	<1.1/<1.1
	2-3'	10/17/2000	39	54	<10	270	<1.1	<2.2	49	<1.1	<1.1	<1.1	<1.1	<5.6	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<5.6	<1.1	<1.1	<5.6	<1.1
	4-6'	10/17/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	10/17/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-51	0-1'	11/14/2000	35B	100	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	11/14/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	11/14/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-8'	11/14/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-52	0-1'	11/14/2000	86B	440	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	11/14/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	11/14/2000	240	140	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	11/14/2000	730	870	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-53	0-1'	11/14/2000	690B	700	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	11/14/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	11/14/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	11/14/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-54	0-1'	11/14/2000	160B	310	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	11/14/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	11/14/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	11/14/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-55	0-1'	11/14/2000	1,700B	***6,300***	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	11/14/2000	***2,000***	***8,000***	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	11/14/2000	1,700	***6,500***	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	11/14/2000	***2,400***	***12,000***	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-56	0-1'	11/14/2000	16B	54	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	11/14/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	11/14/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	11/14/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-57	0-1'	11/14/2000	***2,200B***	***4,700***	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	11/14/2000	66	98	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	11/14/2000	170	200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	11/14/2000	88	350	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-58	0-1'	11/15/2000	11B	<10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	11/15/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	11/15/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	11/15/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MTCA Method C Industrial[g] Soil Cleanup Levels			2,000[h]	2,000[h]	4.53E+06	7.00E+08	3.50E+08	7.00E+09	3.50E+08	2.19E+05	3.50E+08	3.50E+07	2.15E+07	NA[i]	3.15E+09	1.19E+04	2.57E+06	NA	NA	NA	7.00E+05	NA	4.38E+06	1.40E+05	NA

Analytes detected in samples at concentrations exceeding cleanup levels or comparison values are shown in bold and italics.

TABLE 4-4

REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS - TPHs AND VOCs
Former Tacoma Metals Facility

			TPHs (mg/kg)[a]		Volatile Organic Compounds (µg/kg)[b]																				
Sample Designation	Sample Depth (ft)	Collection Date	TPH-Diesel	TPH-motor oil	Benzene	Toluene	Ethyl-benzene	Total[c] Xylenes	Acetone	1,1-Di-chloro-ethene	1,1-Di-chloro-ethane	Cis-1,2-di-chloro-ethene	Chloro-form	2-Butanone	1,1,1-Tri-chloro-ethane	Trichloro-ethene	Tetrachloro-ethene	1,1,2-Tri-chloro-fluoroethane	1,3,5-Tri-methyl-benzene	1,2,4-Tri-methyl-benzene	Hexa-chlorobut-adiene	4-Isopropyl-toluene	Styrene	Naphthalene	Isopropy-benzene
TP-59	0-1'	11/15/2000	520B	1,200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	11/15/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	11/15/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	11/15/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-60	0-1'	11/15/2000	980B	1,700	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	11/15/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	11/15/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	11/15/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-61	0-1'	11/15/2000	***3,700B***	1,900	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	11/15/2000	***8,500B***	***2,300***	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	11/15/2000	120	87	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	11/15/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-62	0-1'	11/15/2000	320B	910	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	11/15/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	11/15/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	11/15/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-63	0-1'	11/15/2000	340B	1,100	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	11/15/2000	860B	***2,100***	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	11/15/2000	240	640	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	11/15/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-64	0-1'	11/15/2000	150B	330	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	11/15/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	11/15/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	11/15/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TP-65	0-1'	11/15/2000	<5.3	<11	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2-3'	11/15/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	4-6'	11/15/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6-10'	11/15/2000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MTCA Method C Industrial[g] Soil Cleanup Levels			2,000[h]	2,000[h]	4.53E+06	7.00E+08	3.50E+08	7.00E+09	3.50E+08	2.19E+05	3.50E+08	3.50E+07	2.15E+07	NA[i]	3.15E+09	1.19E+04	2.57E+06	NA	NA	NA	7.00E+05	NA	4.38E+06	1.40E+05	NA

Analytes detected in samples at concentrations exceeding cleanup levels or comparison values are shown in bold and italics.

Notes:

(a) Total diesel- and motor oil-range hydrocarbons were analyzed by Ecology Method NWTPH-Diesel (Extended).
(b) Samples were analyzed for volatile organic compounds (VOCs) by EPA Method 8260.
(c) Total xylenes were calculated by summing the concentrations of m,p- and o-xylene isomers.
(d) "---" = Sample not tested for selected analyte.
(e) "<" denotes analyte was not detected at the indicated reporting limit.
(f) Duplicate sample.
(g) MTCA Method C industrial soil cleanup levels are based on CLARC II, dated February 1996.
(h) Total petroleum hydrocarbon (TPH) screening level. Samples exceeding the screening level were evaluated using Ecology's TPH Interim Policy for compliance with MTCA standards (Ecology 1997a).
(i) "NA" = No cleanup level is available.

Qualifiers:

J - Indicates an estimated value below the calculated detection limit.
B - Indicates compound also detected in method blank.

mg/kg - milligrams per kilogram
µg/kg - micrograms per kilogram

TABLE 4-5

SUMMARY OF EXTRACTABLE PETROLEUM HYDROCARBONS ANALYTICAL RESULTS
Former Tacoma Metals Facility

Analytes	Sample Designation									
	TP-2-6-10	TP-5-6-10	TP-9-0-1	TP-10-6-10	TP-11-6-10	TP-16-0-1	TP-27-0-1	TP-30-2-3	TP-33-0-1	TP-34-2-3
EXTRACTABLE PETROLEUM HYDROCARBONS (mg/kg)[a]										
Aliphatics										
C8-C10	<50[b]	<65.9	<50	<50	<50	<20	<50	<50	<50	<50
C10-C12	<50	<65.9	137	<50	<50	96	<50	<50	<50	<50
C12-C16	150	419	145	<50	241	280	137	<50	85.5	<50
C16-C21	122	442	463	231	1,830	145	133	202	366	94.1
C21-C34	150	278	2,290	4,580	6,720	475	1,250	1,980	1,200	740
Aromatics										
C10-C12	376	73.2	<50	<50	<5	36	<50	<50	<50	<50
C12-C16	1,260	2,300	<50	<50	<50	106	<50	<50	<50	<50
C16-C21	3,030	5,590	88.8	<50	178	208	<50	53	75.6	<50
C21-C34	3,280	4,950	396	468	761	438	389	295	309	199

Analytes	Sample Designation								
	TP-37-2-3	TP-38-0-1	TP-40-0-1	TP-43-2-3	TP-46-4-6	TP-49-6-10	TP-55-6-10	TP-57-0-1	TP-61-2-3
EXTRACTABLE PETROLEUM HYDROCARBONS (mg/kg)[a]									
Aliphatics									
C8-C10	<10	<50	<20	<50	<50	<119	<28	<50	<10
C10-C12	<10	<50	<20	<50	<50	<119	<28	<50	12
C12-C16	20	<50	<20	<50	<50	319	151	<50	695
C16-C21	163	106	151	339	304	243	1,540	386	3,160
C21-C34	925	948	861	1,520	2,120	172	10,100	2,430	1,190
Aromatics									
C10-C12	<10	<50	<20	<50	<50	<119	<28	<50	<10
C12-C16	19	<50	41.8	55.7	<50	1,960	93	<50	65
C16-C21	95	71.2	265	267	74.6	4,270	308	94	521
C21-C34	559	360	632	670	521	3,260	3,360	676	495

Notes:

(a) Results for analysis of extractable petroleum hydrocarbons (EPHs) by methods identified in Ecology's TPH Interim Policy, dated January 1997.

(b) "<" denotes analyte was not detected at the indicated reporting limit.

mg/kg - milligrams per kilogram

TABLE 4-6

SUMMARY OF TPH INTERIM POLICY CALCULATIONS
Former Tacoma Metals Facility

Sample	Hazard Index	Total Carcinogenic Risk Factor	Concentration at Well	
			DF=20[a]	DF=1[b]
TP-2-6-10	0.08	***4.06E-04***	---	***3.2***
TP-5-6-10	0.13	***3.55E-04***	---	***1.8***
TP-9-0-1	0.01	5.50E-07	0.0	---
TP-10-6-10	0.01	7.47E-08	---	***4.2***
TP-11-6-10	0.02	3.38E-06	---	0.0
TP-16-0-1	0.01	***1.69E-05***	0.1	---
TP-27-0-1	0.00	5.77E-07	0.0	---
TP-30-2-3	0.00	2.60E-06	0.1	---
TP-33-0-1	0.01	1.56E-06	0.0	---
TP-34-2-3	0.00	6.41E-06	0.0	---
TP-37-2-3	0.01	3.34E-06	0.0	---
TP-38-0-1	0.00	8.23E-06	0.0	---
TP-40-0-1	0.01	***9.33E-05***	0.0	---
TP-43-2-3	0.01	5.53E-06	0.0	---
TP-46-4-6	0.01	1.06E-06	0.0	---
TP-49-6-10	0.09	***3.53E-04***	---	***1.7***
TP-55-6-10	0.04	3.12E-06	---	0.2
TP-57-0-1	0.01	8.62E-07	0.0	---
TP-61-2-3	0.03	***1.10E-05***	0.0	---
Exceedence Levels	1	1x10E-05	1 mg/l	1 mg/l

Notes:

(a) Dilution factor (DF) of 20 was used to evaluate samples collected from above the saturated or groundwater smear zone.

(b) Dilution factor (DF) of 1 was used to evaluate samples collected from the groundwater smear zone.

mg/l - milligrams per liter

TABLE 4-7

REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS - TNT/DNT
Former Tacoma Metals Facility

Sample Designation	Sample Depth	Sample Date	TNT/DNT (mg/kg)[a]				
			2,4-Dinitri-toluene	2,6-Dinitro-toluene	2,4,6-Trinitro-toluene	4-Amino-2,6-Dinitrotoluene	2-Amino-4,6-Dinitrotoluene
TP-39	0-1'	10/13/2000	<50[b]	<50	<50	<50	<50
TP-390[c]	0-1'	10/13/2000	<50	<50	<50	<50	<50
TP-39	2-3'	10/13/2000	<50	<50	<50	<50	<50
TP-39	4-6'	10/13/2000	<50	<50	<50	<50	<50
TP-39	6-10'	10/13/2000	<50	<50	<50	<50	<50
TP-44	0-1'	10/13/2000	<50	<50	<50	<50	<50
MTCA Method C Industrial Soil Cleanup Levels [d]			7,000	3,500	N/A[e]	N/A	N/A

Notes

(a) Samples were analyzed for trinitrotoluene/dinitrotoluene (TNT/DNT) by EPA Method 8330.
(b) "<" denotes analyte was not detected at the indicated reporting limit.
(c) Duplicate sample.
(d) MTCA Method C industrial soil cleanup levels are based on CLARC II, dated February 1996.
(e) "NA" = No cleanup level available.

mg/kg - milligrams per kilogram

TABLE 4-8A

REMEDIAL INVESTIGATION
SPLP AND TCLP ANALYTICAL RESULTS - METALS[a]
Former Tacoma Metals Facility

Analyte	Analysis	Sample Designation/Depth														Criteria
		TP-1-0-1	TP-14-6-10	TP-16-2-3	TP-21-2-3	TP-22-2-3	TP-33-2-3	TP-38-0-1	TP-39-0-1	TP-40-2-3	TP-43-2-3	TP-45-0-1	TP-55-0-1	TP-60-0-1	TP-61-0-1	
Arsenic	Total (mg/kg)	40	<6[b]	---[c]	<300	<60	---	60	10	<30	80	100	<30	50	<30	219[d]
	TCLP (mg/l)	---	---	---	---	---	---	---	---	---	---	<0.05	---	---	---	5.0[e]
	SPLP (mg/l)	---	---	---	---	---	---	---	---	---	---	<0.05	---	---	---	NA[f]
Barium	Total (mg/kg)	290	84.9	---	4,190	464	---	2,710	110	851	1,280	774	1,080	1,050	377	245,000[d]
	TCLP (mg/l)	---	---	---	6.99	---	---	---	---	---	---	---	---	---	---	100.0[e]
	SPLP (mg/l)	---	---	---	0.672	---	---	---	---	---	---	---	---	---	---	NA
Cadmium	Total (mg/kg)	8.5	2.3	68	130	52	---	125	13.2	40	46	30	29	30	10	3,500[d]
	TCLP (mg/l)	---	---	---	0.94	---	---	---	---	---	---	---	---	---	---	1.0[e]
	SPLP (mg/l)	---	---	---	<0.002	---	---	---	---	---	---	---	---	---	---	NA
Chromium	Total (mg/kg)	76	35.3	---	***1,080***	913	---	263	30	212	259	368	117	225	53	500[g]
	TCLP (mg/l)	---	---	---	<0.05	---	---	---	---	---	---	---	---	---	---	1.0[e]
	SPLP (mg/l)	---	---	---	<0.005	---	---	---	---	---	---	---	---	---	---	NA
Copper	Total (mg/kg)	873	78.6	---	13,200	20,200	---	3,320	1,100	1,240	2,520	3,560	465	2,330	356	130,000[d]
	TCLP (mg/l)	---	---	---	---	66.2	---	---	---	---	---	---	---	---	---	NA
	SPLP (mg/l)	---	---	---	---	0.005	---	---	---	---	---	---	---	---	---	NA
Lead	Total (mg/kg)	***2,230***	152	***8,240***	***7,570***	***3,690***	***4,560***	***9,380***	***1,040***	***2,050***	***12,300***	***4,060***	***1,750***	***10,800***	***4,180***	1,000[g]
	TCLP (mg/l)	***11.7***	<0.1	3.3	***74.7***	---	***22.4***	***20.6***	0.13	***6.9***	***63.6***	---	***26.5***	---	***12.2***	5.0[e]
	SPLP (mg/l)			<0.02	---	---	---	---	0.03	<0.02	0.03	---	---	---	0.07	NA
Mercury	Total (mg/kg)	1.53	0.07	---	10.2	5.1	1.69	14.3	0.21	3.19	21	47	0.83	77	0.76	1,050[d]
	TCLP (mg/l)	---	---	---	---	---	---	---	---	---	---	---	---	0.0005	---	0.2[e]
	SPLP (mg/l)	---	---	---	---	---	---	---	---	---	---	---	---	0.0021	---	NA
Selenium	Total (mg/kg)	<10	<6	---	<300	<60	---	30	<10	<30	<30	30	<30	40	<30	17,500[d]
	TCLP (mg/l)	---	---	---	---	---	---	---	---	---	---	---	---	<0.2	---	1.0[e]
	SPLP (mg/l)	---	---	---	---	---	---	---	---	---	---	---	---	<0.05	---	NA
Silver	Total (mg/kg)	1.4	<0.4	---	90	198	---	6	<0.8	3	5	7	<2	2	<2	17,500[d]
	TCLP (mg/l)	---	---	---	---	<0.02	---	---	---	---	---	---	---	---	---	5.0[e]
	SPLP (mg/l)	---	---	---	---	<0.003	---	---	---	---	---	---	---	---	---	NA

Analytes detected in samples at concentrations exceeding criteria are shown in bold and italics.

Notes:
(a) Samples were analyzed for TCLP and SPLP Metals by EPA Methods 1311/1312/6010.
(b) "<" denotes analyte was not detected at the indicated reporting limit.
(c) "---" Sample not tested for selected analyte.
(d) MTCA Method C industrial soil cleanup levels are based on CLARC II, dated February 1996.
(e) Toxicity characteristics based on Dangerous Waste Criteria (WAC 173-303-100).
(f) "NA" = No criteria available.
(g) Method A industrial soil cleanup levels (WAC 173-340-745) used where Method C industrial soil cleanup levels are not available.

mg/kg - milligrams per kilogram
mg/l - milligrams per liter

TABLE 4-8B

REMEDIAL INVESTIGATION
SPLP AND TCLP ANALYTICAL RESULTS - PAHs
Former Tacoma Metals Facility

Sample Designation	Sample Depth	Totals	PAHs[a]									cPAHs[a][b]							
			Naphth-alene	Acenaph-thlyene	Acenaph-thene	Fluorene	Phenan-threne	Anth-racene	Fluoran-thene	Pyrene	Benzo (g,h,i) perylene	Chrysene	Benzo (b)-fluoranthene	Benzo (k)-fluoranthene	Benzo (a)-pyrene	Indeno (1,2,3-cd) pyrene	Dibenz (a,h)-anthracene	Benzo (a)-anthracene	Total cPAHs[b]
TP-40	0-1	Total (mg/kg)	0.98	3.8	0.74	1.4	17	4.7	43	51	13	41	24	23	28	14	4.8	33	38.3
		TCLP (µg/l)	<10[c]	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	7.6
		SPLP (µg/l)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	7.6
TP-49	6-10	Total (mg/kg)	8.4	16	440	390	1,300	250	810	620	38	230	73	54	82	31	14M	150	117
		TCLP (µg/l)	<10	<10	300	180	190	20	28	18	<10	<10	<10	<10	<10	<10	<10	<10	7.6
		SPLP (µg/l)	<10	<10	230	140	150	15	23	18	<10	<10	<10	<10	<10	<10	<10	<10	7.6
TP-61	2-3	Total (mg/kg)	2.8	0.67	0.68M	1.7	7.2	2.5M	9.3	7.8	1.1	4.9	2.9	2.7	2.9	1.6	0.61M	4.1	4.14
		TCLP (µg/l)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	7.6
		SPLP (µg/l)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	7.6

Notes:
(a) Samples were analyzed for TCLP and SPLP polycyclic aromatic hydrocarbons (PAHs) by EPA Methods 1311/1312/8270.
(b) Total cPAHs were calculated using the toxicity equivalency factor (TEF) methodology described in MTCA [WAC 173-340-708(8)(e)].
For non-detected cPAH analytes, the TEF factor (listed below) was applied to a value of one-half the laboratory reporting limit prior to summation.
TEF = 1.0 for benzo(a)pyrene
TEF = 0.1 for benzo(a)anthracene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, benzo(a)-fluoranththene, and benzo(k)- fluoranththene
TEF = 0.01 for chrysene
(c) "<" denotes analyte was not detected at the indicated reporting limit.
mg/kg = milligrams per kilogram
µg/l = micrograms per liter

Qualifiers:
M - Indicates an estimated value of analyte found and confirmed by analyst but with low spectral match.

NOTE: This table was upated in July 2013 at Ecology's request based on the revised methodology (i.e., TEF summation) for calculation of total cPAHs which was not required when the original RI/FS was performed. No values other than total cPAHs were revised from the orginal table produced in October 2001.

TABLE 5-1

REMEDIAL INVESTIGATION
RECONNAISSANCE GROUNDWATER ANALYTICAL RESULTS - DISSOLVED METALS
Former Tacoma Metals Facility

Sample Designation	Sample Date	Dissolved Metals (µg/l)[a][b]							
		Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
RGW -1	5/25/2000	<5[c]	61	***9***	<10	<4	<0.2	<50	<7
RGW -2	5/25/2000	<5	49	***6***	<10	<4	<0.2	<50	<7
RGW -3	5/25/2000	<5	62	<5	<10	<4	<0.2	<50	<7
RGW -4	5/25/2000	<5	33	<5	<10	<4	<0.2	<50	<7
RGW -5	5/25/2000	<5	44	***5***	<10	<4	<0.2	<50	<7
RGW -6	5/25/2000	<5	14	<5	<10	<4	<0.2	<50	<7
RGW -7	5/25/2000	<5	23	<5	<10	<4	<0.2	<50	<7
RGW -8	5/25/2000	<5	120	<5	<10	<4	<0.2	<50	<7
RGW -9	5/25/2000	<5	30	<5	<10	<4	<0.2	<50	<7
RGW -10	5/25/2000	<5	17	<5	<10	<4	<0.2	<50	<7
RGW -11	5/25/2000	<5	9	<5	<10	<4	<0.2	<50	<7
RGW -12	5/25/2000	<5	10	<5	<10	<4	<0.2	<50	<7
RGW -13	5/26/2000	<5	11	<5	<10	<4	<0.2	<50	<7
RGW -14	5/26/2000	<5	4	<5	<10	<4	<0.2	<50	<7
RGW -15	5/26/2000	<5	4	<5	<10	<4	<0.2	<50	<7
RGW -16	5/26/2000	<5	12	<5	<10	<4	<0.2	<50	<7
RGW -17	5/26/2000	<5	14	<5	<10	<4	<0.2	<50	<7
RGW -18	5/26/2000	<5	7	<5	<10	<4	***0.2***	<50	<7
MTCA Method B Surface Water Cleanup Level[d]		0.0982 (1)	NA[e]	20.3	NA	NA	NA	NA	25,900
MTCA Method C Surface Water Cleanup Level[d]		2.46 (1)	NA	50.6	NA	NA	NA	NA	64,800
Ecology Chronic Freshwater Surface Water Cleanup Level[f]		190	NA	1.59[g]	288.07[g,h]	4.74[g] (1)	0.012 (1)	5 (1)	NA
National Toxics Rule for Consumption of Organisms[i]		1.4 (1)	NA	NA	NA	NA	1.5 (1)	NA	NA

Analytes detected in samples at concentrations exceeding one or more of the comparison values are shown in bold and italics.

TABLE 5-1

REMEDIAL INVESTIGATION
RECONNAISSANCE GROUNDWATER ANALYTICAL RESULTS - DISSOLVED METALS
Former Tacoma Metals Facility

Notes:
(a) Reconnaissance groundwater samples were analyzed for dissolved metals by EPA Methods 6010/7000 series.
(b) All groundwater samples were field filtered. All concentrations are dissolved.
(c) "<" denotes analyte was not detected at the indicated reporting limit.
(d) MTCA Method B and C surface water cleanup levels based on CLARC II, dated February 1996.
(e) "NA" = No cleanup level available.
(f) Ecology Chronic Freshwater Surface Water Standard (WAC 173-201A).
(g) Surface Water Quality Standard is based on an average groundwater hardness of 180 mg/l.
(h) Chromium as chromium III (CAS# 7440-47-3).
(i) National Toxics Rule for consumption of organisms only based on 40 CFR 131.36 for a risk level of $1x10^{-5}$.

(1) Denotes practical quantification limit (PQL) is greater than MTCA cleanup levels and/or applicable, relevant, and appropriate requirements (ARARs) (Ecology 1993).

mg/l - milligrams per liter
µg/l - micrograms per liter

TABLE 5-2

REMEDIAL INVESTIGATION
RECONNAISSANCE GROUNDWATER ANALYTICAL RESULTS - PCBs
Former Tacoma Metals Facility

Sample Designation	Sample Date	PCBs (µg/l)[a]							Total PCBs[c]
		Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	
RGW-1	5/25/2000	<0.2[b]	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.7
RGW-2	5/25/2000	<1	<1	<1	<1	<1	<1	<1	3.5
RGW-3	5/25/2000	<1	<1	<1	<1	<1	<1	<1	3.5
RGW-4	5/25/2000	<1	<1	<1	<1	<1	<1	<1	3.5
RGW-5	5/25/2000	<2	<2	<2	<2	<2	<2	<2	7.0
RGW-6	5/25/2000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.35
RGW-7	5/25/2000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.35
RGW-8	5/25/2000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.35
RGW-9	5/25/2000	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.7
RGW-10	5/25/2000	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.7
RGW-11	5/25/2000	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.7
RGW-12	5/25/2000	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.7
RGW-13	5/26/2000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.35
RGW-14	5/26/2000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.35
RGW-15	5/26/2000	<1	<1	<1	<1	<1	<1	<1	3.5
RGW-16	5/26/2000	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.7
RGW-17	5/26/2000	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.7
RGW-18	5/26/2000	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.7
MTCA Method B Surface Water Cleanup Level[d]		NA[e]	NA	NA	NA	NA	NA	NA	2.70E-05 (1)
MTCA Method C Surface Water Cleanup Level[d]		NA	NA	NA	NA	NA	NA	NA	6.74E-04 (1)
Ecology Chronic Freshwater Surface Water Quality Standard[f]		NA	NA	NA	NA	NA	NA	NA	0.014 (1)
National Toxics Rule for Consumption of Organisms[g]		NA	NA	NA	NA	NA	NA	NA	0.0017 (1)

TABLE 5-2

REMEDIAL INVESTIGATION
RECONNAISSANCE GROUNDWATER ANALYTICAL RESULTS - PCBs
Former Tacoma Metals Facility

Notes:
(a) Samples were analyzed for polychlorinated biphenyls (PCBs) by EPA Method 8082.
(b) "<" denotes analyte was not detected at the indicated reporting limit.
(c) The total PCBs were calculated by summing the concentrations of all the probable PCBs. If a probable PCB was not detected, a value equal to one-half the reporting limit was used.
(d) MTCA Method B and C surface water cleanup levels based on CLARC II, dated February 1996.
(e) "NA" = No cleanup level available.
(f) Ecology Chronic Freshwater Surface Water Quality Standards (WAC 173-201A).
(g) National Toxics Rule for consumption of organisms only based on 40 CFR 131.36 for a risk level of $1x10^{-5}$.

(1) Denotes practical quantification limit (PQL) is greater than MTCA cleanup levels and/or applicable, relevant, and appropriate requirements (ARARs) (Ecology 1993).

µg/l - micrograms per liter

TABLE 5-3

REMEDIAL INVESTIGATION
RECONNAISSANCE GROUNDWATER ANALYTICAL RESULTS - PAHs
Former Tacoma Metals Facility

Sample Designation	Sample Date	PAHs (µg/l)[a]									cPAHs (µg/l)[a][b]							
		Naphth-alene	Acenaph-thlyene	Acenaph-thene	Fluorene	Phenan-threne	Anth-racene	Fluoran-thene	Pyrene	Benzo (g,h,i) perylene	Chrysene	Benzo (b)-fluoranthene	Benzo (k)-fluoranthene	Benzo (a)-pyrene	Indeno (1,2,3-cd) pyrene	Dibenz (a,h)-anthracene	Benzo (a)-anthracene	Total cPAHs
RGW -1	5/25/2000	<0.02[c]	<0.02	0.24	0.23	0.09	0.07	0.22	0.14	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	***0.03***	0.017
RGW -2	5/25/2000	<0.02	<0.02	***1100***	0.05	0.03	0.03	0.08	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.015
RGW -3	5/25/2000	<0.02	<0.02	0.17	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.015
RGW -4	5/25/2000	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.015
RGW -5	5/25/2000	0.02	<0.02	<0.02	0.04	0.06	<0.02	0.07	0.06	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.015
RGW -6	5/25/2000	<0.02	<0.02	0.16	<0.02	0.04	<0.02	0.09	0.16	0.07	***0.55***	***0.21***	***0.09***	***0.04***	***0.04***	<0.02	***0.09***	***0.090***
RGW -7	5/25/2000	0.02	<0.02	0.55	0.4	1.2	0.18	0.38	0.25	<0.02	***0.04***	<0.02	<0.02	<0.02	<0.02	<0.02	***0.05***	0.019
RGW -8	5/25/2000	<0.02	<0.02	0.02	<0.02	0.09	<0.02	0.05	0.06	<0.02	***0.03***	<0.02	<0.02	0.02	<0.02	<0.02	0.02	0.016
RGW -9	5/25/2000	0.02	<0.02	0.04	<0.02	0.06	<0.02	0.03	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.015
RGW -10	5/25/2000	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.015
RGW -11	5/25/2000	0.13	<0.02	1.4	0.03	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.015
RGW -12	5/25/2000	0.02	<0.02	0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.015
RGW -13	5/26/2000	34	0.61	140	57	31	2.4	4.4	3.1	0.24	***0.47***	***0.27***	***0.23***	***0.38***	***0.21***	***0.07***	***0.43***	***0.51***
RGW -14	5/26/2000	8.6	0.05	3.6	2.2	2.2	0.64	2.7	1.6	0.03	***0.22***	***0.07***	***0.07***	***0.06***	***0.03***	<0.02	***0.28***	***0.11***
RGW -15	5/26/2000	110	0.37	64	38	27	5.3	9.2	7.1	0.18	***0.54***	***0.26***	***0.23***	***0.38***	***0.15***	<0.02	***0.59***	***0.51***
RGW -16	5/26/2000	0.21	0.01	0.13	0.1	0.2	0.04	0.05	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.015
RGW -17	5/26/2000	0.22	<0.02	0.19	0.03	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.015
RGW -18	5/26/2000	45	0.82	66	47	130	26	88	79	7.4	***19***	***13***	***13***	***16***	***6.6***	***2.4***	***26***	***22***
MTCA Method B Surface Water Cleanup Level[d]		9,880	NA[e]	643	3,460	NA	25,900	90.2	2,590	NA	0.0296 (1)	0.0296 (1)	0.0296 (1)	0.0296 (1)	0.0296 (1)	0.0296 (1)	0.0296 (1)	0.0296 (1)
MTCA Method C Surface Water Cleanup Level[d]		24,700	NA	1,610	8,640	NA	64,800	225	6,480	NA	0.740 (1)	0.740 (1)	0.740 (1)	0.740 (1)	0.740 (1)	0.740 (1)	0.740 (1)	0.740 (1)
Ecology Chronic Freshwater Surface Water Quality Standard[f]		620	NA	520	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
National Toxics Rule for Consumption of Organisms[g]		NA	NA	NA	$1.4x10^5$	NA	$1.1x10^6$	3,700	$1.1x10^5$	NA	0.31 (1)	0.31 (1)	0.31 (1)	0.31 (1)	0.31 (1)	0.31 (1)	0.31 (1)	0.31 (1)

Analytes detected in samples at concentrations exceeding one or more of the cleanup levels or comparison values are shown in bold and italics.

Notes:

(a) Samples were analyzed for polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270B GC/MS-SIM.

(b) Total cPAHs were calculated using the toxicity equivalency factor (TEF) methodology described in MTCA [WAC 173-340-708(8)(e)].
For non-detected cPAH analytes, the TEF factor (listed below) was applied to a value of one-half the laboratory reporting limit prior to summation.
TEF = 1.0 for benzo(a)pyrene
TEF = 0.1 for benzo(a)anthracene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, benzo(a)-fluoranththene, and benzo(k)- fluoranththene
TEF = 0.01 for chrysene

(c) "<" denotes analyte was not detected at the indicated reporting limit.

(d) MTCA Method B and C surface water cleanup levels based on CLARC II, dated February 1996.

(e) "NA" = No cleanup level is available.

(f) Ecology Chronic Freshwater Surface Water Quality Standards (WAC 173-201A).

(g) National Toxics Rule for consumption of organisms only based on 40 CFR 131.36 for a risk level of $1x10^{-5}$.

(1) Denotes practical quantification limit (PQL) is greater than MTCA cleanup levels and/or applicable, relevant, and appropriate requirements (ARARs) (Ecology 1993).

µg/l = micrograms per liter

NOTE: This table was upated in July 2013 at Ecology's request based on the revised methodology (i.e., TEF summation) for calculation of total cPAHs which was not required when the original RI/FS was performed. No values other than total cPAHs were revised from the orginal table produced in October 2001.

TABLE 5-4

REMDIAL INVESTIGATION
RECONNAISSANCE GROUNDWATER ANALYTICAL RESULTS - TPHs AND VOCs
Former Tacoma Metals Facility

Sample Designation	Sample Date	TPHs (mg/l)[a]			Volatile Organic Compounds (µg/l)[b]				
		TPH-Gas	TPH-Diesel	TPH-Motor Oil	Benzene	Toluene	Ethylbenzene	Total xylenes	Naphthalene
RGW -1	5/25/2000	<0.05[c]	<0.25	<0.5	<2	3	<2	<6	<2
RGW -2	5/25/2000	<0.05	<0.25	<0.5	<2	<2	<2	<6	<2
RGW -3	5/25/2000	<0.05	<0.25	<0.5	<2	<2	<2	<6	<2
RGW -4	5/25/2000	<0.05	<0.25	<0.5	<2	<2	<2	<6	<2
RGW -5	5/25/2000	<0.05	<0.25	<0.5	<2	<2	<2	<6	<2
RGW -6	5/25/2000	<0.05	<0.25	<0.5	<2	<2	<2	<6	<2
RGW -7	5/25/2000	<0.05	<0.25	<0.5	<2	<2	<2	<6	<2
RGW -8	5/25/2000	<0.05	<0.25	<0.5	<2	2	<2	<6	<2
RGW -9	5/25/2000	<0.05	<0.25	<0.5	<2	<2	<2	<6	<2
RGW -10	5/25/2000	<0.05	<0.25	<0.5	<2	<2	<2	<6	<2
RGW -11	5/25/2000	<0.05	<0.25	<0.5	<2	<2	<2	<6	<2
RGW -12	5/25/2000	<0.05	<0.25	<0.5	<2	<2	<2	<6	<2
RGW -13	5/26/2000	0.33	0.88	<0.5	<2	<2	2	<6	33
RGW -14	5/26/2000	<0.05	<0.25	<0.5	<2	<2	<2	<6	23
RGW -15	5/26/2000	0.2	0.96	0.96	<2	<2	<2	<6	210
RGW -16	5/26/2000	<0.05	***1.7***	<0.5	<2	<2	<2	<6	<2
RGW -17	5/26/2000	<0.05	<0.25	<0.5	<2	<2	<2	<6	<2
RGW -18	5/26/2000	0.09	0.86	<0.5	<2	<2	<2	<6	77
MTCA Method B Surface Water Cleanup Level[d]		NA[e]	NA	NA	43	48,500	6,910	NA	9,880
MTCA Method C Surface Water Cleanup Level[d]		NA	NA	NA	1,070	121,000	17,300	NA	24,700
Ecology Chronic Freshwater Surface Water Quality Standard[f]		NA	NA	NA	NA	NA	NA	NA	620
National Toxics Rule for Consumption of Organisms[g]		NA	NA	NA	710	2,000,000	290,000	NA	NA
MTCA Method A Groundwater Cleanup Level[h]		1	1	1	NA	NA	NA	NA	NA

Analytes detected in samples at concentrations exceeding one or more of the cleanup levels or comparison values are shown in bold and italics.

TABLE 5-4

REMDIAL INVESTIGATION
RECONNAISSANCE GROUNDWATER ANALYTICAL RESULTS - TPHs AND VOCs
Former Tacoma Metals Facility

Notes:

(a) Samples were analyzed for total petroleum hydrocarbons (TPHs) by the appropriate Ecology Methods NWTPH-Gas and NWTPH-Diesel (extended).
(b) Soil and groundwater samples were analyzed for volatile organic compounds (VOCs) by EPA Method 8260.
(c) "<" denotes analyte was not detected at the indicated reporting limit.
(d) MTCA Method B and C surface water cleanup levels based on CLARC II, dated February 1996.
(e) "NA" = No cleanup level available.
(f) Ecology Chronic Freshwater Surface Water Quality Standards (WAC 173-201A).
(g) National Toxics Rule for consumption of organisms only based on 40 CFR 131.36 for a risk level of $1x10^{-5}$.
(h) MTCA Method A groundwater cleanup level based on WAC 173-340-720(2), Table 1 (Ecology 1996A).

mg/l - milligrams per liter
µg/l - micrograms per liter

TABLE 5-5

REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - TOTAL METALS
Former Tacoma Metals Facility

Sample Designation	Sample Date	Total Metals (µg/l)[a]								
		Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver
MW-1	3/14/2000	<5[b]	12	<5	30	---[c]	<4	<0.2	<50	<7
	11/21/2000	<50	9	<2	<5	11	<20	<0.1	<50	<3
	3/5/2001	<50	13	<2	<5	<2	<20	<0.1	<50	<3
MW-2	3/14/2000	<5	5	<5	190	---	<4	<0.2	<50	<7
	11/21/2000	<50	28	<2	<5	***20***	<20	<0.1	<50	<3
	3/5/2001	<50	13	<2	<5	<2	<20	<0.1	<50	<3
MW-4(R)[d]	5/11/2000	<5	8	<5	<10	---	***20***	<0.2	<50	<7
	11/20/2000	<50	12	<2	<5	<2	<20	<0.1	<50	<3
	3/5/2001	<50	14	<2	<5	8	<20	<0.1	<50	<3
MW-5	3/14/2000	<5	18	<5	30	---	<4	<0.2	<50	<7
	11/21/2000	<50	2	<2	<5	4	<20	<0.1	<50	<3
	3/5/2001	<50	21	<2	<5	3	<20	<0.1	<50	<3
MW-6	3/14/2000	<5	24	<5	70	---	<4	<0.2	<50	<7
	11/21/2000	<50	3	<2	<5	5	<20	<0.1	<50	<3
	3/5/2001	<50	22	***3***	<5	<2	<20	<0.1	<50	<3
MW-7	3/14/2000	<5	23	<5	20	---	<4	<0.2	<50	<7
	11/21/2000	<50	31	<2	<5	8	<20	<0.1	<50	<3
	3/6/2001	<50	34	<2	<5	<2	<20	<0.1	<50	<3
MW-8(R)/MW-800[e]	5/12/2000	<5	15	<5	<10	---	***6***	<0.2	<50	<7
	11/20/2000	<50/<50	13/11	<2/<2	<5/<5	2/<2	<20/<20	<0.1/<0.1	<50/<50	<3/<3
	3/6/2001	<50/<50	14/15	<2/<2	<5/<5	<2/<2	<20/<20	<0.1/<0.1	<50/<50	<3/<3
MW-9	5/11/2000	<5	17	<5	<10	---	***6***	<0.2	<50	<7
	11/21/2000	<50	16	<2	<5	<2	<20	<0.1	<50	<3
	3/5/2001	<50	90	<2	<5	<2	<20	<0.1	<50	<3
MW-10	11/20/2000	<50	10	<2	<5	3	<20	<0.1	<50	<3
	3/6/2001	<50	9	<2	<5	4	<20	<0.1	<50	<3
MW-11	11/20/2000	<50	9	<2	<5	3	<20	<0.1	<50	<3
	3/6/2001	<50	8	<2	<5	<2	<20	<0.1	<50	<3
MW-12	11/20/2000	<50	3	<2	<5	<2	<20	<0.1	<50	<3
	3/6/2001	<50	31	<2	<5	<2	<20	<0.1	<50	<3
MTCA Method B Surface Water Cleanup Level[f]		0.00982 (1)	NA[g]	20.3	NA	2,660	NA	NA	NA	25,900
MTCA Method C Surface Water Cleanup Level[f]		2.46 (1)	NA	50.6	NA	6,660	NA	NA	NA	64,800
Ecology Chronic Freshwater Surface Water Cleanup Level[h]		190	NA	1.59[i]	288.07[i,j]	18.76[i]	4.74[i] (1)	0.012 (1)	5 (1)	NA
National Toxics Rule for Consumption of Organisms[k]		1.4 (1)	NA	NA	NA	NA	NA	1.5 (1)	NA	NA

TABLE 5-5

REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - TOTAL METALS
Former Tacoma Metals Facility

Notes:

(a) Groundwater samples were analyzed for metals by EPA Methods 6010/7000 series.
(b) "<" denotes analyte was not detected at the indicated reporting limit.
(c) "---" Sample not analyzed for indicated analyte.
(d) "R" = Replacement well.
(e) Sample MW-800 is a duplicate sample collected from well MW-8(R).
(f) MTCA Method B and C surface water cleanup levels based on CLARC II, dated February 1996.
(g) "NA" = No cleanup level available.
(h) Ecology Chronic Freshwater Surface Water Standard (WAC 173-201A).
(i) Surface Water Quality Standard is based on an average groundwater hardness of 180 mg/l.
(j) Chromium as chromium III, (CAS# 7440-47-3).
(k) National Toxics Rule for consumption of organisms only based on 40 CFR 131.36 for a risk level of $1x10^{-5}$.

(1) Denotes practical quantification limit (PQL) is greater than MTCA cleanup levels and/or applicable, relevant, and appropriate requirements (ARARs) (Ecology 1993).

µg/l - micrograms per liter
mg/l - milligrams per liter

TABLE 5-6

REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DISSOLVED METALS
Former Tacoma Metals Facility

Sample Designation	Sample Date	Dissolved Metals (µg/l)[a][b]								
		Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver
MW-1	11/21/2000	<50[c]	19	<2	<5	<2	<20	<0.1	<50	<3
	3/5/2001	<50	14	<2	<5	<2	<20	<0.1	<50	<3
MW-2	11/21/2000	<50	11	<2	<5	<2	<20	<0.1	<50	<3
	3/5/2001	<50	10	<2	<5	<2	<20	<0.1	<50	<3
MW-4(R)[d]	11/20/2000	<50	13	<2	<5	<2	<20	<0.1	<50	<3
	3/5/2001	<50	10	<2	<5	<2	<20	<0.1	<50	<3
MW-5	11/21/2000	<50	35	<2	<5	<2	<20	<0.1	<50	<3
	3/5/2001	<50	21	<2	<5	<2	<20	<0.1	<50	<3
MW-6	11/21/2000	<50	34	<2	<5	<2	<20	<0.1	<50	<3
	3/5/2001	<50	22	<2	<5	<2	<20	<0.1	<50	<3
MW-7	11/21/2000	<50	39	<2	<5	3	<20	<0.1	<50	<3
	3/6/2001	<50	34	<2	<5	<2	<20	<0.1	<50	<3
MW-8(R)/MW-800[e]	11/20/2000	<50/<50	15/15	<2/<2	<5/<5	<2/<2	<20/<20	<0.1/<0.1	<50/<50	<3/<3
	3/6/2001	<50/<50	19/19	<2/<2	<5/<5	<2/<2	<2/<2	<0.1/<0.1	<50/<50	<3/<3
MW-9	11/21/2000	<50	102	<2	<5	<2	<20	<0.1	***70***	<3
	3/5/2001	<50	97	<2	<5	<2	<20	<0.1	<50	<3
MW-10	11/20/2000	<50	12	<2	<5	<2	<20	<0.1	<50	<3
	3/6/2001	<50	11	<2	<5	<2	<20	<0.1	<50	<3
MW-11	11/20/2000	<50	10	<2	<5	<2	<20	<0.1	<50	<3
	3/6/2001	<50	9	<2	<5	<2	<20	<0.1	<50	<3
MW-12	11/20/2000	<50	35	<2	<5	<2	<20	<0.1	<50	<3
	3/6/2001	<50	33	<2	<5	<2	<20	<0.1	<50	<3
MTCA Method B Surface Water Cleanup Level[f]		0.00982 (1)	NA[g]	20.3	NA	2,660	NA	NA	NA	25,900
MTCA Method C Surface Water Cleanup Level[f]		2.46 (1)	NA	50.6	NA	6,660	NA	NA	NA	64,800
Ecology Chronic Freshwater Surface Water Cleanup Level[h]		190	NA	1.59[i]	288.07[i,j]	18.76[i]	4.74[i] (1)	0.012 (1)	5 (1)	NA
National Toxics Rule for Consumption of Organisms[k]		1.4 (1)	NA	NA	NA	NA	NA	1.5 (1)	NA	NA

Analytes detected in samples at concentrations exceeding one or more of the cleanup levels or comparison values are shown in bold and italics.

TABLE 5-6

REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DISSOLVED METALS
Former Tacoma Metals Facility

Notes:

(a) Groundwater samples were analyzed for metals by EPA Methods 6010/7000 series.
(b) All groundwater samples were field filtered. All concentrations are dissolved.
(c) "<" denotes analyte was not detected at the indicated reporting limit.
(d) "R" = Replacement well.
(e) Sample MW-800 is a duplicate sample collected from well MW-8(R).
(f) MTCA Method B and C surface water cleanup levels based on CLARC II, dated February 1996.
(g) "NA" = No cleanup level available.
(h) Ecology Chronic Freshwater Surface Water Standard (WAC 173-201A).
(i) Surface Water Quality Standard is based on an average groundwater hardness of 180 mg/l.
(j) Chromium as chromium III, (CAS # 7440-47-3).
(k) National Toxics Rule for consumption of organisms only based on 40 CFR 131.36 for a risk level of $1x10^{-5}$.

(1) Denotes practical quantification limit (PQL) is greater than MTCA cleanup levels and/or applicable, relevant, and appropriate requirements (ARARs) (Ecology 1993).

mg/l - milligrams per liter
µg/l - micrograms per liter

TABLE 5-7

REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - PCBs
Former Tacoma Metals Facility

Sample Designation	Sample Date	PCBs (µg/l)[a]							Total PCBs[b]
		Aroclor 1016	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1221	Aroclor 1232	
MW-1	3/14/2000	<0.1[c]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.35
	11/21/2000	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
	3/5/2001	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
MW-2	3/14/2000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.35
	11/21/2000	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
	3/5/2001	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
MW-4(R)[d]	5/11/2000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.35
	11/20/2000	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
	3/5/2001	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
MW-5	3/14/2000	<0.1	<0.1	<0.1	<1.0	<1.0	<0.1	<0.1	1.25
	11/21/2000	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
	3/5/2001	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
MW-6	3/14/2000	<0.1	<0.1	<0.1	<1.0	<1.0	<0.1	<0.1	1.25
	11/21/2000	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
	3/5/2001	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
MW-7	3/14/2000	<0.5	<0.5	<0.5	<2.0	<2.0	<0.5	<0.5	3.25
	11/21/2000	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
	3/6/2001	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
MW-8(R)/MW-800[e]	5/12/2000	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<5	15
	11/20/2000	<1.0/<1.0	<1.0/5.6Y[f]	<1.0/1.9Y	<1.0/1.3Y	<1.0/<1.0	<2.0/<2.0	<1.0/<1.0	4.0/***11.3***
	3/6/2001	<1.0/<1.0	<1.0/<1.0	<1.0/<1.0	<1.0/<1.0	<1.0/<1.0	<2.0/<2.0	<1.0/<1.0	4.0/4.0
MW-9	5/11/2000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.35
	11/21/2000	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
	3/5/2001	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
MW-10	11/20/2000	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
	3/6/2001	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
MW-11	11/20/2000	<1.0	2.0Y	<1.0	<1.0	<1.0	<2.0	<1.0	***5.5***
	3/6/2001	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
MW-12	11/20/2000	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
	3/6/2001	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	4.0
MTCA Method B Surface Water Cleanup Level[g]		NA[h]	NA	NA	NA	NA	NA	NA	2.70E-05 (1)
MTCA Method C Surface Water Cleanup Level[g]		NA	NA	NA	NA	NA	NA	NA	6.74E-04 (1)
Ecology Chronic Freshwater Surface Water Quality Standard[i]		NA	NA	NA	NA	NA	NA	NA	0.014 (1)
National Toxics Rule for Consumption of Organisms[j]		NA	NA	NA	NA	NA	NA	NA	0.0017 (1)

Analytes detected in samples at concentrations exceeding one or more of the cleanup levels or comparison values are shown in bold and italics.

TABLE 5-7

REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - PCBs
Former Tacoma Metals Facility

Notes:
(a) Samples were analyzed for polychlorinated biphenyls (PCBs) by EPA Method 8082.
(b) The total PCBs were calculated by summing the concentrations of all the probable PCBs. If a probable PCB was not detected, a value equal to one-half the reporting limit was used.
(c) "<" denotes analyte was not detected at the indicated reporting limit.
(d) "R" Replacement well.
(e) Sample MW-800 is a duplicate sample collected from well MW-8(R).
(f) "Y" indicates a raised reporting limit due to matrix interferences. The analyte may be present at or below the listed concentration.
(g) MTCA Method B and C surface water cleanup levels based on CLARC II, dated February 1996.
(h) "NA" = No cleanup level available.
(i) Ecology Chronic Freshwater Surface Water Quality Standards (WAC 173-201A).
(j) National Toxics Rule for consumption of organisms only based on 40 CFR 131.36 for a risk level of $1x10^{-5}$.

(1) Denotes practical quantification limit (PQL) is greater than MTCA cleanup levels and/or applicable, relevant, and appropriate requirements (ARARs) (Ecology 1993).

µg/l - micrograms per liter

TABLE 5-8

REMDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - PAHs
Former Tacoma Metals Facility

Sample Designation	Sample Date	PAHs (µg/l)[a] Naphth-alene	Acenaph-thlyene	Acenaph-thene	Fluorene	Phenan-threne	Anth-racene	Fluoran-thene	Pyrene	Benzo (g,h,i) perylene	cPAHs (ug/l)[a][b] Chrysene	Benzo (b)-fluoranthene	Benzo (k)-fluoranthene	Benzo (a)-pyrene	Indeno (1,2,3-cd) pyrene	Dibenz (a,h)-anthracene	Benzo (a)-anthracene	Total cPAHs[b]
MW-1	3/14/2000	<0.02[c]	<0.02	0.09	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.015
	11/21/2000	0.09J	<0.10	0.26	<0.10	0.09J	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.076
	3/5/2001	<0.10	<0.10	0.22	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.076
MW-2	3/14/2000	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.015
	11/21/2000	0.08J	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.076
	3/5/2001	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.076
MW-4(R)[d]	5/11/2000	<0.02	<0.02	0.30	0.05	<0.02	<0.02	0.04	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.015
	11/20/2000	2.4	<0.10	0.54	0.17	0.21	0.05J	0.10	0.06J	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.076
	3/5/2001	0.13	<0.10	0.34	0.08J	0.10	<0.10	0.10	0.06J	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.076
MW-5	3/14/2000	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.015
	11/21/2000	0.40	<0.10	0.06J	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.076
	3/5/2001	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.076
MW-6	3/14/2000	0.17	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.015
	11/21/2000	0.12	<0.10	0.09J	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.076
	3/5/2001	0.10	<0.10	0.15	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.076
MW-7	3/14/2000	<0.02	<0.02	0.25	0.11	<0.02	0.03	0.08	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.015
	11/21/2000	0.19	<0.10	0.79	0.28	0.06J	0.13	0.26	0.16	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.076
	3/6/2001	0.12	<0.10	0.72	0.28	0.06J	0.13	0.20	0.13	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.076
MW-8(R)/MW-800[e]	5/12/2000	***6200***	2.1	130	68	50	38	3.9	2.5	<0.02	***0.32***	***0.05***	***0.06***	***0.06***	<0.02	<0.02	***0.30***	***0.11***
	11/20/2000	***6,200/5,600***	3/2.9	220/200	100/95	70/65	5.2/4.9	5.9/6.2	2.9/2.8	<0.10/<0.10	***0.17/0.18***	<0.10/<0.10	<0.10/<0.10	<0.10/<0.10	<0.10/<0.10	<0.10/<0.10	***0.18/0.19***	***0.090 / 0.090***
	3/6/2001	***4,500/4,000***	3.6M/3.6M	210/190	88/79	60/54	5.0/4.9	5.4/4.7	3.0/2.5	<0.10/<0.10	***0.21M/0.13***	***0.06J***/<0.10	***0.05J***/<0.10	***0.06MJ***/<0.10	<0.10/<0.10	<0.10/<0.10	***0.29/0.19***	***0.11 / 0.091***
	5/14/01[f]	***4,900***	2.8	140	<50	<50	2.7	1.1	0.57	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.076
MW-9	5/11/2000	0.07	<0.02	0.46	0.06	0.15	0.07	0.12	0.10	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.015
	11/21/2000	28	<0.10	3.9	1.1	0.77	0.15	0.32	0.22	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.076
	3/5/2001	4.9	<0.10	1.4	0.37	0.60	0.20	0.40	0.30	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.076
MW-10	11/20/2000	63	0.44	96	50	66	8	10	7.9	0.11	***0.59***	***0.27***	***0.21***	***0.28***	***0.11***	<0.10	***0.70***	***0.42***
	3/6/2001	7	0.86M	68	36	46	6.9	8.5	8.9	0.31	***1.2***	***0.56***	***0.63***	***0.71***	***0.26***	***0.09MJ***	***1.4***	***1.02***
	5/14/01[f]	3.7	<0.10	18	9.9	9.9	1.4	1.2	0.76	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	***0.11***	***0.082***
MW-11	11/20/2000	0.46M	2.4Y	340	190	230	26	38	30	0.75	***4.0M***	***1.8***	***1.5***	***1.8***	***0.72***	***0.23***	***4.8***	***2.75***
	3/6/2001	280	2.2M	210	140	170	16	18	18	0.26	***1.1***	***0.52***	***0.51***	***0.65***	***0.23***	***0.07MJ***	***1.8***	***0.97***
	5/14/01[f]	0.28	<0.10	0.23	<0.10	<0.10	0.11	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.076
MW-12	11/20/2000	1.3	<0.10	2.3	0.83	0.25	0.14	0.24	0.14	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.076
	3/6/2001	2.1	<0.10	2	0.82	0.11	0.13	0.18	0.11	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.076
MTCA Method B Surface Water Cleanup Level[g]		9,880	NA[h]	643	3,460	NA	25,900	90.2	2,590	NA	0.0296 (1)	0.0296 (1)	0.0296 (1)	0.0296 (1)	0.0296 (1)	0.0296 (1)	0.0296 (1)	0.0296 (1)
MTCA Method C Surface Water Cleanup Level[g]		24,700	NA	1,610	8,640	NA	64,800	225	6,480	NA	0.740 (1)	0.740 (1)	0.740 (1)	0.740 (1)	0.740 (1)	0.740 (1)	0.740 (1)	0.740 (1)
Ecology Chronic Freshwater Surface Water Quality Standard[i]		620	NA	520	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
National Toxics Rule for Consumption of Organisms[j]		NA	NA	NA	$1.4x10^5$	NA	$1.1x10^6$	3,700	$1.1x10^5$	NA	0.31 (1)	0.31 (1)	0.31 (1)	0.31 (1)	0.31 (1)	0.31 (1)	0.31 (1)	0.31 (1)

Analytes detected in samples at concentrations exceeding one or more of the cleanup levels or comparison values are shown in bold and italics.

Notes:

(a) Samples were analyzed for polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270B GC/MS-SIM.
(b) Total cPAHs were calculated using the toxicity equivalency factor (TEF) methodology described in MTCA [WAC 173-340-708(8)(e)].
For non-detected cPAH analytes, the TEF factor (listed below) was applied to a value of one-half the laboratory reporting limit prior to summation.
TEF = 1.0 for benzo(a)pyrene
TEF = 0.1 for benzo(a)anthracene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, benzo(a)-fluoranththene, and benzo(k)- fluoranththene
TEF = 0.01 for chrysene
(c) "<" denotes analyte was not detected at the indicated reporting limit.
(d) "R" replacement well.
(e) Sample MW-800 is a duplicate sample collected from well MW-8(R).
(f) Samples were field filtered.
(g) MTCA Method B and C surface water cleanup levels based on CLARC II, dated February 1996.
(h) "NA" = No cleanup level is available.
(i) Ecology Chronic Freshwater Surface Water Quality Standards (WAC 173-201A).
(j) National Toxics Rule for consumption of organisms only based on 40 CFR 131.36 for a risk level of $1x10^{-5.}$
(1) Denotes practical quantification limit (PQL) is greater than MTCA cleanup levels and/or applicable, relevant, and appropriate requirements (ARARs) (Ecology 1993).
µg/l = micrograms per liter

Qualifiers:

J - Indicates an estimated concentration when the value is less than the calculated reporting limit.
M - Indicates an estimated value of analyte found and confirmed by analyst but with low spectral match.

NOTE: This table was upated in July 2013 at Ecology's request based on the revised methodology (i.e., TEF summation) for calculation of total cPAHs which was not required when the original RI/FS was performed. No values other than total cPAHs were revised from the orginal table produced in October 2001.

TABLE 5-9

REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - TPHs AND VOCs
Former Tacoma Metals Facility

Sample Designation	Sample Date	TPHs (mg/l)[a]			Volatile Organic Compounds (µg/l)[b]																			
		TPH-Gas	TPH-Diesel	TPH-Motor Oil	Benzene	Toluene	Ethyl-benzene	Total xylenes	Naphth-alene	Chloro-benzene	Carbon Disulfide	Acetone	Methylene Chloride	P-Isopropy -toluene	1,1,1,2-Tetra chloroethane	1,3,5 Trimethyl benzene	1,2,4 Trimethyl benzene	Isopropyl-benzene	n-Propyl benzene	4-Isopropy toluene	n-Butyl benzene	Styrene	1,4, Dichloro-benzene	1,1 Dichloro-ethane
MW-1	3/14/2000	<0.05[c]	<0.25	<0.50	<5	<5	<5	<15	<5	<5	---	<150	<5	<5	<5	<5	<5	<5	<5	---	<5	<5	<5	<5
	11/21/2000	<0.25	<0.25	<0.50	<0.2	<0.2	<0.2	<0.6	<0.5	<0.2	<0.2	1.8	<0.3	---	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	3/5/2001	<0.25	<0.25	<0.50	<1.0	<1.0	<1.0	<2.0	<5.0	<1.0	<1.0	<5.0	<2.0	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-2	3/14/2000	<0.05	<0.25	<0.50	<5	<5	<5	<15	<5	<5	---	<150	<5	<5	<5	<5	<5	<5	<5	---	<5	<5	<5	<5
	11/21/2000	<0.25	<0.25	<0.50	<0.2	<0.2	<0.2	<0.6	<0.5	<0.2	<0.2	<1.0	<0.3	---	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2
	3/5/2001	<0.25	<0.25	<0.50	<1.0	<1.0	<1.0	<2.0	<5.0	<1.0	<1.0	<5.0	<2.0	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-4(R)[d]	5/11/2000	---[e]	0.42	<0.50	<2	<2	<2	<6	<2	<2	---	<20	<2	5	<2	<2	<2	<2	<2	---	<2	<2	<2	<2
	11/20/2000	<0.25	*0.56*	<0.50	<1.0	<1.0	<1.0	<2.0	<5.0	<1.0	<1.0	<5.0	<2.0	---	<1.0	<1.0	<1.0	<1.0	<1.0	10	<1.0	<1.0	<1.0	<1.0
	3/5/2001	<0.25	*0.67*	<0.50	<1.0	<1.0	<1.0	<2.0	<5.0	<1.0	<1.0	<5.0	<2.0	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-5	3/14/2000	<0.05	<0.25	<0.50	<5	<5	<5	<15	<5	<5	---	<150	<5	<5	<5	<5	<5	<5	<5	---	<5	<5	<5	<5
	11/21/2000	<0.25	*0.62*	<0.50	<0.2	<0.2	<0.2	<0.6	<0.5	<0.2	<0.2	1.7	<0.3	---	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	3/5/2001	<0.25	*0.76*	<0.50	<1.0	<1.0	<1.0	<2.0	<5.0	<1.0	<1.0	<5.0	<2.0	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-6	3/14/2000	<0.05	<0.25	<0.50	<5	<5	<5	<15	<5	36	---	<150	<5	<5	<5	<5	<5	<5	<5	---	<5	<5	<5	<5
	11/21/2000	<0.25	***1.2***	<0.50	<0.2	<0.2	<0.2	<0.6	<5.0	72	0.3	1.3	<0.3	---	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.4	<0.2
	3/5/2001	<0.25	***1.0***	<0.50	<1.0	<1.0	<1.0	<2.0	<5.0	88	<1.0	<5.0	<2.0	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-7	3/14/2000	<0.05	<0.25	<0.50	<5	<5	<5	<15	<5	<5	---	<150	<5	<5	<5	<5	<5	<5	<5	---	<5	<5	<5	<5
	11/21/2000	<0.25	0.44	<0.50	<0.2	<0.2	<0.2	<0.6	<0.5	<0.2	<0.2	1.1	<0.3	---	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	3/6/2001	<0.25	0.33	<0.50	<1.0	<1.0	<1.0	<2.0	<5.0	<1.0	<1.0	<5.0	<2.0	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-8(R)/MW-800[f]	5/12/2000	---	***4.1***	<0.50	23	47	220	880	***2,000***	<2	---	<20	<2	38	<2	120	<2	58	<2	---	10	<20	<2	<2
	11/20/2000	***29/30***	***4/3.8***	<0.50/<0.50	23/25	98/100	280/280	1,560/1,680	***8,500/7,200***	<0.2/<0.2	<0.2/<0.2	4.2/4.5	<0.3/<0.3	---	<0.2/<0.2	170/180	520/540	59/59	12/12	45/44	12M/<0.2	<0.2/<0.2	<0.2/<0.2	<0.2/<0.2
	3/6/2001	***38/39***	***3.8/3.7***	<0.50/<0.50	24/25	70/61	190/190	1,070/1,000	***5,600/6,000***	<10/<10	<10/<10	<50/<50	<20/<20	---	<10/<10	150/150	430/420	44/44	<10/<10	34/34	<10/<10	<10/<10	<10/<10	<10/<10
MW-9	5/11/2000	---	<0.25	<0.50	<2	<2	<2	<6	<2	16	---	<20	<2	<2	<2	<2	<2	<2	<2	---	<2	<2	<2	<2
	11/21/2000	<0.25	*0.52*	<0.50	<0.2	<0.2	1.8	2.4	43	11	<0.2	<1.0	<0.3	---	<0.2	0.2	1.5	0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	3/5/2001	<0.25	*0.63*	<0.50	<1.0	<1.0	<1.0	<2.0	6.0	19	<1.0	<5.0	<2.0	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-10	11/20/2000	0.42	***1.3***	<0.50	0.6	0.4	0.6	2.1	96	<0.2	<0.2	1.5	<0.3	---	<0.2	0.6	1.8	0.9	0.3	5.8	<0.2	<0.2	<0.2	<0.2
	3/6/2001	0.39	***1.1***	<0.50	1.2	<1.0	<1.0	1.6	29	<1.0	<1.0	<5.0	<2.0	---	<1.0	<1.0	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-11	11/20/2000	***1.9***	***3.6***	<0.50	1.5	1.4	6.6	12.5	***1,100***	<0.2	<0.2	3.7	<0.3	---	<0.2	6.0	17	3.8	2.2	14	<0.2	<0.2	<0.2	<0.2
	3/6/2001	***2.5***	***3.1***	<0.50	<5.0	<5.0	7.6	12.1	550	<5.0	<5.0	<25	<10	---	<5.0	<5.0	14	<5.0	<5.0	28	<5.0	<5.0	<5.0	<5.0
MW-12	11/20/2000	<0.25	*0.64*	<0.50	<1.0	<1.0	<1.0	<2.0	11	<1.0	<1.0	<5.0	<2.0	---	<1.0	<1.0	<1.0	<1.0	<1.0	4.5	<1.0	<1.0	<1.0	<1.0
	3/6/2001	<0.25	***1.0***	***1.4***	<1.0	<1.0	<1.0	<2.0	<5.0	<1.0	<1.0	<5.0	<2.0	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MTCA Method B Surface Water Cleanup Level[g]		NA[h]	NA	NA	43	48,500	6,910	NA	9,880	5,030	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.86	NA
MTCA Method C Surface Water Cleanup Level[g]		NA	NA	NA	1,070	121,000	17,300	NA	24,700	12,600	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	121	NA
Ecology Chronic Freshwater Surface Water Quality Standard[i]		NA	NA	NA	NA	NA	NA	NA	620	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
National Toxics Rule for Consumption of Organisms[j]		NA	NA	NA	710	2,000,000	290,000	NA	NA	210,000	NA	NA	16,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	26,000	NA
MTCA Method A Groundwater Cleanup Level[k]		1	1	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Analytes detected in samples at concentrations exceeding one or more of the cleanup levels or comparison values are shown in bold and italics.

Notes:
(a) Samples were analyzed for total petroleum hydrocarbons (TPHs) by Ecology Methods NWTPH-Gas and NWTPH-Diesel (extended).
(b) Groundwater samples were analyzed for volatile organic compounds (VOCs) by EPA Method 8260.
(c) "<" denotes analyte was not detected at the indicated reporting limit.
(d) "R" Replacement well.
(e) "---" Sample not tested for indicated analyte.
(f) Sample MW-800 is a duplicate sample collected from well MW-8(R).
(g) MTCA Method B and C surface water cleanup levels based on CLARC II, dated February 1996.
(h) "NA" = No cleanup level available.
(i) Ecology Chronic Freshwater Surface Water Quality Standards (WAC 173-201A).
(j) National Toxics Rule for consumption of organisms only based on 40 CFR 131.36 for a risk level of $1x10^{-5}$.
(k) MTCA Method A groundwater cleanup level based on WAC 173-340-720(2), Table 1 (Ecology 1996a).

mg/l - milligrams per liter
µg/l - micrograms per liter

TABLE 6-1

REMEDIAL INVESTIGATION
SURFACE WATER ANALYTICAL RESULTS
Former Tacoma Metals Facility

Analyte	Sample Designation				MTCA Method B[a]	MTCA Method C[a]	Ecology SWQS[b]	National Toxics Rule[c]	Ecology NPDES[d]
	SW-1		SW-2						
Total Metals (µg/l)[e]	**3/13/2001**	**4/29/2001**	**3/13/2001**	**4/29/2001**					
Arsenic	<50[f]	<50	<50	<50	0.00982 (1)	2.46 (1)	190	1.4 (1)	NA
Barium	175	49	57	27	NA[g]	NA	NA	NA	NA
Cadmium	***8***	***2***	***8***	***5***	20.3	50.6	0.43[h] (1)	NA	NA
Chromium	***127***	8	7	<5	NA	NA	68.21[h] (1)	NA	NA
Copper	***2,070***	***437***	***410***	***231***	2,660	6,660	4.17[h] (1)	NA	NA
Lead	***8,090***	***360***	***250***	<20	NA	NA	0.69[h] (1)	NA	NA
Mercury	***9.4***	***0.9***	***0.7***	***0.3***	NA	NA	0.012 (1)	1.5 (1)	NA
Selenium	<50	<50	<50	<50	NA	NA	5 (1)	NA	NA
Silver	6	<3	<3	<3	25,900	64,800	NA	NA	NA
Dissolved Metals (µg/l)[i]									
Arsenic	<50	<50	<50	<50	0.00982 (1)	2.46 (1)	190	1.4 (1)	NA
Barium	12	21	35	27	NA	NA	NA	NA	NA
Cadmium	<2	<2	***8***	***5***	20.3	50.6	0.43[h] (1)	NA	NA
Chromium	<5	<5	<5	<5	NA	NA	68.21[h] (1)	NA	NA
Copper	***90***	***181***	***172***	***240***	2,660	6,660	4.17[h] (1)	NA	NA
Lead	<20	<20	<20	<20	NA	NA	0.69[h] (1)	NA	NA
Mercury	<0.1	***0.2***	***0.1***	***0.2***	NA	NA	0.012 (1)	1.5 (1)	NA
Selenium	<50	<50	<50	<50	NA	NA	5 (1)	NA	NA
Silver	<3	<3	<3	<3	25,900	64,800	NA	NA	NA
PCBs (µg/l)[j]									
Aroclor 1016	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA
Aroclor 1242	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA
Aroclor 1248	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA
Aroclor 1254	2.7	1.8	1.0	<1.0	NA	NA	NA	NA	NA
Aroclor 1260	2.1	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA
Aroclor 1221	<2.0	<2.0	<2.0	<2.0	NA	NA	NA	NA	NA
Aroclor 1232	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA
Total PCBs[k]	***7.8***	***5.3***	***4.5***	4	0.000027 (1)	0.000674 (1)	0.014 (1)	0.0017 (1)	NA
TPH (mg/l)[l]									
Diesel	*1.8*	*3.2*	*2*	*2.8*	NA	NA	NA	NA	10
Motor Oil	*2.9*	*3.2*	*2.6*	*1.4*	NA	NA	NA	NA	10
PAHs (µg/l)[m]									
Naphthalene	0.63	0.5	0.12	<0.10	9,880	24,700	620	NA	NA
2-Methylnaphthalene	0.33	0.24	<0.10	<0.10	NA	NA	NA	NA	NA
Acenaphthylene	0.33	0.24	<0.10	<0.10	NA	NA	NA	NA	NA
Acenaphthene	0.37	0.33	0.15	<0.10	643	1,610	520	NA	NA
Fluorene	0.36	0.27	0.1	<0.10	3,460	8,640	NA	140,000	NA
Phenanthrene	0.99	0.74	0.24	<0.10	NA	NA	NA	NA	NA
Anthracene	0.81	0.69	<0.10	<0.10	25,900	64,800	NA	1,100,000	NA
Fluoranthene	2.0	1.1	0.26	<0.10	90.2	225	NA	3,700	NA
Benzo(g,h,i)perylene	0.59	0.36	<0.10	<0.10	NA	NA	NA	NA	NA
Dibenzofuran	0.39	0.29	0.08J[n]	<0.10	NA	NA	NA	NA	NA
Pyrene	2.1	1.2	0.17	<0.10	2,590	6,480	NA	110,000	NA
Benzo(a)anthracene[o]	***0.71***	***0.34***	***0.08J***	<0.10	0.0296 (1)	0.740 (1)	NA	0.31 (1)	NA
Chrysene[o]	***1.8***	***1.4***	***0.11***	<0.10	0.0296 (1)	0.740 (1)	NA	0.31 (1)	NA
Benzo(b)fluoranthene[o]	***1.0***	***0.73***	<0.10	<0.10	0.0296 (1)	0.740 (1)	NA	0.31 (1)	NA
Benzo(k)fluoranthene[o]	***1.2***	***0.70***	<0.10	<0.10	0.0296 (1)	0.740 (1)	NA	0.31 (1)	NA
Benzo(a)pyrene[o]	***1.0***	***0.44***	<0.10	<0.10	0.0296 (1)	0.740 (1)	NA	0.31 (1)	NA
Indeno(1,2,3-cd)pyrene[o]	***0.71***	***0.36***	<0.10	<0.10	0.0296 (1)	0.740 (1)	NA	0.31 (1)	NA
Dibenz(a,h)anthracene[o]	***0.2***	***0.12***	<0.10	<0.10	0.0296 (1)	0.740 (1)	NA	0.31 (1)	NA
Total cPAHs[o,p]	***1.4***	***0.68***	***0.079***	0.076	0.0296 (1)	0.740 (1)	NA	0.31 (1)	NA

Analytes detected in samples at concentrations exceeding one or more of the cleanup levels or comparison values are shown in bold and italics.

TABLE 6-1

REMEDIAL INVESTIGATION
SURFACE WATER ANALYTICAL RESULTS
Former Tacoma Metals Facility

Notes:

(a) MTCA Method B and C surface water cleanup levels based on CLARC II, dated February 1996.
(b) Ecology Chronic Freshwater Surface Water Quality Standards (WAC 173-201A).
(c) National Toxics Rule based on 40 CFR 131.36 for a risk level of $1x10^{-5}$.
(d) Ecology Model National Pollutant Discharge Elimination System (NPDES) Permit Standard for discharges to surface water from leaking underground storage tank (LUST) cleanups where gasoline and diesel fuel are the pollutants of concern (WAC 173-226).
(e) Surface water samples were analyzed for total metals by EPA Methods 6010/7000 series.
(f) "<" denotes analyte was not detected at the indicated reporting limit.
(g) "NA" = No cleanup level is available.
(h) Surface Water Quality Standard is based on an average groundwater hardness of 31 mg/l.

(i) Surface water samples for dissolved metals were field filtered and analyzed by EPA Methods 6010/7000 series.
(j) Surface water samples were analyzed for polychlorinated biphenyls (PCBs) by EPA Method 8082.
(k) The total polychlorinated biphenyls (PCBs) were calculated by summing the concentrations of all the probable PCBs. If a probable PCB was not detected, a value equal to one-half the reporting limit was used.
(l) Suface water samples were analyzed for TPHs by the Ecology Method NWTPH-Diesel (extended).
(m) Surface water samples were analyzed for polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270B GC/MS-SIM.
(n) "J" Indicates an estimated concentration when the value is less than the calculated reporting limit.
(o) Carcinogenic polycyclic aromatic hydrocarbons (cPAHs).
(p) Total cPAHs were calculated using the toxicity equivalency factor (TEF) methodology described in MTCA [WAC 173-340-708(8)(e)]. For non-detected cPAH analytes, the TEF factor (listed below) was applied to a value of one-half the laboratory reporting limit prior to summation.
TEF = 1.0 for benzo(a)pyrene
TEF = 0.1 for benzo(a)anthracene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, benzo(a)-fluoranththene, and benzo(k)- fluoranththene
TEF = 0.01 for chrysene

(1) Denotes practical quantification limit (PQL) is greater than MTCA cleanup levels and/or applicable, relevant, and appropriate requirements (ARARs) (Ecology 1993).

mg/l = milligrams per liter
µg/l = micrograms per liter

NOTE: This table was upated in July 2013 at Ecology's request based on the revised methodology (i.e. TEF summation) for calculation of total cPAHs which was not required when the original RI/FS was performed. No values other than total cPAHs were revised from the orginal table produced in October 2001.

Appendix D

Creosoting Plant Area Site Maps, Sample Maps, and Data Tables

Appendix D: Creosoting Plant Area Site Maps, Sample Maps, and Data Tables

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(NOTE: Figure and table designations are from multiple previous reports and may be duplicated. Figures and tables are presented in the order listed below)

1) Figure 1 Monitoring Well and Boring Location Map *(2008)*

2) Figure 2A Total CPAH Groundwater Concentration Map - March 2008 (2008)

3) Figure 2B Dissolved CPAH Groundwater Concentration Map - March 2008 (2008)

4) Figure 3 Naphthalene Groundwater Concentration Map - March 2008 (2008)

5) Figure 3 Naphthalene Groundwater Concentration Map - February 2006 (2007)

6) Figure 4 CPAH Groundwater Concentration Map - February 2006 (2007)

7) Table 1 October/November 2007 Off-Property Investigation. Soil Analytical Results – TPH and PAHs (2008)

8) Table 2 October 2007 Off-Property Investigation. Reconnaissance Groundwater Analytical Results – TPH and PAHs (2008)

9) Table 3 March 2008 Groundwater Monitoring Well Analytical Results – TPH and PAHs (2008)

10) Table 2A February 2006 Off-Property Investigation Soil Analytical Results – TPH and PAHs (2007)

11) Table 2B February 2006 Groundwater Monitoring Well Analytical Results – TPH and PAHs (2007)

12) Table 3A March 2005 Off-Property Investigation Soil Analytical Results – TPH and PAHs (2007)

13) Table 3B March 2005 Off-Property Investigation Reconnaissance Groundwater Analytical Results – TPH and PAHs (2007)

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15) Table 4A March 2004 Off-Property Investigation Soil Analytical Results – TPH and PAHs (2007)

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24) Table 6A February-March 2003 Investigation Soil Analytical Results (2007)

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27) Table 7A June-August 2002 Investigation Soil Analytical Results (2007)

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31) Table 7E June-August 2002 Investigation Groundwater Analytical Results – PCBs (2007)

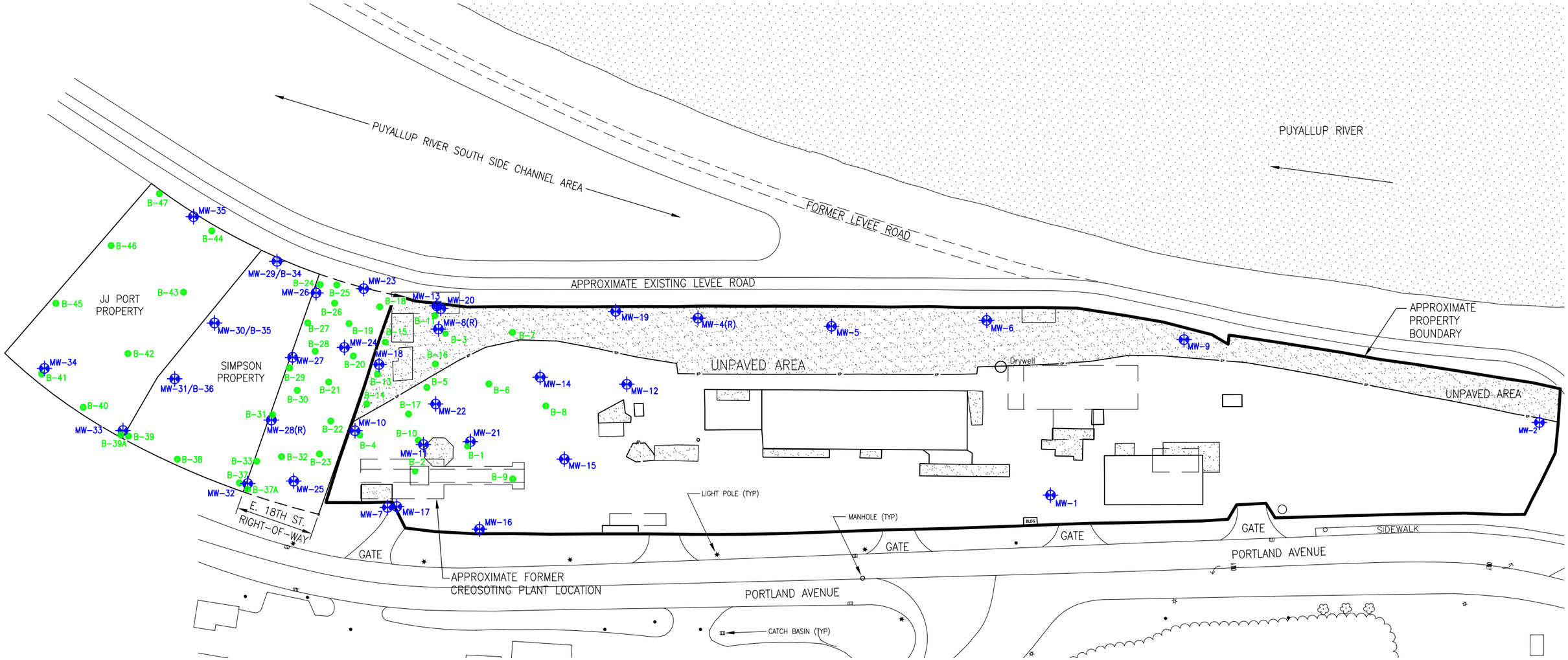
32) Table 7F June-August 2002 Investigation Groundwater Analytical Results – Total and Dissolved Metals (2007)

33) Table 8 October 2001 Groundwater Analytical Results – Dissolved Lead (2007)

Materials included in Appendix D are from the following reports (as indicated in parentheses following the title for each item):

2007 = *Supplemental Data Summary Report* (Kennedy/Jenks Consultants 2007a)

2008 = *Soil and Groundwater Investigation Results – Data Transmittal; October 2007-April 2008 Investigation* (Kennedy/Jenks Consultants 2008)



LEGEND:

B-1	SOIL BORING LOCATION
MW-26	MONITORING WELL LOCATION
	UNPAVED AREA
	APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)

NOTES:

1. BORING AND WELL LOCATIONS ARE BASED ON SITE SURVEY BY EARTH TECH, INC. ON 28 MARCH 2000, 13 MARCH 2003, 31 DECEMBER 2003, 14 APRIL 2004, 21 APRIL 2005, 29 MARCH 2006, AND 11 APRIL 2008.

N

0 50 100

SCALE: 1=100

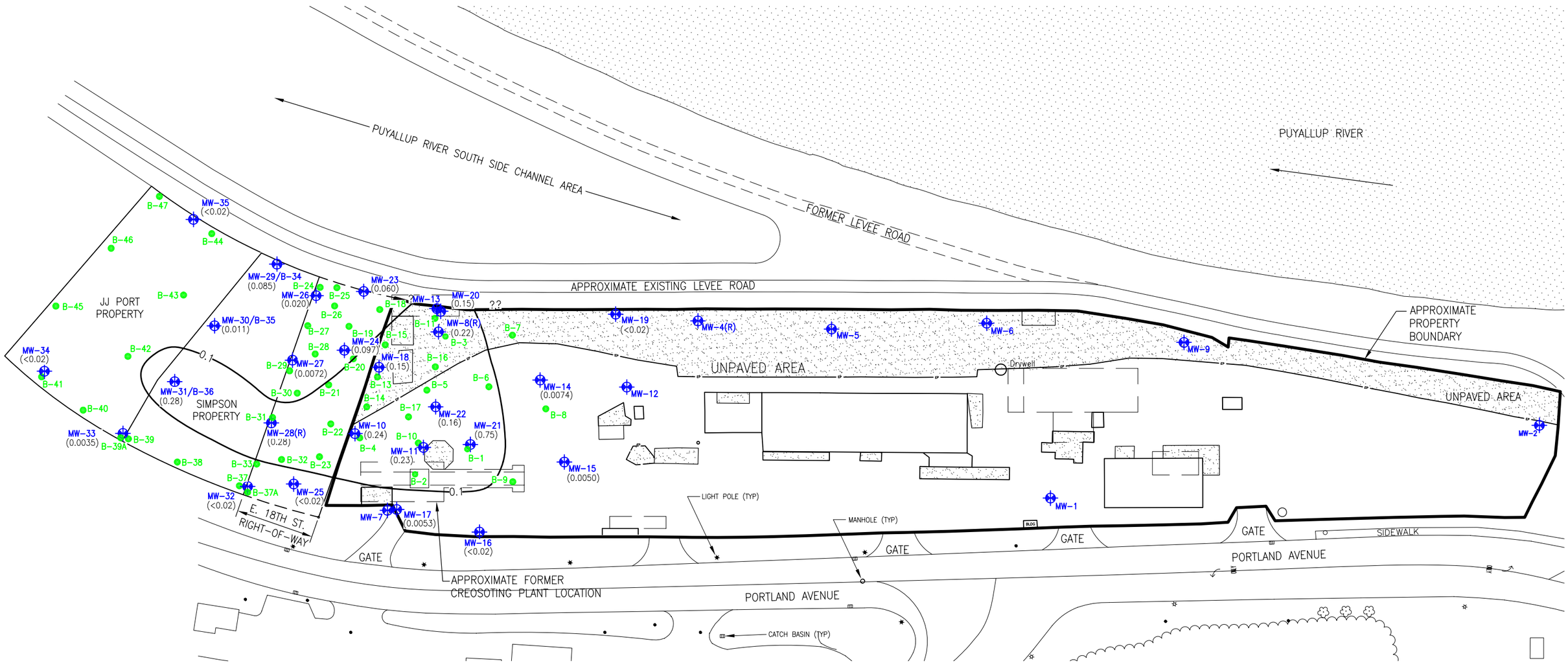
Kennedy/Jenks Consultants

FORMER TACOMA METALS FACILITY
TACOMA, WA

MONITORING WELL AND BORING LOCATION MAP

996098.00\2008 DATA SUMMARY\FIG_01

FIGURE 1



LEGEND:

- B-1 — SOIL BORING LOCATION
- MW-26 — MONITORING WELL LOCATION
- UNPAVED AREA
- APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)
- (0.085) — TOTAL CPAH CONCENTRATION IN MICROGRAMS PER LITER (µg/l)
- 0.1 — TOTAL CPAH CONCENTRATION CONTOUR (APPROXIMATE) IN µg/l
- CPAH – CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS
- µg/l – MICROGRAMS PER LITER

NOTES:

1. BORING AND WELL LOCATIONS ARE BASED ON SITE SURVEY BY EARTH TECH, INC. ON 28 MARCH 2000, 13 MARCH 2003, 31 DECEMBER 2003, 14 APRIL 2004, 21 APRIL 2005, 29 MARCH 2006, AND 11 APRIL 2008.

N

0 50 100
SCALE: 1=100

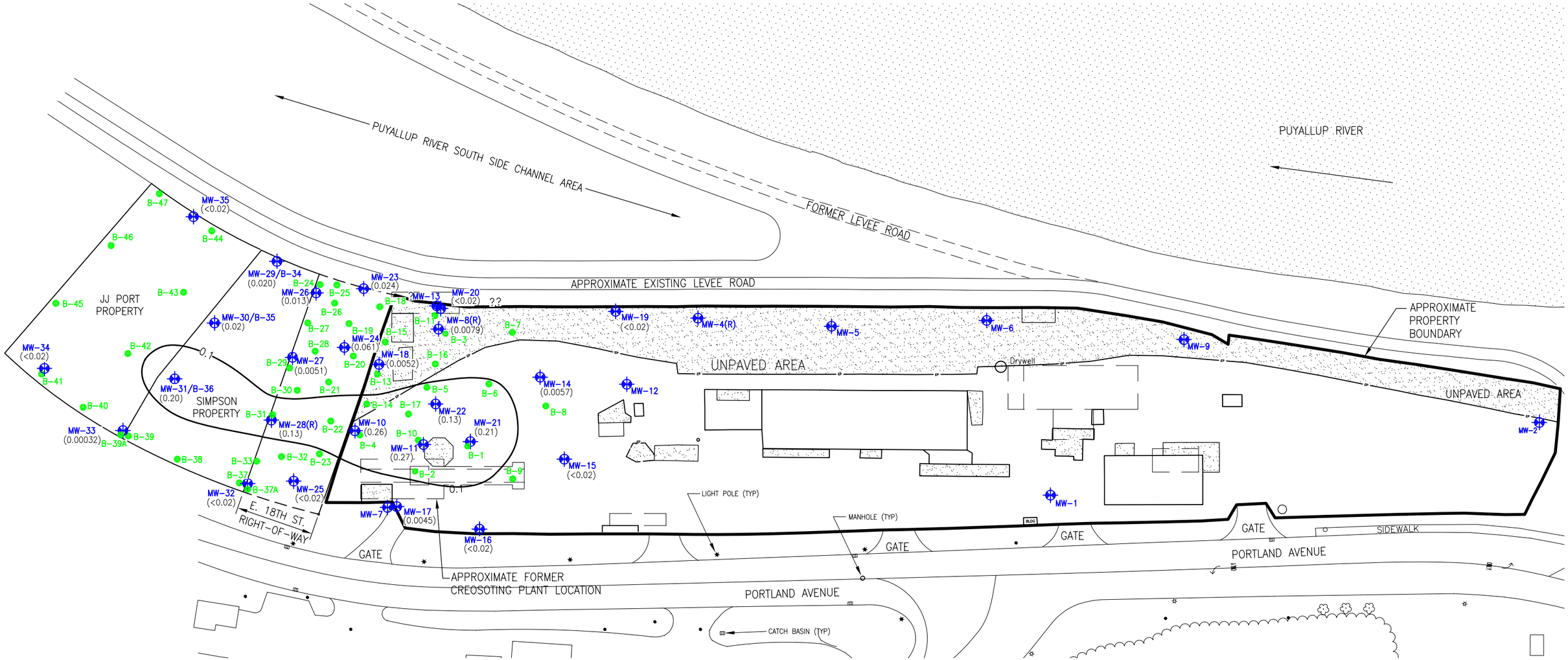
Kennedy/Jenks Consultants

FORMER TACOMA METALS FACILITY
TACOMA, WA

TOTAL CPAH GROUNDWATER CONCENTRATION MAP - MARCH 2008

996098.00\2008 DATA SUMMARY\FIG_02A

FIGURE 2A



LEGEND:

- B-1 — SOIL BORING LOCATION
- MW-26 — MONITORING WELL LOCATION
- UNPAVED AREA
- APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)
- (0.085) — DISSOLVED (FILTERED) CPAH CONCENTRATION IN MICROGRAMS PER LITER (µg/l)
- 0.1 — DISSOLVED CPAH CONCENTRATION CONTOUR (APPROXIMATE) IN µg/l
- CPAH – CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS
- µg/l – MICROGRAMS PER LITER

NOTES:

1. BORING AND WELL LOCATIONS ARE BASED ON SITE SURVEY BY EARTH TECH, INC. ON 28 MARCH 2000, 13 MARCH 2003, 31 DECEMBER 2003, 14 APRIL 2004, 21 APRIL 2005, 29 MARCH 2006, AND 11 APRIL 2008.

N

0 50 100
SCALE: 1=100

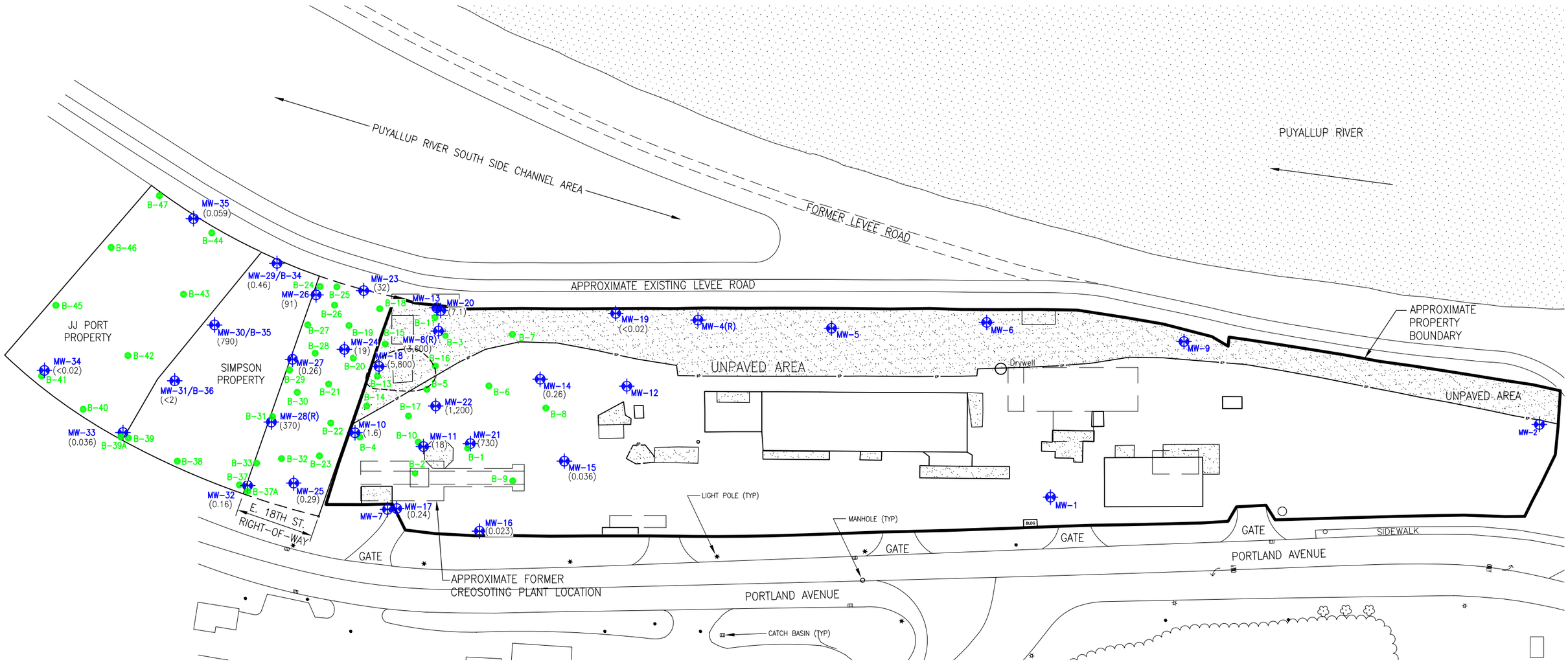
Kennedy/Jenks Consultants

FORMER TACOMA METALS FACILITY
TACOMA, WA

DISSOLVED CPAH GROUNDWATER CONCENTRATION MAP - MARCH 2008

996098.00\2008 DATA SUMMARY\FIG_02B

FIGURE 2B



LEGEND:

B-1 — SOIL BORING LOCATION

MW-26 — MONITORING WELL LOCATION

UNPAVED AREA

APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)

(730) — NAPHTHALENE CONCENTRATION IN MICROGRAMS PER LITER (µg/l)

4,940 — MTCA METHOD B SURFACE WATER CLEANUP LEVEL CONTOUR (APPROXIMATE) IN µg/l

µg/l – MICROGRAMS PER LITER

NOTES:

1. BORING AND WELL LOCATIONS ARE BASED ON SITE SURVEY BY EARTH TECH, INC. ON 28 MARCH 2000, 13 MARCH 2003, 31 DECEMBER 2003, 14 APRIL 2004, 21 APRIL 2005, 29 MARCH 2006, AND 11 APRIL 2008.

N

0 50 100

SCALE: 1=100

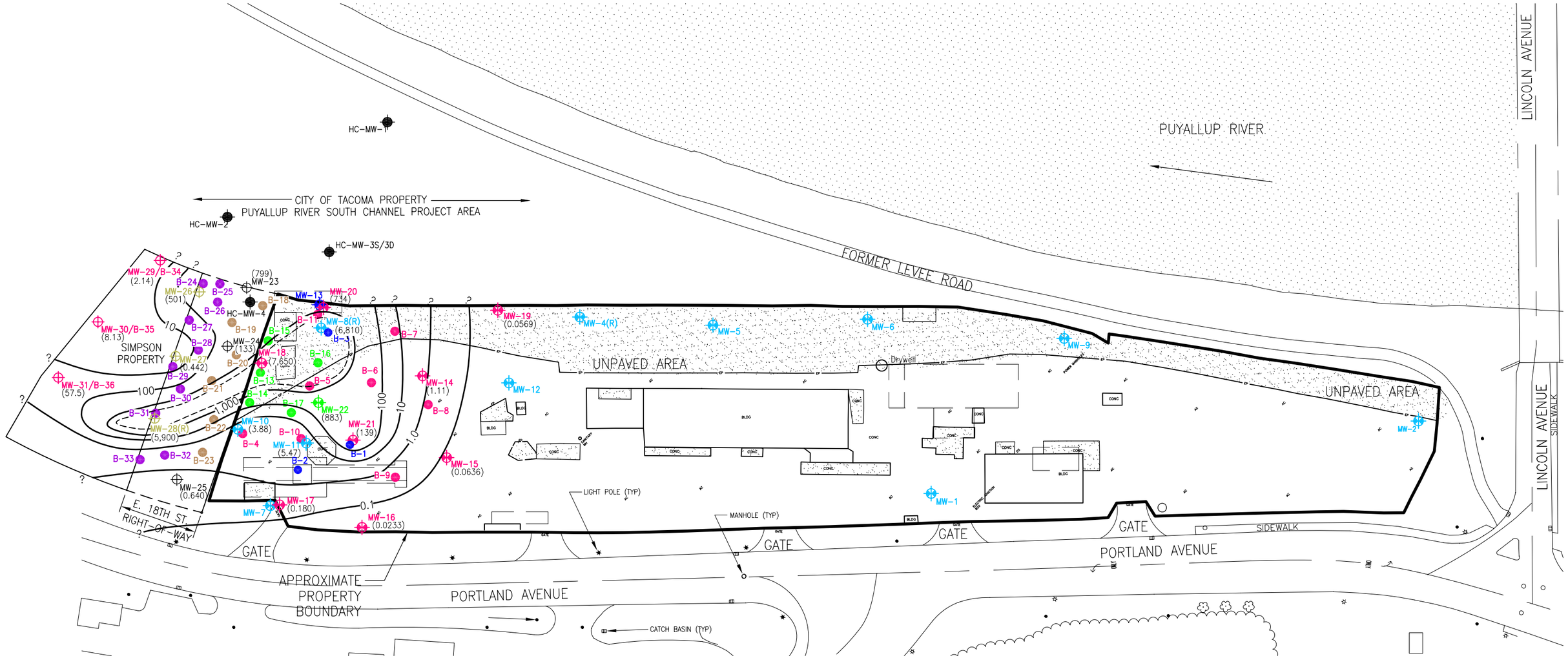
Kennedy/Jenks Consultants

FORMER TACOMA METALS FACILITY
TACOMA, WA

NAPHTHALENE GROUNDWATER CONCENTRATION MAP - MARCH 2008

996098.00\2008 DATA SUMMARY\FIG_03

FIGURE 3



LEGEND:

MW-29/B-34	OFF-PROPERTY MONITORING WELL AND SOIL BORING LOCATION (FEBRUARY 2006)
MW-26	OFF-PROPERTY MONITORING WELL LOCATION (MARCH 2005)
B-24	OFF-PROPERTY GEOPROBE BORING LOCATION (MARCH 2005)
MW-23	OFF-PROPERTY MONITORING WELL LOCATION (MARCH 2004)
B-18	OFF-PROPERTY GEOPROBE BORING LOCATION (MARCH 2004)
MW-12	MONITORING WELL LOCATION (REMEDIAL INVESTIGATION 2000-2001)
MW-13	MONITORING WELL LOCATION (JUNE – AUGUST 2002 INVESTIGATION)
MW-14	MONITORING WELL LOCATION (FEBRUARY – MARCH 2003 INVESTIGATION)
MW-22	MONITORING WELL LOCATION (NOVEMBER – DECEMBER 2003 INVESTIGATION)
HC-MW-4	FORMER OFF-PROPERTY MONITORING WELL LOCATION INSTALLED BY HART-CROWSER (JUNE 2003)
B-1	HOLLOW-STEM AUGER BORING LOCATION (JUNE – AUGUST 2002 INVESTIGATION)
B-4	GEOPROBE BORING LOCATION (FEBRUARY – MARCH 2003 INVESTIGATION)
B-12	GEOPROBE BORING LOCATION (NOVEMBER – DECEMBER 2003 INVESTIGATION)
	UNPAVED AREA
	APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)
(799)	NAPHTHALENE CONCENTRATION IN MICROGRAMS PER LITER (µg/l)
10	NAPHTHALENE CONCENTRATION CONTOUR (APPROXIMATE) IN µg/l
4,940	MTCA METHOD B SURFACE WATER CLEANUP LEVEL CONTOUR (APPROXIMATE) IN µg/l

NOTES:

1. ALL LOCATIONS ARE APPROXIMATE.

N

0 50 100
SCALE: 1=100

DRAFT

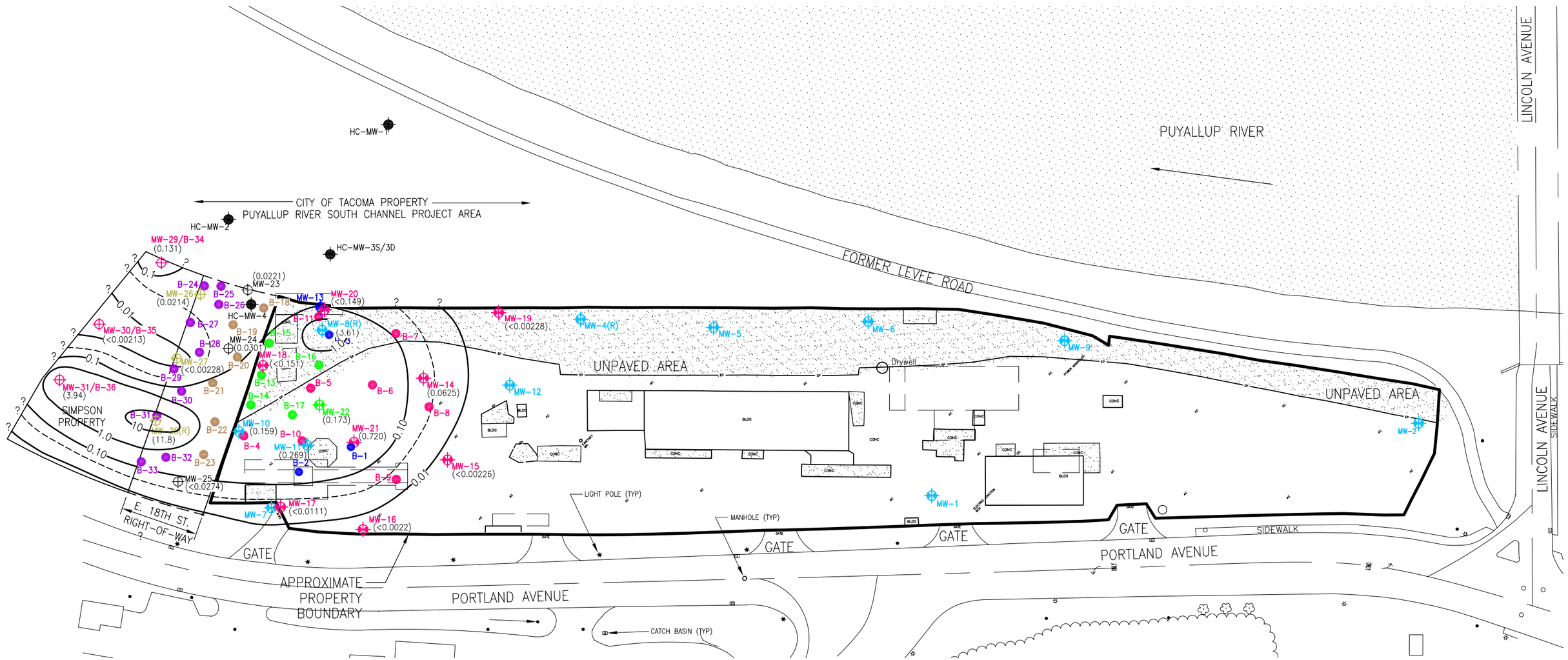
Kennedy/Jenks Consultants

FORMER TACOMA METALS FACILITY
TACOMA, WA

NAPHTHALENE GROUNDWATER CONCENTRATION MAP - FEBRUARY 2006

996098.00\2006 DATA SUMMARY\FIG_3

FIGURE 3



LEGEND:

MW-29/B-34	OFF-PROPERTY MONITORING WELL AND SOIL BORING LOCATION (FEBRUARY 2006)
MW-26	OFF-PROPERTY MONITORING WELL LOCATION (MARCH 2005)
B-24	OFF-PROPERTY GEOPROBE BORING LOCATION (MARCH 2005)
MW-23	OFF-PROPERTY MONITORING WELL LOCATION (MARCH 2004)
B-18	OFF-PROPERTY GEOPROBE BORING LOCATION (MARCH 2004)
MW-12	MONITORING WELL LOCATION (REMEDIAL INVESTIGATION 2000-2001)
MW-13	MONITORING WELL LOCATION (JUNE – AUGUST 2002 INVESTIGATION)
MW-14	MONITORING WELL LOCATION (FEBRUARY – MARCH 2003 INVESTIGATION)
MW-22	MONITORING WELL LOCATION (NOVEMBER – DECEMBER 2003 INVESTIGATION)
HC-MW-4	FORMER OFF-PROPERTY MONITORING WELL LOCATION INSTALLED BY HART-CROWSER (JUNE 2003)
B-1	HOLLOW-STEM AUGER BORING LOCATION (JUNE – AUGUST 2002 INVESTIGATION)
B-4	GEOPROBE BORING LOCATION (FEBRUARY – MARCH 2003 INVESTIGATION)
B-12	GEOPROBE BORING LOCATION (NOVEMBER – DECEMBER 2003 INVESTIGATION)
	UNPAVED AREA
	APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)
(0.720)	TOTAL CPAH CONCENTRATION IN MICROGRAMS PER LITER (µg/l)
1.0	TOTAL CPAH CONCENTRATION CONTOUR (APPROXIMATE) IN µg/l
0.02	SURFACE WATER CLEANUP LEVEL CONTOUR (APPROXIMATE) IN µg/l BASED ON ECOLOGY PQL FOR TOTAL CPAHS

NOTES:

1. ALL LOCATIONS ARE APPROXIMATE.

N

0 50 100
SCALE: 1=100

DRAFT

Kennedy/Jenks Consultants

FORMER TACOMA METALS FACILITY
TACOMA, WA

CPAH GROUNDWATER CONCENTRATION MAP - FEBRUARY 2006

996098.00\2006 DATA SUMMARY\FIG_4

FIGURE 4

TABLE 1

OCTOBER / NOVEMBER 2007 OFF-PROPERTY INVESTIGATION
SOIL ANALYTICAL RESULTS - TPH and PAHs
Former Tacoma Metals Facility

Analyte	Sample Designation (Boring ID - feet bgs)												MTCA Method C Industrial Soil Cleanup Level[a]
	B37 5-6	B37 14-15	B37 21-22	B38 5-6	B38 14.5-15.5	B38 22.5-23.5	B39 5.5-6.5	B39 10-11	B39 21-22	B40 6.5-7.5	B40 14-15	B40 21.5-22.5	
TPHs (mg/kg)[b]													
Gasoline-range Hydrocarbon	<2[c]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	100/30[d]
Diesel-range Hydrocarbon	<50	<50	<50	<50	<50	<50	120	<50	200	<50	<50	<50	2,000[d]
Oil-range Hydrocarbon	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	2,000[d]
PAHs (mg/kg)[e]													
Naphthalene	0.020	<0.01	<0.01	0.015	<0.01	<0.01	1.8	0.24	<0.01	<0.01	<0.01	<0.01	7.00E+04
Acenaphthylene	<0.01	<0.01	<0.01	0.011	<0.01	<0.01	0.12	<0.01	0.11	<0.01	<0.01	<0.01	NA[f]
Acenaphthene	<0.01	0.080	0.032	<0.01	0.10	0.41	0.51	1.1	0.41	<0.01	0.011	<0.01	2.10E+05
Fluorene	<0.01	<0.01	<0.01	<0.01	0.089	<0.01	0.39	1.3	0.40	<0.01	<0.01	<0.01	1.40E+05
Phenanthrene	0.011	<0.01	<0.01	0.034	0.13	0.060	1.3	1.90	2.1	0.019	<0.01	<0.01	NA
Anthracene	<0.01	<0.01	<0.01	0.040	0.033	0.015	0.61	0.47	2.6	<0.01	<0.01	<0.01	1.05E+06
Fluoranthene	0.016	<0.01	<0.01	0.21	0.049	0.017	1.2	1.3	18	<0.01	<0.01	<0.01	1.40E+05
Pyrene	0.016	<0.01	<0.01	0.44	0.027	0.028	1.1	0.77	15	<0.01	<0.01	<0.01	1.05E+05
Benzo(g,h,i)perylene	0.013	<0.01	<0.01	0.095	<0.01	<0.01	0.83	<0.01	1.5	<0.01	<0.01	<0.01	NA
cPAHs (mg/kg)[g]													
Benzo(a)anthracene	<0.01	<0.01	<0.01	0.18	<0.01	<0.01	0.99	0.019	6.7	<0.01	<0.01	<0.01	NA
Chrysene	0.016	<0.01	<0.01	0.27	<0.01	<0.01	1.7	0.012	9.4	<0.01	<0.01	<0.01	NA
Benzo(a)pyrene	<0.01	<0.01	<0.01	0.24	<0.01	<0.01	1.3	<0.01	4.2	<0.01	<0.01	<0.01	NA
Benzo(b)fluoranthene	0.018	<0.01	<0.01	0.33	<0.01	<0.01	2.0	<0.01	5.0	<0.01	<0.01	<0.01	NA
Benzo(k)fluoranthene	<0.01	<0.01	<0.01	0.13	<0.01	<0.01	0.62	<0.01	1.9	<0.01	<0.01	<0.01	NA
Indeno(1,2,3-cd)pyrene	0.011	<0.01	<0.01	0.12	<0.01	<0.01	1.0	<0.01	1.9	<0.01	<0.01	<0.01	NA
Dibenz(a,h)anthracene	<0.01	<0.01	<0.01	0.022	<0.01	<0.01	0.24	<0.01	0.58	<0.01	<0.01	<0.01	NA
Total cPAHs (mg/kg)[h]	0.0031	<0.01	<0.01	0.32	<0.01	<0.01	1.8	0.0020	5.9	<0.01	<0.01	<0.01	18

TABLE 1

OCTOBER / NOVEMBER 2007 OFF-PROPERTY INVESTIGATION
SOIL ANALYTICAL RESULTS - TPH and PAHs
Former Tacoma Metals Facility

Analyte	Sample Designation (Boring ID - feet bgs)										MTCA Method C Industrial Soil Cleanup Level[a]
	B41 7-8	B41 11-12	B41 24.5-25.5	B42 5-6	B42 22-23	B42 24.5-25.5	B43 6-7	B43 14.5-15.5	B43 28.5-29.5	B43 34.5-35.5	
TPHs (mg/kg)[b]											
Gasoline-range Hydrocarbon	<2[c]	<2	<2	<2	<2	<2	<2	<2	<2	<2	100/30[d]
Diesel-range Hydrocarbon	<50	<50	<50	<50	<50	<50	130	<50	<50	69	2,000[d]
Oil-range Hydrocarbon	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	2,000[d]
PAHs (mg/kg)[e]											
Naphthalene	<0.01	<0.01	<0.01	0.028	<0.01	<0.01	0.028	0.26	0.91	0.43	7.00E+04
Acenaphthylene	<0.01	<0.01	<0.01	0.012	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NA[f]
Acenaphthene	<0.01	<0.01	<0.01	<0.01	1.3	<0.01	0.015	0.033	1.4	1.0	2.10E+05
Fluorene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.017	0.012	0.98	0.63	1.40E+05
Phenanthrene	<0.01	<0.01	<0.01	0.052	0.015	<0.01	0.11	0.012	1.5	0.33	NA
Anthracene	<0.01	<0.01	<0.01	0.032	<0.01	<0.01	0.014	<0.01	0.11	0.078	1.05E+06
Fluoranthene	<0.01	<0.01	<0.01	0.067	<0.01	<0.01	0.026	<0.01	0.14	0.12	1.40E+05
Pyrene	<0.01	<0.01	<0.01	0.089	<0.01	<0.01	0.027	<0.01	0.062	0.053	1.05E+05
Benzo(g,h,i)perylene	<0.01	<0.01	<0.01	0.14	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NA
cPAHs (mg/kg)[g]											
Benzo(a)anthracene	<0.01	<0.01	<0.01	0.11	<0.01	<0.01	0.024	<0.01	<0.01	<0.01	NA
Chrysene	<0.01	<0.01	<0.01	0.23	<0.01	<0.01	0.036	<0.01	<0.01	<0.01	NA
Benzo(a)pyrene	<0.01	<0.01	<0.01	0.25	<0.01	<0.01	0.010	<0.01	<0.01	<0.01	NA
Benzo(b)fluoranthene	<0.01	<0.01	<0.01	0.36	<0.01	<0.01	0.013	<0.01	<0.01	<0.01	NA
Benzo(k)fluoranthene	<0.01	<0.01	<0.01	0.12	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NA
Indeno(1,2,3-cd)pyrene	<0.01	<0.01	<0.01	0.17	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NA
Dibenz(a,h)anthracene	<0.01	<0.01	<0.01	0.040	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NA
Total cPAHs (mg/kg)[h]	<0.01	<0.01	<0.01	0.33	<0.01	<0.01	0.014	<0.01	<0.01	<0.01	18

TABLE 1

OCTOBER / NOVEMBER 2007 OFF-PROPERTY INVESTIGATION
SOIL ANALYTICAL RESULTS - TPH and PAHs
Former Tacoma Metals Facility

Analyte	Sample Designation (Boring ID - feet bgs)												MTCA Method C Industrial Soil Cleanup Level[a]
	B44 2-3	B44 14-15	B44 31.5-32.5	B45 6.5-7.5	B45 11-12	B45 21-22	B46 6-7	B46 13-14	B46 21-22	B47 6-7	B47 13-14	B47 30.5-31.5	
TPHs (mg/kg)[b]													
Gasoline-range Hydrocarbon	<2[c]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	100/30[d]
Diesel-range Hydrocarbon	<50	<50	<50	<50	<50	<50	<50	100	<50	78	<50	<50	2,000[d]
Oil-range Hydrocarbon	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	2,000[d]
PAHs (mg/kg)[e]													
Naphthalene	0.045	<0.01	0.052	<0.01	<0.01	<0.01	<0.01	0.022	<0.01	0.038	<0.01	<0.01	7.00E+04
Acenaphthylene	0.076	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.046	<0.01	<0.01	NA[f]
Acenaphthene	<0.01	<0.01	0.55	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	2.10E+05
Fluorene	0.010	<0.01	0.23	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.016	<0.01	<0.01	1.40E+05
Phenanthrene	0.077	0.010	0.081	<0.01	<0.01	<0.01	0.015	0.085	<0.01	0.15	0.020	<0.01	NA
Anthracene	0.083	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.080	<0.01	<0.01	1.05E+06
Fluoranthene	0.23	0.016	<0.01	<0.01	<0.01	<0.01	<0.01	0.049	<0.01	0.27	0.023	<0.01	1.40E+05
Pyrene	0.40	0.023	<0.01	<0.01	<0.01	<0.01	<0.01	0.045	<0.01	0.47	0.022	<0.01	1.05E+05
Benzo(g,h,i)perylene	0.43	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.34	<0.01	<0.01	NA
cPAHs (mg/kg)[g]													
Benzo(a)anthracene	0.36	0.015	<0.01	<0.01	<0.01	<0.01	<0.01	0.011	<0.01	0.37	0.011	<0.01	NA
Chrysene	0.67	0.013	<0.01	<0.01	<0.01	<0.01	<0.01	0.024	<0.01	0.73	0.013	<0.01	NA
Benzo(a)pyrene	0.73	0.014	<0.01	<0.01	<0.01	<0.01	<0.01	0.014	<0.01	0.62	<0.01	<0.01	NA
Benzo(b)fluoranthene	0.96	0.015	<0.01	<0.01	<0.01	<0.01	<0.01	0.019	<0.01	0.81	0.011	<0.01	NA
Benzo(k)fluoranthene	0.25	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.22	<0.01	<0.01	NA
Indeno(1,2,3-cd)pyrene	0.49	0.010	<0.01	<0.01	<0.01	<0.01	<0.01	0.011	<0.01	0.36	<0.01	<0.01	NA
Dibenz(a,h)anthracene	0.14	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.095	<0.01	<0.01	NA
Total cPAHs (mg/kg)[h]	0.97	0.018	<0.01	<0.01	<0.01	<0.01	<0.01	0.018	<0.01	0.81	0.0023	<0.01	18

Notes:

(a) Model Toxics Control Act (MTCA) Method C industrial soil cleanup levels based on CLARC v3.1, dated November 2001 (Ecology 2001b).
(b) Samples were analyzed for diesel- and oil-range hydrocarbons by Ecology Method NWTPH-Dx with silica gel cleanup, and gasoline-range hydrocarbons by Ecology Method NWTPH-G.
(c) "<" denotes analyte was not detected at the indicated laboratory reporting limit.
(d) Total petroleum hydrocarbon (TPH) screening levels based on MTCA Method A industrial soil cleanup levels (Ecology 2001a). For gasoline mixtures without benzene and total ethylbenzene, toluene and xylenes less than 1% of the gasoline mixture the cleanup level is 100 mg/kg. For all other gasoline mixtures, the cleanup level is 30 mg/kg.
(e) Samples were analyzed for polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270C using selected ion monitoring (SIM) mode (where appropriate).
(f) "NA" denotes cleanup level is either not available or not appropriate.
(g) Samples were analyzed for carcinogenic polycyclic aromatic hydrocarbons (cPAHs) by EPA Method 8270C using SIM mode (where appropriate).
(h) Total cPAHs are based on benzo(a)pyrene equivalent values. Individual detected cPAH concentrations were multiplied by benzo(a)pyrene toxicity equivalency factors (TEFs) prior to summation (per WAC 173-340-708). Non-detected cPAH analytes were not included in the summation. TEFs are tabulated on Table1A.

Analytes detected in samples at concentrations exceeding one or more cleanup levels or comparison levels are shown in bold and italics.
mg/kg = milligrams per kilogram
bgs = below ground surface

TABLE 1A
Summary of TEFs

Analyte	TEF
Benzo(a)anthracene	0.1
Chrysene	0.01
Benzo(a)pyrene	1
Benzo(b)fluoranthene	0.1
Benzo(k)fluoranthene	0.1
Indeno(1,2,3-cd)pyrene	0.1
Dibenz(a,h)anthracene	0.1

TABLE 2

OCTOBER 2007 OFF-PROPERTY INVESTIGATION
RECONNAISSANCE GROUNDWATER ANALYTICAL RESULTS - TPH and PAHs
Former Tacoma Metals Facility

Analyte	Reconnaissance Groundwater Sample Designation													Proposed Cleanup Level[a]
	B37 RGW	B37A RGW	B38 RGW	B39 RGW	B39A RGW	B40 RGW	B41 RGW	B42 RGW	B43 RGW	B44 RGW	B45 RGW	B46 RGW	B47 RGW	
TPHs (µg/l)[b]														
Gasoline-range hydrocarbons	<100[c]	<100	<100	<100	<100	<100	<100	120	<100	130	<100	<100	<100	NA[d]
Diesel-range hydrocarbons	64	<50	290	100	<50	<50	<50	95	<50	120	<50	<50	<50	NA
Oil-range hydrocarbons	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	NA
PAHs (µg/l)[e]														
Naphthalene	<0.1	<0.1	0.17	4.2	<0.1	0.36	<0.1	<0.1	0.96	2.0	<0.1	<0.1	<0.1	4,940[f]
Acenaphthylene	<0.1	<0.1	0.36	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Acenaphthene	3.7	2.6	59	5.5	0.91	0.34	<0.1	5.0	8.2	13	<0.1	<0.1	<0.1	643[f]
Fluorene	<0.1	<0.1	2.7	3.1	<0.1	0.24	<0.1	0.71	0.94	2.3	<0.1	<0.1	<0.1	3,460[f]
Phenanthrene	<0.1	<0.1	11	8.9	0.10	0.54	<0.1	0.58	0.26	0.50	<0.1	<0.1	<0.1	NA
Anthracene	<0.1	<0.1	1.6	1.6	<0.1	<0.1	<0.1	0.11	<0.1	<0.1	<0.1	<0.1	<0.1	25,900[f]
Fluoranthene	<0.1	<0.1	2.4	2.8	<0.1	0.13	<0.1	0.21	<0.1	<0.1	<0.1	<0.1	<0.1	90.2[f]
Pyrene	<0.1	<0.1	1.7	1.9	<0.1	<0.1	<0.1	0.19	<0.1	<0.1	<0.1	<0.1	<0.1	2,590[f]
Benzo(g,h,i)perylene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
cPAHs (µg/l)[g]														
Benzo(a)anthracene	<0.1	<0.1	<0.1	0.20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Chrysene	<0.1	<0.1	<0.1	0.28	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Benzo(a)pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Benzo(b)fluoranthene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Benzo(k)fluoranthene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Indeno(1,2,3-cd)pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Dibenz(a,h)anthracene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Total cPAHs (µg/l)[h]	<0.1	<0.1	<0.1	0.023	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1.24[i]

Notes:

(a) Proposed site cleanup levels based on Kennedy/Jenks Consultants' 2007 *Cleanup Level Evaluation* report submitted to Ecology under separate cover.

(b) Samples were analyzed for total petroleum hydrocarbons (TPHs) by Ecology Methods NWTPH-G and NWTPH-Dx with silica gel cleanup.

(c) "<" Denotes analyte was not detected at the indicated laboratory reporting limit.

(d) "NA" denotes cleanup level is either not available or not appropriate.

(e) Samples were analyzed for polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270C using selected ion monitoring (SIM) mode (where appropriate).

(f) Cleanup level based on the Model Toxics Control Act (MTCA) (WAC 173-340) Method B surface water cleanup level based on Ecology's online CLARC database.

(g) Samples were analyzed for carcinogenic polycyclic aromatic hydrocarbons (cPAHs) by EPA Method 8270C using SIM mode (where appropriate).

(h) Total cPAHs are based on benzo(a)pyrene equivalent values. Individual detected cPAH concentrations were multiplied by benzo(a)pyrene toxicity equivalency factors (TEFs) prior to summation (per WAC 173-340-708). Non-detected cPAH analytes were not included in the summation. TEFs are tabulated on Table 1A.

(i) Modified cleanup level for total cPAHs based on the Ambient Water Quality Criteria (AWQC) for consumption of organisms only (EPA 2004) pursuant to Section 304(a)(1) of the Clean Water Act discussed in Kennedy/Jenks Consultants' 2007 *Cleanup Level Evaluation* report.

Analytes detected in samples at concentrations exceeding the proposed cleanup level values are shown in bold and italics.

mg/l = milligrams per liter

µg/l = micrograms per liter

TABLE 2A

FEBRUARY 2006 OFF-PROPERTY INVESTIGATION
SOIL ANALYTICAL RESULTS - TPH and PAHs
Former Tacoma Metals Facility

Analyte	Sample Designation (Boring ID - feet bgs)									MTCA Method C Industrial Soil Cleanup Level[a]
	B34 7-8	B34 18-19	B34 30-31	B35 6-7	B35 32-33	B35 39-40	B36 8-10	B36 23-24	B36 31-32	
TPHs (mg/kg)[b]										
Gasoline-range Hydrocarbons	<12.0[c]	<5.98	<5.22	<7.75	25.8[d]	<5.23	***1,110[e]***	***164[d]***	***464[d]***	100/30[f]
Diesel-range Hydrocarbons	58.6[g]	<13.7	18.5[h]	19.5[g]	18.6[h]	16.4[h]	1,060[h]	***14,900[h]***	***8,830[h]***	2,000[f]
Oil-range Hydrocarbons	305	<34.3	<31.1	138	<29.5	<29.2	1,690	***<3,100[h]***	<1,210[h]	2,000[f]
PAHs (mg/kg)[i]										
Naphthalene	<0.118	0.00992 J[j]	0.0539	0.0504 J	1.93	0.658	1.62 J	204	296	7.00E+04
1-Methylnaphthalene	<0.118	<0.0140	0.282	<0.148	1.02	0.363	<7.59	819	501	NA[k]
2-Methylnaphthalene	<0.118	<0.0140	<0.0127	<0.148	0.890	0.170	<7.59	<25.1	88.2	NA
Acenaphthylene	<0.118	<0.0140	<0.0127	0.0385 J	<0.0588	<0.0600	<7.59	<25.1	22.1 J	NA
Acenaphthene	<0.118	0.188	0.589	<0.148	1.34	1.00	16.9	1,600	1,490	2.10E+05
Fluorene	<0.118	0.0297	0.569	<0.148	1.08	0.725	<7.59	1,290	1,570	1.40E+05
Phenanthrene	0.401	0.0221	1.02	0.122 J	1.47	1.08	19.1	3,650	4,050	NA
Anthracene	<0.118	<0.0140	0.354	0.860 J	0.163	0.132	20.0	417	2,540	1.05E+06
Fluoranthene	1.12	0.0369	0.534	0.247	0.241	0.291	103	1,690	1,560	1.40E+05
Pyrene	0.671	0.0293	0.328	0.274	0.105	0.122	136	1,550	1,150	1.05E+05
Benzo(g,h,i)perylene	0.2440	0.00814 J	<0.0127	0.513	<0.0588	<0.0600	26.0	60.3	50.4	NA
cPAHs (mg/kg)[l]										
Chrysene	0.519	0.0300	0.0154	0.993	<0.0588	<0.0600	***114***	***281***	***507***	18
Benzo(b)fluoranthene	0.474	0.0217	0.00491 J	0.752	<0.0588	<0.0600	***73.2***	***215***	***145***	18
Benzo(k)fluoranthene	0.481	0.0225	0.00169 J	0.631	<0.0588	<0.0600	***78.0***	***245***	***135***	18
Benzo(a)anthracene	0.448	0.0217	0.0284	0.332	<0.0588	<0.0600	***71.7***	***403***	***296***	18
Benzo(a)pyrene	0.491	0.0158	0.0102 J	0.755	<0.0588	<0.0600	***88.8***	***271***	***151***	18
Indeno(1,2,3-cd)pyrene	0.330	0.0215	<0.0127	0.550	<0.0588	<0.0600	***31.7***	***82.7***	***101***	18
Dibenz(a,h)anthracene	0.229	0.0154	<0.0127	0.343	<0.0588	<0.0600	***22.1***	***58.3***	***97.7***	18
Total cPAHs (mg/kg)[m]	0.761	0.031	0.0139	1.13	<0.0588	<0.0600	***124***	***392***	***263***	18

Notes:

(a) Model Toxics Control Act (MTCA) Method C industrial soil cleanup levels based on CLARC v3.1, dated November 2001 (Ecology 2001b).
(b) Samples were analyzed for diesel- and oil-range hydrocarbons by Ecology Method NWTPH-Dx(extended) with silica gel cleanup, and gasoline-range hydrocarbons by Ecology Method NWTPH-G.
(c) "<" denotes analyte was not detected at the indicated laboratory reporting limit.
(d) The total hydrocarbon result in this sample is primarily due to an individual compound eluting in the volatile hydrocarbon range (Laboratory note G-03).
(e) The chromatogram for this sample does not resemble a typical gasoline pattern (Laboratory note G-02).
(f) Total petroleum hydrocarbon (TPH) screening levels based on MTCA Method A industrial soil cleanup levels (Ecology 2001a). For gasoline mixtures without benzene and total ethylbenzene, toluene and xylenes less than 1% of the gasoline mixture the cleanup level is 100 mg/kg. For all other gasoline mixtures, the cleanup level is 30 mg/kg.
(g) Results in the diesel organics range are primarily due to overlap from a heavy oil range product (Laboratory note D-09).
(h) The sample chromatographic pattern does not resemble the fuel standard used for quantitation (Laboratory note D-06).
(i) Samples were analyzed for polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270C using selected ion monitoring (SIM) mode (where appropriate).
(j) "J" denotes an analyte detected at a concentration between the method reporting limit (MRL) and the method detection limit (MDL).
(k) "NA" denotes no cleanup level established.
(l) Samples were analyzed for carcinogenic polycyclic aromatic hydrocarbons (cPAHs) by EPA Method 8270C using SIM mode (where appropriate).
(m) Total cPAHs are based on benzo(a)pyrene equivalent values. Individual detected cPAH concentrations were multiplied by benzo(a)pyrene toxicity equivalency factors (TEFs) prior to summation (per WAC 173-340-708). Non-detected cPAH analytes were not included in the summation. TEFs are tabulated on Table 2A-A.

Analyte concentrations exceeding the indicated cleanup level are shown in bold and italics

mg/kg - milligrams per kilogram
bgs = below ground surface

TABLE 2A-A
Summary of TEFs

Chrysene	0.01
Benzo(b)fluoranthene	0.1
Benzo(k)fluoranthene	0.1
Benzo(a)anthracene	0.1
Benzo(a)pyrene	1
Indeno(1,2,3-cd)pyrene	0.1
Dibenz(a,h)anthracene	0.4

TABLE 2B

FEBRUARY 2006
GROUNDWATER MONITORING WELL ANALYTICAL RESULTS - TPH and PAHs
Former Tacoma Metals Facility

Analyte	Groundwater Sample Designation														MTCA Method B Surface Water[b]	Human Health Consumption of Organisms[c]	Human Health Consumption of Organisms[d]
	MW-8(R)[a]		MW-10		MW-11		MW-14		MW-15		MW-16		MW-17				
	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered			
TPHs (mg/l)[e]																	
Gasoline-range hydrocarbons	41.8	---[f]	0.124	---	0.221	---	<0.050[g]	---	<0.050	---	<0.050	---	<0.050	---	NA[h]	NA	NA
Diesel-range hydrocarbons	8.12[i]	---	0.799	---	1.91	---	0.859[j]	---	0.903[j]	---	0.495[j]	---	0.429[j]	---	NA	NA	NA
Oil-range hydrocarbons	<2.60	---	<0.532	---	<0.562	---	<0.562	---	<0.568	---	<0.562	---	<0.526	---	NA	NA	NA
PAHs (µg/l)[k]																	
Naphthalene	***6,810***	2,370	3.38	1.37	5.47	1.49	1.11	1.02	0.0636 J[l]	0.334	0.0233 J	0.236	0.180 J	0.366	4,940	NA	NA
1-Methylnaphthalene	883	107	8.47	0.753	58.4	3.86	3.64	1.68	0.410	0.216	<0.0176	0.0706 J	0.264 J	0.0989 J	NA	NA	NA
2-Methylnaphthalene	1,420	56.7	0.158	0.114 J	<0.0478	0.114	0.326	0.139	<0.0276	0.0565 J	<0.0269	<0.0266	<0.136	0.0607 J	NA	NA	NA
Acenaphthylene	12.4 J	<10.5	0.238	<0.0512	0.878	0.159	0.115	<0.00980	0.0502 J	<0.0518	<0.00958	<0.00947	<0.0484	<0.0494	NA	NA	NA
Acenaphthene	280	28.6	28.1	0.828	72.4	2.73	9.54	2.06	2.63	0.635	0.280	0.201	5.05	0.211	643	990	NA
Fluorene	146	<7.86	14.0	0.193	53.0	0.507	3.71	0.222	1.22	0.113 J	<0.00749	0.0506 J	2.64	0.0854 J	3,460	5,300	14,000
Phenanthrene	188	<6.19	14.3	0.684	60.5	3.13	1.84	1.23	0.0899 J	0.842	<0.00506	0.600	0.388 J	0.888	NA	NA	NA
Anthracene	31.0	<8.33	2.87	0.598	14.7	2.12	0.566	0.299	0.279	0.146	0.172	0.186	0.297 J	0.142	25,900	40,000	110,000
Fluoranthene	38.6	<5.00	4.52	0.537	17.0	3.02	1.26	0.402	0.235	0.334	<0.00264	0.249	0.830	0.519	90.2	140	370
Pyrene	24.8	<5.95	2.91	0.428	10.7	2.38	0.786	0.363	0.188	0.240	<0.00414	0.199	0.615	0.369	2,590	4,000	11,000
Benzo(g,h,i)perylene	<7.86	<7.86	<0.0388	<0.0384	<0.0359	<0.0375	<0.0379	<0.00319	<0.00319	<0.0388	<0.00311	<0.00308	<0.0157	<0.0371	NA	NA	NA
cPAHs (µg/l)[m]																	
Chrysene	***6.52***	<0.107	***0.353***	***0.0953 J***	***0.678***	***0.450***	***0.115***	<0.00305	<0.00305	<0.0212	<0.00298	<0.00294	<0.0151	***0.0517 J***	0.0296	0.018 * / 0.02[n]	0.031
Benzo(b)fluoranthene	***2.12***	<0.482	***0.0988 J***	<0.0942	***0.137***	***0.148***	<0.0931	<0.00331	<0.00331	<0.0953	<0.00324	<0.00320	<0.0164	<0.0910	0.0296	0.018 * / 0.02[n]	0.031
Benzo(k)fluoranthene	***2.52***	<0.125	***0.0941 J***	<0.0244	***0.161***	***0.145***	***0.0437 J***	<0.00380	<0.00380	<0.0247	<0.00372	<0.00367	<0.0188	<0.0236	0.0296	0.018 * / 0.02[n]	0.031
Benzo(a)anthracene	***6.00***	<0179	***0.320***	***0.105 J***	***0.739***	***0.455***	***0.110 J***	<0.00427	<0.00427	<0.0353	<0.00417	<0.00412	<0.0211	***0.0494 J***	0.0296	0.018 * / 0.02[n]	0.031
Benzo(a)pyrene	***2.48***	<0.155	***0.104 J***	<0.0302	***0.159***	***0.125***	***0.0460 J***	<0.00226	<0.00226	<0.0306	<0.00220	<0.00218	<0.0111	<0.0292	0.0296	0.018 * / 0.02[n]	0.031
Indeno(1,2,3-cd)pyrene	<0.333	<0.167	<0.0329	<0.0326	<0.0304	<0.0318	<0.0322	<0.00258	<0.00258	<0.0329	<0.00252	<0.00249	<0.0128	<0.0315	0.0296	0.018 * / 0.02[n]	0.031
Dibenz(a,h)anthracene	<0.345	<0.173	<0.0341	<0.0337	<0.0315	<0.0330	<0.0333	<0.00295	<0.00295	<0.0341	<0.00289	<0.00285	<0.0146	<0.0326	0.0296	0.018 * / 0.02[n]	0.031
Total cPAHs[l]	***3.61***	<0.155	***0.159***	***0.0115***	***0.269***	***0.204***	***0.0625***	<0.00226	<0.00226	<0.0306	<0.0022	<0.00218	<0.0111	0.00546	0.0296	0.018 * / 0.02[n]	0.031

Analyte	Groundwater Sample Designation														MTCA Method B Surface Water[b]	Human Health Consumption of Organisms[c]	Human Health Consumption of Organisms[d]
	MW-18		MW-19		MW-20		MW-21		MW-22		MW-23		MW-24				
	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered			
TPHs (mg/l)[e]																	
Gasoline-range hydrocarbons	20.8	---	<0.250	---	3.77	---	2.69[o]	---	4.59[o]	---	5.03[p]	---	0.736[p]	---	NA	NA	NA
Diesel-range hydrocarbons	2.35	---	<0.272	---	1.70	---	4.74	---	2.95	---	2.66	---	0.479	---	NA	NA	NA
Oil-range hydrocarbons	<0.521	---	<0.543	---	<0.510	---	0.694[q]	---	<0.532	---	<0.510	---	<0.515	---	NA	NA	NA
PAHs (µg/l)[k]																	
Naphthalene	***7,650***	***6,280***	0.0569 J	0.629	734	658	139	202	883	301	799	191	133	18.0	4,940	NA	NA
1-Methylnaphthalene	334	143	0.722	0.300	282	186	264	30.8	334	36.1	287	31.4	25.7	2.62	NA	NA	NA
2-Methylnaphthalene	210	94.9	0.0308 J	0.130	268	140	31.0	1.63	197	4.36	219	5.68	11.6	0.703	NA	NA	NA
Acenaphthylene	2.34	0.831	<0.00992	<0.0100	<10.1	<10.0	1.60	0.215	1.79	0.106 J	1.20	<0.0506	0.294	<0.0473	NA	NA	NA
Acenaphthene	198	84.3	1.07	0.282	166	92.7	207	17.0	213	13.4	199	14.7	35.1	1.79	643	990	NA
Fluorene	106	3.51	0.103 J	0.0479 J	71.7	<7.50	116	1.18	110	0.209	72.7	<0.0379	18.4	0.140	3,460	5,300	14,000
Phenanthrene	113	0.371 J	<0.00524	0.123	55.2	<5.91	130	2.77	110	0.910	72.6	0.292	13.6	0.312	NA	NA	NA
Anthracene	12.1	0.236 J	0.0784 J	0.0753 J	<8.05	<7.95	12.6	1.63	12.3	0.499	5.67	0.159	2.82	0.185	25,900	40,000	110,000
Fluoranthene	8.19	0.315 J	<0.00273	0.124	<4.83	<4.77	16.3	1.53	12.6	0.616	7.75	0.262	5.89	0.249	90.2	140	370
Pyrene	4.65	0.247 J	<0.00428	0.145	<5.75	<5.68	10.4	1.20	7.37	0.463	4.07	0.195	3.51	0.189	2,590	4,000	11,000
Benzo(g,h,i)perylene	<0.192	<0.185	<0.00322	<0.00326	<7.59	<7.50	0.0744 J	<0.0347	<0.0375	<0.0371	<0.0375	<0.0379	<0.0371	<0.0355	NA	NA	NA
cPAHs (µg/l)[m]																	
Chrysene	<0.105	<0.101	<0.00308	<0.00312	<0.103	<0.102	***0.877***	***0.280***	***0.505***	***0.0989 J***	***0.214***	***0.0391 J***	***0.288***	***0.0301 J***	0.0296	0.018 * / 0.02[n]	0.031
Benzo(b)fluoranthene	<0.471	<0.455	<0.00335	<0.00339	<0.466	<0.460	***0.249***	***0.101 J***	***0.0955 J***	<0.0910	<0.0920	<0.0931	<0.0910	<0.0871	0.0296	0.018 * / 0.02[n]	0.031
Benzo(k)fluoranthene	<0.122	<0.118	<0.00385	<0.00389	<0.121	<0.119	***0.279***	***0.105***	***0.105 J***	<0.0236	<0.0239	<0.0241	<0.0236	<0.0226	0.0296	0.018 * / 0.02[n]	0.031
Benzo(a)anthracene	<0.174	<0.169	<0.00432	<0.00437	<0.172	<0.170	***0.930***	***0.274***	***0.455***	***0.0966 J***	***0.200***	***0.0391 J***	***0.272***	***0.0344 J***	0.0296	0.018 * / 0.02[n]	0.031
Benzo(a)pyrene	<0.151	<0.146	<0.00228	<0.00231	<0.149	<0.148	***0.291***	***0.109***	***0.102 J***	<0.0292	<0.0295	<0.0299	<0.0292	<0.0280	0.0296	0.018 * / 0.02[n]	0.031
Indeno(1,2,3-cd)pyrene	<0.163	<0.157	<0.00261	<0.00264	<0.161	<0.159	***0.0744 J***	<0.0295	<0.0318	<0.0315	<0.0318	<0.0322	<0.0315	<0.0301	0.0296	0.018 * / 0.02[n]	0.031
Dibenz(a,h)anthracene	<0.169	<0.163	<0.00299	<0.00302	<0.167	<0.165	***0.667***	<0.0305	<0.0330	<0.0326	<0.0330	<0.0333	<0.0326	<0.0312	0.0296	0.018 * / 0.02[n]	0.031
Total cPAHs[l]	<0.151	<0.146	<0.00228	<0.00231	<0.149	<0.148	***0.720***	***0.160***	***0.173***	0.0106	***0.0221***	0.00430	***0.0301***	0.00374	0.0296	0.018 * / 0.02[n]	0.031

TABLE 2B

FEBRUARY 2006
GROUNDWATER MONITORING WELL ANALYTICAL RESULTS - TPH and PAHs
Former Tacoma Metals Facility

Analyte	Groundwater Sample Designation														MTCA Method B Surface Water[b]	Human Health Consumption of Organisms[c]	Human Health Consumption of Organisms[d]
	MW-25		MW-26		MW-27		MW-28(R)[a]		MW-29		MW-30		MW-31				
	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered			
TPHs (mg/l)[e]																	
Gasoline-range hydrocarbons	0.262	---[f]	1.37[o]	---	<0.050[g]	---	10.4[o]	---	0.323	---	0.586	---	0.446	---	NA[h]	NA	NA
Diesel-range hydrocarbons	0.300	---	1.65[i]	---	<0.278	---	3.53[i]	---	0.816[i]	---	1.76[i]	---	2.20[i]	---	NA	NA	NA
Oil-range hydrocarbons	<0.485	---	<0.526	---	<0.556	---	<0.490	---	<0.521	---	<0.505	---	<0.543	---	NA	NA	NA
PAHs (µg/l)[k]																	
Naphthalene	0.640	0.536	501	125	1.64	2.05	***5,900***	4,260	2.14	0.507	8.13	3.59	57.5	61.7	4,940	NA	NA
1-Methylnaphthalene	27.9	1.53	81.9	5.90	0.522	0.365	488	260	41.0	2.61	171	9.38	140	85.3	NA	NA	NA
2-Methylnaphthalene	1.29	0.0943 J[l]	79.6	0.736	0.0677 J	0.0821 J	574	233	6.60	0.0916 J	43.4	1.32	16.9	12.3	NA	NA	NA
Acenaphthylene	0.208	<0.115	<0.0102	<0.00958	<0.00992	0.0927 J	28.0	11.4	0.745	<0.00937	<0.00926	<0.00916	1.42	<0.00958	NA	NA	NA
Acenaphthene	39.1	1.23	129	3.23	14.2	1.71	439	184	66.6	1.84	225	8.06	211	71.3	643	990	NA
Fluorene	5.79	0.0644 J	84.7	0.0480 J	7.45	<0.00766	197	8.00	31.6	0.0468 J	65.3	2.84	80.3	4.14	3,460	5,300	14,000
Phenanthrene	0.446	0.163	76.9	0.110 J	0.280	0.0794 J	275	1.19 J	46.2	0.114	24.9	5.51	99.7	3.34	NA	NA	NA
Anthracene	0.229	0.170	4.62	0.253	2.33	1.15	32.1	1.41 J	7.81	0.271	1.94	0.652	16.3	1.01	25,900	40,000	110,000
Fluoranthene	0.0589 J	0.159	10.3	0.717 J	2.53	0.0695 J	68.4	0.527 J	8.16	0.0962 J	1.07	1.25	44.6	1.99	90.2	140	370
Pyrene	0.0379 J	0.113 J	4.66	0.0542 J	1.70	0.0547 J	48.0	<0.549	4.76	0.0635 J	0.724	0.965	29.5	1.97	2,590	4,000	11,000
Benzo(g,h,i)perylene	<0.0347	<0.0379	<0.00330	<0.00311	<0.00322	<0.00319	2.20	<0.725	0.0222 J	<0.00304	<0.00301	<0.00298	0.551 J	<0.00311	NA	NA	NA
cPAHs (µg/l)[m]																	
Chrysene	<0.0189	<0.0207	***0.103***	<0.00298	<0.00308	<0.00305	***10.6***	<0.396	***0.265***	<0.00291	<0.00288	***0.0853***	***3.76***	***0.187***	0.0296	0.018 * / 0.02[n]	0.031
Benzo(b)fluoranthene	<0.0853	<0.0931	***0.0327***	<0.00324	<0.00335	<0.00331	***5.58***	<1.78	***0.0951***	<0.00317	<0.00313	***0.0558***	***1.30***	***0.160***	0.0296	0.018 * / 0.02[n]	0.031
Benzo(k)fluoranthene	<0.0221	<0.0241	0.0142	<0.00372	<0.00385	<0.00380	***6.02***	<0.462	***0.0387***	<0.00363	<0.00359	0.0170	***1.96***	***0.0795***	0.0296	0.018 * / 0.02[n]	0.031
Benzo(a)anthracene	<0.0316	<0.0345	***0.157***	<0.00417	<0.00432	<0.00427	***11.0***	<0.659	***0.392***	<0.00408	<0.00403	***0.134***	***3.87***	***0.336***	0.0296	0.018 * / 0.02[n]	0.031
Benzo(a)pyrene	<0.0274	<0.0299	<0.00234	<0.00220	<0.00228	<0.00226	***6.51***	<0.571	***0.0698***	<0.00216	<0.00213	***0.0267***	***1.83***	***0.105***	0.0296	0.018 * / 0.02[n]	0.031
Indeno(1,2,3-cd)pyrene	<0.0295	<0.0322	<0.00267	<0.00252	<0.00261	<0.00258	***1.89***	<0.615	***0.0641***	<0.00247	<0.00244	<0.00241	***0.472 J***	<0.00252	0.0296	0.018 * / 0.02[n]	0.031
Dibenz(a,h)anthracene	<0.0305	<0.0333	<0.00306	<0.00289	<0.00299	<0.00295	***6.79***	<0.637	<0.00254	<0.00282	<0.00279	<0.00276	***3.27***	<0.00289	0.0296	0.018 * / 0.02[n]	0.031
Total cPAHs[r]	<0.0274	<0.0299	***0.0214***	<0.0022	<0.00228	<0.00226	***11.8***	<0.571	***0.131***	<0.00216	<0.00213	***0.0482***	***3.94***	***0.164***	0.0296	0.018 * / 0.02[n]	0.031

Notes:

(a) Well MW-8(R) was installed in May 2000 as a replacement for MW-8, which was damaged. Well MW-28(R) was installed in February 2006 as a replacement for MW-28, which was damaged during construction activities in the 18th Street right-of-way.
(b) Model Toxics Control Act (MTCA) Method B surface water cleanup level based on CLARC v3.1, dated November 2001 (Ecology 2001b).
(c) National Recommended Water Quality Criteria (NRWQC) for consumption of organisms only (EPA 2002) pursuant to Section 304(a)(1) of the Clean Water Act and in accordance with Washington Administrative Code (WAC) 173-201A at a risk level of $1x10^{-6}$.
(d) National Toxic Rule (NTR) for consumption of organisms only based on 40 CFR 131.36 at a risk level of $1x10^{-6}$.
(e) Samples were analyzed for total petroleum hydrocarbons (TPHs) by Ecology Methods NWTPH-G and NWTPH-Dx(extended) with silica gel cleanup.
(f) "---" Denotes sample was not analyzed for the listed analyte
(g) "<" Denotes analyte was not detected at the indicated laboratory reporting limit.
(h) "NA" denotes no cleanup level established.
(i) Results in the diesel organics range are primarily due to overlap from a gasoline range product (Laboratory note D-08).
(j) The sample chromatographic pattern does not resemble the fuel standard used for quantitation (Laboratory note D-06).
(k) Samples were analyzed for polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270C using selected ion monitoring (SIM) mode (where appropriate). Non-detected analytes are reported to the MDL.
(l) "J" denotes an analyte detected at a concentration between the method reporting limit (MRL) and the method detection limit (MDL).
(m) Samples were analyzed for carcinogenic polycyclic aromatic hydrocarbons (cPAHs) by EPA Method 8270C using SIM mode (where appropriate). Non-detected analytes are reported to the MDL.
(n) Practical quantitation limit (PQL) (Ecology 2001b).
(o) The total hydrocarbon result in this sample is primarily due to an individual compound eluting in the volatile hydrocarbon range (Laboratory note G-03).
(p) The chromatogram for this sample does not resemble a typical gasoline pattern (Laboratory note G-02).
(q) The heavy oil range organics present are due to hydrocarbons eluting primarily in the diesel range (Laboratory note D-10).
(r) Total cPAHs based on benzo(a)pyrene equivalent values. Individual cPAH concentrations were multiplied by toxicity equivalency factors (TEFs) prior to summation (per WAC 173-340-708). TEFs are summarized on Table 2A-A. Non-detected cPAH analytes were not included in the summation.

* Denotes PQL is higher than MTCA cleanup levels and/or applicable, relevant, and appropriate requirements (ARARs).

Analytes detected in samples at concentrations exceeding one or more of the cleanup levels or comparison values are shown in bold and italics. Where appropriate, surface water standards have been adjusted upward to the PQL [WAC 173-340-730(5)(c)].

mg/l = milligrams per liter
µg/l = micrograms per liter

TABLE 3

MARCH 2008
GROUNDWATER MONITORING WELL ANALYTICAL RESULTS - TPH and PAHs
Former Tacoma Metals Facility

Analyte	Groundwater Sample Designation																		Proposed Cleanup Level[b]
	MW-8(R)[a]		MW-10		MW-11		MW-14		MW-15		MW-16		MW-17		MW-18		MW-19		
	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	
TPHs (mg/l)[c]																			
Gasoline-range hydrocarbons	17.0	---[d]	0.490	---	0.270	---	<0.100[e]	---	<0.100	---	<0.100	---	<0.100	---	6.50	---	<0.100	---	NA[f]
Diesel-range hydrocarbons	9.90[g]	---	4.30[g]	---	1.10[g]	---	0.071[g]	---	<0.050	---	<0.050	---	<0.050	---	9.50[g]	---	<0.050	---	NA
Oil-range hydrocarbons	<0.270	---	<0.250	---	<0.250	---	<0.250	---	<0.250	---	<0.250	---	<0.250	---	<0.250	---	<0.250	---	NA
PAHs (µg/l)[i]																			
Naphthalene	3,600	2,900	1.6	1.3	18	13	0.26	0.18	0.036	0.036	0.023	0.026	0.24	0.21	***5,800***	4,400	<0.02	0.042	4,940[k]
Acenaphthylene	5.9	3.8	0.19	0.24	0.84	0.55	0.084	0.071	0.025	0.023	<0.02	<0.02	0.047	0.046	1.4	1.2	<0.02	<0.02	NA
Acenaphthene	170	140	34	31	120	98	10	8.2	3.5	3.0	0.57	0.48	6.20	5.6	180	160	0.17	0.14	643[k]
Fluorene	71	59	18	16	84	73	4.1	3.4	1.8	1.6	<0.02	<0.02	2.8	2.6	84	78	<0.02	<0.02	3,460[k]
Phenanthrene	55	44	18	17	87	79	2.8	2.4	0.28	0.27	<0.02	<0.02	0.25	0.25	88	87	<0.02	<0.02	NA
Anthracene	7.1	3.7	3.2	3.8	16	12	0.45	0.35	0.17	0.12	<0.02	<0.02	0.39	0.32	9.3	8.0	<0.02	<0.02	25,900[k]
Fluoranthene	6.7	3.5	6.1	5.5	15	13	1.3	1.0	0.36	0.31	<0.02	<0.02	0.77	0.71	7.7	6.3	<0.02	<0.02	90.2[k]
Pyrene	4.2	2.1	4.1	3.7	10	8.3	0.84	0.68	0.23	0.19	<0.02	<0.02	0.51	0.46	4.3	3.3	<0.02	<0.02	2,590[k]
Benzo(g,h,i)perylene	<0.2	<0.02	0.032	0.031	<0.2	0.063	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.2	<0.02	<0.02	<0.02	NA
cPAHs (µg/l)[l]																			
Benzo(a)anthracene	0.59	0.072	0.41	0.40	0.68	0.50	0.067	0.052	0.026	<0.02	<0.02	<0.02	0.049	0.042	<0.2	0.048	<0.02	<0.02	NA
Chrysene	0.56	0.072	0.37	0.37	0.48	0.39	0.065	0.049	0.027	<0.02	<0.02	<0.02	0.043	0.032	<0.2	0.036	<0.02	<0.02	NA
Benzo(a)pyrene	<0.2	<0.02	0.16	0.18	<0.2	0.18	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.2	<0.02	<0.02	<0.02	NA
Benzo(b)fluoranthene	0.24	<0.02	0.21	0.21	0.23	0.22	<0.02	<0.02	0.021	<0.02	<0.02	<0.02	<0.02	<0.02	<0.2	<0.02	<0.02	<0.02	NA
Benzo(k)fluoranthene	<0.2	<0.02	0.069	0.09	<0.2	0.089	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.2	<0.02	<0.02	<0.02	NA
Indeno(1,2,3-cd)pyrene	<0.2	<0.02	0.035	0.037	<0.2	0.068	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.2	<0.02	<0.02	<0.02	NA
Dibenz(a,h)anthracene	<0.2	<0.02	<0.02	<0.02	<0.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.2	<0.02	<0.02	<0.02	NA
Total cPAHs[m]	0.22	0.0079	0.24	0.26	0.23	0.27	0.0074	0.0057	0.0050	<0.02	<0.02	<0.02	0.0053	0.0045	0.15	0.0052	<0.02	<0.02	1.24[n]

Analyte	Groundwater Sample Designation																		Proposed Cleanup Level[b]
	MW-20		MW-21		MW-22		MW-23		MW-24		MW-25		MW-26		MW-27		MW-28(R)[a]		
	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	
TPHs (mg/l)[c]																			
Gasoline-range hydrocarbons	1.60	---	1.40	---	3.30	---	3.10	---	0.330	---	0.300	---	0.320	---	<0.100	---	0.640	---	NA[f]
Diesel-range hydrocarbons	2.10[g]	---	2.90[g]	---	0.220[g]	---	3.10	---	0.450	---	0.420	---	0.860	---	0.140	---	3.40	---	NA
Oil-range hydrocarbons	<0.250	---	<0.250	---	<0.250	---	<0.250	---	<0.250	---	<0.250	---	<0.250	---	<0.250	---	<0.250	---	NA
PAHs (µg/l)[i]																			
Naphthalene	7.1	5.8	730	560	1,200	990	32	26	19	18	0.29	0.21	91	74.0	0.26	0.22	370	160	4,940[k]
Acenaphthylene	0.75	0.77	1.4	1.1	1.5	1.3	0.90	0.74	0.44	0.41	0.30	0.25	0.48	0.37	0.20	0.18	<2	1.4	NA
Acenaphthene	160	150	230	180	210	170	150	130	42	40	83	68	77	66	28	25	200	170	643[k]
Fluorene	82	75	120	100	110	95	56	49	23	22	15	13	48	42	10	9.0	100	92	3,460[k]
Phenanthrene	68	66	150	120	110	99	52	48	2.1	2.2	1.1	1.0	47	42	1.1	0.920	130	120	NA
Anthracene	3.4	3.4	14	9.5	16	13	5.5	4.5	4.0	3.6	0.14	0.096	4.1	2.7	<0.02	<0.02	13	11	25,900[k]
Fluoranthene	1.9	1.9	20	14	13	11	8.3	7	7.4	7.1	0.13	0.12	<10	<10	2.1	2.0	22	18	90.2[k]
Pyrene	0.88	0.86	14	9.5	8.0	6.9	5.1	5.0	4.8	5.0	0.087	0.078	4.7	4.2	1.3	1.2	14	11	2,590[k]
Benzo(g,h,i)perylene	<0.2	<0.02	<0.2	0.021	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.026	<0.02	NA
cPAHs (µg/l)[l]																			
Benzo(a)anthracene	<0.2	<0.02	1.3	0.52	0.49	0.36	0.32	0.220	0.42	0.31	<0.02	<0.02	0.16	0.12	0.066	0.047	0.77	0.49	NA
Chrysene	<0.2	<0.02	1.0	0.39	0.47	0.35	0.30	0.21	0.34	0.31	<0.02	<0.02	0.15	0.11	0.061	0.035	0.56	0.36	NA
Benzo(a)pyrene	<0.2	<0.02	0.50	0.13	0.094	0.079	0.022	<0.02	0.043	0.023	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.17	0.067	NA
Benzo(b)fluoranthene	<0.2	<0.02	0.66	0.18	0.13	0.099	0.031	<0.02	0.061	0.038	<0.02	<0.02	0.026	<0.02	<0.02	<0.02	0.21	0.069	NA
Benzo(k)fluoranthene	<0.2	<0.02	0.26	0.055	0.041	0.036	<0.02	<0.02	0.025	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.077	0.035	NA
Indeno(1,2,3-cd)pyrene	<0.2	<0.02	<0.2	0.028	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.036	<0.02	NA
Dibenz(a,h)anthracene	<0.2	<0.02	<0.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	NA
Total cPAHs[m]	0.15	<0.02	0.75	0.21	0.16	0.13	0.060	0.024	0.097	0.061	<0.02	<0.02	0.020	0.013	0.0072	0.0051	0.28	0.13	1.24[n]

TABLE 3

MARCH 2008
GROUNDWATER MONITORING WELL ANALYTICAL RESULTS - TPH and PAHs
Former Tacoma Metals Facility

Analyte	Groundwater Sample Designation																Proposed Cleanup Level[b]
	MW-29		MW-30		MW-31		MW-100 (MW-31 dup)		MW-32		MW-33		MW-34		MW-35		
	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered			
TPHs (mg/l)[c]																	
Gasoline-range hydrocarbons	0.220	---	2.60	---	0.200	---	0.210	---	0.210	---	<0.100	---	<0.100	---	<0.100	---	NA[f]
Diesel-range hydrocarbons	0.390	---	4.40[g]	---	1.80	---	1.90	---	0.180	---	<0.050	---	<0.050	---	<0.050	---	NA
Oil-range hydrocarbons	<0.250	---	<0.250	---	<0.250	---	<0.250	---	<0.250	---	<0.250	---	<0.250	---	<0.250	---	NA
PAHs (µg/l)[i]																	
Naphthalene	0.46	0.34	790	630	<2	0.56	<2	0.54	0.16	0.12	0.036	0.041	<0.02	<0.02	0.059	0.053	4,940[k]
Acenaphthylene	0.32	0.28	1.8	1.9	<2	0.91	<2	0.87	<0.02	0.026	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	NA
Acenaphthene	31	29	390	330	190	170	200	180	12	9.8	2.8	3.0	<0.02	<0.02	0.15	0.13	643[k]
Fluorene	12	12	140	120	98	90	100	93	0.026	0.021	0.051	0.054	<0.02	<0.02	<0.02	<0.02	3,460[k]
Phenanthrene	15	14.000	56	49	110	110	120	110	0.034	<0.02	0.39	0.43	<0.02	<0.02	<0.02	<0.02	NA
Anthracene	4.1	3.0	4.0	<10	14	12	14	13	<0.02	<0.02	0.18	0.11	<0.02	<0.02	<0.02	<0.02	25,900[k]
Fluoranthene	6.0	5.6	2.9	<10	22	19	23	21	<0.02	<0.02	0.38	0.41	<0.02	<0.02	<0.02	<0.02	90.2[k]
Pyrene	3.7	3.6	1.9	<10	15	13	16	15	<0.02	<0.02	0.43	0.46	<0.02	<0.02	0.041	0.037	2,590[k]
Benzo(g,h,i)perylene	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	NA
cPAHs (µg/l)[l]																	
Benzo(a)anthracene	0.26	0.18	<0.2	<0.02	0.77	0.57	0.87	0.62	<0.02	<0.02	0.031	<0.02	<0.02	<0.02	<0.02	<0.02	NA
Chrysene	0.25	0.18	<0.2	<0.02	0.46	0.37	0.55	0.39	<0.02	<0.02	0.040	0.032	<0.02	<0.02	<0.02	<0.02	NA
Benzo(a)pyrene	0.048	<0.02	<0.02	<0.02	0.11	0.082	0.16	0.11	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	NA
Benzo(b)fluoranthene	0.057	<0.02	<0.02	<0.02	0.15	0.10	0.22	0.15	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	NA
Benzo(k)fluoranthene	0.025	<0.02	<0.02	<0.02	0.052	0.038	0.073	0.045	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	NA
Indeno(1,2,3-cd)pyrene	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	NA
Dibenz(a,h)anthracene	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	NA
Total cPAHs[m]	0.085	0.020	0.011	<0.02	0.21	0.16	0.28	0.20	<0.02	<0.02	0.0035	0.00032	<0.02	<0.02	<0.02	<0.02	1.24[n]

Notes:

(a) Well MW-8(R) was installed in May 2000 as a replacement for MW-8, which was damaged. Well MW-28(R) was installed in February 2006 as a replacement for MW-28, which was damaged during construction activities in the 18th Street right-of-way.
(b) Proposed site cleanup levels based on Kennedy/Jenks Consultants' 2007 *Cleanup Level Evaluation* report submitted to Ecology under separate cover.
(c) Samples were analyzed for total petroleum hydrocarbons (TPHs) by Ecology Methods NWTPH-G and NWTPH-Dx with silica gel cleanup.
(d) "---" Denotes sample was not analyzed for the listed analyte
(e) "<" Denotes analyte was not detected at the indicated laboratory reporting limit.
(f) "NA" denotes cleanup level is either not available or not appropriate.
(g) Laboratory note 'x': "The pattern of peaks present is not indicative of diesel".
(i) Samples were analyzed for polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270C using selected ion monitoring (SIM) mode (where appropriate). Non-detected analytes are reported to the MDL.
(k) Cleanup level based on the Model Toxics Control Act (MTCA) (WAC 173-340) Method B surface water cleanup level based on Ecology's online CLARC database.
(l) Samples were analyzed for carcinogenic polycyclic aromatic hydrocarbons (cPAHs) by EPA Method 8270C using SIM mode (where appropriate).
(m) Total cPAHs based on benzo(a)pyrene equivalent values. Individual cPAH concentrations were multiplied by toxicity equivalency factors (TEFs, see Table 1A) prior to summation (per WAC 173-340-708). Non-detected cPAH analytes were not included in the summation if the reporting limit was at the practical quantitation limit (PQL) of 0.02. A value of one-half the reporting limit was used (prior to TEF adjustment) for non-detected analytes with reporting limits above the PQL.
(n) Modified cleanup level for total cPAHs based on the Ambient Water Quality Criteria (AWQC) for consumption of organisms only (EPA 2004) pursuant to Section 304(a)(1) of the Clean Water Act discussed in Kennedy/Jenks Consultants' 2007 *Cleanup Level Evaluation* report.

Analytes detected in samples at concentrations exceeding the proposed cleanup level values are shown in bold and italics.

mg/l = milligrams per liter
µg/l = micrograms per liter

TABLE 3A

MARCH 2005 OFF-PROPERTY INVESTIGATION
SOIL ANALYTICAL RESULTS - TPH and PAHs
Former Tacoma Metals Facility

Analyte	Sample Designation (Boring ID - feet bgs)														MTCA Method C Industrial Soil Cleanup Level[a]
	B24 9-10	B24 15-16	B24 30.5-31.5	B25 14-15	B25 30-31	B26 6.5-7.5	B26 18-19	B26 25-26	B27 7-8	B27 22-23	B27 24.5-25.5	B28 6-7	B28 11-12	B28 23.5-24.5	
TPHs (mg/kg)[b]															
Gasoline-range Hydrocarbon	<5.00[c]	***309***[d]	<5.00	<5.00	***83.8***[d]	<5.00	<5.00	***69.6***[d]	<5.00	<5.00	***2,720***[d]	<5.00	28.6[d]	***172***[d]	100/30[e]
Diesel-range Hydrocarbon	<10.0	409	22.3	16.9	***9,790***	162[f]	801	142	92.3[f]	68.7	***8,750***	686[f]	24.7	238	2,000[e]
Oil-range Hydrocarbon	<25.0	<250	<25.0	<25.0	1,570	268	173	<25.0	258	<25.0	<1,940	1,620	<25.0	<49.3	2,000[e]
PAHs (mg/kg)[h]															
Naphthalene	<0.0100	50.9	0.239	0.344	25.7	0.181	7.63	13.7	0.0910	0.561	2,410	<0.330	1.16	33.5	7.00E+04
1-Methylnaphthalene	<0.0100	45.3	0.606	0.609	97.5	0.0366	5.57	3.07	0.123	0.541	437	<0.330	0.623	13.4	NA[i]
2-Methylnaphthalene	<0.0100	62.6	0.380	0.0166	162	0.0616	1.40	5.79	0.181	0.700	872	<0.330	0.229	20.1	NA
Acenaphthylene	<0.0100	0.363	<0.0500	<0.0100	<1.65	0.0427	1.23	<0.330	0.0692	<0.0100	15.5	<0.330	0.0153	<0.656	NA
Acenaphthene	<0.0100	23.3	1.86	0.498	126	0.0122	19.4	3.82	0.160	0.571	597	<0.330	0.518	23.7	2.10E+05
Fluorene	<0.0100	16.8	2.08	0.170	108	0.0152	33.4	3.67	0.135	0.728	638	<0.330	0.161	29.2	1.40E+05
Phenanthrene	0.0215	32.4	4.59	0.0388	361	0.217	178	9.60	0.493	1.65	1,790	<0.330	0.180	85.7	NA
Anthracene	<0.0100	6.76	0.629	0.0145	58.2	0.0384	64.1	1.18	0.165	0.0771	163	<0.330	0.0784	7.00	1.05E+06
Fluoranthene	0.0162	9.13	1.72	0.0186	148	0.250	137	2.69	0.513	0.0623	626	0.543	0.106	30.0	1.40E+05
Pyrene	0.0127	7.50	1.28	0.0209	134	0.228	101	2.18	0.587	0.0308	450	0.952	0.0831	16.7	1.05E+05
Benzo(g,h,i)perylene	0.0216	<0.330	<0.0500	<0.0100	7.29	0.0397	7.75	<0.330	0.272	<0.0100	11.2	0.344	<0.0100	<0.656	NA
cPAHs (mg/kg)[j]															
Chrysene	0.0280	1.27	0.262	0.0190	***35.5***	0.148	***48.7***	0.531	0.505	<0.0100	***92.8***	1.05	0.0248	3.53	18
Benzo(b)fluoranthene	0.0239	0.366	0.118	<0.0100	15.6	0.116	15.9	<0.330	0.447	<0.0100	***33.1***	0.759	0.0134	0.915	18
Benzo(k)fluoranthene	0.0299	0.383	0.151	0.0203	17.9	0.0939	17.1	<0.330	0.471	<0.0100	***34.0***	0.883	0.0229	0.858	18
Benzo(a)anthracene	<0.0100	1.41	0.264	<0.0100	***36.9***	0.0595	***34.6***	0.539	0.300	<0.0100	***102***	0.711	0.0182	3.91	18
Benzo(a)pyrene	0.0143	0.501	0.0951	<0.0100	***21.1***	0.0668	***20.3***	<0.330	0.409	<0.0100	***37.3***	1.58	0.0153	0.824	18
Indeno(1,2,3-cd)pyrene	0.0174	<0.330	<0.0500	<0.0100	6.64	0.0341	7.90	<0.330	0.253	<0.0100	10.8	1.04	<0.0100	<0.656	18
Dibenz(a,h)anthracene	<0.0100	<0.330	<0.0500	<0.0100	3.11	0.0131	3.44	<0.330	0.112	<0.0100	4.86	<0.330	<0.0100	<0.656	18
Total cPAHs (mg/kg)[k]	0.0217	0.730	0.151	0.0022	***30.4***	0.104	***29.7***	0.0591	0.606	<0.0100	***58.2***	1.93	0.0210	1.43	18

TABLE 3A

MARCH 2005 OFF-PROPERTY INVESTIGATION
SOIL ANALYTICAL RESULTS - TPH and PAHs
Former Tacoma Metals Facility

Analyte	Sample Designation (Boring ID - feet bgs)															MTCA Method C Industrial Soil Cleanup Level[a]
	B29 6.5-7.5	B29 11-12	B29 22.5-23.5	B30 5.5-6.5	B30 11-12	B30 22-23	B31 6-7	B31 19-20	B31 24-25	B32 6-7	B32 11-12	B32 19-20	B33 6-7	B33 18-19	B33 20.5-21.5	
TPHs (mg/kg)[b]																
Gasoline-range Hydrocarbon	<5.00[c]	<5.00	***1,420***[d]	<10.6	<5.00	14.4[d]	<5.00	24.7[d]	***50.8***[d]	<5.00	<10.4	28.6[d]	<5.00	<5.00	<5.00	100/30[e]
Diesel-range Hydrocarbon	61.5[f]	291[f]	***3,920***[g]	<21.1	25.2	159	163[f]	1,140	213	14.2	112[f]	***3,650***[f]	16.3	<10.0	<10.0	2,000[e]
Oil-range Hydrocarbon	116	217	<1,000	<52.9	<25.0	<49.0	229	162	30.5	<25.0	119	1,310	<25.0	<25.0	<25.0	2,000[e]
PAHs (mg/kg)[h]																
Naphthalene	<0.330	1.20	415	0.0297	0.188	<0.643	<0.330	9.29	17.7	0.0741	0.327	8.27	0.0454	<0.0100	<0.0100	7.00E+04
1-Methylnaphthalene	0.0706	1.15	114	<0.0211	0.0468	5.97	<0.330	22.9	4.91	0.0356	0.144	31.1	0.0683	0.0381	0.0593	NA[i]
2-Methylnaphthalene	<0.330	0.711	168	<0.0211	0.0572	5.25	<0.330	2.10	7.77	0.0300	0.0947	25.3	0.0492	0.0151	<0.0100	NA
Acenaphthylene	<0.330	0.536	<6.51	<0.0211	0.0181	<0.643	0.351	1.27	0.360	<0.0100	0.0521	<6.56	<0.0100	<0.0100	<0.0100	NA
Acenaphthene	<0.330	3.06	123	<0.0211	0.0290	14.9	<0.330	50.6	8.30	0.0909	0.193	83.2	<0.0100	0.0876	0.408	2.10E+05
Fluorene	<0.330	2.80	138	<0.0211	0.0363	15.8	<0.330	58.9	7.31	0.0542	0.102	43.7	<0.0100	0.0986	<0.0100	1.40E+05
Phenanthrene	<0.330	5.20	376	0.0552	0.0869	47.5	0.734	215	26.2	0.0634	0.463	755	0.0702	0.0547	<0.0100	NA
Anthracene	<0.330	12.9	45.7	0.0447	0.0285	13.7	1.19	66.4	4.31	0.0262	0.157	255	0.0124	0.0244	<0.0100	1.05E+06
Fluoranthene	0.570	7.53	134	0.0914	0.0612	22.0	2.87	101	11.5	0.0653	0.362	1,000	0.0293	0.0269	<0.0100	1.40E+05
Pyrene	1.04	7.31	97.3	0.0972	0.0344	16.5	5.02	80.8	10.2	0.0366	0.411	813	0.0279	0.0164	<0.0100	1.05E+05
Benzo(g,h,i)perylene	0.576	2.57	<6.51	0.0361	<0.0100	0.763	4.53	3.37	0.577	0.0222	0.934	82.3	0.0162	<0.0100	<0.0100	NA
cPAHs (mg/kg)[j]																
Chrysene	1.17	7.10	***23.2***	0.0689	0.0244	4.26	7.16	***18.1***	2.93	0.0273	0.369	***318***	0.0323	<0.0100	<0.0100	18
Benzo(b)fluoranthene	0.896	3.57	7.83	0.0533	0.0125	1.72	5.85	8.02	1.30	0.0240	0.350	***153***	0.0243	<0.0100	<0.0100	18
Benzo(k)fluoranthene	0.657	3.57	7.32	0.0652	0.0249	1.82	4.65	8.36	1.35	0.0345	0.248	***170***	0.0340	<0.0100	<0.0100	18
Benzo(a)anthracene	0.723	4.33	***25.1***	0.0423	0.0154	4.47	3.69	***19.2***	2.72	0.0156	0.171	***279***	0.0211	<0.0100	<0.0100	18
Benzo(a)pyrene	0.832	4.79	8.18	0.0383	0.0119	2.20	6.37	10.6	1.69	0.0184	0.241	***202***	0.0227	<0.0100	<0.0100	18
Indeno(1,2,3-cd)pyrene	0.520	2.11	<6.51	0.0298	<0.0100	0.698	3.84	3.44	0.542	0.0166	0.371	***76.2***	0.0144	<0.0100	<0.0100	18
Dibenz(a,h)anthracene	<0.330	0.808	<6.51	<0.0211	<0.0100	<0.643	1.53	1.70	<0.330	<0.0100	0.0990	***32.2***	<0.0100	<0.0100	<0.0100	18
Total cPAHs (mg/kg)[k]	1.12	6.54	12.4	0.0580	0.0174	3.11	8.86	15.4	2.31	0.0277	0.398	***286***	0.0324	<0.0100	<0.0100	18

Notes:
(a) Model Toxics Control Act (MTCA) Method C industrial soil cleanup levels based on CLARC v3.1, dated November 2001 (Ecology 2001b).
(b) Samples were analyzed for diesel- and oil-range hydrocarbons by Ecology Method NWTPH-Dx(extended) with silica gel cleanup, and gasoline-range hydrocarbons by Ecology Method NWTPH-G.
(c) "<" denotes analyte was not detected at the indicated laboratory reporting limit.
(d) Lab note G-02: The chromatogram for this sample does not resemble a typical gasoline pattern.
(e) Total petroleum hydrocarbon (TPH) screening levels based on MTCA Method A industrial soil cleanup levels (Ecology 2001a). For gasoline mixtures without benzene and total ethylbenzene, toluene and xylenes less than 1% of the gasoline mixture the cleanup level is 100 mg/kg. For all other gasoline mixtures, the cleanup level is 30 mg/kg.
(f) Lab note D-15: Hydrocarbon pattern most closely resembles a weathered Heavy Fuel Oil product.
(g) Lab note D-06: The sample chromatographic pattern does not resemble the fuel standard used for quantitation.
(h) Samples were analyzed for polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270C using selected ion monitoring (SIM) mode (where appropriate).
(i) "NA" denotes no cleanup level established.
(j) Samples were analyzed for carcinogenic polycyclic aromatic hydrocarbons (cPAHs) by EPA Method 8270C using SIM mode (where appropriate).
(k) Total cPAHs are based on benzo(a)pyrene equivalent values. Individual detected cPAH concentrations were multiplied by benzo(a)pyrene toxicity equivalency factors (TEFs) prior to summation (per WAC 173-340-708). Non-detected cPAH analytes were not included in the summation. TEFs are tabulated on Table 2A-A.

Analytes detected in samples at concentrations exceeding one or more cleanup levels or comparison levels are shown in bold and italics.
mg/kg = milligrams per kilogram
bgs = below ground surface

TABLE 3B

MARCH 2005 OFF-PROPERTY INVESTIGATION
RECONNAISSANCE GROUNDWATER ANALYTICAL RESULTS - TPH and PAHs
Former Tacoma Metals Facility

Analyte	Reconnaissance Groundwater Sample Designation										MTCA Method B Surface Water[a]	NRWQC Human Health Consumption of Organisms[b]	NTR Human Health Consumption of Organisms[c]
	B24 RGW	B25 RGW	B26 RGW	B27 RGW	B28 RGW	B29 RGW	B30 RGW	B31 RGW	B32 RGW	B33 RGW			
TPHs (mg/l)[d]													
Gasoline-range hydrocarbons	0.354[e]	1.27[e]	0.134[e]	8.16[e]	2.78[e]	6.71[e]	0.227[e]	10.4[e]	<0.050[f]	0.537[e]	NA[g]	NA	NA
Diesel-range hydrocarbons	1.88	3.80	0.637	6.13	2.81	3.14	0.399	22.1	0.664	0.639	NA	NA	NA
Oil-range hydrocarbons	<0.500	<0.581	<0.500	<0.685	<0.500	<0.602	<0.500	3.10	<0.500	<0.500	NA	NA	NA
PAHs (µg/l)[h]													
Naphthalene	2.98	39.8	17.7	4,310	1,070	2,730	3.33	***17,400***	6.83	1.52	4,940	NA	NA
1-Methylnaphthalene	20.6	175	19.8	338	224	237	35.9	2,270	29.3	73.5	NA	NA	NA
2-Methylnaphthalene	13.3	203	5.59	462	199	322	15.7	3,340	15.1	5.76	NA	NA	NA
Acenaphthylene	<0.500	1.54	1.18	5.15	<10	4.43	0.980	206	1.39	1.21	NA	NA	NA
Acenaphthene	45.9	171	48.3	243	185	224	60.6	***3,120***	59.5	108	643	990	NA
Fluorene	39.7	103	34.2	120	109	121	18.5	2,480	18.2	18.1	3,460	5,300	14,000
Phenanthrene	83.2	229	51.8	115	121	122	18.7	8,590	61.3	2.42	NA	NA	NA
Anthracene	9.25	24.2	13.7	7.42	12.6	15.2	2.84	1,370	14.9	1.11	25,900	40,000	110,000
Fluoranthene	29.0	75.6	21.5	20.6	23.3	24.5	5.29	***4,170***	60.4	0.505	90.2	140	370
Pyrene	20.1	60.2	18.0	11.4	20.6	17.4	4.71	***3,390***	52.8	<0.500	2,590	4,000	11,000
Benzo(g,h,i)perylene	<0.500	1.54	1.18	<1.00	<10.0	<1.00	<0.500	285	3.37	<0.500	NA	NA	NA
cPAHs (µg/l)[i]													
Chrysene	***3.26***	***12.3***	***6.86***	***5.98***	<10.0	***2.93***	***2.75***	***928***	***12.7***	<0.500	0.0296	0.018 * / 0.02[j]	0.031
Benzo(b)fluoranthene	***1.39***	***7.03***	***3.53***	***2.06***	<10.0	<1.00	***1.08***	***510***	***8.71***	<0.500	0.0296	0.018 * / 0.02[j]	0.031
Benzo(k)fluoranthene	***2.48***	***8.13***	***2.16***	***1.03***	<10.0	<1.00	***0.686***	***519***	***8.22***	<0.500	0.0296	0.018 * / 0.02[j]	0.031
Benzo(a)anthracene	***3.52***	***9.89***	***3.92***	***2.06***	<10.0	***2.83***	***0.882***	***1,090***	***11.3***	<0.500	0.0296	0.018 * / 0.02[j]	0.031
Benzo(a)pyrene	***1.11***	***3.96***	***2.65***	<1.00	<10.0	<1.00	<0.500	***654***	***8.12***	<0.500	0.0296	0.018 * / 0.02[j]	0.031
Indeno(1,2,3-cd)pyrene	<0.500	***1.32***	***1.08***	<1.00	<10.0	<1.00	<0.500	***246***	***2.67***	<0.500	0.0296	0.018 * / 0.02[j]	0.031
Dibenz(a,h)anthracene	<0.500	<1.00	***0.784***	<1.00	<10.0	<1.00	<0.500	***100***	***1.39***	<0.500	0.0296	0.018 * / 0.02[j]	0.031
Total cPAHs (µg/l)[k]	***1.88***	***6.720***	***4.10***	***0.575***	<10.0	***0.312***	***0.292***	***940***	***11.90***	<0.500	0.0296	0.018 * / 0.02[j]	0.031

Notes:

(a) Model Toxics Control Act (MTCA) Method B surface water cleanup level based on CLARC v3.1, dated November 2001 (Ecology 2001b).

(b) National Recommended Water Quality Criteria (NRWQC) for consumption of organisms only (EPA 2002) pursuant to Section 304(a)(1) of the Clean Water Act and in accordance with Washington Administrative Code (WAC) 173-201A at a risk level of $1x10^{-6}$.

(c) National Toxic Rule (NTR) for consumption of organisms only based on 40 CFR 131.36 at a risk level of $1x10^{-6}$.

(d) Samples were analyzed for total petroleum hydrocarbons (TPHs) by Ecology Methods NWTPH-G and NWTPH-Dx(extended) with silica gel cleanup.

(e) Lab note G-02: The chromatogram for this sample does not resemble a typical gasoline pattern.

(f) "<" Denotes analyte was not detected at the indicated laboratory reporting limit.

(g) "NA" denotes no cleanup level established.

(h) Samples were analyzed for polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270C using selected ion monitoring (SIM) mode (where appropriate).

(i) Samples were analyzed for carcinogenic polycyclic aromatic hydrocarbons (cPAHs) by EPA Method 8270C using SIM mode (where appropriate).

(j) Practical quantitation limit (PQL) (Ecology 2001b).

(k) Total cPAHs are based on benzo(a)pyrene equivalent values. Individual detected cPAH concentrations were multiplied by benzo(a)pyrene toxicity equivalency factors (TEFs) prior to summation (per WAC 173-340-708). Non-detected cPAH analytes were not included in the summation. TEFs are tabulated on Table 2A-A.

* Denotes PQL is higher than MTCA cleanup levels and/or applicable, relevant, and appropriate requirements (ARARs).

Analytes detected in samples at concentrations exceeding one or more of the cleanup levels or comparison values are shown in bold and italics. Where appropriate, surface water standards have been adjusted upward to the PQL [WAC 173-340-730(5)(c)].

mg/l = milligrams per liter

µg/l = micrograms per liter

TABLE 3C

MARCH 2005 OFF-PROPERTY INVESTIGATION
GROUNDWATER MONITORING WELL ANALYTICAL RESULTS - TPH and PAHs
Former Tacoma Metals Facility

Analyte	Groundwater Sample Designation						MTCA Method B Surface Water[a]	NRWQC Human Health Consumption of Organisms[b]	NTR Human Health Consumption of Organisms[c]
	MW-26		MW-27		MW-28				
	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered			
TPHs (mg/l)[d]									
Gasoline-range hydrocarbons	2.31[e]	---[f]	<0.0500[g]	---	0.19[e]	---	NA[h]	NA	NA
Diesel-range hydrocarbons	1.78[i]	---	<0.250	---	1.15[i]	---	NA	NA	NA
Oil-range hydrocarbons	<0.500	---	<0.500	---	<0.500	---	NA	NA	NA
PAHs (µg/l)[j]									
Naphthalene	987	990	1.58	1.33	23.1	14.8	4,940	NA	NA
1-Methylnaphthalene	169	99.1	0.596	0.177	81.6	33.5	NA	NA	NA
2-Methylnaphthalene	169	65.4	0.159	<0.100	6.09	2.00	NA	NA	NA
Acenaphthylene	<0.100	<0.100	<0.100	<0.100	<0.100	0.538	NA	NA	NA
Acenaphthene	179	80.6	12.7	0.352	126	39.6	643	990	NA
Fluorene	127	2.72	7.69	<0.100	66.4	4.84	3,460	5,300	14,000
Phenanthrene	134	0.922	0.748	<0.100	105	0.708	NA	NA	NA
Anthracene	10.9	0.443	1.26	0.198	11.5	0.617	25,900	40,000	110,000
Fluoranthene	15.9	0.621	2.00	0.133	15.3	0.508	90.2	140	370
Pyrene	8.49	0.460	1.36	0.118	9.23	0.362	2,590	4,000	11,000
Benzo(g,h,i)perylene	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	NA	NA	NA
cPAHs (µg/l)[k]									
Chrysene	***0.610***	***0.109***	<0.100	<0.100	***0.447***	<0.100	0.0296	0.018 * / 0.02[l]	0.031
Benzo(b)fluoranthene	***0.121***	<0.100	<0.100	<0.100	<0.100	<0.100	0.0296	0.018 * / 0.02[l]	0.031
Benzo(k)fluoranthene	***0.437***	<0.100	<0.100	<0.100	<0.100	<0.100	0.0296	0.018 * / 0.02[l]	0.031
Benzo(a)anthracene	***0.602***	***0.122***	***0.105***	<0.100	***0.480***	***0.140***	0.0296	0.018 * / 0.02[l]	0.031
Benzo(a)pyrene	***0.127***	<0.100	<0.100	<0.100	<0.100	<0.100	0.0296	0.018 * / 0.02[l]	0.031
Indeno(1,2,3-cd)pyrene	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	0.0296	0.018 * / 0.02[l]	0.031
Dibenz(a,h)anthracene	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	0.0296	0.018 * / 0.02[l]	0.031
Total cPAHs (µg/l)[m]	***0.249***	0.0133	0.0105	<0.100	***0.0525***	0.014	0.0296	0.018 * / 0.02[l]	0.031

Notes:

(a) Model Toxics Control Act (MTCA) Method B surface water cleanup level based on CLARC v3.1, dated November 2001 (Ecology 2001b).

(b) National Recommended Water Quality Criteria (NRWQC) for consumption of organisms only (EPA 2002) pursuant to Section 304(a)(1) of the Clean Water Act and in accordance with Washington Administrative Code (WAC) 173-201A at a risk level of $1x10^{-6}$.

(c) National Toxic Rule (NTR) for consumption of organisms only based on 40 CFR 131.36 at a risk level of $1x10^{-6}$.

(d) Samples were analyzed for total petroleum hydrocarbons (TPHs) by Ecology Methods NWTPH-G and NWTPH-Dx(extended) with silica gel cleanup.

(e) Lab note G-02: The chromatogram for this sample does not resemble a typical gasoline pattern.

(f) "---" Denotes sample was not analyzed for the listed analyte

(g) "<" Denotes analyte was not detected at the indicated laboratory reporting limit.

(h) "NA" denotes no cleanup level established.

(i) Lab note D-06: The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

(j) Samples were analyzed for polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270C using selected ion monitoring (SIM) mode (where appropriate).

(k) Samples were analyzed for carcinogenic polycyclic aromatic hydrocarbons (cPAHs) by EPA Method 8270C using SIM mode (where appropriate).

(l) Practical quantitation limit (PQL) (Ecology 2001b).

(m) Total cPAHs are based on benzo(a)pyrene equivalent values. Individual detected cPAH concentrations were multiplied by benzo(a)pyrene toxicity equivalency factors (TEFs) prior to summation (per WAC 173-340-708). Non-detected cPAH analytes were not included in the summation. TEFs are tabulated on Table 2A-A.

* Denotes PQL is higher than MTCA cleanup levels and/or applicable, relevant, and appropriate requirements (ARARs).

Analytes detected in samples at concentrations exceeding one or more of the cleanup levels or comparison values are shown in bold and italics. Where appropriate, surface water standards have been adjusted upward to the PQL [WAC 173-340-730(5)(c)].

mg/l - milligrams per liter

µg/l - micrograms per liter

TABLE 4A

MARCH 2004 OFF-PROPERTY INVESTIGATION
SOIL ANALYTICAL RESULTS - TPH and PAHs
Former Tacoma Metals Facility

Analyte	Sample Designation (Boring ID - feet bgs)																		MTCA Method C Industrial Soil Cleanup Level[a]
	B-18 6-6.5	B-18 12-13	B-18 24-25	B-19 9-10	B-19 14-15	B-19 21-22	B-20 7-8	B-20 10-11	B-20 19-20	B-21 8-9	B-21 13-15	B-21 18-19	B-22 6-7	B-22 11-12	B-22 19-20	B-23 6.5-7.5	B-23 9-10	B-23 18-20	
TPHs (mg/kg)[b]																			
Diesel-range Hydrocarbon	19.0[c]	18.3[d]	<10.0[e]	180	15.1[c]	***5,990***[f]	<20.4	38.1	36.3	30.6	<10.0	474	98.6	241	56.1[f]	49.9	***3,010***	<10.0	2000[g]
Oil-range Hydrocarbon	<25.0	32.6	<25.0	28.0	<25.0	680	<51.0	<25.0	<25.0	38.2	<25.0	43.9	79.9	63.5	<25.0	<25.0	912	<25.0	2000[g]
Gasoline-range Hydrocarbon	<5.00	<5.00	<5.00	***554***[h]	19.5	***2,500***[h]	26.9[h]	***430***[h]	***1,270***[h]	33.1[h]	<5.00	66.7[h]	<11.7	21.5[h]	63.0[i]	7.43	***235***[i]	13.9[h]	100/30[g]
PAHs (mg/kg)[j]																			
Naphthalene	0.0872	0.873	0.332	8.66	0.375	1,160	0.235	17.2	7.89	0.402	0.234	45.2	0.731	0.918	<0.100	0.120	1.78	<0.100	7.00E+04
1-Methylnaphthalene	0.0521	0.262	2.84	3.66	0.411	360	<0.204	6.01	1.39	0.389	0.598	22.0	0.373	0.828	0.637	<0.100	0.801	<0.100	NA[k]
2-Methylnaphthalene	0.0612	0.376	0.728	3.10	0.672	642	<0.204	2.92	2.92	0.299	0.238	32.6	0.560	0.563	<0.100	<0.100	0.925	<0.100	NA
Acenaphthylene	<0.0100	0.221	<0.0100	0.0809	0.0105	<10.3	<0.204	0.0734	<0.0100	0.0267	<0.0100	0.346	2.04	0.282	0.136	<0.100	1.07	<0.100	NA
Acenaphthene	<0.0100	0.841	1.92	2.37	0.348	384	<0.204	3.32	1.22	0.284	0.550	29.5	0.326	1.26	8.62	<0.100	1.73	0.174	2.10E+05
Fluorene	0.0143	0.817	0.702	1.13	0.600	341	<0.204	1.71	3.89	0.222	0.507	28.9	0.575	1.87	11.6	<0.100	1.25	<0.100	1.40E+05
Phenanthrene	0.0482	6.41	0.264	1.18	0.784	920	<0.204	2.40	5.23	0.407	0.554	73.7	1.24	5.15	33.6	<0.100	3.58	0.131	NA
Anthracene	<0.0100	1.25	0.0126	0.304	0.12	148	<0.204	0.702	1.33	0.146	0.0361	11.3	2.77	2.33	4.61	<0.100	5.82	<0.100	1.05E+06
Fluoranthene	0.0182	4.75	<0.0100	0.411	0.193	362	<0.204	1.20	1.61	0.276	0.0205	29.5	2.92	5.87	14.3	<0.100	27.0	0.105	1.40E+05
Pyrene	0.0273	5.52	<0.0100	0.377	0.131	301	<0.204	0.958	1.22	0.240	0.0238	24.0	4.17	3.92	8.80	<0.100	21.5	<0.100	1.05E+05
Benzo(g,h,i)perylene	0.0130	0.812	<0.0100	0.107	0.0158	16.1	<0.204	0.0683	0.015	0.0701	<0.0100	0.659	5.01	0.798	0.187	<0.100	20.4	<0.100	NA
cPAHs (mg/kg)[l]																			
Chrysene	0.0325	2.02	<0.0100	0.142	0.0412	***76.2***	<0.204	0.206	0.144	0.146	<0.0100	4.10	4.68	1.77	1.71	<0.100	***23.0***	<0.100	18
Benzo(b)fluoranthene	0.0521	2.10	<0.0100	0.194	0.057	***68.6***	<0.204	0.192	0.0967	0.181	<0.0100	5.00	9.09	1.55	0.959	<0.100	16.2	0.226	18
Benzo(k)fluoranthene	0.0299	0.597	<0.0100	0.0939	0.0245	***25.4***	<0.204	0.0557	0.0533	0.0709	<0.0100	2.72	3.64	0.319	0.340	<0.100	7.69	<0.100	18
Benzo(a)anthracene	0.0208	2.23	<0.0100	0.189	0.0482	***87.2***	<0.204	0.259	0.228	0.104	<0.0100	6.93	3.40	1.99	2.06	<0.100	12.8	<0.100	18
Benzo(a)pyrene	0.0286	1.74	<0.0100	0.186	0.043	***48.3***	<0.204	0.166	0.075	0.118	<0.0100	3.51	8.26	1.34	0.679	<0.100	15.8	0.122	18
Indeno(1,2,3-cd)pyrene	0.0156	0.867	<0.0100	0.115	0.0167	15.2	<0.204	0.0633	0.0175	0.0732	<0.0100	0.711	5.05	0.961	0.195	<0.100	17.6	<0.100	18
Dibenz(a,h)anthracene	0.0456	0.319	<0.0100	0.0678	0.0324	***31.3***	<0.204	0.0544	0.0317	0.0488	<0.0100	0.317	1.87	0.299	0.314	<0.100	<0.266	<0.100	18
Total cPAHs (mg/kg)[m]	0.059	2.47	<0.0100	0.274	0.071	***81.2***	<0.204	0.247	0.129	0.182	<0.0100	5.21	11.2	1.96	1.18	<0.100	***21.5***	0.145	18

Notes:

(a) Model Toxics Control Act (MTCA) Method C industrial soil cleanup levels based on CLARC v3.1, dated November 2001 (Ecology 2001b).
(b) Samples were analyzed for diesel- and oil-range hydrocarbons by Ecology Method NWTPH-Dx(extended) with silica gel cleanup, and gasoline-range hydrocarbons by Ecology Method NWTPH-G.
(c) Hydrocarbon concentration result in this sample is partially due to one or more individual peaks eluting in the diesel/heavy oil range.
(d) Results in diesel organics range are primarily due to overlap from heavy oil range product.
(e) "<" denotes analyte was not detected at the indicated laboratory reporting limit.
(f) Sample chromatogram pattern does not resemble fuel standard used for quantitation.
(g) Total petroleum hydrocarbon (TPH) screening levels based on MTCA Method A industrial soil cleanup levels (Ecology 2001a). For gasoline mixtures without benzene and total ethylbenzene, toluene and xylenes less than 1% of the gasoline mixture the cleanup level is 100 mg/kg. For all other gasoline mixtures, the cleanup level is 30 mg/kg.
(h) Chromatogram for this sample does not resemble a typical gasoline pattern.
(i) Results reported in the gasoline range are primarily due to overlap from diesel range hydrocarbons.
(j) Samples were analyzed for polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270C using selected ion monitoring (SIM) mode.
(k) "NA" denotes no cleanup level established.
(l) Samples were analyzed for carcinogenic polycyclic aromatic hydrocarbons (cPAHs) by EPA Method 8270C-SIM.
(m) Total cPAHs are based on benzo(a)pyrene equivalent values. Individual detected cPAH concentrations were multiplied by benzo(a)pyrene toxicity equivalency factors (TEFs) prior to summation (per WAC 173-340-708). Non-detected cPAH analytes were not included in the summation. TEFs are tabulated on Table 2A-A.

Analytes detected in samples at concentrations exceeding one or more cleanup levels or comparison levels are shown in bold and italics.
mg/kg = milligrams per kilogram
bgs = below ground surface

TABLE 4B

MARCH 2004 OFF-PROPERTY INVESTIGATION
RECONNAISSANCE GROUNDWATER ANALYTICAL RESULTS - TPH and PAHs
Former Tacoma Metals Facility

Analyte	Well Designation and Date Sampled						MTCA Method B Surface Water[a]	NRWQC Human Health Consumption of Organisms[b]	NTR Human Health Consumption of Organisms[c]
	B-18 3/10/2004	B-19 3/10/2004	B20 3/10/2004	B-21 3/11/2004	B-22 3/11/2004	B-23 3/11/2004			
TPHs (mg/l)[d]									
Gasoline-range hydrocarbons	2.91[e]	12.600[e]	22.500[e]	9.820[e]	2.410[e]	0.523[e]	NA[f]	NA	NA
Diesel-range hydrocarbons	1.28[g]	4.93[g]	12.20[g]	5.49[g]	4.21[g]	0.321[g]	NA	NA	NA
Oil-range hydrocarbons	<0.500[h]	<0.500	0.632[g]	<0.500	<0.500	<0.500	NA	NA	NA
PAHs (µg/l)[i]									
Naphthalene	36.0	***5,870***	***22,900***	4,330	1,100	74.0	4,940	NA	NA
1-Methylnaphthalene	275	<500	<1,000	<500	<200	66.1	NA	NA	NA
2-Methylnaphthalene	214	1,200	3,430	805	456	33.9	NA	NA	NA
Acenaphthylene	<10.0	<500	<1,000	<500	290	27.9	NA	NA	NA
Acenaphthene	159	***692***	***1,810***	554	***866***	76.9	643	990	NA
Fluorene	52.8	<500	1,220	<500	630	33.8	3,460	5,300	14,000
Phenanthrene	23.9	<500	3,440	644	1,790	30.1	NA	NA	NA
Anthracene	26.5	<500	<1,000	712	250	3.00	25,900	40,000	110,000
Fluoranthene	<10.0	<500	***1,080***	<500	***826***	5.07	90.2	140	370
Pyrene	<10.0	<500	<1,000	<500	635	3.40	2,590	4,000	11,000
Benzo(g,h,i)perylene	<10.0	<500	<1,000	<500	<200	<0.100	NA	NA	NA
cPAHs (µg/l)[j]									
Chrysene	<10.0	<500	<1,000	<500	<200	***0.253***	0.0296	0.018 * / 0.02[k]	0.031
Benzo(b)fluoranthene	<10.0	<500	<1,000	<500	<200	***0.0906***	0.0296	0.018 * / 0.02[k]	0.031
Benzo(k)fluoranthene	<10.0	<500	<1,000	<500	<200	***0.103***	0.0296	0.018 * / 0.02[k]	0.031
Benzo(a)anthracene	<10.0	<500	<1,000	<500	<200	***0.306***	0.0296	0.018 * / 0.02[k]	0.031
Benzo(a)pyrene	<10.0	<500	<1,000	<500	<200	***0.122***	0.0296	0.018 * / 0.02[k]	0.031
Indeno(1,2,3-cd)pyrene	<10.0	<500	<1,000	<500	<200	***0.0372***	0.0296	0.018 * / 0.02[k]	0.031
Dibenz(a,h)anthracene	<10.0	<500	<1,000	<500	<200	0.0180	0.0296	0.018 * / 0.02[k]	0.031
Total cPAHs (µg/l)[l]	<10.0	<500	<1,000	<500	<200	***0.185***	0.0296	0.018 * / 0.02[k]	0.031

Notes:

(a) Model Toxics Control Act (MTCA) Method B surface water cleanup level based on CLARC v3.1, dated November 2001 (Ecology 2001b).
(b) National Recommended Water Quality Criteria (NRWQC) for consumption of organisms only (EPA 2002) pursuant to Section 304(a)(1) of the Clean Water Act and in accordance with Washington Administrative Code (WAC) 173-201A at a risk level of $1x10^{-6}$.
(c) National Toxic Rule (NTR) for consumption of organisms only based on 40 CFR 131.36 at a risk level of $1x10^{-6}$.
(d) Samples were analyzed for total petroleum hydrocarbons (TPHs) by Ecology Methods NWTPH-G and NWTPH-Dx(extended) with silica gel cleanup.
(e) Chromatogram for this sample does not resemble a typical gasoline standard pattern.
(f) "NA" denotes no cleanup level established.
(g) Hydrocarbon concentration result in this sample is partially due to one or more individual peaks eluting in the diesel/heavy oil range.
(h) "<" Denotes analyte was not detected at the indicated laboratory reporting limit.
(i) Samples were analyzed for polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270C using selected ion monitoring (SIM) mode.
(j) Samples were analyzed for carcinogenic polycyclic aromatic hydrocarbons (cPAHs) by EPA Method 8270C-SIM.
(k) Practical quantitation limit (PQL) (Ecology 2001b).
(l) Total cPAHs are based on benzo(a)pyrene equivalent values. Individual detected cPAH concentrations were multiplied by benzo(a)pyrene toxicity equivalency factors (TEFs) prior to summation (per WAC 173-340-708). Non-detected cPAH analytes were not included in the summation. TEFs are tabulated on Table 2A-A.

* Denotes PQL is higher than MTCA cleanup levels and/or applicable, relevant, and appropriate requirements (ARARs).

Analytes detected in samples at concentrations exceeding one or more of the cleanup levels or comparison values are shown in bold and italics. Where appropriate, surface water standards have been adjusted upward to the PQL [WAC 173-340-730(5)(c)].

mg/l - milligrams per liter
µg/l - micrograms per liter

TABLE 4C

MARCH 2004 OFF-PROPERTY INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - TPH and PAHs
Former Tacoma Metals Facility

Analyte	Well Designation and Date Sampled				MTCA Method B Surface Water[a]	NRWQC Human Health Consumption of Organisms[b]	NTR Human Health Consumption of Organisms[c]
	MW-18 3/31/2004	MW-23 3/31/2004	MW-24 3/31/2004	MW-25 3/31/2004			
TPHs (mg/l)[d]							
Gasoline-range hydrocarbons	23.4	6.35	13.9	0.577	NA[e]	NA	NA
Diesel-range hydrocarbons	3.36	3.27	4.69	0.460	NA	NA	NA
Oil-range hydrocarbons	<0.500[f]	<0.500	<0.500	<0.500	NA	NA	NA
PAHs (µg/l)[g]							
Naphthalene	***7,490***	972	***6,600***	1.34	4,940	NA	NA
1-Methylnaphthalene	646	449	558	56.1	NA	NA	NA
2-Methylnaphthalene	684	488	868	6.56	NA	NA	NA
Acenaphthylene	2.08	1.33	6.29	<0.100[e]	NA	NA	NA
Acenaphthene	347	381	392	65.7	643	990	NA
Fluorene	148	137	168	11.4	3,460	5,300	14,000
Phenanthrene	124	135	168	0.744	NA	NA	NA
Anthracene	11.6	14.8	20.7	0.838	25,900	40,000	110,000
Fluoranthene	6.29	17.3	17.1	<0.100	90.2	140	370
Pyrene	3.46	9.75	12.2	<0.100	2,590	4,000	11,000
Benzo(g,h,i)perylene	<0.100	<0.100	<0.100	<0.100	NA	NA	NA
cPAHs (µg/l)[h]							
Chrysene	<0.100	***0.442***	***0.667***	<0.0100	0.0296	0.018 * / 0.02[i]	0.031
Benzo(b)fluoranthene	<0.100	***0.327***	***0.419***	<0.0100	0.0296	0.018 * / 0.02[i]	0.031
Benzo(k)fluoranthene	<0.100	<0.100	***0.152***	<0.0100	0.0296	0.018 * / 0.02[i]	0.031
Benzo(a)anthracene	<0.100	***0.577***	***0.800***	<0.0100	0.0296	0.018 * / 0.02[i]	0.031
Benzo(a)pyrene	<0.100	<0.100	<0.100	<0.0100	0.0296	0.018 * / 0.02[i]	0.031
Indeno(1,2,3-cd)pyrene	<0.100	<0.100	<0.100	<0.0100	0.0296	0.018 * / 0.02[i]	0.031
Dibenz(a,h)anthracene	<0.100	<0.100	<0.100	<0.0100	0.0296	0.018 * / 0.02[i]	0.031
Total cPAHs[j]	<0.100	***0.0948***	***0.144***	<0.0100	0.0296	0.018 * / 0.02[i]	0.031

Notes:

(a) Model Toxics Control Act (MTCA) Method B surface water cleanup level based on CLARC v3.1, dated November 2001 (Ecology 2001b).

(b) National Recommended Water Quality Criteria (NRWQC) for consumption of organisms only (EPA 2002) pursuant to Section 304(a)(1) of the Clean Water Act and in accordance with Washington Administrative Code (WAC) 173-201A at a risk level of $1x10^{-6}$.

(c) National Toxic Rule (NTR) for consumption of organisms only based on 40 CFR 131.36 at a risk level of $1x10^{-6}$.

(d) Samples were analyzed for total petroleum hydrocarbons (TPHs) by Ecology Methods NWTPH-G and NWTPH-Dx(extended) with silica gel cleanup.

(e) "NA" denotes no cleanup level established.

(f) "<" Denotes analyte was not detected at the indicated laboratory reporting limit.

(g) Samples were analyzed for polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270C using selected ion monitoring (SIM) mode.

(h) Samples were analyzed for carcinogenic polycyclic aromatic hydrocarbons (cPAHs) by EPA Method 8270C-SIM.

(i) Practical quantitation limit (PQL) (Ecology 2001b).

(j) Total cPAHs are based on benzo(a)pyrene equivalent values. Individual detected cPAH concentrations were multiplied by benzo(a)pyrene toxicity equivalency factors (TEFs) prior to summation (per WAC 173-340-708). Non-detected cPAH analytes were not included in the summation. TEFs are tabulated on Table 2A-A.

* Denotes PQL is higher than MTCA cleanup levels and/or applicable, relevant, and appropriate requirements (ARARs).

Analytes detected in samples at concentrations exceeding one or more of the cleanup levels or comparison values are shown in bold and italics.

Where appropriate, surface water standards have been adjusted upward to the PQL [WAC 173-340-730(5)(c)].

mg/l - milligrams per liter

µg/l - micrograms per liter

TABLE 4D

MARCH 2004 OFF-PROPERTY INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DISSOLVED PAHs
Former Tacoma Metals Facility

Analyte	Well Designation and Date Sampled				MTCA Method B Surface Water[a]	NRWQC Human Health Consumption of Organisms[b]	NTR Human Health Consumption of Organisms[c]
	MW-18 3/31/2004	MW-23 3/31/2004	MW-24 3/31/2004	MW-25 3/31/2004			
PAHs (µg/l)[d]							
Naphthalene	***5,360***	742	4,240	1.60	4,940	NA[e]	NA
1-Methylnaphthalene	305	252	221	10.4	NA	NA	NA
2-Methylnaphthalene	217	248	183	0.654	NA	NA	NA
Acenaphthylene	0.654	0.311	1.33	<0.100[f]	NA	NA	NA
Acenaphthene	142	177	103	10.5	643	990	NA
Fluorene	6.85	32.8	2.48	0.888	3,460	5,300	14,000
Phenanthrene	0.558	30.2	3.40	<0.100	NA	NA	NA
Anthracene	<0.100	2.29	0.827	0.786	25,900	40,000	110,000
Fluoranthene	<0.100	2.72	0.808	<0.100	90.2	140	370
Pyrene	<0.100	1.42	0.538	<0.100	2,590	4,000	11,000
Benzo(g,h,i)perylene	<0.100	<0.100	<0.100	<0.100	NA	NA	NA
cPAHs (µg/l)[g]							
Chrysene	<0.100	<0.100	<0.100	<0.0100	0.0296	0.018 * / 0.02[h]	0.031
Benzo(b)fluoranthene	<0.100	***0.194***	***0.231***	<0.0100	0.0296	0.018 * / 0.02[h]	0.031
Benzo(k)fluoranthene	<0.100	<0.100	<0.100	<0.0100	0.0296	0.018 * / 0.02[h]	0.031
Benzo(a)anthracene	<0.100	<0.100	<0.100	<0.0100	0.0296	0.018 * / 0.02[h]	0.031
Benzo(a)pyrene	<0.100	<0.100	<0.100	<0.0100	0.0296	0.018 * / 0.02[h]	0.031
Indeno(1,2,3-cd)pyrene	<0.100	<0.100	<0.100	<0.0100	0.0296	0.018 * / 0.02[h]	0.031
Dibenz(a,h)anthracene	<0.100	<0.100	<0.100	<0.0100	0.0296	0.018 * / 0.02[h]	0.031
Total cPAHs[i]	<0.100	0.0194	***0.0231***	<0.0100	0.0296	0.018 * / 0.02[i]	0.031

Notes:

(a) Model Toxics Control Act (MTCA) Method B surface water cleanup level based on CLARC v3.1, dated November 2001 (Ecology 2001b).

(b) National Recommended Water Quality Criteria (NRWQC) for consumption of organisms only (EPA 2002) pursuant to Section 304(a)(1) of the Clean Water Act and in accordance with Washington Administrative Code (WAC) 173-201A at a risk level of $1x10^{-6}$.

(c) National Toxic Rule (NTR) for consumption of organisms only based on 40 CFR 131.36 at a risk level of $1x10^{-6}$.

(d) Samples were analyzed for polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270C using selected ion monitoring (SIM) mode. Samples were field-filtered using a 0.45 micron cellulose acetate filter.

(e) "NA" denotes no cleanup level established.

(f) "<" Denotes analyte was not detected at the indicated laboratory reporting limit.

(g) Samples were analyzed for carcinogenic polycyclic aromatic hydrocarbons (cPAHs) by EPA Method 8270C-SIM. Samples were field-filtered using a 0.45 micron cellulose acetate filter.

(h) Practical quantitation limit (PQL) (Ecology 2001b).

(i) Total cPAHs are based on benzo(a)pyrene equivalent values. Individual detected cPAH concentrations were multiplied by benzo(a)pyrene toxicity equivalency factors (TEFs) prior to summation (per WAC 173-340-708). Non-detected cPAH analytes were not included in the summation. TEFs are tabulated on Table 2A-A.

* Denotes PQL is higher than MTCA cleanup levels and/or applicable, relevant, and appropriate requirements (ARARs).

Analytes detected in samples at concentrations exceeding one or more of the cleanup levels or comparison values are shown in bold and italics.

Where appropriate, surface water standards have been adjusted upward to the PQL [WAC 173-340-730(5)(c)].

µg/l - micrograms per liter

TABLE 5A

NOVEMBER-DECEMBER 2003 INVESTIGATION
SOIL ANALYTICAL RESULTS - TPH and PAHs
Former Tacoma Metals Facility

Analyte	Sample Designation (Boring ID - feet bgs)																		MTCA Method C Industrial Soil Cleanup Level[a]
	B-12 4-5	B-12 6.5-7.5	B-12 9-10	B-13 1-3	B-13 5-6	B-13 14-15	B-14 1-2	B-14 5-6	B-14 9-10	B-15 5-6	B-15 7-8	B-15 10-11	B-16 3-4	B-16 5-6	B-16 10-11	B-17 3-4	B-17 5-6	B-17 7-8	
TPHs (mg/kg)[b]																			
Diesel-range Hydrocarbon	1,910 (397)[c]	43.0 (21.8)	1,310 (866)	734 (264)	114 (41.8)	1,680 (1,020)[d]	374 (178)[d]	927 (279)[d]	436 (251)	266 (68.7)	12.8 (<10.0[e])	19.5 (<10.0)	<10.0 (<10.0)	457 (136)	139 (72.8)	<10.0 (<10.0)	138 (23.6)	361 (35.1)	2000[f]
Oil-range Hydrocarbon	***4,800*** (1,250)	64.7 (<25.0)	317 (<125)	1,080 (551)	159 (47.1)	166 (<98.0)	1,410 (705)	1,590 (349)	298 (91.7)	666 (217)	<25.0 (<25.0)	25.7 (<25.0)	<25.0 (<25.0)	642 (59.6)	29.4 (<25.0)	<25.0 (<25.0)	768 (73.5)	1,200 (<84.2)	2000[f]
Gasoline-range Hydrocarbon	8.84[g]	5.18	***331***[g]	<5.00[c]	<5.00	***469***[g]	<5.00	<13.5	14.5[g]	<11.5	<5.00	<5.00	<5.00	51.6[g]	***141***[g]	<5.00	<5.00	<16.8	100/30[f]
PAHs (mg/kg)[h]																			
Naphthalene	3.48	0.191	3.28	1.44	0.218	826	0.713	1.63	4.52	0.421	0.0605	0.0167	0.0725	11.0	22.3	0.0258	0.353	0.535	7.00E+04
Acenaphthylene	11.6	0.346	0.923	3.19	0.896	1.95	1.44	6.74	0.649	<0.115	<0.0100	0.0317	0.0178	0.208	0.217	0.0294	0.239	0.193	NA[i]
Acenaphthene	0.953	0.0577	17.4	<0.200	0.0565	140	<0.200	3.84	3.78	<0.115	<0.0100	0.0676	0.0220	4.05	4.08	0.0179	0.110	0.205	2.10E+05
Fluorene	2.42	<0.0500	14.1	0.592	0.262	115	0.238	4.67	2.97	<0.115	<0.0100	0.0626	0.0107	2.80	3.10	0.0129	0.105	0.193	1.40E+05
Phenanthrene	7.22	0.146	36.5	5.36	3.94	229	1.46	23.7	5.13	0.176	<0.0100	<0.0100	0.0554	3.15	4.73	0.0408	0.702	0.421	NA
Anthracene	5.72	0.457	9.96	1.91	1.32	60.2	0.699	23.3	3.00	0.130	<0.0100	0.0584	0.0185	0.806	1.15	0.0143	0.630	0.273	1.05E+06
Fluoranthene	35.3	0.129	22.3	12.5	10.4	106	4.61	54.7	4.42	0.352	<0.0100	0.0776	0.0469	1.20	1.37	0.0437	2.86	0.501	1.40E+05
Pyrene	23.7	0.169	19.4	11.2	17.3	97.2	3.95	71.8	4.30	0.566	0.0149	0.0759	0.0391	1.26	1.41	0.0430	3.99	0.614	1.05E+05
Benzo(g,h,i)perylene	12.6	0.271	0.982	4.77	4.33	2.30	2.24	14.5	1.16	1.06	0.0123	0.112	0.0171	0.117	<0.200	0.0315	0.998	0.216	NA
cPAHs (mg/kg)[j]																			
Chrysene	17.7	0.115	3.32	7.21	4.70	1.98	3.11	***29.6***	2.25	1.12	0.0526	0.0843	0.0206	0.911	1.10	0.0387	2.76	0.774	18
Benzo(b)fluoranthene	12.7	0.177	1.28	6.44	3.53	7.48	1.99	***18.9***	1.27	0.788	<0.0100	0.0826	0.0320	0.130	<0.200	0.0444	2.35	0.375	18
Benzo(k)fluoranthene	***19.0***	0.120	2.16	7.79	3.72	10.7	3.33	13.4	1.16	0.941	0.0307	0.0868	0.0156	0.494	0.512	0.0279	1.36	0.444	18
Benzo(a)anthracene	15.9	0.0843	4.26	7.32	4.65	***21.2***	2.50	***22.2***	1.38	0.474	<0.0100	0.0376	0.0156	0.221	0.264	0.0301	1.65	0.171	18
Benzo(a)pyrene	***19.5***	0.271	2.13	6.64	5.90	6.95	2.78	***22.7***	1.75	1.14	<0.0100	0.104	0.0320	0.143	<0.200	0.0494	1.66	0.250	18
Indeno(1,2,3-cd)pyrene	12.8	0.226	0.882	4.74	3.47	2.22	2.13	13.0	0.994	0.711	0.0123	0.108	0.0327	0.104	<0.200	0.0444	0.888	0.182	18
Dibenz(a,h)anthracene	5.83	0.0799	0.382	2.17	1.09	1.18	0.966	5.18	0.403	0.329	<0.0100	0.0384	<0.0100	<0.100	<0.200	0.150	0.406	<0.168	18
Total cPAHs (mg/kg)[k]	***28.0***	0.365	3.17	10.2	7.92	11.6	4.19	***31.8***	2.41	1.57	0.00482	0.152	0.0417	0.247	0.0886	0.124	2.47	0.375	18

Notes:
(a) Model Toxics Control Act (MTCA) Method C industrial soil cleanup levels based on CLARC v3.1, dated November 2001 (Ecology 2001b).
(b) Samples were analyzed for diesel- and oil-range hydrocarbons by Ecology Method NWTPH-Dx(extended), and gasoline-range hydrocarbons by Ecology Method NWTPH-G.
(c) "( )" denotes samples were analyzed for diesel- and oil-range hydrocarbons by Ecology Method NWTPH-Dx(extended) with silica gel clean-up.
(d) Results in diesel organics range are primarily due to overlap from heavy oil range hydrocarbons.
(e) "<" denotes analyte was not detected at the indicated laboratory reporting limit.
(f) Total petroleum hydrocarbon (TPH) screening levels based on MTCA Method A industrial soil cleanup levels (Ecology 2001a). For gasoline mixtures without benzene and total ethylbenzene, toluene and xylenes less than 1% of the gasoline mixture the cleanup level is 100 mg/kg. For all other gasoline mixtures, the cleanup level is 30 mg/kg.
(g) Results reported in the gasoline range are primarily due to overlap from diesel range hydrocarbons.
(h) Samples were analyzed for polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270C using selected ion monitoring (SIM) mode.
(i) "NA" denotes no cleanup level established.
(j) Samples were analyzed for carcinogenic polycyclic aromatic hydrocarbons (cPAHs) by EPA Method 8270C-SIM.
(k) Total cPAHs are based on benzo(a)pyrene equivalent values. Individual detected cPAH concentrations were multiplied by benzo(a)pyrene toxicity equivalency factors (TEFs) prior to summation (per WAC 173-340-708). Non-detected cPAH analytes were not included in the summation. TEFs are tabulated on Table 2A-A.

Analytes detected in samples at concentrations exceeding one or more cleanup levels or comparison levels are shown in bold and italics.

mg/kg - milligrams per kilogram
bgs - below ground surface

TABLE 5B

NOVEMBER-DECEMBER 2003 INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - TPH and PAHs
Former Tacoma Metals Facility

	Well Designation and Date Sampled										
Analyte	MW-8(R) 12/2/2003	MW-10 12/3/2003	MW-11 12/2/2003	MW-12 12/2/2003	MW-13 12/2/2003	MW-14 12/1/2003	MW-15 12/1/2003	MW-16 12/1/2003	MTCA Method B Surface Water[a]	NRWQC Human Health Consumption of Organisms[b]	NTR Human Health Consumption of Organisms[c]
TPHs (mg/l)[d]											
Gasoline-range hydrocarbons	32.600	0.0876[e]	0.436	<0.050[f]	0.0935	0.0729[e]	<0.050	<0.050	NA[g]	NA	NA
Diesel-range hydrocarbons	6.12 (3.14)[h][i]	0.806 (0.281)[j]	2.65 (1.51)[j]	1.40 (<0.250)	0.445 (<0.250)	1.11[k] (<0.250)	0.877[k] (<0.250)	0.455[k] (<0.250)	NA	NA	NA
Oil-range hydrocarbons	<0.500 (<0.500)	<0.500 (<0.500)	<0.500 (<0.500)	0.634 (<0.500)	<0.500 (<0.500)	<0.500 (<0.500)	<0.500 (<0.500)	<0.500 (<0.500)	NA	NA	NA
PAHs (µg/l)[l]											
Naphthalene	***8,710***	6.55	89.3	1.07	1.27	10.1	<0.100	<0.100	4,940	NA	NA
1-Methylnaphthalene	775	23.5	131	0.202	3.49	6.65	0.176	<0.100	NA	NA	NA
2-Methylnaphthalene	1,170	25.1	2.58	<0.100	0.147	0.830	<0.100	<0.100	NA	NA	NA
Acenaphthylene	11.1	1.44	1.74	<0.100	<0.100	0.327	<0.100	<0.100	NA	NA	NA
Acenaphthene	278	44.9	147	0.826	3.57	23.1	3.74	0.238	643	990	NA
Fluorene	139	27.8	108	0.223	1.44	10.6	1.62	<0.100	3,460	5,300	14,000
Phenanthrene	126	47.1	131	<0.100	0.773	14.6	<0.100	<0.100	NA	NA	NA
Anthracene	21.3	5.67	21.0	0.634	0.430	2.28	0.381	0.286	25,900	40,000	110,000
Fluoranthene	23.0	9.52	18.2	<0.100	0.253	5.05	0.287	<0.100	90.2	140	370
Pyrene	16.0	6.38	13.6	<0.100	0.147	3.08	0.167	<0.100	2,590	4,000	11,000
Benzo(g,h,i)perylene	0.394	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	NA	NA	NA
cPAHs (µg/l)[m]											
Chrysene	***2.90***	***0.403***	***0.615***	<0.0100	***0.0308***	***0.395***	<0.0100	<0.0100	0.0296	0.018 * / 0.02[n]	0.031
Benzo(b)fluoranthene	***0.841***	***0.109***	***0.209***	<0.0100	0.0175	***0.144***	<0.0100	<0.0100	0.0296	0.018 * / 0.02[n]	0.031
Benzo(k)fluoranthene	***0.885***	***0.0772***	***0.169***	<0.0100	0.0186	***0.118***	<0.0100	<0.0100	0.0296	0.018 * / 0.02[n]	0.031
Benzo(a)anthracene	***3.09***	***0.533***	***0.851***	<0.0100	***0.0439***	***0.446***	<0.0100	<0.0100	0.0296	0.018 * / 0.02[n]	0.031
Benzo(a)pyrene	***1.11***	***0.110***	***0.226***	<0.0100	<0.0100	***0.148***	<0.0100	<0.0100	0.0296	0.018 * / 0.02[n]	0.031
Indeno(1,2,3-cd)pyrene	***0.363***	***0.0292***	***0.119***	<0.0100	<0.0100	***0.109***	<0.0100	<0.0100	0.0296	0.018 * / 0.02[n]	0.031
Dibenz(a,h)anthracene	***0.186***	0.0118	***0.0661***	<0.0100	<0.0100	***0.0705***	<0.0100	<0.0100	0.0296	0.018 * / 0.02[n]	0.031
Total cPAHs[o]	***1.73***	***0.194***	***0.393***	<0.0100	0.00830	***0.262***	<0.0100	<0.0100	0.0296	0.018 * / 0.02[n]	0.031

TABLE 5B

NOVEMBER-DECEMBER 2003 INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - TPH and PAHs
Former Tacoma Metals Facility

Analyte	Well Designation and Date Sampled								MTCA Method B Surface Water[a]	NRWQC Human Health Consumption of Organisms[b]	NTR Human Health Consumption of Organisms[c]
	MW-17 12/1/2003	MW-18 12/3/2003	MW-19 12/2/2003	MW-20 12/2/2003	MW-21 12/3/2003	MW-22 12/3/2003	MW-22D[p] 12/3/2003				
TPHs (mg/l)[d]											
Gasoline-range hydrocarbons	<0.050[f]	16.100[e]	<0.050	1.560	1.990[e]	7.150[e]	7.010[e]		NA[g]	NA	NA
Diesel-range hydrocarbons	0.311[k] (<0.250)	5.09 (2.11)[i]	0.433 (<0.250)	2.34 (0.879)[i]	3.84 (1.57)[i]	4.04 (1.86)[i]	4.04 (1.84)[i]		NA	NA	NA
Oil-range hydrocarbons	<0.500 (<0.500)	0.609 (<0.500)	<0.500 (<0.500)	<0.500 (<0.500)	0.600 (<0.500)	<0.500 (<0.500)	<0.500 (<0.500)		NA	NA	NA
PAHs (µg/l)[l]											
Naphthalene	0.346	***5,970***	<0.100	13.6	678	1,940	2,170		4,940	NA	NA
1-Methylnaphthalene	<0.100	729	0.120	213	483	732	729		NA	NA	NA
2-Methylnaphthalene	<0.100	2.73	<0.100	164	174	904	921		NA	NA	NA
Acenaphthylene	<0.100	2.96	<0.100	<0.100	2.54	3.62	3.77		NA	NA	NA
Acenaphthene	0.437	244	0.417	145	206	249	240		643	990	NA
Fluorene	<0.100	83.7	<0.100	68.3	77.5	85.4	77.3		3,460	5,300	14,000
Phenanthrene	<0.100	121	<0.100	62.9	139	125	116		NA	NA	NA
Anthracene	0.136	11.1	0.136	3.49	18.1	15.2	14.9		25,900	40,000	110,000
Fluoranthene	<0.100	5.81	<0.100	2.85	25.5	12.0	11.5		90.2	140	370
Pyrene	<0.100	3.74	<0.100	1.30	17.7	7.65	7.42		2,590	4,000	11,000
Benzo(g,h,i)perylene	<0.100	<1.00	<0.100	<0.100	0.462	<0.100	<1.00		NA	NA	NA
cPAHs (µg/l)[m]											
Chrysene	0.0157	***0.162***	<0.0100	***0.0255***	***2.04***	***0.443***	***0.410***		0.0296	0.018 * / 0.02[n]	0.031
Benzo(b)fluoranthene	<0.0100	<0.100	<0.0100	<0.0100	***1.16***	***0.0863***	***0.103***		0.0296	0.018 * / 0.02[n]	0.031
Benzo(k)fluoranthene	<0.0100	<0.100	<0.0100	<0.0100	***0.999***	***0.0996***	<0.100		0.0296	0.018 * / 0.02[n]	0.031
Benzo(a)anthracene	***0.0297***	***0.192***	<0.0100	***0.0415***	***2.52***	***0.521***	***0.498***		0.0296	0.018 * / 0.02[n]	0.031
Benzo(a)pyrene	<0.0100	<0.100	<0.0100	<0.0100	***1.25***	***0.117***	***0.134***		0.0296	0.018 * / 0.02[n]	0.031
Indeno(1,2,3-cd)pyrene	<0.0100	<0.100	<0.0100	<0.0100	***0.424***	***0.0303***	<0.100		0.0296	0.018 * / 0.02[n]	0.031
Dibenz(a,h)anthracene	<0.0100	<0.100	<0.0100	<0.0100	***0.231***	0.0123	<0.100		0.0296	0.018 * / 0.02[n]	0.031
Total cPAHs[o]	0.00313	***0.0208***	<0.0100	0.00441	***1.87***	***0.0200***	0.0198		0.0296	0.018 * / 0.02[n]	0.031

Notes:

(a) Model Toxics Control Act (MTCA) Method B surface water cleanup level based on CLARC v3.1, dated November 2001 (Ecology 2001b).
(b) National Recommended Water Quality Criteria (NRWQC) for consumption of organisms only (EPA 2002) pursuant to Section 304(a)(1) of the Clean Water Act and in accordance with Washington Administrative Code (WAC) 173-201A at a risk level of $1x10^{-6}$.
(c) National Toxic Rule (NTR) for consumption of organisms only based on 40 CFR 131.36 at a risk level of $1x10^{-6}$.
(d) Samples were analyzed for total petroleum hydrocarbons (TPHs) by Ecology Methods NWTPH-G and NWTPH-Dx(extended).
(e) Chromatogram for this sample does not resemble a typical gasoline standard pattern.
(f) "<" Denotes analyte was not detected at the indicated laboratory reporting limit.
(g) "NA" denotes no cleanup level established.
(h) "( )" Denotes samples that were analyzed for total petroleum hydrocarbons by Ecology Method NWTPH-Dx with Acid/Silica Gel Clean-up.
(i) Results in diesel organics range are primarily due to overlap from gasoline oraganics range.
(j) Hydrocarbon concentration result in this sample is partially due to one or more individual peaks eluting in the diesel/heavy oil range.
(k) Sample chromatogram pattern does not resemble the fuel standard used for quantitation.
(l) Samples were analyzed for polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270C using selected ion monitoring (SIM) mode.
(m) Samples were analyzed for carcinogenic polycyclic aromatic hydrocarbons (cPAHs) by EPA Method 8270C-SIM.
(n) Practical quantitation limit (PQL) (Ecology 2001b).
(o) Total cPAHs are based on benzo(a)pyrene equivalent values. Individual detected cPAH concentrations were multiplied by benzo(a)pyrene toxicity equivalency factors (TEFs) prior to summation (per WAC 173-340-708). Non-detected cPAH analytes were not included in the summation. TEFs are tabulated on Table 2A-A.
(p) Duplicate sample of MW-22.

* Denotes PQL is higher than MTCA cleanup levels and/or applicable, relevant, and appropriate requirements (ARARs).

Analytes detected in samples at concentrations exceeding one or more of the cleanup levels or comparison values are shown in bold and italics. Where appropriate, surface water standards have been adjusted upward to the PQL [WAC 173-340-730(5)(c)].

mg/l - milligrams per liter
µg/l - micrograms per liter

TABLE 5C

NOVEMBER-DECEMBER 2003 INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DISSOLVED PAHs[a]
Former Tacoma Metals Facility

Analyte	Well Designation and Date Sampled								MTCA Method B Surface Water[b]	NRWQC Human Health Consumption of Organisms[c]	NTR Human Health Consumption of Organisms[d]
	MW-8(R) 12/2/2003	MW-10 12/3/2003	MW-11 12/2/2003	MW-12 12/2/2003	MW-13 12/2/2003	MW-14 12/1/2003	MW-15 12/1/2003	MW-16 12/1/2003			
PAHs (µg/l)[e]											
Naphthalene	***6,770***	6.68	41.7	1.00	1.01	4.35	0.186	<0.100[f]	4,940	NA[g]	NA
1-Methylnaphthalene	498	10.2	43.1	0.347	2.13	2.28	<0.100	<0.100	NA	NA	NA
2-Methylnaphthalene	709	2.58	44.7	<0.100	0.128	<0.100	<0.100	<0.100	NA	NA	NA
Acenaphthylene	12.9	0.214	0.564	<0.100	<0.100	<0.100	<0.100	<0.100	NA	NA	NA
Acenaphthene	177	14.6	35.9	0.544	1.71	4.75	0.130	<0.100	643	990	NA
Fluorene	80.8	0.695	3.15	0.118	<0.100	<0.100	<0.100	<0.100	3,460	5,300	14,000
Phenanthrene	61.5	1.50	8.09	0.364	<0.100	0.111	<0.100	<0.100	NA	NA	NA
Anthracene	15.9	1.45	6.07	0.637	0.260	0.676	0.290	0.321	25,900	40,000	110,000
Fluoranthene	16.0	0.747	4.80	0.181	<0.100	0.184	<0.100	<0.100	90.2	140	370
Pyrene	11.1	0.561	3.81	0.110	<0.100	0.126	<0.100	<0.100	2,590	4,000	11,000
Benzo(g,h,i)perylene	0.114	<0.100	0.213	<0.100	<0.100	<0.100	<0.100	<0.100	NA	NA	NA
cPAHs (µg/l)[h]											
Chrysene	***0.646***	***0.114***	***0.925***	***0.0240***	<0.0100	***0.0536***	<0.0100	<0.0100	0.0296	0.018 * / 0.02[i]	0.031
Benzo(b)fluoranthene	***0.277***	***0.0753***	***0.387***	<0.0100	<0.0100	0.0154	<0.0100	<0.0100	0.0296	0.018 * / 0.02[i]	0.031
Benzo(k)fluoranthene	***0.219***	***0.0398***	***0.347***	<0.0100	<0.0100	0.0161	<0.0100	<0.0100	0.0296	0.018 * / 0.02[i]	0.031
Benzo(a)anthracene	***0.710***	***0.164***	***0.892***	***0.0389***	<0.0100	***0.0624***	<0.0100	<0.0100	0.0296	0.018 * / 0.02[i]	0.031
Benzo(a)pyrene	***0.292***	***0.0787***	***0.442***	<0.0100	<0.0100	0.0185	<0.0100	<0.0100	0.0296	0.018 * / 0.02[i]	0.031
Indeno(1,2,3-cd)pyrene	***0.126***	***0.0320***	***0.185***	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.0296	0.018 * / 0.02[i]	0.031
Dibenz(a,h)anthracene	***0.0635***	0.0168	***0.128***	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.0296	0.018 * / 0.02[i]	0.031
Total cPAHs[j]	***0.457***	***0.118***	***0.684***	0.00413	<0.0100	***0.0253***	<0.0100	<0.0100	0.0296	0.018 * / 0.02[i]	0.031

TABLE 5C

NOVEMBER-DECEMBER 2003 INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DISSOLVED PAHs[a]
Former Tacoma Metals Facility

Analyte	Well Designation and Date Sampled								MTCA Method B Surface Water[b]	NRWQC Human Health Consumption of Organisms[c]	NTR Human Health Consumption of Organisms[d]
	MW-17 12/1/2003	MW-18 12/3/2003	MW-19 12/2/2003	MW-20 12/2/2003	MW-21 12/3/2003	MW-22 12/3/2003	MW-22D[k] 12/3/2003				
PAHs (µg/l)[e]											
Naphthalene	0.195	***6,690***	0.270	3.76	241	752	1,970		4,940	NA[g]	NA
1-Methylnaphthalene	0.113	649	<0.100[f]	37.3	51.8	120	682		NA	NA	NA
2-Methylnaphthalene	<0.100	692	<0.100	9.06	5.87	28.0	845		NA	NA	NA
Acenaphthylene	<0.100	1.50	<0.100	0.106	0.425	0.579	3.02		NA	NA	NA
Acenaphthene	1.43	142	<0.100	18.1	29.9	33.4	184		643	990	NA
Fluorene	<0.100	9.86	<0.100	0.103	0.651	0.843	48.1		3,460	5,300	14,000
Phenanthrene	<0.100	<1.00	<0.100	0.231	1.99	1.81	5.90		NA	NA	NA
Anthracene	0.132	<1.00	0.141	0.107	2.24	1.38	1.74		25,900	40,000	110,000
Fluoranthene	<0.100	<1.00	<0.100	<0.100	1.10	0.863	0.764		90.2	140	370
Pyrene	<0.100	<1.00	<0.100	<0.100	0.790	0.622	0.581		2,590	4,000	11,000
Benzo(g,h,i)perylene	<0.100	<1.00	<0.100	<0.100	<0.100	<0.100	<0.100		NA	NA	NA
cPAHs (µg/l)[h]											
Chrysene	***0.0207***	<0.100	<0.0100	<0.0100	***0.174***	***0.121***	***0.105***		0.0296	0.018 * / 0.02[i]	0.031
Benzo(b)fluoranthene	0.0163	<0.100	<0.0100	<0.0100	***0.0650***	***0.0562***	***0.0489***		0.0296	0.018 * / 0.02[i]	0.031
Benzo(k)fluoranthene	0.0140	<0.100	<0.0100	<0.0100	***0.0708***	***0.0421***	***0.0212***		0.0296	0.018 * / 0.02[i]	0.031
Benzo(a)anthracene	***0.0335***	<0.100	<0.0100	<0.0100	***0.222***	***0.144***	***0.190***		0.0296	0.018 * / 0.02[i]	0.031
Benzo(a)pyrene	<0.0100	<0.100	<0.0100	<0.0100	***0.0891***	***0.0665***	***0.0536***		0.0296	0.018 * / 0.02[i]	0.031
Indeno(1,2,3-cd)pyrene	<0.0100	<0.100	<0.0100	<0.0100	***0.0231***	0.0169	0.0149		0.0296	0.018 * / 0.02[i]	0.031
Dibenz(a,h)anthracene	<0.0100	<0.100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100		0.0296	0.018 * / 0.02[i]	0.031
Total cPAHs[j]	0.00659	<0.100	<0.0100	<0.0100	***0.129***	***0.0936***	***0.0822***		0.0296	0.018 * / 0.02[i]	0.031

Notes:

(a) Samples field filtered using a 0.45 micron cellulose acetate filter.
(b) Model Toxics Control Act (MTCA) Method B surface water cleanup level based on CLARC v3.1, dated November 2001 (Ecology 2001b).
(c) National Recommended Water Quality Criteria (NRWQC) for consumption of organisms only (EPA 2002) pursuant to Section 304(a)(1) of the Clean Water Act and in accordance with Washington Administrative Code (WAC) 173-201A at a risk level of $1x10^{-6}$.
(d) National Toxic Rule (NTR) for consumption of organisms only based on 40 CFR 131.36 at a risk level of $1x10^{-6}$.
(e) Samples were analyzed for polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270C using selected ion monitoring (SIM) mode.
(f) "<" denotes analyte was not detected at the indicated laboratory reporting limit.
(g) "NA" denotes no cleanup level established.
(h) Samples were analyzed for carcinogenic polycyclic aromatic hydrocarbons (cPAHs) by EPA Method 8270C-SIM.
(i) Practical quantitation limit (PQL) (Ecology 2001b).
(j) Total cPAHs are based on benzo(a)pyrene equivalent values. Individual detected cPAH concentrations were multiplied by benzo(a)pyrene toxicity equivalency factors (TEFs) prior to summation (per WAC 173-340-708). Non-detected cPAH analytes were not included in the summation. TEFs are tabulated on Table 2A-A.
(k) Duplicate sample of MW-22.

* Denotes PQL is higher than MTCA cleanup levels and/or applicable, relevant, and appropriate requirements (ARARs).

Analytes detected in samples at concentrations exceeding one or more of the cleanup levels or comparison values are shown in bold and italics. Where appropriate, surface water standards have been adjusted upward to the PQL [WAC 173-340-730(5)(c)].

µg/l - micrograms per liter

TABLE 5D

DECEMBER 2003
GROUNDWATER ANALYTICAL RESULTS - TOTAL METALS (RCRA 8 + COPPER)
Former Tacoma Metals Facility

Sample Designation	Sample Date	Metals (µg/l)[a]								
		Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver
MW-1	12/29/2003	0.69	20.7	<1[b]	5.05	1.41B1	0.51J	***0.179J***	2.24	<1
MW-2	12/29/2003	<1	11.8	<1	0.96J	0.76JB1	0.64J	***0.149J***	3.91	<1
MW-4(R)	12/29/2003	1.22	20.5	<1	2.5	2.25B1	1.34	***0.102J***	2.31	<1
MW-5	12/29/2003	<1	21.2	<1	1.72	3.16B1	2.44	***0.149J***	2.22	<1
MW-6	12/29/2003	***5.33***	56.8	<1	2.14	2.69B1	1.81	<0.2	3.67	<1
MW-7	12/29/2003	<1	35.6	<1	0.895J	1.88B1	0.91J	<0.2	1.02J	<1
MW-8(R)	12/26/2003	<1	32.1	<1	3.85	1.89	0.515J	***0.215***	<2	<1
MW-9	12/29/2003	***5.5***	140	<1	1.95	0.83JB1	<1	***0.258***	***10.5***	<1
MW-10	12/23/2003	0.78J	7.44	<1	2.07	7.76	3.05	<0.2	<2	<1
MW-11	12/26/2003	<1	31.5	<1	3.2	28.9	***40.8***	<0.2	<2	<1
MW-12	12/22/2003	0.665J	20.5	<1	<1	1.38	0.605J	<0.2	1.52J	<1
MW-13	12/22/2003	3.17	13.5	<1	6.9	4.94	1.26	<0.2	2.54	<1
MW-14	12/23/2003	<1	8.77	<1	3.99	2	0.785J	<0.2	1.52J	<1
MW-15	12/29/2003	1.59	31.1	<1	0.815J	7.23B1	1.95	<0.2	<2	<1
MW-16	12/29/2003	1.05	8.14	<1	2.48	0.925JB1	0.665J	<0.2	<2	<1
MW-17	12/23/2003	<1	23.9	<1	2.24	3.06	0.65J	<0.2	<2	<1
MW-18	12/22/2003	1.39	25.5	<1	2.73	0.88J	<1	<0.2	2	<1
MW-19 (MW-200)[c]	12/29/2003	<1 (<1)	23.5 (22.1)	<1 (<1)	5.42 (6.12)	14.1B2 (14.5B2)	***8.43 (8.7)***	***0.16J*** (<0.2)	<2 (1.27J)	<1 (<1)
MW-20	12/22/2003	3.65	7.96	<1	14.2	0.73J	<1	<0.2	***10.1***	<1
MW-21	12/23/2003	1.03	29.5	<1	1.31	3.11	1.61	<0.2	<2	<1
MW-22	12/23/2003	1.61	19.6	<1	1.21	2.36	0.91J	<0.2	<2	<1
MTCA Method B Surface Water Cleanup Level[d]		0.0982 ** / 5[e]	NA[f]	20.3	NA	2,660	NA	NA	2,700	25,900
NRWQC - Aquatic Organisms Chronic Freshwater Criterion[g]		150	NA	0.37 ***	119.94 ***	14.8 ***	4.74 ***	0.77	5.0	NA
NRWQC - Human Health Consumption of Organisms[h]		0.14 ** / 5[e]	NA	NA	NA	NA	NA	NA	4,200	NA
NTR - Aquatic Organisms Chronic Freshwater Criterion[i]		190	NA	1.59 ***	288.07 ***	18.76 ***	4.74 ***	0.012 * / 0.1[j]	5	NA
NTR - Human Health Consumption of Organisms[k]		0.14 ** / 5[e]	NA	NA	NA	NA	NA	0.15	NA	NA

TABLE 5D

DECEMBER 2003
GROUNDWATER ANALYTICAL RESULTS - TOTAL METALS (RCRA 8 + COPPER)
Former Tacoma Metals Facility

Notes:

(a) Samples were analyzed for metals by EPA Methods 6020/7470 series.
(b) "<" denotes analyte was not detected at the indicated laboratory reporting limit.
(c) "( )" denotes duplicate sample.
(d) Model Toxics Control Act (MTCA) Method B surface water cleanup levels based on CLARC v3.1, dated November 2001 (Ecology 2001b).
(e) Natural background concentration (Ecology 2001b).
(f) "NA" denotes no cleanup level established.
(g) National Recommended Water Quality Criteria (NRWQC) chronic freshwater criterion (EPA 2002) pursuant to Section 304(a)(1) of the Clean Water Act and in accordance with Washington Administrative Code (WAC) 173-201A at a risk level of $1x10^{-6}$.
(h) NRWQC for consumption of organisms only (EPA 2002) pursuant to Section 304(a)(1) of the Clean Water Act and in accordance with WAC 173-201A at a risk level of $1x10^{-6}$.
(i) National Toxics Rule (NTR) chronic freshwater criterion based on 40 CFR 131.36 at a risk level of $1x10^{-6}$.
(j) Practical quantitation limit (PQL) (Ecology 2001b).
(k) NTR for consumption of organisms only based on 40 CFR 131.36 at a risk level of $1x10^{-6}$.

* Denotes PQL is higher than MTCA cleanup levels and/or applicable, relevant, and appropriate requirements (ARARs).
** Denotes natural background concentration is higher than MTCA cleanup levels and/or ARARs.
*** Freshwater criterion is expressed as a function of groundwater hardness. Average groundwater hardness at the site is 180 mg/l.

Qualifiers:

J: Estimated concentration above the method reporting limit (MRL) but below the PQL.
B1: Compound also detected in method blank. Analyte concentration was determined not to be significantly higher than associated method blank (i.e., <10 times the concentration reported in the blank).
B2: Compound also detected in method blank. Analyte concentration was determined to be significantly higher than associated method blank (i.e., >10 times the concentration reported in the blank).

Analytes detected in samples at concentrations exceeding one or more of the cleanup levels or comparison values are shown in bold and italics. Where appropriate, surface water standards have been adjusted upward to the natural background concentration and/or PQL [WAC 173-340-730(5)(c)].

µg/l - micrograms per liter
mg/l - milligrams per liter

TABLE 5E

DECEMBER 2003

GROUNDWATER ANALYTICAL RESULTS - DISSOLVED METALS (RCRA 8 + COPPER)[a]

Former Tacoma Metals Facility

Sample Designation	Sample Date	Metals (µg/l)[b]								
		Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver
MW-1	12/29/2003	0.945J	19.6	<1[c]	24.8	<1	<1	***0.195J***	2.38	<1
MW-2	12/29/2003	1.79	12.2	<1	6.77	<1	0.68J	***0.136J***	5	<1
MW-4(R)	12/29/2003	0.9J	20.6	<1	26.2	1.48	0.955J	<0.2	2.24	<1
MW-5	12/29/2003	0.58	21.2	<1	32.4	<1	<1	<0.2	1.2J	<1
MW-6	12/29/2003	4.7	54.8	<1	30.4	<1	<1	<0.2	3.28	<1
MW-7	12/29/2003	<1	31.9	<1	23.4	<1	<1	***0.182J***	<2	<1
MW-8(R)	12/26/2003	2.18	27.4	<1	15.7	<1	<1	<0.2	<2	<1
MW-9	12/29/2003	3.49	123	<1	30.7	0.755J	0.6J	<0.2	***11.5***	<1
MW-10	12/23/2003	<1	6.58	<1	9.53	0.98J	0.545J	<0.2	<2	<1
MW-11	12/26/2003	1.11	29.1	<1	14	1.52	1.93	<0.2	<2	<1
MW-12	12/22/2003	0.605J	19.6	<1	10.3	<1	0.505J	<0.2	<2	<1
MW-13	12/22/2003	2.13	13	<1	15.3	0.89J	<1	<0.2	<2	<1
MW-14	12/23/2003	0.6J	8.03	<1	15.6	<1	<1	***0.182J***	1.47J	<1
MW-15	12/29/2003	0.845J	28.8	<1	20.8	1.04	0.93J	<0.2	1.67J	<1
MW-16	12/29/2003	0.605J	8.51	<1	22.7	<1	0.7J	***0.297***	1.3J	<1
MW-17	12/23/2003	<1	23.4	<1	13.1	<1	<1	<0.2	<2	<1
MW-18	12/22/2003	1.59	24.3	<1	19.3	<1	<1	<0.2	<2	<1
MW-19 (MW-200)[d]	12/29/2003	1.25 (1.3)	21.4 (20.3)	<1 (<1)	25.3 (23.9)	<1.23 (<1.19)	0.95J (0.805J)	***0.283 (0.451)***	1.76J (1.34J)	<1 (<1)
MW-20	12/22/2003	2.85	8.84	<1	26.4	<1	<1	<0.2	6.11	<1
MW-21	12/23/2003	<1	28.9	<1	12.4	<1	<1	<0.2	<2	<1
MW-22	12/23/2003	<1	18.8	<1	15.5	<1	<1	***0.191J***	<2	<1
MTCA Method B Surface Water Cleanup Level[e]		0.0982 ** / 5[f]	NA[g]	20.3	NA	2,660	NA	NA	2,700	25,900
NRWQC - Aquatic Organisms Chronic Freshwater Criterion[h]		150	NA	0.37 ***	119.94 ***	14.8 ***	4.74 ***	0.77	5.0	NA
NRWQC - Human Health Consumption of Organisms[i]		0.14 ** / 5[f]	NA	NA	NA	NA	NA	NA	4,200	NA
NTR - Aquatic Organisms Chronic Freshwater Criterion[j]		190	NA	1.59 ***	288.07 ***	18.76 ***	4.74 ***	0.012 * / 0.1[k]	5	NA
NTR - Human Health Consumption of Organisms[l]		0.14 ** / 5[f]	NA	NA	NA	NA	NA	0.15	NA	NA

TABLE 5E

DECEMBER 2003

GROUNDWATER ANALYTICAL RESULTS - DISSOLVED METALS (RCRA 8 + COPPER)[a]

Former Tacoma Metals Facility

Notes:

(a) Samples were field filtered using a 0.45 micron filter.
(b) Samples were analyzed for metals by EPA Methods 6020/7470 series.
(c) "<" denotes analyte was not detected at the indicated laboratory reporting limit.
(d) "( )" denotes duplicate sample.
(e) Model Toxics Control Act (MTCA) Method B surface water cleanup levels based on CLARC v3.1, dated November 2001 (Ecology 2001b).
(f) Natural background concentration (Ecology 2001b).
(g) "NA" denotes no cleanup level established.
(h) National Recommended Water Quality Criteria (NRWQC) chronic freshwater criterion (EPA 2002) pursuant to Section 304(a)(1) of the Clean Water Act and in accordance with Washington Administrative Code (WAC) 173-201A at a risk level of $1x10^{-6}$.
(i) NRWQC for consumption of organisms only (EPA 2002) pursuant to Section 304(a)(1) of the Clean Water Act and in accordance with WAC 173-201A at a risk level of $1x10^{-6}$.
(j) National Toxics Rule (NTR) chronic freshwater criterion based on 40 CFR 131.36 at a risk level of $1x10^{-6}$.
(k) Practical quantitation limit (PQL) (Ecology 2001b).
(l) NTR for consumption of organisms only based on 40 CFR 131.36 at a risk level of $1x10^{-6}$.

* Denotes PQL is higher than MTCA cleanup levels and/or applicable, relevant, and appropriate requirements (ARARs).
** Denotes natural background concentration is higher than MTCA cleanup levels and/or ARARs.
*** Freshwater criterion is expressed as a function of groundwater hardness. Average groundwater hardness at the site is 180 mg/l.

Qualifiers:
J: Estimated concentration above the method reporting limit (MRL) but below the PQL.

Analytes detected in samples at concentrations exceeding one or more of the cleanup levels or comparison values are shown in bold and italics. Where appropriate, surface water standards have been adjusted upward to the natural background concentration and/or PQL [WAC 173-340-730(5)(c)].

µg/l - micrograms per liter
mg/l - milligrams per liter

TABLE 6A

FEBRUARY-MARCH 2003 INVESTIGATION
SOIL ANALYTICAL RESULTS
Former Tacoma Metals Facility

	Sample Designation (Well ID - feet bgs)																	Sample Designation (Boring ID - ft.bgs)			MTCA Method C
Analyte	**MW-14 14-14.5**	**MW-14 22-22.3**	**MW-14 23.8-24**	**MW-14 26-26.5**	**MW-15 11-11.5**	**MW-15 25-26**	**MW-16 7.5-8**	**MW-16 25-26**	**MW-17 12-16**	**MW-17 20.5-22**	**MW-18 11.5-12**	**MW-18 21.5-21.9**	**MW-19 16-18**	**MW-19 23.5-24**	**MW-20 24-24.3**	**MW-21 20.5-21.4**	**MW-21 22.5-23.3**	**B-6 23-23.2**	**B-8 23.5-24**	**B-8 26.5-27**	**Industrial Soil Cleanup Level [a]**
PAHs (mg/kg)[b]																					
Naphthalene	0.980	54.1	25.8	1.03	0.695	<0.0100 [c]	40.1	<0.0100	0.375	<0.0100	326	1,750	0.0798	<0.0100	0.631	100	0.664	1,850	103	0.432	7.00E+04
1-Methylnaphthalene	2.10	36.3	14.5	5.06	0.357	<0.0100	7.26	<0.0100	0.156	<0.0100	73.3	517	0.0819	0.184	0.694	106	1.23	645	262	0.0786	NA [d]
2-Methylnaphthalene	1.85	12.4	3.88	0.746	0.293	<0.0100	9.95	<0.0100	0.0790	<0.0100	25.9	759	0.0787	<0.0100	0.288	35.5	0.389	491	8.23	0.0761	NA
Acenaphthylene	0.137	0.642	1.37	<0.0100	0.0659	<0.0100	0.297	<0.0100	0.0571	<0.0100	<0.0299	16.2	<0.0100	<0.0100	0.0186	1.41	0.0380	5.64	3.13	<0.0100	NA
Acenaphthene	0.224	60.5	18.4	1.31	0.403	<0.0100	2.03	<0.0100	0.371	<0.0100	68.9	22.9	0.0539	0.462	0.433	456	0.788	596	281	0.581	2.10E+05
Fluorene	0.380	64.4	31.6	0.676	0.258	<0.0100	1.79	<0.0100	0.306	<0.0100	90.4	349	0.0725	0.232	0.238	639	0.876	455	239	0.617	1.40E+05
Phenanthrene	0.612	179	72.4	0.322	0.585	<0.0100	5.45	<0.0100	0.222	0.0137	240	976	0.194	0.123	0.226	1,970	2.43	1,590	822	1.98	NA
Anthracene	0.102	20.0	11.3	0.0324	0.128	<0.0100	1.61	<0.0100	0.254	<0.0100	107	146	0.0342	0.0267	0.0468	283	1.05	229	49.6	0.222	1.05E+06
Fluoranthene	0.622	61.5	25.1	0.0540	0.206	<0.0100	3.66	0.0333	0.997	0.0359	110	371	0.0591	0.0117	0.0678	978	1.30	570	277	0.386	1.40E+05
Pyrene	0.922	39.3	14.8	0.0332	0.268	<0.0100	4.19	<0.0100	0.995	<0.0100	79.6	308	<0.0100	<0.0100	0.0380	884	1.08	427	190	0.256	1.05E+05
Benzo(g,h,i)perylene	0.433	0.936	1.17	<0.0100	<0.0304	<0.0100	0.521	<0.0100	0.0588	<0.0100	1.95	5.50	<0.0100	<0.0100	<0.0100	26.6	0.0777	5.72	2.88	<0.0100	NA
cPAHs (mg/kg)[e]																					
Chrysene	0.578	8.62	3.41	<0.0100	0.0719	<0.0100	1.56	<0.0100	0.111	<0.0100	***27.9***	***75.4***	<0.0100	<0.0100	<0.0100	***130***	0.357	***111***	***52.1***	0.0107	18
Benzo(b)fluoranthene	0.507	3.41	0.783	<0.0100	<0.0304	<0.0100	0.864	<0.0100	0.0185	<0.0100	6.37	***43.8***	<0.0100	<0.0100	<0.0100	***59.0***	0.129	***30.7***	***21.0***	<0.0100	18
Benzo(k)fluoranthene	0.634	2.44	0.940	<0.0100	0.0319	<0.0100	1.13	<0.0100	0.0387	<0.0100	7.96	***42.3***	<0.0100	<0.0100	<0.0100	***60.5***	0.162	***65.8***	***24.8***	<0.0100	18
Benzo(a)anthracene	0.444	9.43	3.92	<0.0100	0.0799	<0.0100	1.64	<0.0100	0.146	<0.0100	***27.5***	***83.2***	<0.0100	0.0125	0.0323	***170***	0.312	***128***	***50.5***	0.0165	18
Benzo(a)pyrene	0.620	3.25	1.88	<0.0100	0.0739	<0.0100	1.14	<0.0100	0.0874	<0.0100	17.9	***42.8***	<0.0100	<0.0100	<0.0100	***59.5***	0.189	***65.8***	***21.1***	<0.0100	18
Indeno(1,2,3-cd)pyrene	0.451	0.925	0.862	<0.0100	<0.0304	<0.0100	0.513	<0.0100	0.0454	<0.0100	2.10	5.25	<0.0100	<0.0100	<0.0100	***24.4***	0.0684	***18.7***	7.91	<0.0100	18
Dibenz(a,h)anthracene	<0.0222	0.268	<0.500	<0.0100	<0.0304	<0.0100	<0.0586	<0.0100	<0.0148	<0.0100	1.39	3.54	<0.0100	<0.0100	<0.0100	4.34	<0.0100	8.28	3.86	<0.0100	18
Total cPAHs (mg/kg)[f]	0.829	5.06	2.56	<0.0100	0.0858	<0.0100	1.57	<0.0100	0.113	<0.0100	***23.1***	***62.4***	<0.0100	0.00125	0.00323	***93.9***	0.260	***94.5***	***33.6***	0.00176	18

Notes:

(a) Model Toxics Control Act (MTCA) Method C industrial soil cleanup levels based on CLARC v3.1, dated November 2001 (Ecology 2001b).

(b) Samples were analyzed for polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270C using selected ion monitoring (SIM) mode.

(c) "<" denotes analyte was not detected at the indicated laboratory reporting limit.

(d) "NA" denotes no cleanup level established.

(e) Samples were analyzed for carcinogenic polycyclic aromatic hydrocarbons (cPAHs) by EPA Method 8270C-SIM.

(f) Total cPAHs are based on benzo(a)pyrene equivalent values. Individual detected cPAH concentrations were multiplied by benzo(a)pyrene toxicity equivalency factors (TEFs) prior to summation (per WAC 173-340-708). Non-detected cPAH analytes were not included in the summation. TEFs are tabulated on Table 2A-A.

Analytes detected in samples at concentrations exceeding one or more cleanup levels or comparison levels are shown in bold and italics.

mg/kg - milligrams per kilogram
bgs - below ground surface

TABLE 6B

FEBRUARY-MARCH 2003 INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS
Former Tacoma Metals Facility

Analyte	Well Designation and Date Sampled									MTCA Method B Surface Water[b]	NRWQC Human Health Consumption of Organisms[c]	NTR Human Health Consumption of Organisms[d]
	MW-14 3/11/2003	MW-15 3/11/2003	MW-16 3/10/2003	MW-17 3/10/2003	MW-18 3/10/2003	MW-19 3/10/2003	MW-20 3/10/2003	MW-201[a] 3/10/2003	MW-21 3/11/2003			
TPHs (mg/l)[e]												
Gasoline-range hydrocarbons	0.253[f]	<0.050[g]	<0.050	<0.050	23.8	<0.050	1.8	1.83	2.91[f]	NA[h]	NA	NA
Diesel-range hydrocarbons	2.06	0.884	3.10	0.810	7.43	0.965	3.05	3.35	3.65	NA	NA	NA
Oil-range hydrocarbons	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	NA	NA	NA
VOCs (µg/l)[i] Only those VOCs detected are listed. See laboratory analytical reports for a complete list of VOCs analyzed.												
Naphthalene	120	<0.500	1.26	1.19	***10,600***	<0.500	31.7	31.6	2,040	4,940	NA	NA
1,2,4-Trimethylbenzene	<10.0	<0.200	<0.200	<0.200	353	<0.200	6.55	6.72	<100	NA	NA	NA
1,3,5-Trimethylbenzene	<10.0	<0.500	<0.500	<0.500	114	<0.500	<1.00	<1.00	<100	NA	NA	NA
Benzene	<10.0	<0.200	<0.200	<0.200	<100	<0.200	3.29	3.69	<100	22.7	51	71
Toluene	<10.0	<0.200	<0.200	0.448	<100	<0.200	<1.00	<1.00	<100	48,500	200,000	200,000
Ethylbenzene	<10.0	<0.200	<0.200	<0.200	246	<0.200	11.8	14.0	<100	6,910	29,000	29,000
m,p-Xylene	<10.0	<0.500	<0.500	<0.500	325	<0.500	12.2	12.7	<100	NA	NA	NA
o-Xylene	<10.0	<0.250	<0.250	<0.250	175	<0.250	3.97	4.19	<100	NA	NA	NA
Isopropylbenzene	<10.0	<0.500	<0.500	<0.500	<100	<0.500	15.4	15.5	<100	NA	NA	NA
n-Propylbenzene	<10.0	<0.500	<0.500	<0.500	<100	<0.500	3.96	4.00	<100	NA	NA	NA
p-Isopropyltoluene	<10.0	5.65	<0.200	5.70	<100	1.89	6.73	6.91	<100	NA	NA	NA
SVOCs (µg/l)[j] Only those SVOCs detected are listed. See laboratory analytical reports for a complete list of SVOCs analyzed.												
2-Methylnaphthalene	<10.0	<10.0	<10.0	<10.0	1,240E	<10.0	218	258	167	NA	NA	NA
2-Methylphenol	<10.0	<10.0	<10.0	<10.0	15.1	<10.0	<10.0	<10.0	<10.0	NA	NA	NA
2,4-Dimethylphenol	<10.0	<10.0	<10.0	<10.0	108	<10.0	<10.0	<10.0	<10.0	553	850	NA
3 & 4- Methylphenol	<10.0	<10.0	<10.0	<10.0	<10.0	80.6	<10.0	<10.0	<10.0	NA	NA	NA
Acenaphthene	63.6	<10.0	<10.0	<10.0	416E	<10.0	187	174	<500	643	990	NA
Anthracene	<10.0	<10.0	<10.0	<10.0	16.8	<10.0	<10.0	<10.0	22.5	25,900	40,000	110,000
Benzoic Acid	<20.0	<20.0	<20.0	<20.0	<20.0	26.0	<20.0	<20.0	23.8	NA	NA	NA
Carbazole	16.1	<10.0	<10.0	<10.0	259E	<10.0	107	110	146	NA	NA	NA
Dibenzofuran	34.9	<10.0	<10.0	<10.0	219E	<10.0	70.6	64.4	113	NA	NA	NA
Fluoranthene	13.5	<10.0	<10.0	<10.0	12.1	<10.0	<10.0	<10.0	20.0	90.2	140	370
Fluorene	<10.0	<10.0	<10.0	<10.0	173E	<10.0	96.3	101	<10.0	3,460	5,300	14,000
Naphthalene	109	<10.0	<10.0	<10.0	***11,900***	<10.0	<10.0	<10.0	1,600	4,940	NA	NA
Pyrene	<10.0	<10.0	<10.0	<10.0	12.7	<10.0	<10.0	<10.0	14.3	2,590	4,000	11,000
Phenanthrene	87.4	<10.0	<10.0	<10.0	137	<10.0	99.9	95.8	179	NA	NA	NA

TABLE 6B

FEBRUARY-MARCH 2003 INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS
Former Tacoma Metals Facility

Analyte	Well Designation and Date Sampled									MTCA Method B Surface Water[b]	NRWQC Human Health Consumption of Organisms[c]	NTR Human Health Consumption of Organisms[d]
	MW-14 3/11/2003	MW-15 3/11/2003	MW-16 3/10/2003	MW-17 3/10/2003	MW-18 3/10/2003	MW-19 3/10/2003	MW-20 3/10/2003	MW-201[a] 3/10/2003	MW-21 3/11/2003			
PAHs (ug/l)[k]												
Naphthalene	28.3	0.235	0.877	0.793	***9,840E***	<0.100[g]	27.9	31.2	1,740	4,940	NA[h]	NA
1-Methylnaphthalene	60.7	0.569	0.447	<0.500	914	0.182	265E	273E	413	NA	NA	NA
2-Methylnaphthalene	8.87	<0.100	0.149	<0.500	1,060	<0.100	214E	223E	192	NA	NA	NA
Acenaphthylene	0.654	<0.100	<0.100	<0.500	<10.0	<0.100	63.9	<0.500	1.88	NA	NA	NA
Acenaphthene	39.5	4.35	1.07	4.62	410	1.08	183	186	328	643	990	NA
Fluorene	19.0	2.08	0.924	1.76	171	0.208	95.1	92.7	169	3,460	5,300	14,000
Phenanthrene	8.27	0.255	2.80	0.992	157	<0.100	88.8	89.6	192	NA	NA	NA
Anthracene	8.13	0.373	0.426	<0.500	<10.0	<0.100	<0.500	<0.500	43.3	25,900	40,000	110,000
Fluoranthene	13.5	0.294	0.781	1.05	11.8	<0.100	4.12	4.27	19.6	90.2	140	370
Pyrene	7.35	0.157	0.572	0.693	<10.0	<0.100	1.96	1.94	11.7	2,590	4,000	11,000
Benzo(g,h,i)perylene	0.154	<0.100	<0.100	<0.500	<10.0	<0.100	<0.500	<0.500	<0.100	NA	NA	NA
cPAHs (µg/l)[l]												
Chrysene	***1.08***	<0.100	***0.0812***	<0.0500	<10.0	<0.0100	<0.500	<0.500	***0.654***	0.0296	0.018 * / 0.02[m]	0.031
Benzo(b)fluoranthene	***0.308***	<0.100	<0.0100	<0.0500	<10.0	<0.0100	<0.500	<0.500	***0.154***	0.0296	0.018 * / 0.02[m]	0.031
Benzo(k)fluoranthene	***0.423***	<0.100	<0.0100	<0.0500	<10.0	<0.0100	<0.500	<0.500	***0.212***	0.0296	0.018 * / 0.02[m]	0.031
Benzo(a)anthracene	***1.10***	<0.100	***0.131***	<0.0500	<10.0	<0.0100	<0.500	<0.500	***0.981***	0.0296	0.018 * / 0.02[m]	0.031
Benzo(a)pyrene	***0.385***	<0.100	<0.0100	<0.0500	<10.0	<0.0100	<0.500	<0.500	***0.212***	0.0296	0.018 * / 0.02[m]	0.031
Indeno(1,2,3-cd)pyrene	***0.135***	<0.100	<0.0100	<0.0500	<10.0	<0.0100	<0.500	<0.500	<0.100	0.0296	0.018 * / 0.02[m]	0.031
Dibenz(a,h)anthracene	<0.100	<0.100	<0.0100	<0.0500	<10.0	<0.0100	<0.500	<0.500	<0.100	0.0296	0.018 * / 0.02[m]	0.031
Total cPAHs[n]	***0.592***	<0.100	0.0139	<0.0500	<10.0	<0.0100	<0.500	<0.500	***0.353***	0.0296	0.018 * / 0.02[m]	0.031

Notes:
(a) Duplicate sample for well MW-20.
(b) Model Toxics Control Act (MTCA) Method B surface water cleanup level based on CLARC v3.1, dated November 2001 (Ecology 2001b).
(c) National Recommended Water Quality Criteria (NRWQC) for consumption of organisms only (EPA 2002) pursuant to Section 304(a)(1) of the Clean Water Act and in accordance with Washington Administrative Code (WAC) 173-201A at a risk level of $1x10^{-6}$.
(d) National Toxic Rule (NTR) for consumption of organisms only based on 40 CFR 131.36 at a risk level of $1x10^{-6}$.
(e) Samples were analyzed for total petroleum hydrocarbons (TPHs) by Ecology Methods NWTPH-G and NWTPH-Dx(extended).
(f) The chromatogram for this sample does not resemble a typical gasoline standard pattern.
(g) "<" denotes analyte was not detected at the indicated laboratory reporting limit.
(h) "NA" denotes no cleanup level established.
(i) Samples were analyzed for volatile organic compounds (VOCs) by EPA Method 8260B.
(j) Samples were analyzed for semivolatile organic compounds (SVOCs) by EPA Method 8270C.
(k) Samples were analyzed for polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270C using selected ion monitoring (SIM) mode.
(l) Samples were analyzed for carcinogenic polycyclic aromatic hydrocarbons (cPAHs) by EPA Method 8270C-SIM.
(m) Practical quantitation limit (PQL) (Ecology 2001b).
(n) Total cPAHs are based on benzo(a)pyrene equivalent values. Individual detected cPAH concentrations were multiplied by benzo(a)pyrene toxicity equivalency factors (TEFs) prior to summation (per WAC 173-340-708). Non-detected cPAH analytes were not included in the summation. TEFs are tabulated on Table 2A-A.

* PQL is higher than MTCA cleanup levels and/or applicable, relevant, and appropriate requirements (ARARs).

Qualifiers:
E: Estimated result. The reported value exceeds the calibration range of the analysis.

Analytes detected in samples at concentrations exceeding one or more of the cleanup levels or comparison values are shown in bold and italics. Where appropriate, surface water standards have been adjusted upward to the PQL [WAC 173-340-730(5)(c)].
mg/l - milligrams per liter
µg/l - micrograms per liter

TABLE 6C

FEBRUARY-MARCH 2003 INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DISSOLVED PAHs[a]
Former Tacoma Metals Facility

Analyte	Well Designation and Date Sampled									MTCA Method B Surface Water[c]	NRWQC Human Health Consumption of Organisms[d]	NTR Human Health Consumption of Organisms[e]
	MW-14 3/11/2003	MW-15 3/11/2003	MW-16 3/10/2003	MW-17 3/10/2003	MW-18 3/10/2003	MW-19 3/10/2003	MW-20 3/10/2003	MW-201[b] 3/10/2003	MW-21 3/11/2003			
PAHs (µg/l)[f]												
Naphthalene	66.4	1.720	0.194	0.157	***4,990***	<0.100[g]	24.3	14.2	1,290	4,940	NA[h]	NA
1-Methylnaphthalene	10.0	0.205	<0.100	<0.100	184	<0.100	190	38.7	201	NA	NA	NA
2-Methylnaphthalene	<1.00	0.206	<0.100	<0.100	127	<0.100	156	10.9	59.2	NA	NA	NA
Acenaphthylene	<1.00	<0.100	<0.100	<0.100	<10.0	<0.100	<5.0	<10	<50.0	NA	NA	NA
Acenaphthene	13.3	0.244	<0.100	0.229	72.9	<0.100	104	29.3	157	643	990	NA
Fluorene	<1.00	<0.100	<0.100	<0.100	<10.0	<0.100	28.6	<10	<50.0	3,460	5,300	14,000
Phenanthrene	<1.00	0.143	<0.100	<0.100	<10.0	<0.100	<5.0	<10	<50.0	NA	NA	NA
Anthracene	<1.00	0.157	<0.100	<0.100	<10.0	<0.100	<5.0	<10	<50.0	25,900	40,000	110,000
Fluoranthene	<1.00	<0.100	<0.100	<0.100	<10.0	<0.100	<5.0	<10	<50.0	90.2	140	370
Pyrene	<1.00	<0.100	<0.100	<0.100	<10.0	<0.100	<5.0	<10	<50.0	2,590	4,000	11,000
Benzo(g,h,i)perylene	<1.00	<0.100	<0.100	<0.100	<10.0	<0.100	<5.0	<10	<50.0	NA	NA	NA
cPAHs (µg/l)[i]												
Chrysene	<0.100	<0.0100	<0.0100	<0.0100	<1.0	<0.0100	<0.500	<1.0	<5.00	0.0296	0.018 * / 0.02[j]	0.031
Benzo(b)fluoranthene	<0.100	<0.0100	<0.0100	<0.0100	<1.0	<0.0100	<0.500	<1.0	<5.00	0.0296	0.018 * / 0.02[j]	0.031
Benzo(k)fluoranthene	<0.100	<0.0100	<0.0100	<0.0100	<1.0	<0.0100	<0.500	<1.0	<5.00	0.0296	0.018 * / 0.02[j]	0.031
Benzo(a)anthracene	<0.100	<0.0100	<0.0100	<0.0100	<1.0	<0.0100	<0.500	<1.0	<5.00	0.0296	0.018 * / 0.02[j]	0.031
Benzo(a)pyrene	<0.100	<0.0100	<0.0100	<0.0100	<1.0	<0.0100	<0.500	<1.0	<5.00	0.0296	0.018 * / 0.02[j]	0.031
Indeno(1,2,3-cd)pyrene	<0.100	<0.0100	<0.0100	<0.0100	<1.0	<0.0100	<0.500	<1.0	<5.00	0.0296	0.018 * / 0.02[j]	0.031
Dibenz(a,h)anthracene	<0.100	<0.0100	<0.0100	<0.0100	<1.0	<0.0100	<0.500	<1.0	<5.00	0.0296	0.018 * / 0.02[j]	0.031
Total cPAHs[k]	<0.100	<0.0100	<0.0100	<0.0100	<1.0	<0.0100	<0.500	<1.0	<5.00	0.0296	0.018 * / 0.02[j]	0.031

Notes:

(a) Samples field filtered using a 0.45 micron cellulose acetate filter.
(b) Duplicate sample.
(c) Model Toxics Control Act (MTCA) Method B surface water cleanup level based on CLARC v3.1, dated November 2001 (Ecology 2001b).
(d) National Recommended Water Quality Criteria (NRWQC) for consumption of organisms only (EPA 2002) pursuant to Section 304(a)(1) of the Clean Water Act and in accordance with Washington Administrative Code (WAC) 173-201A at a risk level of $1x10^{-6}$.
(e) National Toxic Rule (NTR) for consumption of organisms only based on 40 CFR 131.36 at a risk level of $1x10^{-6}$.
(f) Samples were analyzed for polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270C using selected ion monitoring (SIM) mode.
(g) "<" denotes analyte was not detected at the indicated laboratory reporting limit.
(h) "NA" denotes no cleanup level established.
(i) Samples were analyzed for carcinogenic polycyclic aromatic hydrocarbons (cPAHs) by EPA Method 8270C-SIM.
(j) Practical quantitation limit (PQL) (Ecology 2001b).
(k) Total cPAHs are based on benzo(a)pyrene equivalent values. Individual detected cPAH concentrations were multiplied by benzo(a)pyrene toxicity equivalency factors (TEFs) prior to summation (per WAC 173-340-708). Non-detected cPAH analytes were not included in the summation. TEFs are tabulated on Table 2A-A.

* Denotes PQL is higher than MTCA cleanup levels and/or applicable, relevant, and appropriate requirements (ARARs).

Analytes detected in samples at concentrations exceeding one or more of the cleanup levels or comparison values are shown in bold and italics. Where appropriate, surface water standards have been adjusted upward to the PQL [WAC 173-340-730(5)(c)].

µg/l - micrograms per liter

TABLE 7A

JUNE-AUGUST 2002 INVESTIGATION
SOIL ANALYTICAL RESULTS
Former Tacoma Metals Facility

Analyte	Sample Designation (Boring ID - feet bgs)							MTCA Method C Industrial Soil Cleanup Level[a]
	B1-10.5	B1-20.5	B1-26	B2-21	B3-10	B3-21.5	MW13-17.5	
TPHs (mg/kg)[b]								
Diesel-Range Hydrocarbon	***5,500[c]***	***2,700[c]***	***7,300[c]***	1,600[c]	20[c]	180/250[c][d]	130/70[c][e]	2,000[f]
Oil-Range Hydrocarbon	***2,200***	640	1,600	420	<10[g]	<29/38[d]	80/20[e]	2,000[f]
Gasoline-Range Hydrocarbon	***2900[h]***	***360[h]***	***3300[h]***	***730[h]***	***120[h]***	***660[h]***	44[h]	100/30[f]
VOCs (µg/kg)[i] Only those VOCs detected are listed. See laboratory analytical reports for a complete list of VOCs analyzed.								
Acetone	<29,000	<1,600	<3,900	<1,700	73	<3,800	-- [j]	3.50E+08
Ethylbenzene	<5,900	<310	<780	<340	59	<760	--	3.50E+08
m,p-xylene	<5,900	<310	<780	<340	130	<760	--	7.00E+09
o-xylene	<5,900	<310	<780	<340	160	<760	--	7.00E+09
1,3,5-Trimethylbenzene	<5,900	<310	740J	300J	150	970	--	NA[k]
1,2,4-Trimethylbenzene	4,300J	450	2,100	2,100	470	2,900	--	NA
Isopropylbenzene	<5,900	<310	<780	<340	39	<760	--	NA
4-Isopropyltoluene	5,200J	310	490J	250J	94	480J	--	NA
Naphthalene	210,000	120,000	420,000	280,000	6,800	310,000	--	7.00E+07
SVOCs (µg/kg)[l] Only those SVOCs detected are listed. See laboratory analytical reports for a complete list of SVOCs analyzed.								
4-Methylphenol	2,900	<2,600	<1,200	<620	<170	<77	<86	NA
Carbazole	73,000	34,000	90,000	14,000	<170	3,100	2,200	6.56E+06
bis(2-Ethylhexyl)phthalate	4,400	<2,600	11,000	4,800	270	690	130	9.38E+06
Naphthalene	220,000	94,000	290,000	52,000	5,400	24,000	--	7.00E+07
2-Methylnaphthalene	120,000	39,000	120,000	21,000	1,700	10,000	--	NA
Acenaphthylene	9,300	<2,600	4,200	<620	<170	<77	--	NA
Acenaphthene	210,000	66,000	180,000	50,000	900	12,000	--	2.10E+08
Dibenzofuran	110,000	35,000	87,000	26,000	580	9,400	--	NA
Fluorene	220,000	76,000	170,000	43,000	500	13,000	--	1.40E+08
Phenanthrene	500,000	150,000	420,000	94,000	390	25,000	--	NA
Anthracene	280,000	68,000	230,000	34,000	<170	2,700	--	1.05E+09
Fluoranthene	300,000	97,000	190,000	46,000	<170	8,400	--	1.40E+08
Pyrene	250,000	83,000	170,000	44,000	<170	6,100	--	1.05E+08
Benzo(a)anthracene	***79,000***	***19,000***	***48,000***	12,000	<170	1,300	--	18,000
Chrysene	***94,000***	***20,000***	***59,000***	14,000	<170	1,100	--	18,000
Benzo(b)fluoranthene	***41,000***	9,600	***25,000***	5,200	<170	320	--	18,000
Benzo(k)fluoranthene	***36,000***	7,900	***20,000***	5,000	<170	280	--	18,000
Benzo(a)pyrene	***40,000***	7,800	***22,000***	6,200	<170	250	--	18,000
Indeno(1,2,3-cd)pyrene	18,000	2,800	9,800	2,400	<170	<77	--	18,000
Dibenz(a,h)anthracene	4,400	<2,600	2,300	690	<170	<77	--	18,000
Benzo(g,h,i)perylene	19,000	3,400	8,700	2,300	<170	<77	--	NA
PAHs (µg/kg)[m]								
Naphthalene[n]	300,000B	110,000B	300,000B	58,000B	5,600B	26,000B	14,000	7.00E+07
2-Methylnaphthalene[n]	180,000B	41,000B	110,000B	20,000B	1,800B	11,000B	3,900	NA
Acenaphthylene	11,000	1,900	4,200	560	54	75	130	NA
Acenaphthene	200,000	49,000	130,000	33,000	700	8,300	7,700	2.10E+08
Fluorene	180,000	54,000	140,000	28,000	390	9,200	4,100	1.40E+08
Phenanthrene	520,000	140,000	390,000	84,000	390	23,000	4,000	NA
Anthracene	320,000	60,000	200,000	26,000	120	2,500	170	1.05E+09
Fluoranthene	290,000	86,000	170,000	35,000	150	7,400	78	1.40E+08
Pyrene	290,000	74,000	160,000	35,000	140	4,800	54	1.05E+08
Dibenzofuran	100,000	27,000	71,000	17,000	470	7,000	4,800	NA
Benzo(g,h,i)perylene	18,000	3,300	7,700	2,000	33	51	<8.6	NA

TABLE 7A

JUNE-AUGUST 2002 INVESTIGATION
SOIL ANALYTICAL RESULTS
Former Tacoma Metals Facility

Analyte	Sample Designation (Boring ID - feet bgs)							MTCA Method C Industrial Soil Cleanup Level[a]
	B1-10.5	B1-20.5	B1-26	B2-21	B3-10	B3-21.5	MW13-17.5	
cPAHs (µg/kg)[o]								
Chrysene	***100,000***	18,000	***51,000***	11,000	59	1,100	29	18,000
Benzo(b)fluoranthene	***34,000***	7,500	17,000	4,700	35	330	<8.6[g]	18,000
Benzo(k)fluoranthene	***52,000***	8,900	***20,000***	5,100	37	260	10	18,000
Benzo(a)anthracene	***79,000***	18,000	***43,000***	9,700	46	1,200	22	18,000
Benzo(a)pyrene	***53,000***	8,800	***22,000***	5,800	32	250	10	18,000
Indeno(1,2,3-cd)pyrene	17,000	3,400	7,900	2,200	33	59	<8.6	18,000
Dibenz(a,h)anthracene	8,100	1,300	4,200	1,100	<17	28	<8.6	18,000
Total cPAHs (µg/kg)[p]	***75,400***	13,300	***33,000***	8,520	47.7	457	13.5	18,000

Notes:

(a) Model Toxics Control Act (MTCA) Method C industrial soil cleanup levels based on CLARC v3.1, dated November 2001 (Ecology 2001b).
(b) Samples were analyzed for diesel- and oil-range hydrocarbons by Ecology Method NWTPH-Dx(extended), and gasoline-range hydrocarbons by Ecology Method NWTPH-G.
(c) The chromatogram for this sample does not resemble a typical diesel standard pattern.
(d) Sample reanalysis.
(e) Laboratory control sample surrogate was outside designated control limits. Sample was re-extracted with acceptable surrogate recoveries; however, re-extracted data did not confirm original data, the original data was significantly higher. Both data sets are reported.
(f) Total petroleum hydrocarbon (TPH) screening levels based on MTCA Method A industrial soil cleanup levels (Ecology 2001a). For gasoline mixtures without benzene and total ethylbenzene, toluene and xylenes less than 1% of the gasoline mixture the cleanup level is 100 mg/kg. For all other gasoline mixtures, the cleanup level is 30 mg/kg.
(g) "<" denotes analyte was not detected at the indicated laboratory reporting limit.
(h) The chromatogram for this sample does not resemble a typical gasoline standard pattern.
(i) Samples were analyzed for volatile organic compounds (VOCs) by EPA Method 8260B. Only detected analytes have been listed.
(j) "--" denotes sample not evaluated for indicated analyte.
(k) "NA" denotes no cleanup level established.
(l) Samples were analyzed for semivolatile organic compounds (SVOCs) by EPA Method 8270C. Only detected analytes have been listed. Polycyclic aromatic hydrocarbons (PAHs) detected using EPA Method 8270C are not listed with SVOCs [see PAHs detected using selected ion monitoring (SIM) mode].
(m) Samples were analyzed for PAHs by EPA Method 8270C-SIM.
(n) Method blank values for naphthalene and 2-methylnaphthalene are 34 and 13 ug/l, respectively. All samples contained greater than 10 times the level found in the blank thus not significantly effecting the data.
(o) Samples were analyzed for carcinogenic polycyclic aromatic hydrocarbons (cPAHs) by EPA Method 8270C-SIM.
(p) Total cPAHs are based on benzo(a)pyrene equivalent values. Individual detected cPAH concentrations were multiplied by benzo(a)pyrene toxicity equivalency factors (TEFs) prior to summation (per WAC 173-340-708). Non-detected cPAH analytes were not included in the summation. TEFs are tabulated on Table 2A-A.

Qualifiers:

B - Compound also detected in method blank.
J - Estimated concentration when the value is less than the calculated laboratory reporting limit.

Analytes detected in samples at concentrations exceeding one or more cleanup levels or comparison levels are shown in bold and italics.

µg/kg - micrograms per kilogram
mg/kg - milligrams per kilogram
bgs - below ground surface

TABLE 7B

JUNE-AUGUST 2002 INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SVOCs
Former Tacoma Metals Facility

Sample Designation	Sample Date	SVOCs (µg/l)[a] See analytical reports for complete list of SVOCs analyzed.						
		4-Methyl-phenol	Naphth-alene	2-Methyl-naphthalene	Acenaph-thene	Dibenzo-furan	Fluorene	Phenan-threne
MW-13	8/5/2002	440	8.4	3.2	15	3.8	5.1	2.9
MTCA Method B Surface Water Cleanup Level[b]		NA[c]	4,940	NA	643	NA	3,460	NA
NRWQC - Human Health Consumption of Organisms[d]		NA	NA	NA	990	NA	5,300	NA
NTR - Human Health Consumption of Organisms[e]		NA	NA	NA	NA	NA	14,000	NA

Notes:

(a) Samples were analyzed for semivolatile organic compounds (SVOCs) by EPA Method 8270C. Only detected analytes have been listed.

(b) Model Toxics Control Act (MTCA) Method B surface water cleanup levels based on CLARC v3.1, dated November 2001 (Ecology 2001b).

(c) "NA" denotes no cleanup level establshed.

(d) National Recommended Water Quality Criteria (NRWQC) for consumption of organisms only (EPA 2002) pursuant to Section 304(a)(1) of the Clean Water Act and in accordance with Washington Administrative Code (WAC) 173-201A at a risk level of $1x10^{-6}$.

(e) National Toxics Rule (NTR) for consumption of organisms only based on 40 CFR 131.36 at a risk level of $1x10^{-6}$.

µg/l - micrograms per liter

TABLE 7C

JUNE-AUGUST 2002 INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - PAHs[a]
Former Tacoma Metals Facility

Sample Designation	Sample Date	PAHs (µg/l)											cPAHs (µg/l)							
		Naphth-alene	2-Methyl-naphthalene	Acenaph-thlyene	Acenaph-thene	Fluorene	Phenan-threne	Anth-racene	Fluoran-thene	Pyrene	Dibenzo-furan	Benzo (g,h,i) perylene	Chrysene	Benzo (b)-fluoranthene	Benzo (k)-fluoranthene	Benzo (a)-pyrene	Indeno (1,2,3-cd) pyrene	Dibenz (a,h)-anthracene	Benzo (a)-anthracene	Total cPAHs[h]
MW-13	8/5/2002	11	5.6	0.35M	17	6.2	3.0	0.65	0.52	0.42	4.2	<0.11[b]	***0.05MJ***	<0.11	<0.11	<0.11	<0.11	<0.11	***0.05J***	***0.0205***
MTCA Method B Surface Water Cleanup Level[c]		4,940	NA[d]	NA	643	3,460	NA	25,900	90.2	2,590	NA	NA	0.0296	0.0296	0.0296	0.0296	0.0296	0.0296	0.0296	0.0296
NRWQC - Human Health Consumption of Organisms[e]		NA	NA	NA	990	5,300	NA	40,000	140	4,000	NA	NA	0.018* / 0.02[f]	0.018* / 0.02[f]	0.018* / 0.02[f]	0.018* / 0.02[f]	0.018* / 0.02[f]	0.018* / 0.02[f]	0.018 * / 0.02[f]	0.018 * / 0.02[f]
NTR - Human Health Consumption of Organisms[g]		NA	NA	NA	NA	14,000	NA	110,000	370	11,000	NA	NA	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031

Notes:

(a) Samples were analyzed for polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270C using selected ion monitoring (SIM) mode.

(b) "<" denotes analyte was not detected at the indicated laboratory reporting limit.

(c) Model Toxics Control Act (MTCA) Method B surface water cleanup levels based on CLARC v3.1, dated November 2001 (Ecology 2001b).

(d) "NA" denotes no cleanup level is established.

(e) National Recommended Water Quality Criteria (NRWQC) for consumption of organisms only (EPA 2002) pursuant to Section 304(a)(1) of the Clean Water Act and in accordance with Washington Administrative Code (WAC) 173-201A at a risk level of $1x10^{-6}$.

(f) Practical quantitation limit (PQL) (Ecology 2001b).

(g) National Toxics Rule (NTR) for consumption of organisms only based on 40 CFR 131.36 at a risk level of $1x10^{-6}$.

(h) Total cPAHs are based on benzo(a)pyrene equivalent values. Individual detected cPAH concentrations were multiplied by benzo(a)pyrene toxicity equivalency factors (TEFs) prior to summation (per WAC 173-340-708). Non-detected cPAH analytes were not included in the summation. TEFs are tabulated on Table 2A-A.

* Denotes PQL is higher than MTCA cleanup levels and/or applicable, relevant, and appropriate requirements (ARARs).

Qualifiers:

J: Indicates an estimated concentration when the value is less than the laboratory reporting limit.

M: Indicates an estimated value of analyte found and confirmed by analyst but with low spectral match.

Analytes detected in samples at concentrations exceeding one or more of the cleanup standards or comparison values are shown in bold and italics. Where appropriate, surface water standards have been adjusted upward to the PQL [WAC 173-340-730(5)(c)].

µg/l - micrograms per liter

TABLE 7D

JUNE-AUGUST 2002 INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - TPHs AND VOCs
Former Tacoma Metals Facility

Sample Designation	Sample Date	TPHs (mg/l)[a]			VOCs (µg/l)[b] (See analytical reports for complete list of VOCs analyzed.)									
		Gasoline-Range Hydrocarbon	Diesel-Range Hydrocarbon	Oil-Range Hydrocarbon	Benzene	Ethyl-benzene	Total xylenes	Naphth-alene	Vinyl Chloride	Acetone	1,3,5 Trimethyl benzene	1,2,4 Trimethyl benzene	Isopropyl-benzene	4-Isopropyl toluene
MW-13	8/5/2002	1.0	0.76[c]	<0.50[d]	7.0	1.6	2.8	18	***6.2***	14	1.0	2.0	3.3	12
MTCA Method B Surface Water Cleanup Level[e]		NA[f]	NA	NA	22.7	6,910	NA	4,940	3.69	NA	NA	NA	NA	NA
NRWQC - Human Health Consumption of Organisms[g]		NA	NA	NA	51	29,000	NA	NA	530	NA	NA	NA	NA	NA
NTR - Human Health Consumption of Organisms[h]		NA	NA	NA	71	29,000	NA	NA	525	NA	NA	NA	NA	NA

Notes:

(a) Samples were analyzed for diesel- and oil-range hydrocarbons by Ecology Method NWTPH-Dx(extended), and gasoline-range hydrocarbons by Ecology Method NWTPH-G.

(b) Samples were analyzed for volatile organic compounds (VOCs) by EPA Method 8260B. Only detected analytes have been listed.

(c) The chromatogram for this sample does not resemble a typical diesel standard pattern.

(d) "<" denotes analyte was not detected at the indicated laboratory reporting limit.

(e) Model Toxics Control Act (MTCA) Method B surface water cleanups level based on CLARC v3.1, dated November 2001 (Ecology 2001b).

(f) "NA" denotes no cleanup level established.

(g) National Recommended Water Quality Criteria (NRWQC) for consumption of organisms only (EPA 2002) pursuant to Section 304(a)(1) of the Clean Water Act and in accordance with Washington Administrative Code (WAC) 173-201A at a risk level of $1x10^{-6}$.

(h) National Toxics Rule (NTR) for consumption of organisms only based on 40 Code of Federal Regulations (CFR) 131.36 at a risk level of $1x10^{-6}$.

Analytes detected in samples at concentrations exceeding one or more of the cleanup levels or comparison values are shown in bold and italics.

mg/l - milligrams per liter

µg/l - micrograms per liter

TABLE 7E

JUNE-AUGUST 2002 INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - PCBs
Former Tacoma Metals Facility

Sample Designation	Sample Date	PCBs (µg/l)[a]							Total PCBs[b]
		Aroclor 1016	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1221	Aroclor 1232	
MW-13	8/5/2002	<1.1[c]	<1.1	<1.1	<1.1	<1.1	<2.2	<1.1	<4.4
MTCA Method B Surface Water Cleanup Level[d]		0.00582 * / 0.1[e]	NA[f]	NA	0.00166 * / 0.1[e]	NA	NA	NA	NA
NRWQC - Aquatic Organisms Chronic Freshwater Criterion[g]		NA	NA	NA	NA	NA	NA	NA	0.014 * / 0.1[e]
NRWQC - Human Health Consumption of Organisms[h]		NA	NA	NA	NA	NA	NA	NA	6.40E-05 * / 0.1[e]
NTR - Aquatic Organisms Chronic Freshwater Criterion[i]		0.014 * / 0.1[e]	0.014 * / 0.1[e]	0.014 * / 0.1[e]	0.014 * / 0.1[e]	0.014 * / 0.1[e]	0.014 * / 0.1[e]	0.014 * / 0.1[e]	NA
NTR - Human Health Consumption of Organisms[j]		NA	NA	NA	NA	NA	NA	NA	1.70E-04 * / 0.1[e]

Notes:

(a) Samples were analyzed for polychlorinated biphenyls (PCBs) by EPA Method 8082.
(b) Total PCBs were calculated by summing the concentrations of detected PCB Aroclors. If a PCB Aroclor was not detected, a value equal to one-half the laboratory reporting limit was used in the summation.
(c) "<" denotes analyte was not detected at the indicated laboratory reporting limit.
(d) Model Toxics Control Act (MTCA) Method B surface water cleanup levels based on CLARC v3.1, dated November 2001 (Ecology 2001b).
(e) Practical quantitation limit (PQL) (Ecology 2001b).
(f) "NA" denotes no cleanup level established.
(g) National Recommended Water Quality Criteria (NRWQC) chronic freshwater criterion (EPA 2002) pursuant to Section 304(a)(1) of the Clean Water Act and in accordance with Washington Administrative Code (WAC) 173-201A at a risk level of $1x10^{-6}$.
(h) NRWQC for consumption of organisms only (EPA 2002) pursuant to Section 304(a)(1) of the Clean Water Act and in accordance with WAC 173-201A at a risk level of $1x10^{-6}$.
(i) National Toxics Rule (NTR) chronic freshwater criterion based on 40 CFR 131.36 at a risk level of $1x10^{-6}$.
(j) NTR for consumption of organisms only based on 40 CFR 131.36 at a risk level of $1x10^{-6}$.

* Denotes PQL is higher than MTCA cleanup levels and/or applicable, relevant, and appropriate requirements (ARARs).

µg/l - micrograms per liter

TABLE 7F

JUNE-AUGUST 2002 INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - TOTAL AND DISSOLVED METALS
Former Tacoma Metals Facility

Sample Designation	Sample Date		Metals (µg/l)[a]								
			Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver
MW-13	8/5/2002	Total	<50/1.1[c]	26	<2[d]	9	3	<20/3[c]	<0.1	<50/0.7[c]	<3
		Dissolved[b]	<50/1.1[c]	23	<2	8	<2	<20/<1[c]	<0.1	<50/0.9[c]	<3
MTCA Method B Surface Water Cleanup Level[e]			0.0982 ** / 5[f]	NA[g]	20.3	NA	2,660	NA	NA	2,700	25,900
NRWQC - Aquatic Organisms Chronic Freshwater Criterion[h]			150	NA	0.37 ***	119.94 ***	14.8 ***	4.74 ***	0.77	5.0	NA
NRWQC - Human Health Consumption of Organisms[i]			0.14 ** / 5[f]	NA	NA	NA	NA	NA	NA	4,200	NA
NTR - Aquatic Organisms Chronic Freshwater Criterion[j]			190	NA	1.59 ***	288.07 ***	18.76 ***	4.74 ***	0.012 * / 0.1[k]	5	NA
NTR - Human Health Consumption of Organisms[l]			0.14 ** / 5[f]	NA	NA	NA	NA	NA	0.15	NA	NA

Notes:
(a) Samples were analyzed for metals by EPA Methods 6010/7470 series.
(b) Groundwater samples for dissolved metals were field filtered using a 0.45 micron filter.
(c) Samples were re-analyzed for metals by EPA Method 200.8 to obtain lower laboratory reporting limits.
(d) "<" denotes analyte was not detected at the indicated laboratory reporting limit.
(e) Model Toxics Control Act (MTCA) Method B surface water cleanup levels based on CLARC v3.1, dated November 2001 (Ecology 2001b).
(f) Natural background concentration (Ecology 2001b).
(g) "NA" denotes no cleanup level established.
(h) National Recommended Water Quality Criteria (NRWQC) chronic freshwater criterion (EPA 2002) pursuant to Section 304(a)(1) of the Clean Water Act and in accordance with Washington Administrative Code (WAC) 173-201A at a risk level of $1x10^{-6}$.
(i) NRWQC for consumption of organisms only (EPA 2002) pursuant to Section 304(a)(1) of the Clean Water Act and in accordance with WAC 173-201A at a risk level of $1x10^{-6}$.
(j) National Toxics Rule (NTR) chronic freshwater criterion based on 40 CFR 131.36 at a risk level of $1x10^{-6}$.
(k) Practical quantitation limit (PQL) (Ecology 2001b).
(l) NTR for consumption of organisms only based on 40 CFR 131.36 at a risk level of $1x10^{-6}$.

* Denotes PQL is higher than MTCA cleanup levels and/or applicable, relevant, and appropriate requirements (ARARs).
** Denotes natural background concentration is greater than MTCA cleanup levels and/or ARARs.
*** Freshwater criterion is expressed as a function of groundwater hardness. Average groundwater hardness at the site is 180 mg/l.

µg/l - micrograms per liter
mg/l - milligrams per liter

TABLE 8

OCTOBER 2001
GROUNDWATER ANALYTICAL RESULTS - DISSOLVED LEAD[a]
Former Tacoma Metals Facility

Sample Designation	Sample Date	Metals (µg/l)[b]								
		Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver
MW-1	10/30/2001	--[c]	--	--	--	--	0.304	--	--	--
MW-2	10/30/2001	--	--	--	--	--	0.269	--	--	--
MW-4(R)	10/30/2001	--	--	--	--	--	0.199	--	--	--
MW-5	10/30/2001	--	--	--	--	--	0.292	--	--	--
MW-6	10/30/2001	--	--	--	--	--	0.383	--	--	--
MW-7	10/30/2001	--	--	--	--	--	0.249	--	--	--
MW-8(R)	10/30/2001	--	--	--	--	--	0.231	--	--	--
MW-9	10/30/2001	--	--	--	--	--	0.226	--	--	--
MW-10	10/30/2001	--	--	--	--	--	0.246	--	--	--
MW-11	10/30/2001	--	--	--	--	--	0.413	--	--	--
MW-12	10/30/2001	--	--	--	--	--	0.303	--	--	--
MTCA Method B Surface Water Cleanup Level[d]		0.0982 ** / 5[e]	NA[f]	20.3	NA	2,660	NA	NA	NA	25,900
NRWQC - Aquatic Organisms Chronic Freshwater Criterion[g]		150	NA	0.37 ***	119.94 ***	14.8 ***	4.74 ***	0.77	5.0	NA
NRWQC - Human Health Consumption of Organisms[h]		0.14 ** / 5[e]	NA	NA	NA	NA	NA	NA	4,200	NA
NTR - Aquatic Organisms Chronic Freshwater Criterion[i]		190	NA	1.59 ***	288.07 ***	18.76 ***	4.74 ***	0.012 * / 0.1[j]	5	NA
NTR - Human Health Consumption of Organisms[k]		0.14 ** / 5[e]	NA	NA	NA	NA	NA	0.15	NA	NA

Notes:

(a) Samples were field filtered using a 0.45 micron filter.
(b) Samples were analyzed for metals by EPA Method 200.8.
(c) "--" denotes samples not analyzed for listed compound.
(d) Model Toxics Control Act (MTCA) Method B surface water cleanup levels based on CLARC v3.1, dated November 2001 (Ecology 2001b).
(e) Natural background concentration (Ecology 2001b).
(f) "NA" denotes no cleanup level established.
(g) National Recommended Water Quality Criteria (NRWQC) chronic freshwater criterion (EPA 2002) pursuant to Section 304(a)(1) of the Clean Water Act and in accordance with Washington Administrative Code (WAC) 173-201A at a risk level of $1x10^{-6}$.
(h) NRWQC for consumption of organisms only (EPA 2002) pursuant to Section 304(a)(1) of the Clean Water Act and in accordance with WAC 173-201A at a risk level of $1x10^{-6}$.
(i) National Toxics Rule (NTR) chronic freshwater criterion based on 40 CFR 131.36 at a risk level of $1x10^{-6}$.
(j) Practical quantitation limit (PQL) (Ecology 2001b).
(k) NTR for consumption of organisms only based on 40 CFR 131.36 at a risk level of $1x10^{-6}$.

* Denotes PQL is higher than MTCA cleanup levels and/or applicable, relevant, and appropriate requirements (ARARs).
** Denotes natural background concentration is higher than MTCA cleanup levels and/or ARARs.
*** Freshwater criterion is expressed as a function of groundwater hardness. Average groundwater hardness at the site is 180 mg/l.

µg/l - micrograms per liter
mg/l - milligrams per liter

Appendix E

Puyallup River Side Channel Investigation Maps and Data Tables

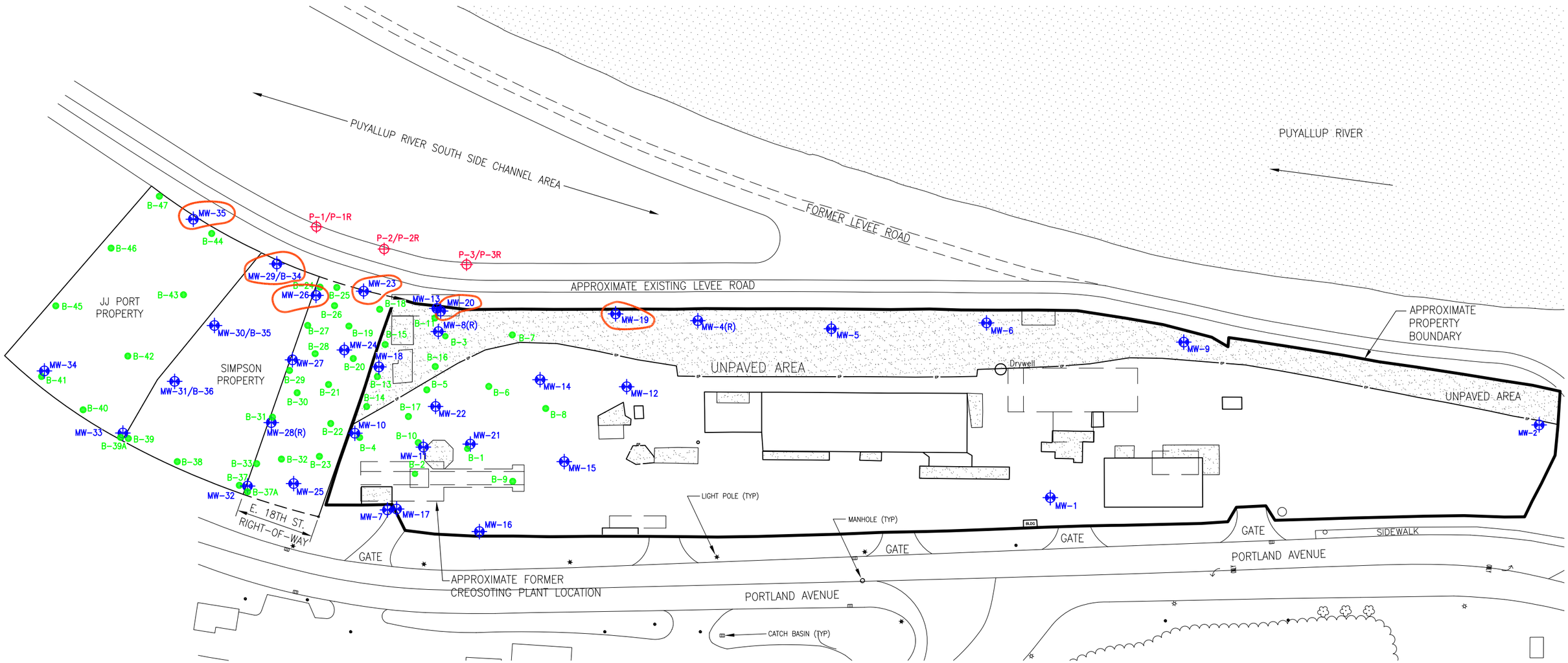
Appendix E: Puyallup River Site Channel Investigation Maps and Data Tables

Table of Contents

1) Figure 1 Site and Sample Location Map

2) Table 1 Summary of Groundwater Analytical Results for Point of Compliance Wells and Temporary Piezometers

All materials included in Appendix E are from *Revised Groundwater Investigation Summary, Puyallup River Side Channel Investigation* (Kennedy/Jenks Consultants 2012)



LEGEND:

B-1	PREVIOUS SOIL BORING LOCATION
MW-26	MONITORING WELL LOCATION
	MONITORING WELL SAMPLED OCTOBER 2010 AND FEBRUARY 2011
	UNPAVED AREA
	APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)
P-1	TEMPORARY PIEZOMETER LOCATION OCTOBER 2010 AND FEBRUARY 2011

NOTES:

1. BORING AND WELL LOCATIONS ARE BASED ON SITE SURVEY BY EARTH TECH, INC. ON 28 MARCH 2000, 13 MARCH 2003, 31 DECEMBER 2003, 14 APRIL 2004, 21 APRIL 2005, 29 MARCH 2006, AND 11 APRIL 2008.
2. ALL LOCATIONS ARE APPROXIMATE.

N

0 50 100

SCALE: 1=100

Kennedy/Jenks Consultants

FORMER TACOMA METALS FACILITY
TACOMA, WA

SITE AND SAMPLE LOCATION MAP

996098.00\2010 PRSC\FIG_01

FIGURE 1

TABLE 1

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
POINT OF COMPLIANCE WELLS AND TEMPORARY PIEZOMETERS
Former Tacoma Metals Facility

Analyte	P-1 / P-1R				P-2 / P-2R[b]				P-3 / P-3R[b]				MW-19				Proposed Cleanup Level[a]
	unfiltered samples		filtered samples		unfiltered samples		filtered samples		unfiltered samples		filtered samples		unfiltered samples		filtered samples		
	Oct-10	Feb-11	Oct-10	Feb-11	Oct-10	Feb-11	Oct-10	Feb-11	Oct-10	Feb-11	Oct-10	Feb-11	Oct-10	Feb-11	Oct-10	Feb-11	
BTEX (µg/L) [c]																	
Benzene	<0.35	<0.35	---	---	<0.35 / <0.35	<0.35	---	---	<0.35	2.2 / 2.1	---	---	<0.35 [d]	<0.35	--- [e]	---	23
Toluene	<1	<1	---	---	<1 / <1	<1	---	---	<1	<1 / <1	---	---	<1	<1	---	---	19,000
Etylbenzene	<1	<1	---	---	<1 / <1	<1	---	---	<1	<1 / <1	---	---	<1	<1	---	---	6,900
Total xylenes	<3	<3	---	---	<3 / <3	<3	---	---	<3	<3 / 2.0	---	---	<3	<3	---	---	16,000 [f]
PAHs (µg/L) [g]																	
Naphthalene	0.14 j	0.12	0.10 j	0.081	0.01 j / <0.10	0.069	0.01 j / <0.10	0.032	0.01 j	0.44 / 0.46	<0.10	0.28 / 0.58	0.01 j,J	<0.025	0.02 j	<0.025	4,940
Acenaphthylene	<0.10	0.12	<0.10	0.14	<0.10 / <0.10	0.17	<0.10/<0.10	0.20	<0.10	0.40 / 0.42	<0.10	0.40 / 0.39	<0.10 J	<0.025	<0.10	<0.025	NA [h]
Acenaphthene	12	19	11	18	1.5 / 1.5	28	1.3 / 1.4	18	<0.10	76 / 63	<0.10	62 / 63	0.40 J	0.21	0.41	0.18	643
Fluorene	1.3	1.8	1.2	1.6	0.06 j / 0.06 j	5.9	0.06 j / 0.06 j	4.1	<0.10	14 / 13	<0.10	9.3 / 9.9	0.04 j,J	<0.025	0.04 j	<0.025	3,460
Phenanthrene	0.64	0.75	0.59	0.71	0.04 j / 0.04 j	2.1	0.03 j / 0.05 j	1.4	<0.10	1.6 / 1.7	<0.10	1.6 / 1.5	0.02 j,J	<0.025	<0.10	<0.025	NA
Anthracene	0.12	0.20	0.11	0.20	<0.10 / <0.10	0.10	<0.10 / <0.10	0.13	<0.10	0.086 / 0.094	<0.10	0.084 / 0.082	<0.10 J	<0.025	<0.10	<0.025	25,900
Fluoranthene	0.12	0.18	0.09 j	0.15	<0.10 / 0.02 j	0.10	<0.10 / 0.01 j	0.070	<0.10	0.048 / 0.049	<0.10	0.040 / 0.033	<0.10 J	<0.025	<0.10	<0.025	90.2
Pyrene	0.05 j	0.068	0.04 j	0.055	<0.10 / 0.01 j	0.048	<0.10 / <0.10	0.033	0.03 j	0.027 / 0.027	<0.10	<0.025 / <0.025	<0.10 J	<0.025	<0.10	<0.025	2,590
Benzo(g,h,i)perylene	<0.10	<0.025	<0.10	<0.025	<0.10 / <0.10	<0.025	<0.10 / <0.10	<0.025	<0.10	<0.025 / <0.025	<0.10	<0.025 / <0.025	<0.10 J	<0.025	<0.10	<0.025	NA
cPAHs (µg/L) [i]																	
Benzo(a)anthracene	<0.10	<0.025	<0.10	<0.025	<0.10 / <0.10	<0.025	<0.10 / <0.10	<0.025	<0.10	<0.025 / <0.025	<0.10	<0.025 / <0.025	<0.10 J	<0.025	<0.10	<0.025	NA
Chrysene	<0.10	<0.025	0.01 j	<0.025	0.01 j / <0.10	<0.025	<0.10 / <0.10	<0.025	<0.10	<0.025 / <0.025	0.01j	<0.025 / <0.025	0.01 j,J	<0.025	<0.10	<0.025	NA
Benzo(a)pyrene	<0.10	<0.025	<0.10	<0.025	<0.10 / <0.10	<0.025	<0.10 / <0.10	<0.025	<0.10	<0.025 / <0.025	<0.10	<0.025 / <0.025	<0.10 J	<0.025	<0.10	<0.025	0.03
Benzo(b)fluoranthene	<0.10	<0.025	<0.10	<0.025	<0.10 / <0.10	<0.025	<0.10 / <0.10	<0.025	<0.10	<0.025 / <0.025	<0.10	<0.025 / <0.025	<0.10 J	<0.025	<0.10	<0.025	NA
Benzo(k)fluoranthene	<0.10	<0.025	<0.10	<0.025	<0.10 / <0.10	<0.025	<0.10 / <0.10	<0.025	<0.10	<0.025 / <0.025	<0.10	<0.025 / <0.025	<0.10 J	<0.025	<0.10	<0.025	NA
Indeno(1,2,3-cd)pyrene	<0.10	<0.025	<0.10	<0.025	<0.10 / <0.10	<0.025	<0.10 / <0.10	<0.025	<0.10	<0.025 / <0.025	<0.10	<0.025 / <0.025	<0.10 J	<0.025	<0.10	<0.025	NA
Dibenz(a,h)anthracene	<0.10	<0.025	<0.10	<0.025	<0.10 / <0.10	<0.025	<0.10 / <0.10	<0.025	<0.10	<0.025 / <0.025	<0.10	<0.025 / <0.025	<0.10 J	<0.025	<0.10	<0.025	NA

TABLE 1

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
POINT OF COMPLIANCE WELLS AND TEMPORARY PIEZOMETERS
Former Tacoma Metals Facility

	MW-20				MW-23				MW-26				MW-29				MW-35				Proposed Cleanup Level[a]
	unfiltered samples		filtered samples		unfiltered samples		filtered samples		unfiltered samples		filtered samples		unfiltered samples		filtered samples		unfiltered samples		filtered samples		
Analyte	Oct-10	Feb-11	Oct-10	Feb-11	Oct-10	Feb-11	Oct-10	Feb-11	Oct-10	Feb-11	Oct-10	Feb-11	Oct-10	Feb-11	Oct-10	Feb-11	Oct-10	Feb-11	Oct-10	Feb-11	
BTEX (µg/L) [c]																					
Benzene	3.6	5.0	---	---	***56***	***53***	---	---	<0.35	<0.35	---	---	<0.35	<0.35	---	---	<0.35[d]	<0.35	---[e]	---	23
Toluene	<1	<1	---	---	1.4	1.2	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1	---	---	19,000
Etylbenzene	3.0	2	---	---	56	52	---	---	1.1	<1	---	---	<1	<1	---	---	<1	<1	---	---	6,900
Total xylenes	4.7	3.8	---	---	22	18.7	---	---	<3	<3	---	---	<3	<3	---	---	<3	<3	---	---	16,000 [f]
PAHs (µg/L) [g]																					
Naphthalene	7.4 j	3.4	6.2	3.2	59	50	54	44	140	47	120 ve	44	0.25	0.56 J	0.39	0.31	0.02 j	<0.025	0.01 j	<0.025	4,940
Acenaphthylene	<0.10 J	0.72 J	<0.10	0.64	<0.10 J	0.91	<0.10 J	0.92	<0.10	0.33	0.62 J	0.51	<0.10 J	0.43 J	<0.10	0.37	<0.10	<0.025	<0.10	<0.025	NA [h]
Acenaphthene	210	180	190	170	170	160	170	150	67	69	60	62	43	44	37	45	0.02 j	<0.025	<0.10	<0.025	643
Fluorene	100	80	96	79	56	60	59	48	38	42	39	38	12	14	12	14	0.03 j	0.033	<0.10	<0.025	3,460
Phenanthrene	92	68	80	71	51	54	50	50	40	35	36	32	14	15	13	16	0.02 j	<0.025	0.01 j	<0.025	NA
Anthracene	4.8 j	3.0	3.7	2.7	4.6	5.5	5.7 j	4.2	3.6	4.1	3.1	3.5	3.5	4.0	3.3	3.8	<0.10	<0.025	<0.10	<0.025	25,900
Fluoranthene	1.9 J	1.7 J	1.9	1.2	5.9	6.6	6.3 J	4.9	7.1	8.2	6.3	6.3	5.4	6.4	5.2	6.4	<0.10	<0.025	<0.10	<0.025	90.2
Pyrene	0.81 J	0.77 J	0.76	0.51	3.7	4.0	3.9 J	2.9	3.7	4.4	3.2	3.7	3.3	4.1	3.2	3.7	0.11	0.16	0.09 j	0.098	2,590
Benzo(g,h,i)perylene	<0.10	<0.025	<0.10	<0.025	<0.10	<0.025	<0.10 J	<0.025	<0.10	<0.025	<0.10	<0.025	<0.10 J	<0.025 J	<0.10	<0.025	<0.10	<0.025	<0.10	<0.025	NA
cPAHs (µg/L) [i]																					
Benzo(a)anthracene	0.02 j	<0.025	<0.10	<0.025	0.30	0.28	0.20 J	0.15	0.16	0.12	0.12	0.11	0.23 J	0.28 J	0.16	0.17	<0.10	<0.025	<0.10	<0.025	NA
Chrysene	<0.10	<0.025	<0.10	<0.025	0.26	0.21	0.17 J	0.15	0.13	0.094	0.09 j	0.089	0.20 J	0.25 J	0.14	0.15	<0.10	<0.025	0.01 j	<0.025	NA
Benzo(a)pyrene	<0.10	<0.025	<0.10	<0.025	0.015 j	0.029	<0.10 J	<0.025	0.01 j	<0.025	<0.10	<0.025	***0.04 j,J***	***0.049 J***	0.01 j	<0.025	<0.10	<0.025	<0.10	<0.025	0.03
Benzo(b)fluoranthene	<0.10	<0.025	<0.10	<0.025	0.02 j	0.036	<0.10 J	<0.025	0.03 j	<0.025	<0.10	<0.025	0.05 j,J	0.062 J	0.01 j	<0.025	<0.10	<0.025	<0.10	<0.025	NA
Benzo(k)fluoranthene	<0.10	<0.025	<0.10	<0.025	<0.10	<0.025	<0.10 J	<0.025	<0.10	<0.025	<0.10	<0.025	0.02 j,J	<0.025 J	<0.10	<0.025	<0.10	<0.025	<0.10	<0.025	NA
Indeno(1,2,3-cd)pyrene	<0.10	<0.025	<0.10	<0.025	<0.10	<0.025	<0.10 J	<0.025	<0.10	<0.025	<0.10	<0.025	<0.10 J	<0.025 J	<0.10	<0.025	<0.10	<0.025	<0.10	<0.025	NA
Dibenz(a,h)anthracene	<0.10	<0.025	<0.10	<0.025	<0.10	<0.025	<0.10 J	<0.025	<0.10	<0.025	<0.10	<0.025	<0.10 J	<0.025 J	<0.10	<0.025	<0.10	<0.025	<0.10	<0.025	NA

Notes:

(a) Proposed site cleanup levels based on Kennedy/Jenks Consultants' 2007 *Cleanup Level Evaluation* report (submitted to Ecology under separate cover) and the Model Toxics Control Act (MTCA) (WAC 173-340) Method B surface water cleanup level based on Ecology's online CLARC database.
(b) Where two values are displayed, the second is the analytical result for a field blind duplicate sample (Dup-1).
(c) Samples were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Method 8260C for volatile compounds.
(d) "<" Denotes analyte was not detected at the indicated laboratory reporting limit.
(e) "---" Denotes sample was not analyzed for the listed analyte
(f) Denotes the MTCA Method B groundwater cleanup level based on Ecology's online CLARC database.
(g) Unfiltered and filtered (0.70 micron glass filter prior to extraction in laboratory) samples were analyzed for polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270C using selected ion monitoring (SIM) mode (where appropriate).
(h) "NA" denotes cleanup level is either not available or not appropriate.
(i) Samples were analyzed for carcinogenic polycyclic aromatic hydrocarbons (cPAHs) by EPA Method 8270C using SIM mode (where appropriate).

j = The result is below normal reporting limits (the value reported is an estimate)
J = The internal standard assoicated with the analyte is out of control limits (the reported concentration is an estimate).
ve = Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.
µg/L = micrograms per liter

Analytes detected in samples at concentrations exceeding the proposed cleanup level values are shown in bold and italics.

Appendix F

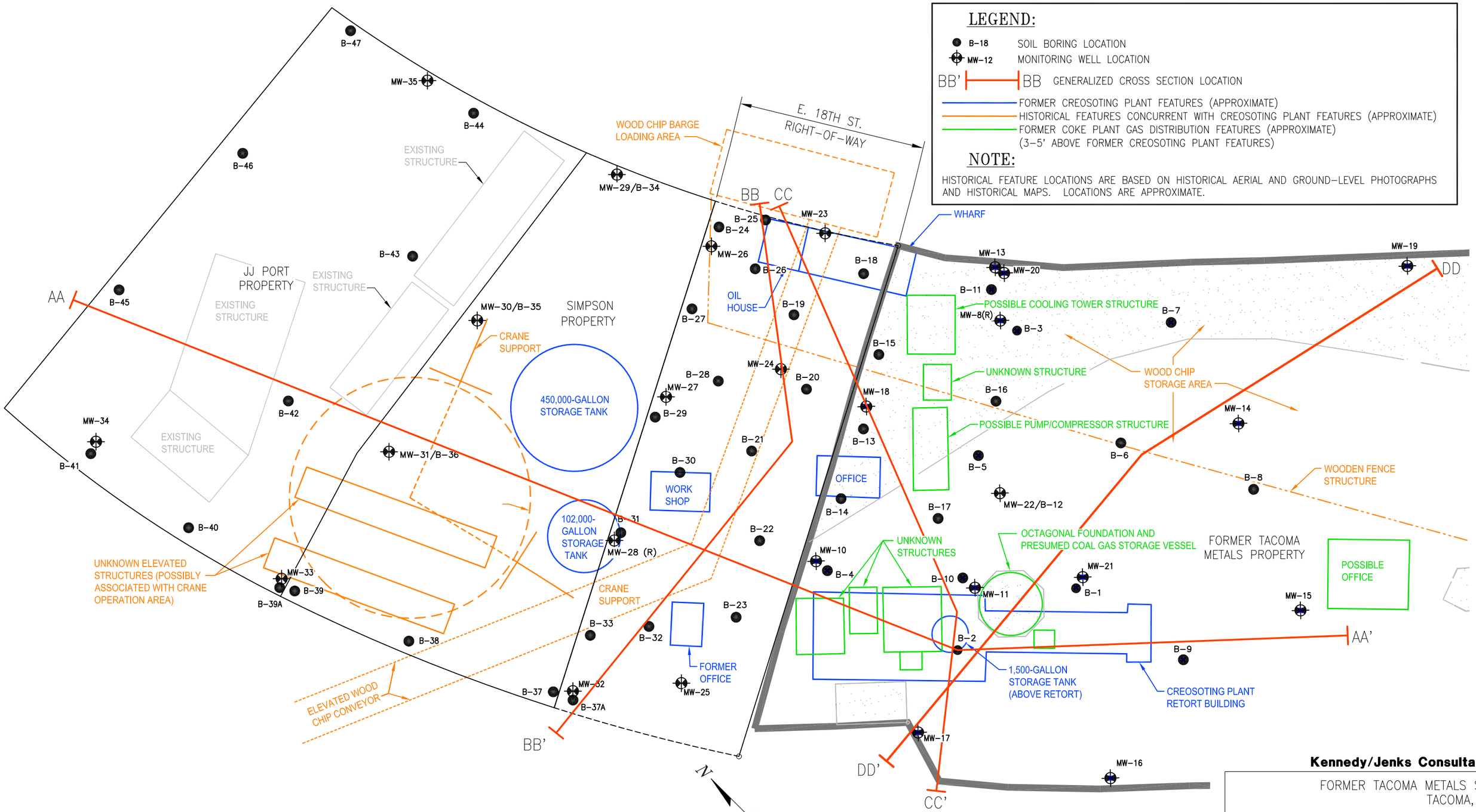
Creosote-Related Impact Maps and Cross Sections

Appendix F: Creosote-Related Impact Maps and Cross Sections

Table of Contents

1) Figure 1 Former Creosoting Plant Site and Sample Location Map
2) Figure 2A Former Creosoting Plant Site Summary of Subsurface Soil Impacts 0-10 Feet BGS
3) Figure 2B Former Creosoting Plant Site Summary of Subsurface Soil Impacts 10-20 Feet BGS
4) Figure 2C Former Creosoting Plant Site Summary of Subsurface Soil Impacts 20-30 Feet BGS
5) Figure 2D Former Creosoting Plant Site Summary of Subsurface Soil Impacts 30-40 Feet BGS
6) Figure 3A Former Creosoting Plant Site Generalized Cross Section AA-AA'
7) Figure 3B Former Creosoting Plant Site Generalized Cross Section BB-BB'
8) Figure 3C Former Creosoting Plant Site Generalized Cross Section CC-CC'
9) Figure 3D Former Creosoting Plant Site Generalized Cross Section DD-DD'

All materials included in Appendix F are from *Response to Ecology Comment, Forensic Evaluation of Hydrocarbons* (Kennedy/Jenks Consultants 2009)



NOTES:

1. ALL LOCATIONS ARE APPROXIMATE.
2. BGS = BELOW GRADE SURFACE.
3. THIS FIGURE WAS MODIFIED FROM THE ORIGINAL (2008) AT ECOLOGY'S REQUEST.

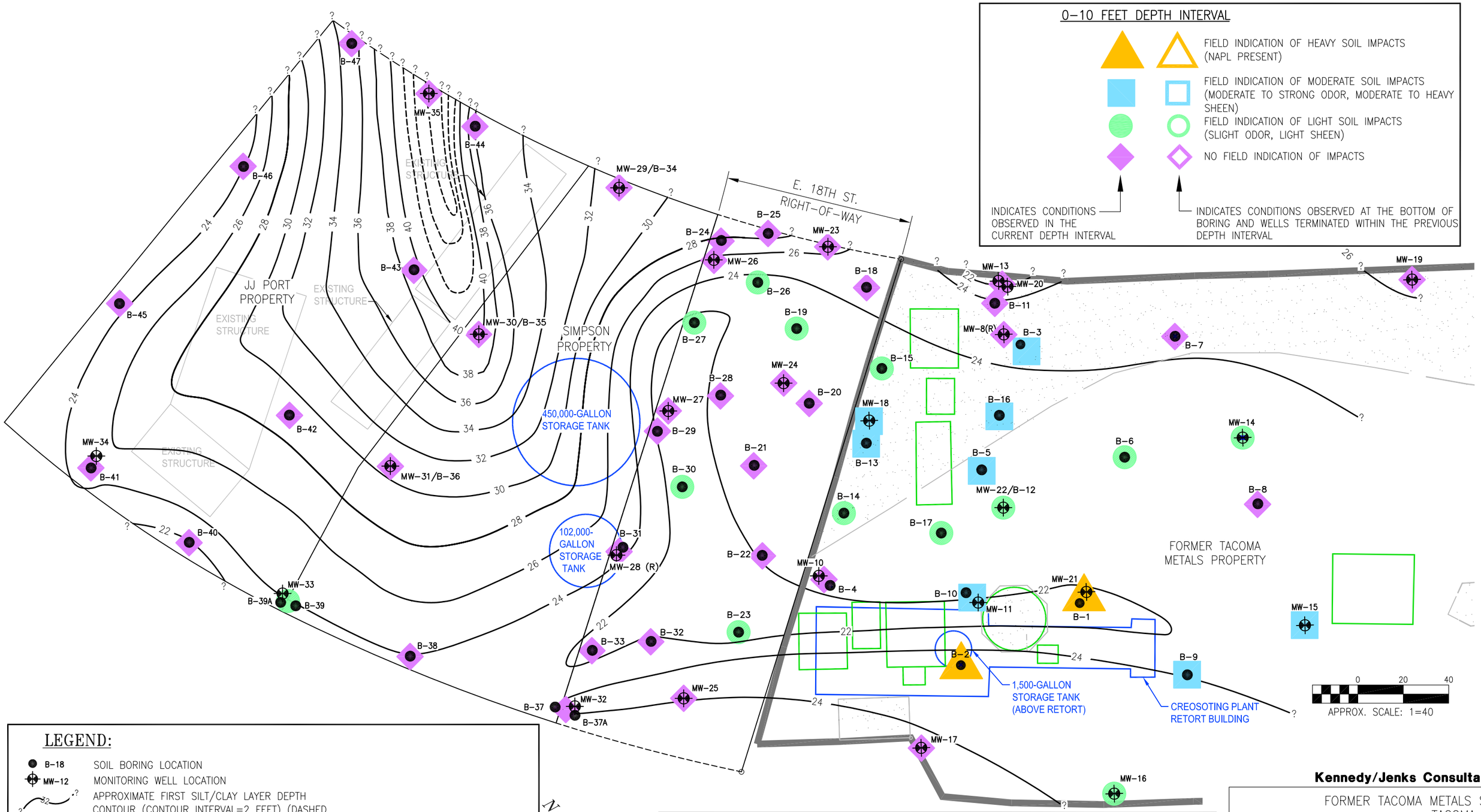
Kennedy/Jenks Consultants

FORMER TACOMA METALS SITE
TACOMA, WA

FORMER CREOSOTING PLANT SITE AND SAMPLE LOCATION MAP

996098.00\2008 SOURCE\FIG_01dwg

FIGURE 1



LEGEND:

- B-18 — SOIL BORING LOCATION
- MW-12 — MONITORING WELL LOCATION
- 32 — APPROXIMATE FIRST SILT/CLAY LAYER DEPTH CONTOUR (CONTOUR INTERVAL=2 FEET) (DASHED WHERE UNCERTAIN) (FEET BGS)
- FORMER CREOSOTING PLANT FEATURES (APPROXIMATE)
- FORMER COKE PLANT GAS DISTRIBUTION FEATURES (APPROXIMATE) (3–5' ABOVE FORMER CREOSOTING PLANT FEATURES)

NOTE:

HISTORICAL FEATURE LOCATIONS ARE BASED ON HISTORICAL AERIAL AND GROUND–LEVEL PHOTOGRAPHS AND HISTORICAL MAPS. LOCATIONS ARE APPROXIMATE.

NOTES:

1. ALL LOCATIONS ARE APPROXIMATE.
2. BGS = BELOW GROUND SURFACE.
3. THIS MAP SHOWS THE HIGHEST LEVEL OF SOIL IMPACTS OBSERVED WITHIN THE INDICATED DEPTH INTERVAL. THESE CONDITIONS ARE NOT NECESSARILY REPRESENTATIVE OF THE ENTIRE DEPTH INTERVAL.
4. DEPTHS ARE IN FEET BGS NORMALIZED TO AN ELEVATION DATUM OF 10 FEET (THE APPROXIMATE EXISTING SURFACE ELEVATION AT THE FORMER CREOSOTING PLANT STRUCTURE).
5. NAPL = NON–AQUEOUS PHASE LIQUID.
6. FIGURE WAS MODIFIED FROM THE ORIGINAL (2008) AT ECOLOGY'S REQUEST.

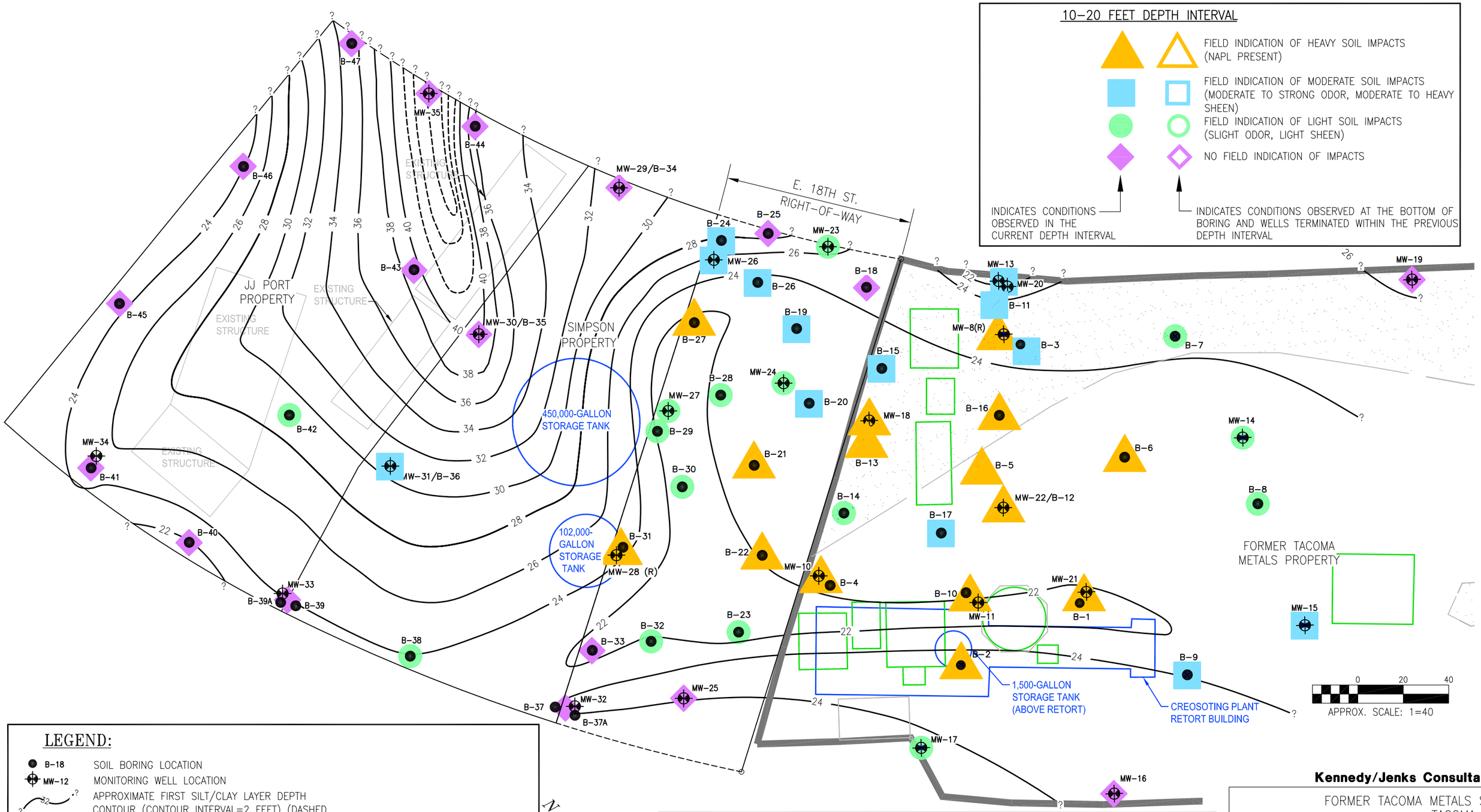
Kennedy/Jenks Consultants

FORMER TACOMA METALS SITE
TACOMA, WA

FORMER CREOSOTING PLANT SITE
SUMMARY OF SUBSURFACE SOIL IMPACTS
0-10 FEET BGS

996098.00\2008 SOURCE\FIG_02A.dwg

FIGURE 2A



LEGEND:

- B-18 — SOIL BORING LOCATION
- MW-12 — MONITORING WELL LOCATION
- APPROXIMATE FIRST SILT/CLAY LAYER DEPTH CONTOUR (CONTOUR INTERVAL=2 FEET) (DASHED WHERE UNCERTAIN) (FEET BGS)
- FORMER CREOSOTING PLANT FEATURES (APPROXIMATE)
- FORMER COKE PLANT GAS DISTRIBUTION FEATURES (APPROXIMATE) (3–5' ABOVE FORMER CREOSOTING PLANT FEATURES)

NOTE:

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4. DEPTHS ARE IN FEET BGS NORMALIZED TO AN ELEVATION DATUM OF 10 FEET (THE APPROXIMATE EXISTING SURFACE ELEVATION AT THE FORMER CREOSOTING PLANT STRUCTURE).
5. NAPL = NON–AQUEOUS PHASE LIQUID.
6. FIGURE WAS MODIFIED FROM THE ORIGINAL (2008) AT ECOLOGY'S REQUEST.

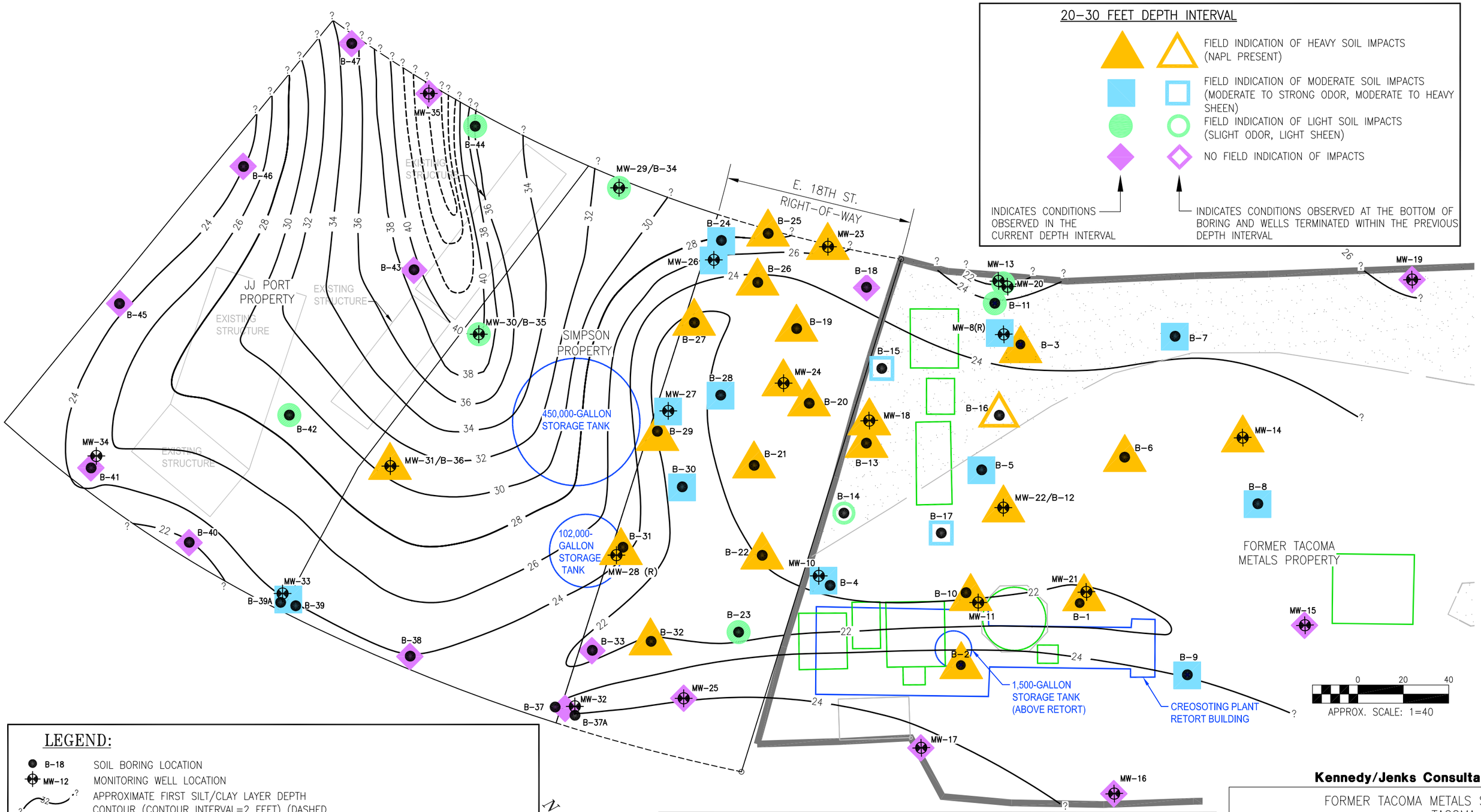
Kennedy/Jenks Consultants

FORMER TACOMA METALS SITE
TACOMA, WA

FORMER CREOSOTING PLANT SITE
SUMMARY OF SUBSURFACE SOIL IMPACTS
10-20 FEET BGS

996098.00\2008 SOURCE\FIG_02B.dwg

FIGURE 2B



LEGEND:

- B-18 — SOIL BORING LOCATION
- MW-12 — MONITORING WELL LOCATION
- 22 — APPROXIMATE FIRST SILT/CLAY LAYER DEPTH CONTOUR (CONTOUR INTERVAL=2 FEET) (DASHED WHERE UNCERTAIN) (FEET BGS)
- FORMER CREOSOTING PLANT FEATURES (APPROXIMATE)
- FORMER COKE PLANT GAS DISTRIBUTION FEATURES (APPROXIMATE) (3–5' ABOVE FORMER CREOSOTING PLANT FEATURES)

NOTE:

HISTORICAL FEATURE LOCATIONS ARE BASED ON HISTORICAL AERIAL AND GROUND-LEVEL PHOTOGRAPHS AND HISTORICAL MAPS. LOCATIONS ARE APPROXIMATE.

NOTES:

1. ALL LOCATIONS ARE APPROXIMATE.
2. BGS = BELOW GROUND SURFACE.
3. THIS MAP SHOWS THE HIGHEST LEVEL OF SOIL IMPACTS OBSERVED WITHIN THE INDICATED DEPTH INTERVAL. THESE CONDITIONS ARE NOT NECESSARILY REPRESENTATIVE OF THE ENTIRE DEPTH INTERVAL.
4. DEPTHS ARE IN FEET BGS NORMALIZED TO AN ELEVATION DATUM OF 10 FEET (THE APPROXIMATE EXISTING SURFACE ELEVATION AT THE FORMER CREOSOTING PLANT STRUCTURE).
5. NAPL = NON-AQUEOUS PHASE LIQUID.
6. FIGURE WAS MODIFIED FROM THE ORIGINAL (2008) AT ECOLOGY'S REQUEST.

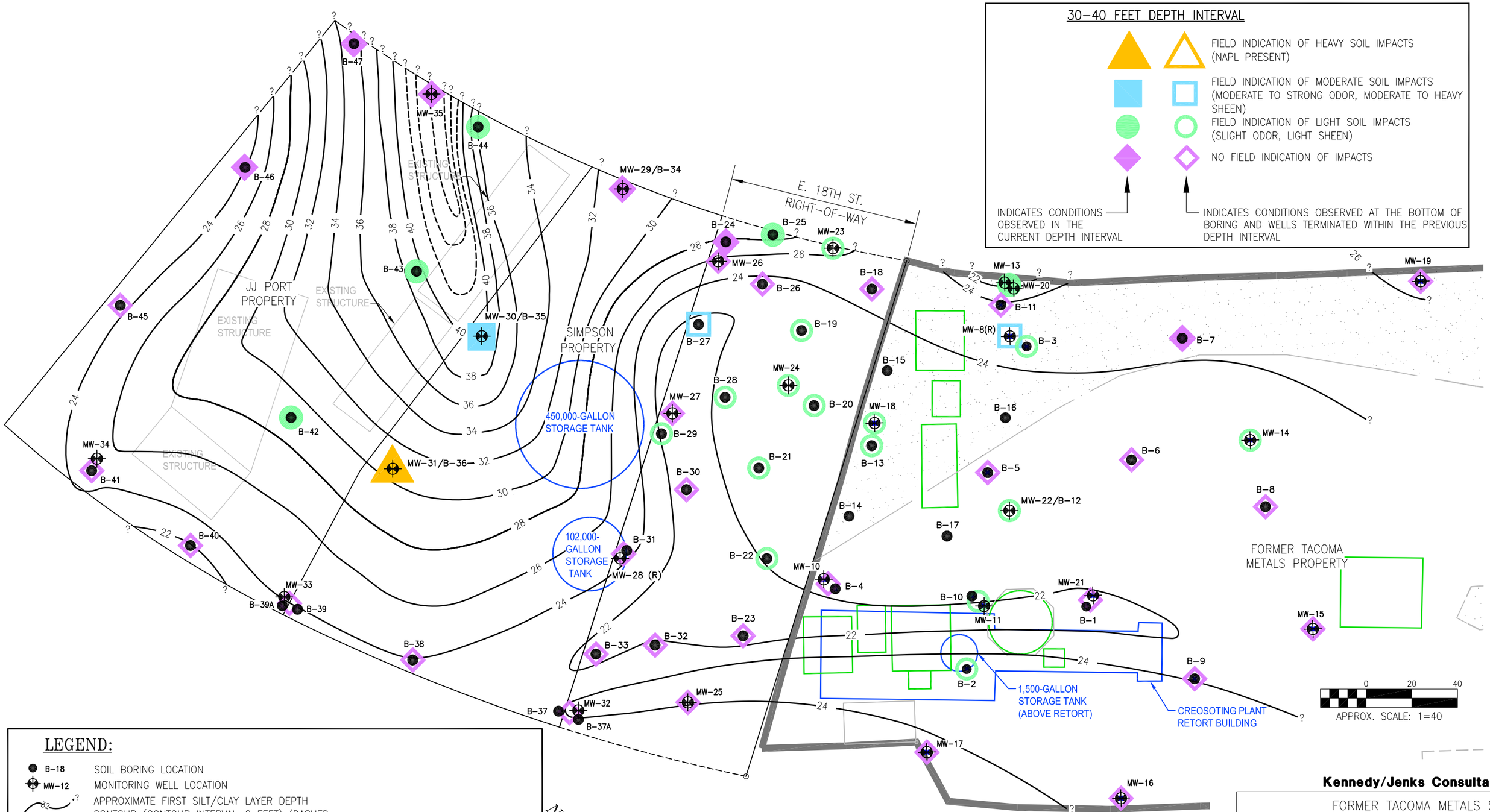
Kennedy/Jenks Consultants

FORMER TACOMA METALS SITE
TACOMA, WA

FORMER CREOSOTING PLANT SITE
SUMMARY OF SUBSURFACE SOIL IMPACTS
20-30 FEET BGS

996098.00\2008 SOURCE\FIG_02C.dwg

FIGURE 2C



LEGEND:

- B-18 — SOIL BORING LOCATION
- MW-12 — MONITORING WELL LOCATION
- 32 — APPROXIMATE FIRST SILT/CLAY LAYER DEPTH CONTOUR (CONTOUR INTERVAL=2 FEET) (DASHED WHERE UNCERTAIN) (FEET BGS)
- FORMER CREOSOTING PLANT FEATURES (APPROXIMATE)
- FORMER COKE PLANT GAS DISTRIBUTION FEATURES (APPROXIMATE) (3–5' ABOVE FORMER CREOSOTING PLANT FEATURES)

NOTE:

HISTORICAL FEATURE LOCATIONS ARE BASED ON HISTORICAL AERIAL AND GROUND-LEVEL PHOTOGRAPHS AND HISTORICAL MAPS. LOCATIONS ARE APPROXIMATE.

NOTES:

1. ALL LOCATIONS ARE APPROXIMATE.
2. BGS = BELOW GROUND SURFACE.
3. THIS MAP SHOWS THE HIGHEST LEVEL OF SOIL IMPACTS OBSERVED WITHIN THE INDICATED DEPTH INTERVAL. THESE CONDITIONS ARE NOT NECESSARILY REPRESENTATIVE OF THE ENTIRE DEPTH INTERVAL.
4. DEPTHS ARE IN FEET BGS NORMALIZED TO AN ELEVATION DATUM OF 10 FEET (THE APPROXIMATE EXISTING SURFACE ELEVATION AT THE FORMER CREOSOTING PLANT STRUCTURE).
5. NAPL = NON-AQUEOUS PHASE LIQUID.
6. FIGURE WAS MODIFIED FROM THE ORIGINAL (2008) AT ECOLOGY'S REQUEST.

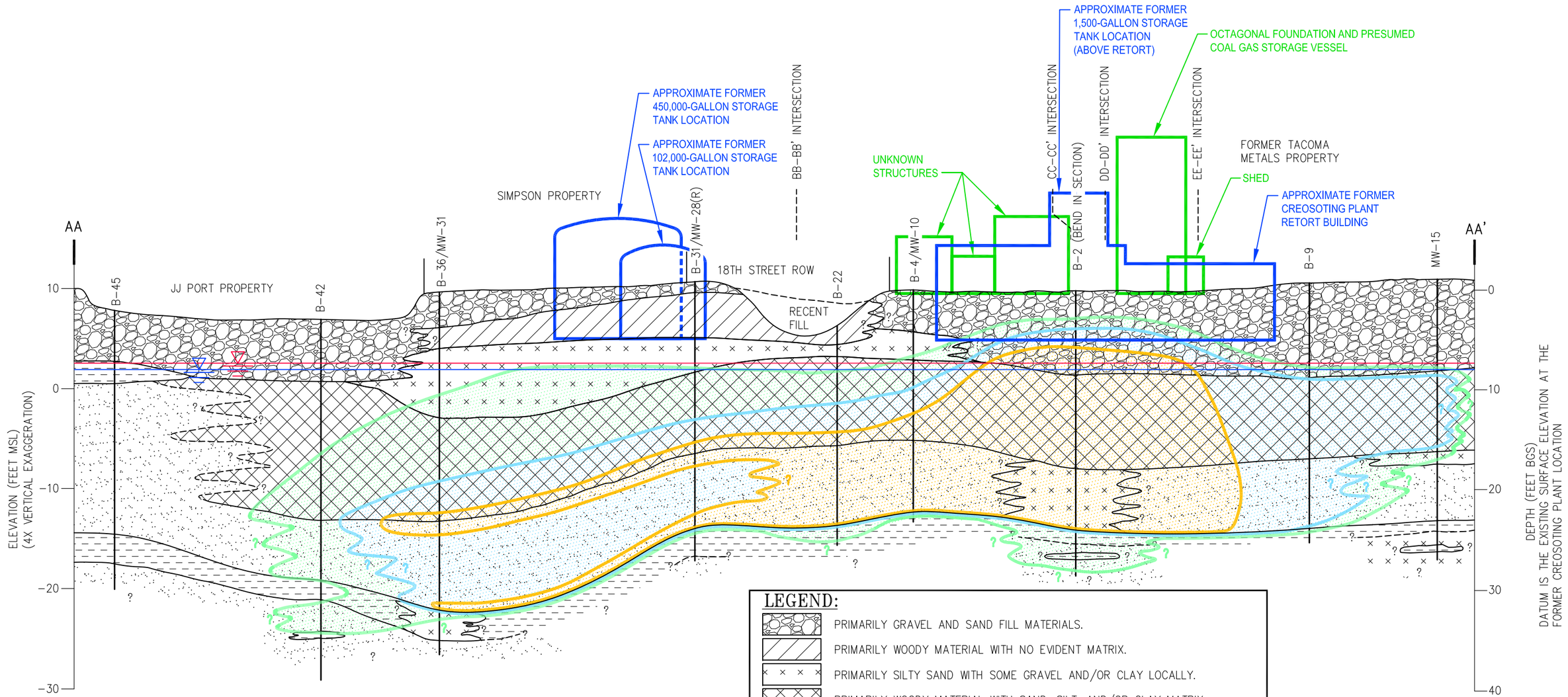
Kennedy/Jenks Consultants

FORMER TACOMA METALS SITE
TACOMA, WA

FORMER CREOSOTING PLANT SITE
SUMMARY OF SUBSURFACE SOIL IMPACTS
30-40 FEET BGS

996098.00\2008 SOURCE\FIG_02D.dwg

FIGURE 2D



NOTES:

1. REFER TO FIGURE 1 FOR CROSS SECTION LOCATIONS.
2. ALL LOCATIONS AND DEPTHS ARE APPROXIMATE.
3. MSL = FEET ABOVE MEAN SEA LEVEL (NGVD 1929).
4. NAPL = NON–AQUEOUS PHASE LIQUID.
5. BGS = BELOW GROUND SURFACE.
6. FIGURE WAS MODIFIED FROM THE ORIGINAL (2008) AT ECOLOGY'S REQUEST

APPROX. SCALE: 1=40 HORIZONTAL (0, 20, 40)

APPROX. SCALE: 1=10 VERTICAL (0, 5, 10)

LEGEND:

- PRIMARILY GRAVEL AND SAND FILL MATERIALS.
- PRIMARILY WOODY MATERIAL WITH NO EVIDENT MATRIX.
- PRIMARILY SILTY SAND WITH SOME GRAVEL AND/OR CLAY LOCALLY.
- PRIMARILY WOODY MATERIAL WITH SAND, SILT, AND/OR CLAY MATRIX.
- PRIMARILY SAND WITH SOME SILT LOCALLY.
- PRIMARILY CLAY AND SILT WITH SOME SAND LOCALLY.
- APPROXIMATE AREA OF FIELD INDICATION OF HEAVY SOIL IMPACTS (NAPL PRESENT).
- APPROXIMATE AREA OF FIELD INDICATION OF MODERATE SOIL IMPACTS (MODERATE TO STRONG ODOR, MODERATE TO HEAVY SHEEN).
- APPROXIMATE AREA OF FIELD INDICATION OF LIGHT SOIL IMPACTS (SLIGHT ODOR, LIGHT SHEEN).
- APPROXIMATE POTENTIOMETRIC SURFACE ELEVATION AT HIGH TIDE, 11 APRIL 2008.
- APPROXIMATE POTENTIOMETRIC SURFACE ELEVATION AT LOW TIDE, 11 APRIL 2008.
- FORMER CREOSOTING PLANT FEATURES (APPROXIMATE)
- FORMER COKE PLANT GAS DISTRIBUTION FEATURES (APPROXIMATE) (3–5' ABOVE FORMER CREOSOTING PLANT FEATURES)

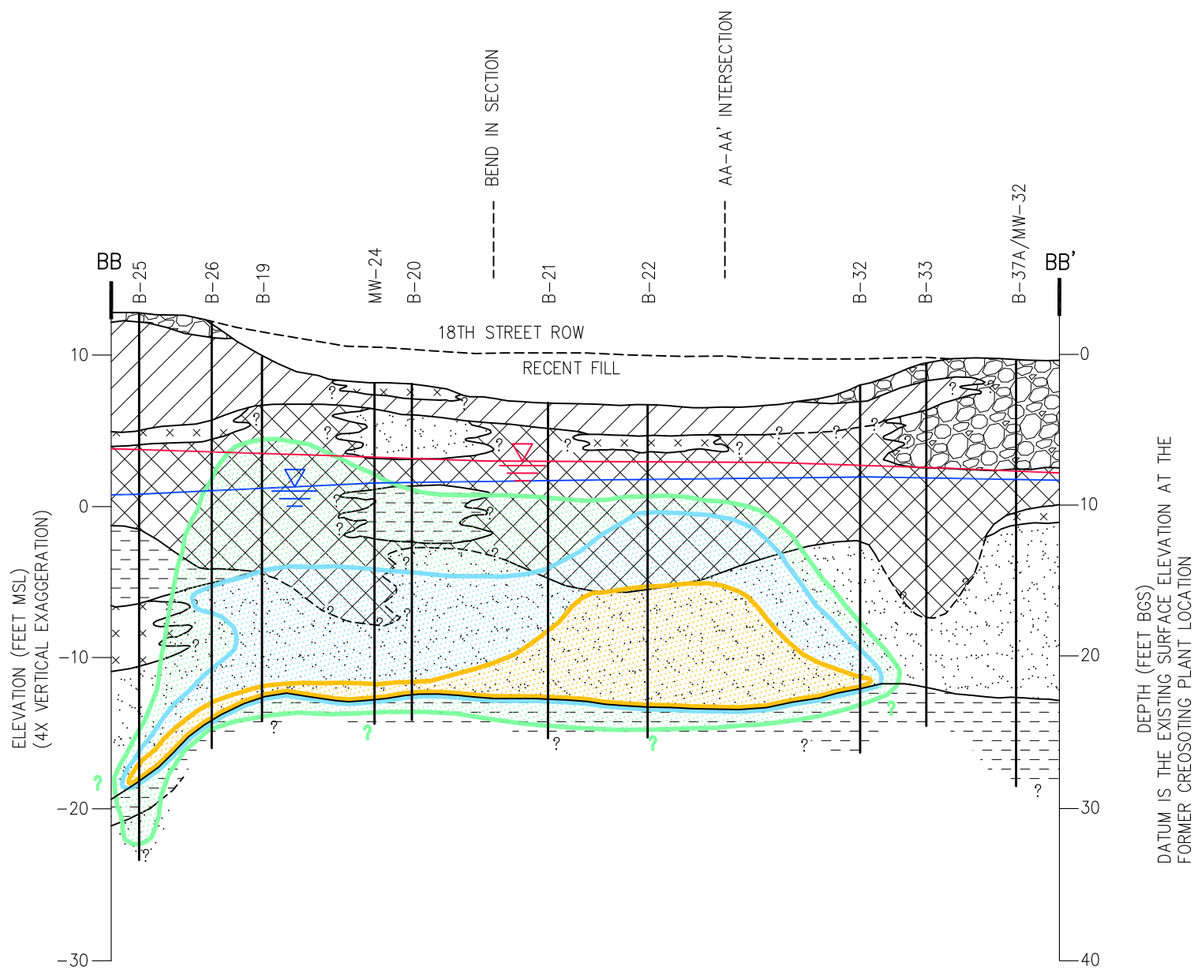
Kennedy/Jenks Consultants

FORMER TACOMA METALS SITE
TACOMA, WA

FORMER CREOSOTING PLANT SITE GENERALIZED CROSS SECTION AA-AA'

996098.00\2008 SOURCE\FIG_03A.dwg

FIGURE 3A



LEGEND:

- PRIMARILY GRAVEL AND SAND FILL MATERIALS.
- PRIMARILY WOODY MATERIAL WITH NO EVIDENT MATRIX.
- PRIMARILY SILTY SAND WITH SOME GRAVEL AND/OR CLAY LOCALLY.
- PRIMARILY WOODY MATERIAL WITH SAND, SILT, AND/OR CLAY MATRIX.
- PRIMARILY SAND WITH SOME SILT LOCALLY.
- PRIMARILY CLAY AND SILT WITH SOME SAND LOCALLY.
- APPROXIMATE AREA OF FIELD INDICATION OF HEAVY SOIL IMPACTS (NAPL PRESENT).
- APPROXIMATE AREA OF FIELD INDICATION OF MODERATE SOIL IMPACTS (MODERATE TO STRONG ODOR, MODERATE TO HEAVY SHEEN).
- APPROXIMATE AREA OF FIELD INDICATION OF LIGHT SOIL IMPACTS (SLIGHT ODOR, LIGHT SHEEN).
- APPROXIMATE POTENTIOMETRIC SURFACE ELEVATION AT HIGH TIDE, 11 APRIL 2008.
- APPROXIMATE POTENTIOMETRIC SURFACE ELEVATION AT LOW TIDE, 11 APRIL 2008.

NOTES:

1. REFER TO FIGURE 1 FOR CROSS SECTION LOCATIONS.
2. ALL LOCATIONS AND DEPTHS ARE APPROXIMATE.
3. MSL = FEET ABOVE MEAN SEA LEVEL (NGVD 1929).
4. NAPL = NON-AQUEOUS PHASE LIQUID.
5. BGS = BELOW GROUND SURFACE.
6. FIGURE WAS MODIFIED FROM THE ORIGINAL (2008) AT ECOLOGY'S REQUEST

0 20 40

APPROX. SCALE: 1=40 HORIZONTAL

0 5 10

APPROX. SCALE: 1=10 VERTICAL

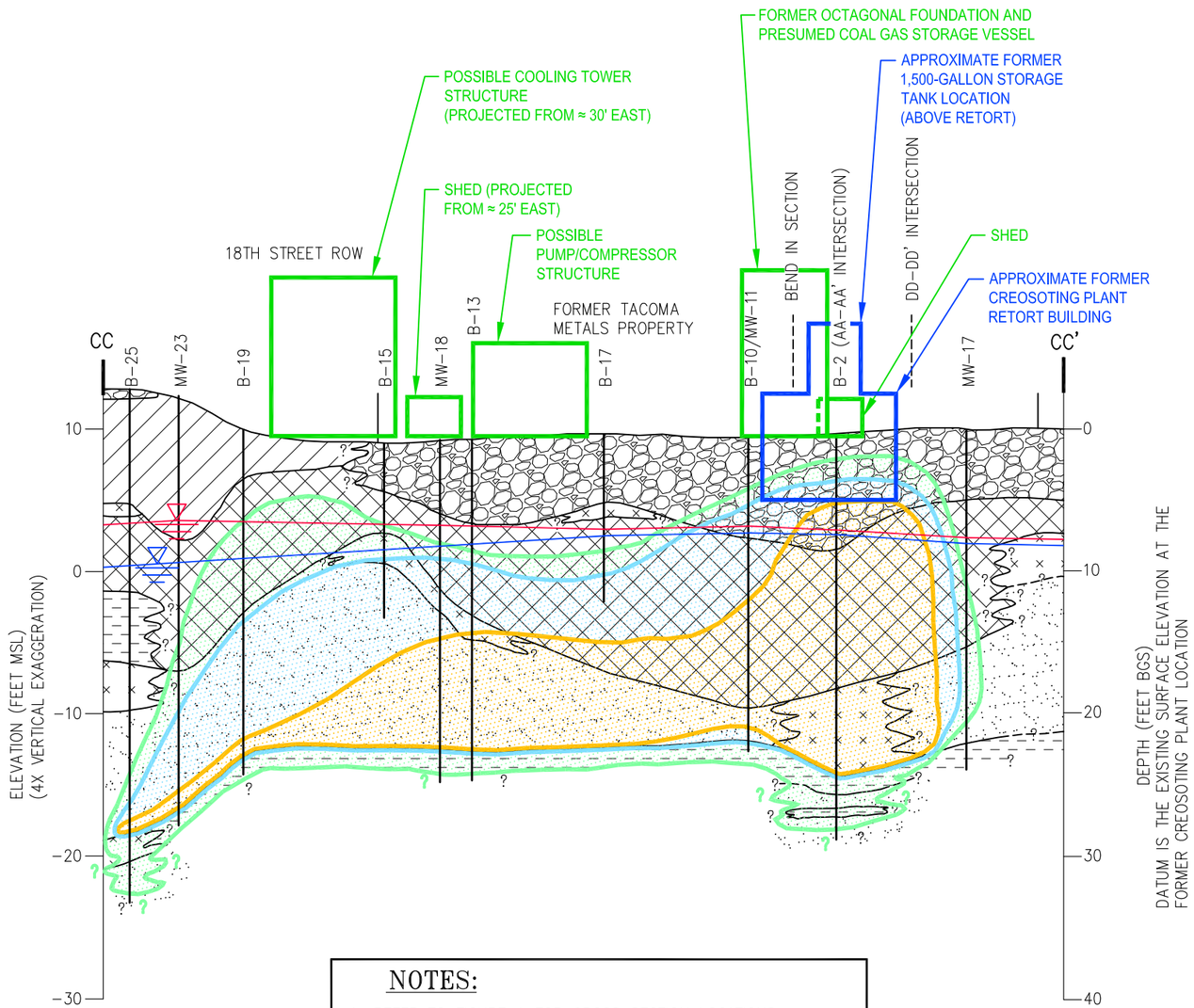
Kennedy/Jenks Consultants

FORMER TACOMA METALS SITE
TACOMA, WA

FORMER CREOSOTING PLANT SITE
GENERALIZED CROSS SECTION BB-BB'

996098.00\2008 SOURCE\FIG_03B.dwg

FIGURE 3B



LEGEND:

- PRIMARILY GRAVEL AND SAND FILL MATERIALS.
- PRIMARILY WOODY MATERIAL WITH NO EVIDENT MATRIX.
- PRIMARILY SILTY SAND WITH SOME GRAVEL AND/OR CLAY LOCALLY.
- PRIMARILY WOODY MATERIAL WITH SAND, SILT, AND/OR CLAY MATRIX.
- PRIMARILY SAND WITH SOME SILT LOCALLY.
- PRIMARILY CLAY AND SILT WITH SOME SAND LOCALLY.
- APPROXIMATE AREA OF FIELD INDICATION OF HEAVY SOIL IMPACTS (NAPL PRESENT).
- APPROXIMATE AREA OF FIELD INDICATION OF MODERATE SOIL IMPACTS (MODERATE TO STRONG ODOR, MODERATE TO HEAVY SHEEN).
- APPROXIMATE AREA OF FIELD INDICATION OF LIGHT SOIL IMPACTS (SLIGHT ODOR, LIGHT SHEEN).
- APPROXIMATE POTENTIOMETRIC SURFACE ELEVATION AT HIGH TIDE, 11 APRIL 2008.
- APPROXIMATE POTENTIOMETRIC SURFACE ELEVATION AT LOW TIDE, 11 APRIL 2008.
- FORMER CREOSOTING PLANT FEATURES (APPROXIMATE)
- FORMER COKE PLANT GAS DISTRIBUTION FEATURES (APPROXIMATE) (3-5' ABOVE FORMER CREOSOTING PLANT FEATURES)

NOTES:

1. REFER TO FIGURE 1 FOR CROSS SECTION LOCATIONS.
2. ALL LOCATIONS AND DEPTHS ARE APPROXIMATE.
3. MSL = FEET ABOVE MEAN SEA LEVEL (NGVD 1929).
4. NAPL = NON-AQUEOUS PHASE LIQUID.
5. BGS = BELOW GROUND SURFACE.
6. FIGURE WAS MODIFIED FROM THE ORIGINAL (2008) AT ECOLOGY'S REQUEST

0 20 40
APPROX. SCALE: 1=40 HORIZONTAL

0 5 10
APPROX. SCALE: 1=10 VERTICAL

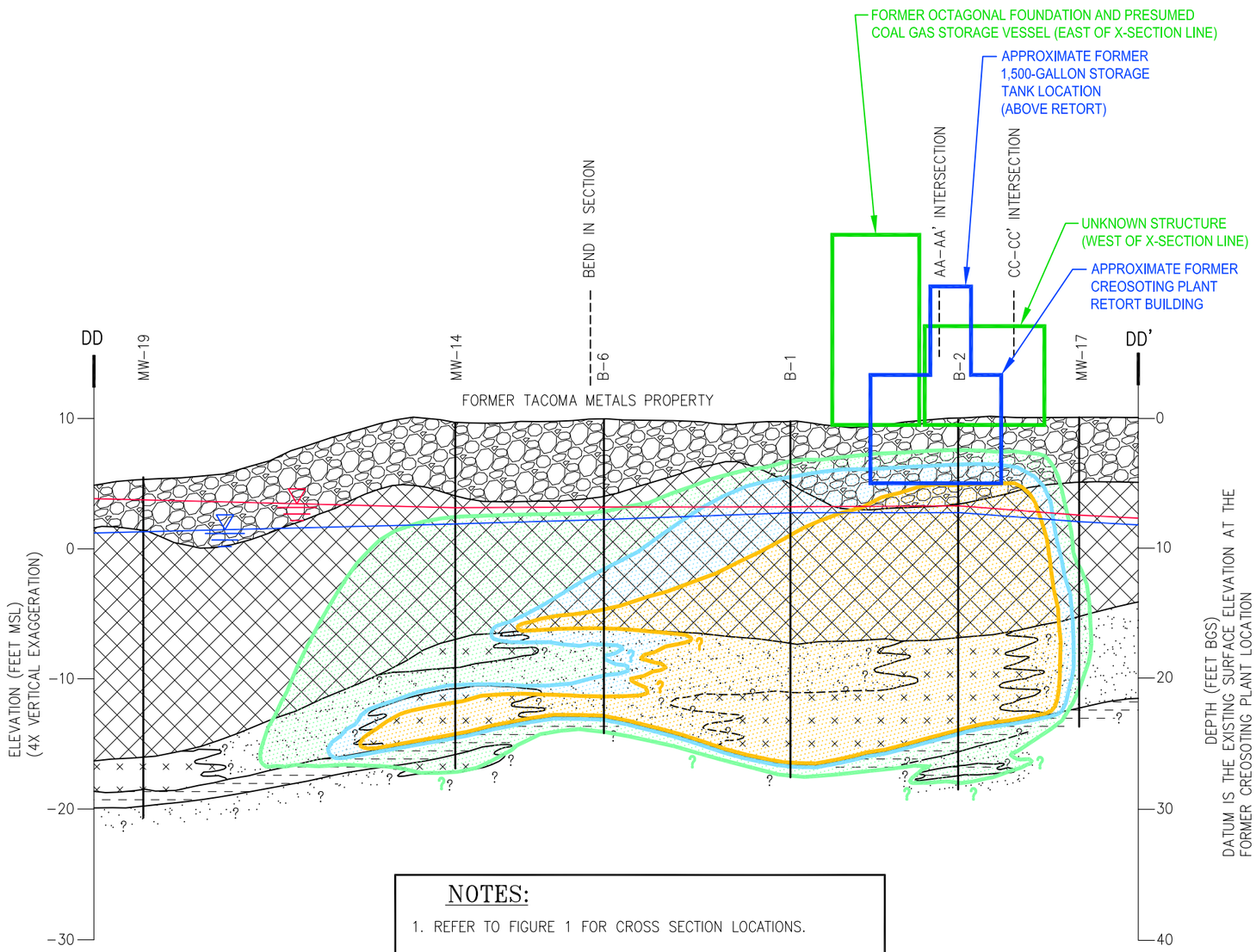
Kennedy/Jenks Consultants

FORMER TACOMA METALS SITE
TACOMA, WA

FORMER CREOSOTING PLANT SITE GENERALIZED CROSS SECTION CC-CC'

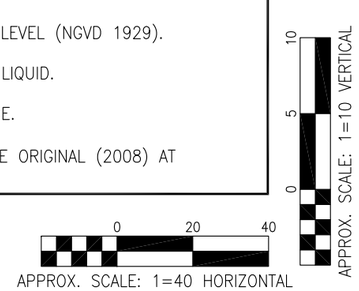
996098.00\2008 SOURCE\FIG_03C.dwg

FIGURE 3C



NOTES:

1. REFER TO FIGURE 1 FOR CROSS SECTION LOCATIONS.
2. ALL LOCATIONS AND DEPTHS ARE APPROXIMATE.
3. MSL = FEET ABOVE MEAN SEA LEVEL (NGVD 1929).
4. NAPL = NON–AQUEOUS PHASE LIQUID.
5. BGS = BELOW GROUND SURFACE.
6. FIGURE WAS MODIFIED FROM THE ORIGINAL (2008) AT ECOLOGY'S REQUEST



LEGEND:

- PRIMARILY GRAVEL AND SAND FILL MATERIALS.
- PRIMARILY WOODY MATERIAL WITH NO EVIDENT MATRIX.
- PRIMARILY SILTY SAND WITH SOME GRAVEL AND/OR CLAY LOCALLY.
- PRIMARILY WOODY MATERIAL WITH SAND, SILT, AND/OR CLAY MATRIX.
- PRIMARILY SAND WITH SOME SILT LOCALLY.
- PRIMARILY CLAY AND SILT WITH SOME SAND LOCALLY.
- APPROXIMATE AREA OF FIELD INDICATION OF HEAVY SOIL IMPACTS (NAPL PRESENT).
- APPROXIMATE AREA OF FIELD INDICATION OF MODERATE SOIL IMPACTS (MODERATE TO STRONG ODOR, MODERATE TO HEAVY SHEEN).
- APPROXIMATE AREA OF FIELD INDICATION OF LIGHT SOIL IMPACTS (SLIGHT ODOR, LIGHT SHEEN).
- APPROXIMATE POTENTIOMETRIC SURFACE ELEVATION AT HIGH TIDE, 11 APRIL 2008.
- APPROXIMATE POTENTIOMETRIC SURFACE ELEVATION AT LOW TIDE, 11 APRIL 2008.
- FORMER CREOSOTING PLANT FEATURES (APPROXIMATE)
- FORMER COKE PLANT GAS DISTRIBUTION FEATURES (APPROXIMATE) (3–5' ABOVE FORMER CREOSOTING PLANT FEATURES)

Kennedy/Jenks Consultants

FORMER TACOMA METALS SITE
TACOMA, WA

FORMER CREOSOTING PLANT SITE
GENERALIZED CROSS SECTION DD-DD'

996098.00\2008 SOURCE\FIG_03D.dwg

FIGURE 3D

Appendix G

RI/FS Site Conceptual Model and Cleanup Alternatives

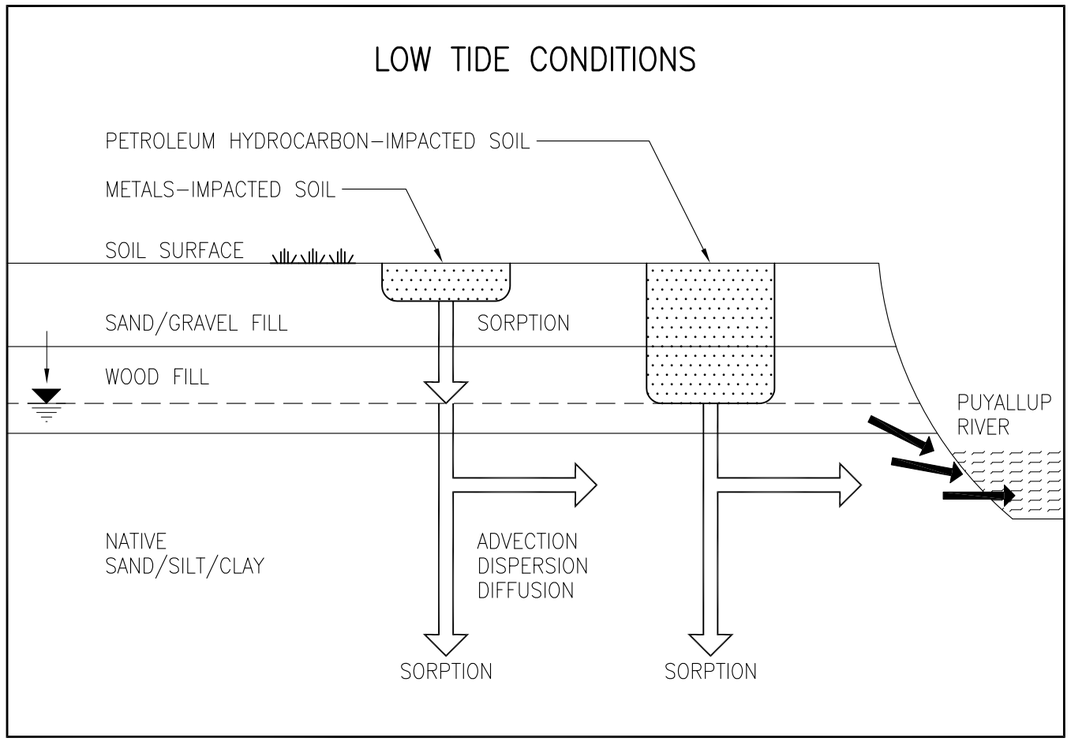
Appendix G: RI/FS Site Conceptual Model and Cleanup Alternatives

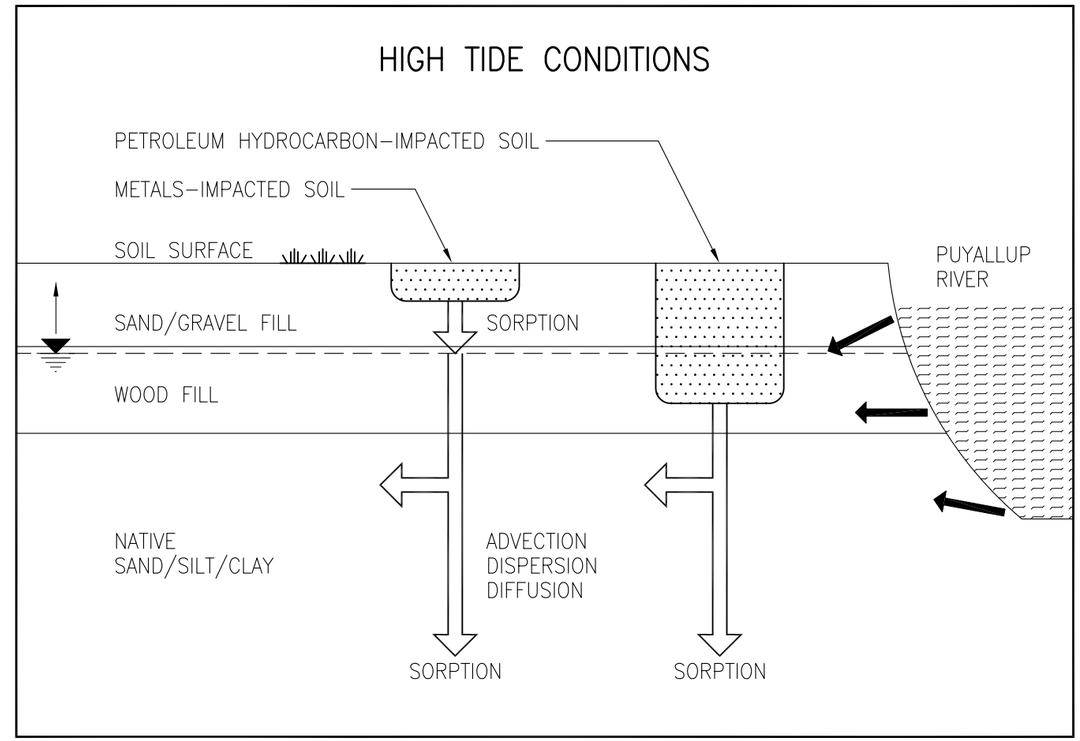
Table of Contents

1) Figure 8-1 Conceptual Model of Chemical Migration

2) Figure 9-1 Proposed Remedial Action Excavation Areas

All materials included in Appendix G are from *Remedial Investigation/Feasibility Study Report* (Kennedy/Jenks Consultants 2001)





LEGEND:

FALLING POTENTIOMETRIC SURFACE

RISING POTENTIOMETRIC SURFACE

GROUNDWATER FLOW PATH

NOTE:

1. THIS FIGURE REPRESENTS THE CONCEPTUAL CONDITIONS ASSUMED FOR CHEMICAL TRANSPORT MODELING. REFER TO FIGURES 3–1, 3–2, AND 3–3 FOR INTERPRETIVE CROSS SECTIONS OF SITE GEOLOGIC CONDITIONS.

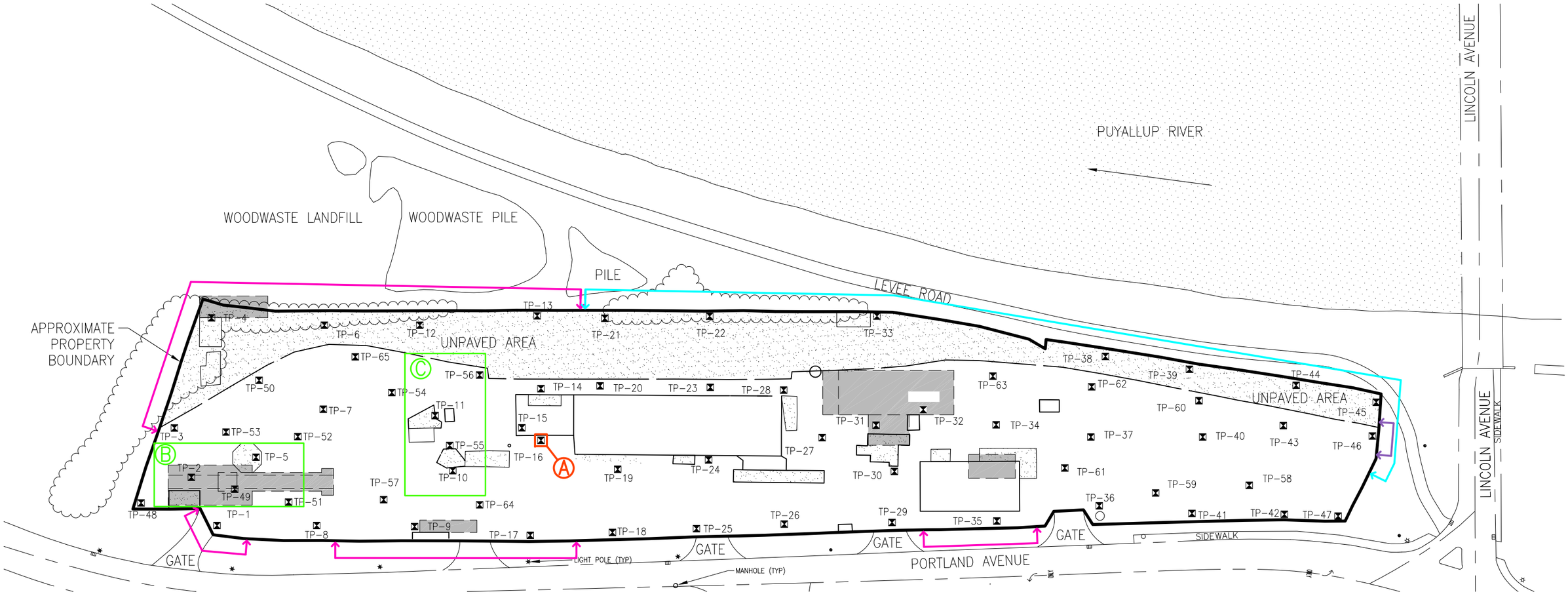
Kennedy/Jenks Consultants

FORMER TACOMA METALS FACILITY
TACOMA, WA

CONCEPTUAL MODEL OF CHEMICAL MIGRATION

996098.00/P01SK008–1

FIGURE 8-1



LEGEND:

- TP-1 — TEST PIT LOCATION
- UNPAVED AREA
- APPROXIMATE PREVIOUS STRUCTURE LOCATION (IDENTIFIED IN HISTORICAL AERIAL PHOTOGRAPHS AND/OR SANBORN MAPS)

NOTES:

1. MAP IS BASED ON SITE SURVEY BY EARTH TECH INC., ON 28 MARCH 2000.
2. REFER TO FIGURE 4-4 FOR CONCENTRATIONS OF PETROLEUM HYDROCARBONS IN SOIL.
3. REFER TO FIGURE 4-1 FOR CONCENTRATIONS OF METALS IN SOIL.

N

0 50 100
SCALE: 1=100

ALTERNATIVES 1, 2, AND 3
LEAD-ACID BATTERY CASINGS AND ASSOCIATED IMPACT SOIL

A — 10ft LONG x 10ft WIDE x 3ft DEEP (AVERAGE) (10 CUBIC YARDS)

TOTAL 10 CUBIC YARDS (APPROXIMATE).

ALTERNATIVES 1, 2, AND 3
PETROLEUM HYDROCARBON-IMPACTED SOIL EXCAVATION AREAS (INCLUDES AREAS OF ANTICIPATED FREE PRODUCT).

B — FORMER CREOSOTING PLANT
150ft LONG x 60ft WIDE x 10ft DEEP (AVERAGE)
(3,333 CUBIC YARDS)

C — WEST OF RED BRICK BUILDING
150ft LONG x 80ft WIDE x 10ft DEEP (AVERAGE)
(4,444 CUBIC YARDS)

TOTAL 7,800 CUBIC YARDS (APPROXIMATE).

ALTERNATIVES 2 AND 3 ONLY
PROPERTY BOUNDARY METALS-IMPACTED SOIL EXCAVATION AREAS (BUFFER ZONE)

930ft — 5ft WIDE x 1ft DEEP (AVERAGE) (172 CUBIC YARDS)

920ft — 5ft WIDE x 3ft DEEP (AVERAGE) (511 CUBIC YARDS)

30ft — 5ft WIDE x AN ADDITIONAL 3ft DEEP (AVERAGE) (17 CUBIC YARDS)

TOTAL 700 CUBIC YARDS (APPROXIMATE).

Kennedy/Jenks Consultants

FORMER TACOMA METALS FACILITY
TACOMA, WA

PROPOSED REMEDIAL ACTION EXCAVATION AREAS

996098.00/P01SK009-1

FIGURE 9-1

Appendix H

Revised Remedial Alternative Costs

Appendix H: Revised Remedial Alternative Costs

Table of Contents

1) Remedial Alternative 1 Revised Costs 2014

2) Remedial Alternative 2 Revised Costs 2014 (Preferred Alternative)

3) Remedial Alternative 3 Revised Costs 2014

REMEDIAL ALTERNATIVE 1 REVISED COSTS 2014
Former Tacoma Metals Site
EXCAVATION / OFFSITE DISPOSAL / ASPHALT CAP / INSTITUTIONAL CONTROLS

Task	Quantity	Unit	Material Unit Cost	Material Extension	Labor Unit Cost	Labor Extension	Lump Sum Price	Total Cost
REMEDIATION COSTS								
Excavate TPH / CPAH impacted soil	10564	CY			3.16	$ 33,382		$ 33,382
Oxygen-releasing compound - Phase I	3,000	LBS	9.00	$ 27,000	0.33	$ 1,000		$ 28,000
Oxygen-releasing compound - Phase II	8,775	LBS	8.00	$ 70,200	1.82	$ 16,000		$ 86,200
Import bank run soil, backfill, compact	12326	CY	14.20	$ 175,029	1.99	$ 24,529		$ 199,558
Import top course soil, grade, compact	2751	CY	20.25	$ 55,708	6.00	$ 16,506		$ 72,214
Pave asphalt cap, low permeability	28,556	SY	8.43	$ 240,727	1.04	$ 29,698		$ 270,425
Stormwater detention system	1	EA	100,000	$ 100,000	125,000	$ 125,000		$ 225,000
Stormwater lift station	1	EA	50,000	$ 50,000	25,000	$ 25,000		$ 75,000
Stormwater treatment system	1	EA	75,000	$ 75,000	25,000	$ 25,000		$ 100,000
Dust control	4	WK	250.00	$ 1,000	1636.25	$ 6,545		$ 7,545
Install signs	10	EA	15.00	$ 150	30.00	$ 300		$ 450
Deed restrictions	1	LS					$ 2,750	$ 2,750
Subtotal Remediation Costs A (A)								**$ 1,100,524**
Contractor overhead and profit	15	% of A					$ 165,079	$ 165,079
Bond and insurance	3	% of A					$ 33,016	$ 33,016
Mobilization/demobilization	5	% of A					$ 55,026	$ 55,026
Sales Tax / Tacoma	8.5	% of A					$ 93,545	$ 93,545
Contingency	10	% of A					$ 110,052	$ 110,052
Subtotal Remediation Costs B (B)								**$ 1,557,242**
Engineering Services	15	% of B					$ 233,586	$ 233,586
Construction management	10	% of B					$ 155,724	$ 155,724
Mobile laboratory	15	DAY			1,500.00	$ 22,500		$ 22,500
Off-site soil transportation/disposal (C)	15,846	TON			32.54	$ 515,629		$ 515,629
Disposal contingency	10	% of C					$ 51,563	$ 51,563
Lead battery casing disposal	1	LS					$ 10,000	$ 10,000
Monitoring well abandon and replace	1	LS					$ 60,000	$ 60,000
TOTAL REMEDIATION COSTS								**$ 2,606,244**
O&M COSTS								
Semi-Annual groundwater (CPOC Wells)	2	EA			4,500.00	$ 9,000		$ 9,000
Semi-Annual laboratory sample analysis	2	EA			15,000.00	$ 30,000		$ 30,000
Annual reporting	1	EA			4,000.00	$ 4,000		$ 4,000
Annual cap inspection / reporting	1	EA			1,000.00	$ 1,000		$ 1,000
Annual well inspection / maintenance	1	EA			5,000.00	$ 5,000		$ 5,000
Subtotal O&M Costs (D)								**$ 49,000**
Project management	15	% of D					$ 7,350	$ 7,350
O&M Contingency	10	% of D					$ 4,900	$ 4,900
TOTAL O&M COSTS (5 YR)								$ 61,250
(present worth i=0.05, n=5, P/A=4.3295)								**$ 265,182**
TOTAL - Based on 2001 cost assumptions								**$ 2,871,000**
REVISED TOTAL - Based on inflation adjustment for 2014								**$ 4,216,160**

Notes:

Present worth calculated using uniform series present worth equation

2013 inflation adjustment calculation [PV / ((1+% inflation)^#Years)] where % inflation=0.03.

REMEDIAL ALTERNATIVE 2 REVISED COSTS 2014 (PREFERRED ALTERNATIVE)
Former Tacoma Metals Site
EXCAVATION / BUFFER/ OFFSITE DISPOSAL / ASPHALT CAP / INSTITUTIONAL CONTROLS

Task	Quantity	Unit	Material Unit Cost	Material Extension	Labor Unit Cost	Labor Extension	Lump Sum Price	Total Cost
REMEDIATION COSTS								
Excavate TPH / CPAH impacted soil	10564	CY			3.16	$ 33,382		$ 33,382
Excavate buffer, grade, compact	700	CY			3.53	$ 2,471		$ 2,471
Oxygen-releasing compound - Phase I	3,000	LBS	9.00	$ 27,000	0.33	$ 1,000		$ 28,000
Oxygen-releasing compound - Phase II	8,775	LBS	8.00	$ 70,200	1.82	$ 16,000		$ 86,200
Import bank run soil, backfill, compact	13,026	CY	14.20	$ 184,969	1.99	$ 25,922		$ 210,891
Import top course soil, grade, compact	2751	CY	20.25	$ 55,708	6.00	$ 16,506		$ 72,214
Pave asphalt cap, low permeability	28,556	SY	8.43	$ 240,727	1.04	$ 29,698		$ 270,425
Stormwater detention system	1	EA	100,000	$ 100,000	125,000	$ 125,000		$ 225,000
Stormwater lift station	1	EA	50,000	$ 50,000	25,000	$ 25,000		$ 75,000
Stormwater treatment system	1	EA	75,000	$ 75,000	25,000	$ 25,000		$ 100,000
Dust control	4	WK	250.00	$ 1,000	1636.25	$ 6,545		$ 7,545
Install signs	10	EA	15.00	$ 150	30.00	$ 300		$ 450
Deed restrictions	1	LS					$ 2,750	$ 2,750
Subtotal Remediation Costs A (A)								**$ 1,114,328**
Contractor overhead and profit	15	% of A					$ 167,149	$ 167,149
Bond and insurance	3	% of A					$ 33,430	$ 33,430
Mobilization/demobilization	5	% of A					$ 55,716	$ 55,716
Sales Tax / Tacoma	8.5	% of A					$ 94,718	$ 94,718
Contingency	10	% of A					$ 111,433	$ 111,433
Subtotal Remediation Costs B (B)								**$ 1,576,774**
Engineering Services	15	% of B					$ 236,516	$ 236,516
Construction management	10	% of B					$ 157,677	$ 157,677
Mobile laboratory	15	DAY			1,500.00	$ 22,500		$ 22,500
Off-site soil transportation/disposal (C)	15,846	TON			32.54	$ 515,629		$ 515,629
Disposal contingency	10	% of C					$ 51,563	$ 51,563
Lead battery casing disposal	1	LS					$ 10,000	$ 10,000
Monitoring well abandon and replace	1	LS					$ 60,000	$ 60,000
TOTAL REMEDIATION COSTS								**$ 2,630,660**
O&M COSTS								
Semi-Annual groundwater (CPOC Wells)	2	EA			4,500.00	$ 9,000		$ 9,000
Semi-Annual laboratory sample analysis	2	EA			15,000.00	$ 30,000		$ 30,000
Annual reporting	1	EA			4,000.00	$ 4,000		$ 4,000
Annual cap inspection / reporting	1	EA			1,000.00	$ 1,000		$ 1,000
Annual well inspection / maintenance	1	EA			5,000.00	$ 5,000		$ 5,000
Subtotal O&M Costs (D)								**$ 49,000**
Project management	15	% of D					$ 7,350	$ 7,350
O&M Contingency	10	% of D					$ 4,900	$ 4,900
TOTAL O&M COSTS (5 YR)								$ 61,250
(present worth i=0.05, n=5, P/A=4.3295)	4.3295	P/A						**$ 265,182**
TOTAL - Based on 2001 cost assumptions								**$ 2,896,000**
REVISED TOTAL - Based on inflation adjustment for 2014								**$ 4,252,874**

Notes:
Present worth calculated using uniform series present worth equation
2013 inflation adjustment calculation [PV / ((1+% inflation)^#Years)] where % inflation=0.03.

REMEDIAL ALTERNATIVE 3 REVISED COSTS 2014
Former Tacoma Metals Site
EXCAVATION / ONSITE TREATMENT / ASPHALT CAP / INSTITUTIONAL CONTROLS

Task	Quantity	Unit	Material Unit Cost	Material Extension	Labor Unit Cost	Labor Extension	Lump Sum Price	Total Cost
REMEDIATION COSTS								
Excavate TPH / CPAH impacted soil	10564	CY			3.16	$ 33,382		$ 33,382
Screen TPH / CPAH impacted soil	10564	CY			3.01	$ 31,794		$ 31,794
Thermal desorption of TPH / CPAH soil	9897	CY			82.50	$ 816,530		$ 816,530
Excavate lead impacted soil	11,047	CY			3.16	$ 34,909		$ 34,909
Screen lead impacted soil	11,047	CY			3.01	$ 33,247		$ 33,247
Stabilization of lead impacted soil	16,071	TON			21.00	$ 337,481		$ 337,481
Oxygen-releasing compound - Phase I	3,000	LBS	9.00	$ 27,000	0.33	$ 1,000		$ 28,000
Oxygen-releasing compound - Phase II	8,775	LBS	8.00	$ 70,200	1.82	$ 16,000		$ 86,200
Backfill and compact treated soil	20,944	CY			2.19	$ 45,868		$ 45,868
Import bank run soil, backfill, compact	2444	CY	14.20	$ 34,705	1.99	$ 4,864		$ 39,568
Import top course soil, grade, compact	2736	CY	20.25	$ 55,404	6.00	$ 16,416		$ 71,820
Pave asphalt cap, low permeability	28,556	SY	8.43	$ 240,727	1.04	$ 29,698		$ 270,425
Stormwater detention system	1	EA	100,000	$ 100,000	125,000	$ 125,000		$ 225,000
Stormwater lift station	1	EA	50,000	$ 50,000	25,000	$ 25,000		$ 75,000
Stormwater treatment system	1	EA	75,000	$ 75,000	25,000	$ 25,000		$ 100,000
Dust control	8	WK	250.00	$ 2,000	1636.25	$ 13,090		$ 15,090
Install signs	10	EA	15.00	$ 150	30.00	$ 300		$ 450
Deed restrictions	1	LS					$ 2,750	$ 2,750
Subtotal Remediation Costs A (A)								**$ 2,247,514**
Contractor overhead and profit	15	% of A					$ 337,127	$ 337,127
Bond and insurance	3	% of A					$ 67,425	$ 67,425
Mobilization/demobilization	5	% of A					$ 112,376	$ 112,376
Sales Tax / Tacoma	8.5	% of A					$ 191,039	$ 191,039
Contingency	10	% of A					$ 224,751	$ 224,751
Subtotal Remediation Costs B (B)								**$ 3,180,232**
Engineering Services	15	% of B					$ 477,035	$ 477,035
Construction management	10	% of B					$ 318,023	$ 318,023
Mobile laboratory	15	DAY			1,500.00	$ 22,500		$ 22,500
Off-site debris transportation/disposal (C)	1,000	TON			32.54	$ 32,540		$ 32,540
Disposal contingency	10	% of C					$ 3,254	$ 3,254
Lead battery casing disposal	1	LS					$ 10,000	$ 10,000
Monitoring well abandon and replace	1	LS					$ 60,000	$ 60,000
TOTAL REMEDIATION COSTS								**$ 4,043,584**
O&M COSTS								
Semi-Annual groundwater (CPOC Wells)	2	EA			4,500.00	$ 9,000		$ 9,000
Semi-Annual laboratory sample analysis	2	EA			15,000.00	$ 30,000		$ 30,000
Annual reporting	1	EA			4,000.00	$ 4,000		$ 4,000
Annual cap inspection / reporting	1	EA			1,000.00	$ 1,000		$ 1,000
Annual well inspection / maintenance	1	EA			5,000.00	$ 5,000		$ 5,000
Subtotal O&M Costs (D)								**$ 49,000**
Project management	15	% of D					$ 7,350	$ 7,350
O&M Contingency	10	% of D					$ 4,900	$ 4,900
TOTAL O&M COSTS (5 YR)								$ 61,250
(present worth i=0.05, n=5, P/A=4.3295)								**$ 265,182**
TOTAL - Based on 2001 cost assumptions								**$ 4,309,000**
REVISED TOTAL - Based on inflation adjustment for 2014								**$ 6,327,912**

Notes:

Present worth calculated using uniform series present worth equation

2013 inflation adjustment calculation [PV / ((1+% inflation)^#Years)] where % inflation=0.03.

Appendix I

Borings and Well Construction Logs

Appendix I: Appendix I: Boring and Well Construction Logs

Table of Contents

1) Monitoring Well Construction Details

2) Boring and Well Logs

MONITORING WELL CONSTRUCTION DETAILS
Former Tacoma Metals Facility

Well Designation	Previous Designation[a]	Date of Installation	Casing Diameter/ Construction	Nominal Borehole Diameter	Top of PVC Casing Elevation (feet)[b]	Total Well Depth (feet)	Length of Screen (feet)	Slot Size (inch)
On-Property Wells								
MW-1	NA[c]	8/25/1992[d]	2-inch / PVC	9-inch	12.23	16.5	6	0.010
MW-2	NA	8/25/1992[d]	2-inch / PVC	9-inch	12.04	16.5	6	0.010
MW-3(D)[e]	MW-3	8/26/1992[d]	2-inch / PVC	9-inch	NA	16.5	6	0.010
MW-4(R)[f]	NMW-2	9-May-00	2-inch / PVC	9-inch	12.55	22.8	17.8	0.010
MW-5	NA	8/27/1992[d]	2-inch / PVC	9-inch	10.90	16.5	6	0.010
MW-6	NA	8/26/1992[d]	2-inch / PVC	9-inch	10.07	16.5	6	0.010
MW-7	NA	9/11/1992[d]	2-inch / PVC	9-inch	9.45	16.5	6	0.010
MW-8(R)[g]	NMW-3	9-May-00	2-inch / PVC	9-inch	11.12	23.6	18.6	0.010
MW-9	NMW-1	9-May-00	2-inch / PVC	9-inch	13.61	23.5	18.5	0.010
MW-10	NMW-4	10-Nov-00	2-inch / PVC	9-inch	9.39	20	12	0.010
MW-11	NMW-5	10-Nov-00	2-inch / PVC	9-inch	9.47	20	14	0.020
MW-12	NMW-6	10-Nov-00	2-inch / PVC	9-inch	10.80	20	12	0.020
MW-13	NA	26-Jun-02	2-inch / PVC	9-inch	9.84	18.5	10	0.010
MW-14	NA	26-Feb-03	2-inch / PVC	9-inch	9.77	24	10	0.010
MW-15	NA	28-Feb-03	2-inch / PVC	9-inch	10.49	26.3	10	0.010
MW-16	NA	28-Feb-03	2-inch / PVC	9-inch	9.72	26.8	10	0.010
MW-17	NA	28-Feb-03	2-inch / PVC	9-inch	9.57	23.2	10	0.010
MW-18	NA	27-Feb-03	2-inch / PVC	9-inch	11.79	22.7	10	0.010
MW-19	NA	27-Feb-03	2-inch / PVC	9-inch	10.78	24.2	10	0.010
MW-20	NA	27-Feb-03	2-inch / PVC	9-inch	10.21	27	5	0.010
MW-21	NA	28-Feb-03	2-inch / PVC	9-inch	9.47	21.8	10	0.010
MW-22	NA	1-Dec-03	2-inch / PVC	9-inch	9.51	23.3	10	0.010
Off-Property Wells								
MW-23	NA	29-Mar-04	2-inch / PVC	9-inch	14.35	30	10	0.010
MW-24	NA	29-Mar-04	2-inch / PVC	9-inch	10.58	23	10	0.010
MW-25	NA	29-Mar-04	2-inch / PVC	9-inch	11.24	24	10	0.010
MW-26	NA	5-Apr-05	2-inch / PVC	9-inch	12.52	28.5	10	0.010
MW-27	NA	5-Apr-05	2-inch / PVC	9-inch	11.06	26.8	10	0.010
MW-28(D)[h]	MS-28	5-Apr-05	2-inch / PVC	9-inch	10.43	26	10	0.010
MW-28(R)[h]	NA	15-Feb-06	2-inch / PVC	9-inch	10.43	24.25	10	0.010
MW-29	NA	15-Feb-06	2-inch / PVC	9-inch	11.12	32.5	10	0.010
MW-30	NA	15-Feb-06	2-inch / PVC	9-inch	10.05	41	15	0.010
MW-31	NA	15-Feb-06	2-inch / PVC	9-inch	9.38	33	10	0.010
MW-32	NA	29-Feb-08	2-inch / PVC	9-inch	9.26	24.5	10	0.010
MW-33	NA	28-Feb-08	2-inch / PVC	9-inch	9.24	24.5	10	0.010
MW-34	NA	28-Feb-08	2-inch / PVC	9-inch	9.62	25.6	10	0.010
MW-35	NA	28-Feb-08	2-inch / PVC	9-inch	7.95	50.5	10	0.010

Notes:

(a) Wells installed in 2000 by Kennedy/Jenks Consultants were initially designated NMW-# but were subsequently numbered in sequential order with the existing site monitoring wells.

(b) Elevations measured at northern side of PVC casing. Vertical elevations (NGVD 29) based on well surveys performed by KPG, Inc. (previously Earth Tech, Inc.) on 28 March 2000, 21 November 2000, 13 March 2003, 31 December 2003, 14 April 2004, 21 April 2005, 29 March 2006, and 11 April 2008.

(c) NA = Not applicable.

(d) Wells not installed by Kennedy/Jenks Consultants; boring and well construction logs unavailable.

(e) MW-3(D) was originally installed on 26 August 1992 by Pacific Groundwater Group. MW-3(D) was demolished (D) by a former Tacoma Metals site tenant.

(f) MW-4 was originally installed on 26 August 1992 by Pacific Groundwater Group. MW-4(R) was replaced (R) 9 May 2000 by Kennedy/Jenks Consultants.

(g) MW-8 was originally installed on 25 August 1992 by Pacific Groundwater Group. MW-8(R) was replaced (R) 9 May 2000 by Kennedy/Jenks Consultants.

(h) MW-28 was initially installed on 5 April 2005, but was subsequently destroyed (D) by a contractor during construction of the Puyallup River South Side Channel. MW-28(D) was abandoned and replaced with MW-28(R) on 15 February 2006.

PVC - Polyvinyl chloride (Schedule 40)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION	Cresoting Plant Retort Area
DRILLING COMPANY	Cascade
DRILLER	James
DRILLING METHOD(S)	HSA
DRILL BIT(S) SIZE	9-inch OD
ISOLATION CASING	N/A — FROM N/A TO N/A FT.
BLANK CASING	N/A — FROM N/A TO N/A FT.
SLOTTED CASING	N/A — FROM N/A TO N/A FT.
SIZE AND TYPE OF FILTER PACK	N/A — FROM N/A TO N/A FT.
SEAL	Pure Gold Bentonite Chips — FROM 2 TO 27 FT.
GROUT	Concrete — FROM 0 TO 2 FT.

Boring Name	B-1
Project Name	Former Tacoma Metals
Project Number	996098.00
ELEVATION AND DATUM	
TOTAL DEPTH	27.0 ft. bgs
DATE STARTED	6/25/02
DATE COMPLETED	6/25/02
INITIAL WATER DEPTH (FT)	11.0
LOGGED BY	DKM
SAMPLING METHODS	Split Spoon
WELL COMPLETION	☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	OVA	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
SS	1	30 15 6				>2000		SW	**Well-graded SAND with gravel** Gray/brown, ~50% medium sand, 40-45% fine- to medium- gravel, some silt, no odor, no sheen.
SS	1	2 2 7		B1-4		82.8			
SS	1.5	10 11 14	5			>2000			**WOOD DEBRIS with SILT or SAND matix** Dark gray to black, wood debris typically with 5-10% silt and fine sand matrix overall, locally matrix is <5% to 20%, moist to wet below ~11 feet, very strong creosote odor, heavy sheen with NAPL blebs visible on water surface in sheen test and on wood surfaces in sampler.
SS	1.5	3 4 6		B1-7		>2000			
SS	1.5	4 9 15		B1-9					
SS	1.5	15 32 29	10	B1-10.5		457		Wood	
SS	1.5	7 14 24		B1-11		328			
SS	1	9 50-5				>2000			
SS	0.2	19 34 29	15	B1-16		1400			
SS	1.5	5 13 14		B1-18		>2000		SP	**Poorly graded SAND** Dark gray, medium sand with up to 5% fibrous wood debris and some silt, wet, moderate to strong creosote odor, product blebs visible on water suface in sheen test.
SS	1.5	2 3 7	20	B1-19		37.9			
SS	1.5	3 3 4		B1-20.5		>2000			
SS	1.5	6 22 24		B1-22		>2000		SP/ SM	**Poorly graded SAND with silt** Gray to brown, fine- to medium- sand with 5-30% silt (locally variable) generally fining downward, wet, strong creosote odor, heavy sheen with NAPL blebs visible on water surface in sheen test and on soil surface in sampler.
SS	1.5	3 3 3	25	B1-24		>2000			
SS	1.5	3 3 6		B1-25.5 B1-26 B1-27		>2000		ML/ CL	**Clayey SILT** Gray/brown, clayey silt, stiff, wet, no evident odor, no sheen.

KJ PNW JUNE 2002 LOGS.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: North Part of Creosoting Plant	**Boring Name:** B-2
DRILLING COMPANY: Cascade	DRILLER: James
DRILLING METHOD(S): HSA	DRILL BIT(S) SIZE: 9-inch OD
	Project Name: Former Tacoma Metals
	Project Number: 996098.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.
BLANK CASING: N/A	FROM N/A TO N/A FT.
SLOTTED CASING: N/A	FROM N/A TO N/A FT.
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.
SEAL: Pure Gold Bentonite Chips	FROM 2 TO 28.5 FT.
GROUT: Concrete	FROM 0 TO 2 FT.
ELEVATION AND DATUM	TOTAL DEPTH: 28.5 ft. bgs
DATE STARTED: 6/25/02	DATE COMPLETED: 6/25/02
INITIAL WATER DEPTH (FT): 11.0	
LOGGED BY: DKM	
SAMPLING METHODS: Split Spoon	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	OVA	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
SS	0.1	100			19	GW/ GM	**Well-graded GRAVEL with silt and sand** Gray, sand/silt/gravel mixture, locally includes minor wood debris with creosote odor, otherwise no odor, no sheen.
SS	0.1	14 14 12			94.3		
SS	1.5	15 11 11	5	B2-5	96.6	SP	**Poorly graded SAND** Brown, fine- to medium- sand with some silt, moist, moderate creosote odor and light sheen 3.5-6.5 feet, strong creosote odor and heavy sheen with NAPL blebs visible on water surface in sheen test 6.5-8.5 feet.
SS	1.5	1 2 3		B2-7	>2000		
SS	1.5	2 2 3		B2-9	138		
SS	1.5	9 13 13	10		138	Wood	**WOOD DEBRIS with SILT or SAND matrix** Dark gray to black, wood debris typically with 5-10% silt and fine sand matrix overall, locally matrix is <5% to 20%, moist to wet at ~11 feet, very strong creosote odor, heavy sheen with NAPL blebs visible on water surface in sheen test and on wood surfaces in sampler.
SS	0.3	10 50			141		
SS	0.2	10 7 9					
SS	0.5	6 9 15	15		163		
SS	0.1	19 20 26					
SS	0.1	6 4 6			>2000		
SS	1.5	6 5 6	20			SM	**Silty SAND** Gray/brown, fine- to medium- sand with 30-50% silt, locally layered, wet, moderate creosote odor, light to moderate sheen, NAPL blebs visible on water surface in sheen test for some samples.
SS	1.5	3 4 4		B2-21	48.9		
SS	1.5	5 7 7		B2-24	>2000		
SS	1.5	8 9 9	25	B2-25.5	26.6	ML	**Sandy SILT** Gray, silt wtih 10-15% fine sand, vague layering visible, moderately stiff, wet, slight creosote odor and sheen.
SS	1.5	5 6 6		B2-27	33	CL/	**Silty CLAY** Gray/brown, layered silty clay with 10-20% fine sand, wet, no evident odor, very slight sheen.
SS	1.5	7 8 6		B2-28		ML	**Poorly graded SAND** Gray, fine- to medium- sand with <5% silt, wet, slight creosote odor and sheen.
						SP	**Silty CLAY** Silty clay as above.
						CL/	*(See next page for lithology description)*

BACKFILL DETAILS

KJ PNW JUNE 2002 LOGS.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

Project Name Former Tacoma Metals **Project Number** 996098.00 **Boring Name** B-2

SAMPLES			DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	OVA	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"							
								ML	**Poorly graded SAND**
								SP	Gray, fine- to medium- sand, wet, very slight creosote odor, no sheen.

KJ PNW JUNE 2002 LOGS.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: NE Corner of Site Next to MW-8(R)		**Boring Name**	B-3
DRILLING COMPANY: Cascade	DRILLER: James	**Project Name**	Former Tacoma Metals
DRILLING METHOD(S): HSA	DRILL BIT(S) SIZE: 9-inch OD	**Project Number**	996098.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM	TOTAL DEPTH: 28.0 ft. bgs
BLANK CASING: N/A	FROM N/A TO N/A FT.	DATE STARTED: 6/26/02	DATE COMPLETED: 6/26/02
SLOTTED CASING: N/A	FROM N/A TO N/A FT.	INITIAL WATER DEPTH (FT): 11.0	
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.	LOGGED BY: DKM	
SEAL: Pure Gold Bentonite Chips	FROM 2 TO 28 FT.	SAMPLING METHODS: Split Spoon	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.
GROUT: Concrete	FROM 0 TO 2 FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	OVA	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
SS	1	6 8 8				7.6		SW/ SM	**Well-graded SAND with silt and gravel** Brown, medium- and fine- sand with 30-35% fine- to medium- gravel and 10-15% silt, slight creosote odor increasing with depth, no sheen.
SS	1	6 6 3		B3-4					
SS	1.5	3 5 5	5	B3-5				Wood	**WOOD DEBRIS with SILT** Blocky wood debris with 10-15% silt matrix between fragments, moist, slight creosote odor, no sheen.
SS	1.5	3 2 2				7.8		SM	**Silty SAND** Gray to brown, fine sand with 30-35% silt, layered between silty fine sand and moderately dense sandy silt, moist, moderate creosote odor, moderate to heavy sheen.
SS	1.5	2 2 3		B3-9		64.3			
SS	1.5	2 5 6				20.1		SP	**Poorly graded SAND** Gray, medium- to coarse- sand with up to 5% silt, moist to wet at ~11 feet, moderate creosote odor generally deceasing with depth but stronger at ~20 feet than above, overall light to no visible sheen but minor NAPL blebs are visible on soil surface at 20-20.5 feet.
SS	1.5	2 3 4	10	B3-10		14.2			
SS	1.5	6 5 4		B3-11.5		7.5			
SS	1.5	12 9 5				313			
SS	1.5	9 9 11	15	B3-14.5		25.7			
SS	0.4	9 14 16				159			
SS	1.5	18 15 19				57.7			
SS	1.5	6 10 9	20	B3-19		160			
SS	1.5	5 5 7		B3-20.5 B3-21.5		141		SP/ SM	**Poorly graded SAND with silt** Gray, medium- to fine- sand with 30-35% silt, layered texture, wet, strong creosote odor and heavy sheen at approximately 21.5, 23, and 23.5 feet in sandy layers, small NAPL blebs locally visible on soil surface.
SS	1.5	13 15 19		B3-23		82.9			
SS	1	22 50		B3-23.5		12.4			
			25	B3-24.5				ML/ CL	**Clayey SILT** Gray, clayey silt, wet, no evident odor, no sheen.
SS	1.5	9 13 23				26.5			**Poorly graded SAND** Gray, medium- to fine- sand with minor silt, wet, moderate creosote odor and sheen.
SS	1.5	11 13 14		B3-26.5 B3-27.5		51.8		SP SM	**Silty SAND** Gray, fine sand with up to 50% silt, vague layering visible, moderately dense, wet, slight creosote odor, very slight sheen.

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F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION	Former Creosoting Area Western Property Boundary (Adjacent MW-10)
DRILLING COMPANY	Cascade Drilling, Inc.
DRILLER	Kasey
DRILLING METHOD(S)	GeoProbe - Direct Push
DRILL BIT(S) SIZE	N/A
ISOLATION CASING	N/A
FROM / TO / FT.	N/A / N/A
BLANK CASING	N/A
FROM / TO / FT.	N/A / N/A
SLOTTED CASING	N/A
FROM / TO / FT.	N/A / N/A
SIZE AND TYPE OF FILTER PACK	N/A
FROM / TO / FT.	N/A / N/A
SEAL	N/A
FROM / TO / FT.	N/A / N/A
GROUT	Cement Slurry (tremied)
FROM / TO / FT.	0.0 / 23.0

Boring Name	B-4
Project Name	Former Tacoma Metals
Project Number	996098.00
ELEVATION AND DATUM	9.44' (NGVD29)
TOTAL DEPTH	23.0 ft. bgs
DATE STARTED	3/11/03
DATE COMPLETED	3/11/03
INITIAL WATER DEPTH (FT)	10.5
LOGGED BY	AJA
SAMPLING METHODS	1"x2' split spoon with acetate liner
WELL COMPLETION	☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
							GW	**Well-graded GRAVEL with sand (fill)** Brown, dry, gravel (~60%) with medium and fine sand (~35%) and minor (<5%) silt.
							GW	**Well-graded GRAVEL with sand (fill)** Medium brown, dry, gravel (~50%) with fine and medium sand (~50%). Gravel material is generally fine-grained.
			5				ML/ CL	**Clayey SILT with sand (fill)** Light brown, crumbly, moderately dense silt with ~5-10% fine sand. Includes some clay.
							ML/ CL	**Clayey SILT (fill)** Mixed silt and clay, dark brown, soft, low density.
			10				Wood	**WOOD DEBRIS with SILT or SAND matrix** Brown to gray, wet at ~10.5' bgs, soft silt and fine sand with some clay. Mixed with wood debris. Wood debris is typically ~85-95% of material. Silt, sand and clay are around and coating the wood material.
			15					
SS	2.0			B-4-16.5-17			SP	**Poorly graded SAND** Brownish black (5YR 2/1), fine to medium grained sand, wet, moderate creosote odor.
SS	1.5							~16.2-17' visible creosote sheen, visible product blebs on soil.
SS	2.0		20					~19-19.5' visible creosote sheen on soil, visible product blebs on soil.
SS	2.0			B-4-21.5-22				~20' strong creosote odor.
							CL	**Lean CLAY** Dark yellowish brown (10YR 4/2) with moderate yellow brown mottling, upper contact is sharp, lean clay at least 1' thick, low to moderate plasticity, moist, no odor, no sheen.

NOTES

1. Boring was advanced to confirm confining layer location. Lithology from the upper 15 feet has been inferred from boring location MW-10.
2. Ground surface elevation based on City of Tacoma datum (NGVD 29).

KJ PNW TACOMA METALS OBSERVATION BORING LOGS 2003.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Former Creosoting Area	
DRILLING COMPANY: Cascade Drilling, Inc.	DRILLER: Kasey
DRILLING METHOD(S): GeoProbe - Direct Push	DRILL BIT(S) SIZE: N/A
ISOLATION CASING: N/A	FROM N/A TO N/A FT.
BLANK CASING: N/A	FROM N/A TO N/A FT.
SLOTTED CASING: N/A	FROM N/A TO N/A FT.
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.
SEAL: N/A	FROM N/A TO N/A FT.
GROUT: Cement Slurry (tremied)	FROM 0.0 TO 24.0 FT.

Boring Name	B-5
Project Name	Former Tacoma Metals
Project Number	996098.00
ELEVATION AND DATUM: 9.89' (NGVD29)	TOTAL DEPTH: 24.0 ft. bgs
DATE STARTED: 3/11/03	DATE COMPLETED: 3/11/03
INITIAL WATER DEPTH (FT): 10.0	
LOGGED BY: AJA	
SAMPLING METHODS: 1"x2' and 2"x4' split spoon with acetate liner	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
								Asphalt
SS	2.0						GP	**Poorly graded GRAVEL with sand (fill)** Dark yellowish brown (10YR 4/2), loose, fine to medium grained gravel (subrounded to subangular), ~40% fine to coarse grained sand, moist, no odor.
SS	1.0		5					
SS	0.0		10				Wood	**WOOD DEBRIS with SILT or SAND matrix** Olive black (5Y 2/1) to black (N1), wet at ~10' bgs, wood debris with ~5-15% silt/fine grained sand matrix overall, matix locally up to 20% or less than 5%.
SS	0.5		15	B-5-15.5-16				~12' very strong creosote odor, visible blebs of brown creosote product on wood.
SS	1						SP	**Poorly graded SAND** Olive black (5Y 2/1), fine to medium grained sand, wet.
SS	2.0		20	B-5-21.5-22				~20-21.5' predominately medium grained sand. ~21.5' very strong creosote odor with visible sheen.
SS	2.0						CL	**Lean CLAY** Olive gray (5Y 4/1), upper contact is sharp, lean clay layer at least 2' thick, moderate plasticity, moist, no odor, no sheen.

NOTES

1. Boring was advanced to confirm confining layer location.
2. Ground surface elevation based on City of Tacoma datum (NGVD 29).

KJ PNW TACOMA METALS OBSERVATION BORING LOGS 2003.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Former Creosoting Area		**Boring Name**	B-6
DRILLING COMPANY: Cascade Drilling, Inc.	DRILLER: Kasey	**Project Name**	Former Tacoma Metals
DRILLING METHOD(S): GeoProbe - Direct Push	DRILL BIT(S) SIZE: N/A	**Project Number**	996098.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM: 9.78' (NGVD29)	TOTAL DEPTH: 24.0 ft. bgs
BLANK CASING: N/A	FROM N/A TO N/A FT.	DATE STARTED: 3/11/03	DATE COMPLETED: 3/11/03
SLOTTED CASING: N/A	FROM N/A TO N/A FT.	INITIAL WATER DEPTH (FT): 10.0	
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.	LOGGED BY: AJA	
SEAL: N/A	FROM N/A TO N/A FT.	SAMPLING METHODS: 1"x2' and 2"x4' split spoon with acetate liner	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.
GROUT: Cement Slurry (tremied)	FROM 0.0 TO 24.0 FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
								Asphalt
SS	1.0						SW	**Well-graded SAND with gravel (fill)** Moderate brown (5YR 3/4) to olive gray (5Y 4/1), loose, fine to coarse grained sand, ~15-20% gravel-subangular to subrounded, moist, no odor.
SS	1.0		5					
							Wood	**WOOD DEBRIS with SILT or SAND matrix** Olive black (5Y 2/1) to black (N1), wood debris with ~5-15% silt/fine sand matrix overall, locally up to 20% or less than 5%.
SS	0.5		10					~10' wet, slight creosote odor.
SS	3.0		15	B6-15.5-16				~15-16' strong creosote odor, visible blebs of brown creosote product on wood, visible sheen on soil.
SS	2.0						SP	**Poorly graded SAND** Olive black (5Y 2/1), fine to medium grained sand, wet, slight creosote odor and sheen.
SS	2.0		20					~18-20' coarser grained sand lens.
SS	2.0							
SS	2.0			B-6-23-23.2 B-6-23.8-24				~22' gradation to predominantly fine grained sand/silt, very strong creosote odor, visible blebs of brown creosote product on soil.
							CL	**Lean CLAY** Dark yellowish brown (10YR 4/2), lean clay layer is at least 0.75' thick, ~1-inch thick sand lens at ~23.6' bgs, low to moderate plasticity, moist, no odor, no sheen.

NOTES

1. Boring was advanced to confirm confining layer location.
2. Ground surface elevation based on City of Tacoma datum (NGVD 29).

KJ PNW TACOMA METALS OBSERVATION BORING LOGS 2003.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Former Creosoting Area	
DRILLING COMPANY: Cascade Drilling, Inc.	DRILLER: Kasey
DRILLING METHOD(S): GeoProbe - Direct Push	DRILL BIT(S) SIZE: N/A
ISOLATION CASING: N/A	FROM N/A TO N/A FT.
BLANK CASING: N/A	FROM N/A TO N/A FT.
SLOTTED CASING: N/A	FROM N/A TO N/A FT.
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.
SEAL: N/A	FROM N/A TO N/A FT.
GROUT: Cement Slurry (tremied)	FROM 0.0 TO 30.0 FT.

Boring Name B-7

Project Name Former Tacoma Metals

Project Number 996098.00

ELEVATION AND DATUM: 9.41' (NGVD29)	TOTAL DEPTH: 30.0 ft. bgs
DATE STARTED: 3/11/03	DATE COMPLETED: 3/11/03
INITIAL WATER DEPTH (FT): 9.5	
LOGGED BY: AJA	
SAMPLING METHODS: 1"x2' and 2"x4' split spoon with acetate liner	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
SS	3.0				SP	**Poorly graded SAND with gravel (fill)** Dusky yellowish brown (10YR 2/2), loose, medium to coarse grained sand, ~30-40% gravel-subangular to subrounded, moist, no odor.
SS	3.0		5		ML	**SILT with WOOD debris** Dusky yellowish brown (10YR 2/2), occasional wood debris, moist, no odor.
SS	3.5		10			~9-10' wet.
					SP/	**Poorly graded SAND with silt** Dusky yellowish brown (10YR 2/2), fine sand, ~30-50% fines, wet, no odor or sheen.
					SM	**SILT with sand** Dusky yellowish brown (10YR 2/2), ~15-20% fine sand, wet.
SS	4.0				ML	
			15		SP/	**Poorly graded SAND with silt** As described above.
SS	1.5				SM	**Well-graded SAND** Dusky yellowish brown (10YR 2/2), fine to coarse grained sand, occasional gravel, wet.
SS	2.0				SW	~19' creosote odor, slight sheen.
			20			~21' strong creosote odor, visible sheen on soil.
SS	2.0					~21.7-21.9' silt with sand, dusky yellowish brown (10YR 2/2), wet.
				B-7-21.9-22		
SS	2.0			B-7-23-23.5		~22' poorly graded sand, dusky yellowish brown (10YR 2/2), wet, fine grained, very strong creosote odor, visible sheen on soil.
					CL	**Lean CLAY** Dark yellowish brown (10YR 4/2), lean clay layer 0.5' thick, low plasticity, moist.
SS	2.0		25		SP	**Poorly graded SAND** Olive black (5Y 2/1), fine grained sand, wet.
SS	2.0					
SS	2.0				ML	~26' creosote odor and sheen. ~26-27.7' contains silt layers. ~26-28.7' slight creosote odor.
			30			**SILT** Dark yellowish brown (10YR 4/2), silt, non-plastic, moist, no odor, no sheen.

NOTES

1. Boring was advanced to confirm confining layer location.
2. Ground surface elevation based on City of Tacoma datum (NGVD 29).

KJ PNW TACOMA METALS OBSERVATION BORING LOGS 2003.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Former Creosoting Area	
DRILLING COMPANY: Cascade Drilling, Inc.	DRILLER: Kasey
DRILLING METHOD(S): GeoProbe - Direct Push	DRILL BIT(S) SIZE: N/A
ISOLATION CASING: N/A	FROM N/A TO N/A FT.
BLANK CASING: N/A	FROM N/A TO N/A FT.
SLOTTED CASING: N/A	FROM N/A TO N/A FT.
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.
SEAL: N/A	FROM N/A TO N/A FT.
GROUT: Cement Slurry (tremied)	FROM 0.0 TO 28.0 FT.

Boring Name B-8

Project Name Former Tacoma Metals

Project Number 996098.00

ELEVATION AND DATUM: 10.15' (NGVD29)	TOTAL DEPTH: 28.0 ft. bgs
DATE STARTED: 3/11/03	DATE COMPLETED: 3/11/03
INITIAL WATER DEPTH (FT): 10.0	
LOGGED BY: AJA	
SAMPLING METHODS: 1"x2' and 2"x4' split spoon with acetate liner	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
								Asphalt
SS	3.0						SP	**Poorly graded SAND with gravel (fill)** Dusky yellowish brown (10YR 2/2), fine to medium grained sand, ~15-20% gravel-subangular to subrounded, occasional wood fragments, moist, no odor.
SS	3.0		5					
SS	3.0		10		▽		Wood	**WOOD DEBRIS with SILT or SAND matrix** Olive black (5Y 2/1), wood debris with variable ~20-25% silt/fine sand matrix. ~10' wet, slight creosote odor.
SS	3.5		15					
SS	1.5							
SS	2.0		20				SP	**Poorly graded SAND** Olive black (5Y 2/1), fine grained sand, trace fines, wet. ~19.25-24' strong to moderate creosote odor, visual sheen on soil.
SS	2.0							
SS	2.0			B-8-23.5-24				
SS	2.0		25				CL	**Lean CLAY** Dark yellowish brown (10YR 4/2), lean clay 0.8' thick, moderate plasticity, moist.
SS	2.0			B-8-26.5-27			SP	**Poorly graded SAND** As described above, slight creosote odor.
							CL	**Lean CLAY** As described above, lean clay at least 1' thick, no odor, no sheen.

NOTES

1. Boring was advanced to confirm confining layer location.
2. Ground surface elevation based on City of Tacoma datum (NGVD 29).

KJ PNW TACOMA METALS OBSERVATION BORING LOGS 2003.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Former Creosoting Area		**Boring Name**	B-9
DRILLING COMPANY: Cascade Drilling, Inc.	DRILLER: Kasey	**Project Name**	Former Tacoma Metals
DRILLING METHOD(S): GeoProbe - Direct Push	DRILL BIT(S) SIZE: N/A	**Project Number**	996098.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM: 10.51' (NGVD29)	TOTAL DEPTH: 26.0 ft. bgs
BLANK CASING: N/A	FROM N/A TO N/A FT.	DATE STARTED: 3/11/03	DATE COMPLETED: 3/11/03
SLOTTED CASING: N/A	FROM N/A TO N/A FT.	INITIAL WATER DEPTH (FT): 11.0	
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.	LOGGED BY: AJA	
SEAL: N/A	FROM N/A TO N/A FT.	SAMPLING METHODS: 1"x2' and 2"x4' split spoon with acetate liner	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.
GROUT: Cement Slurry (tremied)	FROM 0.0 TO 26.0 FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
								Asphalt
SS	3.0						GP	**Poorly graded GRAVEL with sand (fill)** Various colors (dusky yellowish brown- 10YR 2/2, light olive gray-5Y 5/2, dark reddish brown - 10R 3/4), ~15-20% coarse sand, moist, no odor.
SS	3.0		5				SP	**Poorly graded SAND (fill)** Olive black (5Y 2/1), fine to medium sand, moist, no odor.
SS	3.0		10				Wood	**WOOD DEBRIS with SILT or SAND matrix** Dark yellowish brown (10YR 4/2), typically with ~5-10% silt/fine sand matrix although ~20-40% was observed, slight creosote odor. ~9-11' wood, very little matrix. ~11' wet.
SS	1.0		15					
SS	1.7						SP/ SM	**Poorly graded SAND with silt** Dusky yellowish brown (10YR 2/2), fine sand, trace fines, visual sheen on soil, non-plastic, wet, strong creosote odor.
SS	1.5		20					
SS	2.0						SP	**Poorly graded SAND** Dusky yellowish brown (10YR 2/2), fine sand, no visual sheen on soil, wet, moderate creosote odor.
SS	2.0			B-9-23.5-24			SP/ SM	~18-22' gradual gradation fine to coarser sand. **Poorly graded SAND with silt** Dusky brown (5YR 2/2), fine sand, trace fines, visual sheen on soil, wet, strong creosote odor.
SS	1.8		25				CL	**Lean CLAY** Olive gray (5Y 4/1), clay layer at least 1.5' thick, fine sand lens at ~25.5-25.8' bgs, moderate plasticity, moist, no odor or sheen.

NOTES

1. Boring was advanced to confirm confining layer location.
2. Ground surface elevation based on City of Tacoma datum (NGVD 29).

KJ PNW TACOMA METALS OBSERVATION BORING LOGS 2003.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Former Creosoting Area (Adjacent MW-11)	**Boring Name:** B-10
DRILLING COMPANY: Cascade Drilling, Inc. / DRILLER: Kasey	**Project Name:** Former Tacoma Metals
DRILLING METHOD(S): GeoProbe - Direct Push / DRILL BIT(S) SIZE: N/A	**Project Number:** 996098.00
ISOLATION CASING: N/A — FROM N/A TO N/A FT.	ELEVATION AND DATUM: 9.29' (NGVD29) / TOTAL DEPTH: 22.0 ft. bgs
BLANK CASING: N/A — FROM N/A TO N/A FT.	DATE STARTED: 3/11/03 / DATE COMPLETED: 3/11/03
SLOTTED CASING: N/A — FROM N/A TO N/A FT.	INITIAL WATER DEPTH (FT): 10.5
SIZE AND TYPE OF FILTER PACK: N/A — FROM N/A TO N/A FT.	LOGGED BY: AJA
SEAL: N/A — FROM N/A TO N/A FT.	SAMPLING METHODS: 1"x2' split spoon with acetate liner / WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.
GROUT: Cement Slurry (tremied) — FROM 0.0 TO 22.0 FT.	

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
							GW	**Well-graded GRAVEL with sand (fill)** Gray to brown-orange, slightly moist, gravel with ~25-30% sand and some (<5%) silt.
			5					
			10				Wood	**WOOD DEBRIS with SILT or SAND matrix** Brown to gray, wet at ~10.5' bgs, soft silt and fine sand with some clay. Mixed with wood debris. Wood debris is typically ~85-95% of material. Silt, sand and clay are around and coating the wood material.
			15					~16' Olive black (5Y 2/1), visible blebs of brown creosote product on wood, wet, strong creosote odor.
SS	0.2							
SS	0.6							
			20				SP	**Poorly graded SAND** Brownish black (5YR 2/1), fine to medium grained sand, wet.
SS	2.0			B-10-21-21.5				~20.5' strong creosote odor, visible sheen on soil.
							CL	**Lean CLAY** Dark yellowish brown (10YR 4/2), upper contact is sharp, fine grained sand in toe of sampler, lean clay layer 0.5' thick, low to moderate plasticity, moist, no odor, no sheen.

NOTES

1. Boring was advanced to confirm confining layer location. Lithology from the upper 16 feet has been inferred from boring location MW-11.
2. Ground surface elevation based on City of Tacoma datum (NGVD 29).

KJ PNW TACOMA METALS OBSERVATION BORING LOGS 2003.GPJ KJ PNW.GDT 2/19/13

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION	Former Creosoting Area (Northern Property Boundary)
DRILLING COMPANY	Cascade Drilling, Inc.
DRILLER	Kasey
DRILLING METHOD(S)	GeoProbe - Direct Push
DRILL BIT(S) SIZE	N/A
ISOLATION CASING	N/A
FROM / TO / FT.	N/A / N/A
BLANK CASING	N/A
FROM / TO / FT.	N/A / N/A
SLOTTED CASING	N/A
FROM / TO / FT.	N/A / N/A
SIZE AND TYPE OF FILTER PACK	N/A
FROM / TO / FT.	N/A / N/A
SEAL	N/A
FROM / TO / FT.	N/A / N/A
GROUT	Cement Slurry (tremied)
FROM / TO / FT.	0.0 / 22.0

Boring Name	B-11
Project Name	Former Tacoma Metals
Project Number	996098.00
ELEVATION AND DATUM	7.42' (NGVD29)
TOTAL DEPTH	22.0 ft. bgs
DATE STARTED	3/11/03
DATE COMPLETED	3/11/03
INITIAL WATER DEPTH (FT)	11.0
LOGGED BY	AJA
SAMPLING METHODS	1"x2' split spoon with acetate liner
WELL COMPLETION	☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
							GW	**Well-graded GRAVEL with sand** Brown fine to medium gravel with ~40-45% fine to medium sand and some silt, no odor, no apparent sheen.
			5				Wood	**WOOD DEBRIS with SILT matrix** Dark gray, wood debris typically with ~5-10% silt/fine sand matrix, no sheen above 13 feet, moderate sheen below 13 feet, slight to moderate creosote odor below 13 feet.
			10					~11' wet.
			15					
SS	1.8						SP	**Poorly graded SAND** Dusky yellowish brown (10YR 2/2), fine to medium sand, wet, slight creosote odor, no sheen.
SS	2.0							
SS	2.0		20				SM	**Silty SAND** Dusky yellowish brown (10YR 2/2), fine sand, 1-inch medium sand lens at ~21.3' bgs, wet, slight creosote odor, no sheen.
							CL	**Lean CLAY** Dark yellowish brown (10YR 4/2), upper contact is sharp, clay at least 0.4' thick, low to moderate plasticity, moist, no odor, no sheen.

NOTES

1. Boring was advanced to confirm confining layer location. Lithology from the upper 16 feet has been inferred from boring location MW-13.
2. Ground surface elevation based on City of Tacoma datum (NGVD 29).

KJ PNW TACOMA METALS OBSERVATION BORING LOGS 2003.GPJ KJ PNW.GDT 2/19/13

Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION: Former Creosoting Area		**Well Name**	MW-22 (B-12)
DRILLING COMPANY: Cascade Drilling Company	DRILLER: Andy / Don	**Project Name**	Tacoma Metals
DRILLING METHOD(S): HSA / Geoprobe	DRILL BIT(S) SIZE: 9" OD / 2" OD	**Project Number**	996098.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM: ground surface	TOTAL DEPTH: 24.0 ft. bgs
BLANK CASING: 2" Schedule 40 PVC Pipe	FROM 0 TO 13 FT.; 23 23.3	DATE STARTED: 11/24/03	DATE COMPLETED: 12/1/03
SLOTTED CASING: 2" Schedule 40 PVC Pipe 0.010" slot	FROM 13 TO 23 FT.	INITIAL WATER DEPTH (FT): 7.5	STATIC WATER ELEV. (FT): N/A
SIZE AND TYPE OF FILTER PACK: Lapis Lustre #2/12 Monterey Sand	FROM 11 TO 23.5 FT.	LOGGED BY: DKM	
SEAL: Pure Gold Bentonite Chips	FROM 2 TO 11 FT.; 23.5 24	SAMPLING METHODS: 2"x4' shelby tube with acetate liner	WELL COMPLETION: ■ SURFACE HOUSING; ☐ STAND PIPE _____ FT.
GROUT: Cement	FROM 0 TO 2 FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	OVA	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
							Asphalt Surface
SH	3			B12-2-3	4.4	GW/GM	**Well-graded GRAVEL with silt and sand** Gray/green, locally orange/brown, 55-65% gravel, 5-10% silt, moist, no odor, no sheen. 2-3' slight chemical odor.
					2.1		
SH	4		5	B12-4-5	1.6		5.5-6', 3" gray granular material above 3" of fractured red brick material.
				B12-6.5-7.5 (well; Geoprobe boring)	1.3		6-8', black/dark gray angular gravel with sand and silt, wet below 7.5'.
SH	2			B12-8-9	7.2		8-9', pea gravel with brick fragments and coarse sand.
				B12-9-10	40.5		
SH	1		10			Wood	**WOOD DEBRIS** Blocky to fibrous wood debris with 5-15% silt and fine sand matrix material, wet, moderate to strong creosote odor, heavy sheen on water in sampler.
SH	1						
			15				
SH	1				21.9		
			20			SP	**Poorly graded SAND** Dark gray, poorly graded medium sand with <5% silt, creosote product on grains, wet, strong creosote odor, very heavy sheen, product blebs rinse out in sheen test covering 5-10% of water surface, slightly more below 22'.
SH	4			B12-20-21	17.9		
				B12-22-23	20.6		
					10.8	CL/ML	**Silty CLAY** Brown, silty clay, dense, wet, slight sheen and creosote odor.

NOTES

1. Pilot boring advance with Geoprobe rig on 11/24/03.
2. Well installed with hollow-stem auger rig on 12/1/03.
3. OVA - Organic Vapor Analyzer
4. A 0.3 foot sump installed from 23 to 23.3 feet bgs.

KJ PNW TACOMA METALS DNAPL BORING LOGS DEC 2003.GPJ KJ PNW.GDT 12/16/03

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Former Creosoting Area	
DRILLING COMPANY: Cascade Drilling Company	DRILLER: Don
DRILLING METHOD(S): Geoprobe	DRILL BIT(S) SIZE: 2" OD
ISOLATION CASING: N/A	FROM N/A TO N/A FT.
BLANK CASING: N/A	FROM N/A TO N/A FT.
SLOTTED CASING: N/A	FROM N/A TO N/A FT.
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.
SEAL: N/A	FROM N/A TO N/A FT.
GROUT: Baroid Quick-Grout Bentonite	FROM 0 TO 24 FT.

Boring Name	B-13
Project Name	Tacoma Metals
Project Number	996098.00
ELEVATION AND DATUM: ground surface	TOTAL DEPTH: 24.0 ft. bgs
DATE STARTED: 11/24/03	DATE COMPLETED: 11/24/03
INITIAL WATER DEPTH (FT): 8.5	
LOGGED BY: DKM	
SAMPLING METHODS: 2"x4' shelby tube with acetate liner	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	OVA	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
SH	2			B13-1-3		GW/ GM	**Well-graded GRAVEL with silt and sand** Dark brown to gray, gravel with 30-40% sand and some silt, minor glass a metal debris in upper several feet, moist, no odor, no sheen.
SH	4		5	B13-5-6	6.3		
					1.1	Wood	**WOOD DEBRIS** Woody debris, fine to coarse chips in sampler, 10-30% gray to light brown silty matrix material, moist, no odor, no sheen.
SH	.5		10	B13-8-10	7.7 4.6		8-10', brown woody debris with 20-30% fine sand and silt matrix, wet below approximately 8.5 feet, moderate creosote odor, no evident sheen.
SH	3		15	B13-14-15	7.1	ML	**SILT** Dark gray, silt with some clay, soft, loose, wet, moderate creosote odor, slight sheen.
					29.5	SP	**Poorly graded SAND** Gray, medium to coarse sand, mixed with fine sand in upper 6", heavy sheen on surface in sampler (13-16 feet), creosote product on sand grains, wet, strong creosote odor, heavy sheen, product blebs on 10% of water surface in sheen test.
SH	4				80.1 59.1		Medium to coarse sand, minor silt in small clumps, fines with depth, mostly medium sand by 19', wet, strong creosote odor, heavy sheen with product blebs over 5% of water surface in sheen test.
SH	2		20	B13-19-20 B13-21-22	19.5		
SH	1					CL	**Lean CLAY** Gray to brown, silty clay with some fibrous plant material, wet, very slight creosote odor, no evident sheen.
SH	1			B13-23-24			

BACKFILL DETAILS: ▽

NOTES

1. OVA- Organic Vapor Analyzer

KJ PNW TACOMA METALS DNAPL BORING LOGS DEC 2003.GPJ KJ PNW.GDT 12/16/03

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Former Creosoting Area	
DRILLING COMPANY: Cascade Drilling Company	DRILLER: Don
DRILLING METHOD(S): Geoprobe	DRILL BIT(S) SIZE: 2" OD
ISOLATION CASING: N/A	FROM N/A TO N/A FT.
BLANK CASING: N/A	FROM N/A TO N/A FT.
SLOTTED CASING: N/A	FROM N/A TO N/A FT.
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.
SEAL: Pure Gold Bentonite Chips	FROM 0 TO 12 FT.
GROUT: N/A	FROM N/A TO N/A FT.

Boring Name B-14

Project Name Tacoma Metals

Project Number 996098.00

ELEVATION AND DATUM: ground surface	TOTAL DEPTH: 12.0 ft. bgs
DATE STARTED: 11/24/03	DATE COMPLETED: 11/24/03
INITIAL WATER DEPTH (FT): 8	
LOGGED BY: DKM	
SAMPLING METHODS: 2"x4' shelby tube with acetate liner	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	OVA	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
SH	2		1–4	B14-1-2		4.0		GW/GM	**Well-graded GRAVEL with silt and sand** Brown, gravel with 30-40% sand and some silt, contains fine roots 0-2', moist, no odor, no sheen.
SH	3		5–8	B14-5-6		1.5		Wood	**WOOD DEBRIS** Orange-brown to dark brown, 10-20% sandy silt matrix, soft, moist to wet (below 8').
						1.7			4.5-8', no odor, no sheen.
SH	2		9–12	B14-9-10		13.1			8-10', slight creosote odor, slight sheen.
									11-12', very slight creosote odor, slight sheen.

NOTES

1. OVA- Organic Vapor Analyzer

KJ PNW TACOMA METALS DNAPL BORING LOGS DEC 2003.GPJ KJ PNW.GDT 12/16/03

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Former Creosoting Area	
DRILLING COMPANY: Cascade Drilling Company	DRILLER: Don
DRILLING METHOD(S): Geoprobe	DRILL BIT(S) SIZE: 2" OD
ISOLATION CASING: N/A	FROM N/A TO N/A FT.
BLANK CASING: N/A	FROM N/A TO N/A FT.
SLOTTED CASING: N/A	FROM N/A TO N/A FT.
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.
SEAL: Pure Gold Bentonite Chips	FROM 0 TO 12 FT.
GROUT: N/A	FROM N/A TO N/A FT.

Boring Name B-15

Project Name Tacoma Metals

Project Number 996098.00

ELEVATION AND DATUM: ground surface	TOTAL DEPTH: 12.0 ft. bgs
DATE STARTED: 11/24/03	DATE COMPLETED: 11/24/03
INITIAL WATER DEPTH (FT): 7.5	
LOGGED BY: DKM	
SAMPLING METHODS: 2"x4' shelby tube with acetate liner	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	OVA	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
SH	2		1–3	B15-1-2	1.3	GW/ GM	**Well-graded GRAVEL with silt and sand** Brown, gravel with 30-40% sand and some silt, moist, no odor, no sheen.
			4			Wood	**WOOD DEBRIS** Brown to dark brown, wood debris with 10-20% soft sandy silt matrix, moist, no odor, no sheen.
SH	4		5–6	B15-5-6	0.6		
			7–8	B15-7-8	0.6	SM	**Silty SAND** Gray, moderately dense fine sand with 30-40% silt, moist to wet, no odor, no sheen.
SH	3		9–12	B15-10-11	0.6	SP	**Poorly graded SAND** Gray, medium sand with some coarse sand and minor silt, wet, no odor, no sheen.

BACKFILL DETAILS: ▽

NOTES

1. OVA- Organic Vapor Analyzer

KJ PNW TACOMA METALS DNAPL BORING LOGS DEC 2003.GPJ KJ PNW.GDT 12/16/03

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Former Creosoting Area	**Boring Name:** B-16
DRILLING COMPANY: Cascade Drilling Company	DRILLER: Don
DRILLING METHOD(S): Geoprobe	DRILL BIT(S) SIZE: 2" OD
Project Name: Tacoma Metals	
Project Number: 996098.00	
ISOLATION CASING: N/A	FROM N/A TO N/A FT.
BLANK CASING: N/A	FROM N/A TO N/A FT.
SLOTTED CASING: N/A	FROM N/A TO N/A FT.
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.
SEAL: Pure Gold Bentonite Chips	FROM 0 TO 12 FT.
GROUT: N/A	FROM N/A TO N/A FT.
ELEVATION AND DATUM: ground surface	TOTAL DEPTH: 12.0 ft. bgs
DATE STARTED: 11/24/03	DATE COMPLETED: 11/24/03
INITIAL WATER DEPTH (FT): 9	
LOGGED BY: DKM	
SAMPLING METHODS: 2"x4' shelby tube with acetate liner	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	OVA	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
			1			121		GW/ GM	**Well-graded GRAVEL with silt and sand** Light to dark brown, gravel with 30-40% sand and some silt, moist, moderate chemical odor, no sheen.
SH	3.5		2	B16-1.5-2.5		71.1		SP/ SM	**Poorly graded SAND with silt** Gray, medium sand with 5-10% silt in small pods, moist, moderate chemical odor, no sheen.
			3	B16-3-4		74.9		GW/ GM	**Well-graded GRAVEL with silt and sand** Gray/green, gravel with 30-40% sand and some silt, moist, moderate chemical odor, no sheen.
			4						
			5	B16-5-6		133		Wood	**WOOD DEBRIS** Brown to gray, woody debris with 10-20% soft silty matrix, moist, moderate chemical odor, no sheen.
SH	3.5		6						
			7	B16-7-8		106		SM	**Silty SAND** Gray, silty fine sand with some medium sand, moist to wet, strong creosote odor, slight sheen.
			8						
			9	B16-8.5-9.5		249			
SH	4		10	B16-10-11				SP	**Poorly graded SAND** Gray, medium to coarse sand with minor silt, wet, strong creosote odor, heavy sheen, minor product blebs.
			11			224			
			12						

NOTES

1. OVA- Organic Vapor Analyzer

KJ PNW TACOMA METALS DNAPL BORING LOGS DEC 2003.GPJ KJ PNW.GDT 12/16/03

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Former Creosoting Area	
DRILLING COMPANY: Cascade Drilling Company	DRILLER: Don
DRILLING METHOD(S): Geoprobe	DRILL BIT(S) SIZE: 2" OD
ISOLATION CASING: N/A	FROM N/A TO N/A FT.
BLANK CASING: N/A	FROM N/A TO N/A FT.
SLOTTED CASING: N/A	FROM N/A TO N/A FT.
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.
SEAL: Pure Gold Bentonite Chips	FROM 0 TO 12 FT.
GROUT: N/A	FROM N/A TO N/A FT.

Boring Name B-17

Project Name Tacoma Metals

Project Number 996098.00

ELEVATION AND DATUM: ground surface	TOTAL DEPTH: 12.0 ft. bgs
DATE STARTED: 11/24/03	DATE COMPLETED: 11/24/03
INITIAL WATER DEPTH (FT): 9.5	
LOGGED BY: DKM	
SAMPLING METHODS: 2"x4' shelby tube with acetate liner	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	OVA	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
							Asphalt surface
SH	3.5		1–4	B17-1-2, B17-3-4	2.6, 2.0	GW/GM	**Well-graded GRAVEL with silt and sand** Brown to gray, gravel with 30-40% sand and some silt, pea gravel with coarse sand in lower foot, moist, no odor, no sheen.
SH	3		5–8	B17-5-6, B17-7-8	1.3, 2.4	SM	**Silty SAND** Light brown to gray, fine sand with silt, moist, no odor, no sheen.
						Wood	**WOOD DEBRIS** Dark brown, fibrous to blocky woody debris, 10-20% soft silt matrix material, moist to wet, no odor, no sheen.
SH	1		9–12		30.3		

BACKFILL DETAILS

NOTES

1. OVA- Organic Vapor Analyzer

KJ PNW TACOMA METALS DNAPL BORING LOGS DEC 2003.GPJ KJ PNW.GDT 12/16/03

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Off-property (Northwest former Tacoma Metals)	**Boring Name:** B-18
DRILLING COMPANY: Cascade Drilling, Inc. / DRILLER: Kasey Goble	**Project Name:** Former Tacoma Metals
DRILLING METHOD(S): Geoprobe Direct Push / DRILL BIT(S) SIZE: N/A	**Project Number:** 996098.00
ISOLATION CASING: N/A — FROM N/A TO N/A FT.	ELEVATION AND DATUM: / TOTAL DEPTH: 26.0 ft. bgs
BLANK CASING: N/A — FROM N/A TO N/A FT.	DATE STARTED: 3/10/04 / DATE COMPLETED: 3/10/04
SLOTTED CASING: N/A — FROM N/A TO N/A FT.	INITIAL WATER DEPTH (FT): 8
SIZE AND TYPE OF FILTER PACK: N/A — FROM N/A TO N/A FT.	LOGGED BY: SDM
SEAL: Bentonite Chips — FROM 0 TO 26 FT.	SAMPLING METHODS: Macro Core / WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.
GROUT: N/A — FROM N/A TO N/A FT.	

SAMPLES: TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	OVA (PPM)	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
								Wood	**WOOD DEBRIS wood chips** Tan, ~1/2 inch diameter loose wood chips, dry to slightly moist, no odor, no sheen.
				B-18-3.4-4				ML	**Gravelly SILT** Black, ~30% 1/2-inch diameter rounded to subrounded gravel, ~70% silt, moist, no odor, no sheen.
			5			0		Wood	**WOOD DEBRIS** Black, wood debris, ~<10% silt content, moist, slight wood odor, no sheen.
								SP	**Poorly graded SAND** Gray/brown, poorly graded fine to medium sand, slightly moist, no odor, no sheen.
				B-18-8-8.5				CL/ ML	**Silty CLAY with wood debris** Gray, silt to clay matrix with ~30% wood debris, wood debris in shoe, one foot in macro core tube, slightly moist, no odor, no sheen. ~ 8' Very moist to saturated.
			10						
				B-18-12-13					
			15					SW	**Well-graded SAND** Black, fine to medium sand, little or no fines, saturated, no odor, no sheen.
				B-18-18-19					
			20						
				B-18-22-23					
				B-18-24-25					
			25					CH	**Fat CLAY** Gray/brown, upper contact sharp, soft, medium plasticity, very moist, no odor, no sheen.

KJ PNW TACOMA METALS OFF PROPERTY MAR 2004.GPJ KJ PNW.GDT 3/24/04

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Off-property (Northwest former Tacoma Metals)	**Boring Name:** B-19
DRILLING COMPANY: Cascade Drilling, Inc. / DRILLER: Kasey Goble	**Project Name:** Former Tacoma Metals
DRILLING METHOD(S): Geoprobe Direct Push / DRILL BIT(S) SIZE: N/A	**Project Number:** 996098.00
ISOLATION CASING: N/A — FROM N/A TO N/A FT.	ELEVATION AND DATUM: / TOTAL DEPTH: 24.0 ft. bgs
BLANK CASING: N/A — FROM N/A TO N/A FT.	DATE STARTED: 3/10/04 / DATE COMPLETED: 3/10/04
SLOTTED CASING: N/A — FROM N/A TO N/A FT.	INITIAL WATER DEPTH (FT): 12
SIZE AND TYPE OF FILTER PACK: N/A — FROM N/A TO N/A FT.	LOGGED BY: SDM
SEAL: Bentonite Chips — FROM 0 TO 24 FT.	SAMPLING METHODS: Macro Core / WELL COMPLETION: ☐ SURFACE HOUSING
GROUT: N/A — FROM N/A TO N/A FT.	☐ STAND PIPE _____ FT.

SAMPLES: TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	OVA (PPM)	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
								Wood	**WOOD DEBRIS** Tan, ~1/2-inch diameter loose wood chips, no odor, no sheen.
				B-19-2-4				Wood	**WOOD DEBRIS with silt** Wood debris with ~20-30% silt matrix, slight creosote odor, no sheen.
			5			6		Wood	
				B-19-9-10		25		Wood	
			10					Wood	~ 9'-10' Moderate cresote odor, visable sheen.
								SP	**Poorly graded SAND** Black, poorly graded fine to medium sand, little or no fines, saturated, moderate creosote odor, moderate sheen.
				B-19-14-15				SP	
			15					SP	
			20					SP	
				B-19-21-22				SP	~21'- 22.5' Product blebs, strong creosote odor, visable sheen.
				B-19-23-24				CL/ ML	**Silty CLAY** Gray/brown, upper contact is sharp, soft, medium plasticity, moist, slight creosote odor, no sheen.

NOTES

1. Top one foot of reconniasance groundwater sample tube coated with product on outside.

KJ PNW TACOMA METALS OFF PROPERTY MAR 2004.GPJ KJ PNW.GDT 3/24/04

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Off-property (Northwest former Tacoma Metals)	**Boring Name:** B-20
DRILLING COMPANY: Cascade Drilling, Inc. / DRILLER: Kasey Goble	**Project Name:** Former Tacoma Metals
DRILLING METHOD(S): Geoprobe Direct Push / DRILL BIT(S) SIZE: N/A	**Project Number:** 996098.00
ISOLATION CASING: N/A — FROM N/A TO N/A FT.	ELEVATION AND DATUM: / TOTAL DEPTH: 22.0 ft. bgs
BLANK CASING: N/A — FROM N/A TO N/A FT.	DATE STARTED: 3/10/04 / DATE COMPLETED: 3/10/04
SLOTTED CASING: N/A — FROM N/A TO N/A FT.	INITIAL WATER DEPTH (FT): 8
SIZE AND TYPE OF FILTER PACK: N/A — FROM N/A TO N/A FT.	LOGGED BY: SDM
SEAL: Bentonite Chips — FROM 0 TO 22 FT.	SAMPLING METHODS: Macro Core / WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.
GROUT: N/A — FROM N/A TO N/A FT.	

SAMPLES: TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	OVA (PPM)	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
								Wood	**WOOD DEBRIS**
								ML	Tan, ~1/2-inch diameter loose wood chips, dry to slightly moist, no odor, no sheen.
								Wood	**SILT with wood**
									Black, ~40-50% silt matrix with decomposed wood, very moist, slight wood odor, no sheen.
				B-20-3.5-4		<1		SP	**WOOD DEBRIS**
									Black, ~1-inch diameter wood chips, moist, wood odor, no sheen.
			5						**Poorly graded SAND with gravel**
								Wood	Gray, poorly graded medium to coarse sand with ~<10% 1/2-inch diameter black gravel, little to no fines, slightly moist, no odor, no sheen.
									WOOD DEBRIS with silt and sand
									Black to tan (on fresh wood surfaces), wood debris with ~30% silt matrix, slightly moist, no odor, no sheen.
				B-20-7-8					**Silty CLAY with wood debris**
								CL/ ML	Dark gray, ~60-70% silty clay with ~40-50% wood debris, soft, medium plasticity, mosit, no odor, no sheen.
									~8' Saturated, slight creosote odor.
			10	B-20-10-11					
									Poorly graded SAND
									Black, poorly graded fine to medium sand, little or no fines, saturated.
				B-20-12-13					~12'-14' Moderate creosote odor, slight visable sheen. Odor and sheen subsides below ~14' and increase at ~18'.
			15					SP	
									~18'-20.5' Sheen coats inside of sample liner.
				B-20-19-20					
			20			36			
								CH	**Fat CLAY**
									Dark gray, clay, upper contact sharp, soft, medium plasticity, moist, slight creosote odor, no sheen.

NOTES

1. Product coats outside of entire length of tubing used to collect reconniasance groundwater sample.

KJ PNW TACOMA METALS OFF PROPERTY MAR 2004.GPJ KJ PNW.GDT 3/24/04

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Off-property (Northwest former Tacoma Metals)		**Boring Name**	B-21
DRILLING COMPANY: Cascade Drilling, Inc.	DRILLER: Kasey Goble	**Project Name**	Former Tacoma Metals
DRILLING METHOD(S): Geoprobe Direct Push	DRILL BIT(S) SIZE: N/A	**Project Number**	996098.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM	TOTAL DEPTH: 22.0 ft. bgs
BLANK CASING: N/A	FROM N/A TO N/A FT.	DATE STARTED: 3/11/04	DATE COMPLETED: 3/11/04
SLOTTED CASING: N/A	FROM N/A TO N/A FT.	INITIAL WATER DEPTH (FT): 8	
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.	LOGGED BY: SDM	
SEAL: Bentonite Chips	FROM 0 TO 22 FT.	SAMPLING METHODS: Macro Core	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.
GROUT: N/A	FROM N/A TO N/A FT.		

SAMPLES: TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	OVA (PPM)	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
								Wood	**WOOD DEBRIS** Tan/brown, ~1/2-inch diameter loose wood chips, slightly moist, wood odor, no sheen.
				B-21-3-4		3		Wood	**WOOD DEBRIS with sand and gravel** Black, wood debris with ~30% medium sand and gravel matrix,~1/2-inch diameter subrounded to rounded gravel, very moist, no odor, no sheen.
			5					Wood	**WOOD DEBRIS** Tan, loose wood, slightly moist, no odor, no sheen.
				B-21-8-9				Wood	**WOOD DEBRIS in clay matrix** Gray, wood debris, ~30% clay, medium plasticity, very moist, no odor, no sheen. ~8' Gray/brown, saturated, very slight creosote odor, no sheen.
			10						
				B-21-13-14				SP	**Poorly graded SAND** Black, poorly graded fine to medium sand, little or no fines, saturated, very slight creosote odor, no sheen.
			15						~16'-19.5' Product blebs, strong creosote odor, moderate to heavy sheen.
				B-21-18-19					
			20					CH	**Fat CLAY** Gray, upper contact sharp, soft, medium plasticity, moist, very slight odor, no sheen.
				B-21-21-21.5		3			

NOTES

1. Product coats outside of entire length of tubing used to collect reconniasance groundwater sample.

KJ PNW TACOMA METALS OFF PROPERTY MAR 2004.GPJ KJ PNW.GDT 3/24/04

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Off-property (Northwest former Tacoma Metals)	**Boring Name:** B-22
DRILLING COMPANY: Cascade Drilling, Inc. / DRILLER: Kasey Goble	**Project Name:** Former Tacoma Metals
DRILLING METHOD(S): Geoprobe Direct Push / DRILL BIT(S) SIZE: N/A	**Project Number:** 996098.00
ISOLATION CASING: N/A — FROM N/A TO N/A FT.	ELEVATION AND DATUM: / TOTAL DEPTH: 22.0 ft. bgs
BLANK CASING: N/A — FROM N/A TO N/A FT.	DATE STARTED: 3/11/04 / DATE COMPLETED: 3/11/04
SLOTTED CASING: N/A — FROM N/A TO N/A FT.	INITIAL WATER DEPTH (FT): 8
SIZE AND TYPE OF FILTER PACK: N/A — FROM N/A TO N/A FT.	LOGGED BY: SDM
SEAL: Bentonite Chips — FROM 0 TO 22 FT.	SAMPLING METHODS: Macro Core / WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.
GROUT: N/A — FROM N/A TO N/A FT.	

SAMPLES: TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	OVA (PPM)	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
								Wood	**WOOD DEBRIS** Dark brown to black, ~1/2-inch diameter loose wood chips, slightly decomposed, slightly moist, no odor, no sheen.
								Wood	**WOOD DEBRIS with sand and gravel** Black, wood debris with ~30% medium sand and gravel matrix, ~1/2-inch diameter subrounded to rounded gravel, very moist, no odor, no sheen.
								SM	
				B-22-3-3.5		3		Wood	**Silty SAND** Dark brown, silty sand, ~60% medium sand, ~40% non-plastic fines, slightly moist, no odor, no sheen.
				B-22-4-5					**WOOD DEBRIS with sand and gravel** Same as 1.5' to 2', no odor, no sheen.
			5					Wood	**WOOD DEBRIS with some sand** Wood debris with ~10-20% fine sand matrix, very moist to saturated, no odor, no sheen.
				B-22-6-7					
								Wood	**WOOD DEBRIS with silt** Dark gray, wood debris, ~10-20% silt matrix, saturated, moderate to strong creosote odor, moderate sheen.
			10						
				B-22-11-12		42			
								SP	**Poorly graded SAND** Black, poorly graded fine to medium sand, little or no fines, product blebs, saturated, moderate to strong creosote odor, visable sheen.
			15						
				B-22-19-20					
			20					CH	**Fat CLAY** Gray, upper contact sharp, soft, medium plasticity, moist, slight creosote odor, no sheen.
				B-22-21.5-22					

NOTES

1. Product coats outside of entire length of tubing used to collect reconniasance groundwater sample.

KJ PNW TACOMA METALS OFF PROPERTY MAR 2004.GPJ KJ PNW.GDT 3/24/04

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Off-property (Northwest former Tacoma Metals)	**Boring Name:** B-23
DRILLING COMPANY: Cascade Drilling, Inc. / DRILLER: Kasey Goble	**Project Name:** Former Tacoma Metals
DRILLING METHOD(S): Geoprobe Direct Push / DRILL BIT(S) SIZE: N/A	**Project Number:** 996098.00
ISOLATION CASING: N/A — FROM N/A TO N/A FT.	ELEVATION AND DATUM: / TOTAL DEPTH: 22.0 ft. bgs
BLANK CASING: N/A — FROM N/A TO N/A FT.	DATE STARTED: 3/11/04 / DATE COMPLETED: 3/11/04
SLOTTED CASING: N/A — FROM N/A TO N/A FT.	INITIAL WATER DEPTH (FT): 7.5
SIZE AND TYPE OF FILTER PACK: N/A — FROM N/A TO N/A FT.	LOGGED BY: SDM
SEAL: Bentonite Chips — FROM 0 TO 22 FT.	SAMPLING METHODS: Macro Core / WELL COMPLETION: ☐ SURFACE HOUSING
GROUT: N/A — FROM N/A TO N/A FT.	☐ STAND PIPE _____ FT.

SAMPLES: TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	OVA (PPM)	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
								Wood	**WOOD DEBRIS** Dark brown, slightly decomposed loose wood debris, slightly moist, no odor, no sheen.
								Wood	**WOOD DEBRIS in silt matrix** Black, ~1/2-inch to ~1-inch diameter wood debris, ~20% silt matrix, very moist, no odor, no sheen.
				B-23-3-4		0		SP	**Poorly graded SAND with gravel** Gray, poorly graded fine to medium sand stringer, slightly moist, no odor, no sheen.
			5					Wood	**WOOD DEBRIS in silt matrix** Brown to black, wood debris, ~10-20% silt matrix, slightly moist, no odor, no sheen.
				B-23-6.5-7					
									~7.5' Saturated, slight creosote odor. ~8'-10' Slight sheen.
				B-23-9-10					
			10						
								SP	**Poorly graded SAND** Black, poorly graded fine to medium sand, little or no fines, saturated, no odor, no sheen.
			15	B-23-14-16					
				B-23-18-20					~19-20' Slight creosote odor, slight sheen.
			20					CH	**Fat CLAY** Gray, upper contact is sharp, soft, medium plasticity, moist, no odor, no sheen.
				B-23-21.5-22					

KJ PNW TACOMA METALS OFF PROPERTY MAR 2004.GPJ KJ PNW.GDT 3/24/04

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: East 18th St Right of Way, NW of Tacoma Metals property	**Boring Name** B-24
DRILLING COMPANY: Cascade / DRILLER: Jaymen	**Project Name** Tacoma Metals
DRILLING METHOD(S): Geoprobe / DRILL BIT(S) SIZE: 2-inch	**Project Number** 996098.00
ISOLATION CASING: N/A — FROM N/A TO N/A FT.	ELEVATION AND DATUM / TOTAL DEPTH: 36.0 ft. bgs
BLANK CASING: N/A — FROM N/A TO N/A FT.	DATE STARTED: 3/23/05 / DATE COMPLETED: 3/23/05
SLOTTED CASING: N/A — FROM N/A TO N/A FT.	INITIAL WATER DEPTH (FT): 14
SIZE AND TYPE OF FILTER PACK: N/A — FROM N/A TO N/A FT.	LOGGED BY: DKM
SEAL: Bentonite Chips — FROM 0 TO 36 FT.	SAMPLING METHODS: MacroCore w/PVC liner / WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.
GROUT: N/A — FROM N/A TO N/A FT.	

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	OVA	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
								GW	**Well-graded GRAVEL with sand** Approximately 3 inches surface gravel.
SS	3					0.0		Wood	**WOOD DEBRIS** Brown/orange, wood material, medium wood chip to coarse sawdust sized, no soil present, loose, moist, no evident odor, no sheen.
SS	1		5						
SS	2.5		10	B24-9-10		0.0		SM	**Silty SAND** Gray, silty fine sand, massive, moderately dense, moist, no evident odor, no sheen.
SS	3.5		15	B24-15-16	approx.	164 329		Wood	**WOOD DEBRIS** Gray/brown, wood material, blocky, 10-15% silt/clay matrix overall but matrix varies from <5% to 20-25% locally, matrix is soft with moderate plasticity and dilatency, moist to wet below ~14 feet, no evident odor, no sheen above ~ 14 feet, below ~14 feet faint creosote odor, no sheen.
SS	0.5								
SS	0.5		20			154			Moderate creosote odor, moderate intermittent sheen on water in sampler.
SS	2.5		25			285			Strong creosote odor, heavy sheen on water surface in sampler.
SS	1.5		30	B24-30.5-31.5		51.3		SM	**Silty SAND** Gray/brown, silty fine sand overall, evident layering of poorly graded fine sand, silty fine sand, and sandy silt, typically 1-2 inch layers, moderately dense, wet, slight creosote odor, light sheen.
SS	3		35			0.0		SP	**Poorly graded SAND** Gray, poorly graded medium to coarse sand, coarsens downwards, wet, no evident odor, no sheen.

NOTES

1. Reconnaissance groundwater sample B24-RGW screen placed ~28-32 feet bgs.
2. Refusal at first location at ~12 feet bgs, moved ~4 feet west. Refusal at second location, moved additional ~8 feet west. Third location successful.

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: East 18th St Right of Way, NW of Tacoma Metals property		**Boring Name**	B-25
DRILLING COMPANY: Cascade	DRILLER: Jaymen	**Project Name**	Tacoma Metals
DRILLING METHOD(S): Geoprobe	DRILL BIT(S) SIZE: 2-inch	**Project Number**	996098.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM	TOTAL DEPTH: 36.0 ft. bgs
BLANK CASING: N/A	FROM N/A TO N/A FT.	DATE STARTED: 3/23/05	DATE COMPLETED: 3/23/05
SLOTTED CASING: N/A	FROM N/A TO N/A FT.	INITIAL WATER DEPTH (FT): 13	
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.	LOGGED BY: DKM	
SEAL: Bentonite Chips	FROM 0 TO 36 FT.	SAMPLING METHODS: MacroCore w/PVC liner	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.
GROUT: N/A	FROM N/A TO N/A FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	OVA	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
SS	4					30.6		GM	**Silty GRAVEL with sand** Gravely silt with grass and roots.
								Wood	**WOOD DEBRIS** Orange/brown, wood material, medium chip to coarse sawdust sized, no soil present, fibrous texture locally, loose, moist, no evident odor, no sheen.
SS	2		5	B25-6-7		2.5			
								GM	**Silty GRAVEL** Dark brown, silty gravel with some grayish wood chip material, poor sample recovery but appears to grade into underlying wood debris material, moist, no evident odor, no sheen.
SS	1		10			1.8		Wood	**WOOD DEBRIS** Dark brown/gray, wood material, some gravel, 10-15% silty fine sand matrix evident in sampler (poor revovery), wet at ~13 feet, no evident odor, no sheen.
SS	2		15	B25-14-15	approx.	3.0		ML	**SILT** Gray, silt, some fine sand and clay likely, locally contains fine root-like material, some wood chip material in upper ~1 foot, moderately stiff, low plasticity, moderately rapid dilatency, wet, no evident odor, no sheen.
SS	2.5					0.0			
			20					SM	**Silty SAND** Gray, silty fine sand, 25-30% silt overall, possibly some clay locally, not evidently layered but some textural variation (sandy silt locally), wet, no evident odor, no sheen.
SS	4			B25-22-23		3.2			
			25					SP	**Poorly graded SAND** Dark gray, poorly graded medium sand, wet, no evident odor, no sheen above ~29 feet.
SS	2.5					5.3			
						4.3			
SS	2		30	B25-30-31		262			Below ~29 feet, strong creosote odor, heavy sheen, NAPL blebs evident locally in sampler.
								SM	**Silty SAND** Silty sand overall, interbedded poorly graded fine sand, sandy silt/silty sand, and silt in lower ~1 foot, typically in 2-3" layers, wet, slight creosote odor, light sheen.
SS	3.5		35	B25-34-35		25.1		SP	**Poorly graded SAND** Dark gray, poorly graded medium sand, wet, very slight creosote odor, light sheen.

NOTES

1. Reconnaissance groundwater sample B25-RGW screen placed ~28-32 feet bgs.

KJ PNW LOGS B24 TO B33.GPJ KJ PNW.GDT 5/5/05

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION	East 18th St Right of Way, NW of Tacoma Metals property
DRILLING COMPANY	Cascade
DRILLER	Jaymen
DRILLING METHOD(S)	Geoprobe
DRILL BIT(S) SIZE	2-inch
ISOLATION CASING	N/A
FROM / TO / FT.	N/A / N/A / N/A
BLANK CASING	N/A
FROM / TO / FT.	N/A / N/A / N/A
SLOTTED CASING	N/A
FROM / TO / FT.	N/A / N/A / N/A
SIZE AND TYPE OF FILTER PACK	N/A
FROM / TO / FT.	N/A / N/A / N/A
SEAL	Bentonite Chips
FROM / TO / FT.	0 / 28
GROUT	N/A
FROM / TO / FT.	N/A / N/A / N/A

Boring Name	B-26
Project Name	Tacoma Metals
Project Number	996098.00
ELEVATION AND DATUM	
TOTAL DEPTH	28.0 ft. bgs
DATE STARTED	3/24/05
DATE COMPLETED	3/24/05
INITIAL WATER DEPTH (FT)	15
LOGGED BY	DKM
SAMPLING METHODS	MacroCore w/PVC liner
WELL COMPLETION	☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	OVA	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
SS	4					0.0		GW	**Well-graded GRAVEL** Greenish to brown, gravel with some silt in upper few inches, no evident odor, no sheen.
								Wood	**WOOD DEBRIS** Orange/brown, wood material, medium chips to coarse sawdust sized, no soil evident, loose, moist, no evident odor, no sheen.
SS	3		5	B26-6.5-7.5		0.0		ML	**SILT** Dark gray to black, silt with some gravel and wood material, moist, no evident odor, no sheen.
SS	0.5		10					Wood	**WOOD DEBRIS** Gray/brown, wood material, blocky, silty matrix material, poor sample recovery, wet below ~15 feet, no evident odor, no sheen in recovered material.
SS	0.5		15	approx.					
						0.0		ML	**SILT** Brown/gray, silt mixed with some wood material, very soft, wet, no evident odor, no sheen.
SS	3.5			B26-18-19		0.0		SP	**Poorly graded SAND** Gray, poorly graded medium sand, 5-15% silt locally, wet, above ~19 feet strong creosote odor and moderately heavy sheen (no NAPL), below ~19 feet, no evident odor and no sheen.
SS	3.5		20			0.0			Coarsens downwards to medium/coarse sand mix at ~23 feet bgs.
SS	3.5		25	B26-25-26		356			Below ~24 feet bgs, moderately strong creosote odor and moderate sheen, fines downwards to mostly medium sand by ~25 feet.
						2.4		CL/ ML	**Silty CLAY** Tan/brown, silty clay, moderately stiff, moderately high plasticity, no dilatency, wet, no evident odor, no sheen.

NOTES

1. Reconnaissance groundwater sample B26-RGW screen placed ~22-26 feet bgs.

KJ PNW LOGS B24 TO B33.GPJ KJ PNW.GDT 5/5/05

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION	East 18th St Right of Way, NW of Tacoma Metals property
DRILLING COMPANY	Cascade
DRILLER	Jaymen
DRILLING METHOD(S)	Geoprobe
DRILL BIT(S) SIZE	2-inch
ISOLATION CASING	N/A
FROM / TO / FT.	N/A / N/A
BLANK CASING	N/A
FROM / TO / FT.	N/A / N/A
SLOTTED CASING	N/A
FROM / TO / FT.	N/A / N/A
SIZE AND TYPE OF FILTER PACK	N/A
FROM / TO / FT.	N/A / N/A
SEAL	Bentonite Chips
FROM / TO / FT.	0 / 28
GROUT	N/A
FROM / TO / FT.	N/A / N/A

Boring Name	B-27
Project Name	Tacoma Metals
Project Number	996098.00
ELEVATION AND DATUM	
TOTAL DEPTH	28.0 ft. bgs
DATE STARTED	3/23/05
DATE COMPLETED	3/23/05
INITIAL WATER DEPTH (FT)	10
LOGGED BY	DKM
SAMPLING METHODS	MacroCore w/PVC liner
WELL COMPLETION	☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	OVA	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
								GW	**Well-graded GRAVEL** Approximately 3 inches surface gravel.
SS	1							Wood	**WOOD DEBRIS** Orange/brown, wood material, medium chips to coarse sawdust sized, no evident soil, loose, moist, no evident odor, no sheen.
SS	3.5		5						
				B27-7-8		3.0		ML	**SILT** Dark gray to black, silty material, ~30-35% wood chip material, oily surface appearance locally, soft, moist, no evident odor, possible light sheen.
SS	1.5		10	approx.		27.7		Wood	**WOOD DEBRIS** Grayish brown, wood material, blocky to fibrous texture, 10-15% silty/clayey matrix overall but varies from <5% to 20-25% locally, matrix matrial has moderate plasticity and dilatency, wet below ~10 feet, possible faint creosote odor, no sheen.
SS	0.5		15						No evident odor, no sheen in recovered sample material.
SS	0		20						
SS	3			B27-22-23		1.6		SP	**Poorly graded SAND** Dark gray, poorly graded medium to coarse sand, fining downwards to mostly medium sand, moderately dense, wet, possible slight creosore odor, no sheen at top.
			25	B27-24.5-25.5		2,517			Below ~24 feet, strong creosote odor, heavy sheen, abundant NAPL blebs on water surface.
SS	3							ML	**Sandy SILT** Medium gray/brown, silt with ~30% fine sand, wet, low to moderate creosote odor, heavy sheen, minor NAPL blebs locally.
				B27-27-28		104		SP	**Poorly graded SAND** Medium gray, poorly graded fine to medium sand, some silt, wet, slight to moderate creosote odor, no evident sheen.

NOTES

1. Reconnaissance groundwater sample B27-RGW screen placed ~24-28 feet bgs.

KJ PNW LOGS B24 TO B33.GPJ KJ PNW.GDT 5/5/05

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION	East 18th St Right of Way, NW of Tacoma Metals property
DRILLING COMPANY	Cascade
DRILLER	Jaymen
DRILLING METHOD(S)	Geoprobe
DRILL BIT(S) SIZE	2-inch
ISOLATION CASING	N/A
FROM / TO / FT.	N/A / N/A / N/A
BLANK CASING	N/A
FROM / TO / FT.	N/A / N/A / N/A
SLOTTED CASING	N/A
FROM / TO / FT.	N/A / N/A / N/A
SIZE AND TYPE OF FILTER PACK	N/A
FROM / TO / FT.	N/A / N/A / N/A
SEAL	Bentonite Chips
FROM / TO / FT.	0 / 28
GROUT	N/A
FROM / TO / FT.	N/A / N/A / N/A

Boring Name	B-28
Project Name	Tacoma Metals
Project Number	996098.00
ELEVATION AND DATUM	
TOTAL DEPTH	28.0 ft. bgs
DATE STARTED	3/24/05
DATE COMPLETED	3/24/05
INITIAL WATER DEPTH (FT)	10
LOGGED BY	DKM
SAMPLING METHODS	MacroCore w/PVC liner
WELL COMPLETION	☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	OVA	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
SS	3.5							GW	**Well-graded GRAVEL with sand** Brown to gray/green, gravel with sand, dense, no evident odor, no sheen.
								Wood	**WOOD DEBRIS** Brown/orange, wood material, medium chips to coarse sawdust sized, no evident soil, moist, no evdient odor, no sheen.
SS	4		5	B28-6-7		2.1		SW/ SM	**Well-graded SAND with silt and gravel** Dark gray/brown, sand, gravel, and silt mixture, locally granular texture, some coal-like fragments, moist, no evident odor, no sheen.
SS	2		10	B28-11-12	approx.	0.0		Wood	**WOOD DEBRIS** Gray, wood material, 10-15% silty/clayey matrix overall but varies from <5% to 20-25% locally, wet below ~10 feet bgs, no evident odor, no sheen.
SS	3		15						Sheen present on water surface in sampler ~15-16 feet bgs, slight creosote odor.
SS	2.5					0.0			
			20			0.0		SP	**Poorly graded SAND** Dark gray, poorly graded medium to coarse sand, wet, no evident odor and no sheen above ~23.5 feet bgs.
SS	2.5					0.0			Below ~23.5 feet, moderate creosote odor and sheen, no evident NAPL.
				B28-23.5-24.5		284			
SS	3.5		25	B28-25-26		0.0		CL/ ML	**Silty CLAY** Tan/brown, silty clay, moderately stiff, moderate plasticity , slow dilatency, wet, possible faint creosote odor, no sheen.

NOTES

1. Reconnaissance groundwater sample B28-RGW screen placed ~21-25 feet bgs.

KJ PNW LOGS B24 TO B33.GPJ KJ PNW.GDT 5/5/05

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION	East 18th St Right of Way, NW of Tacoma Metals property
DRILLING COMPANY	Cascade
DRILLER	Jaymen
DRILLING METHOD(S)	Geoprobe
DRILL BIT(S) SIZE	2-inch
ISOLATION CASING	N/A
FROM / TO / FT.	N/A / N/A
BLANK CASING	N/A
FROM / TO / FT.	N/A / N/A
SLOTTED CASING	N/A
FROM / TO / FT.	N/A / N/A
SIZE AND TYPE OF FILTER PACK	N/A
FROM / TO / FT.	N/A / N/A
SEAL	Bentonite Chips
FROM / TO / FT.	0 / 28
GROUT	N/A
FROM / TO / FT.	N/A / N/A

Boring Name	B-29
Project Name	Tacoma Metals
Project Number	996098.00
ELEVATION AND DATUM	
TOTAL DEPTH	28.0 ft. bgs
DATE STARTED	3/23/05
DATE COMPLETED	3/23/05
INITIAL WATER DEPTH (FT)	8.5
LOGGED BY	DKM
SAMPLING METHODS	MacroCore w/PVC liner
WELL COMPLETION	☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	OVA	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
						GW/ GM	**Well-graded GRAVEL with silt** Gravel with ~4" topsoil above.
SS	4					Wood	**WOOD DEBRIS** Orange/brown, wood material, medium chips to coarse sawdust sized, no evident soil, loose, moist, no evident odor, no sheen.
SS	4		5				
				B29-6.5-7.5	0.0	SW	**Well-graded SAND with gravel** Grayish green, sand with 10-15% gravel, granular texture, moist, no evident odor, no sheen.
						ML	**Sandy SILT** Dark gray, silt with ~20% fine sand and minor gravel, some wood material below ~7.5 feet, poor recovery but appears to grade into underlying wood material, soft, moist to wet, no evident odor, no sheen.
				approx.			
SS	1.5		10				
				B29-11-12	0.9	Wood	**WOOD DEBRIS** Dark gray, wood material, 10-15% silty matrix with some fine sand and clay, matrix varies locally from <5% to 20-25%, slightly less matrix (~10%) and lighter gray color below ~16 feet, wet, no evident odor, no sheen.
SS	1.5						
			15		0.3		
SS	1.5						
			20		0.0	SP	**Poorly graded SAND** Dark gray, poorly graded medium to coarse sand grading downwards to mainly medium sand, wet, slight odor, no sheen at top.
SS	3						Below ~22 feet, strong creosote odor, heavy sheen, some NAPL blebs.
				B29-22.5-23.5	1,309		
			25			CL/ ML	**Silty CLAY** Brown, silty clay to clayey silt, some wood material present locally, sticky, moderately stiff, moderately low plasticity, moderate dilatency, wet, slight creosote odor, no sheen.
SS	4			B29-25-26	14.1		

NOTES

1. Reconnaissance groundwater sample B29-RGW screen placed ~20-24 feet bgs.

KJ PNW LOGS B24 TO B33.GPJ KJ PNW.GDT 5/5/05

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: East 18th St Right of Way, NW of Tacoma Metals property		**Boring Name**	B-30
DRILLING COMPANY: Cascade	DRILLER: Jaymen	**Project Name**	Tacoma Metals
DRILLING METHOD(S): Geoprobe	DRILL BIT(S) SIZE: 2-inch	**Project Number**	996098.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM	TOTAL DEPTH: 24.0 ft. bgs
BLANK CASING: N/A	FROM N/A TO N/A FT.	DATE STARTED: 3/24/05	DATE COMPLETED: 3/24/05
SLOTTED CASING: N/A	FROM N/A TO N/A FT.	INITIAL WATER DEPTH (FT): 10	
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.	LOGGED BY: DKM	
SEAL: Bentonite Chips	FROM 0 TO 24 FT.	SAMPLING METHODS: MacroCore w/PVC liner	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.
GROUT: N/A	FROM N/A TO N/A FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	OVA	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
								GW/ GM	**Well-graded GRAVEL with silt and sand** Gray/brown, gravel with sand and silt, moist, no evident odor, no sheen.
SS	3							Wood	**WOOD DEBRIS** Orange/brown, wood material, medium chips to coarse sawdust sized, no evident soil, moist, no evident odor, no sheen.
			5						
SS	3	☒		B30-5.5-6.5		0.0		SM	**Silty SAND** Dark gray to black, silty sand with fine decayed wood material (<25%), oily surface appearance, soft, moist, no evident odor, heavy sheen.
SS	3		10	approx.				Wood	**WOOD DEBRIS** Brown/gray, wood material, blocky, 5-15% silty/clayey matrix overall, matrix varies from <5% to 20-25% locally, wet below ~10 feet, very faint creosote odor, no sheen.
		☒		B30-11-12		0.0			
SS	3								
			15			0.0			**Poorly graded SAND** Gray, poorly graded medium sand, up to 5-10% silt, wet, no evdient odor, no sheen.
SS	1							SP	Poor recovery, but light sheen is visible on water surface in sampler, no evident odor.
						0.0			
			20						
SS	3.5	☒		B30-22-23		86.2			Below ~22 feet, moderate sheen, slight to moderate creosote odor, medium to coarse sand.
						1.7		CL/ ML	**Silty CLAY** Tan/brown, silty clay, some wood material, moderately soft, high plasticity, low dilatency, wet, sticky, no evident odor, no sheen.

NOTES

1. Reconnaissance groundwater sample B30-RGW screen placed ~20-24 feet bgs.
2. Refusal at first location at ~13 feet bgs, moved ~3 feet east. Second location successful.

KJ PNW LOGS B24 TO B33.GPJ KJ PNW.GDT 5/5/05

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION	East 18th St Right of Way, NW of Tacoma Metals property
DRILLING COMPANY	Cascade
DRILLER	Jaymen
DRILLING METHOD(S)	Geoprobe
DRILL BIT(S) SIZE	2-inch
ISOLATION CASING	N/A
FROM / TO / FT.	N/A / N/A / N/A
BLANK CASING	N/A
FROM / TO / FT.	N/A / N/A / N/A
SLOTTED CASING	N/A
FROM / TO / FT.	N/A / N/A / N/A
SIZE AND TYPE OF FILTER PACK	N/A
FROM / TO / FT.	N/A / N/A / N/A
SEAL	Bentonite Chips
FROM / TO / FT.	0 / 28
GROUT	N/A
FROM / TO / FT.	N/A / N/A / N/A

Boring Name	B-31
Project Name	Tacoma Metals
Project Number	996098.00
ELEVATION AND DATUM	
TOTAL DEPTH	28.0 ft. bgs
DATE STARTED	3/24/05
DATE COMPLETED	3/24/05
INITIAL WATER DEPTH (FT)	11
LOGGED BY	DKM
SAMPLING METHODS	MacroCore w/PVC liner
WELL COMPLETION	☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	OVA	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
								GW	**Well-graded GRAVEL** Gray/green/brown, well graded gravel.
SS	3							Wood	**WOOD DEBRIS** Brown/orange, wood material, medium chips to fine sawdust sized, no evident soil, moist, no evident odor, no sheen.
			5						
SS	2.5			B31-6-7		3.2		ML	**Gravelly SILT** Dark brown to gray, silty material with some gravel and wood chips, oily appearance locally, soft, moist, no evident odor, no evident sheen.
								ML	**SILT** Dark brown, silty material with <25% wood material, some fine sand, soft, moist, no evident odor, no evident sheen.
SS	2		10						**WOOD DEBRIS** Gray/brown, wood material, blocky, <10% matrix in recovered sample material, wet below ~11 feet, no evident odor, no sheen.
				approx.					
SS	0							Wood	
			15						
SS	2.5								16 to 20 foot sample--material above sand is very wet (sloppy, runny) and large NAPL blebs are present on the water surface in the sampler.
				B31-19-20		100.1			**Poorly graded SAND** Gray, poorly graded medium sand, coarsens gradually downwards, wet, strong creosote odor, heavy sheen on surface in sampler appears to increase with depth, no evident NAPL but gloves/baggies are stained.
			20						
SS	4					523.0		SP	
				B31-24-25		1,292			
			25						
SS	3.5					8.4		CL/ ML	**Silty CLAY** Brown/gray, silty clay to clayey silt, moderately stiff, moderate plasticity, low diltatency, wet, no evdient odor, no sheen.

NOTES

1. Reconnaissance groundwater sample B31-RGW screen placed ~21-25 feet bgs.

KJ PNW LOGS B24 TO B33.GPJ KJ PNW.GDT 5/5/05

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION	East 18th St Right of Way, NW of Tacoma Metals property
DRILLING COMPANY	Cascade
DRILLER	Jaymen
DRILLING METHOD(S)	Geoprobe
DRILL BIT(S) SIZE	2-inch
ISOLATION CASING	N/A
FROM / TO / FT.	N/A / N/A / N/A
BLANK CASING	N/A
FROM / TO / FT.	N/A / N/A / N/A
SLOTTED CASING	N/A
FROM / TO / FT.	N/A / N/A / N/A
SIZE AND TYPE OF FILTER PACK	N/A
FROM / TO / FT.	N/A / N/A / N/A
SEAL	Bentonite Chips
FROM / TO / FT.	0 / 24
GROUT	N/A
FROM / TO / FT.	N/A / N/A / N/A

Boring Name	B-32
Project Name	Tacoma Metals
Project Number	996098.00
ELEVATION AND DATUM	
TOTAL DEPTH	24.0 ft. bgs
DATE STARTED	3/24/05
DATE COMPLETED	3/24/05
INITIAL WATER DEPTH (FT)	8
LOGGED BY	DKM
SAMPLING METHODS	MacroCore w/PVC liner
WELL COMPLETION	☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	OVA	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
SS	2					GM	**Silty GRAVEL with sand** Brown, gravel with sand and silt, 3-4 inches red/brown topsoil above gravel, moist, no evident odor, no sheen.
						Wood	**WOOD DEBRIS** Gray/brown, wood material, 10-15% silty/clayey matrix overall, matrix varies from <5% to 20-25% locally, moist to wet at ~8 feet, no evident odor, no sheen.
SS	3		5	B32-6-7	0.0		Appears to be the "lower/older" wood unit.
				approx. ▽			
SS	2.5		10	B32-11-12	0.0	SP	**Poorly graded SAND** Dark gray to black, poorly graded medium sand, some silt locally, wet, no evident odor, no sheen.
SS	0		15				
SS	2.5			B32-19-20	83.0		Below ~18 feet, strong creosote odor, moderate sheen, NAPL blebs rinse out in sheen test.
SS	3.5		20	B32-21-22	0.0	CL/ ML	**Silty CLAY** Tan/brown, sitly clay, moderately stiff, moderately high plasticity, low dilatency, wet, no evident odor, no sheen.

NOTES

1. Reconnaissance groundwater sample B32-RGW screen placed ~16-20 feet bgs.

KJ PNW LOGS B24 TO B33.GPJ KJ PNW.GDT 5/5/05

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: East 18th St Right of Way, NW of Tacoma Metals property	**Boring Name:** B-33
DRILLING COMPANY: Cascade / DRILLER: Jaymen	**Project Name:** Former Tacoma Metals
DRILLING METHOD(S): Geoprobe / DRILL BIT(S) SIZE: 2-inch	**Project Number:** 996098.00
ISOLATION CASING: N/A — FROM N/A TO N/A FT.	ELEVATION AND DATUM / TOTAL DEPTH: 24.0 ft. bgs
BLANK CASING: N/A — FROM N/A TO N/A FT.	DATE STARTED: 3/24/05 / DATE COMPLETED: 3/24/05
SLOTTED CASING: N/A — FROM N/A TO N/A FT.	INITIAL WATER DEPTH (FT): 10.0
SIZE AND TYPE OF FILTER PACK: N/A — FROM N/A TO N/A FT.	LOGGED BY: DKM
SEAL: Bentonite Chips — FROM 0 TO 24 FT.	SAMPLING METHODS: MacroCore w/PVC liner / WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.
GROUT: N/A — FROM N/A TO N/A FT.	

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	OVA	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
SS	3.5					8.9		GM	**Silty GRAVEL** Brown, silty gravel, moist, no evident odor, no sheen.
								Wood	**WOOD DEBRIS** Orange/brown, wood material, medium chip to coarse sawdust sized, no evident soil, moist, no evident odor, no sheen.
								GW	**Well-graded GRAVEL with sand** Gray/green to dark gray, well graded gravel with ~40% sand, possibly some silt, layered appearance, dense, moist, no evident odor, no sheen.
SS	3		5	B33-6-7		3.4		SW/ SM	**Well-graded SAND with silt and gravel** Dark gray, sand and silt with some gravel, granular texture locally, moist, no evident odor, no sheen.
SS	3		10	approx.				Wood	**WOOD DEBRIS** Gray, wood material, coarse blocky texture, less than 10% matrix present in recovered sample material, moist to wet below ~10 feet, no evident odor, no sheen.
SS	1		15			10.1			
SS	2			B33-18-19		0.0		SP	**Poorly graded SAND** Dark gray, poorly graded sand, mainly coarse sand, some medium sand, wet, no evident odor, no sheen.
			20						
SS	4			B33-20.5-21.5		3.1		ML	**Sandy SILT** Brown/gray, sandy silt, 30-40% fine sand, wet, no evident odor, no sheen.
						0.0		CL/ ML	**Silty CLAY** Tan/brown, silty clay, moderately stiff, moderate plasticity, low dilatency, wet, no evident odor, no sheen.

NOTES

1. Reconnaissance groundwater sample B33-RGW screen placed ~18-22 feet bgs.

KJ PNW LOGS B24 TO B33 2005.GPJ KJ PNW.GDT 2/25/13

F-40.1
(6-87) (3-88) (8-90)

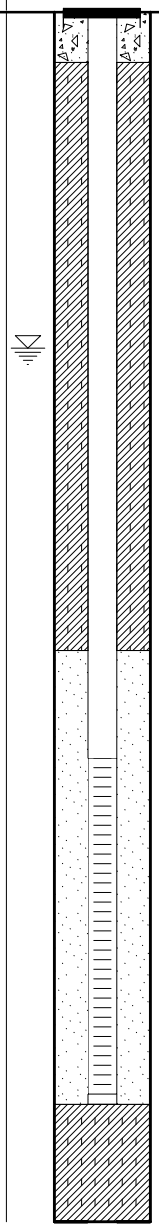
Boring & Well Construction Log

Kennedy/Jenks Consultants

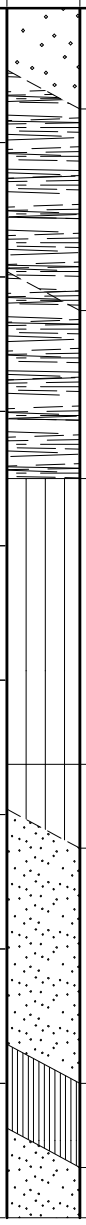
BORING LOCATION: Northeast Corner Simpson Property		**Well Name**	MW-29 / B-34
DRILLING COMPANY: Cascade	DRILLER: Casey / Jaymen	**Project Name**	Former Tacoma Metals
DRILLING METHOD(S): HSA / GeoProbe	DRILL BIT(S) SIZE: 9-inch / 2-inch	**Project Number**	998098.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM	TOTAL DEPTH: 36.0 ft. bgs
BLANK CASING: 2" Schedule 40 PVC Pipe	FROM 0 TO 22.2 FT.; FROM 32.2 TO 32.5	DATE STARTED: 2/14/06	DATE COMPLETED: 2/15/06
SLOTTED CASING: 2" Schedule 40 PVC Pipe, 0.010-Slot	FROM 22.2 TO 32.2 FT.	INITIAL WATER DEPTH (FT): 10.0	
SIZE AND TYPE OF FILTER PACK: Lapis Lustre #2/12 Monterey Sand	FROM 19 TO 32.5 FT.	LOGGED BY: DKM	
SEAL: Pure Gold Bentonite Chips	FROM 1.5 TO 19 FT.; FROM 32.5 TO 36	SAMPLING METHODS: MacroCore w/PVC Liner	WELL COMPLETION: ■ SURFACE HOUSING; ☐ STAND PIPE _____ FT.
GROUT: Concrete	FROM 0 TO 1.5 FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	OVA	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
SH	2				0.2	SW	**Well-graded SAND with gravel** Gray, medium sand with 10-15% gravel and ~5% red/brown woody material locally, moderately dense, moist, no odor, no sheen.
SH	1		5	B34-7-8	0.5	Wood	**WOOD DEBRIS** Red/brown, woody material, fine chips to coarse sawdust size, locally up to 5% silt but typically no matrix material, soft, moist, no odor, no sheen.
SH	0.5		10			Wood	**WOOD DEBRIS** Dark gray to dark orange/brown, blocky wood material, typically coated with silt and fine sand, 5-10% matrix material, moist to wet below 10 feet bgs, no odor, no sheen.
SH	3		15			ML	**Sandy SILT** Medium gray/brown, silt with fine sand, <5% sand at top, 15-20% sand by ~16 feet bgs, ~20% sand by 20 feet bgs, moderately dense overall but loose 20-22.5 feet bgs, wet, no odor, no sheen.
SH	2.5			B34-18-19	0.0		
SH	4		20				
SH	2.5		25			ML	**SILT** Gray, silt, becomes sandier (fine sand) with depth, up to 10% sand by ~24 feet bgs, moderately stiff, wet, no odor, no sheen.
SH	3.5		30	B34-30-31	57.4	SP	**Poorly graded SAND** Gray, medium to coarse sand at top, primarily medium sand by ~28 feet bgs, fine sand present below ~30 feet bgs, moderately dense, wet, slight creosote odor, no sheen.
SH	3.5		35	B34-34-35	1.0	SM	**Silty SAND** Gray, silty fine sand, 15-20% silt, moderately dense, wet, no odor, no sheen.
					0.3	SP	**Poorly graded SAND** Gray, medium to fine sand at top, grading to mostly medium/coarse sand by 36 feet bgs, moderately dense, wet, no odor, no sheen.

WELL CONSTRUCTION



LITHOLOGY



NOTES

1. Sampling and lithologic logging were performed during GeoProbe boring on 2/14/06. The well was installed at the same location on 2/15/06.

KJ PNW LOGS MW-28R TO MW-31 2006.GPJ KJ PNW.GDT 2/19/13

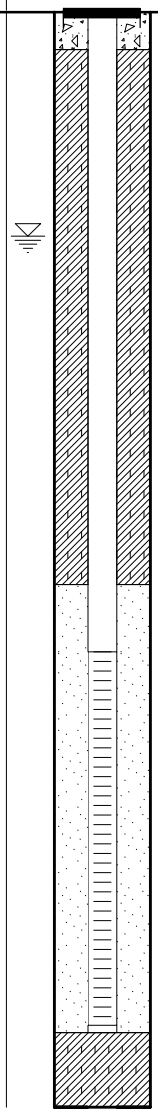
F-40.1
(6-87) (3-88) (8-90)

Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION: Simpson Property center well		**Well Name**	MW-30 / B-35
DRILLING COMPANY: Cascade	DRILLER: Casey / Jaymen	**Project Name**	Former Tacoma Metals
DRILLING METHOD(S): HSA / GeoProbe	DRILL BIT(S) SIZE: 9-inch / 2-inch	**Project Number**	998098.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM	TOTAL DEPTH: 44.0 ft. bgs
BLANK CASING: 2" Schedule 40 PVC Pipe	FROM 0 TO 25.7 FT. / 40.7 41	DATE STARTED: 2/14/06	DATE COMPLETED: 2/15/06
SLOTTED CASING: 2" Schedule 40 PVC Pipe, 0.010-Slot	FROM 25.7 TO 40.7 FT.	INITIAL WATER DEPTH (FT): 9.0	
SIZE AND TYPE OF FILTER PACK: Lapis Lustre #2/12 Monterey Sand	FROM 23 TO 41 FT.	LOGGED BY: DKM	
SEAL: Pure Gold Bentonite Chips	FROM 1.5 TO 23 FT. / 41 44	SAMPLING METHODS: MacroCore w/PVC Liner	WELL COMPLETION: ■ SURFACE HOUSING ☐ STAND PIPE _____ FT.
GROUT: Concrete	FROM 0 TO 1.5 FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	OVA	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
SH	1.5					SW	**Well-graded SAND with gravel** Brown/gray, sand with 25-30% rounded gravel, some silt below ~4 feet bgs, moist, no odor, no sheen.
SH	2.5		5	B35-6-7	0.3	SM	**Silty SAND with gravel** Dark gray to black, granular (sand-sized) material mixed with 15-20% silt and some angular gravel material, oily surface appearance locally, moist, no odor, no sheen.
SH	2.5		10			Wood	**WOOD DEBRIS** Gray to brown/yellow (on exposed surfaces), blocky wood debris with gray silty matrix material (5-10%) typically coating wood surfaces, wet, no odor, no sheen.
SH	1		15		0.5		
SH	0		20				
SH	3			B35-23-24	0.4	SP	**Poorly graded SAND** Medium gray, poorly graded medium to coarse sand, locally minor fine sand, wet, no odor, no sheen above ~24 feet bgs.
SH	4		25		1.1		Slight creosote odor and no sheen ~24-28 feet bgs.
SH	4		30		1.4		Slight to moderate creosote odor and no sheen ~28-35 feet bgs (strongest odor ~30-33').
SH	4			B35-32-33	15.5		
			35		5.6		
SH	4						No odor or sheen below ~35 feet bgs.
			40	B35-39-40	0.4		
SH	4				0.9	ML	**SILT** Tan/gray, silt, minor fine sand and clay, stiff, moderate plasticity and dilatency, wet, no odor, no sheen.
					0.8	SP	**Poorly graded SAND** Medium gray, poorly graded medium to coarse sand, wet, no odor, no sheen.
						ML	**SILT** Tan/gray, silt, minor fine sand and clay, stiff, moderate plasticity and dilatency, wet, no odor, no sheen.
						SP	



NOTES

1. Sampling and lithologic logging were performed during GeoProbe boring on 2/14/06. The well was installed at the same location on 2/15/06.

(See next page for lithology description)

KJ PNW LOGS MW-28R TO MW-31 2006.GPJ KJ PNW.GDT 2/19/13

Boring & Well Construction Log

Kennedy/Jenks Consultants

Project Name Former Tacoma Metals **Project Number** 998098.00 **Well Name** MW-30 / B-35

SAMPLES			DEPTH (FEET)	SAMPLE NUMBER	WELL CONSTRUCTION	OVA	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"							
									Poorly graded SAND Medium gray, poorly graded medium to coarse sand, wet, no odor, no sheen.

KJ PNW LOGS MW-28R TO MW-31 2006.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION: Simpson Property nearest Portland Avenue		**Well Name**	MW-31 / B-36
DRILLING COMPANY: Cascade	DRILLER: Casey / Jaymen	**Project Name**	Former Tacoma Metals
DRILLING METHOD(S): HSA / GeoProbe	DRILL BIT(S) SIZE: 9-inch / 2-inch	**Project Number**	998098.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM	TOTAL DEPTH: 36.0 ft. bgs
BLANK CASING: 2" Schedule 40 PVC Pipe	FROM 0 TO 22.7 FT. / 32.7 TO 33	DATE STARTED: 2/14/06	DATE COMPLETED: 2/15/06
SLOTTED CASING: 2" Schedule 40 PVC Pipe, 0.010-Slot	FROM 22.7 TO 32.7 FT.	INITIAL WATER DEPTH (FT): 10.0	
SIZE AND TYPE OF FILTER PACK: Lapis Lustre #2/12 Monterey Sand	FROM 20 TO 33 FT.	LOGGED BY: DKM	
SEAL: Pure Gold Bentonite Chips	FROM 1.5 TO 20 FT. / 33 TO 36	SAMPLING METHODS: MacroCore w/PVC Liner	WELL COMPLETION: ■ SURFACE HOUSING ☐ STAND PIPE _____ FT.
GROUT: Concrete	FROM 0 TO 1.5 FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	OVA	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
SH	2					GW/ GM	**Well-graded GRAVEL with silt and sand** Tan, gravel fill with sand and silt, dense, moist, no odor, no sheen.
SH	3.5		5			Wood	**WOOD DEBRIS** Orange/brown, wood material, fine chips to coarse sawdust size, some silt present locally (<5% total), moderately loose, moist, no odor, no sheen.
SH	3.5		10	B36-8-10	72.6	SM	**Silty SAND with gravel** Dark brown, Mixture of silt (20-30%), gravel (10-15%), fine sand, and wood material, moderately loose, moist to wet, moderate odor with moderate sheen ~7-10 feet bgs, slight odor but no sheen below ~10 feet.
SH	3		15			Wood	**WOOD DEBRIS** Gray, coarse wood material coated with silt and fine sand matrix (5-10% overall but locally variable), wet, no odor, light to moderate sheen increasing with depth.
SH	1				6.7		NAPL blebs are locally visible on the water surface in the sampler, increasing with depth.
SH	3		20	B36-23-24	20.8		
SH	3		25		3.4	SP	**Poorly graded SAND** Dark gray, poorly graded sand, mostly fine sand at 23 feet bgs, medium to coarse sand ~24-25 feet bgs, becoming silty (up to ~10%) below ~26 feet bgs, wet, strong creosote odor with heavy sheen and brownish NAPL blebs visible ~23-24 feet bgs, moderate odor and sheen (no visible NAPL blebs) below ~24 feet bgs.
					2.5	SP/	
SH	2.5		30			SM	**Poorly graded SAND with silt** Gray, poorly graded fine sand with 10-15% silt, moderately dense, wet, slight creosote odor, light sheen.
				B36-31-32	31.5	SP	**Poorly graded SAND** Gray to dark gray, fine to medium sand at top grading to mostly medium sand by ~32 feet bgs, moderately dense, wet, moderate creosote odor and sheen above ~31 feet bgs, strong odor with heavy sheen with NAPL blebs visible below ~31 feet bgs.
SH	3.5		35	B36-34-35	1.1 / 0.8	SM / SP	

Silty SAND Gray, fine sand with 15-20% silt, moderately dense, wet, no odor, no sheen.

(See next page for lithology description)

NOTES

1. Sampling and lithologic logging were performed during GeoProbe boring on 2/14/06. The well was installed at the same location on 2/15/06.

KJ PNW LOGS MW-28R TO MW-31 2006.GPJ KJ PNW.GDT 2/19/13

Boring & Well Construction Log

Kennedy/Jenks Consultants

Project Name Former Tacoma Metals **Project Number** 998098.00 **Well Name** MW-31 / B-36

SAMPLES			DEPTH (FEET)	SAMPLE NUMBER	WELL CONSTRUCTION	OVA	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"							
									Poorly graded SAND Gray, poorly graded medium to coarse sand, moderately dense, wet, no odor, no sheen.

KJ PNW LOGS MW-28R TO MW-31 2006.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Simpson Property		**Boring Name**	B-37
DRILLING COMPANY: Cascade	DRILLER: Kasey	**Project Name**	Tacoma Metals
DRILLING METHOD(S): GeoProbe	DRILL BIT(S) SIZE: 2-inch	**Project Number**	996098*00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM: ground surface	TOTAL DEPTH: 24.0 ft. bgs
BLANK CASING: N/A	FROM N/A TO N/A FT.	DATE STARTED: 10/29/07	DATE COMPLETED: 10/29/07
SLOTTED CASING: N/A	FROM N/A TO N/A FT.	INITIAL WATER DEPTH (FT): 9.5	
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.	LOGGED BY: DKM	
SEAL: Bentonite	FROM 0 TO 24 FT.	SAMPLING METHODS: MacroCore with PVC Liner	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.
GROUT: N/A	FROM N/A TO N/A FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	PID	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
SH	3.5				0	GW	**Well-graded GRAVEL with sand** Brown, gravel and sand fill, moist, no odor, no sheen.
SH	3		5	B37-5-6		SW	**Well-graded SAND with gravel** Layered green-gray/dark gray/tan, abrupt contacts between different colored layers, sand with 20-30% gravel overall (locally variable), some silt locally, moderately dense, moist, no odor, no sheen.
						Wood	**WOOD DEBRIS** Dark brown to red-brown, wood material with 5-10% silty matrix, moist, no odor, no sheen.
SH	2.5		10		0	SP	**Poorly graded SAND** Dark gray, poorly graded medium sand, moderately dense, moist to wet at ~9.5 feet bgs, no odor, no sheen.
						SM	**Silty SAND** Gray/brown, silty fine sand, some woody material locally, moderately dense, wet, no odor, no sheen.
SH	2.5		15	B37-14-15	0	SP	**Poorly graded SAND** Dark gray, poorly graded medium to coarse sand, local small (<1/2 inch) silt nodules in lower ~3 feet, moderately dense, wet, possible faint creosote odor 16-20 feet, otherwise no odor, no sheen.
SH	3						
SH	3		20	B37-21-22	0	CL/ ML	**Silty CLAY** Gray, silty clay, moderately stiff, moderately high plasticity, wet, no odor, no sheen.
						SP	**Poorly graded SAND** Gray, poorly graded medium sand, moderately dense, wet, no odor, no sheen.
						ML	**Sandy SILT** Gray, sandy silt, moderately stiff, low plasticity, wet, no odor, no sheen.

NOTES

1. Reconnaissance groundwater sample B37-RGW screen set 18-22 feet bgs.

KJ PNW LOGS B37 TO B47 2007.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: City of Tacoma Right of Way	**Boring Name:** B-37A
DRILLING COMPANY: Cascade	DRILLER: Eli
DRILLING METHOD(S): GeoProbe	DRILL BIT(S) SIZE: 2-inch
	Project Name: Tacoma Metals
	Project Number: 996098*00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.
BLANK CASING: N/A	FROM N/A TO N/A FT.
SLOTTED CASING: N/A	FROM N/A TO N/A FT.
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.
SEAL: Bentonite	FROM 0 TO 24 FT.
GROUT: N/A	FROM N/A TO N/A FT.
ELEVATION AND DATUM: ground surface	TOTAL DEPTH: 24.0 ft. bgs
DATE STARTED: 1/25/08	DATE COMPLETED: 1/25/08
INITIAL WATER DEPTH (FT): 10.0	
LOGGED BY: RCZ	
SAMPLING METHODS: MacroCore with PVC Liner	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	PID	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
SH	3					0		GP	**Poorly graded GRAVEL with sand** Brown, gravely fill material, moderately dense, no odor, no sheen.
								SP	**Poorly graded SAND with gravel** Gray, poorly graded medium-fine sand with 5-10% gravel, moderately dense, no odor, no sheen.
								SP/ SM	**Poorly graded SAND with silt** Brown, sand with 30% silt, some organic debris and wood chip material, soft, no odor, no sheen.
SH	2.5		5			0		SW	**Well-graded SAND with gravel** Dark gray, sand with 50% gravel, moderately dense, no odor, no sheen.
								SW/ SM	**Well-graded SAND with silt** Dark gray to brown, sand with 30% silt, moderately dense, moist, no odor, no sheen.
SH	2.3		10			0		Wood	**WOOD DEBRIS** Dark brown to red-brown, wood material with 5-10% silty matrix, moist, no odor, no sheen.
								GW/ GM	**Well-graded GRAVEL with silt and sand** Dark gray, well graded gravel with 10% fine sand and 20% silt, moderately dense, wet, no odor, no sheen.
SH	1.3		15					SP	**Poorly graded SAND** Gray, poorly graded medium sand, 5% fine to medium gravel in upper 2 feet, grading to fine sand by 20-21 feet, moderately dense, wet, no odor, no sheen.
SH	0.5					0			
			20						
SH	3					0		CL/ ML	**Silty CLAY** Gray, silty clay, moderately stiff, medium-low pasticity, wet, no odor, no sheen.

NOTES

1. Reconnaissance groundwater sample B37A-RGW screen set 18-22 feet bgs.

KJ PNW LOGS B37 TO B47 2007.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Simpson Property		**Boring Name**	B-38
DRILLING COMPANY: Cascade	DRILLER: Kasey	**Project Name**	Tacoma Metals
DRILLING METHOD(S): GeoProbe	DRILL BIT(S) SIZE: 2-inch	**Project Number**	996098*00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM: ground surface	TOTAL DEPTH: 28.0 ft. bgs
BLANK CASING: N/A	FROM N/A TO N/A FT.	DATE STARTED: 10/29/07	DATE COMPLETED: 10/29/07
SLOTTED CASING: N/A	FROM N/A TO N/A FT.	INITIAL WATER DEPTH (FT): 9.0	
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.	LOGGED BY: DKM	
SEAL: Bentonite	FROM 0 TO 28 FT.	SAMPLING METHODS: MacroCore with PVC Liner	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.
GROUT: N/A	FROM N/A TO N/A FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	PID	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
SH	3							GW	**Well-graded GRAVEL with sand** Tan, gravelly fill material, moderately dense, slightly moist, no odor, no sheen.
								SP/ SM	**Poorly graded SAND with silt** Dark gray, sand with 10-15% silt and 5-10% gravel, moderately dense, moist, no odor, no sheen.
SH	3		5	B38-5-6					
								SM	**Silty SAND** Gray, very fine sand with 30-40% silt, moderately dense, moist, no odor, no sheen.
SH	2.8		10			0			
								SP	**Poorly graded SAND** Gray, poorly graded medium sand, local small (<1/2") silt nodules in lower ~5 feet, moderately dense, wet, possible slight creosote odor ~15-20 feet bgs, no odor otherwise, no sheen.
SH	3.2		15	B38-14.5-15.5		0			
SH	2.5					0			
			20						
SH	3.5			B38-22.5-23.5		0			@ ~23 feet bgs 1/2" thick layer of gray/brown silty clay
			25					CL/ ML	**Silty CLAY** Gray, silty clay, some fine sand locally, moderately stiff, high plasticity, wet, no odor, no sheen.
SH	4								

NOTES

1. Reconnaissance groundwater sample B38-RGW screen set 20-24 feet bgs.

KJ PNW LOGS B37 TO B47 2007.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Simpson Property		**Boring Name**	B-39
DRILLING COMPANY: Cascade	DRILLER: Kasey	**Project Name**	Tacoma Metals
DRILLING METHOD(S): GeoProbe	DRILL BIT(S) SIZE: 2-inch	**Project Number**	996098*00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM: ground surface	TOTAL DEPTH: 28.0 ft. bgs
BLANK CASING: N/A	FROM N/A TO N/A FT.	DATE STARTED: 10/29/07	DATE COMPLETED: 10/29/07
SLOTTED CASING: N/A	FROM N/A TO N/A FT.	INITIAL WATER DEPTH (FT): 10.0	
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.	LOGGED BY: DKM	
SEAL: Bentonite	FROM 0 TO 28 FT.	SAMPLING METHODS: MacroCore with PVC Liner	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.
GROUT: N/A	FROM N/A TO N/A FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	PID	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
SH	2							GW	**Well-graded GRAVEL with sand** Brown to gray/brown, gravelly fill, moderately dense, no odor, no sheen.
								SM	**Silty SAND** Brown/red, silty fine sand with 10-20% wood chip material, soft, moist, no odor, no sheen.
			5					Wood	**WOOD DEBRIS** Brown/gray, wood debris with <5% silt/sand matrix material, moist, creosote odor, no sheen.
SH	3.5			B39-5.5-6.5		0		SM	**Silty SAND** Dark gray, silty sand with some wood debris, moderately dense, moist, possible slight creosote odor, medium sheen.
SH	3		10	B39-10-11		0		SM	**Silty SAND** Tan/gray, fine sand with >40% silt, moderately dense, moist, no odor, no sheen.
SH	0		15					SP	**Poorly graded SAND** Dark gray, poorly graded medium sand, coarser sand with some fine gravel in lower ~3 feet, moderately dense, wet, no odor, medium to heavy sheen ~21-22 feet bgs, no sheen otherwise.
SH	3.5								
			20			0			
SH	4			B39-21-22				ML/	**Clayey SILT** Gray, clayey silt, moderately stiff, wet, no odor, no sheen.
				B39-23-24		0		CL	**Poorly graded SAND with silt** Gray, fine sand with 10-15% silt overall, layered texture with interbedded poorly graded sand to silty fine sand, moderately dense, wet, no odor, no sheen.
			25					SP/	
SH	4							SM	**Silty CLAY** Gray, silty clay, moderately stiff, high plasticity, wet, no odor, no sheen.
								CL/	
								ML	

NOTES

1. Reconnaissance groundwater sample B39-RGW screen set 19-23 feet bgs.

KJ PNW LOGS B37 TO B47 2007.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: JJ Port Property	**Boring Name:** B-39A
DRILLING COMPANY: Cascade	DRILLER: Eli
DRILLING METHOD(S): GeoProbe	DRILL BIT(S) SIZE: 2-inch
	Project Name: Tacoma Metals
	Project Number: 996098*00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.
BLANK CASING: N/A	FROM N/A TO N/A FT.
SLOTTED CASING: N/A	FROM N/A TO N/A FT.
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.
SEAL: Bentonite	FROM 0 TO 28 FT.
GROUT: N/A	FROM N/A TO N/A FT.
ELEVATION AND DATUM: ground surface	TOTAL DEPTH: 28.0 ft. bgs
DATE STARTED: 1/25/08	DATE COMPLETED: 1/25/08
INITIAL WATER DEPTH (FT): 10.0	
LOGGED BY: RCZ	
SAMPLING METHODS: MacroCore with PVC Liner	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	PID	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
SH	3							GW	**Well-graded GRAVEL with sand** Dark orange/brown, gravelly fill with 30-40% sand, moderately dense, no odor, no sheen.
						0		SW/ SM	**Well-graded SAND with silt** Dark orange/brown, silty fine sand with 10-20% wood chip material and 10% gravel, moderately dense, moist, no odor, no sheen.
SH	3		5			0		SW/ SM	**Well-graded SAND with silt** Tan/gray, silty fine sand with 5-10% gravel, moderately dense, moist, no odor, no sheen. **Well-graded SAND with silt** Dark orange/brown, fine sand with 10% silt, moderately dense, moist, no odor, no sheen.
SH	2.5		10			0		SW/ SM	**WOOD DEBRIS** Brown/red, wood debris with up to 50% silt/sand matrix material, moist, no odor, no sheen. **Silty SAND** Tan/gray, fine sand with 30-40% silt, moderately dense, moist, no odor, no sheen.
SH	2.5		15					Wood SM	**Poorly graded SAND** Dark gray, poorly graded medium sand, coarsening downwards to medium/coarse sand, some gravel at 24 feet, moderately dense, wet, no odor, no sheen.
SH	3					0		SP	
SH	2		20						
SH	3.5		25			0		ML/ CL	**Clayey SILT** Gray, clayey silt with 5% fine sand, moderately stiff, high plasticity, wet, no odor, no sheen.

NOTES

1. Reconnaissance groundwater sample B39A-RGW screen set 22.5-26.5 feet bgs.

KJ PNW LOGS B37 TO B47 2007.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: JJ Port Property		**Boring Name**	B-40
DRILLING COMPANY: Cascade	DRILLER: Kasey	**Project Name**	Tacoma Metals
DRILLING METHOD(S): GeoProbe	DRILL BIT(S) SIZE: 2-inch	**Project Number**	996098*00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM: ground surface	TOTAL DEPTH: 28.0 ft. bgs
BLANK CASING: N/A	FROM N/A TO N/A FT.	DATE STARTED: 10/29/07	DATE COMPLETED: 10/29/07
SLOTTED CASING: N/A	FROM N/A TO N/A FT.	INITIAL WATER DEPTH (FT): 9.0	
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.	LOGGED BY: DKM	
SEAL: Bentonite	FROM 0 TO 28 FT.	SAMPLING METHODS: MacroCore with PVC Liner	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.
GROUT: N/A	FROM N/A TO N/A FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	PID	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
									Asphalt surface and base gravel fill.
SH	3.5					0		SW	**Well-graded SAND with gravel** Tan/orange/brown, sand with 30-35% fine to medium gravel, some silt, moderately dense, moist, no odor, no sheen.
SH	3		5	B40-6.5-7.5				SP	**Poorly graded SAND** Brown, poorly graded medium sand with 5-10% gravel, moderately dense, moist, no odor, no sheen.
								Wood	**WOOD DEBRIS** Dark orange/brown, wood chip material, <5% matrix material, moist, no odor, no sheen.
SH	3.5		10			0		SM	**Silty SAND** Tan/gray, fine sand with 30-40% silt overall (locally variable), moderately dense, moist to wet at ~9' bgs, no odor, no sheen.
SH	3.5		15	B40-14-15				SP	**Poorly graded SAND** Dark gray, poorly graded sand, mostly medium sand at top, grading downward to medium/coarse sand mixture, local small (<1") silt nodules ~17-20 feet bgs, moderately dense, wet, no odor, no sheen.
SH	3					0			
SH	3.5		20	B40-21.5-22.5		0			
								ML	**Sandy SILT** Gray, silt with ~30% fine sand, moderately stiff, low plasticity, wet, no odor, no sheen.
SH	3.5		25					SM	**Silty SAND** Brown/gray, fine sand with 15-20% silt, moderately dense, wet, no odor, no sheen.
								CL/ ML	**Silty CLAY** Gray/tan, silty clay, moderately stiff, moderately high plasticity, wet, no odor, no sheen.
								SP/ SM	**Poorly graded SAND with silt** Gray, poorly graded medium to fine sand with 10-15% silt, moderately dense, wet, no odor, no sheen.

NOTES

1. Reconnaissance groundwater sample B40-RGW screen set 19-23 feet bgs.

KJ PNW LOGS B37 TO B47 2007.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: JJ Port Property		**Boring Name**	B-41
DRILLING COMPANY: Cascade	DRILLER: Kasey	**Project Name**	Tacoma Metals
DRILLING METHOD(S): GeoProbe	DRILL BIT(S) SIZE: 2-inch	**Project Number**	996098*00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM: ground surface	TOTAL DEPTH: 28.0 ft. bgs
BLANK CASING: N/A	FROM N/A TO N/A FT.	DATE STARTED: 10/30/07	DATE COMPLETED: 10/30/07
SLOTTED CASING: N/A	FROM N/A TO N/A FT.	INITIAL WATER DEPTH (FT): 9.5	
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.	LOGGED BY: DKM	
SEAL: Bentonite	FROM 0 TO 28 FT.	SAMPLING METHODS: MacroCore with PVC Liner	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.
GROUT: N/A	FROM N/A TO N/A FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	PID	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
									Asphalt surface and base gravel fill.
SH	2					0		SM	**Silty SAND with gravel** Tan, fine to medium sand with 20-25% silt and 5-15% gravel, moderately dense, moist, no odor, no sheen.
SH	3.5		5			0		SP	**Poorly graded SAND** Brown, poorly graded medium to coarse sand, ~5% fine gravel, moderately dense, moist, no odor, no sheen.
				B41-7-8				OH	**Organic SILT** Dark brown to dark gray, silt with abundant organic material including woody debris, soft, moist, no odor, no sheen.
SH	3		10			0		CL/ ML	**Silty CLAY** Tan to tan-brown, silty clay, moderately stiff, high plasticity, moist, no odor, no sheen.
				B41-11-12				ML	**Sandy SILT** Gray/brown, silt with 30-40% fine sand overall, layered texture with interbedded clayey silt, silt, and sandy silt, wet, no odor, no sheen.
SH	3		15			0		SP	**Poorly graded SAND** Dark gray, poorly graded sand, mostly medium sand at top coarsening slightly downward, local small (<1/2") silt nodules ~16-20 feet bgs, moderately dense, wet, no odor, no sheen.
SH	3					0			
			20						
SH	3.5			B41-21.5-22.5		0		SM	**Silty SAND** Gray, fine sand with 20-25% silt, moderately dense, wet, no odor, no sheen.
SH	3.5		25	B41-24.5-25.5				SP	**Poorly graded SAND** Gray, poorly graded fine sand, moderately dense, wet, no odor, no sheen.
								CL	**Lean CLAY** Olive/gray, clay, moderately stiff, moderately high plasticity, wet, no odor, no sheen
								SP	**Poorly graded SAND** Gray, poorly graded fine sand, moderately dense, wet, no odor, no sheen.

NOTES

1. Reconnaissance groundwater sample B41-RGW screen set 21-25 feet bgs.

KJ PNW LOGS B37 TO B47 2007.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: JJ Port Property	**Boring Name:** B-42
DRILLING COMPANY: Cascade	DRILLER: Kasey
DRILLING METHOD(S): GeoProbe	DRILL BIT(S) SIZE: 2-inch
	Project Name: Tacoma Metals
	Project Number: 996098*00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.
BLANK CASING: N/A	FROM N/A TO N/A FT.
SLOTTED CASING: N/A	FROM N/A TO N/A FT.
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.
SEAL: Bentonite	FROM 0 TO 36 FT.
GROUT: N/A	FROM N/A TO N/A FT.
ELEVATION AND DATUM: ground surface	TOTAL DEPTH: 36.0 ft. bgs
DATE STARTED: 10/30/07	DATE COMPLETED: 10/30/07
INITIAL WATER DEPTH (FT): 9.0	
LOGGED BY: DKM	
SAMPLING METHODS: MacroCore with PVC Liner	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	PID	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
SH	2					0		GW	**Well-graded GRAVEL with sand** Brown to gray, gravelly fill with >40% sand, moderately dense, moist, no odor, no sheen.
SH	2		5	B42-5-6		4.9		SW	**Well-graded SAND with gravel** Granular fill material including charcoal and rock fragments, moderately loose, no odor, no sheen.
SH	2		10			0		Wood	**WOOD DEBRIS** Brown to red/brown, wood debris with 5-10% silty matrix, moist to wet at ~9 feet bgs, slight creosote odor, light sheen below ~12 feet bgs.
SH	1.5		15						
SH	2					0			
SH	2.5		20	B42-22-23		0		SP	**Poorly graded SAND** Gray, poorly graded fine to medium sand, some fibrous to blocky wood debris locally, moderately dense, wet, no odor, no sheen.
SH	3		25	B42-24.5-25.5		0		CL/	**Silty CLAY** Tan/gray, silty clay, moderately stiff, medium plasticity, wet, no odor, no sheen.
SH	3		30	B42-30-31		0		ML	**Poorly graded SAND** Gray, poorly graded sand, mostly medium sand, moderately dense, wet, possible very faint creosote odor, no sheen.
SH	4		35					SP	**Sandy SILT** Tan/gray, silt with 30-40% fine to very fine sand, moderately stiff, wet, no odor, no sheen.
								ML	**Poorly graded SAND** Gray, poorly graded medium to coarse sand, up to 15% silt at ~33-34 feet bgs, otherwise <5% silt, moderately dense, wet, no odor, no sheen.
								SP	

NOTES

1. Reconnaissance groundwater sample B42-RGW screen set 22-26 feet bgs.

KJ PNW LOGS B37 TO B47 2007.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: JJ Port Property	**Boring Name:** B-43
DRILLING COMPANY: Cascade	DRILLER: Kasey
DRILLING METHOD(S): GeoProbe	DRILL BIT(S) SIZE: 2-inch
	Project Name: Tacoma Metals
	Project Number: 996098*00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.
BLANK CASING: N/A	FROM N/A TO N/A FT.
SLOTTED CASING: N/A	FROM N/A TO N/A FT.
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.
SEAL: Bentonite	FROM 0 TO 44 FT.
GROUT: N/A	FROM N/A TO N/A FT.
ELEVATION AND DATUM: ground surface	TOTAL DEPTH: 44.0 ft. bgs
DATE STARTED: 10/30/07	DATE COMPLETED: 10/30/07
INITIAL WATER DEPTH (FT): 10.0	
LOGGED BY: DKM	
SAMPLING METHODS: MacroCore with PVC Liner	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	PID	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
SH	2.5					0.5		SW	**Well-graded SAND with gravel** Gray/orange/dark gray, Sand and gravel (20-30%) fill material, cinders, rock fragments, some silt, moist, no odor, no sheen.
SH	2.5		5	B43-6-7		0		Wood	**WOOD DEBRIS** Brown, wood material with 5-10% gray silty matrix material, matrix varies locally from <5% up to ~20%, moist to wet at ~10 feet bgs, no odor, no sheen.
SH	1.5		10			0			
SH	2.5		15	B43-14.5-15.5		0		SP	**Poorly graded SAND** Gray, poorly graded sand, mostly medium sand at top grading to fine sand at bottom, some woody material in upper ~5 feet, moderately dense, wet, slight to moderate creosote odor ~27-33 feet bgs, otherwise no odor, no sheen.
SH	3								
SH	3.5		20			0			
SH	3.5		25			0			
SH	3.5		30	B43-28.5-29.5		0			
SH	3.5		35	B43-34.5-35.5		0			
SH	3.5					0		ML/ CL	**Clayey SILT** Gray, clayey silt, moderately stiff, medium plasticity, wet, no odor, no sheen.
SH	3		40					SP	**Poorly graded SAND** Gray, poorly graded sand, medium to coarse sand at top grading to mostly medium sand by ~39 feet bgs, local small (<1") silty fine sand layers or nodules below ~38 feet bgs, moderately dense, wet, no odor, no sheen.

KJ PNW LOGS B37 TO B47 2007.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

Project Name Tacoma Metals **Project Number** 996098*00 **Boring Name** B-43

SAMPLES			DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	PID	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"							

NOTES

1. Reconnaissance groundwater sample B43-RGW screen set 26-30 feet bgs.

KJ PNW LOGS B37 TO B47 2007.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: JJ Port Property	**Boring Name:** B-44
DRILLING COMPANY: Cascade	DRILLER: Kasey	**Project Name:** Tacoma Metals
DRILLING METHOD(S): GeoProbe	DRILL BIT(S) SIZE: 2-inch	**Project Number:** 996098*00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM: ground surface	TOTAL DEPTH: 40.0 ft. bgs
BLANK CASING: N/A	FROM N/A TO N/A FT.	DATE STARTED: 10/31/07	DATE COMPLETED: 10/31/07
SLOTTED CASING: N/A	FROM N/A TO N/A FT.	INITIAL WATER DEPTH (FT): 8.0
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.	LOGGED BY: DKM
SEAL: Bentonite	FROM 0 TO 40 FT.	SAMPLING METHODS: MacroCore with PVC Liner	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.
GROUT: N/A	FROM N/A TO N/A FT.

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	PID	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
SH	3			B44-2-3				GW	**Well-graded GRAVEL** Well graded gravel fill material, no odor, no sheen.
								SM	**Silty SAND** Tan to gray, silty fine sand fill, moist, no odor, no sheen.
SH	3		5					ML	**SILT** Dark brown, silt, abundant fine wood material, moderately soft, moist, no odor, no sheen.
								Wood	**WOOD DEBRIS** Brown/red-brown, wood debris with 10-15% silty matrix overall, matrix locally variable <5% up to 20%, moist, no odor, no sheen.
SH	2		10					ML	
								ML	**Sandy SILT with gravel** Dark gray, silt/sand mixture with some gravel, very loose/soft, moist to wet at ~8 feet bgs, no odor, no sheen.
SH	2.5		15	B44-14-15				SP	**SILT** Gray, silt, soft, low placticity, wet, no odor, no sheen.
SH	2					0		SM	**Poorly graded SAND** Gray, poorly graded medium sand, moderately dense, wet, no odor, no sheen.
SH	2.5		20			0		SP	**Silty SAND** Gray, fine sand with 30-40% silt overall, interbedded poorly graded sand with silt, silty sand, and sandy silt, lower contact is sharp but depth is approximate, moderately dense, wet, no odor, no sheen.
SH	2.5		25	B44-25.5-26.5		0			**Poorly graded SAND** Gray, poorly graded sand, fine to medium sand at top, grading gradually to medium/coarse sand by ~30 feet bgs, moderately dense, wet, slight creosote odor and light sheen at ~24-26 feet bgs and below ~30 feet bgs, no odor and no sheen otherwise.
SH	2		30	B44-31.5-32.5		0			
SH	3		35			0		CL/ ML	**Silty CLAY** Dark brown, silty clay, moderately stiff, high plasticity, wet, no odor, no sheen.
SH	3		40			0		SP	**Poorly graded SAND** Gray, poorly graded sand, fine to medium sand at top grading to medium/coarse sand by ~37 feet bgs, moderately dense, wet, no odor, no sheen.

NOTES

1. Reconnaissance groundwater sample B44-RGW screen set 28-32 feet bgs.

KJ PNW LOGS B37 TO B47 2007.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: JJ Port Property		**Boring Name**	B-45
DRILLING COMPANY: Cascade	DRILLER: Kasey	**Project Name**	Tacoma Metals
DRILLING METHOD(S): GeoProbe	DRILL BIT(S) SIZE: 2-inch	**Project Number**	996098*00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM: ground surface	TOTAL DEPTH: 28.0 ft. bgs
BLANK CASING: N/A	FROM N/A TO N/A FT.	DATE STARTED: 10/30/07	DATE COMPLETED: 10/30/07
SLOTTED CASING: N/A	FROM N/A TO N/A FT.	INITIAL WATER DEPTH (FT): 8.0	
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.	LOGGED BY: DKM	
SEAL: Bentonite Chips	FROM 0 TO 28 FT.	SAMPLING METHODS: MacroCore with PVC Liner	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.
GROUT: N/A	FROM N/A TO N/A FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	PID	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
SH	2.5					0		GW	**Well-graded GRAVEL with sand** Tan, gravelly fill with 40-45% sand, moderately dense, no odor, no sheen.
								SW	**Well-graded SAND** Dark gray, granular material with cinders, charcoal, and pumice-like fragments, no odor, no sheen.
			5					CL/ ML	**Silty CLAY** Orange/gray to gray, silty clay, moderately stiff, medium plasticity, moist, no odor, no sheen.
SH	2.5			B45-6-7		0			
SH	3.5		10			0		SP	**Poorly graded SAND** Dark Gray, poorly graded medium sand, grading to medium/coarse sand mixure by ~15 feet bgs, moderately dense, wet, no odor, no sheen.
				B45-11-12					
SH	2		15			0			
SH	2.5					0			@ ~17.5 feet bgs, ~1.5 inch silt layer or nodule
			20			0			
SH	3.5			B45-21-22				CL/ ML	**Silty CLAY** Tan/light brown, silty clay, moderately stiff, moderately high plasticity, wet, no odor, no sheen.
			25			0			
SH	3.5							SP/ SM SP	**Poorly graded SAND with silt** Gray, poorly graded fine sand with 10-15% silt, moderately dense, wet, no odor, no sheen. **Poorly graded SAND** Gray, poorly graded medium to fine sand, moderately dense, wet, no odor, no sheen.

NOTES

1. Reconnaissance groundwater sample B45-RGW screen set 18-22 feet bgs.

KJ PNW LOGS B37 TO B47 2007.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: JJ Port Property		**Boring Name**	B-46
DRILLING COMPANY: Cascade	DRILLER: Kasey	**Project Name**	Tacoma Metals
DRILLING METHOD(S): GeoProbe	DRILL BIT(S) SIZE: 2-inch	**Project Number**	996098*00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM: ground surface	TOTAL DEPTH: 32.0 ft. bgs
BLANK CASING: N/A	FROM N/A TO N/A FT.	DATE STARTED: 10/31/07	DATE COMPLETED: 10/31/07
SLOTTED CASING: N/A	FROM N/A TO N/A FT.	INITIAL WATER DEPTH (FT): 8.0	
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.	LOGGED BY: DKM	
SEAL: Bentonite	FROM 0 TO 32 FT.	SAMPLING METHODS: MacroCore with PVC Liner	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.
GROUT: N/A	FROM N/A TO N/A FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	PID	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
SH	3					0		SW	**Well-graded SAND with gravel** Brown, sandy fill with 10-20% gravel, some silt, moderately dense, moist, no odor, no sheen.
SH	3		5	B46-6-7		0		SP/ SM	**Poorly graded SAND with silt** Brown, fine sand with 10-20% silt, moderately dense, moist to wet at ~9 feet bgs, no odor, no sheen.
SH	3.5		10			0		Wood	**WOOD DEBRIS** Dark brown to orange-brown, wood debris, 5-10% sandy matrix material, wet, no odor, no sheen.
SH	4			B46-13-14				SM	**Silty SAND** Dark gray, fine sand with 20-30% silt, moderately dense, wet, no odor, no sheen.
SH	3		15			0		SP	**Poorly graded SAND** Gray, poorly graded medium sand, local small (<1/2") silt nodules, moderately dense, wet, no odor, no sheen.
SH	3.5		20	B46-21-22		0		ML	**Sandy SILT** Gray, silt with ~40% fine sand, moderately stiff, wet, no odor, no sheen.
SH	4		25			0		CL/ ML	**Silty CLAY** Tan to gray, layered, silty clay, moderately stiff, moderately high plasticity, wet, no odor, no sheen.
								SM	**Silty SAND** Gray, fine sand with 30-40% silt, moderately dense, wet, no odor, no sheen.
SH	3.5		30					SP	**Poorly graded SAND** Gray, poorly graded medium sand, moderately dense, wet, no odor, no sheen.

NOTES

1. Reconnaissance groundwater sample B46-RGW screen set 17-21 feet bgs.

KJ PNW LOGS B37 TO B47 2007.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: JJ Port Property	**Boring Name:** B-47
DRILLING COMPANY: Cascade	DRILLER: Kasey
DRILLING METHOD(S): GeoProbe	DRILL BIT(S) SIZE: 2-inch
	Project Name: Tacoma Metals
	Project Number: 996098*00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.
BLANK CASING: N/A	FROM N/A TO N/A FT.
SLOTTED CASING: N/A	FROM N/A TO N/A FT.
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.
SEAL: Bentonite	FROM 0 TO 36 FT.
GROUT: N/A	FROM N/A TO N/A FT.
ELEVATION AND DATUM: ground surface	TOTAL DEPTH: 36.0 ft. bgs
DATE STARTED: 10/31/07	DATE COMPLETED: 10/31/07
INITIAL WATER DEPTH (FT): 8.0	
LOGGED BY: DKM	
SAMPLING METHODS: MacroCore with PVC Liner	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	PID	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
SH	3					0		SW/ SM	**Well-graded SAND with silt and gravel** Brown to dark brown, gravelly fill with 40-45% sand and 5-10% silt, moderately dense, moist, no odor, no sheen.
SH	1.8		5	B47-6-7		0		GM	**Silty GRAVEL with sand** Gravelly fill with 30-40% sand and 10-15% silt, moderately dense, moist, no odor, no sheen.
SH	4		10			0		ML/ CL	**Clayey SILT** Gray, clayey silt, moderately soft, medium plasticity, wet, no odor, no sheen.
SH	3		15	B47-13-14		0		SP	**Poorly graded SAND** Gray, poorly graded medium sand, moderately dense, wet, no odor, no sheen.
SH	0							SM	**Silty SAND** Gray, fine sand with 20-30% silt, moderately dense, wet, no odor, no sheen.
			20					ML	**Sandy SILT** Gray, silt with 30-40% fine to very fine sand, moderately stiff, wet, no odor, no sheen.
SH	1.5					0		CL	**Lean CLAY** Olive gray, clay, some fine root material, moderately stiff, high plasticity, wet, no odor, no sheen.
SH	2.5		25			0		SM	**Silty SAND** Gray/brown, fine sand with 35-45% silt, layered texture, moderately dense, wet, no odor, no sheen.
SH	3.3		30	B47-30.5-31.5		0		GP/ GM	**Poorly graded GRAVEL with silt and sand** Gray-green to dark gray, angular medium gravel-sized rock material with up to 15% silt/sand matrix material, generally poor sample recovery, ~6 inches of white fractured rock material with no matrix at top of unit, dense, wet, no odor, no sheen.
SH	3.5		35			0		SP	**Poorly graded SAND** Gray, poorly graded medium sand, some coarse sand, moderately dense, wet, no odor, no sheen.
								ML/ CL	**Clayey SILT** Tan/brown, clayey silt, moderately stiff, medium plasticity, wet, no odor, no sheen.
								SP	**Poorly graded SAND** Gray, poorly graded medium to coarse sand, no odor, no sheen.
								ML/ CL	**Sandy clayey SILT** Gray, interbedded clayey silt and poorly graded medium to coarse sand with silt, layers typically 1/2 to 1 inch thick with abrupt contacts, wet, no odor, no sheen.
								SP	*(See next page for lithology description)*

NOTES

1. Reconnaissance groundwater sample B47-RGW screen set 28-32 feet bgs.

KJ PNW LOGS B37 TO B47 2007.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

Project Name Tacoma Metals **Project Number** 996098*00 **Boring Name** B-47

SAMPLES			DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	PID	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"							
									Poorly graded SAND Gray, poorly graded sand, coarse to medium sand at top grading to fine/medium sand by ~35.5 feet bgs, some silt below ~35.5 feet, moderately dense, wet, no odor, no sheen.

KJ PNW LOGS B37 TO B47 2007.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION	EAST–NORTHEAST OF RED BRICK BUILDING		
DRILLING COMPANY	CASCADE DRILLING, INC.	DRILLER	SCOTT KREUGER
DRILLING METHOD	HOLLOW STEM AUGER	DRILL BIT(S) SIZE:	9 INCH

		FROM	TO	FT.
ISOLATION CASING	NONE			
BLANK CASING	2" DIA. SCH 40 PVC	0.0	5.0	
PERFORATED CASING	2" DIA. SCH 40 PVC 0.010 SLOTTED	5.0	22.8	
SIZE AND TYPE OF FILTER PACK	LAPIS LUSTRE #2/12 SILICA	4.0	22.8	
SEAL	BENTONITE CHIPS	2.0	4.0	
GROUT	CONCRETE	0.0	2.0	

Boring/Well Name MW–4(R)

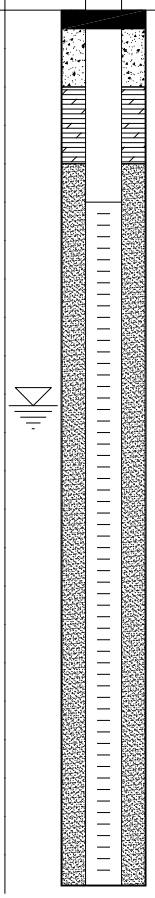
Project Name TACOMA METALS

Project Number 996098.00

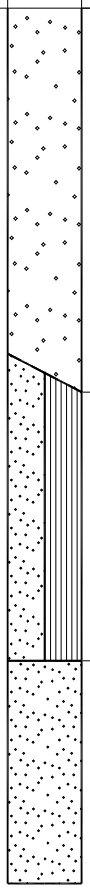
ELEVATION AND DATUM: 10.0	TOTAL DEPTH: 22.8
DATE STARTED: 05/09/2000	DATE COMPLETED: 05/09/2000
INITIAL WATER DEPTH (FT): 10.3	
LOGGED BY: TAH/DKM	
SAMPLING METHODS: 2.5" ID SPLIT SPOON	WELL COMPLETION: SURFACE HOUSING; STAND PIPE 3.0 FT.

SAMPLES TYPE	RECOVERY (FEET)	PENETRATION RESIST (BLOWS/6 IN.)	DEPTH (FEET)	SAMPLE NO.	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
S	1.5	24 25 28		NMW–2–0.0	SW	**Well-graded SAND with gravel** Mixed gravelly sand. Well–graded sand, well–graded gravel (~20%), medium dense, moist, brown, contains wood, glass, and metal fragments, moderate to strong creosote–like odor, no sheen.
S	1.5	5 5 6	5	NMW–2–5.0		
S	1.5	15 17 20	10	NMW–2–10.0	SP/SM	**Poorly graded SAND with silt** Highly organic (woody) silty sand, fine sand, dense, brown, wet. Organic material is partially decomposed wood w/strong to very strong creosote–like odor. Very strong odor at 15.0 feet bgs.
S	1.0	32 50	15	NMW–2–15.0		
S	1.5	27 30 32	20	NMW–2–21.3	SP	**Poorly graded SAND** Angular to sub–angular medium to coarse clean sand (predominantly coarse sand), dense, charcoal gray/black, wet, massive, strong creosote–like odor.

WELL CONSTRUCTION



LITHOLOGY



Notes:

1 Creosote–like odor detected in all soil samples collected. Strongest odor occurs at elevation of wood fill material.

2 Below depth of 10 feet bgs, soil also has diesel–like petroleum odor

Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION	NORTHEAST CORNER OF SITE		
DRILLING COMPANY	CASCADE DRILLING, INC.	DRILLER	SCOTT KREUGER
DRILLING METHOD	HOLLOW STEM AUGER	DRILL BIT(S) SIZE:	9 INCH

		FROM	TO	FT.
ISOLATION CASING	NONE			
BLANK CASING	2" DIA. SCH 40 PVC	0.0	5.0	
PERFORATED CASING	2" DIA. SCH 40 PVC 0.010 SLOTTED	5.0	23.6	
SIZE AND TYPE OF FILTER PACK	LAPIS LUSTRE #2/12 SILICA	4.0	23.6	
SEAL	BENTONITE CHIPS	2.0	4.0	
GROUT	CONCRETE	0.0	2.0	

Boring/Well Name MW-8(R)

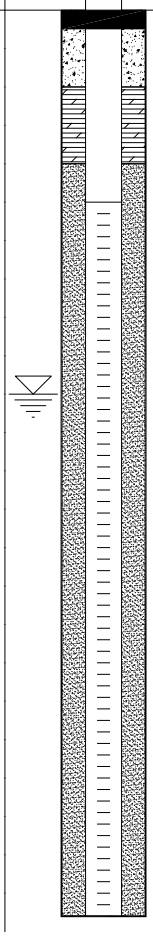
Project Name TACOMA METALS

Project Number 996098.00

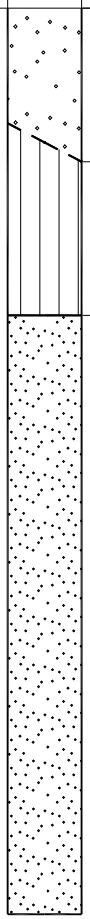
ELEVATION AND DATUM: 8.5	TOTAL DEPTH: 23.6
DATE STARTED: 05/09/2000	DATE COMPLETED: 05/09/2000
INITIAL WATER DEPTH (FT): 10.0	
LOGGED BY: TAH/DKM	
SAMPLING METHODS: 2.5" ID SPLIT SPOON	WELL COMPLETION: SURFACE HOUSING; STAND PIPE 3.0 FT.

SAMPLES TYPE	RECOVERY (FEET)	PENETRATION RESIST (BLOWS/6 IN.)	DEPTH (FEET)	SAMPLE NO.	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
S	1.5	25 25 22			SW	**Well-graded SAND with gravel** Mixed gravelly sand with some silt, medium dense, brown, moist, mixed, contains some small metal scrap, no hydrocarbon sheen, no odor.
S	1.5	5 5 6	5	NMW-3-5.0	ML	**Sandy SILT** Sandy silt/silty sand. Fine sand, loose, gray, wet, heterogeneous, contains trace small wood fragments, no hydrocarbon odor, no sheen.
S	1.5	12 15 16	10	NMW-3-10.0	SP	**Poorly graded SAND** Angular to sub-angular fine to medium clean sand, dense, charcoal gray/black, wet, massive. Heavy sheen, very strong hydrocarbon odor. At 15' bgs, strong odor, no sheen. At 20' bgs, moderate odor, no sheen.
S	1.5	12 13 15	15			
S	1.5	12 15 15	20	NMW-3-22.1		

WELL CONSTRUCTION



LITHOLOGY



Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION	EAST OF STORAGE BUILDING		
DRILLING COMPANY	CASCADE DRILLING, INC.	DRILLER	SCOTT KREUGER
DRILLING METHOD	HOLLOW STEM AUGER	DRILL BIT(S) SIZE:	9 INCH

		FROM	TO	FT.
ISOLATION CASING	NONE			
BLANK CASING	2" DIA. SCH 40 PVC	0.0	5.0	
PERFORATED CASING	2" DIA. SCH 40 PVC 0.010 SLOTTED	5.0	23.5	
SIZE AND TYPE OF FILTER PACK	LAPIS LUSTRE #2/12 SILICA	4.0	23.5	
SEAL	BENTONITE CHIPS	2.0	4.0	
GROUT	CONCRETE	0.0	2.0	

Boring/Well Name MW-9

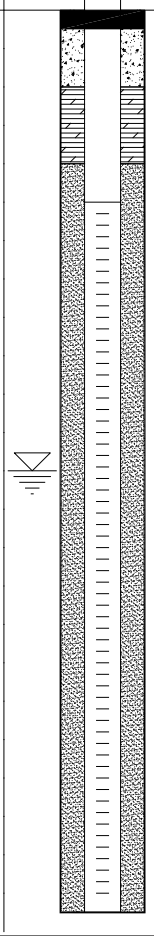
Project Name TACOMA METALS

Project Number 996098.00

ELEVATION AND DATUM 12.0	TOTAL DEPTH 23.5
DATE STARTED 05/09/2000	DATE COMPLETED 05/09/2000
INITIAL WATER DEPTH (FT) 12.0	
LOGGED BY TAH/DKM	
SAMPLING METHODS 2.5" ID SPLIT SPOON	WELL COMPLETION ■ SURFACE HOUSING ■ STAND PIPE 3.0 FT.

SAMPLES TYPE	RECOVERY (FEET)	PENETRATION RESIST (BLOWS/6 IN.)	DEPTH (FEET)	SAMPLE NO.	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
S	0.7	16 12 12		NMW-1-0.0	SW/ SM	**Well-graded SAND with silt and gravel** Mixed gravelly sand with some silt, medium dense, brown, moist, contains some wood and small metal scrap, no hydrocarbon sheen, no odor.
S	1.5	3 4 12	5	NMW-1-5.0		
					SP	**Poorly graded SAND** Fine to medium sand (predominantly medium), medium dense, wet, gray, contains small glass fragments, no hydrocarbon sheen, no odor.
					SM	**Silty SAND** Fine sand, medium dense, gray, wet, homogeneous, no hydrocarbon sheen, no odor.
S	1.5	15 15 16	10	NMW-1-10.0		
					SP	**Poorly graded SAND** Medium Sand, medium dense, gray, wet, homogeneous, no hydrocarbon sheen, no odor.
S	1.5	42 35 37	15	NMW-1-15.0		
					SP	**Poorly graded SAND** Angular to sub-angular fine to medium clean sand, dense, charcoal gray/black, wet, massive, no sheen, no odor.
			20			
S	1.5	18 29 30		NMW-1-22.0		

WELL CONSTRUCTION



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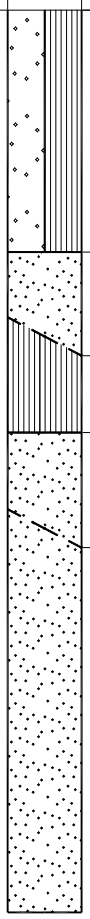


Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION	WEST PROPERTY LINE		
DRILLING COMPANY	CASCADE	DRILLER	
DRILLING METHOD	HSA	DRILL BIT(S) SIZE:	9 INCH
ISOLATION CASING		FROM	TO FT.
BLANK CASING	2-INCH SCHEDULE 40 PVC	FROM 0.0	TO 8.0 FT.
PERFORATED CASING	2-INCH SCHEDULE 40 PVC 0.010 SLOT	FROM 8.0	TO 20.0 FT.
SIZE AND TYPE OF FILTER PACK	RMC #2/12 LAPIS LUSTRE SAND	FROM 7.0	TO 20.0 FT.
SEAL	PURE GOLD MEDIUM BENTONITE CHIPS	FROM 1.0	TO 7.0 FT.
GROUT	CONCRETE	FROM 0.0	TO 1.0 FT.

Boring/Well Name MW-10

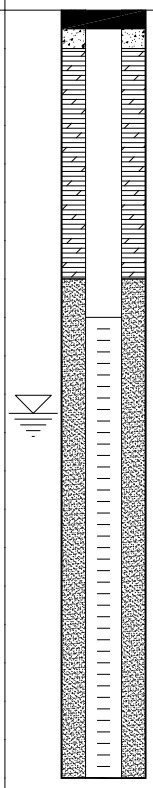
Project Name TACOMA METALS

Project Number 996098.00

ELEVATION AND DATUM	TOTAL DEPTH
DATE STARTED 11/10/1900	DATE COMPLETED 11/10/1900
INITIAL WATER DEPTH (FT) 10.5	
LOGGED BY DKM	
SAMPLING METHODS SPLIT SPOON	WELL COMPLETION ■ SURFACE HOUSING ☐ STAND PIPE _____ FT.

SAMPLES TYPE	RECOVERY (FEET)	PENETRATION RESIST (BLOWS/6 IN.)	DEPTH (FEET)	SAMPLE NO.	OVA	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
S	1.0	16 12 9		NMW-4-2.5	0.0	GW	**Well-graded GRAVEL with sand** Brown, dry, gravel (60%) with medium and fine sand (35%) and minor (<5%) silt.
S	1.5	4 5 6	5	NMW-4-5.0	0.0	GW	**Well-graded GRAVEL with sand** Medium brown, dry, gravel (50%) with fine and medium sand (50%). Gravel material is generally fine-grained.
S	0.5	6		NMW-4-7.5	10	ML/CL	**Clayey SILT with sand** Light brown, crumbly, moderately dense silt with 5-10% fine sand. Includes some clay.
S	1.0	10 7 50/3	10			ML/CL	**Clayey SILT** Mixed silt and clay, dark brown, soft, low density.
S	0.3	35 25 20	15			ML/CL	**Clayey SILT** Brown to gray, wet, soft silt and fine sand with some clay. Mixed with wood debris. Wood debris is typically 85%-95% of material. Silt, sand and clay are around and coating the wood material.
S	1.5	5 7 10		NMW-4-17.5	7	SP	**Poorly graded SAND** Dark brown, wet, poorly graded medium to fine grained sand.
S	1.0	4 10 10	20	NMW-4-20.0	6		
			25				
			30				

WELL CONSTRUCTION



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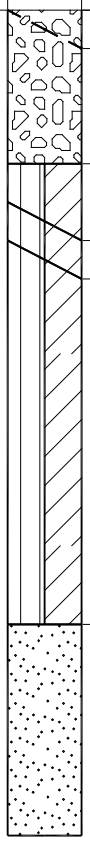


Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION	WEST OF OCTAGON FOUNDATION		
DRILLING COMPANY	CASCADE	DRILLER	
DRILLING METHOD	HSA	DRILL BIT(S) SIZE:	12 INCH
ISOLATION CASING		FROM	TO FT.
BLANK CASING	4-INCH SCHEDULE 40 PVC	FROM 0.0	TO 6.0 FT.
PERFORATED CASING	4-INCH SCHEDULE 40 PVC 0.020 SLOT	FROM 6.0	TO 20.0 FT.
SIZE AND TYPE OF FILTER PACK	RMC #2/12 LAPIS LUSTRE SAND	FROM 5.0	TO 20.0 FT.
SEAL	PURE GOLD MEDIUM BENTONITE CHIPS	FROM 1.0	TO 5.0 FT.
GROUT	CONCRETE	FROM 0.0	TO 1.0 FT.

Boring/Well Name MW-11

Project Name TACOMA METALS

Project Number 996098.00

ELEVATION AND DATUM	TOTAL DEPTH
DATE STARTED 11/10/1900	DATE COMPLETED 11/10/1900
INITIAL WATER DEPTH (FT) 10.5	
LOGGED BY DKM	
SAMPLING METHODS SPLIT SPOON	WELL COMPLETION ■ SURFACE HOUSING ☐ STAND PIPE _____ FT.

SAMPLES TYPE	RECOVERY (FEET)	PENETRATION RESIST (BLOWS/6 IN.)	DEPTH (FEET)	SAMPLE NO.	OVA	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
S	0.7	20 20 9		NMW-5-2.5	0.8	GW	**Well-graded GRAVEL with sand** Gray to brown-orange, slightly moist, gravel with 25-30% sand and some (<5%) silt. Fill material.
S	0.5	5 3 2	5	NMW-5-5.0	2.0		
S		40 18 10				ML/CL	**Clayey SILT** Brown to gray, wet, soft silt and fine sand with some clay. Mixed with wood debris. Wood debris is typically 85%-95% of material. Silt, sand and clay are around and coating the wood material.
S	0.2	23 13 8	10	NMW-5-10.0	12		
S		8 50/3					
S	0.2	25 20 50/2	15				
S	0.4	7 10 12		NMW-5-17.5	38	SP	**Poorly graded SAND** Dark brown, wet, poorly graded medium to fine grained sand.
S	1.5	2 5 37	20	NMW-5-20.0	33	CL/ML	**Silty CLAY** Light brown, soft slay to silty clay with small fibrous wood fragments.
			25				
			30				

Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION	WEST OF MACHINE SHED		
DRILLING COMPANY	CASCADE	DRILLER	
DRILLING METHOD	HSA	DRILL BIT(S) SIZE:	12 INCH
ISOLATION CASING		FROM	TO FT.
BLANK CASING	4-INCH SCHEDULE 40 PVC	FROM 0.0	TO 7.0 FT.
PERFORATED CASING	4-INCH SCHEDULE 40 PVC 0.020 SLOT	FROM 7.0	TO 19.0 FT.
SIZE AND TYPE OF FILTER PACK	RMC #2/12 LAPIS LUSTRE SAND	FROM 6.0	TO 19.0 FT.
SEAL	PURE GOLD MEDIUM BENTONITE CHIPS	FROM 1.0	TO 6.0 FT.
GROUT	CONCRETE	FROM 0.0	TO 1.0 FT.

Boring/Well Name MW-12

Project Name TACOMA METALS

Project Number 996098.00

ELEVATION AND DATUM	TOTAL DEPTH
DATE STARTED 11/10/1900	DATE COMPLETED 11/10/1900
INITIAL WATER DEPTH (FT) 10	
LOGGED BY DKM	
SAMPLING METHODS SPLIT SPOON	WELL COMPLETION ■ SURFACE HOUSING ☐ STAND PIPE _____ FT.

SAMPLES TYPE	RECOVERY (FEET)	PENETRATION RESIST (BLOWS/6 IN.)	DEPTH (FEET)	SAMPLE NO.	OVA	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
						GW	**Well-graded GRAVEL with sand** Dark brown to gray, slightly moist, gravel (55–60%) with sand (35%) and some silt (<5%).
S	0.3	6 14 14				SW	**Well-graded SAND with gravel** Medium brown sand and gravel (40%) with some silt (5%), moist, includes some wood fragments.
S	1.0	8 6 6	5	NMW-6-5.0	0.8	GW	**Well-graded GRAVEL with sand** Dark gray to brown, moist, gravel (60–65%) with sand.
S	0.1	8 2 6					
S	0.5	5 5 15	10			ML/CL	**Clayey SILT** Brown to gray, wet, soft silt and fine sand with some clay. Mixed with wood debris. Wood debris is typically 85%–95% of material. Silt, sand and clay are around and coating the wood material.
S	0.3	5 10 25					
S	0.2	4 7 35	15				
S	1.5	7 20 20		NMW-6-17.5	1	SP	**Poorly graded SAND** Gray/brown, wet, poorly graded medium to fine grained sand.
S	1.0	2 5 8	20	NMW-6-20.0	1		
			25				
			30				

Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION	NE OF MW-8(R) NEAR PROPERTY BOUNDARY
DRILLING COMPANY	CASCADE
DRILLER	JAMES
DRILLING METHOD	HOLLOW STEM AUGER
DRILL BIT(S) SIZE:	9-INCH OD
ISOLATION CASING	FROM TO FT.
BLANK CASING	2-INCH SCHEDULE 40 PVC PIPE FROM 0.0 TO 7.0 FT.
PERFORATED CASING	2-INCH SCHEDULE 40 PVC 0.010-INCH SLOT FROM 7.0 TO 18.0 FT.
SIZE AND TYPE OF FILTER PACK	LAPIS LUSTRE #2/12 MOTEREY SAND FROM 5.0 TO 18.5 FT.
SEAL	PURE GOLD BENTONITE CHIPS FROM 2.0 TO 5.0 FT.
GROUT	CONCRETE FROM 2.0 TO 0 FT.

Boring/Well Name	MW-13
Project Name	TACOMA METALS
Project Number	996098.00
ELEVATION AND DATUM	
TOTAL DEPTH	21.5
DATE STARTED	06/26/2002
DATE COMPLETED	06/26/2002
INITIAL WATER DEPTH (FT)	11.0
LOGGED BY	DKM
SAMPLING METHODS	SPLIT SPOON
WELL COMPLETION	☐ SURFACE HOUSING ■ STAND PIPE 3.0 FT.

SAMPLES TYPE	RECOVERY (FEET)	PENETRATION RESIST (BLOWS/6 IN.)	DEPTH (FEET)	SAMPLE NO.	OVA	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
S	1.0	7 6 6				GW	**Well-graded GRAVEL with sand** Brown fine- to medium- gravel with 40-45% fine- to medium- sand and some silt, no odor, no apparent sheen.
S	1.0	5 6 5		MW-13-2.5	133		
S	1.0	7 50			68		**WOOD with SILT matrix** Dark gray, wood debris typically with 5-10% silt/fine sand matrix, no sheen above 13 feet, moderate sheen below 13 feet, slight to moderate creosote odor below 13 feet.
			5	MW-13-5	9.3		
S	1.0	4 4 5					
S	1.5	4 5 12			701		
S	0.5	19 50			245		
S	1.0	22 16 25	10		>2000	SM	
S	0.4	5 13 13			>2000		
S	1.0	5 6 6			67.1		
			15				
S	0.3	15 29 32			221		
S	1.5	8 7 5		MW-13-17.5	>2000 764	SP ML/CL	**Poorly graded SAND** Dark gray fine sand with some silt, slight creosote odor and sheen.
S	1.5	8 12 15	20	MW-13-20	>2000	SP/SM	**Clayey SILT** Gray to light brown clayey silt, soft, moderately dense, no creosote odor, no apparent sheen.
S	1.5				>2000		
			25				**Poorly graded SAND with silt** Gray fine sand with 10-20% silt, none to very slight creosote odor, no apparent sheen.

Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION: Former Creosoting Area		**Well Name**	MW-14
DRILLING COMPANY: Cascade Drilling, Inc.	DRILLER: Brian	**Project Name**	Former Tacoma Metals
DRILLING METHOD(S): Hollow-Stem Auger	DRILL BIT(S) SIZE: 9-inch OD	**Project Number**	996098.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM: 10.05' (NGVD29)	TOTAL DEPTH: 26.5 ft. bgs
BLANK CASING: 2-inch SCH.40 PVC with 6-inch sump	FROM 0.0 TO 13.5 FT.; 23.5 24.0	DATE STARTED: 2/26/03	DATE COMPLETED: 2/26/03
SLOTTED CASING: 2-inch SCH.40 PVC 0.010-inch slot	FROM 13.5 TO 23.5 FT.	INITIAL WATER DEPTH (FT): 9.0	
SIZE AND TYPE OF FILTER PACK: Lapis Lustre #2/12 Monterey Sand	FROM 11.5 TO 25.0 FT.	LOGGED BY: JML/AJA	
SEAL: Pure Gold Bentonite Chips	FROM 2.5 TO 11.5 FT.; 25.0 26.5	SAMPLING METHODS: 2.5" ID split spoon	WELL COMPLETION: ■ SURFACE HOUSING; ☐ STAND PIPE _____ FT.
GROUT: Concrete	FROM 0.0 TO 2.5 FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	OVA (ppm)	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
							Asphalt
SS	0	32 50 4				SW	**Well-graded SAND with gravel (fill)** Dark yellowish brown to (10YR 4/12) to dusky brown (5YR 2/2), fine to coarse sand, ~10-20% fine gravel, trace fines, moist, no odor/sheen.
SS	1	10 13 10			1.2		
SS	0.9	3 4 3	5		1.6		~4' brownish black (5YR 2/1).
SS	1	3 3 4			1.7		~5.5' dusky brown (5YR 2/2), gradual increase in fines.
SS	0.5	4 6 4			17.0	Wood	**WOOD DEBRIS with SILT or SAND matrix** Dark gray (N3) to black (N1), wood debris typically with ~5-10% silt/fine sand matrix, although matrix >20% and <5% was observed.
SS	0.5	3 2 5	10				~7' Slight creosote odor.
SS	0.4	3 2 2			0.7		~9' Wet.
SS	0.3	3 50 6			1.8		~10' Increase in fines, matrix predominantly silt to silt clay. ~11' Visible sheen, creosote odor.
SS	0.2	3 5 5		MW-14-14-14.5	1.2		
SS	0.4	20 20 15	15		1.6		~14.5' Large wood debris.
SS	0.8	8 8 8			0.9	SM	**Silty SAND** Brownish black (5YR 2/1), ~10-20% fine-medium sand, some fibrous organic material, wet, slight sheen and creosote odor.
SS	0.7	6 5 6			0.3		
SS	0.3	4 5 5	20		2.2	SP	**Poorly graded SAND** Brownish black (5YR 2/1), fine to medium sand, trace fines, wet, slight sheen and creosote odor.
SS	0.2	5 7 7				SM	**Silty SAND** Dusky brown (5YR 2/2), fine sand, ~20-35% fines, wet.
SS	0.8	3 8 11		MW-14-22-22.3	6.6		
SS	1.2	8 16 30		MW-14-23.8-24	5.5	CL	~22' very strong sheen and creosote odor, small blebs visible on soil surface.
SS	--	10 25 37	25	MW-14-26-26.5	2.0	SM	**Lean CLAY** Dusky yellowish brown (10YR 2/2), low to moderate plasticity, moist, slight creosote odor, no sheen.
						ML	**Silty SAND** As described above.
						CL	**SILT with sand** Dusky yellowish brown (10YR 2/2), trace fines, wet, no visible sheen or odor.
						SM	**Lean CLAY with sand** As described above with ~15% fine sand.
							Silty SAND Dusky yellowish brown (10YR 2/2), fine to medium sand, ~15-25% fines, wet, slight creosote odor, no sheen.

NOTES
1. OVA - Organic vapor analyzer.
2. Ground surface elevation based on City of Tacoma datum (NGVD29).

KJ PNW TACOMA METALS DNAPL BORING LOGS 2003.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION: Former Creosoting Area		**Well Name**	MW-15
DRILLING COMPANY: Cascade Drilling, Inc.	DRILLER: Brian	**Project Name**	Former Tacoma Metals
DRILLING METHOD(S): Hollow-Stem Auger	DRILL BIT(S) SIZE: 9-inch OD	**Project Number**	996098.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM: 10.77' (NGVD29)	TOTAL DEPTH: 28.0 ft. bgs
BLANK CASING: 2-inch SCH.40 PVC with 2-inch sump	FROM 0.0 TO 16.1 FT.; 26.1 26.3	DATE STARTED: 2/28/03	DATE COMPLETED: 2/28/03
SLOTTED CASING: 2-inch SCH.40 PVC 0.010-inch slot	FROM 16.1 TO 26.1 FT.	INITIAL WATER DEPTH (FT): 11.0	
SIZE AND TYPE OF FILTER PACK: Lapis Lustre #2/12 Monterey Sand	FROM 14.0 TO 26.3 FT.	LOGGED BY: JML/SCK	
SEAL: Pure Gold Bentonite Chips	FROM 2.5 TO 14.0 FT.; 26.3 28.0	SAMPLING METHODS: 1"x2' and 2"x4' split spoon with acetate liner	WELL COMPLETION: ■ SURFACE HOUSING; ☐ STAND PIPE _____ FT.
GROUT: Concrete	FROM 0.0 TO 2.5 FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	OVA (ppm)	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
							Asphalt
SS	2.4				5.5	GW	**Well-graded GRAVEL with sand (fill)** Moderate brown (5YR 4/4) to black (N1), fine to coarse gravel-subangular to subrounded, ~30-40% fine to medium sand, trace silt, moist.
SS	0.8		5		36.0		~3.5' color change to olive black (5YR 2/1), sheen, strong hydrocarbon odor.
SS	2.8		10	MW-15-11-11.5	22.0	Wood	**WOOD DEBRIS with SILT or SAND matrix** Red to dark yellowish brown (10YR 4/2), ~95% wood, moderate sheen and slight hydrocarbon odor. ~11' Wet.
SS	0.0				--		
SS	1.8		15		10.2		~15' ~100% wood, light gray (N7), no sheen or odor. ~16'-17' ~ 50% wood, ~50% silty fine sand.
SS	2.0				8.6	SM	**Silty SAND** Dark gray (N3) to brownish black (5YR 2/1), fine sand, ~30-50% silt, wet, slight sheen and creosote odor.
SS	1.7		20		3.4	SP	**Poorly graded SAND** Dark gray (N3) to black (N1), fine to medium sand, wet, no sheen or odor.
SS	2.0				3.6		
SS	2.0				7.9		~22.9' gradual increase in fine sand.
SS	2.0		25	MW-15-25-26	2.9	ML	**SILT** Light olive gray (5YR 5/2), contains fibrous organic material, wet, no sheen or odor.
SS	2.0				2.5	SM	**Silty SAND** As described above, no sheen or odor.
						CL	**Lean CLAY** Light gray (N7), moderate plasticity, moist, no sheen or odor.
						SM	**Silty SAND** Pale brown (5YR 5/2), wet, no sheen or odor.

NOTES

1. Pilot boring advanced with GeoProbe rig. Well installed using 9-inch diameter hollow-stem auger drill rig.
2. OVA - Organic vapor analyzer.
3. Ground surface elevation based on City of Tacoma datum (NGVD29).

KJ PNW TACOMA METALS DNAPL BORING LOGS 2003.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION: Former Creosoting Area (Southern Property Boundary)		**Well Name**	MW-16
DRILLING COMPANY: Cascade Drilling, Inc.	DRILLER: Brian	**Project Name**	Former Tacoma Metals
DRILLING METHOD(S): Hollow-Stem Auger	DRILL BIT(S) SIZE: 9-inch OD	**Project Number**	996098.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM: 10.23' (NGVD29)	TOTAL DEPTH: 28.0 ft. bgs
BLANK CASING: 2-inch SCH.40 PVC with 6-inch sump	FROM 0.0 TO 16.3 FT.; 26.3 26.8	DATE STARTED: 2/28/03	DATE COMPLETED: 2/28/03
SLOTTED CASING: 2-inch SCH.40 PVC 0.010-inch slot	FROM 16.3 TO 26.3 FT.	INITIAL WATER DEPTH (FT): 10.0	
SIZE AND TYPE OF FILTER PACK: Lapis Lustre #2/12 Monterey Sand	FROM 14.5 TO 26.8 FT.	LOGGED BY: JML/SCK	
SEAL: Pure Gold Bentonite Chips	FROM 2.0 TO 14.5 FT.; 26.8 28.0	SAMPLING METHODS: 1"x2' and 2"x4' split spoon with acetate liner	WELL COMPLETION: ■ SURFACE HOUSING; ☐ STAND PIPE ____ FT.
GROUT: Concrete	FROM 0.0 TO 2.0 FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	OVA (ppm)	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
							Asphalt
SS	2.5				0.5	GP	**Poorly graded GRAVEL (fill)** Moderate yellowish brown (10YR 5/4), moist, no odor.
						SP/ SM	**Poorly graded SAND with silt and gravel (fill)** Dark to dusky yellowish brown (10YR 4/2-10Y 2/2), fine to medium sand, ~20-30% fine gravel (up to 1"), moist.
			5				
SS	3.0			MW-16-7.5-8	3.5	Wood	**WOOD DEBRIS with SILT or CLAY matrix** Various colors (moderate reddish brown, to moderate yellowish brown), trace to ~40% fines. ~7.5' Very slight creosote odor, no sheen.
SS	0.4				4.3		~ 8' No odor or sheen.
			10				
SS	0.4				4.2		~10' Wet.
SS	1.5				4.3	CL	**Lean CLAY** Dark yellowish brown (10YR 4/2), low plasticity, moist.
SS	1.6		15		4.4	SP	**Poorly graded SAND** Brownish black (5YR 2/1), fine to medium sand, trace silt, wet, no odor or sheen.
SS	1.7				5.8		~17.5' Gradual increase to medium to coarse sand.
SS	1.7				2.1		
			20				
SS	1.8				2.0		~19.5' and 21.9' Minor silt layers less than 1" thick.
SS	2.0				1.7	SM	**Silty SAND** Dusky yellowish brown (10YR 2/2), ~25-40% fines, wet, no odor or sheen.
SS	2.0		25	MW16-25-26	2.0		
SS	1.9				1.1	CL	**Lean CLAY** Dark yellowish brown to olive gray (10YR 4/2 to 5YR 4/1), minor fibrous organic material, clay is at least 2' thick, moderate plasticity, moist, no odor or sheen.

NOTES

1. Pilot boring advanced with GeoProbe rig. Well installed using 9-inch diameter hollow-stem auger drill rig.
2. OVA - Organic vapor analyzer.
3. Ground surface elevation based on City of Tacoma datum (NGVD29).

KJ PNW TACOMA METALS DNAPL BORING LOGS 2003.GPJ KJ PNW.GDT 2/19/13

Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION: Former Creosoting Area (Southern Property Boundary)		**Well Name**	MW-17
DRILLING COMPANY: Cascade Drilling, Inc.	DRILLER: Brian	**Project Name**	Former Tacoma Metals
DRILLING METHOD(S): Hollow-Stem Auger	DRILL BIT(S) SIZE: 9-inch OD	**Project Number**	996098.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM: 9.90' (NGVD29)	TOTAL DEPTH: 24.0 ft. bgs
BLANK CASING: 2-inch SCH.40 PVC with 6-inch sump	FROM 0.0 TO 12.7 FT.; 22.7 TO 23.2	DATE STARTED: 2/28/03	DATE COMPLETED: 2/28/03
SLOTTED CASING: 2-inch SCH.40 PVC 0.010-inch slot	FROM 12.7 TO 22.7 FT.	INITIAL WATER DEPTH (FT): 9.0	
SIZE AND TYPE OF FILTER PACK: Lapis Lustre #2/12 Monterey Sand	FROM 10.7 TO 23.2 FT.	LOGGED BY: JML/SCK	
SEAL: Pure Gold Bentonite Chips	FROM 2.0 TO 10.7 FT.	SAMPLING METHODS: 1"x2' and 2"x4' split spoon with acetate liner	WELL COMPLETION: ■ SURFACE HOUSING; ☐ STAND PIPE _____ FT.
GROUT: Concrete	FROM 0.0 TO 2.0 FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	OVA (ppm)	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
SS	2.2				6.3	SP/ SM	**Poorly graded SAND with silt (fill)** Dark to dusky yellowish brown (10YR 4/2 10YR 2/2), fine to medium sand, ~30% gravel up to 1"- subangular to subrounded, moist. ~2'-2.5' ash-like material. ~2.5'-5' ~10% fine gravel.
SS	3.2		5	MW-17-7.5-8	3.7	Wood	**WOOD DEBRIS with SILT matrix** Various colors (reddish brown to gray to pale yellow), varying silt content (~10-40%).
SS	1.8		10		6.5		~9' Wet.
SS	0.7			MW-17-12-16	3.4		~13' Minor silt with sand lenses within wood, dusky yellowish brown, wet, slight creosote odor and sheen.
SS	1.6		15		4.8		
SS	1.6				5.6	SP	**Poorly graded SAND** Brownish black (5YR 2/1), fine to medium grained, wet, slight creosote odor and sheen.
SS	1.8		20		2.9		~18' Medium to coarse sand occasional fine to coarse gravel, no odor or sheen.
SS	1.6			MW-17-20.5-22	3.7		
SS	1.9				4.1	CL	**Lean CLAY** Dark yellowish brown to olive gray (10YR 4/2-5YR 4/1), upper 0.5' contains fibrous organic material, clay is at least 2' thick, moist, no odor or sheen.

NOTES

1. Pilot boring advanced with GeoProbe rig. Well installed using 9-inch diameter hollow-stem auger drill rig.
2. OVA - Organic vapor analyzer.
3. Ground surface elevation based on City of Tacoma datum (NGVD29).

KJ PNW TACOMA METALS DNAPL BORING LOGS 2003.GPJ KJ PNW.GDT 2/19/13

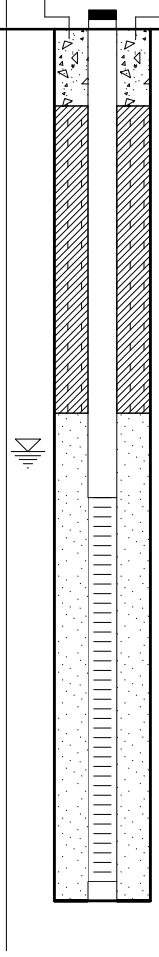
Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION: Former Creosoting Area (Western Property Boundary)		**Well Name**	MW-18
DRILLING COMPANY: Cascade Drilling, Inc.	DRILLER: Brian	**Project Name**	Former Tacoma Metals
DRILLING METHOD(S): Hollow-Stem Auger	DRILL BIT(S) SIZE: 9-inch OD	**Project Number**	996098.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM: 9.40' (NGVD29)	TOTAL DEPTH: 24.0 ft. bgs
BLANK CASING: 2-inch SCH.40 PVC with 6-inch sump	FROM 0.0 TO 12.2 FT. / 22.2 22.7	DATE STARTED: 2/27/03	DATE COMPLETED: 2/27/03
SLOTTED CASING: 2-inch SCH.40 PVC 0.010 -inch slot	FROM 12.2 TO 22.2 FT.	INITIAL WATER DEPTH (FT): 11.0	
SIZE AND TYPE OF FILTER PACK: Lapis Lustre #2/12 Monterey Sand	FROM 10.0 TO 22.7 FT.	LOGGED BY: JML/SCK	
SEAL: Pure Gold Bentonite Chips	FROM 2.0 TO 10.0 FT.	SAMPLING METHODS: 1"x2' and 2"x4' split spoon with acetate liner	WELL COMPLETION: ☐ SURFACE HOUSING ■ STAND PIPE 3.58 FT.
GROUT: Concrete	FROM 0.0 TO 2.0 FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	OVA (ppm)	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
SS	1.5				2.4		GM	**Silty GRAVEL with sand (fill)** Moderate yellowish brown to dusky yellowish brown (10YR 5/4 to 10YR 2/2), moist, no odor or sheen. ~2' Ash-like material.
SS	1.5		5		4.1		Wood	**WOOD DEBRIS with SILT or SAND matrix** Dark gray to black (N3-N1), wood debris typically with ~5-10% silt/fine sand matrix, although ~20-30% was observed.
SS	0.0				--			
SS	2.0		10	MW-18-11.5-12	15.3			~10' Moderate creosote odor. ~11' Wet.
SS	1.0				--		CL	**Lean CLAY** Black (N1), blebs of creosote product visible, moist, strong creosote odor.
SS	2.0		15		17.5		SM	**Silty SAND** Black (N1), fine grained sand, creosote product coating soil, wet.
SS	1.2				74.4		SP	**Poorly graded SAND** Black (N1), medium to coarse sand, creosote product coating soil, wet, strong creosote odor.
SS	1.4				7.8			~18.5'-18-8' Interbedded lean clay and sand layers.
SS	1.7		20	MW-18-21.5-21.9	46.0			~ 21.5' Very strong creosote odor, creosote product coating soil, creosote product visible.
SS	1.8				8.8		CL	**Lean CLAY** Olive gray (5Y4/1), contains some fibrous organic material, clay is at least 2' thick, no apparent staining or product, moist, slight creosote odor.

WELL CONSTRUCTION



NOTES

1. Pilot boring advanced with GeoProbe rig. Well installed using 9-inch diameter hollow-stem auger drill rig.
2. OVA - Organic vapor analyzer.
3. Ground surface elevation based on City of Tacoma datum (NGVD29).

KJ PNW TACOMA METALS DNAPL BORING LOGS 2003.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION: Former Creosoting Area (Northern Property Boundary)		**Well Name**	MW-19
DRILLING COMPANY: Cascade Drilling, Inc.	DRILLER: Brian	**Project Name**	Former Tacoma Metals
DRILLING METHOD(S): Hollow-Stem Auger	DRILL BIT(S) SIZE: 9-inch OD	**Project Number**	996098.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM: 7.58' (NGVD29)	TOTAL DEPTH: 26.0 ft. bgs
BLANK CASING: 2-inch SCH.40 PVC with 2-inch sump	FROM 0.0 TO 14.0 FT.; 24.0 24.2	DATE STARTED: 2/27/03	DATE COMPLETED: 2/27/03
SLOTTED CASING: 2-inch SCH.40 PVC 0.010-inch slot	FROM 14.0 TO 24.0 FT.	INITIAL WATER DEPTH (FT): 10.5	
SIZE AND TYPE OF FILTER PACK: Lapis Lustre #2/12 Monterey Sand	FROM 12.0 TO 24.2 FT.	LOGGED BY: JML/SCK	
SEAL: Pure Gold Bentonite Chips	FROM 2.5 TO 12.0 FT.	SAMPLING METHODS: 1"x2' and 2"x4' split spoon with acetate liner	WELL COMPLETION: ☐ SURFACE HOUSING ■ STAND PIPE 3.54 FT.
GROUT: Concrete	FROM 0.0 TO 2.5 FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	OVA (ppm)	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
						Wood	**WOOD DEBRIS and BARK (fill)**
SS	2.5				0.6	SW	**Well-graded SAND with gravel (fill)** Moderate yellowish brown (10YR 5/4), fine to coarse sand, ~30% gravel (up to 3") - subangular to subrounded, moist, no odor or sheen.
SS	0.2		5		5.0	Wood	**WOOD DEBRIS with SILT or SAND matrix** Various colors (reddish brown to brown to olive gray), varying fines up to ~50%, no odor or sheen.
SS	0.1		10		3.0		~10.5' Wet.
SS	1.0		15		1.7		
SS	1.2			MW-19-16-18	1.5		
SS	0.8	3 4 3	20				
SS	1.2	12 12 18			2.6	SM	**Silty SAND** Dark gray (N3), fine to medium sand, ~20% fines, wet, no odor or sheen.
SS	1.2	10 14 14		MW-19-23.5-24			
SS	2.0		25	MW-19-24.5-25	2.1	CL	**Lean CLAY** Olive gray (5Y 4/1), moist, no odor or sheen.
						SP	**Poorly graded SAND** Brownish black (5YR 2/1), fine to medium sand, trace fines, wet, no odor or sheen. ~25' Sandy silt layer ~4" thick, olive gray (5Y 4/1), wet, no odor or sheen, grades back to poorly graded sand.

NOTES

1. Pilot boring advanced with GeoProbe rig. Well installed using 9-inch diameter hollow-stem auger drill rig.
2. Due to poor sample recovery using GeoProbe rig, soil samples were collected using the hollow-stem auger rig and 2.5" ID split spoon sampler between 19.5' and 24'.
3. OVA - Organic vapor analyzer.
4. Ground surface elevation based on City of Tacoma datum (NGVD29).

KJ PNW TACOMA METALS DNAPL BORING LOGS 2003.GPJ KJ PNW.GDT 2/19/13

Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION: Former Creosoting Area (Northern Property Boundary)		**Well Name**	MW-20
DRILLING COMPANY: Cascade Drilling, Inc.	DRILLER: Brian	**Project Name**	Former Tacoma Metals
DRILLING METHOD(S): Hollow-Stem Auger	DRILL BIT(S) SIZE: 9-inch OD	**Project Number**	996098.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM: 7.58' (NGVD29)	TOTAL DEPTH: 30.5 ft. bgs
BLANK CASING: 2-inch SCH.40 PVC with 6-inch sump	FROM 0.0 TO 21.5 FT.; 26.5 27.0	DATE STARTED: 2/26/03	DATE COMPLETED: 2/27/03
SLOTTED CASING: 2-inch SCH.40 PVC 0.010-inch slot	FROM 21.5 TO 26.5 FT.	INITIAL WATER DEPTH (FT): 11.0	
SIZE AND TYPE OF FILTER PACK: Lapis Lustre #2/12 Monterey Sand	FROM 21.0 TO 27.3 FT.	LOGGED BY: JML/SCK	
SEAL: Pure Gold Bentonite Chips	FROM 2.0 TO 21.0 FT.	SAMPLING METHODS: 2.5" ID split spoon	WELL COMPLETION: ☐ SURFACE HOUSING ■ STAND PIPE 2.75 FT.
GROUT: Concrete	FROM 0.0 TO 2.0 FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	OVA (ppm)	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
						GW	**Well-graded GRAVEL with sand** Brown fine to medium gravel with ~40-45% fine to medium sand and some silt, no odor, no apparent sheen.
			5			Wood	**WOOD DEBRIS with SILT matrix** Dark gray, wood debris typically with ~5-10% silt/fine sand matrix, no sheen above 13 feet, moderate sheen below 13 feet, slight to moderate creosote odor below 13 feet.
			10				~11' Wet.
SS	0.2	9 14 10	15		3.9		
SS	0.2	18 10 18			3.6	SP/ SM	**Poorly graded SAND with silt** Brownish black (5YR 2/1), medium to coarse sand, trace to ~15% fines, wet, slight creosote odor, no sheen.
SS	0.6	10 18 14			3.3		
SS	0.6	4 7 8	20		4.1		~19' Fibrous organic material.
SS	1.5	3 4 3			4.5		
SS	0.8	3 2 2			5.1	CL	**Lean CLAY** Moderate yellowish brown (10YR 5/4), fibrous organic material, moist.
SS	1.2	3 5 5		MW-20-24-24.3	4.2	SP/	**Poorly graded SAND with silt** As described above.
SS	1.5	11 15 19	25	MW-20-24.8-25	4.1	SM	**SILT with sand** Olive gray (5Y 4/1), fine sand, wet, no odor or sheen.
SS	1.5	4 11 20		MW-20-26.7-26.9	4.5 3.1 2.6	ML	**Poorly graded SAND with silt** As described above.
SS	1.5	10 17 23			3.6	SP/	**SILT with sand** As described above.
SS	1.5	12 18 19	30		3.5	SM	**Poorly graded SAND with silt** Brownish black (5YR 2/1), fine to medium sand, trace to ~15 % fines, wet, slight creosote odor, no sheen.
						ML	**SILT with sand** As described above.
						SP/	***(See next page for lithology description)***

NOTES

1. Pilot boring drilled with hollow-stem auger adjacent to well MW-13. Lithology from upper 16 feet has been inferred from boring location MW-13.
2. OVA - Organic vapor analyzer.
3. Ground surface elevation based on City of Tacoma datum (NGVD29).

KJ PNW TACOMA METALS DNAPL BORING LOGS 2003.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring & Well Construction Log

Kennedy/Jenks Consultants

Project Name Former Tacoma Metals **Project Number** 996098.00 **Well Name** MW-20

SAMPLES TYPE	SAMPLES RECOV. (FEET)	SAMPLES PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	WELL CONSTRUCTION	OVA (ppm)	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
								SM	**Poorly graded SAND** Olive gray (5Y 4/1), fine to medium sand, contains interbedded silt layers (1/8-1/16" thick), wet, slight creosote odor, no sheen.
								ML	
								SP	

KJ PNW TACOMA METALS DNAPL BORING LOGS 2003.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION: Former Creosoting Area (Adjacent to Boring B-2)		**Well Name**	MW-21
DRILLING COMPANY: Cascade Drilling, Inc.	DRILLER: Brian	**Project Name**	Former Tacoma Metals
DRILLING METHOD(S): Hollow-Stem Auger	DRILL BIT(S) SIZE: 9-inch OD	**Project Number**	996098.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM: 9.77' (NGVD29)	TOTAL DEPTH: 26.0 ft. bgs
BLANK CASING: 2-inch SCH.40 PVC with 2-inch sump	FROM 0.0 TO 11.6 FT.; 21.6 21.8	DATE STARTED: 2/28/03	DATE COMPLETED: 2/28/03
SLOTTED CASING: 2-inch SCH.40 PVC 0.010-inch slot	FROM 11.6 TO 21.6 FT.	INITIAL WATER DEPTH (FT): 11.0	
SIZE AND TYPE OF FILTER PACK: Lapis Lustre #2/12 Monterey Sand	FROM 9.5 TO 21.8 FT.	LOGGED BY: JML/SCK	
SEAL: Pure Gold Bentonite Chips	FROM 2.0 TO 9.5 FT.	SAMPLING METHODS: 1"x2' and 2"x4' split spoon with acetate liner	WELL COMPLETION: ■ SURFACE HOUSING; ☐ STAND PIPE _____ FT.
GROUT: Concrete	FROM 0.0 TO 2.0 FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	OVA (ppm)	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
						GW/ GM	**Well-graded GRAVEL with silt and sand** Gray sand/silt/gravel mixture, some minor wood debris with moderate to strong creosote odor.
			5			SP	**Poorly graded SAND** Brown fine to medium sand with some silt, moderate creosote odor and slight sheen 3.5-6.5 feet bgs; gray-stained and strong creosote odor 6.5-8.5 feet bgs, small product blebs visible in sheen test.
			10			Wood	**WOOD DEBRIS with SILT or SAND matrix** Dark gray to black, wood debris typically with ~5-10% silt/fine sand matrix, although matrix up to ~20% or <~5% was observed in samples, very strong creosote odor, visible blebs on wood surfaces. ~11' Wet.
			15				
			20			SM	**Silty SAND** Black to brownish black (N1-5YR 2/1), fine to medium sand, ~30-50% silt, wet, small creosote product blebs visible on soil, very strong creosote odor.
SS	1.4			MW-21-20.5-21.4; MW-21-21.5-22	3.2		
SS	2.0			MW-21-22.5-23.3	7.8	CL	**Lean CLAY** Dark yellowish brown (10YR 4/2), trace sand, moist, slight creosote odor and sheen.
						SM	**Silty SAND** Dark yellowish brown (10YR 4/2), fine sand, wet, slight creosote odor and sheen.
SS	1.7		25	MW-21-25-26	3.2	CL	**Lean CLAY** As described above.
						SM	**Silty SAND** Brownish black (5YR 2/1), fine to medium sand, wet, slight creosote odor and sheen.
						CL	**Lean CLAY** Dark yellowish brown (10YR 4/2), clay is at least 1' thick, moist, slight creosote odor, no sheen.

NOTES

1. Pilot boring advanced with GeoProbe. Lithology from upper 20' has been inferred from boring location B-2. Well installed using 9-inch diameter hollow-stem auger drill rig.
2. OVA - Organic vapor analyzer.
3. Ground surface elevation based on City of Tacoma datum (NGVD29).

KJ PNW TACOMA METALS DNAPL BORING LOGS 2003.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION: Former Creosoting Area		**Well Name**	MW-22 (B-12)
DRILLING COMPANY: Cascade Drilling Company	DRILLER: Andy / Don	**Project Name**	Former Tacoma Metals
DRILLING METHOD(S): HSA / Geoprobe	DRILL BIT(S) SIZE: 9" OD / 2" OD	**Project Number**	996098.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM	TOTAL DEPTH: 24.0 ft. bgs
BLANK CASING: 2" Schedule 40 PVC Pipe	FROM 0 TO 23.3 FT. (23)	DATE STARTED: 11/24/03	DATE COMPLETED: 12/1/03
SLOTTED CASING: 2" Schedule 40 PVC Pipe 0.010" slot	FROM 13 TO 23 FT.	INITIAL WATER DEPTH (FT): 7.5	STATIC WATER ELEV. (FT): N/A
SIZE AND TYPE OF FILTER PACK: Lapis Lustre #2/12 Monterey Sand	FROM 11 TO 23.5 FT.	LOGGED BY: DKM	
SEAL: Pure Gold Bentonite Chips	FROM 2 TO 24 FT. (23.5)	SAMPLING METHODS: 2"x4' shelby tube with acetate liner	WELL COMPLETION: ■ SURFACE HOUSING ☐ STAND PIPE _____ FT.
GROUT: Cement	FROM 0 TO 2 FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	OVA	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
							Asphalt Surface
SH	3			B12-2-3	4.4	GW/ GM	**Well-graded GRAVEL with silt and sand** Gray/green, locally orange/brown, 55-65% gravel, 5-10% silt, moist, no odor, no sheen. 2-3' slight odor.
					2.1		
SH	4		5	B12-4-5	1.6		5.5-6', 3" gray granular material above 3" of fractured red brick material.
				B12-6.5-7.5 (well, Geoprobe boring)	1.3		6-8', black/dark gray angular gravel with sand and silt, wet below 7.5'.
SH	2			B12-8-9	7.2		8-9', pea gravel with brick fragments and coarse sand.
				B12-9-10	40.5	Wood	**WOOD DEBRIS** Blocky to fibrous wood debris with 5-15% silt and fine sand matrix material, wet, moderate to strong creosote odor, heavy sheen visible on water in sampler.
SH	1		10				
SH	1		15				
SH	1				21.9		
SH	4		20	B12-20-21	17.9	SP	**Poorly graded SAND** Dark gray, poorly graded medium sand with <5% silt, creosote product on grains, wet, strong creosote odor, very heavy sheen, visible product blebs rinse out in sheen test covering 5-10% of water surface, slightly more below 22'.
				B12-22-23	20.6		
					10.8	CL/ ML	**Silty CLAY** Brown, silty clay, dense, wet, slight sheen and creosote odor.

NOTES

1. Pilot boring advance with Geoprobe rig on 11/24/03.
2. Well installed with hollow-stem auger rig on 12/1/03.
3. OVA - Organic Vapor Analyzer
4. A 0.3 foot sump installed from 23 to 23.3 feet bgs.

KJ PNW TACOMA METALS DNAPL BORING LOGS DEC 2003.GPJ KJ PNW.GDT 2/19/13

Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION: 38 feet NW of NW property corner, north of SB-18		**Well Name**	MW-23
DRILLING COMPANY: Cascade Drilling Company, Inc.	DRILLER: Andy	**Project Name**	Former Tacoma Metals
DRILLING METHOD(S): HSA	DRILL BIT(S) SIZE: 9 inches	**Project Number**	996098.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM	TOTAL DEPTH: 30.0 ft. bgs
BLANK CASING: 2 inch sch. 40 PVC	FROM 0 TO 18.5 FT. / 29.5 TO 30	DATE STARTED: 3/29/04	DATE COMPLETED: 3/29/04
SLOTTED CASING: 2 inch 0.010 slotted sch. 40 PVC	FROM 18.5 TO 29.5 FT.	INITIAL WATER DEPTH (FT): 9.7	
SIZE AND TYPE OF FILTER PACK: 2/12 Clean Silica	FROM 16.5 TO 29.5 FT.	LOGGED BY: GCD	
SEAL: 3/8 inch Bentonite Chips	FROM 1.0 TO 16.5 FT.	SAMPLING METHODS: 2 inch Cal. Mod D&M spoon	WELL COMPLETION: ☐ SURFACE HOUSING ■ STAND PIPE 3 FT.
GROUT: Concrete w/ 2ft.X2ft. Surface PA	FROM 0 TO 1 FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	WELL CONSTRUCTION	PID	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
						0			**WOOD DEBRIS** Red/brown, coarse sawdust, dry to damp, no odor, no sheen.
			5					Wood	
			10			0			**WOOD DEBRIS with silty sand matrix** Brown/black, blocky to coarse wood debris with ~40-50% silty fine sand matrix, wet, no odor, no sheen.
			15			0		Wood	Sand content increasing downwards.
SS	80%	NM	20			0.1		SP	**Poorly graded SAND** Gray, fine sand with some silt (~20%), loose, wet, slight creosote odor, no sheen.
SS	80%	3 3 4							
SS	100%	3 3 2							**Poorly graded SAND** Black, medium sand, loose, fining downward to ~23 feet then coarsening, wet, strong creosote odor, heavy sheen starting at ~21 bgs.
SS	80%	NM	25			0.3		SP	
SS	10%	NM							
SS	100%	4 11 7							~27' Clayey silt layer ~1" thick.
SS	80%	4 10 8				0.1		CL	**Lean CLAY** Gray/brown, moderately stiff to stiff silty clay, contact at top of clay is not distinct, wet, slight creosote odor, no sheen.
			30						

NOTES

1. Threaded bottom cap at bottom of well screen is 0.5 feet. Slotted portion of screen extends approximately 2 inches below top of clay.
2. Soil descriptions between the ground surface and 19 feet bgs based on cuttings and adjacent soil probe number B18.
3. PID-Photoionization Detector Headspace Reading

KJ PNW TACOMA METALS DNAPL BORING LOGS MAR 2004.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION: NW of SB-20 37 feet from property boundary		**Well Name**	MW-24
DRILLING COMPANY: Cascade Drilling Company, Inc.	DRILLER: Andy	**Project Name**	Former Tacoma Metals
DRILLING METHOD(S): HSA	DRILL BIT(S) SIZE: 9 inches	**Project Number**	996098.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM	TOTAL DEPTH: 23.0 ft. bgs
BLANK CASING: 2 inch sch. 40 PVC	FROM 0 TO 12.8 FT. / 22.5 23	DATE STARTED: 3/29/04	DATE COMPLETED: 3/29/04
SLOTTED CASING: 2 inch 0.010 slotted sch. 40 PVC	FROM 12.8 TO 22.5 FT.	INITIAL WATER DEPTH (FT): 10.0	
SIZE AND TYPE OF FILTER PACK: 2/12 Clean Silica	FROM 11 TO 22.3 FT.	LOGGED BY: GCD	
SEAL: 3/8 inch Bentonite Chips	FROM 1 TO 11 FT.	SAMPLING METHODS: 2 inch Cal. Mod D&M spoon	WELL COMPLETION: ☐ SURFACE HOUSING ■ STAND PIPE 3 FT.
GROUT: Concrete w/ 2ft.X2ft. Surface PA	FROM 0 TO 1 FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	PID	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
					0	Wood	**WOOD DEBRIS** Brown, loose woody debris with ~30-50% silty sand matrix, wet at ~10 feet, no odor, no sheen.
			5		0		
			10				
			15				
SS	10%	<50 6			0.4		
SS	50%	23 41 >50			0.8	SP	**Poorly graded SAND** Black, medium dense, medium sand with trace silt (<10%), wet, slight creosote odor, slight sheen, increasing odor and sheen to ~22 feet.
SS	75%	20 21 5			0.8		
SS	80%	11 13 14	20		0.8		
SS	80%	10 11 11			0	CL	**Lean CLAY** Gray, medium stiff to stiff clay with silt, moist, slight creosote odor, no sheen.

NOTES

1. Threaded bottom cap at bottom of well screen is 0.5 feet. Slotted portion of screen extends approximately 2 inches below top of clay.
2. Soil descriptions between the ground surface and 15 feet bgs based on cuttings.
3. PID-Photoionization Detector Headspace Reading

KJ PNW TACOMA METALS DNAPL BORING LOGS MAR 2004.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION: NW of SB-23 40 feet from property boundary near Portland Ave.		**Well Name**	MW-25
DRILLING COMPANY: Cascade Drilling Company, Inc.	DRILLER: Andy	**Project Name**	Former Tacoma Metals
DRILLING METHOD(S): HSA	DRILL BIT(S) SIZE: 9 inches	**Project Number**	996098.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM	TOTAL DEPTH: 24.0 ft. bgs
BLANK CASING: 2 inch sch. 40 PVC	FROM 0 TO 13.8 FT. / 23.5 24.0	DATE STARTED: 3/29/04	DATE COMPLETED: 3/29/04
SLOTTED CASING: 2 inch 0.010 slotted sch. 40 PVC	FROM 13.8 TO 23.5 FT.	INITIAL WATER DEPTH (FT): 7.5	
SIZE AND TYPE OF FILTER PACK: 2/12 Clean Silica	FROM 11.8 TO 23.3 FT.	LOGGED BY: GCD	
SEAL: 3/8 inch Bentonite Chips	FROM 1 TO 11.8 FT.	SAMPLING METHODS: 2 inch Cal. Mod D&M spoon	WELL COMPLETION: ☐ SURFACE HOUSING ■ STAND PIPE 3 FT.
GROUT: Concrete w/ 2ft.X2ft. Surface PA	FROM 0 TO 1 FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	WELL CONSTRUCTION	PID	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
						0			**WOOD DEBRIS** Brown/gray, loose woody debris with ~50% silty fine sand matrix, moist to wet at ~7.5 feet, no odor, no sheen.
			5						
						0		Wood	
			10						
			15						
SS	75%	9 7 9				0			**Well-graded SAND** Black, loose to medium dense, fine to medium sand with trace silt, wet, no odor, no sheen.
SS	75%	7 9 16				0			
SS	90%	25 26 10				0		SW	
SS	90%	11 12 3	20			0			
SS	80%	6 7 6				0			
SS	80%	6 12 11				0		ML/CL	**Clayey SILT** Gray, moderately stiff clayey silt, moist to wet, no odor, no sheen.

NOTES

1. Threaded bottom cap at bottom of well screen is 0.5 feet. Slotted portion of screen extends approximately 2 inches below top of clay.
2. Soil descriptions between the ground surface and 15 feet bgs based on cuttings.
3. PID-Photoionization Detector Headspace Reading

KJ PNW TACOMA METALS DNAPL BORING LOGS MAR 2004.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION: E 18th Street Right of Way, between borings B-24 and B-27		**Well Name**	MW-26
DRILLING COMPANY: Cascade	DRILLER: Frank	**Project Name**	Former Tacoma Metals
DRILLING METHOD(S): HSA	DRILL BIT(S) SIZE: 9-inch	**Project Number**	996098.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM	TOTAL DEPTH: 29.0 ft. bgs
BLANK CASING: 2-inch schedule 40 PVC pipe	FROM 0 TO 18.1 FT.; 28.1 28.5	DATE STARTED: 4/5/05	DATE COMPLETED: 4/5/05
SLOTTED CASING: 2-inch schedule 40 PVC pipe, 0.010 slot	FROM 18.1 TO 28.1 FT.	INITIAL WATER DEPTH (FT): 14.0	
SIZE AND TYPE OF FILTER PACK: RMC Lapis Lustre #2/12 sand	FROM 15 TO 29 FT.	LOGGED BY: DKM	
SEAL: Pure Gold bentonite chips	FROM 2 TO 15 FT.	SAMPLING METHODS: Split Spoon	WELL COMPLETION: ■ SURFACE HOUSING ☐ STAND PIPE _____ FT.
GROUT: Concrete	FROM 0 TO 2 FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	WELL CONSTRUCTION	PID	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
								GW	**Well-graded GRAVEL with sand** Approximately 3 inches surface gravel.
								Wood	**WOOD DEBRIS** Brown/orange, wood material, medium wood chip to coarse sawdust sized, no soil present, loose, moist, no evident odor, no sheen.
SS	1.5	3 3 6	5			2.4			
SS	0.5	1 2 3	10			148		SM	**Silty SAND** Gray, silty fine sand, moderately dense, moist, no evident odor, no sheen.
								Wood	**WOOD DEBRIS** Gray/brown, wood material, blocky, 10-15% silt/clay matrix overall but matrix varies from <5% to 20-25% locally, matrix is soft with moderate plasticity and dilatency, moist to wet below ~14 feet, low to moderate creosote odor, evident sheen on water in sampler.
SS	1.5	2 2 4	15			276			
SS	<0.5	15 20 23	20			251			Strong creosote odor, heavy sheen on water surface in sampler.
SS	1.5	33 28 21				0.6			
SS	1	20 26 21	25			0.0		SP	**Poorly graded SAND** Gray, poorly graded medium sand, wet, no odor, no sheen at top of sand, but increases to moderate odor and light sheen by 26 feet.
SS	0.5	14 5 6				147 654			
SS	0.75	19 38 33				32.1		SM	**Silty SAND** Gray/brown, silty fine sand overall, evident layering of poorly graded fine sand, silty fine sand, and sandy silt, typically 1-2 inch layers, moderately dense, wet, slight creosote odor, light sheen.
								SP	**Poorly graded SAND** Gray, poorly graded medium to coarse sand, wet, no evident odor, no sheen.

NOTES

1. Lithology is also based on findings from soil borings B-24 and B-27.

KJ PNW LOGS MW26 TO MW28 2005.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION: E 18th Street Right of Way, near soil boring B-29		**Well Name**	MW-27
DRILLING COMPANY: Cascade	DRILLER: Frank	**Project Name**	Former Tacoma Metals
DRILLING METHOD(S): HSA	DRILL BIT(S) SIZE: 9-inch	**Project Number**	996098.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM	TOTAL DEPTH: 27.0 ft. bgs
BLANK CASING: 2-inch schedule 40 PVC pipe	FROM 0 TO 16.4 FT.; FROM 26.4 TO 26.8	DATE STARTED: 4/5/05	DATE COMPLETED: 4/5/05
SLOTTED CASING: 2-inch schedule 40 PVC pipe, 0.010 slot	FROM 16.4 TO 26.4 FT.	INITIAL WATER DEPTH (FT): 10.0	
SIZE AND TYPE OF FILTER PACK: RMC Lapis Lustre #2/12 sand	FROM 13 TO 27 FT.	LOGGED BY: DKM	
SEAL: Pure Gold bentonite chips	FROM 2 TO 13 FT.	SAMPLING METHODS: Split Spoon	WELL COMPLETION: ■ SURFACE HOUSING ☐ STAND PIPE _____ FT.
GROUT: Concrete	FROM 0 TO 2 FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	WELL CONSTRUCTION	PID	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
								GW/ GM	**Well-graded GRAVEL with silt** Gravel with ~4" topsoil above.
								Wood	**WOOD DEBRIS** Orange/brown, wood material, medium chips to coarse sawdust sized, no evident soil, loose, moist, no evident odor, no sheen.
SS	1.5	8 6 8	5			0.6			
								SW	**Well-graded SAND with gravel** Grayish green, sand with 10-15% gravel, granular texture, moist, no evident odor, no sheen.
								ML	**Sandy SILT** Dark gray, silt with ~20% fine sand and minor gravel, soft, moist to wet, no evident odor, no sheen.
SS	0.5	15 50-3	10			84.8			
								Wood	**WOOD DEBRIS** Dark gray, wood material, 10-15% silty matrix with some fine sand and clay, matrix varies locally from <5% to 20-25%, slightly less matrix (~10%) and lighter gray color below ~16 feet, wet, no evident odor, no sheen.
SS	<0.5	14 14 11	15			7.4			
SS	1	2 6 9	20			1.4		SP	**Poorly graded SAND** Dark gray, poorly graded medium to coarse sand, wet, slight creosote odor at top increasing downwards to moderate at bottom, very slight sheen locally.
SS	1.5	11 13 17				0.0			
SS	1.5	7 7 6				16.2			
SS	1.5	5 11 15	25			58.1			
SS	1.5	2 2 3				29.5 1.1		CL/ ML	**Silty CLAY** Tan/brown, silty clay, moderately stiff, moderate plasticity, moderate dilatency, wet, no evident odor, no sheen.

NOTES

1. Lithology is also based on findings from soil boring B-29.

KJ PNW LOGS MW26 TO MW28 2005.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION: E 18th Street Right of Way, near soil boring B-31		**Well Name**	MW-28 (Abandoned)
DRILLING COMPANY: Cascade	DRILLER: Frank	**Project Name**	Former Tacoma Metals
DRILLING METHOD(S): HSA	DRILL BIT(S) SIZE: 9-inch	**Project Number**	996098.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM	TOTAL DEPTH: 28.5 ft. bgs
BLANK CASING: 2-inch schedule 40 PVC pipe	FROM 0 TO 15.7 FT. / 25.7 26	DATE STARTED: 4/5/05	DATE COMPLETED: 4/5/05
SLOTTED CASING: 2-inch schedule 40 PVC pipe, 0.010 slot	FROM 15.7 TO 25.7 FT.	INITIAL WATER DEPTH (FT): 11.0	
SIZE AND TYPE OF FILTER PACK: RMC Lapis Lustre #2/12 sand	FROM 13 TO 28.5 FT.	LOGGED BY: DKM	
SEAL: Pure Gold bentonite chips	FROM 2 TO 13 FT.	SAMPLING METHODS: Split Spoon	WELL COMPLETION: ■ SURFACE HOUSING ☐ STAND PIPE _____ FT.
GROUT: Concrete	FROM 0 TO 2 FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	PID	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
					GW	**Well-graded GRAVEL** Gray/green/brown, well graded gravel.
					Wood	**WOOD DEBRIS** Brown/orange, wood material, medium chips to fine sawdust sized, no evident soil, moist, no evident odor, no sheen.
SS	1	6 5 4	5	0.5		
					ML	**Gravelly SILT** Dark brown to gray, silty material with some gravel and wood chips, soft, moist, no evident odor, no evident sheen.
					ML	**SILT** Dark brown, silty material with <25% wood material, some fine sand, soft, moist, no evident odor, no evident sheen.
SS	<0.5	100-3	10	44.3		
					Wood	**WOOD DEBRIS** Gray/brown, wood material, blocky, 10-15% silty matrix, wet below ~11 feet, moderate creosote odor, moderate to heavy sheen on water in sampler.
SS	0	43 16 14	15			Strong creosote odor, heavy sheen on water surface in sampler.
SS	0	8 6 5	20		SP	**Poorly graded SAND** Dark gray, poorly graded medium sand, coarsens gradually downwards, wet, moderate creosote odor, moderate to heavy sheen.
SS	<0.5	9 9 4		0.0		
SS	1	9 8 3		31.1		
SS	1	3 5 8	25	130		
SS	1	2 5 2		31.4	ML	**Sandy SILT** Brown/gray, layered poorly graded sand with silt, silty sand, sandy silt, and silt, layers typically 2-4 inches thick, 60% of sequence appears to be silt and sandy silt, wet, no evident odor, no sheen.
SS	1.5	15 30 40		0.0		

NOTES

1. Lithology is also based on findings from soil boring B-31.
2. Well MW-28 was abandoned in February 2006 because of damage to the monument and upper casing. The well was replaced with MW-28(R).

KJ PNW LOGS MW26 TO MW28 2005.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

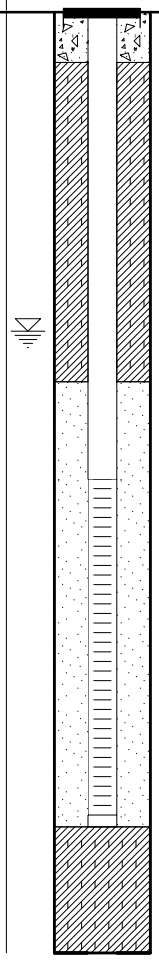
Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION: Next to MW-28		**Well Name**	MW-28(R)
DRILLING COMPANY: Cascade	DRILLER: Casey / Jaymen	**Project Name**	Former Tacoma Metals
DRILLING METHOD(S): HSA / GeoProbe	DRILL BIT(S) SIZE: 9-inch / 2-inch	**Project Number**	998098.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM	TOTAL DEPTH: 28.0 ft. bgs
BLANK CASING: 2" Schedule 40 PVC Pipe	FROM 0 TO 13.9 FT.; 23.9 TO 24.25	DATE STARTED: 2/14/06	DATE COMPLETED: 2/15/06
SLOTTED CASING: 2" Schedule 40 PVC Pipe, 0.010-Slot	FROM 13.9 TO 23.9 FT.	INITIAL WATER DEPTH (FT): 9.5	
SIZE AND TYPE OF FILTER PACK: Lapis Lustre #2/12 Monterey Sand	FROM 11 TO 24.25 FT.	LOGGED BY: DKM	
SEAL: Pure Gold Bentonite Chips	FROM 1.5 TO 11 FT.; 24.25 TO 28	SAMPLING METHODS: MacroCore w/PVC Liner	WELL COMPLETION: ■ SURFACE HOUSING; ☐ STAND PIPE _____ FT.
GROUT: Concrete	FROM 0 TO 1.5 FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	OVA	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
SH	3				0.9	GW	**Well-graded GRAVEL with sand** Greenish brown, gravel with sand and silt, moderately dense, moist, no odor, no sheen.
SH	3		5	B37-7-8	0.8	Wood	**WOOD DEBRIS** Orange/brown, wood material, fine chips/shreds to coarse sawdust, no soil matrix, moist, no odor, no sheen.
SH	2		10		0.4	ML	**SILT** Dark gray/brown, silty material mixed with up to 25% wood chips and shreds, some sand and gravel, soft, moist to wet at 9.5 feet bgs, slight odor 7.5-8 feet bgs, otherwise no odor, no sheen.
SH	2		15		0.7	Wood	**WOOD DEBRIS** Dark gray to dark orange/brown, coarse wood material coated with grayish silt, approximately 5-10% silt matrix material overall, wet, no odor or sheen. Possibly some small NAPL blebs visible on water surface in sampler 12-16 feet bgs.
SH	3.5			B37-17-18	28.3	SP	**Poorly graded SAND** Gray to dark gray, fine to medium sand at top grading to mostly medium sand by 20 feet bgs and to medium/coarse sand mixture at bottom, wet, slight creosote odor to ~19 feet bgs, no sheen.
SH	3		20	B37-23-24	44.4		Moderate creosote odor 19-21 feet bgs, no sheen. Below 21 feet bgs, strong creosote odor and moderate sheen (abrupt interface). At 22 feet bgs, moderate sheen with no NAPL visible. At 23 feet bgs, heavy sheen with NAPL blebs visible. At 23.5 feet, very heavy sheen with NAPL blebs visible.
SH	3.5		25	B37-26-27	0.9	ML	
					0.7	SP	**Sandy SILT** Tan, sandy silt, 30-40% fine sand, moderately stiff, low plasticity, moderately quick dilatency, wet, no odor, no sheen. **Poorly graded SAND** Gray, primarily medium sand, some fine sand, wet, no odor, no sheen.

WELL CONSTRUCTION



LITHOLOGY

NOTES

1. Sampling and lithologic logging were performed during GeoProbe boring on 2/14/06. The well was installed at the same location on 2/15/06.

KJ PNW LOGS MW-28R TO MW-31 2006.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

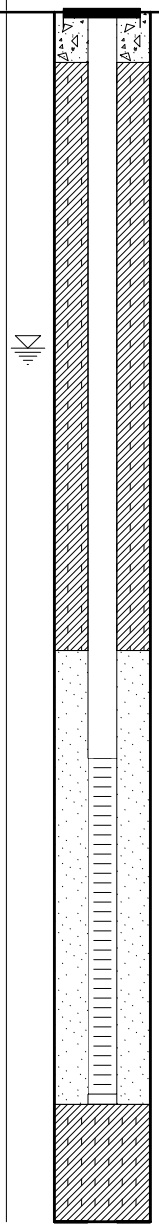
Boring & Well Construction Log

Kennedy/Jenks Consultants

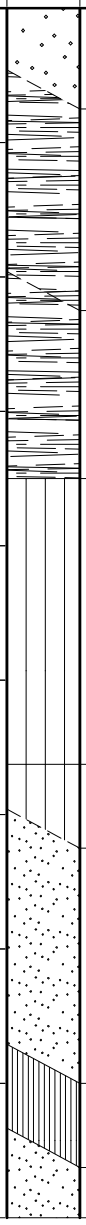
BORING LOCATION: Northeast Corner Simpson Property		**Well Name**	MW-29 / B-34
DRILLING COMPANY: Cascade	DRILLER: Casey / Jaymen	**Project Name**	Former Tacoma Metals
DRILLING METHOD(S): HSA / GeoProbe	DRILL BIT(S) SIZE: 9-inch / 2-inch	**Project Number**	998098.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM	TOTAL DEPTH: 36.0 ft. bgs
BLANK CASING: 2" Schedule 40 PVC Pipe	FROM 0 TO 22.2 FT.; FROM 32.2 TO 32.5	DATE STARTED: 2/14/06	DATE COMPLETED: 2/15/06
SLOTTED CASING: 2" Schedule 40 PVC Pipe, 0.010-Slot	FROM 22.2 TO 32.2 FT.	INITIAL WATER DEPTH (FT): 10.0	
SIZE AND TYPE OF FILTER PACK: Lapis Lustre #2/12 Monterey Sand	FROM 19 TO 32.5 FT.	LOGGED BY: DKM	
SEAL: Pure Gold Bentonite Chips	FROM 1.5 TO 19 FT.; FROM 32.5 TO 36	SAMPLING METHODS: MacroCore w/PVC Liner	WELL COMPLETION: ■ SURFACE HOUSING; ☐ STAND PIPE _____ FT.
GROUT: Concrete	FROM 0 TO 1.5 FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	OVA	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
SH	2				0.2	SW	**Well-graded SAND with gravel** Gray, medium sand with 10-15% gravel and ~5% red/brown woody material locally, moderately dense, moist, no odor, no sheen.
SH	1		5	B34-7-8	0.5	Wood	**WOOD DEBRIS** Red/brown, woody material, fine chips to coarse sawdust size, locally up to 5% silt but typically no matrix material, soft, moist, no odor, no sheen.
SH	0.5		10			Wood	**WOOD DEBRIS** Dark gray to dark orange/brown, blocky wood material, typically coated with silt and fine sand, 5-10% matrix material, moist to wet below 10 feet bgs, no odor, no sheen.
SH	3		15			ML	**Sandy SILT** Medium gray/brown, silt with fine sand, <5% sand at top, 15-20% sand by ~16 feet bgs, ~20% sand by 20 feet bgs, moderately dense overall but loose 20-22.5 feet bgs, wet, no odor, no sheen.
SH	2.5			B34-18-19	0.0		
SH	4		20				
SH	2.5		25			ML	**SILT** Gray, silt, becomes sandier (fine sand) with depth, up to 10% sand by ~24 feet bgs, moderately stiff, wet, no odor, no sheen.
SH	3.5		30	B34-30-31	57.4	SP	**Poorly graded SAND** Gray, medium to coarse sand at top, primarily medium sand by ~28 feet bgs, fine sand present below ~30 feet bgs, moderately dense, wet, slight creosote odor, no sheen.
SH	3.5		35	B34-34-35	1.0	SM	**Silty SAND** Gray, silty fine sand, 15-20% silt, moderately dense, wet, no odor, no sheen.
					0.3	SP	**Poorly graded SAND** Gray, medium to fine sand at top, grading to mostly medium/coarse sand by 36 feet bgs, moderately dense, wet, no odor, no sheen.

WELL CONSTRUCTION



LITHOLOGY



NOTES

1. Sampling and lithologic logging were performed during GeoProbe boring on 2/14/06. The well was installed at the same location on 2/15/06.

KJ PNW LOGS MW-28R TO MW-31 2006.GPJ KJ PNW.GDT 2/19/13

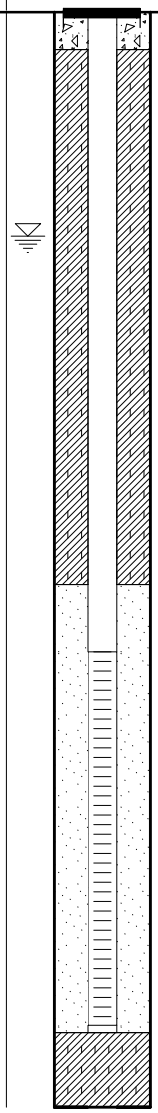
F-40.1
(6-87) (3-88) (8-90)

Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION: Simpson Property center well		**Well Name**	MW-30 / B-35
DRILLING COMPANY: Cascade	DRILLER: Casey / Jaymen	**Project Name**	Former Tacoma Metals
DRILLING METHOD(S): HSA / GeoProbe	DRILL BIT(S) SIZE: 9-inch / 2-inch	**Project Number**	998098.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM	TOTAL DEPTH: 44.0 ft. bgs
BLANK CASING: 2" Schedule 40 PVC Pipe	FROM 0 TO 25.7 FT. / 40.7 41	DATE STARTED: 2/14/06	DATE COMPLETED: 2/15/06
SLOTTED CASING: 2" Schedule 40 PVC Pipe, 0.010-Slot	FROM 25.7 TO 40.7 FT.	INITIAL WATER DEPTH (FT): 9.0	
SIZE AND TYPE OF FILTER PACK: Lapis Lustre #2/12 Monterey Sand	FROM 23 TO 41 FT.	LOGGED BY: DKM	
SEAL: Pure Gold Bentonite Chips	FROM 1.5 TO 23 FT. / 41 44	SAMPLING METHODS: MacroCore w/PVC Liner	WELL COMPLETION: ■ SURFACE HOUSING ☐ STAND PIPE _____ FT.
GROUT: Concrete	FROM 0 TO 1.5 FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	OVA	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
SH	1.5					SW	**Well-graded SAND with gravel** Brown/gray, sand with 25-30% rounded gravel, some silt below ~4 feet bgs, moist, no odor, no sheen.
SH	2.5		5	B35-6-7	0.3	SM	**Silty SAND with gravel** Dark gray to black, granular (sand-sized) material mixed with 15-20% silt and some angular gravel material, oily surface appearance locally, moist, no odor, no sheen.
SH	2.5		10			Wood	**WOOD DEBRIS** Gray to brown/yellow (on exposed surfaces), blocky wood debris with gray silty matrix material (5-10%) typically coating wood surfaces, wet, no odor, no sheen.
SH	1		15		0.5		
SH	0		20				
SH	3			B35-23-24	0.4	SP	**Poorly graded SAND** Medium gray, poorly graded medium to coarse sand, locally minor fine sand, wet, no odor, no sheen above ~24 feet bgs.
SH	4		25		1.1		Slight creosote odor and no sheen ~24-28 feet bgs.
SH	4		30		1.4		Slight to moderate creosote odor and no sheen ~28-35 feet bgs (strongest odor ~30-33').
SH	4			B35-32-33	15.5		
			35		5.6		
SH	4						No odor or sheen below ~35 feet bgs.
			40	B35-39-40	0.4		
SH	4				0.9	ML	**SILT** Tan/gray, silt, minor fine sand and clay, stiff, moderate plasticity and dilatency, wet, no odor, no sheen.
					0.8	SP	**Poorly graded SAND** Medium gray, poorly graded medium to coarse sand, wet, no odor, no sheen.
						ML	**SILT** Tan/gray, silt, minor fine sand and clay, stiff, moderate plasticity and dilatency, wet, no odor, no sheen.
						SP	



NOTES

1. Sampling and lithologic logging were performed during GeoProbe boring on 2/14/06. The well was installed at the same location on 2/15/06.

(See next page for lithology description)

KJ PNW LOGS MW-28R TO MW-31 2006.GPJ KJ PNW.GDT 2/19/13

Boring & Well Construction Log

Kennedy/Jenks Consultants

Project Name Former Tacoma Metals **Project Number** 998098.00 **Well Name** MW-30 / B-35

SAMPLES			DEPTH (FEET)	SAMPLE NUMBER	WELL CONSTRUCTION	OVA	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"							
									Poorly graded SAND Medium gray, poorly graded medium to coarse sand, wet, no odor, no sheen.

KJ PNW LOGS MW-28R TO MW-31 2006.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION: Simpson Property nearest Portland Avenue		**Well Name**	MW-31 / B-36
DRILLING COMPANY: Cascade	DRILLER: Casey / Jaymen	**Project Name**	Former Tacoma Metals
DRILLING METHOD(S): HSA / GeoProbe	DRILL BIT(S) SIZE: 9-inch / 2-inch	**Project Number**	998098.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM	TOTAL DEPTH: 36.0 ft. bgs
BLANK CASING: 2" Schedule 40 PVC Pipe	FROM 0 TO 22.7 FT. / 32.7 TO 33	DATE STARTED: 2/14/06	DATE COMPLETED: 2/15/06
SLOTTED CASING: 2" Schedule 40 PVC Pipe, 0.010-Slot	FROM 22.7 TO 32.7 FT.	INITIAL WATER DEPTH (FT): 10.0	
SIZE AND TYPE OF FILTER PACK: Lapis Lustre #2/12 Monterey Sand	FROM 20 TO 33 FT.	LOGGED BY: DKM	
SEAL: Pure Gold Bentonite Chips	FROM 1.5 TO 20 FT. / 33 TO 36	SAMPLING METHODS: MacroCore w/PVC Liner	WELL COMPLETION: ■ SURFACE HOUSING ☐ STAND PIPE _____ FT.
GROUT: Concrete	FROM 0 TO 1.5 FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	OVA	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
SH	2					GW/ GM	**Well-graded GRAVEL with silt and sand** Tan, gravel fill with sand and silt, dense, moist, no odor, no sheen.
SH	3.5		5			Wood	**WOOD DEBRIS** Orange/brown, wood material, fine chips to coarse sawdust size, some silt present locally (<5% total), moderately loose, moist, no odor, no sheen.
SH	3.5		10	B36-8-10	72.6	SM	**Silty SAND with gravel** Dark brown, Mixture of silt (20-30%), gravel (10-15%), fine sand, and wood material, moderately loose, moist to wet, moderate odor with moderate sheen ~7-10 feet bgs, slight odor but no sheen below ~10 feet.
SH	3		15			Wood	**WOOD DEBRIS** Gray, coarse wood material coated with silt and fine sand matrix (5-10% overall but locally variable), wet, no odor, light to moderate sheen increasing with depth.
SH	1				6.7		NAPL blebs are locally visible on the water surface in the sampler, increasing with depth.
SH	3		20	B36-23-24	20.8		
SH	3		25		3.4	SP	**Poorly graded SAND** Dark gray, poorly graded sand, mostly fine sand at 23 feet bgs, medium to coarse sand ~24-25 feet bgs, becoming silty (up to ~10%) below ~26 feet bgs, wet, strong creosote odor with heavy sheen and brownish NAPL blebs visible ~23-24 feet bgs, moderate odor and sheen (no visible NAPL blebs) below ~24 feet bgs.
					2.5	SP/	
SH	2.5		30			SM	**Poorly graded SAND with silt** Gray, poorly graded fine sand with 10-15% silt, moderately dense, wet, slight creosote odor, light sheen.
				B36-31-32	31.5	SP	**Poorly graded SAND** Gray to dark gray, fine to medium sand at top grading to mostly medium sand by ~32 feet bgs, moderately dense, wet, moderate creosote odor and sheen above ~31 feet bgs, strong odor with heavy sheen with NAPL blebs visible below ~31 feet bgs.
SH	3.5		35	B36-34-35	1.1 / 0.8	SM / SP	

Silty SAND Gray, fine sand with 15-20% silt, moderately dense, wet, no odor, no sheen.

(See next page for lithology description)

NOTES

1. Sampling and lithologic logging were performed during GeoProbe boring on 2/14/06. The well was installed at the same location on 2/15/06.

KJ PNW LOGS MW-28R TO MW-31 2006.GPJ KJ PNW.GDT 2/19/13

Boring & Well Construction Log

Kennedy/Jenks Consultants

Project Name Former Tacoma Metals **Project Number** 998098.00 **Well Name** MW-31 / B-36

SAMPLES			DEPTH (FEET)	SAMPLE NUMBER	WELL CONSTRUCTION	OVA	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"							
									Poorly graded SAND Gray, poorly graded medium to coarse sand, moderately dense, wet, no odor, no sheen.

KJ PNW LOGS MW-28R TO MW-31 2006.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION: 18th Street Right of Way		**Well Name**	MW-32
DRILLING COMPANY: Cascade	DRILLER: Scott	**Project Name**	Tacoma Metals
DRILLING METHOD(S): HSA	DRILL BIT(S) SIZE: 9-inch	**Project Number**	996098*00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM: ground surface	TOTAL DEPTH: 24.5 ft. bgs
BLANK CASING: 2-inch Schedule 40 PVC Pipe	FROM 0 TO 14.15 FT. / FROM 24.15 TO 24.5 FT.	DATE STARTED: 2/29/08	DATE COMPLETED: 2/29/08
SLOTTED CASING: 2-inch Schedule 40 PVC Pipe, 0.010 inch slots	FROM 14.15 TO 24.15 FT.	INITIAL WATER DEPTH (FT): 8.0	
SIZE AND TYPE OF FILTER PACK: Lapis Lustrr #2/12 Monterey Sand	FROM 12 TO 24.5 FT.	LOGGED BY: DKM	
SEAL: Pure Gold Bentonite Chips	FROM 1 TO 12 FT.	SAMPLING METHODS: Split Spoon	WELL COMPLETION: ■ SURFACE HOUSING ☐ STAND PIPE _____ FT.
GROUT: Concrete	FROM 0 TO 1 FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	WELL CONSTRUCTION	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
							GP	**Poorly graded GRAVEL with sand** Brown, gravelly fill material, moderately dense, no odor, no sheen.
							SP	**Poorly graded SAND with gravel** Gray, poorly graded medium-fine sand with 5-10% gravel, moderately dense, no odor, no sheen.
							SP/ SM	**Poorly graded SAND with silt** Brown, sand with 30% silt, some organic debris and wood chip material, soft, no odor, no sheen.
			5				SW	**Well-graded SAND with gravel** Dark gray, sand with 50% gravel, moderately dense, no odor, no sheen.
							SW/ SM	**Well-graded SAND with silt** Dark gray to brown, sand with 30% silt, moderately dense, moist, no odor, no sheen.
			10				Wood	**WOOD DEBRIS** Dark brown to red-brown, wood material with 5-10% silty matrix, moist, no odor, no sheen.
							GW/ GM	**Well-graded GRAVEL with silt and sand** Dark gray, well graded gravel with 10% fine sand and 20% silt, moderately dense, wet, no odor, no sheen.
			15				SP	**Poorly graded SAND** Gray, poorly graded medium sand, 5% fine to medium gravel in upper 2 feet, grading to fine sand by 20-21 feet, moderately dense, wet, no odor, no sheen.
			20					
SS	1.5	7 8 8					SP/ SM	**Poorly graded SAND with silt** Gray, poorly graded fine to medium sand with ~15% silt, moderately dense, wet, no odor, no sheen.
SS	.5	5 8 8						
SS	1.5	3 3 3					CL/ ML	**Silty CLAY** Gray, silty clay, moderately stiff, medium-low plasticity, wet, no odor, no sheen.

NOTES

1. Lithology for upper 20 feet is based on B-37A.

KJ PNW LOGS B37 TO B47 2007.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION: JJ Port Property		**Well Name**	MW-33
DRILLING COMPANY: Cascade	DRILLER: Scott	**Project Name**	Tacoma Metals
DRILLING METHOD(S): HSA	DRILL BIT(S) SIZE: 9-inch	**Project Number**	996098*00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM: ground surface	TOTAL DEPTH: 24.5 ft. bgs
BLANK CASING: 2-inch Schedule 40 PVC Pipe	FROM 0 TO 14.15 FT.; FROM 24.15 TO 24.5	DATE STARTED: 2/28/08	DATE COMPLETED: 2/28/08
SLOTTED CASING: 2-inch Schedule 40 PVC Pipe, 0.010 inch slots	FROM 14.15 TO 24.15 FT.	INITIAL WATER DEPTH (FT): 9.0	
SIZE AND TYPE OF FILTER PACK: Lapis Lustrr #2/12 Monterey Sand	FROM 12 TO 24.5 FT.	LOGGED BY: DKM	
SEAL: Pure Gold Bentonite Chips	FROM 1 TO 12 FT.	SAMPLING METHODS: Split Spoon	WELL COMPLETION: ■ SURFACE HOUSING ☐ STAND PIPE _____ FT.
GROUT: Concrete	FROM 0 TO 1 FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	WELL CONSTRUCTION	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
							GW	**Well-graded GRAVEL with sand** Dark orange/brown, gravelly fill with 30-40% sand, moderately dense, no odor, no sheen.
							SW/ SM	**Well-graded SAND with silt** Dark orange/brown, silty fine sand with 10-20% wood chip material and 10% gravel, moderately dense, moist, no odor, no sheen.
			5				SW/	**Well-graded SAND with silt** Tan/gray, silty fine sand with 5-10% gravel, moderately dense, moist, no odor, no sheen.
							SM	**Well-graded SAND with silt** Dark orange/brown, fine sand with 10% silt, moderately dense, moist, no odor, no sheen.
							SW/	**WOOD DEBRIS** Brown/red, wood debris with up to 50% silt/sand matrix material, moist, no odor, no sheen.
			10				SM	**Silty SAND** Tan/gray, fine sand with 30-40% silt, moderately dense, moist, no odor, no sheen.
							Wood	
							SM	**Poorly graded SAND** Dark gray, poorly graded medium sand, coarsening downwards to medium/coarse sand, some fine gravel at 20-24 feet bgs, moderately dense, wet, no odor, no sheen.
			15				SP	
			20					
SS	1.5	8 12 15						
SS	1	8 15 16						
SS	1.5	10 6 4						
							ML/ CL	**Clayey SILT** Gray, clayey silt, moderately stiff, moderate plasticity, wet, no odor, no sheen.

NOTES

1. Lithology for upper 20 feet is based on B-39A.

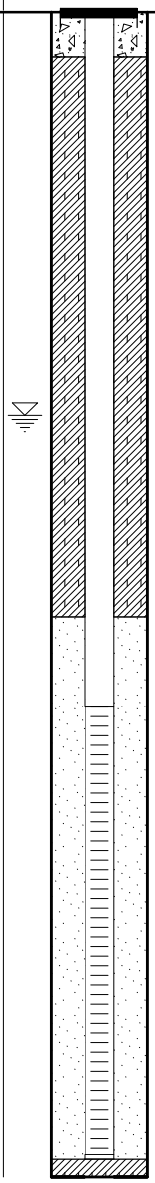
KJ PNW LOGS B37 TO B47 2007.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION: JJ Port Property		**Well Name**	MW-34
DRILLING COMPANY: Cascade	DRILLER: Scott	**Project Name**	Tacoma Metals
DRILLING METHOD(S): HSA	DRILL BIT(S) SIZE: 9-inch	**Project Number**	996098*00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM: ground surface	TOTAL DEPTH: 26.0 ft. bgs
BLANK CASING: 2-inch Schedule 40 PVC Pipe	FROM 0 TO 15.5 FT.; FROM 25.5 TO 25.6	DATE STARTED: 2/28/08	DATE COMPLETED: 2/28/08
SLOTTED CASING: 2-inch Schedule 40 PVC Pipe, 0.010 inch slots	FROM 15.5 TO 25.5 FT.	INITIAL WATER DEPTH (FT): 9.0	
SIZE AND TYPE OF FILTER PACK: Lapis Lustrr #2/12 Monterey Sand	FROM 13.5 TO 25.6 FT.	LOGGED BY: DKM	
SEAL: Pure Gold Bentonite Chips	FROM 1 TO 13.5 FT.; FROM 25.6 TO 26	SAMPLING METHODS: Split Spoon	WELL COMPLETION: ■ SURFACE HOUSING; ☐ STAND PIPE _____ FT.
GROUT: Concrete	FROM 0 TO 1 FT.		



SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
					Asphalt surface and base gravel fill.
				SM	**Silty SAND with gravel** Tan, fine to medium sand with 20-25% silt and 5-15% gravel, moderately dense, moist, no odor, no sheen.
			5	SP	**Poorly graded SAND** Brown, poorly graded medium to coarse sand, ~5% fine gravel, moderately dense, moist, no odor, no sheen.
				OH	**Organic SILT** Dark brown to dark gray, silt with abundant organic material including woody debris, soft, moist, no odor, no sheen.
				CL/ ML	**Silty CLAY** Tan to tan-brown, silty clay, moderately stiff, high plasticity, moist, no odor, no sheen.
			10	ML	**Sandy SILT** Gray/brown, silt with 30-40% fine sand overall, layered texture with interbedded clayey silt, silt, and sandy silt, wet, no odor, no sheen.
			15	SP	**Poorly graded SAND** Dark gray, poorly graded sand, mostly medium sand at top coarsening slightly downward, local small (<1/2") silt nodules ~16-20 feet bgs, moderately dense, wet, no odor, no sheen.
SS	1.5	9 13 15	20		
SS	1.5	13 15 18			
SS	1.5	10 15 18		SM	**Silty SAND** Gray, fine sand with 20-25% silt, moderately dense, wet, no odor, no sheen.
SS	1.5	10 12 15	25	SP	**Poorly graded SAND** Gray, poorly graded fine sand, moderately dense, wet, no odor, no sheen.
				ML/ CL	**Clayey SILT** Gray, clayey silt, moderately stiff, moderately high plasticity, wet, no odor, no sheen
				SP/	***(See next page for lithology description)***

NOTES

1. Lithology for upper 20 feet is based on B-41.

KJ PNW LOGS B37 TO B47 2007.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring & Well Construction Log

Kennedy/Jenks Consultants

Project Name Tacoma Metals **Project Number** 996098*00 **Well Name** MW-34

SAMPLES			DEPTH (FEET)	SAMPLE NUMBER	WELL CONSTRUCTION		LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"							
								SM	**Poorly graded SAND with silt** Gray, poorly graded fine sand with some silt, moderately dense, wet, no odor, no sheen.

KJ PNW LOGS B37 TO B47 2007.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION: JJ Port Property		**Well Name**	MW-35
DRILLING COMPANY: Cascade	DRILLER: Scott	**Project Name**	Tacoma Metals
DRILLING METHOD(S): HSA	DRILL BIT(S) SIZE: 9-inch	**Project Number**	996098*00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM: ground surface	TOTAL DEPTH: 51.0 ft. bgs
BLANK CASING: 2-inch Schedule 40 PVC Pipe	FROM 0 TO 40.5 FT. / 50.4 50.5	DATE STARTED: 2/28/08	DATE COMPLETED: 2/28/08
SLOTTED CASING: 2-inch Schedule 40 PVC Pipe, 0.010 inch slots	FROM 40.5 TO 50.4 FT.	INITIAL WATER DEPTH (FT): 8.0	
SIZE AND TYPE OF FILTER PACK: Lapis Lustrr #2/12 Monterey Sand	FROM 38.5 TO 50.5 FT.	LOGGED BY: DKM	
SEAL: Pure Gold Bentonite Chips	FROM 2 TO 38.5 FT. / 50.5 51	SAMPLING METHODS: Split Spoon	WELL COMPLETION: ☐ SURFACE HOUSING ■ STAND PIPE 2.5 FT.
GROUT: Concrete	FROM 0 TO 2 FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
				GW	**Well-graded GRAVEL** Well graded gravel fill material, no odor, no sheen.
				SM	**Silty SAND** Tan to gray, silty fine sand fill, moist, no odor, no sheen.
				ML	**SILT** Dark brown, silt, abundant fine wood material, moderately soft, moist, no odor, no sheen.
SS	1.5	1 1 2	5	Wood	**WOOD DEBRIS** Brown/red-brown, wood debris with 10-15% silty matrix (locally variable <5% up to 20%), moist to wet, no odor, no sheen.
SS	1.5	2 3 3	10	SP	**Poorly graded SAND** Gray, poorly graded medium sand, moderately dense, wet, no odor, no sheen.
SS	1.5	2 3 3	15	SM	**Silty SAND** Gray, fine sand with 30-40% silt overall, interbedded poorly graded sand with silt, silty sand, and sandy silt, moderately dense, wet, no odor, no sheen.
SS	1	3 3 3	20	SP	**Poorly graded SAND** Gray, poorly graded sand, typically medium to coarse sand, locally some silt and gravel, moderately dense, wet, no odor, no sheen.
SS	.5	50	25		
SS	.5	50			
SS	.5	50			Dark gray coarse sand, some medium sand.

WELL CONSTRUCTION

LITHOLOGY

KJ PNW LOGS B37 TO B47 2007.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring & Well Construction Log

Kennedy/Jenks Consultants

Project Name Tacoma Metals **Project Number** 996098*00 **Well Name** MW-35

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	WELL CONSTRUCTION	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
SS	1	18 23 25	30					**Poorly graded SAND** Gray, poorly graded sand, typically medium to coarse sand, locally some silt and gravel, moderately dense, wet, no odor, no sheen. ***(Continued)***
SS	1.5	15 19 20						
SS	1.5	15 18 23						
SS	1.5	15 19 22	35					Mostly medium sand, some coase sand, minor silt.
SS	1.5	14 17 23						
SS	1.5	18 21 25						
SS	1.5	18 25 27	40				SP	
SS	1.5	18 23 24						Locally 5-10% silt in small nodules.
SS	1.5	12 15 18						
SS	1.5	15 18 20						
SS	1.5	18 26 30	45					Gravelly sand (fine gravel) 44-47 feet bgs
SS	1.5	18 27 30						
SS	1.5	15 22 29						
SS	1.5	18 26 15	50					
SS	.5	18					ML	**Sandy SILT** Brown, silt with 20-30% fine sand, some clay, moderately stiff, moderately low plasticity, wet, no odor, no sheen.
							SP	**Poorly graded SAND** Gray, poorly graded fine to medium sand with some silt, moderately dense, wet, no odor, no sheen.

NOTES

1. Lithology for upper 30 feet is also based on B-44.

KJ PNW LOGS B37 TO B47 2007.GPJ KJ PNW.GDT 2/19/13

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: NE Existing Levee Road		**Boring Name**	P-1 / P1-R
DRILLING COMPANY: Cascade Drilling	DRILLER:	**Project Name**	Former Tacoma Metals
DRILLING METHOD(S): Steel Tip Advance	DRILL BIT(S) SIZE: 1-inch	**Project Number**	998098.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM: bgs	TOTAL DEPTH: 20.0 ft. bgs
BLANK CASING: 1-inch stainless steel	FROM N/A TO N/A FT.	DATE STARTED: 2/1/11	DATE COMPLETED: 2/1/11
SLOTTED CASING: 0.010-inch slot stainless steel	FROM 16 TO 20 FT.	INITIAL WATER DEPTH (FT): 6.0	
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.	LOGGED BY: Inference	
SEAL: N/A	FROM N/A TO N/A FT.	SAMPLING METHODS: NA	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.
GROUT: Bentonite Chips	FROM 0 TO 20 FT.		

SAMPLES: TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
							SW	**Well-graded SAND with gravel** Gray, medium sand with 10-15% gravel and ~5% red/brown woody material locally, moderately dense, moist, no odor, no sheen.
			5				Wood	**WOOD DEBRIS** Red/brown, woody material, fine chips to coarse sawdust size, locally up to 5% silt but typically no matrix material, soft, moist, no odor, no sheen.
			10				Wood	**WOOD DEBRIS** Dark gray to dark orange/brown, blocky wood material, typically coated with silt and fine sand, 5-10% matrix material, moist to wet below 10 feet bgs, no odor, no sheen.
			15				ML	**Sandy SILT** Medium gray/brown, silt with fine sand, <5% sand at top, 15-20% sand by ~16 feet bgs, ~20% sand by 20 feet bgs, moderately dense overall but loose 20-22.5 feet bgs, wet, no odor, no sheen.
			20					

NOTES

1. Temporary piezometers installed without lithologic samples collected due to drilling technique. Lithology shown on log has been inferrred from the most proximal well (MW-29/B-34)
2. Total depths from February 2011 installations

KJ PNW TEMPPIEZOMETERS.GPJ KJ PNW.GDT 2/25/13

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: NE Existing Levee Road		**Boring Name**	P-2 / P2-R
DRILLING COMPANY: Cascade Drilling	DRILLER:	**Project Name**	Former Tacoma Metals
DRILLING METHOD(S): Steel Tip Advance	DRILL BIT(S) SIZE: 1-inch	**Project Number**	998098.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM: bgs	TOTAL DEPTH: 20.0 ft. bgs
BLANK CASING: 1-inch stainless steel	FROM N/A TO N/A FT.	DATE STARTED: 2/1/11	DATE COMPLETED: 2/1/11
SLOTTED CASING: 0.010-inch slot stainless steel	FROM 16 TO 20 FT.	INITIAL WATER DEPTH (FT): 4.7	
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.	LOGGED BY: Inference	
SEAL: N/A	FROM N/A TO N/A FT.	SAMPLING METHODS: NA	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.
GROUT: Bentonite Chips	FROM 0 TO 20 FT.		

SAMPLES: TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
			5				Wood	**WOOD DEBRIS** Red/brown, coarse sawdust, dry to damp, no odor, no sheen.
			10				Wood	**WOOD DEBRIS with silty sand matrix** Brown/black, blocky to coarse wood debris with ~40-50% silty fine sand matrix, wet, no odor, no sheen.
			15					Sand content increasing downwards.
			20				SP	**Poorly graded SAND** Gray, fine sand with some silt (~20%), loose, wet, slight creosote odor, no sheen.

NOTES

1. Temporary piezometers installed without lithologic samples collected due to drilling technique. Lithology shown on log has been inferrred from the most proximal well (MW-23)
2. Total depths and screen intervals from February 2011 installations

KJ PNW TEMPPIEZOMETERS.GPJ KJ PNW.GDT 2/25/13

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: NE Existing Levee Road		**Boring Name**	P-3 / P3-R
DRILLING COMPANY: Cascade Drilling	DRILLER:	**Project Name**	Former Tacoma Metals
DRILLING METHOD(S): Stell Tip Advance	DRILL BIT(S) SIZE: 1-inch	**Project Number**	998098.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM: bgs	TOTAL DEPTH: 20.0 ft. bgs
BLANK CASING: 1-inch stainless steel	FROM N/A TO N/A FT.	DATE STARTED: 2/1/11	DATE COMPLETED: 2/1/11
SLOTTED CASING: 0.010-inch slot stainless steel	FROM 16 TO 20 FT.	INITIAL WATER DEPTH (FT): 3.4	
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.	LOGGED BY: Inference	
SEAL: N/A	FROM N/A TO N/A FT.	SAMPLING METHODS: NA	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE _____ FT.
GROUT: Bentonite Chips	FROM 0 TO 20 FT.		

SAMPLES: TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
							GW	**Well-graded GRAVEL with sand** Brown fine to medium gravel with ~40-45% fine to medium sand and some silt, no odor, no apparent sheen.
			5				Wood	**WOOD DEBRIS with SILT matrix** Dark gray, wood debris typically with ~5-10% silt/fine sand matrix, no sheen above 13 feet, moderate sheen below 13 feet, slight to moderate creosote odor below 13 feet.
			10					~11' Wet.
			15				SP/ SM	**Poorly graded SAND with silt** Brownish black (5YR 2/1), medium to coarse sand, trace to ~15% fines, wet, slight creosote odor, no sheen.
			20					~19' Fibrous organic material.

NOTES

1. Temporary piezometers installed without lithologic samples collected due to drilling technique. Lithology shown on log has been inferrred from the most proximal well (MW-20)
2. Total depths and screen intervals from February 2011 installations

KJ PNW TEMPPIEZOMETERS.GPJ KJ PNW.GDT 2/25/13

F-40.1
(6-87) (3-88) (8-90)