FINAL SUPPLEMENTAL REMEDIAL INVESTIGATION/FEASIBILITY STUDY WORK PLAN
LAUREL STATION
1009 EAST SMITH ROAD
BELLINGHAM, WASHINGTON

For

Kinder Morgan Canada
URS Job No.: 33762344

May 28, 2010

URS

May 28, 2010

Mr. David South
Senior Engineer
Toxics Cleanup Program
Washington Department of Ecology
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3190 160th Avenue SE
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Final Supplemental Remedial
Investigation/Feasibility Study Work Plan
Laurel Station
1009 East Smith Road
Bellingham, Washington
URS Job No.: 33762344

Dear Mr. South:

Presented herein is the Final Supplemental Remedial Investigation/Feasibility Study Work Plan for the above referenced property. This report was prepared by URS Corporation on behalf of Kinder Morgan Canada Inc., operator of the Trans Mountain (Puget Sound) LLC. pipeline system, in accordance with the First Amended Enforcement Order No. DE 91-N192 effective June 15, 1992. Please contact us if you have any questions or require additional information.

Sincerely,
URS Corporation

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LIST OF ACRONYMS AND ABBREVIATIONS

--	not analyzed
ARARs	applicable or relevant and appropriate requirements
ARI	Analytical Resources, Inc.
B.C.	British Columbia
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
CAP	cleanup action plan
cPAHs	carcinogenic polycyclic aromatic hydrocarbons
cy	cubic yards
DMR(s)	Discharge Monitoring Reports
DRO	diesel-range hydrocarbons
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
FS	Feasibility Study
GC	gas chromatography
GRO	gasoline-range hydrocarbons
HA	hand auger
HSP	health and safety plan
HO	heavy oil-range hydrocarbons
J	estimated value
Kinder Morgan	Kinder Morgan Canada Inc.
MCC	motor control center
µg/kg	micrograms per kilogram
mg/kg	milligrams per kilogram
µg/L	micrograms per liter
mg/L	milligrams per liter
msl	mean sea level
MTCA	Model Toxics Control Act
ND	not detected
NPDES	National Pollutant Discharge Elimination System
NWTPH-Dx	Northwest total petroleum hydrocarbons – diesel range
NWTPH-Gx	Northwest total petroleum hydrocarbons – gasoline range
OSHA	Occupational Safety and Health Administration
PAHs	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
PCL(s)	preliminary cleanup level(s)
PCS	petroleum-contaminated soil
PSE	Puget Sound Energy
psi	pound(s) per square inch
Purnell	W.D. Purnell & Associates
PVC	polyvinyl chloride
RI/FS	Remedial Investigation/Feasibility Study
SAP	Sampling and Analysis Plan

SAS	Sound Analytical Services, Inc.
SMS	Sediment Management Standards
SVOCs	semivolatile organic compounds
TEE	terrestrial ecological evaluation
TMOPL	Trans Mountain Oil Pipe Line Corporation
TP	test pit
TPH	total petroleum hydrocarbons
TPH (418.1)	TPH result by analytical method 418.1
TPH-FS	TPH field screening result
TTEC	total toxicity equivalency concentration
URS	URS Corporation
VOCs	volatile organic compounds
WAC	Washington Administrative Code
WISHA	Washington Industrial Safety and Health Act
WTPH-HCID	Washington Hydrocarbon Identification Analytical Method

1.0 INTRODUCTION

Presented herein is the Final Supplemental Remedial Investigation/Feasibility Study (RI/FS) Work Plan for Kinder Morgan Canada Inc., operator of Trans Mountain Pipeline (Puget Sound) LLC's (formerly Trans Mountain Oil Pipe Line Corporation [TMOPL] and Terasen Pipelines) Laurel Station facility located at 1009 East Smith Road in Bellingham, Washington (site). The Final Supplemental RI/FS Work Plan was prepared to meet the requirements of Washington Administrative Code (WAC) 173-340-350 and as required by Item II.A of Exhibit A of the First Amended Enforcement Order (Amended Order) No. DE 91-N192 (effective June 15, 1992), and the Washington Department of Ecology (Ecology) directives outlined during the August 25, 2009 meeting between Ecology, Kinder Morgan Canada Inc. (Kinder Morgan), and URS Corporation (URS). During this meeting, Ecology requested that Kinder Morgan submit a Draft Supplemental RI/FS Work Plan in accordance with the requirements of WAC 173-340-350(7)(c) and (8)(c) and WAC 173-340-840, which was to include the following:

- A Microsoft Access database compiling data collected at the site to date
- Proposed cleanup levels
- Identification of data gaps
- Proposed scope of work and schedule to fill data gaps; and
- Proposed date for submitting a Draft RI/FS Report

The Draft Supplemental RI/FS Work Plan was submitted to Ecology on January 15, 2010 and Ecology's comments were received on February 15, 2010. Kinder Morgan and URS met with Ecology on March 12, 2010 to discuss the comments, which have been incorporated into the Final RI/FS Work Plan. Ecology requested that data collected during the data gap investigation be compiled and presented in a Draft RI/FS Report.

1.1 ENFORCEMENT ORDER

In October 1991, TMOPL received an Enforcement Order (Original Order) No. DE 91-N192 from Ecology concerning assessment and cleanup of a natural gas condensate release at the site on January 15, 1991. Ecology issued an Amended Order to TMOPL effective June 15, 1992 to address two additional releases (crude oil) that occurred at the site on December 11, 1991 and March 7, 1992 and soil contamination unrelated to the three releases that was discovered during facility upgrades following the January 15, 1991 release. URS and Kinder Morgan, with concurrence from Ecology, have determined that the Amended Order supersedes the Original Order.

The Amended Order contains action items and requirements related to environmental data components (e.g., work plans and reports associated with sample collection and management of petroleum-contaminated soil [PCS]) and non-data components (e.g., plans associated with health and safety, spill prevention, dam and surface water maintenance, and oil/water separator maintenance). Numerous documents have been submitted to Ecology and activities conducted by Kinder Morgan since the Original and Amended Orders were issued; however, the Order remains open by Ecology.

URS developed a matrix summarizing the apparent status of the required actions of the Order. To develop this matrix, URS reviewed internal project files, Ecology's documents at the Washington State Archives Office in Olympia, Washington, and documents located at Kinder Morgan's headquarters in Calgary, Alberta. Pertinent documents related to items in the Order were used to develop three separate bibliographies: one for URS internal documents; the second for Ecology-filed documents; and the third for documents reviewed at Kinder Morgan's headquarters. The matrix, supporting bibliographies, and a copy of the Amended Order are included as Appendix A. The matrix includes a list of:

- The action items as specified in the Amended Order;
- References to documents associated with individual items;
- References to Ecology response/comment documents associated with individual items; and
- A status column indicating one of the following:
    1. actions completed and acknowledged by Ecology as completed;
    2. actions completed and not acknowledged by Ecology as completed;
    3. actions completed but information not submitted to Ecology to obtain acknowledgement of completion; and
    4. actions not completed or pending.

Data-related actions not completed or pending are discussed in Section 8. The remaining data collection activities and actions are discussed in Section 6. Non-data components of the Amended Order are discussed in Section 11.

1.2 SITE DESCRIPTION AND BACKGROUND

The site is located at 1009 East Smith Road, approximately 4 miles north of the City of Bellingham, in Whatcom County, Washington (Figure 1). The site is zoned as R5 with a Conditional Use Permit for industrial development and situated in an area of mixed agricultural and residential land use. Green belts and wooded park land are common in the surrounding properties. The site has been previously logged and now consists of access roads, service areas and second growth deciduous and conifer trees.

The developed site covers approximately 15 acres and is bounded by an additional 135 acres of Trans Mountain Pipeline (Puget Sound) LLC-owned undeveloped or agriculture land on three sides. Current facility improvements include 20-inch and 16-inch pipelines, a pump station and associated valve manifolds, an oil drain system, and two 96,000 barrel aboveground (1 barrel equivalent to 42 gallons) break-out tanks. Auxiliary facilities which support the industrial activities include a fire fighting system, electrical building, Tank Motor Control Center (MCC) Building, Puget Sound Energy (PSE) Substation, an emergency generator, transformer, HVAC heat pump, the Trans Mountain administrative office and maintenance facilities. The Laurel Station facility supplies crude oil to refineries in Ferndale and Anacortes, Washington and has been in operation since 1956. Site plans showing historic and current features are included as Figures 2A and 2B, respectively.

1.3 SITE OPERATIONAL HISTORY

Laurel Station was constructed in 1956 and pumping commenced at the site in December 1956. Originally the site was used to transport crude oil via pipeline from Alberta, Canada to Ferndale and Anacortes, Washington. The pipeline divides into Ferndale and Anacortes branches at Laurel Station. In 1972, crude oil delivery from Canada was significantly reduced and the use of the pumping station was virtually discontinued with only one to two deliveries of crude oil per year. In late 1977, deliveries of crude oil and natural gas condensate increased to frequencies of 2 to 3 deliveries per month. In 1982, Mobil began using the storage tanks at the site to store natural gas condensate which was shipped via the pipeline to a refinery located in Ferndale. BP Oil subsequently took over use of these tanks from Mobil.

In the early 1990s, a number of site integrity upgrades were initiated. That initiative in conjunction with a lack of oil deliveries resulted in the pump station being decommissioned in 1991 with all associated valves and piping consolidated and repositioned above ground. In 1991, the waste oil burn pit was removed and a fiberglass oil sump was installed with level switches and automated oil detection systems. Stormwater drains were installed in 1992 and the facility was contoured with swales to contain all stormwater and surface flow to the facility. The oil/water separators were installed with automated sensors as was the siphon system within the relief tank bay. In 1992, the break-out tanks (Tanks No. 170 and 180) were taken out of service and later isolated and decommissioned in 1994. Similarly, the booster pump piping was removed in 1995, the pump having been removed in 1991. A densitometer building and an electrical control building (MCC) was installed that same year. In 2000, the station valve manifold was revised and covered by a building with spill containment.

Oil deliveries remained consistent into the early 2000s with an increase demand by local refineries in the later part of the decade. In conjunction with a system upgrade of the Canadian Trans Mountain pipeline system, which made increased volumes possible at Sumas Station, the Trans Mountain (Puget Sound) pipeline system was also expanded. The 2008 upgrade included replacement of the former pump station, decommissioning of the relief tank (Tank No. 120), installation of the stormwater retention pond, and reactivation of the break-out tanks (Tanks No. 170 and 180) as well as upgraded oil/water separators, coalescing vaults and oil detection systems in the tank bays. Figure 2B depicts site features subsequent to the 2008 upgrade.

1.4 PURPOSE OF DOCUMENT

This Final Supplemental RI/FS Work Plan has been developed to summarize and compile data generated during investigations and cleanup actions previously performed at the site in accordance with the Orders, and to identify data gaps. To meet these objectives, this Final Supplemental RI/FS Work Plan contains:

- The site description and background (Section 1.0).
- A description of the environmental setting (Section 2.0).
- The potential sources of contamination and areas of concern (Sections 3.0 and 4.0, respectively).
- Development of preliminary cleanup standards (Section 5.0).
- A summary of previous investigations and interim cleanup actions implemented at the site (Section 6.0).

- A discussion of the nature and extent of contamination (Section 7.0).
- A discussion of data gaps and the proposed data gap investigation (Sections 8.0 and 9.0, respectively).
- A brief discussion of the FS and Non-Data Enforcement Order Actions (Sections 10.0 and 11.0, respectively).
- A schedule for completing the proposed data gap investigation and submitting the Draft RI/FS Report (Section 12.0).

Analytical results are presented on tables and figures. Sample locations are provided in figures. The data are also available in an ACCESS data base format that can be provided at Ecology's request. The information compiled in this report is primarily from other reports generated during the timeframe since the Order was initiated. Specific sources of information are referenced in the RI/FS Work Plan text and the reference list is provided in Section 13.0. In addition to information from reports, correspondence, field notes, and laboratory reports were reviewed as necessary to confirm that the information provided herein is accurately presented.

2.0 ENVIRONMENTAL SETTING

2.1 PHYSIOGRAPHY

The surface topography in the site vicinity slopes gently to the north-northwest. The region around the site is composed of gently rolling hills with approximately 40 feet of relief. The two aboveground bulk break-out tanks (Tanks No. 170 and 180) at the site are located on a low hill at an elevation of approximately 330 feet above mean sea level (msl) (United States Geological Survey, 1994). From this hill the ground surface slopes to the northwest to East Smith Road with an average gradient of about 9 feet per 100 feet. The main station facilities are located on an asphalt pad at an elevation of approximately 300 feet msl.

2.2 GEOLOGIC SETTING

The site is mantled by unconsolidated glacial deposits which are capped by a glaciomarine drift (Bellingham Drift). The Bellingham Drift consists of unsorted and unstratified pebbly, sandy silts and clays which were deposited by floating ice. Underlying the Bellingham Drift is the Demming Sand, an advance outwash deposit which occurs as discontinuous lenses of coarse sand, gravelly sand and layers and lenses of gravels and silty clays. The Demming Sand is underlain by the Kulshan Drift, which consists of an unsorted and unstratified mixture of silt, clay, sand and pebbles. The Vashon Till, consisting of a compact mixture of pebbles in a matrix of silt, clay and sand, underlies the Kulshan Drift. The Esperance Sand (part of the Vashon Drift) underlies the Vashon Till and overlies bedrock (Chuckanut Formation). The top of the Chuckanut Formation lies at a depth of approximately 350 feet below ground surface (bgs). The Esperance Sand consists of crossbedded outwash deposits of sand and gravel (Dames & Moore, 1992a).

Excavations, test pits and exploratory borings completed at the Laurel Station facility indicate that the site is covered by a nearly continuous layer of relatively low permeability silty, sandy, gravelly clay or till, which corresponds to the Bellingham Drift. This layer dips towards the west, following the natural slope of the site, and thickens at the base of the slope near the station.

In the area of the former oily water sump, the silty clay layer is not currently present and was apparently removed during grading for initial construction of the station. Beneath this silty clay layer are undifferentiated glacial deposits consisting of silty sandy gravels and gravelly sandy silts ranging from 100 to 150 feet in thickness. This unit appears to have been deposited as discontinuous lenses with significant heterogeneity and varying permeability (Dames & Moore, 1992b).

In general, the shallow soils are characteristic of the Bellingham Drift. It is difficult to correlate the underlying glacial deposits from borings and soil samples in the site area with the units described by Easterbrook (1976). Thus, these units have simply been designated as the undifferentiated glacial sediments. The Bellingham Drift is described in the field to consist generally of grey or brown silty sand over consolidated silty clays with small amounts of scattered rounded gravel. These soils are very dense and have low to very low permeability. Underlying the drift soils, at a depth of approximately 50 feet bgs, is a moderately heterogeneous grey to tan silty gravelly sand with higher permeability than the Bellingham Drift material. In borings that encountered this unit, horizontal lenses with lesser silt and/or greater gravel content with greater relative hydraulic conductivity than the surrounding material were noted (Dames & Moore, 1992a).

2.3 HYDROGEOLOGICAL SETTING

During previous subsurface investigations at the site, groundwater was encountered at depths ranging from approximately 150 to 215 feet bgs (deep aquifer). Isolated occurrences of perched shallow groundwater have been encountered during previous investigations at the site at depths ranging from 15 to 45 feet bgs (shallow aquifer). North-south and east-west geologic cross sections of the site are shown on Figures 3 and 4, respectively. Boring logs from prior site investigations are included as Appendix B. Interpretation of the subsurface conditions at the site has been revised subsequent to URS' review of the boring logs and current geologic literature.

The groundwater monitoring well network at the site consist of five shallow wells (SW-1 through SW-5) and previously included five deep wells (DW–1 through DW–5). Monitoring wells DW–1 through DW–5 were decommissioned in May 2008 in compliance with WAC 173–160–151 and WAC 173–160–381. Well construction logs and decommissioning records are provided in Appendix C. Groundwater flow is northwesterly in the shallow aquifer and westerly in the deep aquifer (Dames & Moore, 1992a and URS Corporation, 2008b). Representative groundwater elevation contour maps for the shallow and deep aquifers are presented as Figures 5 and 6, respectively. Groundwater measurements from monitoring well SW–1 were not used to contour groundwater elevations as this well is screened across the silty clay/clayey silt unit noted at approximately 10 feet bgs throughout most of the site. Groundwater within SW–1 is perched on the silty clay/clayey silt unit and is not considered to be laterally connected to groundwater encountered in the other shallow monitoring wells. Groundwater elevation measurements for the monitoring well network are presented in Table 1.

2.4 SURFACE WATER HYDROLOGY

No permanent streams are located on the facility. Located north of the site, across East Smith Road, is an intermittent tributary to Deer Creek. This tributary is fed by surface water runoff

which is contained in two drainage ditches running parallel with East Smith Road along the northern boundary of the facility (Figures 2A and 2B). The tributary runs primarily in a north-northwesterly direction where it terminates at the confluence with Deer Creek, approximately 1,300 feet from its beginning (Figures 2A and 2B). Wetland areas exist along the northwestern property boundary and in the southern portion of the site.

Surface water drainage on the facility property is divided into three sub-basins, which drain to three outfalls from the facility. The first drainage sub-basin includes stormwater from the northwest portion of the facility, including the major operating facilities (maintenance, office, and Cold Storage Buildings, Manifold Area, Pump Building and PSE Substation), and is directed to the stormwater detention pond located in the northwest corner of the facility. The Manifold Area is covered and has a trench drain equipped with an electronic oil-water detector that is linked to an automated gate valve on the discharge drain piping, as well as a high level alarm. The PSE Substation is equipped with four trench drains, two manholes and one catch basin that all drain to the underground stormwater drain pipe. A second transformer, located outside the PSE Substation, is equipped with containment curbing, a normally-closed drain valve and a gravel base. Stormwater enters catch basins, manholes, trench drains or a collection ditch that flows to an oil detection chamber and oil/water separator near the property's northwest corner. The oil detection chamber has a hydrocarbon detector that alarms locally and in the Control Centre in Edmonton, Alberta.

The stormwater detention pond is approximately three feet deep including freeboard above the 100-year event, a bottom area of 1,050 square feet and side slopes with a ratio of 4:1. The discharge structure is a riser with lower orifice and upper notched weir, a normally-open valve, and an emergency overflow. The detention pond discharges to the roadside ditch along East Smith Road, which ultimately drains to a tributary of Deer Creek, a tributary of the Nooksack River.

The second drainage sub-basin contains the two break-out tanks (Tanks No. 170 and 180). Catch basins within each tank bay include oil detection and excess flow instrumentation. The catch basins are piped to oil/water coalescing separators and detention boxes outside the tank bays. Drain valves from the diked area are normally open and will automatically close if oil is detected or if excess flow is detected. Stormwater collected within each of the containment dikes surrounding Tanks No. 170 and 180 discharges through an alarmed oil/water coalescing separator and detention box before discharging to an open ditch leading to the roadside ditch along East Smith Road, which comingles with discharge from the retention pond and eventually discharges to Deer Creek. Discharges from both the first and second drainage sub-basin do not flow directly to the impaired segments of Deer Creek, currently identified on the 303(d) list (Ecology, 2008).

The third drainage sub-basin contains the decommissioned relief tank (Tank No. 120). The tank containment area is discharged through an undefined channel through a heavily vegetated area on the facility's west side that drains to the Baker Creek drainage basin. Being decommissioned, the secondary containment valve is normally open. The discharge does not flow directly into impaired segments of Baker Creek, currently identified on the 303(d) list (Ecology, 2008).

3.0 POTENTIAL SOURCES OF CONTAMINATION

The principal contaminants at the site are Canadian crude oil and natural gas condensate. These petroleum products have been the primary materials conveyed through the pipeline and stored in tanks at the site. Gasoline or other refined petroleum products have not reportedly been conveyed through the pipeline or stored at the site. Other potential contaminants are polychlorinated biphenyls (PCBs) that may have been present in the onsite transformers and xylene. Xylene was used in the past to clean the seals on the pumps. The used xylene was reportedly disposed of into the former oily water sump. Minor quantities of lubricants, cleaners, and paints have also been used at the facility for general maintenance and cleaning.

Releases which are known or may have occurred at the site include: historic oil spills previously reported to Ecology; the January 15, 1991 natural gas condensate release; petroleum contaminated soil (PCS) encountered during the October 1991 facility upgrade; the December 11, 1991 crude oil release; the March 7, 1992 crude oil release; and the October 26, 2000 crude oil release. These areas are depicted on Figure 7. Other potential sources of chemical or petroleum releases include the former electrical substation, the former oily water sump and associated piping, the former drain tile, the former waste pit, the former burn pit, the former oil/water separator, the break-out tanks (Tanks No. 170 and 180), relief tank (Tank No. 120), areas where PCS have been stockpiled in the past, and the oil pipeline and associated underground and aboveground equipment. The known spills and releases are discussed in more detail in Sections 3.1 through 3.6 below. No releases have been reported at the facility since the October 26, 2000 spill incident.

3.1 HISTORIC SPILLS AND RELEASES

According to former TMOPL personnel, historical releases occurred at the site in 1971 and 1979. The 1971 spill occurred in July when approximately 6,300 barrels of crude oil leaked from a flange on the main line pump at the facility. The crude oil leaked into a ditch leading to the property north of East Smith Road. Approximately 3,500 barrels were recovered with the balance either evaporating or infiltrating into surficial soils in the spill area. Soils that were affected by this spill were excavated and placed in the Boneyard, and were landfarmed by tilling with agricultural equipment (Dames & Moore, 1992a).

The 1979 spill occurred in February when a tank roof drain line froze and ruptured resulting in a condensate release in the containment area of Tank No. 170. This release of approximately 1,149 barrels formed a pool of natural gas condensate approximately 2 feet deep inside the bermed containment area surrounding the tank. The condensate was pumped back into the tank and no further remedial actions were reportedly implemented. Frozen soils and surface water in the spill area were noted to have likely slowed the potential migration of condensate to the subsurface (Dames & Moore, 1992a).

Other areas of potential contamination noted by former TMOPL personnel included the containment area around Tank No. 120 and an area adjacent to the containment berm. PCS encountered during the 1983 refurbishment of the former burn pit, small quantities of soils from miscellaneous small spills and leaks, and PCS from a historic East Smith Road spill were

reportedly placed in the containment area around Tank No. 120 or in an area to the south of the tank (Dames & Moore, 1992a).

3.2 JANUARY 15, 1991

The January 15, 1991 spill occurred when approximately 75 barrels of natural gas condensate leaked from the drain tile that was connected to the 16-inch Ferndale pipeline (Figures 2A and 2B). The leak surfaced down slope and flowed overland into the field of the western adjacent property. Natural gas condensate was also found leaching from the northern boundary of the field into a drainage ditch located on the south side of East Smith Road. From this area, stormwater flowed north through a culvert under East Smith Road, then east and north into a tributary of Deer Creek (Figures 2A and 2B). To control further migration of condensate, interceptor trenches were constructed on the western adjacent property (see Figure 2A), and control dams (siphon dams) were constructed in the north ditch along East Smith Road, at the outlet of a small slough draining into the tributary of Deer Creek (Dam 2), and in Deer Creek at Hannegan Road (Dam 3) (TMOPL Corporation, 1991).

3.3 STATION AREA UPGRADES

Subsequent to the January 15, 1991 spill, TMOPL elected to upgrade the facility and removed unnecessary fittings and piping. The upgrade was undertaken in order to minimize the potential for future leaks at the station. The station upgrade work began on October 15, 1991. During excavation activities on October 25, 1991, it was apparent that subsurface leakage of crude oil and/or natural gas condensate had occurred from either pumps, drain lines, or the oily water sump.

When the oily water sump was exposed, the pipe connections to the sump were observed to be broken, which allowed oily water to escape from the sump into the adjacent soils. The pathways for subsurface migration of oily water appeared to have been trenches excavated in the pump station area for pipelines, drain lines, and conduit runs. The trenches were noted to have been backfilled with disturbed native soil, which had a higher permeability than the adjacent undisturbed native soil, therefore creating preferential pathways. During excavation of the drain line running from the oily water sump to the former burn pit, oily water was noted in the backfill materials of the trench. Additional areas of contamination noted during the station upgrade included a former waste pit, a drain tile, and a former oil/water separator that was connected to the former burn pit. The oily water sump and drain tile were removed as part of the 1991/1992 station upgrade activities.

A former PSE electrical substation was located in the northwest portion of the site. The substation provided power for cathodic protection of the pipeline and operation of station equipment. Cooling oils have not been used in pumps at the site as pump bearings are lubricated by the petroleum product passing through the pipeline. Therefore, PCBs were not considered to be a potential contaminant at the site with the possible exception of the former electrical substation. No releases at the substation have been reported.

3.4 DECEMBER 11, 1991

The December 11, 1991 crude oil spill occurred south of the Cold Storage Building during excavation activities associated with the station upgrade that began in October 1991. The spill was caused by the fracture of a non-standard unprotected vent fitting. The fracture occurred during excavation activities above the 16-inch lateral (Ferndale pipeline) just off the mainline. Crude oil escaped under a pipeline pressure of approximately 200 pounds per square inch (psi), which caused crude oil to jet vertically into the air. Approximately 30 minutes elapsed before the leak could be stopped and an estimated 84 barrels of crude oil was released (Dames & Moore, 1992a).

At the time of the release there was a slight breeze from the southwest towards the northeast. Consequently, a fine mist of crude oil was blown to the northeast. The bulk of the spilled oil was discharged to the ground in the station area. The grass and tree covered area between the leak and East Smith Road had a thin coating of oil. Discrete droplets of oil were observed on the surface of East Smith Road, and a slight sheen was observed on surface water that had accumulated on the northern adjacent property (across East Smith Road) as a result of airborne hydrocarbons. After the leak was stopped, an estimated 51 barrels of crude oil within the excavation adjacent to the pipeline and accumulating on the surrounding ground surface was recovered (Dames & Moore, 1992a).

3.5 MARCH 7, 1992

During a delivery of crude oil to Anacortes on March 7, 1992, a pressure relief valve malfunction resulted in a partial diversion of oil from the pipeline to the 3,000 barrel relief tank (Tank No. 120). The tank eventually overflowed and an estimated 1,250 barrels of crude oil entered the surrounding spill containment dike. The relief tank was equipped with a normally closed drain valve, which led to an oil/water separator. The valve was operated to release stormwater that had accumulated within the dike. Following the March 7 incident, the drain valve was found to be in a partially open position, which resulted in the release of 30 to 50 barrels of crude oil from the dike into an adjacent wooded wetland area. The spilled oil travelled along a narrow depression for approximately 600 feet, where a temporary dam (designated the March 7, 1992 Spill Containment Dam) was constructed to prevent further migration and to facilitate oil recovery (Dames & Moore, 1992a). Cleanup efforts were implemented to recover any pooled oil from the wetland area.

3.6 OCTOBER 26, 2000

On October 26, 2000, an estimated 645 barrels of crude oil leaked from an open 2-inch vent valve on the 16-inch lateral pipeline (Ferndale pipeline). The vent was located approximately 10 feet bgs near the southwest corner of the Cold Storage Building. At the time of the release, the vent was exposed in an excavation that was associated with an upgrade of the station valves. The leak occurred following this upgrade when the pipeline was being refilled after restart of station operations. Prior to restarting station operations and resuming the flow of crude oil, the pipeline had been shut off and purged of petroleum product, and the vent was opened to purge the pipeline of nitrogen. However, the vent was inadvertently left open when the flow of crude oil resumed (URS, 2001).

Upon discovery, the oil had filled up the excavation and pooled around the perimeter of the excavation. The greatest area of pooling was to the south of the excavation, and eventually the oil flowed down slope to the north. A 4-inch diameter polyvinyl chloride (PVC) storm drain pipe was situated along the north sidewall of the excavation at approximately 8 feet bgs. The storm drain pipe had been cut to facilitate earthwork activities associated with the station valve upgrade. This open pipe served as a conduit for crude oil flow that eventually surfaced down slope approximately 140 feet to the northwest. The crude oil continued to flow down slope along the stormwater drainage swale and entered the first of two containment excavations that were dug in response to the release. The containment excavations were both lined with a geomembrane, and the first containment excavation captured all of the overland flow of crude oil. Approximately 628 barrels of crude oil were recovered using vacuum trucks during the spill response action and PCS was removed from the site during subsequent excavation activities (URS, 2001).

4.0 AREAS OF CONCERN

The Amended Order defines the facility or "site" as three areas of concern (Areas 1 through 3) at the site, as well as "all other properties in the vicinity of the pump station property which have been affected or are potentially affected by spills, leaks, or discharges of petroleum products or other hazardous substances from the pump station". Other areas of concern at the site that are not defined in the Amended Order coincide with the other spills discussed in Section 3.0, as well as the areas where PCS was previously stored onsite (former PCS storage cells). The non-Order-defined areas of concern at the site are discussed in seven individual "Study Units" (Study Units 1 through 7). A summary of the areas of concern and the correlation between the individual spills, Study Units, and Order-defined Areas 1 through 3 is provided in Table 2. The areas of concern are shown on Figures 2A and 2B and described in more detail below.

4.1 ORDER-DEFINED AREAS

The Order-defined Areas 1 through 3 (Figures 2A and 2B) correlate directly with the January 15, 1991 spill and include the following: (1) Area 1 – all property located up to 350 feet west of the pump station property line, south of Smith Road, including the portion of the access easement located west of the pump station property line; (2) Area 2 – all property located north of Area 1 including the adjacent eastern access road, north of Smith Road; (3) Area 3 – Deer Creek and its tributaries including all wetlands, ditches, culverts, streams, ponds, creeks, and other surface water bodies and uplands adjacent to Deer Creek and its tributaries from the southern Smith Road culvert, immediately north of Area 1, downstream to Guide Meridian Road.

4.2 STUDY UNIT 1

Study Unit 1 addresses historic spills and releases, portions of the January 15, 1991 spill, contamination encountered during station upgrade projects, the December 11, 1991 spill, and the October 2000 spill. Study Unit 1 generally covers the pump station operations area and includes the former pump station area, former oily water sump, former burn pit, former oil/water separator, former drain line between the oily water sump and the burn pit, former drain tile, former waste pit, 16-inch Ferndale pipeline, 20-inch Main pipeline, and the former PSE electrical substation.

4.3 STUDY UNIT 2

Study Unit 2 addresses the February 1979 spill and covers the area located within the containment berms surrounding the aboveground break-out tanks (Tanks No. 170 and 180).

4.4 STUDY UNIT 3

Study Unit 3 addresses the March 7, 1992 spill and covers the area located within the former relief tank containment dike and the wetland area located southeast of the tank. Study Unit 3 also addresses PCS encountered during the 1983 refurbishment of the former burn pit, small quantities of soils from miscellaneous small spills and leaks, and PCS from a historic East Smith Road spill that were reportedly placed in the enclosure of the relief tank or in an area to the south of the tank enclosure. PCS from small spills and leaks was reportedly stored in the relief tank enclosure (Dames & Moore, 1992a). One of the PCS storage cells (Storage Cell No. 1) was also located within Study Unit 3.

4.5 STUDY UNIT 4

Study Unit 4 (the Boneyard) addresses soils impacted by the July 1971 spill. Soils impacted from this spill were excavated and placed in the Boneyard, where they were landfarmed by tilling with agricultural equipment. This area was also used to store miscellaneous equipment (e.g., pumps) and piping.

4.6 STUDY UNIT 5

Study Unit 5 addresses portions of the July 1971 and December 11, 1991 spills and covers an area directly northeast of the Laurel Station entrance, on the north side of East Smith Road. Study Unit 5 also addresses the area north of the reported historic East Smith Road spill.

4.7 STUDY UNIT 6

Study Unit 6 addresses the December 11, 1991 spill, and the area north of the reported historic East Smith Road spill.

4.8 STUDY UNIT 7

Study Unit 7 addresses the locations of the former onsite PCS storage cells. During previous interim cleanup actions conducted at the site, excavated PCS was placed in lined storage cells prior to offsite disposal. As mentioned in Section 4.4, PCS Storage Cell No. 1 was located within Study Unit 3.

5.0 PRELIMINARY CLEANUP STANDARDS

This section discusses preliminary cleanup standards that could be used to develop and evaluate cleanup alternatives. The preliminary cleanup standards listed in this section are not approved by Ecology as final cleanup standards for the site. Final cleanup standards will be established in the cleanup action plan (CAP). However, Ecology expects that cleanup standards will be *"…initially established during the scoping of the remedial investigation and may be further refined during the remedial investigation and/or feasibility study"* per WAC 173-340-350(9)(a).

WAC 173-340-700(3) defines the term "cleanup standards" as follows:

> *"Cleanup standards shall consist of the following:*
>
> - Cleanup levels for hazardous substances present at the site
> - The location where these cleanup levels must be met (point of compliance)
> - Other regulatory requirements that apply to the site because of the type of action and/or location of the site ('applicable state and federal laws')"

This section does not establish preliminary remediation levels, because no potential cleanup alternatives have been identified that would use remediation levels. However, cleanup alternatives developed as the RI/FS progresses may include remediation levels. If so, preliminary remediation levels will be developed at the time that they are proposed. The Model Toxics Control Act (MTCA) explains the difference between cleanup levels and remediation levels as follows:

> *Remediation levels are not the same as cleanup levels. A cleanup level defines the concentrations of hazardous substances above which a contaminated medium (e.g., soil) must be remediated in some manner (e.g., treatment, containment, and/or institutional controls). A remediation level, on the other hand, defines the concentration (or other method of identification) of a hazardous substance in a particular medium above or below which a particular cleanup action component (e.g., soil treatment or containment) will be used. Remediation levels, by definition, exceed cleanup levels.*

5.1 PRELIMINARY CLEANUP LEVELS

The MTCA process for establishing cleanup levels begins with identifying the nature of the contamination, the potentially contaminated media, the current and potential pathways of exposure, the current and potential receptors, and the current and potential land and resource uses (WAC 173-340-700[5]). These parameters are assessed on a preliminary basis in this section, with the expectation that further data collection will result in refinement of these parameters and adoption of final cleanup levels in the CAP.

Summary-level statistics of the available historical data were used to preliminarily identify the nature of the contamination and the potentially contaminated media at the site (see also Section 3 for a discussion of potential sources of contamination). The results of this summary-level analysis are presented by medium in Subsections 5.1.2 through 5.1.4, while historical data are discussed in more detail in Section 6. Tables 3 through 5 present lists of compounds previously analyzed in soil, groundwater, and surface water samples collected at the site, and summarize number of samples analyzed, number of detections of a chemical constituent, maximum detected result, and the maximum reporting limit of the existing data set for each analyte in each medium. These tabulations are also used in this subsection to assess whether the use of indicator compounds under WAC 173-340-703 is appropriate for the site. Indicator compounds are sometimes used at sites contaminated with a large number of hazardous substances, where it can be appropriate to eliminate from consideration those hazardous substances that contribute a small percentage of the overall threat to human health and the environment.

5.1.1 Land and Resource Uses, Exposure Pathways, and Receptors

As discussed in Section 1, the current land use at the site is industrial, while land use at the surrounding properties is mixed agricultural and residential. Although the land use at the site is expected to remain industrial for the foreseeable future because of the infrastructure investment on the site, future residential land use cannot be ruled out. Groundwater in the vicinity of the site is currently used as a drinking water source, and this use is expected to continue. Surface water bodies at or near the site have been historically impacted, or have the potential to be impacted, by releases at the site. These surface water bodies include on-site wetlands and stormwater drainage ditches that drain to a tributary of Deer Creek. Both surface water and soil/sediment in these freshwater bodies have the potential to be impacted by releases.

Exposure pathways involve four necessary elements. These are: (1) a source and mechanism of chemical release to the environment, (2) an environmental transport medium, (3) a point of potential receptor contact with the medium containing the site-related chemical, and (4) a receptor intake route at the contact point. Whenever one or more of these elements are missing in an exposure pathway, the pathway is incomplete and there is no potential for exposure, and therefore no risk, under current conditions.

5.1.1.1 Human Exposure Pathways and Receptors

The potential human receptors and pathways listed below are retained for consideration in this RI/FS. As more information becomes available regarding exposure pathways relative to contaminant distribution, this list of exposure pathways will be refined.

- Current and future construction and remediation workers, from potential exposure to dust or volatile emissions (inhalation) and direct contact (incidental ingestion and dermal absorption) with affected subsurface soils and sediments during construction or remediation.
- Future remediation workers, from potential exposure via dermal contact or inhalation of volatile compounds in affected groundwater or surface water during remediation
- Current and future industrial workers, and future residents and recreation users, from potential exposure to vapors emitted to the outdoor air from affected subsurface soils, sediments, and surface water during daily activities.
- Current and future industrial workers, residents, and recreational users, from potential exposure to groundwater in the event that affected groundwater is used now or in the future for water supply.
- Current and future industrial workers, residents, and recreational users, from potential inhalation exposures to volatile chemicals in vapors migrating into indoor air.

5.1.1.2 Ecological Exposure Pathways

Pathways to ecological receptors are evaluated under MTCA using the procedures established in WAC 173-340-7490. Because the undeveloped land area in the vicinity of the site exceeds 4 acres, the site is unlikely to qualify for an exemption from the terrestrial ecological evaluation requirements under WAC 173-340-7491. The simplified terrestrial ecological evaluation

procedure of WAC 173-340-7492 is expected to be applicable. As part of this simplified evaluation, the chemical concentration values presented in WAC 173-340-900, Table 749-2 are included in Table 3, for comparison to the summarized soil sample results for the site. This comparison in Table 3 allows an initial contaminant analysis in accordance with WAC 173-340-7492(2)(c). Other elements of the simplified terrestrial ecological evaluation (such as the exposure analysis and the pathway analysis) will be refined as further information is obtained regarding exposure pathways relative to contaminant distribution.

5.1.2 Preliminary Soil Cleanup Levels

As summarized in Table 3, five classes of potential contaminants have been included in analyses of soil samples at the site: petroleum, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), PCBs, and metals. For each analyte under these classes, Table 3 presents summary statistics for historical soil samples representative of soil remaining onsite. That is, samples representative of soil removed during historical interim actions (see Section 6) are not included in the statistical results presented in Table 3. For each analyte, Table 3 shows the number of sample results available, the number of detections at the site, the maximum reporting limit, and the maximum detected concentration. Columns to the right of the statistical summary for each analyte document the relevant potential soil cleanup levels, including MTCA Methods A, B, and C for direct contact, MTCA Method B and Method C soil cleanup levels protective of groundwater, and terrestrial ecological evaluation (TEE) values from MTCA Table 749-2.

Table 3 shows that much of the available historical data for the site consists of field screening data. These data values were generated using a field gas chromatography (GC) instrument calibrated against either a crude oil standard or a natural gas condensate standard. The details of the field analyses and the calibration are limited. These data are used in this RI/FS as screening level data, to help assess where data gaps are present, and what level of additional investigation is warranted for various portions of the site. Review of the field screening data indicates that samples were evaluated against natural gas condensate and/or crude oil pattern profiles. Natural gas condensate is a low density liquid hydrocarbon that may contain light end volatile constituents as well as long chain hydrocarbon groups. The GC instrument was set up for analysis such that all samples and standards were analyzed under the same conditions and therefore the data, regardless of natural gas condensate or crude oil pattern identification, was based on the same carbon range. As the field procedure was not designed to include analysis of light end constituents such as benzene, the field data are collectively compared to diesel/motor oil range screening values. The field screening data values for crude oil are compared against the TEE cleanup level for diesel. These values are selected based on the apparent hydrocarbon ranges represented by the historical field screening analyses. Future analyses indicated in the data gap investigation will consider the overall pattern profile for hydrocarbons in the sample when comparing to PCLs.

The MTCA TEE soil cleanup level is selected as the preliminary cleanup level (PCL) for total petroleum hydrocarbons (TPH) as diesel, while the PCLs for the other petroleum fractions are selected as the MTCA Method A unrestricted soil cleanup levels (WAC 173-340-900, Table 745-1). To date, Kinder Morgan has elected to not perform fractionation analysis of the petroleum compounds found at the site, and therefore has elected not to calculate MTCA Method B or C cleanup levels for TPH. Kinder Morgan may elect future performance of fractionation

analyses and calculation of MTCA Method B or C cleanup levels for TPH during the progress of the RI/FS.

For VOCs in soil, the MTCA Method B soil cleanup levels for direct contact are selected as the PCLs for most compounds, unless the MTCA Method A soil cleanup level is lower (in such cases the Method A value is selected). The available groundwater data for these analytes (Table 4) do not show substantial impacts to groundwater, providing a preliminary empirical demonstration that measured soil concentrations will not cause an exceedance of the applicable groundwater cleanup levels per WAC 173-340-747(3)(f).

For individual SVOCs in soil, the MTCA Method B soil cleanup levels for direct contact are selected as the PCLs. The available groundwater data for these analytes (Table 4) do not show substantial impacts to groundwater, providing a preliminary empirical demonstration that measured soil concentrations will not cause an exceedance of the applicable groundwater cleanup levels per WAC 173-340-747(3)(f). For the seven carcinogenic polycyclic aromatic hydrocarbons (cPAHs), the MTCA Method A soil cleanup level is selected because it is lower than the Method B value. The total concentration of the cPAH compounds (benzo[a]pyrene, indeno[1,2,3-cd]pyrene, dibenzo[a,h]anthracene, chrysene, benzo[k]fluoranthene, benzo[b]fluoranthene, and benzo[a]anthracene) is compared to the cleanup level using the Toxicity Equivalency Factor methodology of WAC 173-340-708(8).

In general, the MTCA Method A soil cleanup level for PCB mixtures is selected as the PCL. PCBs have not been detected in soil at the site, and the historical reporting limits are below the potential cleanup levels in Table 3, except for the MTCA Method B and Method C protection of groundwater cleanup levels for Aroclor 1254.

For arsenic and lead in soil, the MTCA Method A soil cleanup levels are selected as the PCL. For nickel and selenium in soil, the natural background concentrations (Ecology, 1994) are selected as the preliminary soil cleanup levels. The available groundwater data for these metals (Table 4) imply that soil concentrations protective of groundwater are most applicable as cleanup levels, however the protection of groundwater cleanup levels for these metals are substantially below the natural background concentrations. Therefore, use of the natural background concentration is applicable per WAC 173-340-700(6)(d). For antimony, beryllium, copper, silver, thallium, and zinc, MTCA Method B soil cleanup levels for direct contact are selected as the PCLs. The available groundwater data for these metals (Table 4) do not show potential impacts to groundwater, providing a preliminary empirical demonstration that measured soil concentrations will not cause an exceedance of the applicable groundwater cleanup levels per WAC 173-340-747(3)(f). This is also true for cadmium and mercury, however the MTCA Method A soil cleanup values are selected for these two metals because the Method A values are lower than the MTCA Method B values. For chromium in soil, the MTCA Method B soil cleanup values protective of groundwater are selected as the PCLs. The available groundwater data for this metal (Table 4) imply that soil concentrations protective of groundwater are most applicable, and the cleanup level is higher than the natural background concentration (assuming the chromium found on site is all chromium III). Based on product types that were transported through the facility, it is unlikely hexavalent chromium is present.

MTCA Method C soil cleanup levels have not been selected as PCLs for any analytes because future residential land use cannot be ruled out (see also Section 5.1.1).

5.1.3 Preliminary Groundwater Cleanup Levels

Four classes of potential contaminants have been included in analyses of groundwater samples at the site: petroleum, VOCs, SVOCs, and metals. For each analyte under these classes, Table 4 presents summary statistics for historical groundwater samples collected from monitoring wells at the site. For the purposes of evaluating all historical detections in groundwater, Table 4 summarizes all groundwater sample results from 1992 through 2006. For the purpose of characterizing current groundwater conditions, only the most recent data should be considered (see Section 6.3 for a more detailed discussion of groundwater conditions beneath the site). For each analyte, Table 4 shows the number of sample results available, the number of detections at the site, the maximum reporting limit, and the maximum detected concentration. Columns to the right of the statistical summary for each analyte document the relevant potential groundwater cleanup levels, including MTCA Methods A, B, and C groundwater cleanup levels.

The lower of the MTCA Method A or Method B groundwater cleanup value is selected as the PCL for each analyte. MTCA Method C groundwater cleanup levels have not been selected as PCLs for any analytes because future residential land use cannot be ruled out (see Section 5.1.1).

5.1.4 Preliminary Surface Water Cleanup Levels

Three classes of potential contaminants have been included in analyses of surface water samples at the site: petroleum, VOCs (benzene, toluene, ethylbenzene, and xylenes [BTEX]), and PAHs. For each analyte under these classes, Table 5 presents summary statistics for historical surface water samples. For each analyte, Table 5 shows the number of sample results available, the number of detections at the site, the maximum reporting limit, and the maximum detected concentration. Columns to the right of the statistical summary for each analyte document the relevant potential surface water cleanup levels, including MTCA Methods A, B and C surface water cleanup levels, the National Recommended Water Quality Criteria (NTR 40 CFR 131.36, 2006) for protection of human health, Section 304 of the Clean Water Act, and the state surface water quality criteria (both acute and chronic criteria for freshwater) for toxics substances (WAC 173-201A, Table 240[3]) for protection of aquatic organisms.

No surface water cleanup standards have been established for TPH or xylenes. The selected PCL for benzene is 1.2 μg/L, based on the National Recommended Water Quality Criteria. The PCLs for ethylbenzene and toluene are 530 μg/L and 1,300 μg/L respectively, based on Section 304 of the Clean Water Act. For gasoline and diesel range hydrocarbons, the MTCA Method A groundwater cleanup levels are selected as the PCLs.

5.1.5 Preliminary Air Cleanup Levels

For those historical analytes in soil, groundwater, or surface water (Tables 3 through 5) that are considered volatile compounds with the potential to result in air contamination, potential MTCA Method B and C air cleanup levels were calculated and are presented in Table 6. Because of the potential for a future complete pathway from contamination remaining in soil to indoor air in

residences, MTCA Method B cleanup levels are appropriate as preliminary air cleanup levels. No air sampling has been conducted at the site. The preliminary air cleanup levels are used during this RI/FS to evaluate the need for additional assessment of the vapor intrusion pathway. The need to assess air will be based on future soil and groundwater data collected at the site.

5.1.6 Preliminary Sediment Cleanup Levels

None of the historical samples at the site have been considered to be sediment. MTCA reserves regulatory authority to address potential releases to freshwater sediments under WAC 173-340-760, and by reference to freshwater standards under the Washington Sediment Management Standards (SMS) (WAC 173-204-340). However, Ecology has not yet promulgated freshwater sediment cleanup levels. There is an ongoing discussion within the regulatory and scientific community regarding monitoring, sampling and analysis of freshwater sediments, and there are draft proposed revisions to the SMS for freshwater sediments.

For this RI/FS, analytical results of solids samples potentially considered to be freshwater sediment will be compared to either the Freshwater Sediment Quality Values presented in Table 11 of Ecology's *Creation and Analysis of Freshwater Sediment Cleanup Values in Washington State*, dated July 1997, or the preliminary soil cleanup levels selected in Table 3. The rationale for the values selected for each analyte will be based on the characteristics of the samples actually collected and will be documented in the data reports. The need for bioassays will be assessed after evaluation of the chemical data generated during the proposed data gap investigation (see Section 9.3).

5.2 PRELIMINARY POINTS OF COMPLIANCE

The point of compliance element of cleanup standards developed under MTCA identifies where on the site the numeric cleanup level must be met for each environmental medium. In general, the preliminary points of compliance for all media at the site are the standard points of compliance established in WAC 173-340-720 through -750. The data and site conditions do not currently warrant the proposal of alternative points of compliance. However, additional data collection and analysis may result in a conclusion that alternative points of compliance for one or more environmental medium are appropriate. If so, alternative points of compliance will be evaluated when they are proposed.

The standard points of compliance are:

- **Groundwater:** Throughout the site from the uppermost level of the saturated zone (shallow aquifer) extending vertically to the lowest most depth (deep aquifer) which could potentially be affected by the site (WAC 173-340-720[8][b])
- **Surface Water:** The point or points at which hazardous substances are released to surface waters of the state (WAC 173-340-730[6][a])
- **Soil:** For soil cleanup levels based on the protection of groundwater, soils throughout the site (WAC 173-340-740[6][b]). For soil cleanup levels based on protection from vapors, soils throughout the site from the ground surface to the uppermost groundwater saturated zone (WAC 173-340-740[6][c]). For soil cleanup levels based on human exposure via

direct contact or ecological considerations, soil throughout the site from ground surface to 15 feet bgs (WAC 173-340-740[6][d] and WAC 173-340-7490[4][b]).

- **Air:** Ambient air throughout the site (WAC 173-340-750[6])

A standard point of compliance for sediment has not been promulgated. The preliminary point of compliance for sediment at the site is therefore based on the definition of sediment in the SMS, and the standard point of compliance for other site media.

- **Sediment:** Throughout the site, settled particulate matter located in the predominant biologically active aquatic zone, or exposed to the water column

5.3 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

The third component of developing cleanup standards is consideration of "applicable state and federal laws" (WAC 173-340-700[3]). MTCA also requires that cleanup actions comply with legally applicable state and federal laws and regulations, as well as other applicable or relevant and appropriate requirements (ARARs).

"Legally applicable" requirements under MTCA are *"those cleanup standards, standards of control, and other environmental protection requirements, criteria, or limitations adopted under state or federal law that specifically address a hazardous substance, cleanup action, location or other circumstances at the site"* (WAC 173-340-710[3]).

"Relevant and appropriate" requirements are *"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"* (WAC 173-340-710[4]).

As part of developing preliminary cleanup standards, chemical-specific ARARs were considered on a media-specific basis in Subsections 5.1.2 through 5.1.6. When cleanup alternatives are developed as part of the Feasibility Study (FS), ARARs that potentially apply to the cleanup alternatives will be added to this discussion.

6.0 PREVIOUS INVESTIGATIONS AND INTERIM CLEANUP ACTIONS

Numerous investigations and interim cleanup actions have been conducted at the site to address the potential sources of contamination (i.e., spill areas). A summary of previous investigations and interim cleanup actions conducted at the site is provided below in Section 6.1. Surface water and groundwater investigations are discussed in Sections 6.2 and 6.3, respectively. Wetlands studies are discussed in Section 6.4. Analytical results are summarized in Tables 7 through 23. Sample locations are shown on Figures 8 through 31. Laboratory analytical reports for the samples discussed in Section 6 are provided in Appendix D.

6.1 SOIL INVESTIGATIONS

As discussed in Section 5.1.2, much of the available historical data for the site consists of field screening data. Most of these data values were generated using a field GC instrument calibrated

against a crude oil standard, and in some cases, a natural gas condensate standard. To assess whether the historical field screening data indicate potentially contaminated soil remains in portions of the site, the field screening data values for natural gas condensate and crude oil are compared against the TEE cleanup level for diesel. This value is selected based on the hydrocarbon ranges represented by the historical field screening analyses. The value for natural gas condensate is also selected based on the likely absence of benzene considering the age of the releases and the frequency of benzene detections documented in Table 3 (12 of 125 samples).

6.1.1 Historic Spills and Releases

Investigations and interim cleanup actions conducted at the site to address historical spills and releases are discussed below and a summary of analytical data results are presented in Table 7.

6.1.1.1 1971 Spill

Soils impacted north of East Smith Road by the 1971 spill were excavated, placed in the Boneyard, and landfarmed. During the 1992 interim RI (Dames & Moore, 1992b), a series of test pits were completed north of East Smith Road and in the Boneyard (Figures 8 and 9, respectively).

Test pits TP-5-1 through TP-5-6 were completed north of East Smith Road, and soil samples were collected at depths of 1, 5, and 10 feet bgs. Field GC analysis conducted onsite indicated that TPH concentrations in each of the soil samples were below the instrument detection limit of 25 milligrams per kilogram (mg/kg) (Dames & Moore, 1992a). Additional soil samples were collected in this area to address the December 11, 1991 spill and are discussed in Section 6.1.3.10.

Test pits TP-19 through TP-24 were completed in the Boneyard, and soil samples were collected at depths of 1, 5, and 10 feet bgs. Field GC analysis indicated the presence of low levels of TPH, ranging in concentration from 30 to 50 mg/kg, in the 1 foot bgs soil samples collected from test pits TP-20, TP-21, and TP-23. Four confirmation soil samples (TP-20 at 10 feet bgs, TP-21 at 1 foot bgs, TP-22 at 5 feet bgs, and TP-24 at 1 foot bgs) were submitted to Analytical Resources, Inc. (ARI) for TPH analysis. TPH was detected in the 1 foot bgs sample collected from TP-21 at a concentration of 16 mg/kg, and was not detected above the reporting limit in the remaining three confirmation samples (Dames & Moore, 1992a).

Based on this data, the subsurface investigations and interim cleanup actions conducted subsequent to the 1971 spill, including excavation of PCS north of East Smith Road, and placement and landfarming in the Boneyard, appear to have adequately characterized the vertical and lateral extent of contamination and effectively remediated soils impacted by the 1971 spill to below the applicable PCLs.

6.1.1.2 1979 Spill

Natural gas condensate released during the 1979 spill pooled within the bermed containment area surrounding Tank No. 170. The condensate was pumped back into the tank and no further remedial actions were reportedly implemented. Frozen soils and surface water in the spill area were noted to have likely minimized any migration of condensate into the subsurface. During

the 1992 interim RI (Dames & Moore, 1992b), three soil borings (TM-B7, TM-B8, and TM-B13) were drilled using hollow stem auger methods within the bermed containment of Tanks No. 170 and 180 (Figure 10). Soil borings TM-B7 and TM-B8 were drilled adjacent to the southwest and northeast of Tank No. 170 to depths of 18 and 34 feet bgs, respectively. Soil samples were collected from 3 and 8 feet bgs in boring TM-B7, and from 4, 9, and 34 feet bgs in boring TM-B8. Field GC analysis indicated that TPH levels were below the 25 mg/kg detection limit in each of the samples with the exception of the 9-foot bgs sample collected from boring TM-B8, where TPH was detected at a concentration of 140 mg/kg, which is below the PCL for diesel of 460 mg/kg.

Soil boring TM-B13 was drilled adjacent to the north of Tank No. 180 to a depth of 26 feet bgs, and soil samples were collected from 9 and 24 feet bgs. Field GC analysis of these two samples indicated that TPH concentrations were below the 25 mg/kg detection limit. The 24-foot bgs sample was submitted to ARI for TPH analysis, and TPH (diesel range hydrocarbons) was not detected above the reporting limit of 10 mg/kg, which corresponded to the field GC analysis (Dames & Moore, 1992a).

Additional soil sampling was conducted within the containment area of Tanks No. 170 and 180 in March 2008, prior to reactivation of the tanks after a several year period of being out of service. Soil samples were collected from two hand auger borings (08-B2 and 08-B3) located near the northeast and southeast portions of Tank No. 170 at depths of 1, 3, and 4.5 feet bgs, and from two locations beneath Tank No. 170 (sample identifications Tank 170-1 and Tank 170-2) at depths ranging from the surface to 3.5 feet bgs. These borings were accessed by cutting holes in the bottom of the steel tanks at locations which had evidence of corrosion. Soil samples were also collected from three hand auger borings (08-B4 through 08-B6) located to the west, east, and south of Tank No. 180 at depths ranging from 1 to 4.5 feet bgs, and from three locations beneath Tank No. 180 (sample identifications Tank 180-1 through Tank 180-3) at depths ranging from the surface to 4 feet bgs. Each of the soil samples were analyzed for gasoline-range hydrocarbons by Ecology Method NWTPH-Gx, diesel- and motor oil-range hydrocarbons by method NWTPH-Dx, and BTEX by EPA Method 8021B. Gasoline-, diesel-, and motor oil-range hydrocarbons were detected at maximum concentrations of 350 mg/kg, 3,100 mg/kg, and 3,500 mg/kg, respectively, in the 3-foot bgs sample collected at Tank 180-1, which exceeded their respective PCLs. These constituents were not detected above their respective PCLs in the soil samples collected from the other locations. Benzene was detected at a concentration of 33 micrograms per kilogram (μg/kg) in the 4.5-foot bgs sample collected from 08-B3, which slightly exceeded the PCL of 30 μg/kg. BTEX were not detected above their respective PCLs in the remaining soil samples (URS, 2008a).

During a geotechnical evaluation conducted by URS in 2007, no field evidence of petroleum contamination was noted in geotechnical borings (U-3 and U-4) drilled to depths of 23 and 24 feet bgs on the containment dike to the west of Tanks No. 170 and 180, respectively.

6.1.1.3 Relief Tank Area

The containment area around the relief tank and an area adjacent to the south of the containment berm were used to store PCS encountered during the 1983 refurbishment of the former burn pit, small quantities of soils from miscellaneous small spills and leaks, and PCS from a historic East

Smith Road spill (Dames & Moore, 1992a). During the 1992 interim RI (Dames & Moore, 1992b), surface soil samples were collected from three hand auger borings (HA-3-1 through HA-3-3) within the relief tank containment berm area. Subsurface samples were collected from a hand auger boring southeast of the tank within the containment area (HA-3-4). Subsurface soil samples were also collected from an additional hand auger boring (HA-3-5) and three test pits (TP-3-1 through TP-3-3) in the area adjacent to the south of the containment area (Figure 11).

Field GC analysis of the surface samples collected from within the containment berm area indicated that TPH levels were below the 25 mg/kg detection limit in each of the soil samples with the exception of the sample collected from HA-3-2, where TPH was detected at a concentration of 200 mg/kg. The HA-3-3 sample was submitted to ARI for TPH analysis, and TPH was not detected above the reporting limit of 10 mg/kg (Dames & Moore, 1992a).

Soil samples were collected from hand auger borings HA-3-4 and HA-3-5 at depths of 0.5, 5, and 8 feet bgs. Field GC analysis of these samples indicated that TPH levels were below the 25 mg/kg detection limit. Soil samples were collected from test pits TP-3-1 through TP-3-3 at depths of 0.5, 5, and 10 feet bgs. Field GC analysis of these samples indicated that TPH levels were below the 25 mg/kg detection limit with the exception of the 0.5-foot bgs sample collected from TP-3-1 and the 5-foot bgs sample collected from TP-3-2, where TPH was detected at concentrations of 80 mg/kg and 4,000 mg/kg, respectively (Dames & Moore, 1992a). The TPH concentration detected in the 5-foot bgs sample collected from TP-3-2 exceeded the PCL of 460 mg/kg; however, TPH was not detected above the 25 mg/kg detection limit in the 10-foot bgs sample collected from TP-3-2.

Additional soil samples were collected from these two areas and excavation of PCS was conducted within the containment berm subsequent to the March 7, 1992 spill, which are discussed in Section 6.1.4.

6.1.2 January 15, 1991 Spill

The January 15, 1991 spill was originally investigated by W.D. Purnell & Associates (Purnell). Purnell's investigation (W.D. Purnell and Associates, Inc., 1991a) focused on the 16-inch Ferndale pipeline and the Order-defined Areas 1 through 3, which are discussed individually below. A summary of soil analytical data generated during the Purnell investigation is presented in Table 8.

6.1.2.1 16-Inch Ferndale Pipeline

Purnell completed three hand auger borings (TH-1, TH-3, and TH-4) to a depth of approximately 5 feet bgs adjacent to the north of the 16-inch Ferndale pipeline (Figure 12). Soil samples collected from TH-1, TH-3, and TH-4 at approximately 5 feet bgs were submitted to Sound Analytical Services, Inc. (SAS) of Tacoma, Washington for TPH analysis by EPA SW-846 modified Method 8015 (Method 8015). Diesel-range hydrocarbons were detected in TH-3 and TH-4 at concentrations of 72 mg/kg and 12 mg/kg, respectively. TPH was not detected above the laboratory reporting limit of 10 mg/kg in the soil sample collected from TH-1 (W.D. Purnell and Associates, Inc., 1991a).

6.1.2.2 Area 1

Assessment of the lateral extent of contamination in Area 1 included the collection of 39 soil samples (sample numbers 1 through 31, 36 through 39, and 47 through 50) collected at depths ranging from 0 to 36 inches bgs (Figure 13). The samples were analyzed for TPH by EPA Method 8015. TPH was not detected above the laboratory reporting limit of 10 mg/kg in 19 of the samples. Diesel-range hydrocarbons were detected in the remaining soil samples at concentrations ranging from 45 mg/kg (sample number 36) to 15,411 mg/kg (sample number 13) (W.D. Purnell and Associates, Inc., 1991b). TPH was detected above the PCL of 460 mg/kg in 15 of the soil samples.

Fifteen of the 39 soil samples were submitted to the laboratory for analysis of BTEX by EPA SW-846 Method 8020. BTEX were detected at maximum concentrations of 6,830 μg/kg (benzene), 57,300 μg/kg (toluene), and 8,640 μg/kg (ethylbenzene), in sample number 1 which was collected at a depth of 0 to 10 inches bgs. Xylenes were detected at the highest concentration of 109,000 μg/kg in sample 13 which was collected at a depth of 10 to 14 inches bgs. BTEX were detected above their respective PCLs of 30 μg/kg, 7,000 μg/kg, 6,000 μg/kg, and 9,000 μg/kg in sample numbers 1 and 13. Benzene and xylenes were also detected above the PCL in sample numbers 2, 10, 16, and 21. The reporting limit for benzene (50 μg/kg) was above the PCL of 30 μg/kg in samples reported as not detected for benzene. Toluene was also detected above the PCL in sample numbers 10 and 21.

Soil sample number 47 was submitted to the laboratory for analysis of PAHs by EPA SW-846 Method 8270. Naphthalene, fluorene, and phenanthrene were detected at concentrations of 810 μg/kg, 400 μg/kg, and 250 μg/kg, respectively. The concentrations of naphthalene and fluorene were below their respective PCLs of 1,600 μg/kg and 3,200 μg/kg. A PCL was not established for phenanthrene.

The lateral extent of soil contamination resulting from the January 15, 1991 spill appears to have been adequately characterized in Area 1, with the exception of the northern extent, which migrated through a stormwater culvert into Area 2 north of East Smith Road (see Section 6.1.2.3).

To further assess the vertical extent of contamination in portions of the spill area, 13 soil samples were collected from 3 Shelby Tube samplers (SH-1 through SH-3) advanced within Area 1 (Figure 13). Three soil samples were collected from SH-1 (4 to 6, 16 to 18, and 28 to 30 inches bgs) and five soil samples were collected from both SH-2 and SH-3 (4 to 6, 10 to 12, 16 to 18, 22 to 24, and 28 to 30 inches bgs). TPH was not detected above the laboratory reporting limit of 10 mg/kg in 9 of the samples, including all five samples collected from SH-3. Diesel-range hydrocarbons were detected in the 4 to 6 inch bgs (843 mg/kg) sample collected from SH-1, which exceeds the PCL, but were not detected above laboratory reporting limits in the deeper samples collected from 16 to 18 and 28 to 30 inches bgs. Diesel-range hydrocarbons were also detected in the 4 to 6 (2,053 mg/kg), 10 to 12 (4,907 mg/kg), and 16 to 18 inch bgs (1,667 mg/kg) samples collected from SH-2, which exceed the PCL, but were not detected above laboratory reporting limits in the deeper samples collected from 22 to 24 and 28 to 30 inches bgs.

Four of the samples collected with detectable concentrations of TPH were also analyzed for PAHs. Naphthalene, fluorene, and phenanthrene were detected in each of the samples at

concentrations ranging from 500 µg/kg (SH2 at 4 to 6 inches bgs) to 5,500 µg/kg (SH-1 at 4 to 6 inches bgs), 500 µg/kg (SH-2 at 4 to 6 inches bgs) to 1,200 µg/kg (SH-1 at 4 to 6 inches bgs), and 400 µg/kg (SH-2 at 4 to 6 inches bgs) to 800 µg/kg (SH-1 at 4 to 6 inches bgs), respectively. Benzo(b)fluoranthene was detected at a concentration of 100 µg/kg in the 4 to 6 inch bgs sample collected from SH-1. The concentrations of the detected PAHs in these four samples were below their respective PCLs, if established, with the exception of the naphthalene concentrations detected in the 4 to 6 inch bgs sample collected from SH-1 and the 10 to 12 inch bgs and 16 to 18 inch bgs samples collected from SH-2.

Although the 4 to 6 inch bgs sample collected from SH-1 and the 4 to 6, 10 to 12, and 16 to 18 inch bgs samples collected from SH-2 exceeded the PCL for TPH, the vertical extent of soil contamination at these locations was defined. However, the vertical extent of naphthalene impacts exceeding the PCL at SH-1 and SH–2 was not defined.

Three monitoring wells (MW-1 through MW-3) were installed in Area 1 that were screened from approximately 2.5 to 3 feet bgs and were sampled on at least three occasions between March and June, 1991. The wells were installed within a designated wetland area and groundwater levels in these wells ranged from 2.5 to 12.5 inches bgs. Based on the depth to water in these wells, water samples collected from these wells are considered to be representative of surface water and are discussed in more detail in Section 6.2.2.

Approximately 2,250 cubic yards (cy) of PCS was estimated in Area 1 as a result of the January 15, 1991 spill incident. Insitu treatment was recommended as the preferred remedial alternative. No documentation was found that indicated impacted soils exceeding PCLs within Area 1 were remediated.

6.1.2.3 Area 2

To assess the lateral extent of contamination in Area 2, 10 soil samples (sample numbers 32 through 35, 40, 41, and 51 through 54) were collected (Figure 14) at depths ranging from 0 to 18 inches bgs. Each of the samples was analyzed for TPH by Method 8015. TPH was not detected above the laboratory reporting limit of 10 mg/kg in 5 of the samples. Diesel-range hydrocarbons were detected in the remaining soil samples at concentrations ranging from 18 mg/kg (sample number 35) to 439 mg/kg (sample number 41). TPH was not detected above the PCL in the remaining soil samples (W.D. Purnell and Associates, Inc., 1991b).

The vertical extent of contamination in Area 2 was determined in the field to be limited to the ground surface and/or surface water, and within the upper 3 inches of soil. The vertical extent of contamination was confirmed by advancing a Shelby Tube (SH–4) at the approximate location of sample number 41. Three soil samples were collected from SH–4 at depths of 4 to 6, 18 to 20, and 28 to 30 inches bgs, and were submitted to the laboratory for TPH analysis. TPH was not detected above the laboratory reporting limit of 10 mg/kg in any of the samples. Approximately 300 cy of PCS were estimated within Area 2 as a result of the January 15, 1991 spill incident. Insitu treatment was recommended as the preferred remedial alternative (W.D. Purnell and Associates, Inc., 1991b). However, it does not appear that impacted soils within Area 2 were remediated.

6.1.2.4 Area 3

Purnell's assessment of Area 3 was limited to a surface water monitoring program at Dams 2 and 3. Surface water investigations are discussed in Section 6.2.

Fisheries Assessment

To assess the effects of the January 15, 1991 spill incident, 9 stations located between the spill origin and the mouth of Deer Creek were sampled on March 26, 1991 (Seymour & Associates, 1991). Approximately 150 to 300 feet of the creek was electrofished at each station. Juvenile fish were stunned, netted, identified as to species and age class, and returned to the creek. Stations included spawning areas, pool and riffle sections, forested and residential areas, agricultural sections, and an area within the spill cleanup zone. The purpose of the sampling was to evaluate the diversity of juvenile fish in the creek and to detect any abnormal situation that may have been the result of the spill. No attempt was made to enumerate total population size during this investigation. Based on the results of the assessment, Seymour & Associates concluded that the January 15, 1991 spill incident did not have a measurable impact upon the fish resources of Deer Creek, below Hannegan Road (Dames & Moore, 1992a).

6.1.3 Station Area and December 11, 1991 Spill

To address contamination identified during the station upgrading activities implemented subsequent to the January 15, 1991 spill, and contamination resulting from the December 11, 1991 spill, the following sub-areas were investigated and are discussed below: the former pump station area, former oily water sump, former burn pit, former oil/water separator, former drain line between the oily water sump and the burn pit, former drain tile, former waste pit, 16-inch Ferndale pipeline, 20-inch Main pipeline, and the former PSE electrical substation (Figure 2A).

Due to the close proximity of many of the sub-areas to one another, distinguishing the exact source or contribution of contamination identified in the soil at each sub-area was difficult or impossible to determine. The majority of the sub-areas discussed below (designated "former") were removed during the upgrading activities conducted at the site between 1991 and 1992. The field investigation conducted during Dames & Moore's 1992 interim RI initially focused on the areas around the former drain line between the former oily water separator and former burn pit. The area of soil investigation was subsequently extended out from the boundaries of these initial areas to assess the lateral extent of hydrocarbon occurrence. Where hydrocarbon impacts extended beyond the depth capabilities of the backhoe utilized to perform test pits, soil borings were drilled to complete the assessment in these areas.

6.1.3.1 Former Pump Station Area

During station upgrading activities in December 1991, three pumps were removed from the pump station area, and soil samples were collected at two-foot intervals beneath the pumps from test pits (PB-1, PB-2, and PB-4) completed to depths ranging from 12 to 17 feet bgs (Figure 15). Field GC analysis indicated that TPH levels were below the 25 mg/kg detection limit in each of the samples with the exception of the 6 and 10-foot bgs samples collected from test pit PB-4, and the 12-foot bgs sample collected from test pit PB-2, where TPH was detected at concentrations of 1,900 mg/kg, 64 mg/kg, and 5,300 mg/kg, respectively. The vertical extent of TPH

contamination was defined in test pit PB-4 as TPH was below the 25 mg/kg detection limit in the 12-foot bgs sample (Dames & Moore, 1992a and 1992b); however, the vertical extent of TPH contamination was not defined at test pit PB-2.

Three additional test pits (TP-1, TP-2, and TP-18) were completed in the station area in November and December 1991, and soil samples were collected at 4 feet bgs (Figure 15). Field GC analysis indicated that TPH levels were below the 25 mg/kg detection limit in each of the samples (Dames & Moore, 1992a and 1992b).

Soil borings TM-B10, TM-B14, and TM-B15 were drilled in the pump station area in February 1992 to depths of 40, 55, and 30 feet bgs, respectively (Figure 15). Groundwater was encountered at approximately 25 feet bgs in boring TM-B15, but was not encountered in TM-B10 or TM-B14. Field screening of soil samples collected from 15 and 40 feet bgs in boring TM-B10 did not identify TPH above the 25 mg/kg detection limit. The field screening result at 25 feet bgs was approximately 28 mg/kg, which is below the PCL. The 15-foot bgs soil sample collected from TM-B10 was submitted to ARI for WTPH-HCID analysis, and TPH was not detected above the reporting limit of 10 mg/kg. Field screening of soil samples collected from 13 and 54 feet bgs in boring TM-B14 identified TPH at concentrations of 430 mg/kg and less than the 25 mg/kg detection limit, respectively. A soil sample collected from 34 feet bgs in TM-B14 was submitted to ARI for TPH analysis, and diesel-range hydrocarbons were detected at a concentration of 20 mg/kg. Field screening of a soil sample collected from 29 feet bgs in boring TM-B15 identified TPH at a concentration of 1,600 mg/kg. However, a sample collected from 30 feet bgs in TM-B15 was submitted to ARI for TPH analysis, and diesel-range hydrocarbons were detected at 50 mg/kg (Dames & Moore, 1992a and 1992b), which is below the PCL. A summary of the analytical results for samples collected in the former pump station area are presented in Table 9.

6.1.3.2 Former Oily Water Sump

To assess potential hydrocarbon contamination in the area of the former oily water sump, soil borings TM-B4 and TM-B16 were drilled to depths of 28 and 40 feet bgs, respectively, and were completed as shallow monitoring wells SW-4 and SW-5 (Figure 16). Monitoring wells SW-4 and SW-5 were screened from 18 to 28 feet bgs and 34 to 39 feet bgs, respectively. Groundwater analytical results for monitoring wells SW-4 and SW-5 are discussed in Section 6.3.1.

Soil field screening results from samples collected at 18 and 23 feet bgs in boring TM-B4 identified TPH at concentrations of 400 mg/kg and 1,300 mg/kg, respectively. However, TPH was not detected above the 25 mg/kg detection limit in the 28-foot bgs sample collected from TM-B4. The sample collected from TM-B4 at 18 feet bgs was submitted to ARI for BTEX, WTPH-HCID, TPH-418.1, SVOCs, and priority pollutant metals analyses. BTEX were either not detected above the laboratory reporting limit or not detected above their respective PCLs. The reporting limit for benzene exceeded the PCL of 30 μg/kg. Diesel-range hydrocarbons and TPH by Method 418.1 were detected at concentrations of 320 mg/kg and 1,200 mg/kg, respectively. SVOCs were not detected above their respective PCLs with the exception of 2-methylnaphthalene, which was detected at a concentration of 1,300 μg/kg. Metals were not detected above their respective PCLs.

Soil samples collected from boring TM-B16 at 13, 19, 29, and 39 feet bgs were submitted to ARI for WTPH-HCID analysis. Diesel-range hydrocarbons were detected at concentrations of 3,100 mg/kg and 510 mg/kg in the 13 and 19 foot bgs samples, respectively, which exceed the PCL of 460 mg/kg. TPH was detected in the 29 foot bgs sample at a concentration of 30 mg/kg. TPH was not detected in the sample collected at 39 feet bgs. (Dames & Moore, 1992a and 1992b).

A summary of the analytical results for soil samples collected in the former oily water sump are presented in Table 10. Based on this data, the vertical extent of TPH impacts above PCLs in soil appear to have been adequately characterized at boring locations TM-B4 and TM-B16; however, the lateral extent of contamination exceeding PCLs is undefined.

6.1.3.3 Former Burn Pit and Former Oil/Water Separator

To assess potential hydrocarbon contamination in the area of the former burn pit and former oil/water separator, four test pits (TP-6, TP-7, TP-10, and BURNPIT #1) and three soil borings (TM-B2, TM-B3, and TM-B6) were completed in this area (Figure 17) from November 1991 through February 1992.

Field screening of soil samples collected from the test pits identified maximum TPH concentrations of 1,200 mg/kg at 13 feet bgs in TP-6 and 13,200 mg/kg at 5 feet bgs in TP-7. TPH concentrations in TP-6 decreased to 220 mg/kg at 15 feet bgs, and to 51 mg/kg at 15 feet bgs in TP-7, which are below the PCL. BTEX, TPH by Method 418.1, or diesel-range petroleum hydrocarbons by WTPH-HCID were not detected above their respective laboratory reporting limits or PCLs in the 10-foot bgs sample from TP-6 that was submitted to ARI for analysis. The reporting limit for benzene was above the PCL. The sample was also analyzed for gasoline-range petroleum hydrocarbons and the concentration detected was 12 mg/kg, below the PCL. TPH was not identified above the 25 mg/kg detection limit in the samples collected from test pit TP-10 (Dames & Moore, 1992a and 1992b).

One soil sample was collected from BURNPIT #1 at a depth of 3 feet bgs and submitted to ARI for WTPH-HCID, BTEX, metals, and PAH analysis. Diesel-range hydrocarbons were detected at a concentration of 170 mg/kg, and ethylbenzene and xylenes were detected at concentrations of 830 μg/kg and 2,100 μg/kg, respectively. Benzene was not detected above the laboratory reporting limit of 160 μg/kg. ARI's reporting limit for benzene exceeded the PCL of 30 μg/kg. Toluene was not detected. Metals identified in the sample were not detected above their respective PCLs. Naphthalene, fluorene, phenanthrene, pyrene, dibenz(a,h)anthracene, indeno(1,2,3)pyrene, and chrysene were detected in the BURNPIT #1 sample at concentrations below their respective PCLs, where established (Dames & Moore, 1992a and 1992b); however, 2-methylnaphthalene (750 μg/kg) was detected above the PCL of 320 μg/kg.

Soil borings TM-B2 and TM-B3 were drilled to depths of 20 and 50 feet bgs, respectively, and were completed as shallow monitoring wells SW-1 and SW-2 (Figure 17). Groundwater analytical results for monitoring wells SW-1 and SW-2 are discussed in Section 6.3.1.

Soil boring TM-B6 was drilled to a depth of 58 feet bgs. Field screening did not identify hydrocarbon impacts at this location. Field screening did not identify hydrocarbon impacts in TM-B2 from 5 to 20 feet bgs, or in TM-B3 from 22 to 47 feet bgs. The 5-foot bgs soil sample

collected from TM-B2 was submitted to ARI for TPH analysis by Method 418.1, and TPH was detected at a concentration of 21 mg/kg (Dames & Moore, 1992a and 1992b), below the PCL.

The analytical results for soil samples collected in the former burn pit and former oil/water separator area are summarized in Table 11. Based on this data, the vertical extent of TPH impacts above PCLs in soil appear to have been adequately characterized at test pit locations TP-6, TP-7, TP-10, and BURNPIT #1 and boring locations TM-B2, TM-B3, and TM-B6; however, the lateral extent of contamination exceeding PCLs at test pits TP-6 and TP-7 appears to be undefined.

6.1.3.4 Former Drain Line Between Oily Water Sump and Burn Pit

To assess potential hydrocarbon contamination in the area of the former drain line between the former oily water sump and the former burn pit, one test pit (TP-8) and six soil borings (TM-B18 and TM-B20 through TM-B24) were completed in this area between November 1991 and February 1992 (Figure 18).

Field screening of soil samples collected from TP-8 identified TPH at concentrations ranging from below the 25 mg/kg detection limit to 100 mg/kg. The 6-foot bgs soil sample was submitted to ARI for BTEX, TPH by Method 418.1, and WTPH-HCID analysis. BTEX were not detected above their respective laboratory reporting limits; however, ARI's reporting limit for benzene exceeded the PCL. TPH was detected at a concentration of 140 mg/kg and gasoline-range hydrocarbons were detected at 38 mg/kg (Dames & Moore, 1992a and 1992b), which are below their respective PCLs.

Soil borings TM-B18 and TM-B20 through TM-B24 were drilled to depths of 30, 24.5, 15, 10, 13.5, and 10 feet bgs, respectively. Field screening of soil samples collected from these borings did not identify TPH concentrations above the 25 mg/kg detection limit (Dames & Moore, 1992a and 1992b).

A summary of the analytical results for soil samples collected in the area of the former drain line between the former oily water sump and former burn pit is presented in Table 12. Based on this data, the lateral and vertical extent of TPH impacts exceeding PCLs appears to have been defined at these sampling locations.

6.1.3.5 Former Drain Tile

In December 1991, soil boring TM-B5 was drilled between the former drain tile and the 16-inch Ferndale pipeline to a depth of 32 feet bgs, and was completed as shallow monitoring well SW-3 (Figure 19). Groundwater analytical results for monitoring well SW-3 are discussed in Section 6.3.1. Soil samples were collected at depths of 8, 13, and 18 feet bgs, and field screening of soil samples collected from TM-B5 did not identify TPH above the 25 mg/kg detection limit. The 13-foot bgs soil sample was submitted to ARI for TPH analysis by Method 418.1, and TPH was not detected above the laboratory reporting limit of 10 mg/kg (Dames & Moore, 1992a and 1992b). Additional soil samples were collected and excavation of PCS was conducted in this area subsequent to the October 2000 spill incident and is discussed in Section 6.1.5.

During January and February 1992, the former drain tile was removed as it was no longer needed subsequent to the station upgrading activities. The excavation to remove the drain tile was approximately 4 feet wide and varied in depth from approximately 6 feet at the south end where the drain tile connected to the 16-inch Ferndale pipeline, to approximately 1 foot in depth at the north end where the drain tile daylighted (Figure 19). Portions of the 16-inch Ferndale pipeline also were exposed during the excavation activities to remove below-ground instrumentation no longer required. TPH concentrations of soils removed during the excavation activities ranged from less than 25 mg/kg to 3,700 mg/kg. Nine post-excavation soil samples were collected (DTE-1 through DTE-7, EXFERN-5 and EXFERN-7) and field screening identified TPH in DTE-1 (base of excavation sample) and DTE-3 (sidewall sample) at concentrations of 680 mg/kg and 36 mg/kg, respectively. The DTE-1 sample was submitted to ARI for WTPH-HCID analysis and diesel-range hydrocarbons were detected at a concentration of 460 mg/kg (Dames & Moore, 1992c), which is equal to the PCL. Approximately 40 cy of soil exhibiting field evidence of petroleum contamination was excavated and placed in one of the PCS storage cells located within Study Unit 7. Clean fill was reportedly used to backfill the drain tile excavation.

A summary of the analytical results for soil samples collected in the former drain tile excavation area are presented in Table 13. Based on this data, the lateral and vertical extent of TPH impacts exceeding PCLs appears to have been defined at the former drain tile location, with the exception of location DTE-1.

6.1.3.6 Former Waste Pit

To assess potential hydrocarbon contamination in the area of the suspected former waste pit, two test pits (TP-4 and TP-5) and three soil borings (TM-B19, TM-B25, and PIT #1) were completed in this area between November 1991 and February 1992 (Figure 20).

Test pits TP-4 and TP-5 were completed to 12 and 14 feet bgs, respectively. Field screening of soil samples collected from TP-4 and TP-5 did not identify TPH above the 25 mg/kg detection limit with the exception of the 5-foot bgs sample collected from TP-5 (50 mg/kg). A sample collected from TP-5 at 14 feet bgs was submitted to ARI for TPH analysis by Method 418.1. TPH was not detected above the laboratory reporting limit of 10 mg/kg (Dames & Moore, 1992a and 1992b).

Soil borings TM-B19, TM-B25, and PIT #1 were drilled to depths of 18, 20, and 15 feet bgs, respectively. Field screening of samples collected from TM-B19 and TM-B25 did not identify TPH above the 25 mg/kg detection limit. The 15-foot bgs soil sample collected from PIT #1 was submitted to ARI for analysis of metals, VOCs by EPA Method 8240, and SVOCs by EPA Method 8270. Metals identified in the sample were not detected above their respective PCLs. Toluene (450 μg/kg) was detected in the sample at a concentration below its respective PCL. Other VOCs were either not detected or were below their respective PCLs. The reporting limit for benzene (190 μg/kg) exceeds the PCL. SVOCs detected in the sample included 2-methylnaphthalene (200 μg/kg), butylbenzylphthalate (370 μg/kg), naphthalene (79 μg/kg), and phenanthrene (47 μg/kg), each of which were below their respective PCLs, where established.

A summary of the analytical results for soil samples collected in the former waste pit area are presented in Table 14. Based on this data, the lateral and vertical extent of TPH, VOC, SVOC,

and metals impacts exceeding PCLs appears to have been defined at the former waste pit location.

6.1.3.7 16-Inch Ferndale Pipeline

As discussed in Section 6.1.3.5, the 16-inch Ferndale pipeline was partially exposed during the former drain tile excavation activities conducted during January and February 1992 and soil samples were collected along the exposed pipeline as shown on Figure 19. Field screening of soils removed during the excavation activities identified TPH at concentrations ranging from less than 25 mg/kg (EXFERN-1) to 3,700 mg/kg (EXFERN-11) (Dames & Moore, 1992c). Field screening of post-excavation soil samples EXFERN-5 and EXFERN-7 did not identify TPH above the 25 mg/kg detection limit. Approximately 40 cy of PCS was excavated and placed in one of the PCS storage cells located within Study Unit 7. Clean fill was reportedly used to backfill the excavation (Dames & Moore, 1992c). The analytical results for post-excavation soil samples collected in the area of the 16-inch Ferndale pipeline are summarized in Table 13. Additional soil samples were collected and excavation of PCS was conducted in this area subsequent to the October 26, 2000 spill incident, which is discussed in Section 6.1.5.

6.1.3.8 20-Inch Main Pipeline

The 20-inch Main Pipeline was exposed in January 1992 for inspection and maintenance. The excavation was reportedly extended to depths ranging from approximately 7 to 15 feet bgs. A total of 34 post-excavation soil samples were collected from the trench, including 18 bottom of excavation samples (designated "PLB") and 16 sidewall samples (designated "PLS") (Figure 21). The sample depths were not documented. Field screening of the post-excavation soil samples did not identify TPH above the 25 mg/kg detection limit. Several of the post-excavation samples were submitted to ARI for analysis for TPH by Method 418.1 and WTPH-HCID. Diesel-range petroleum hydrocarbons were detected at 7 feet bgs in sample PLB-1-1 at a concentration of 110 mg/kg, which is below PCL. The remaining post-excavation soil samples submitted to ARI did not detect TPH above 20 mg/kg (Dames & Moore, 1992a and 1992b).

Eighteen soil samples were collected from stockpiled material generated during the 20-inch Main Pipeline work, two of which were submitted to ARI for WTPH-HCID analysis. TPH concentrations ranged from non-detect to 39 mg/kg (diesel-range hydrocarbons). The stockpiled material was reportedly placed in one of the PCS storage cells located within Study Unit 7 (Dames & Moore, 1992b).

The analytical results for soil samples collected in the area of the 20-inch Main Pipeline are summarized in Table 15. Based on this data, TPH impacts identified during exposure of the 20-inch Main Pipeline during the January 1992 inspection and maintenance activities appear to be minimal and do not exceed PCLs.

6.1.3.9 Former PSE Electrical Substation

To determine whether PCB-containing fluids had leaked from either the onsite electrical substation near the northwest corner of the site and/or the transformer located near the Laurel Station office, five hand auger borings (ES-1 through ES-5) were advanced in the areas of concern in March 1992 (Figure 22). Two soil samples were collected from each hand auger location at depths ranging between 4 and 12 inches bgs and were submitted to ARI for PCB

analysis. PCBs were not detected in any of the soil samples above the laboratory reporting limit of 0.05 mg/kg (Dames & Moore, 1992a and 1992b). The analytical results for soil samples collected in the area of the former PSE electrical substation are summarized in Table 16.

6.1.3.10 December 11, 1991 Spill

Surficial soils in the station area affected by airborne and pooling oil resulting from the December 11, 1991 spill were scraped from the surface and reportedly placed in one of the PCS storage cells located within Study Unit 7. Post-excavation soil samples EX-10, EX-11, EX-13, and EX-15 through EX-17 were collected from near the surface following excavation of impacted soils (see Figure 23) and TPH was not detected above 61 mg/kg based on field screening (Dames & Moore, 1992a and 1992b).

Thirty-eight surface soil samples (HA-6-1 through HA-6-20 and SS-6-1 through SS-6-8 and SS-6-11 through SS-6-20) were collected to the north, northeast, and east of the pump station area to further assess potential hydrocarbon impacts downwind of the December 11, 1991 spill location (Figure 23). Field screening of the soil samples did not identify TPH above the 25 mg/kg detection limit. Six of the samples (HA-6-5, HA-6-9, HA-6-11, HA-6-20, SS-6-7, and SS-6-15) were submitted to ARI for WTPH-HCID analysis, and TPH was not detected above the laboratory reporting limit of 10 mg/kg (Dames & Moore, 1992b).

The analytical results for soil samples collected as a result of the December 11, 1991 spill are summarized in Table 17. Based on this data, the subsurface investigations and interim cleanup actions conducted subsequent to the December 11, 1991 spill, including excavation of PCS in the pump station area and placement in one of the PCS storage cells in Study Unit 7 appear to have adequately characterized the vertical and lateral extent of contamination and effectively remediated soils impacted by this spill.

6.1.4 March 7, 1992 Spill

Following the recovery of crude oil spilled during the March 7, 1992 spill incident, PCS located within the containment berm surrounding the relief tank was excavated and reportedly placed in one of the PCS storage cells located in Study Unit 7. Seven post-excavation soil samples (PRT-1, PRT-2, PRT–3, PRT–4, PRT-5, PRT0-1, and PRT0-2) were collected from within the containment berm as shown on Figure 24 and submitted to ARI for analysis. TPH was detected in samples collected at 2 feet bgs from PRT-1 and PRT-2 at concentrations of 16,000 mg/kg and 10,000 mg/kg, respectively, which exceed the PCL. TPH was not detected in the remaining five post-excavation samples (Dames & Moore, 1992a). The excavation reportedly extended to approximately 4 feet bgs in the eastern half of the containment area, and to 2-3 feet bgs in the western half; however, additional post-excavation samples were not collected. Subsequent to the removal of PCS, the containment area and dykes were reconstructed with an impermeable clay liner.

In addition to constructing the March 7, 1992 Spill Containment Dam at the southern limit of the spill path (Figures 2A and 2B), a water flood and skimming operation was implemented to remove free product from the wetland area. Process water generated during this operation was transferred to Tank No. 170 for settling. Following the flooding and skimming operation, oil-

contaminated debris was manually removed from the wetland area and shipped to Recomp of Washington for industrial incineration (TMOPL Corporation, 1992).

A summary of the analytical results for soil samples collected in the area of the March 7, 1992 spill are presented in Table 18. Based on this data, the vertical and lateral extent of TPH impacts within the containment area and exceeding the PCL were not fully characterized within the containment berm. Surface water sample collection associated with the wetland area is described in Section 6.2.2.2. No solids sampling was conducted in the wetland area.

6.1.5 October 26, 2000 Spill

As described in Section 3.6, the primary areas impacted by the October 26, 2000 spill incident were downslope from the release location (Figure 25). Following initial response actions, soil excavation was performed at locations where field-screening indicated elevated levels of petroleum contamination existed. Seventy-two (72) post-excavation soil samples were collected from the excavations for analysis of diesel, heavy oil, and gasoline-range hydrocarbons (Ecology Methods NWTPH-Dx and NWTPH-Gx), and BTEX (EPA Method 8021B). Initially, 7 of the 72 post-excavation soil samples (PEX-6-S-5, PEX-9-B-10, PEX-11-S-7, PEX-12-S-7, PEX-13-S-5, PEX-14-S-1, and PEX-72-B-1) contained concentrations of petroleum hydrocarbons and/or BTEX constituents that exceeded MTCA cleanup levels. Additional excavation was performed at these seven locations and the areas were re-sampled (PEX-48-S-4, PEX-77-B-11, PEX-38-S-4, PEX-77-B-11, PEX-55-S-2, PEX-53-S-1.5, and PEX-76-B-4). Petroleum hydrocarbons or BTEX were not detected above applicable PCLs in the areas where additional excavation was performed. Post-excavation soil samples collected from the lower excavation were either non-detect for petroleum hydrocarbons or BTEX constituents or were below applicable PCLs, with the exception of sample PEX-34-S-1, where benzene was detected at a concentration of 125 μg/kg, which was below the 2000 MTCA cleanup level of 500 μg/kg. Two post-excavation soil samples collected from the upper excavation (PEX-17-B-5 and PEX-18-S-3) contained benzene at concentrations of 139 μg/kg and 96.1 μg/kg, respectively, above the PCL of 30 μg/kg, but did not exceed the 2000 MTCA cleanup level of 500 μg/kg (URS, 2001).

Approximately 3,500 tons of PCS was excavated and placed in two lined containment cells located within Study Unit 7. Fifteen soil samples were collected from the stockpiled material and analyzed for diesel, heavy oil, and gasoline-range hydrocarbons, and BTEX. Gasoline-range hydrocarbons ranged in concentration from non-detect to 720 mg/kg; diesel-range hydrocarbons ranged in concentration from non-detect to 1,500 mg/kg; and heavy oil-range hydrocarbons ranged in concentration from non-detect to 1,100 mg/kg. BTEX were detected at maximum concentrations of 2,700 μg/kg, 16,000 μg/kg, 5,200 μg/kg, and 36,000 μg/kg, respectively. Approximately 3,500 tons of PCS was transported offsite to the CSR America Associated (aka, Associated Sand and Gravel) facility in Everett, Washington, where it was treated by low temperature thermal desorption (URS Corporation, 2001). The post-excavation and stockpile soil sample analytical results associated with the October 26, 2000 spill incident are summarized in Table 19.

With the exception of benzene concentrations at sample locations PEX-17-B-5, PEX-18-S-3, and PEX-34-S-1, the cleanup actions implemented during the October 26, 2000 spill appear to have effectively remediated PCS to below applicable PCLs.

6.1.6 PCS Storage Cells

As described in Sections 6.1.3.10 and 6.1.4 above, PCS removed during various interim actions was placed into seven PCS storage cells located south of the main pump station facility (Study Unit 7). The storage cells were constructed within and used the native silty clay soils for the cell sidewalls. The cells were lined with a 30-mil PVC/nitrile synthetic liner. PCS within the enclosure was covered with a 20-mil high density polyethylene tarp. The seams of the liner were chemically welded by the manufacturer, while the exterior tarp seams were overlapped by 6 to 8 inches and laced together (Dames & Moore, 1993a).

From October through December 1992, three and a half of the PCS storage cells (Nos. 1, 4S, the western half of Cell No. 5, and the "blue tarp") were consolidated into four other storage cells (Nos. 2 through 5) (Figure 26). The remaining cells were also regraded so that stormwater would not accumulate on the tarps covering the cells. Subsequent to the consolidation and regrading work, post-consolidation soil samples were collected from beneath the former liners of PCS Storage Cell Nos. 1, 4S, the western half of Cell No. 5, and the blue tarp (Figure 26). A total of 35 post-consolidation soil samples were collected from beneath the former storage cell liners and were submitted to ARI for WTPH-HCID analysis. None of the samples contained TPH at concentrations above the laboratory reporting limit of 10 mg/kg (Dames & Moore, 1993b).

In July 1993, soil samples were collected within Storage Cell Nos. 2 through 5 for waste characterization purposes. The soil samples were collected from a series of 24 hand auger borings as shown on Figure 26, and were submitted to ARI for WTPH-HCID and BTEX analysis. Two samples with elevated TPH concentrations were also analyzed for PAHs. TPH was detected in Storage Cell Nos. 2 through 5 at maximum concentrations of 7,200 mg/kg, (gasoline-range hydrocarbons), 22,000 mg/kg (diesel-range hydrocarbons), and 7,800 mg/kg (heavy-oil range hydrocarbons). BTEX were detected at maximum concentrations of 5,400 μg/kg, 21,000 μg/kg, 12,000 μg/kg, and 52,000 μg/kg, respectively. Three samples analyzed for PAHs contained concentrations well below the threshold values applied by the State of Washington at that time for determining if the material was considered a dangerous waste (Dames & Moore, 1993a).

Between June and October 1994, approximately 8,000 cy of PCS was removed from the storage cells and transported to permitted treatment and disposal facilities including: Roosevelt Regional Landfill in Roosevelt, Washington; Associated Sand & Gravel in Everett, Washington; and Holnam Inc. cement facility in Seattle, Washington. Based on their January 26, 1995 letter (Appendix E), Ecology considered the interim cleanup action complete and required no further action for the PCS storage cells (Ecology, 1995).

A summary of soil analytical results for soil samples collected in association with the PCS storage cells is presented as Table 20.

6.2 SURFACE WATER INVESTIGATIONS

Subsequent to the January 15, 1991, December 11, 1991, and March 7, 1992 spill incidents, surface water sampling was instituted at various onsite and offsite locations. In addition, surface

water monitoring has been conducted at onsite oil/water separators located in the main pump station area (OWS-1), the relief tank (OWS-PR), and break-out Tanks No. 170 and 180 (OWS-170 and OWS-180, respectively). The onsite and offsite surface water sampling programs are discussed below and a summary of analytical results for surface water samples is presented in Table 21.

6.2.1 Onsite Surface Water

6.2.1.1 Oil/Water Separator Monitoring

Surface water samples were collected from four onsite oil/water separators (OWS-170, OWS-180, OWS-1, and OWS-PR) between December 1991 and November 1992 and were submitted to ARI for TPH (418.1), WTPH-HCID, and BTEX analysis. Oil/water separators OWS-170 and OWS–180 are shown on Figure 27; OWS-1 is shown on Figure 28; and OWS-PR is shown on Figure 29. The oil/water separators associated with the tanks address discharge of rain water accumulation within the tank containment areas.

Benzene, toluene, and xylenes were detected in OWS-170 at maximum concentrations of 14 μg/L, 16 μg/L, and 7.3 μg/L, respectively. TPH and ethylbenzene were not detected above their respective laboratory reporting limits in surface water samples collected from OWS–170. TPH or BTEX were not detected above their respective laboratory reporting limits in surface water samples collected from OWS–180 (Dames & Moore, 1992d and Dames & Moore, 1992e). The benzene concentration detected in OWS–170 (14 μg/L) during the January 27, 1992 sampling event exceeded the PCL; however, benzene was not detected above the laboratory reporting limit during the subsequent sampling event conducted on November 10, 1992.

Gasoline-range hydrocarbons were detected in the surface water sample collected from OWS-1 in December 1991 at a concentration of 0.95 mg/L, which is below the PCL of 1.0 mg/L. BTEX were not detected above their respective laboratory reporting limits in surface water samples collected from OWS-1 (Dames & Moore, 1992e).

TPH was detected in the surface water sample collected from OWS-PR in January 1992 at a concentration of 1.7 mg/L. BTEX were not detected above their respective laboratory reporting limits in surface water samples collected from OWS–PR (Dames & Moore, 1992d).

6.2.1.2 Surface Water Monitoring

To assess potential impacts from the March 7, 1992 spill incident, a surface water monitoring program was implemented in the wetland area beginning March 10, 1992 and was continued through November 1992. Nine surface water sampling locations (SW-1, SW-2, SW-3, SPILL-1, SPILL-2, SPILL-3, SPILL-4/SPILL-6, SPILL-5, and SPILL-7) were established between the relief tank area and downstream of the March 7, 1992 Spill Containment Dam (Figure 29). Sample locations SW-1 and SW-3 were located on the downstream side of the spill containment dam constructed at the terminus of the spill. Surface water samples were analyzed for TPH, gasoline, diesel, and oil-range hydrocarbons, and BTEX. These compounds were not detected above their respective PCLs, with the exception of benzene, which was detected at a concentration of 5.4 μg/L in the surface water sample collected at SW-2 on March 10, 1992. Benzene was not detected above the laboratory reporting limit in the surface water sample

collected at SW-2 on March 11, 1992. Benzene was also detected above the PCL in the surface water sample collected at SPILL-3 (1.8 µg/L) on November 4, 1992, but was not detected at any of the downstream surface water samples collected on the same day. Subsequent surface water sampling was not conducted at location SPILL-3.

6.2.2 Offsite Surface Water

6.2.2.1 Area 1

As discussed in Section 6.1.2.2, three wells (MW-1 through MW-3) were installed offsite in Area 1 following the January 15, 1991 spill incident (Figure 28). These wells were screened from 2.5 to 3 feet bgs and were installed within a wetland area. Therefore, water samples from these wells are considered to be representative of surface water. The water samples were submitted to SAS for analysis of TPH by EPA Method 8015 and BTEX by EPA Method 8020. Diesel-range hydrocarbons and BTEX were detected at maximum concentrations of 21 mg/L, 290 µg/L, 66 µg/L, 37 µg/L, and 632 µg/L, respectively, in MW-2. The maximum benzene concentration detected in MW-2 (290 µg/L) exceeded the PCL of 1.2 µg/L. However, the benzene concentration in MW-2 decreased to less than the laboratory reporting limit of 1 µg/L by the May 1991 sampling round. The concentration of diesel-range hydrocarbons in MW-2 had decreased to 6.6 mg/L by the June 1991 sampling round (W.D. Purnell and Associates, Inc., 1991b), but still exceeded the PCL of 0.5 mg/L. The water sample collected from MW-2 on April 8, 1991 was also submitted to the laboratory for analysis of PAHs by EPA Method 8270. Naphthalene, fluorene, and phenanthrene were detected at concentrations of 120 µg/L, 5 µg/L, and 2 µg/L, respectively. All detected PAHs were below PCLs, if established.

6.2.2.2 Area 3

To assess potential offsite (Area 3) impacts from the January 15, 1991 spill incident, a surface water monitoring program was implemented at Dam 2 (SWRO-D2) and Dam 3 (SWRO-D3) (Figure 28), which were monitored twice weekly from January 17, 1991 to April 4, 1991, and once weekly from April 4, 1991 to April 28, 1991. The surface water samples were analyzed for TPH by EPA Method 8015. During certain sampling events, surface water samples were also analyzed for BTEX by EPA Method 8020, and were analyzed for PAHs by EPA Method 8270. During the January to April sampling period, TPH concentrations detected in surface water samples collected at Dam 2 and Dam 3 decreased from 3.9 mg/L and 2.3 mg/L, respectively, to less than the laboratory reporting limit of 1.0 mg/L (W.D. Purnell and Associates, Inc., 1991b).

Benzene was not detected above the laboratory reporting limit of 1 µg/L in any of the surface water samples collected from Dam 2 or Dam 3 during the sampling period. Toluene, ethylbenzene, and xylenes were only detected during the January 28, 1991 sampling event at maximum concentrations of 4 µg/L, 1 µg/L, and 11 µg/L, respectively, which are below their respective PCLs, where established. PAHs were not detected above their established reporting limit of 11 µg/L (W.D. Purnell and Associates, Inc., 1991b).

Subsequent to the December 11, 1991 spill incident, a surface water sampling program was implemented at the stormwater culvert on the north side of East Smith Road, and at Dams 2 and 3 (Figure 28). Surface water samples were collected periodically at the stormwater culvert (SWRO-C) and behind Dam 2 (SWRO-D2) from December 11 or 12, 1991 through July 22,

1992, and from behind Dam 3 (SWRO-D3) from December 11, 1991 through May 20, 1992. The samples were submitted to ARI for BTEX, TPH (Method 418.1), and WTPH-HCID analysis. These constituents were not detected above laboratory reporting limits, with the exception of benzene (2 µg/L), toluene (2.2 µg/L), and xylenes (1.7 µg/L) in the first surface water sample collected at the stormwater culvert on December 11, 1991 (Dames & Moore, 1992a). The benzene concentration detected at the stormwater culvert on December 11, 1991 exceeded the PCL of 1.2 µg/L; however, benzene was not detected above the laboratory reporting limit in surface water samples collected during subsequent sampling events.

6.3 GROUNDWATER INVESTIGATIONS

Five shallow groundwater monitoring wells (SW-1 through SW-5) and five deep groundwater monitoring wells (DW–1 through DW–5) were installed at the site between December 1991 and April 1992. The analytical results for the groundwater sampling events conducted between 1992 and 2008 are summarized in Tables 22 and 23 and are discussed below. The monitoring well construction diagrams are provided in Appendix C. A summary of groundwater level and elevation measurements is presented in Table 1.

6.3.1 Shallow Aquifer

The shallow monitoring well locations are shown on Figure 30. Groundwater samples collected from SW-1 and SW-2 in April 1992 did not contain TPH or BTEX concentrations above laboratory reporting limits. Chloroform was detected in SW-1 during the April 1992 sampling event at a concentration of 14 µg/L, which exceeds the PCL of 7.2 µg/L; however, the chloroform detection was attributed to laboratory interference (Dames & Moore, 1992b). Chloroform has not been detected in SW-1 since the April 1992 sampling event. The groundwater samples collected from SW-1 and SW-2 in April 1992 were also analyzed for total priority pollutant metals. Arsenic, chromium (total), and lead were detected at or above their respective PCLs in both wells, and nickel was detected above the PCL in SW-2. Groundwater samples collected from SW-1 and SW-2 have not been analyzed for metals subsequent to the April 1992 sampling event, and groundwater samples collected from SW-3 through SW-5 have never been analyzed for metals. Arsenic, chromium, lead, and nickel were not detected above PCLs in soil at the site so the groundwater detections in the shallow aquifer appear to be unrelated to the site releases.

Monitoring well SW-1 was sampled in October 2000, September 2004, May 2006, and March 2008, and gasoline-range hydrocarbons, motor oil-range hydrocarbons, and BTEX were not detected above their respective PCLs. PAHs including benzo(a)pyrene (0.02 µg/L), benzo(a)anthracene (0.01 µg/L), benzo(b)fluoranthene (0.01 µg/L), benzo(k)fluoranthene (0.01 µg/L), chrysene (0.02 µg/L), fluoranthene (0.02 µg/L), fluorene (0.04 µg/L), 2-methylnaphthalene (0.43 µg/L), naphthalene (0.08 µg/L), phenanthrene (0.12 µg/L), and pyrene (0.02 µg/L) were detected in SW-1 during the May 2006 sampling event (Knight Piesold, 2006). The total toxicity equivalency concentration (TTEC) for cPAHs detected in SW-1 (0.023 µg/L) during the May 2006 sampling event exceeded the PCL of 0.012 µg/L; however, cPAHs were not detected above laboratory reporting limits during the March 2008 sampling event. PAHs including 1-methylnaphthalene (0.023 µg/L) and 2-methylnaphthalene

(0.027 µg/L) were detected in SW-1 during the March 2008 sampling event at concentrations below their respective PCLs.

Monitoring well SW-2 was sampled in October 2000, September 2004, May 2006, December 2006, and March 2008, and gasoline-range hydrocarbons, motor oil-range hydrocarbons, and BTEX were not detected above their respective PCLs. PAHs including fluorene (0.02 µg/L), 2-methylnaphthalene (0.22 µg/L), naphthalene (0.11 µg/L), phenanthrene (0.06 µg/L), and pyrene (0.02 µg/L) were detected in SW-2 during the May 2006 sampling event (Knight Piesold, 2006) at concentrations below their respective PCLs, where established. The cPAHs were not detected in 2006 or 2008.

During the April 1992 sampling event, monitoring well SW-3 was analyzed for BTEX, which were not detected above their respective laboratory reporting limits (URS Corporation, 2008b). BTEX were also not detected during the May 2006 sampling event, nor were TPH. PAHs including 2-methylnaphthalene (0.01 µg/L), phenanthrene (0.02 µg/L), and pyrene (0.01 µg/L) were detected in SW-3 during the May 2006 sampling event (Knight Piesold, 2006) at concentrations below their respective PCLs, where established. The cPAHs were not detected. SW-3 was dry during the December 2006 sampling event and was reportedly damaged during the March 2008 sampling event (URS Corporation, 2008b).

A groundwater sample was not analyzed from monitoring well SW-4 in April 1992. The well was sampled in November 2006 and March 2008, and TPH and BTEX were not detected above laboratory reporting limits. Naphthalene was detected in SW-4 during the March 2008 sampling event at a concentration of 0.012 µg/L (URS, 2008b), which is below the PCL.

The groundwater sample collected from SW-5 in April 1992 contained oil & grease (TPH-418.1) and benzene at concentrations of 18 mg/L and 1.3 µg/L, respectively (Dames & Moore, 1992a and 1992b), which exceeded the PCLs. However, gasoline-range hydrocarbons, diesel-range hydrocarbons, motor oil-range hydrocarbons, and BTEX were not detected above their respective laboratory reporting limits in SW-5 during the September 2004 and May 2006 sampling events. PAHs benzo(a)pyrene (0.01 µg/L), chrysene (0.04 µg/L), fluoranthene (0.01 µg/L), 2-methylnaphthalene (0.01 µg/L), naphthalene (0.02 µg/L), phenanthrene (0.02 µg/L), and pyrene (0.03 µg/L) were detected in SW-5 during the May 2006 sampling event (Knight Piesold, 2006) at concentrations below their respective PCLs.

Based on this data, contaminants of concern above the PCLs are not currently present in the shallow aquifer. A summary of groundwater analytical results for the shallow aquifer monitoring wells is presented in Table 22.

6.3.2 Deep Aquifer

The deep monitoring well locations are shown on Figure 31. Groundwater samples collected from monitoring wells DW-1 through DW-5 during the April 1992 sampling event were submitted to ARI for analysis of TPH by Method 418.1, BTEX, and metals. TPH and BTEX were not detected above their respective laboratory reporting limits. Arsenic was detected above the PCL of 0.005 mg/L in monitoring wells DW-1 (0.083 mg/L), DW-3 (0.018 mg/L), DW-4 (0.014 mg/L), and DW-5 (0.019 mg/L). Chromium was detected above the PCL of 0.05 mg/L in

monitoring well DW-2 (0.154 mg/L). Lead was detected above the PCL of 0.015 mg/L in monitoring wells DW-2 (0.167 mg/L), DW-3 (0.028 mg/L), and DW-4 (0.021 mg/L). Metals analyses were not conducted on groundwater samples collected in subsequent sampling events. Arsenic, chromium, and lead were not detected above PCLs in soil at the site so detections in the deep aquifer appear to be unrelated to site releases.

Groundwater samples were collected from monitoring wells DW–2 and DW–3 in October 2000, following the October 26, 2000 spill incident, and submitted to ARI for analysis of gasoline, diesel, and heavy oil-range hydrocarbons (Ecology Methods NWTPH-Gx and NWTPH-Dx) and BTEX. Toluene and xylenes were detected in DW–3 at concentrations of 0.771 μg/L and 1.25 μg/L, respectively, which are below their respective PCLs. Benzene and ethylbenzene were not detected above their respective laboratory reporting limits in DW-3. BTEX were not detected above their respective laboratory reporting limits in DW-2, and TPH were not detected above their respective laboratory reporting limits in either well (URS, 2008b).

Groundwater samples were collected from all five deep monitoring wells in December 2006 and submitted to ARI for analysis of gasoline, diesel, and heavy oil-range hydrocarbons (Ecology Methods NWTPH-Gx and NWTPH-Dx), BTEX, and PAHs. There were no detected constituents above their respective laboratory reporting limits and reporting limits were below PCLs (URS, 2008b). A summary of the groundwater analytical results for the deep aquifer monitoring wells is presented in Table 23.

Based on the deep well sampling results, with the exception of toluene and xylenes, contaminants of concern have not been identified in the deep aquifer. Toluene and xylenes detections in DW-3 were well below applicable cleanup levels. In 2007, Kinder Morgan contacted Ecology to obtain their concurrence regarding decommissioning the five deep wells. On Kinder Morgan's behalf, URS notified Ecology on April 24, 2008 that the five deep wells were scheduled for decommissioning. On May 1, 2008, the five deep wells were decommissioned by Cascade Drilling, Inc. in compliance with the provisions of WAC 173–160–151 and WAC 173–160–381 (URS, 2008c). Well decommissioning records are provided in Appendix C.

6.4 WETLANDS STUDIES

Wetlands investigations were conducted by Purnell in Areas 1, 2, and 3 in March and October 1991, and January 1992. Wetlands located downstream of Hannegan Road were not included as part of the Area 3 investigation. During their investigation, Purnell delineated nine isolated wetlands within Areas 1, 2, and 3, which totaled approximately 9.1 acres. Approximately 2.9 acres of both emergent (wet meadow) and forested plant communities were delineated in Area 1, approximately 3.4 acres of both emergent and forested wetlands were delineated in Area 2, and approximately 2.8 acres of forested wetlands were delineated in Area 3 (W.D. Purnell and Associates, Inc., 1992). The Purnell wetland delineation maps are included as Appendix E.

URS conducted a wetland investigation in August 2009 to assess the status of wetlands previously delineated in Areas 1, 2, and 3, and wetlands affected by the March 7, 1992 spill incident. During the investigation, URS noted that wetland conditions have persisted in the areas

affected by past spill incidents. Wetland hydrology indicators were observed in representative areas previously delineated by Purnell, and hydric soils were also confirmed in these areas. Plant species were observed to be similar to those documented during Purnell's wetlands delineation and field notes taken by Dames & Moore personnel in the March 7, 1992 spill area (Study Unit 3). URS also noted that Dam 3, on Deer Creek near Hannegan Road, was no longer present. Dam 2 was still in place and a small, unvegetated pond was observed behind the dam. URS concluded that since the wetlands affected by past spill incidents appeared to have recovered and were observed to be very similar to what was documented in 1991 and 1992, wetland mitigation activities did not appear to be necessary at this time (URS, 2010). The boundaries of the wetland area in Study Unit 3 were not determined during URS' August 2009 assessment.

The wetland investigations described above have not included sediment/soil sampling within the wetland areas potentially affected by petroleum releases at the site.

Prior to the 2008/2009 facility upgrade, Kinder Morgan conducted a Wetland/Fish & Wildlife Study (Aqua-Terr Systems, Inc. [ATSI], 2007), the purpose of which was to provide an assessment of the presence, location, and extent of wetlands, streams, and other biological critical areas and their regulated buffers under the jurisdiction of Whatcom County, Ecology, and the U.S. Army Corps of Engineers that were within the proposed Kinder Morgan upgrade project area. Wetlands were not observed within the project area nor within 300 feet of the project area at the site, however, an apparent forested wetland was observed immediately north of East Smith Road, separate from the project area. Local species of concern, or state and federally listed species, were not observed in the project area. The ATSI report is included in Appendix E.

7.0 NATURE AND EXTENT OF CONTAMINATION

7.1 SOIL

The nature of contamination present in soil at the site consists primarily of diesel-range hydrocarbons resulting from historic natural gas condensate and crude oil spill incidents, and pump station operations. The extent of contamination exceeding PCLs appears to be limited to isolated hot spots identified during Dames & Moore's 1991/1992 RI and areas not fully remediated during interim cleanup actions. In general, natural gas condensate and crude oil released at the site have migrated laterally via surface water drainage features or former underground piping systems, or in the case of the December 11, 1991 spill incident, lateral migration was caused by an airborne release.

The majority of the petroleum product historically released at the site was addressed during spill response actions and vertical migration of petroleum product appears to have been limited by the presence of a silty clay/clayey silt unit located at approximately 10 feet bgs throughout most of the site. This silty clay/clayey silt unit varies in thickness from approximately 3 feet at test pit PB-4 to approximately 60 feet at soil boring TM-B12. Deeper zones of contamination (between 10 feet bgs and the perched groundwater) remaining onsite appear to be the result of leaks from former pump station features, such as the former oil/water separator, pumps and former oily water sump. At these locations, the silty clay/clayey silt unit is either relatively thin or non-existent, and petroleum product releases from these former features has migrated directly into the

Bellingham Drift, which is much coarser relative to the silty clay/clayey silt unit. Areas with residual soil contamination including analytical data are depicted on the north-south and east-west geologic cross sections presented on Figures 32 and 33, respectively. The locations of the areas with apparent residual soil contamination are shown on Figures 34 through 38.

The lateral extent of TPH contamination in Area 1, which is a delineated wetland impacted by the January 15, 1991 natural gas condensate spill incident, is shown on Figure 34. Soils containing petroleum hydrocarbons and BTEX above the PCLs may remain based on the historic sampling results (Figure 34). The data collected thus far provides a lateral extent of the area affected in Area 1, but the vertical extent of petroleum hydrocarbons, BTEX, and PAHs was not clearly defined.

In Area 2 (north of East Smith Road), also impacted by the January 15, 1991 release, the vertical extent of TPH-affected soil was not fully delineated where impacted soil was identified (Figure 35). In addition, BTEX was not assessed in the area of impacted soil.

Study Unit 1 includes the pump station operations area and as previously described was affected by the releases in January 1991, December 1991, and October 2000. Petroleum-contaminated soil was also found during station upgrades following the January 1991 release. Isolated areas of soil contamination remained in place at the time of the investigations and the data collected did not fully define the lateral and/or vertical extent of contamination above PCLs at the former oily water sump and piping manifold, former pump station, north end of the former drain tile, in the vicinity of the Cold Storage Building, and former oil/water separator. These areas are noted on Figure 36.

Samples collected from beneath the north side of Tank No. 180 in the break-out tank area indicated TPH above PCLs to 3 feet bgs, the maximum depth sampled. On the southeast side of Tank No. 170, a single sample indicated benzene above the PCL at 4.5 feet bgs. These locations are shown on Figure 37. The vertical and lateral extent of the areas is not fully defined.

The vertical extent of affected soil area within the containment berm of Tank No. 120 (relief tank) where PCS was stored and where the overflow of crude oil was temporarily held following the March 2, 1992 was not defined below 2 feet bgs.

7.2 ONSITE AND OFFSITE SURFACE WATER

Significant or long-term impacts to onsite or offsite surface water were not identified during prior investigations. As per the requirements of the National Pollution Discharge Elimination System (NPDES) permit program, Laurel Station, having had a reportable quantity release occurring after November 16, 1987, is required to meet Ecology's Industrial Stormwater General Permit (Permit) for stormwater discharges from the facility. Both stormwater sampling and visual inspections are conducted at three outfall locations (Figures 2A and 2B). The sampling parameters required by the permit are turbidity, pH, total zinc, petroleum and grease, lead, and copper. Quarterly sampling and visual inspections are conducted at the two outfalls to the East Smith Road ditch, at the northwest and northeast corners of the facility. An annual inspection of the discharge outfall from the relief tank (Tank No. 120) containment berm is also required. Annual inspections of the three outfalls are conducted during July, August or September for

unpermitted, non-stormwater discharges to storm drains or receiving waters. Discharge Monitoring Reports (DMRs) prepared by Kinder Morgan during 2009 are included as Appendix F.

7.3 GROUNDWATER

7.3.1 Shallow Aquifer

The initial monitoring of the shallow groundwater monitoring wells indicated that petroleum hydrocarbon concentrations were present in SW-1 and SW-5 and were not detected in the other shallow wells. Subsequent sampling of these wells did not detect petroleum hydrocarbons. Based on these findings it is apparent that the shallow groundwater quality has not been affected by the historic petroleum releases and existing residual soil contamination. As shown on the north to south geologic cross section (Figure 32), residual contamination was present in the soil above the shallow groundwater; however, the underlying groundwater has not been impacted. In addition, monitoring wells SW-1 and SW-2 are situated downgradient from a number of former and potentially existing PCS areas (e.g., former burn pit, former oily water sump, former oil/water separator, former drain tile and pipeline spill locations) and petroleum hydrocarbon constituents were not detected or were detected below PCLs. Based on this data, it is apparent that migration of petroleum constituents into the shallow saturated zone is limited by the dense, low permeability glacial soils underlying Laurel Station.

Although total arsenic, chromium, lead, and nickel have been detected above PCLs in SW-1 and SW-2, these metals were not detected above PCLs in soil at the site, indicating that the detections in the shallow groundwater do not appear to be related to site releases.

7.3.2 Deep Aquifer

Consistent with the shallow groundwater, the deeper groundwater quality beneath the site has not been impacted by petroleum hydrocarbon releases and residual levels of petroleum in the site soils. With the exception of part per billion levels of xylenes and toluene detected in DW-3 during a single monitoring event in 2000, petroleum hydrocarbons have not been detected in the downgradient monitoring wells (DW-2 and DW-3) situated on the west side of the facility (Figure 31).

Total arsenic, chromium, and lead were detected in selected deep monitoring wells above PCLs, but these metals were not detected above PCLs in soil on the site. The detections in the deeper groundwater do not appear to be related to site releases.

7.4 ONSITE AND OFFSITE SEDIMENT

7.4.1 Onsite Wetland Sediment/Soil

During the March 7, 1992 spill incident, a wooded wetland area located southeast of the release point (Figure 29) was impacted by approximately 30 to 50 barrels of crude oil which traveled along a narrow depression for approximately 600 feet, where a temporary dam (the March 7, 1992 Spill Containment Dam) was constructed to facilitate oil recovery. Cleanup efforts were implemented to recover any pooled oil from the wetland area. This included a water flooding

and skimming operation. Subsequent surface water monitoring (Section 6.2.1.2) conducted within the wetland area and downstream of the containment dam did not detect significant levels of petroleum constituents (Table 21). Based on the surface water sampling results and the subsequent visual assessment of the affected area, significant impacts to wetland sediment/soil quality were not apparent. However, as mentioned previously, wetland sediment/soil sampling was not performed within the wetland. Any impacted wetland sediment/soil within this area would be limited to the narrow depression associated with the spill path.

7.4.2 Offsite Wetland Sediment/Soil

The wetland areas located within Area 1 and Areas 2 and 3, situated west and north of the site (Appendix E), respectively, were impacted by petroleum releases associated with the January 15, 1991 and December 11, 1991 spill incidents. The January 15, 1991 spill consisted of approximately 75 barrels of natural gas condensate that flowed overland into the field west of the site (Area 1). Petroleum also migrated into the drainage ditch located on the south side of East Smith Road and flowed north (Area 2) through a culvert under East Smith Road, then east and north into a tributary of Deer Creek (Area 3). Interceptor trenches (Figure 2A) were constructed in the wetland area draining into the tributary of Deer Creek (Dam 2), and in Deer Creek at Hannegan Road (Dam 3). During the December 11, 1991 spill incident, approximately 84 barrels of crude oil was released into the air, the bulk of which discharged to the ground in the station area. A slight sheen was observed on the surface water in Area 2 as a result of airborne hydrocarbons. An estimated 51 barrels of crude oil was recovered during the cleanup activities.

Initial surface water monitoring implemented in Areas 1 and 3 (Section 6.2.2) detected elevated levels of petroleum hydrocarbons and subsequent sampling events showed a significant decline in petroleum hydrocarbon concentrations. Sampling of wetland sediment/soil was not previously performed within Areas 2 and 3. However, based on the cleanup efforts and subsequent observations in the off site wetland areas, significant impacts to wetland sediment/soil quality are not anticipated. The estimated limit of any impacted sediment/soil in the wetland areas is consistent with the lateral extent of surface water occurrence following the spill events.

8.0 DATA GAPS

Data gaps identified during the review and compilation of soil, groundwater and surface water data generated during the investigations and cleanup actions implemented at the Laurel Station facility are summarized in Table 24. The identification of data gaps considered changes in analytical methodology and revisions made to MTCA since the effective date of the Amended Order for all media as well as the applicability of the timing of the data collection to best demonstrate the current water quality of surface water bodies and groundwater. The screening levels for benzene and cPAHs based on MTCA were revised downward since most of the data collection was completed in the 1990s. Consequently, the assessment of benzene and cPAHs by the current standard (PCLs as discussed in Section 5.0) was often incomplete as laboratory reporting limits exceeded the selected current PCLs. These adjustments were considered as part of the data gaps assessment and the analytical program proposed for the supplemental investigation (Section 9.0) includes testing to clearly identify if these constituents are compounds of concern at the site.

Data gaps are primarily limited to isolated locations where the vertical and/or lateral extent of contamination in soil was not previously defined. Groundwater monitoring completed between 2000 and 2008 in the shallow and deep groundwater wells was performed and no groundwater quality impacts were identified, and no data gaps were evident relative to characterization of the shallow/deep groundwater.

Although significant data gaps were not identified associated with the onsite and offsite surface water sampling previously conducted at the site, the majority of the data was collected prior to 1993. Thus, current surface water quality information does not exist for the areas affected by the historic petroleum releases.

Onsite and offsite sediment/soil sampling has not been performed within the areas of perennially submerged wetlands, ditches or creeks potentially affected by historic spills at the site.

The outer limits of the wooded wetland area affected by the March 7, 1992 spill incident have not been delineated, although a wetland assessment conducted by URS in August 2009 documented the presence of wetland hydrology indicators, including hydric soils and native hydrophytic vegetation (URS, 2010).

The Amended Order indicates that a wetland mitigation plan shall be required for cleanup actions in wetland areas of the site. Wetlands assessment data and surface water data indicate the wetland areas are not affected by previous facility releases; however, the soil/sediments within the channels have not been assessed.

9.0 PROPOSED DATA GAP INVESTIGATION

To address the data gaps presented in Section 8, further assessment of the soil, wetland sediment/soil and surface water conditions is proposed at locations both onsite and offsite. The proposed investigation will be conducted in accordance with the Sampling and Analysis Plan (SAP), included as Appendix G, and will be implemented within 60 days of Ecology's approval of the data gap investigation. The proposed scope of work is summarized in Table 25 and discussed in more detail below. The proposed data gap sampling locations are depicted on Figures 34 through 41.

9.1 SOIL

To further evaluate the lateral and vertical extent of impacted soils, a series of hand auger and/or push probe borings (A1-B1 through A1-B25, A2-B1, SU3-B1 through SU3-B7, SU1-B1 through SU1-B20, and SU2-B1 through SU2-B8), depending on field conditions, will be advanced at the proposed locations shown on Figures 34 through 38. Several of the proposed deeper borings may need to be advanced using hollow stem auger drilling methods. The proposed boring rationale, soil sampling depths and analyses for each boring is presented in Table 25. Soil samples will be analyzed for gasoline, diesel, and heavy oil-range hydrocarbons (NWTPH-Gx and NWTPH-Dx), BTEX, and at selected locations, PAHs. If diesel or heavy-oil range hydrocarbons are detected in a sample above the PCL of 460 mg/kg, that sample will also be analyzed for PAHs. Contingency step-out borings will be performed if field-screening indicates the need for additional lateral characterization of hydrocarbon impacts. Soil sampling

procedures and methods as well as quality assurance measures are presented in the SAP (Appendix G).

9.2 ONSITE AND OFFSITE SURFACE WATER

Surface water sampling will be conducted at offsite locations within Areas 1, 2 and 3 and onsite within Study Unit 3 (Table 25). The proposed sampling locations are shown on Figures 39 and 40. The proposed sampling locations generally coincide with prior surface water sampling locations. The surface water sampling procedures and methods are outlined in the SAP presented in Appendix G. Surface water sampling will be conducted when surface water is present within the proposed sampling locations. Samples will be analyzed for gasoline, diesel, and heavy oil-range hydrocarbons (NWTPH-Gx and NWTPH-Dx) and BTEX.

In Area 1, sampling locations A1-SW1 and A1-SW3 will be located adjacent to former shallow monitoring well locations MW-3 and MW-2, respectively (Figure 39). Sample A1-SW2 will be situated in the central portion of the former spill path from the January 15, 1991 release. A surface water sample (A2-SW1) will be collected at the confluence of two drainages located in Area 2 on the north side of East Smith Road (Figure 39). In Area 3, surface water samples A3-Dam 2 and A3-Dam 3 will be collected on the upstream side of the containment dam located within the tributary of Deer Creek and within Deer Creek near the previous dam, respectively (Figure 39).

In Study Unit 3, three surface water samples (SU3-SW1, SU3-SW2 and SU3-SW3) are proposed within the wetlands along the spill path of the March 7, 1992 release (Figure 40). Sample SU3-SW1 will be collected directly upstream of the March 7, 1992 Spill Containment Dam.

9.3 ONSITE AND OFFSITE WETLAND SEDIMENT/SOIL

Wetland sediment/soil sampling will be conducted at both onsite and offsite locations within Areas 1, 2 and 3 and Study Unit 3 to assess the current conditions of the wetland sediments in the areas impacted by historic spills (Table 25). Wetland sediment/soil sampling will be conducted in accordance with the procedures and methods presented in the SAP (Appendix G). This sampling will be performed using hand sampling devices and no motorized sampling equipment (e.g., drilling rig) will be used within wetland areas.

The wetland sediment/soil sample locations will be generally co-located with surface water sampling locations (Figures 39 and 40). At each sample location, a transect across the drainage/or standing water is proposed, including up to three sampling points as follows: 1) central portion of drainage channel/or standing water body; 2) right bank of drainage or standing water; and 3) left bank of the drainage or standing water. The purpose of the transect across each sample location is to provide a representative sampling of the areas affected by the main petroleum spill path and subsequent dispersion on the water surface.

9.4 WETLANDS

Although wetland mitigation may not be required, URS will supplement the data collected and observations made during the August 2009 wetlands investigation by determining the outer boundaries of the wetland area in Study Unit 3.

10.0 FEASIBILITY STUDY

Upon completion of the data gap investigation, an FS will be developed as part of the Draft RI/FS Report and will evaluate cleanup action alternatives to enable a cleanup action to be selected for the site. The FS will be developed in accordance with WAC-340-350(8).

11.0 NON-DATA ENFORCEMENT ORDER ACTIONS

Several interim actions were included in Exhibit A of the Amended Order that were not directly related to data collection activities and reporting. These activities may support data collection efforts or support risk management for potential future releases and include health and safety planning, spill prevention, and infrastructure to mitigate site releases (oil/water separators, containment dams). Ecology indicated to Kinder Morgan during a meeting on August 25, 2009 that the intent of the required actions in Exhibit A may be met in the course of compliance with other Ecology or regulatory requirements outside of the RI/FS documented in this report. This section addresses the Exhibit A activities that are outside of the RI/FS activities and how they currently or will be addressed.

11.1 HEALTH AND SAFETY PLAN

Exhibit A, Section IIA of the Amended Order states that a Health and Safety Plan (HSP) must be included in the RI/FS work plan. A HSP was previously provided to, acknowledged by, and reviewed by Ecology (refer to Appendix A). Per the Order, approval by Ecology was not required; however a written statement by TMOPL (now Kinder Morgan) was required to acknowledge the plan met the appropriate legal requirements.

Kinder Morgan has a corporate health and safety program and facility-specific requirements to ensure that appropriate health and safety procedures as required by law are followed during all facility operations including activities conducted by subcontractors working for Kinder Morgan. All work performed as part of the supplemental RI/FS activities will be conducted under a HSP that meets the applicable requirements under the Occupational Safety and Health Administration (OSHA) 29 CFR 1910.120, Washington Industrial Safety and Health Act (WISHA), and Kinder Morgan facility specific requirements. As the plan does not require approval by Ecology, Kinder Morgan proposes that the requirement for Ecology's review of a HSP applicable to the supplemental RI/FS and it's inclusion in the SAP (Appendix G) be removed and that the statement above indicating that a HSP will meet the applicable legal requirements will adequately meet the intent of the Order.

11.2 SPILL PREVENTION PLAN

Exhibit A, Section III.E.1 through 3 of the Amended Order describes detailed requirements for a spill prevention plan, implementation, and schedule for implementation. Kinder Morgan

submitted an Oil Spill Contingency Plan to the Spill Prevention, Preparedness, and Response department at Ecology. This plan meets the current Ecology requirements and was approved by Ecology in a letter dated August 27, 2009. The plan is available for review but has not been included in this report. A copy of the approval letter is included in Appendix H.

11.3 OIL/WATER SEPARATORS

Exhibit A, Section III.F.1 through 4 requests as-builts, sampling and analysis plans, sample results, and reporting associated with the oil/water separators that were onsite at the effective date of the Order. Several reports were submitted to Ecology with this information in the 1990's.

The facility has undergone several upgrades since the Order became effective including upgrades to their stormwater containment features inclusive of oil/water separators. In addition, with new construction such as the electrical substation, Kinder Morgan installed equipment to mitigate potential future releases and manage stormwater. Remote sensing devices are included at all of the separators and an operations and maintenance program is documented and followed by the facility staff.

The remote sensing hydrocarbon probes are capable of detecting a thin (0.01 inches) layer of oil on the water surface. Once detected, an alarm is received locally and at the Edmonton Control Centre alerting both the onsite Operating Technician and the Control Centre Operator so that appropriate action can be initiated to prevent oil from reaching the public storm water system. The probes are located at:

- The station manifold sump where a valve can be automatically closed if hydrocarbons are detected, isolating the release to the manifolds secondary containment area.
- The stormwater oil/water separator adjacent to East Smith Road. If hydrocarbons are detected, an automated valve would close, stopping discharge from the separator. The separator is designed to retain 125 barrels of petroleum.
- Each of the individual tank bays for Tanks No. 170 and 180 contain oil/water coalescing filters and a retention vault. Probes are installed both at the automated valve on the upstream side of the filter and within the vault.
- Relief Tank No. 120 containment berm draining through at the siphon drain and weir-type separator through which the containment berm for the relief tank No. 120 drains.

As described in Section 2.4, the oil/water separators are components of an integrated system designed to prevent petroleum-affected water associated with the facility from entering surrounding creeks and tributaries.

11.4 CURRENT STATUS OF DAMS AND FUTURE PLANS

Exhibit A, Section III.D.1 through 5 describes requirements for maintenance and operation of containment Dams 2, 3, and the March 7, 1992 Spill containment dam, evaluation of removing these dams and submittal of a dam removal plan. The project file contains several reports and correspondence from November 26, 1991 to February 22, 1993 in regard to this requirement.

Based on the current physical conditions of the dams and the potential utility of the dams for future spill containment, the requirements in the Order appear outdated.

Kinder Morgan is currently assessing upgrading Dam 2 to provide an ongoing physical containment barrier useful in the event of a future release from the site. Dam 2 is identified as a spill control point in the facility's emergency response plan and has been routinely maintained since its installation. The earthen berm was reinforced and erosion features filled in around the 20" inverted pipe in the fall of 2009. Cobble armoring was also placed at the discharge point.

The March 7, 1992 Spill Containment Dam, constructed of fiberglass panels with an impervious liner, is still in place although its upkeep has not been maintained. Kinder Morgan would like to remove it and conduct vegetation brushing for ready access so the site could be used as a future spill response point if required. Onsite emergency response equipment would be deployed to reconstruct a dam if required. With the decommissioning of relief tank No. 120, the source for a release has been removed.

Dam 3 consisted of a boomed area to facilitate collection of oil and was removed at the end of the emergency response phase. As observed during the August 2009 wetland assessment (Appendix E), Dam 3 is no longer present.

As noted in Section 9.0, solids and surface water sampling is proposed for areas associated with these dams. These data will be presented in the Draft RI/FS Report with proposed actions for each dam.

12.0 SCHEDULE AND DELIVERABLES

The data gap investigation will be implemented within 60 days of receiving formal acceptance of the proposed investigation from Ecology. Ecology will be notified at least 30 days prior to the implementation of field work activities. The Draft RI/FS Report will be submitted within 120 days of receiving the final analytical results from the laboratory. Monthly status reports will be submitted to Ecology during the time period between implementation of the data gap investigation field work and submittal of the Draft RI/FS Report. Additionally, a meeting will be held between Ecology, Kinder Morgan, and URS within 60 days of receiving the final analytical results from the laboratory. The purpose of this meeting will be to discuss the data and preliminary cleanup alternatives. The proposed schedule is presented below.

The analytical results and coordinates of each sampling location included in the proposed data gap investigation will be added to the existing Microsoft Access database for submittal to Ecology. The sample analytical results will be compared to the PCLs established in Tables 3 and 5 of the Final Supplemental RI/FS Work Plan.

Schedule

Activity	Date Range
Final Supplemental RI/FS Work Plan submittal	May 28, 2010
Data gap investigation field work	June/July 2010
Meeting with Ecology	August/September 2010
Draft RI/FS Report submittal	October/November 2010
Monthly status reports	Monthly from May to October 2010

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TABLES

Table 1
Groundwater Elevation Data Summary
Laurel Station
Bellingham, Washington

WELL ID	DATE MEASURED	TOTAL DEPTH (ft-TOC)	TOC ELEVATION (ft-MSL)	SCREEN INTERVAL (ft-bgs)	SCREEN INTERVAL ELEVATION (ft-MSL)	TOC HEIGHT (ft-bgs)	DEPTH TO GROUNDWATER (ft-TOC)	GROUNDWATER ELEVATION (ft-MSL)
SW-1	April 15-17, 1992	NM	296.09	5 - 20	291.09 - 276.09	NM	6.06	290.03
	October 31 - November 2, 2000	NM	296.09			NM	5.60	290.49
	September 2004	18.60	296.09			NM	4.92	291.17
	May 10, 2006	18.60	296.09			NM	5.45	290.64
	November 7-8, 2006	NM	296.09			NM	NM	NC
	December 7-8, 2006	NM	296.09			NM	NM	NC
	March 13, 2008	18.60	296.09			NM	4.86	291.23
SW-2	April 15-17, 1992	NM	296.69	40 - 50	256.69 - 246.69	NM	38.82	257.87
	October 31 - November 2, 2000	NM	296.69			NM	39.85	256.84
	September 2004	49.34	296.69			NM	39.93	256.76
	May 10, 2006	49.34	296.69			NM	38.58	258.11
	November 7-8, 2006	45.70	296.69			-0.3	40.50	256.19
	December 7-8, 2006	45.70	296.69			-0.3	38.60	258.09
	March 13, 2008	48.82	296.69			-0.3	37.48	259.21
SW-3	April 15-17, 1992	NM	304.79	22 - 32	282.79 - 272.79	NM	33.56	271.23
	October 31 - November 2, 2000	NM	304.79			NM	DRY	NC
	September 2004	35.33	304.79			NM	DRY	NC
	May 10, 2006	35.33	304.79			NM	33.96	270.83
	November 7-8, 2006	34.70	304.79			2.5	DRY	NC
	December 7-8, 2006	34.70	304.79			2.5	DRY	NC
	March 13, 2008	34.79	304.79			2.5	32.75	272.04
SW-4	April 15-17, 1992	NM	298.30	18 - 28	280.30 - 270.30	NM	DRY	NC
	September 2004	NM	298.30			NM	DRY	NC
	May 10, 2006	NM	298.30			NM	DRY	NC
	November 7-8, 2006	27.40	298.30			-0.2	15.30	283.00
	December 7-8, 2006	27.20	298.30			-0.2	17.30	281.00
	March 13, 2008	27.41	298.30			-0.2	17.95	280.35
SW-5	April 15-17, 1992	NM	298.86	34 - 39	264.86 - 259.86	NM	20.64	278.22
	September 2004	27.26	298.86			NM	20.31	278.55
	May 10, 2006	27.26	298.86			NM	20.24	278.62
	November 7-8, 2006	38.60	298.86			-0.5	DRY	NC
	December 7-8, 2006	38.60	298.86			-0.3	DRY	NC
	March 13, 2008	38.60	298.86			-0.5	DRY	NC
DW-1	April 15-17, 1992	NM	322.41	186.5 - 226.5	135.91 - 95.91	NM	197.70	124.71
	November 7-8, 2006	224.80	322.41			3.7	197.80	124.61
	December 7-8, 2006	223.20	322.41			3.7	198.30	124.11
DW-2	April 15-17, 1992	NM	291.80	153 - 173	138.80 - 118.80	NM	168.86	122.94
	November 7-8, 2006	NM	291.80			3.0	168.70	123.10
	December 7-8, 2006	NM	291.80			3.0	169.30	122.50
DW-3	April 15-17, 1992	NM	282.41	146.5 - 166.5	135.91 - 115.91	NM	159.35	123.06
	November 7-8, 2006	NM	282.41			3.1	160.50	121.91
	December 7-8, 2006	NM	282.41			3.1	160.20	122.21
DW-4	April 15-17, 1992	NM	281.42	155.5 - 175.5	125.92 - 105.92	NM	157.16	124.26
	November 7-8, 2006	NM	281.42			0.0	157.70	123.72
	December 7-8, 2006	NM	281.42			0.0	157.90	123.52
DW-5	April 15-17, 1992	NM	327.73	194 - 214	133.73 - 113.73	NM	195.61	132.12
	November 7-8, 2006	NM	327.73			0.3	204.20	123.53
	December 7-8, 2006	NM	327.73			0.3	204.20	123.53

Notes:

1. Total depth was measured by sounding the wells prior to sampling and may differ from total depth as installed.
2. Source of top of casing elevations - Remedial Investigation/Feasibility Study Workplan, Trans Mountain Oil Pipeline, Corp., Laurel Station, Bellingham, WA (Dames & Moore, 1992)

TOC - top of well casing
ft-TOC - feet below top of well casing
ft-MSL - feet above mean sea level
ft-bgs - feet below ground surface
NC - not calculated
NM - not measured

Table 2
Areas of Concern Summary
Laurel Station
Bellingham, Washington

Spill/Incident	Enforcement Order Area	Area of Concern	Notable Facility Features
Historic Spills and Releases	Other Areas	Study Units 1, 2, 4, 5, and 6	Pump Station Area, Boneyard, Bulk Storage Tank Area
January 1991 Spill	Areas 1, 2, and 3	Study Unit 1 and Areas 1, 2, and 3	None; impacted areas are located offsite
Pump Station Upgrade Discoveries	Other Areas	Study Unit 1	Pump Station Area
December 1991 Spill	Area 3 and Other Areas	Study Units 1, 5, and 6	Pump Station Area
March 1992 Spill	Other Areas	Study Unit 3	Relief Tank Area
October 2000 Spill	Other Areas	Study Unit 1	Pump Station Area
PCS Storage Cells	Other Areas	Study Units 3 and 7	North of Pressure Relief Tank Area

Notes:
PCS - petroleum-contaminated soil

Table 3
Summary Statistics and Potential Cleanup Levels - Soil
Laurel Station
Bellingham, Washington

Analyte	Existing Data Summary				Potential Cleanup Levels							
					Direct Contact				Protection of GW			
	Number of Samples	Number of Detections	Maximum Detection	Maximum Reporting Limit	MTCA Method A (Unrestricted)	MTCA Method A (Industrial)	MTCA Method B	MTCA Method C	MTCA Method B	MTCA Method C	MTCA TEE	NBSM
Field Analyses (mg/kg)												
TPH - crude oil range	80	56	13,200	25	NA	NA	NA	NA	NA	NA	NA	NA
TPH - field screen	290	53	10,000	25	NA	NA	NA	NA	NA	NA	NA	NA
TPH - natural gas condensate	81	8	5,700	25	NA	NA	NA	NA	NA	NA	NA	NA
TPH (mg/kg)												
TPH - diesel range	257	103	15,411	61	2,000	2,000	NE	NE	NE	NE	**460**	NA
TPH - gasoline range	143	32	350	58	**100/30**[1]	100/30[1]	NE	NE	NE	NE	200	NA
TPH - heavy fuel oil range	73	23	173	25	**2,000**	2,000	NE	NE	NE	NE	NE	NA
TPH - motor oil range	27	9	3,500	14	**2,000**	2,000	NE	NE	NE	NE	NE	NA
TPH - oil	39	3	180	10	**2,000**	2,000	NE	NE	NE	NE	NE	NA
TPH by 418.1	26	15	1,700	10	**2,000**	2,000	NE	NE	NE	NE	NE	NA
VOCs (ug/kg)												
1,1,1-trichloroethane	2	0	NA	630	**2**	2	72,000	3,150,000	83,410	185,400	NE	NA
1,1,2,2-tetrachloroethane	2	0	NA	630	NE	NE	**5**	656	1.6	16	NE	NA
1,1,2-trichloroethane	2	0	NA	630	NE	NE	**18**	2,303	5.5	55	NE	NA
1,1,2-trichlorotrifluoroethane	2	1	590	1,300	NE	NE	NE	NE	NE	NE	NE	NA
1,1-dichloroethene	2	0	NA	630	NE	NE	NE	NE	NE	NE	NE	NA
1,2-dichloroethane	2	0	NA	630	NE	NE	**11**	1,442	2.3	23	NE	NA
1,2-dichloroethene	2	0	NA	630	NE	NE	NE	NE	NE	NE	NE	NA
1,2-dichloropropane	2	0	NA	630	NE	NE	**15**	1,930	3.5	35	NE	NA
2-butanone	2	0	NA	3,100	NE	NE	NE	NE	NE	NE	NE	NA
2-hexanone	2	0	NA	3,100	NE	NE	NE	NE	NE	NE	NE	NA
4-methyl-2-pentanone	2	0	NA	3,100	NE	NE	NE	NE	NE	NE	NE	NA
acetone	2	1	4,400	630	NE	NE	**8,000,000**	350,000,000	2.1	4.5	NE	NA
benzene	125	12	6,830	630	**30**	30	18,181	2,386,363	0.0052	0.052	NE	NA
bromodichloromethane	2	0	NA	630	NE	NE	**16**	2,117	4.2	42	NE	NA
bromoform	2	0	NA	630	NE	NE	**127**	16,614	57	570	NE	NA
bromomethane	2	0	NA	1,300	NE	NE	**112**	4,900	37	83	NE	NA
carbon disulfide	2	0	NA	630	NE	NE	**8,000**	350,000	5,100	11,500	NE	NA
carbon tetrachloride	2	0	NA	630	NE	NE	**7.7**	1,010	4.3	43	NE	NA
chlorobenzene	2	0	NA	630	NE	NE	**1,600**	70,000	2,543	5,562	NE	NA
chloroethane	2	0	NA	1,300	NE	NE	NE	NE	NE	NE	NE	NA
chloroform	1	0	NA	190	NE	NE	**164**	21,516	42	423	NE	NA
chloromethane	2	0	NA	1,300	NE	NE	**77**	10,096	9.9	99	NE	NA
cis-1,2-dichloroethene	2	0	NA	630	NE	NE	NE	NE	NE	NE	NE	NA
cis-1,3-dichloropropene	2	0	NA	630	NE	NE	NE	NE	NE	NE	NE	NA
dibromochloromethane	2	0	NA	630	NE	NE	**12**	1,563	3.3	33	NE	NA
ethylbenzene	125	21	8,640	190	**6,000**	6,000	8,000,000	350,000,000	12	26	NE	NA
hexachloroethane	3	0	NA	170	NE	NE	**71/80**	9,375/3,500	343	1,993	NE	NA
m,p-xylene	27	1	58	70	NE	NE	**160,000**	7,000,000,000	233[2]	511[2]	NE	NA
methylene chloride	2	1	900	1,300	**20**	20	133,333	17,500,000	0.019	0.19	NE	NA
o-xylene	27	1	30	35	NE	NE	**160,000,000**	7,000,000,000	275	602	NE	NA
styrene	2	0	NA	630	NE	NE	**33**	4,375	86	859	NE	NA
tetrachloroethene	2	0	NA	630	NE	NE	NE	NE	NE	NE	NE	NA
toluene	125	16	57,300	630	**7,000**	7,000	6,400,000	280,000,000	7.2	16	NE	NA
total xylenes	125	32	109,000	656	**9,000**	9,000	16,000,000	700,000,000	27	59	NE	NA
trans-1,2-dichloroethene	2	0	NA	630	NE	NE	NE	NE	NE	NE	NE	NA
trans-1,3-dichloropropene	2	0	NA	630	NE	NE	NE	NE	NE	NE	NE	NA
trichloroethene	2	0	NA	630	NE	NE	NE	NE	NE	NE	NE	NA
trichlorofluoromethane	2	0	NA	1,300	NE	NE	**24,000**	1,050,000	NE	NE	NE	NA
vinyl chloride	2	0	NA	1,300	NE	NE	**0.67**	88	0.014	1.4	NE	NA
SVOCs (ug/kg)												
1,2,4-trichlorobenzene	3	0	NA	86	NE	NE	**800**	35,000	8,369	18,830	NE	NA
1,2-dichlorobenzene	3	0	NA	86	NE	NE	**7,200**	315,000	18,310	40,690	NE	NA
1,3-dichlorobenzene	3	0	NA	86	NE	NE	NE	NE	NE	NE	NE	NA
1,4-dichlorobenzene	3	0	NA	86	NE	NE	**42**	5,469	72	717	NE	NA
2,2'-Oxybis(1-Chloropropane)	3	0	NA	86	NE	NE	NE	NE	NE	NE	NE	NA
2,4,5-trichlorophenol	3	0	NA	430	NE	NE	**8,000**	350,000	78,850	177,400	NE	NA
2,4,6-Trichlorophenol	3	0	NA	430	NE	NE	**91**	11,932	101	1,014	NE	NA
2,4-dichlorophenol	3	0	NA	260	NE	NE	**240**	10,500	277	612.7	NE	NA
2,4-dimethylphenol	3	0	NA	170	NE	NE	**1,600**	70,000	2,426	5,306	NE	NA
2,4-dinitrophenol	3	0	NA	860	NE	NE	**160**	7,000	82	179	NE	NA
2,4-dinitrotoluene	3	0	NA	430	NE	NE	**160**	7,000	266	582	NE	NA
2,6-dinitrotoluene	3	0	NA	430	NE	NE	**80**	3,500	107	234	NE	NA
2-chloronaphthalene	3	0	NA	86	NE	NE	NE	NE	NE	NE	NE	NA
2-chlorophenol	3	0	NA	86	NE	NE	**400**	17,500	NE	NE	NE	NA
2-methylnaphthalene	3	3	1,300	NA	NE	NE	**320**	14,000	0.082	0.18	NE	NA
2-methylphenol	3	0	NA	86	NE	NE	NE	NE	NE	NE	NE	NA
2-nitroaniline	3	0	NA	430	NE	NE	NE	NE	NE	NE	NE	NA
2-nitrophenol	3	0	NA	430	NE	NE	NE	NE	NE	NE	NE	NA
3 & 4-methylphenol	3	0	NA	86	NE	NE	NE	NE	NE	NE	NE	NA
3,3'-dichlorobenzidine	3	0	NA	430	NE	NE	**2.2**	292	8.7	87	NE	NA
3-nitroaniline	3	0	NA	430	NE	NE	NE	NE	NE	NE	NE	NA
4,6-dinitro-2-methylphenol	3	0	NA	860	NE	NE	NE	NE	NE	NE	NE	NA
4-bromophenyl-phenylether	3	0	NA	86	NE	NE	NE	NE	NE	NE	NE	NA
4-chloro-3-methylphenol	3	0	NA	170	NE	NE	NE	NE	NE	NE	NE	NA
4-chloroaniline	3	0	NA	260	NE	NE	NE	NE	NE	NE	NE	NA
4-chlorophenyl-phenylether	3	0	NA	86	NE	NE	NE	NE	NE	NE	NE	NA
4-nitroaniline	3	0	NA	430	NE	NE	NE	NE	NE	NE	NE	NA
4-nitrophenol	3	0	NA	430	NE	NE	NE	NE	NE	NE	NE	NA
acenaphthene	6	0	NA	1,000	NE	NE	**4,800**	210,000	285	623	NE	NA
acenaphthylene	9	0	NA	1,000	NE	NE	NE	NE	NE	NE	NE	NA
anthracene	9	0	NA	1,000	NE	NE	**24,000**	1,050,000	6,778	14,830	NE	NA
benzo(a)anthracene	9	0	NA	1,000	See Note 3	See Note 3	See Note 3	See Note 3	See Note 3	See Note 3	NE	NA
benzo(a)pyrene	9	0	NA	1,000	See Note 3	See Note 3	See Note 3	See Note 3	See Note 3	See Note 3	30	NA
benzo(b)fluoranthene	9	1	100	1,000	See Note 3	See Note 3	See Note 3	See Note 3	See Note 3	See Note 3	NE	NA
benzo(g,h,i)perylene	9	1	74	1,000	NE	NE	NE	NE	NE	NE	NE	NA
benzo(k)fluoranthene	9	0	NA	1,000	See Note 3	See Note 3	See Note 3	See Note 3	See Note 3	See Note 3	NE	NA
benzoic acid	3	0	NA	860	NE	NE	**320,000**	14,000,000	NE	NE	NE	NA
benzyl alcohol	3	0	NA	430	NE	NE	**24,000**	1,050,000	NE	NE	NE	NA
bis(2-chloroethoxy)methane	3	0	NA	86	NE	NE	NE	NE	NE	NE	NE	NA
bis(2-chloroethyl)ether	3	0	NA	86	NE	NE	**0.91**	119	NE	NE	NE	NA
bis(2-ethylhexyl)phthalate	3	0	NA	86	NE	NE	**71**	9,375	NE	NE	NE	NA
butylbenzylphthalate	3	1	370	74	NE	NE	**16,000**	700,000	2,696,000	5,898,000	NE	NA

Table 3
Summary Statistics and Potential Cleanup Levels - Soil
Laurel Station
Bellingham, Washington

Analyte	Existing Data Summary				Potential Cleanup Levels							
					Direct Contact				Protection of GW			
	Number of Samples	Number of Detections	Maximum Detection	Maximum Reporting Limit	MTCA Method A (Unrestricted)	MTCA Method A (Industrial)	MTCA Method B	MTCA Method C	MTCA Method B	MTCA Method C	MTCA TEE	NBSM
SVOCs (ug/kg) (continued)												
carbazole	3	0	NA	86	NE	NE	**50**	6,563	909	9,089	NE	NA
chrysene	9	2	98	1,000	See Note 3	See Note 3	See Note 3	See Note 3	See Note 3	See Note 3	NE	NA
dibenz(a,h)anthracene	9	1	46	1,000	See Note 3	See Note 3	See Note 3	See Note 3	See Note 3	See Note 3	NE	NA
dibenzofuran	3	1	49	86	NE	NE	**160**	7,000	82	179	NE	NA
diethylphthalate	3	0	NA	86	NE	NE	NE	NE	NE	NE	NE	NA
dimethylphthalate	3	0	NA	86	NE	NE	**80,000**	3,500,000	40,960	89,600	NE	NA
di-n-butylphthalate	3	0	NA	86	NE	NE	NE	NE	NE	NE	200	NA
di-n-octylphthalate	3	0	NA	86	NE	NE	**1,600**	70,000	1,594,000,000	3,486,000,000	NE	NA
fluoranthene	9	1	75	1,000	NE	NE	**3,200**	140,000	1,887	4,128	NE	NA
fluorene	9	6	1,200	1,000	NE	NE	**3,200**	140,000	698	651	NE	NA
hexachlorobenzene	3	0	NA	86	NE	NE	**0.63**	82	264	2,641	NE	NA
hexachlorocyclopentadiene	3	0	NA	430	NE	NE	**480**	21,000	NE	NE	NE	NA
indeno[1,2,3-cd]pyrene	9	1	70	1,000	See Note 3	See Note 3	See Note 3	See Note 3	See Note 3	See Note 3	NE	NA
isophorone	3	0	NA	86	NE	NE	**1,053**	138,158	248	2,475	NE	NA
naphthalene	9	7	5,500	1,000	5	5	**1,600**	70,000	12	26	NE	NA
nitrobenzene	3	0	NA	86	NE	NE	**40**	1,750	39	85.9	NE	NA
n-nitroso-di-n-propylamine	3	0	NA	86	NE	NE	**0.14**	19	NE	NE	NE	NA
n-nitrosodiphenylamine	3	1	200	86	NE	NE	**204**	26,786	NE	NE	NE	NA
pentachlorophenol	3	0	NA	430	NE	NE	**8.3**	1,094	28	277	11	NA
phenanthrene	9	7	800	1,000	NE	NE	NE	NE	NE	NE	NE	NA
phenol	3	0	NA	170	NE	NE	**48,000**	2,100,000	20,640	47,300	NE	NA
pyrene	9	2	77	1,000	NE	NE	**2,400**	105,000	1,959	4,286	NE	NA
TTEC cPAH	63	5	22.58	NA	**100**	2,000	137	NE	0.7	7	NE	NA
PCBs (mg/kg)												
aroclor 1016/1242	10	0	NA	0.05	**1**[9]	NE	5.6	245	7.2	16	2	NA
aroclor 1248	10	0	NA	0.05	**1**[9]	NE	NE	NE	NE	NE	2	NA
aroclor 1254	10	0	NA	0.05	**1**[9]	NE	1.6	70	0.00082	0.0018	2	NA
aroclor 1260	10	0	NA	0.05	**1**[9]	NE	NE	NE	NE	NE	2	NA
Pesticides (mg/kg)												
hexachlorobutadiene	3	0	NA	0.17	NE	NE	**13**	700	1,816	11,350	NE	NA
Metals (mg/kg)												
antimony	3	0	NA	7	NE	NE	**32**	1,400	0.016	0.036	NE	NE
arsenic	3	3	6.4	NA	**20**	20	0.66	88	0.00015	0.0015	20/95[5]	7
beryllium	3	3	0.5	NA	NE	NE	**160**	7,000	0.082	0.18	25	0.6
cadmium	3	0	NA	0.3	**2**	2	80	3,500	0.020	0.045	25	1
chromium	3	3	52.2	NA	2,000/19[6]	2,000/19[6]	240	10,500	**61/0.12**[6]	134/0.27[6]	42	48
copper	3	3	31	NA	NE	NE	**2,960**	129,500	1.516	3.3	100	36
lead	3	3	6.4	NA	**250**	1,000	NE	NE	0.039[7]	0.038[7]	220	24
mercury	3	1	0.07	0.07	**2**	2	24	1,050	0.014	0.031	9/0.7[8]	0.07
nickel	3	3	45	NA	NE	NE	1,600[4]	70,000	0.82	1.8	100	**48**
selenium	3	1	0.3	0.1	NE	NE	400	17,500	0.20	0.45	0.8	**38**
silver	3	1	0.5	0.3	NE	NE	**400**	17,500	0.20	0.45	NE	NE
thallium	3	0	NA	0.1	NE	NE	**5.6**[4]	245	0.0029	0.0063	NE	NE
zinc	3	3	119	NA	NE	NE	**24,000**	1,050,000	12	27	270	85

Notes:
Bolded values indicate the selected Preliminary Cleanup Level for each analyte
GW - groundwater
MTCA - Model Toxics Control Act
TEE - terrestrial ecological evaluation
NBSM - Natural Background Soil Metals Concentrations in Washington State, Puget Sound Region 90th Percentile Value, October 1994.
TPH - total petroleum hydrocarbons
VOCs - volatile organic compounds
SVOCs - semivolatile organic compounds
PCBs - polychlorinated biphenyls
mg/kg - milligrams per kilogram
ug/kg - micrograms per kilogram
NA - not applicable
NE - not established

[1] gasoline mixtures without benzene/gasoline mixtures with benzene

[2] Value for m-xylene used in calculation, p-xylene value is NE

[3] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8).
The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene.

[4] For nickel and thallium, value is for soluble salts

[5] ArsenicIII/ArsenicV

[6] ChromiumIII/ChromiumVI

[7] MTCA Method A groundwater value used for calculation because no Method B or C values are available for lead

[8] inorganic/organic

[9] Preliminary Cleanup Level is for the total mixture of PCBs using TEQ summation

Table 4
Summary Statistics and Potential Cleanup Levels - Groundwater
Laurel Station
Bellingham, Washington

Analyte	Existing Data Summary				Potential Cleanup Levels		
	Number of Samples	Number of Detections	Maximum Detection	Maximum Reporting Limit	MTCA Method A	MTCA Method B	MTCA Method C
Field Analyses (mg/L)							
TPH - field screen	8	8	0.43	NA	NA	NA	NA
TPH (mg/L)							
EPH (C10-C19)	5	0	NA	0.08	NE	NE	NE
EPH (C19-C32)	5	0	NA	0.08	NE	NE	NE
HEPH (C19-C32 less PAH)	5	0	NA	0.08	NE	NE	NE
LEPH (C10-C19 less PAH)	5	0	NA	0.08	NE	NE	NE
TPH - diesel range	11	2	370	250	**0.5**	NE	NE
TPH - gasoline range	11	0	NA	250	**0.8/1.0** [1]	NE	NE
TPH - motor oil range	11	0	NA	500	**0.5**	NE	NE
TPH by 418.1	9	1	18	1	NE	NE	NE
VH C6-C10	8	0	NA	100	NE	NE	NE
VPHw (VHWL to 10-BTEX)	8	0	NA	100	NE	NE	NE
VOCs (ug/L)							
1,1,1-trichloroethane	9	1	5.7	1	**200**	7,200	15,750
1,1,2,2-tetrachloroethane	9	0	NA	1	NE	**0.22**	2.19
1,1,2-trichloroethane	9	0	NA	1	NE	**0.77**	7.77
1,1,2-trichlorotrifluoroethane	9	0	NA	2	NE	NE	NE
1,1-dichloroethane	9	1	1.2	1	NE	**1,600**	3,500
1,1-dichloroethene	9	0	NA	1	NE	NE	NE
1,2-dichloroethane	9	0	NA	1	5	**0.48**	4.81
1,2-dichloropropane	9	0	NA	1	NE	**0.64**	6.43
2-butanone	9	0	NA	5	NE	NE	NE
2-chloroethylvinylether	9	0	NA	1	NE	NE	NE
2-hexanone	9	0	NA	5	NE	NE	NE
4-methyl-2-pentanone	9	0	NA	5	NE	NE	NE
acetone	9	0	NA	5	NE	**800**	1,750
benzene	29	1	1.3	1	5	**0.795**	7.95
bromodichloromethane	9	0	NA	1	NE	**0.71**	7.06
bromoform	9	0	NA	1	NE	**5.5**	55
bromomethane	9	0	NA	2	NE	**11**	24.5
carbon disulfide	9	0	NA	1	NE	**800**	1,750
carbon tetrachloride	9	0	NA	1	NE	**0.34**	3.37
chlorobenzene	9	0	NA	1	NE	**160**	350
chloroethane	9	0	NA	2	NE	NE	NE
chloroform	9	1	14	2	NE	**7.2**	72
chloromethane	9	1	1.6	4	NE	**3.4**	34
cis-1,2-dichloroethene	9	0	NA	1	NE	NE	NE
cis-1,3-dichloropropene	9	0	NA	1	NE	NE	NE
dibromochloromethane	9	0	NA	1	NE	**0.52**	5.2
ethylbenzene	28	0	NA	2	**700**	800	1,750
m,p-xylene	8	0	NA	0.5	NE	**1,600**	35,000
methyl tert-butyl ether	8	0	NA	4	**20**	24	243
methylene chloride	9	0	NA	2	5	5.8	58
o-xylene	8	0	NA	0.5	NE	**16,000**	35,000
styrene	17	0	NA	1	NE	**1.5**	15
tetrachloroethene	9	0	NA	1	NE	NE	NE
toluene	27	1	0.771	2	1,000	**640**	1,400
total xylenes	28	1	1.25	4	**1,000**	1,600	3,500
trans-1,2-dichloroethene	9	0	NA	1	NE	NE	NE
trans-1,3-dichloropropene	9	0	NA	1	NE	NE	NE
trichloroethene	9	0	NA	1	NE	NE	NE
trichlorofluoromethane	9	0	NA	2	NE	**2,400**	5,250
vinyl acetate	9	0	NA	1	NE	**8,000**	17,500
vinyl chloride	9	0	NA	2	0	**0.03**	0.29

Table 4
Summary Statistics and Potential Cleanup Levels - Groundwater
Laurel Station
Bellingham, Washington

Analyte	Existing Data Summary				Potential Cleanup Levels		
	Number of Samples	Number of Detections	Maximum Detection	Maximum Reporting Limit	MTCA Method A	MTCA Method B	MTCA Method C
SVOCs (ug/L)							
1-methylnaphthalene	4	2	0.023	0.01	NE	NE	NE
2-methylnaphthalene	13	5	0.43	0.01	NE	**32**	70
acenaphthene	5	1	0.01	0.01	NE	**960**	2,100
acenaphthylene	5	0	NA	0.01	NE	NE	NE
acridine	5	0	NA	0.05	NE	NE	NE
anthracene	5	0	NA	0.01	NE	**4,800**	10,500
benzo(a)anthracene	5	1	0.01	0.01	See Note 2	See Note 2	See Note 2
benzo(a)pyrene	13	2	0.02	0.01	See Note 2	See Note 2	See Note 2
benzo(b)fluoranthene	5	1	0.01	0.02	See Note 2	See Note 2	See Note 2
benzo(b,k)fluoranthene	5	1	0.03	0.02	NE	NE	NE
benzo(g,h,i)perylene	5	1	0.01	0.02	NE	NE	NE
benzo(k)fluoranthene	5	3	0.04	0.01	See Note 2	See Note 2	See Note 2
chrysene	5	0	NA	0.02	See Note 2	See Note 2	See Note 2
dibenz(a,h)anthracene	5	3	0.02	0.01	See Note 2	See Note 2	See Note 2
fluoranthene	5	2	0.04	0.01	NE	**640**	1,400
fluorene	5	0	NA	0.02	NE	**640**	1,400
indeno[1,2,3-cd]pyrene	13	5	0.11	0.011	See Note 2	See Note 2	See Note 2
naphthalene	5	5	0.12	NA	160	**160**	350
phenanthrene	5	5	0.03	NA	NE	NE	NE
pyrene	5	0	NA	0.05	NE	**480**	1,050
quinoline	5	3	0.02	0	NE	**0.0036**	0.036
TTEC cPAH	51	15	0.026	NA	0.1	**0.012**	0.12
Metals (mg/L)							
antimony	7	5	0.003	0.001	NE	NE	NE
arsenic	7	6	0.083	0.002	**0.005**	0.00006 [3]	0.00058 [3]
beryllium	7	4	0.006	0.001	NE	**0.032**	0.07
cadmium	7	1	0.002	0.002	**0.005**	0.008	0.0175
chromium	7	7	0.767	NA	**0.05** [4]	24/.048 [4]	53/0.11 [4]
copper	7	7	0.523	NA	NE	**0.59**	1.3
lead	7	7	0.167	NA	**0.015**	NE	NE
mercury	7	1	0.0001	0.001	**0.002**	0.0048	0.011
nickel	7	7	0.6	NA	NE	**0.32**	0.7
selenium	7	1	0.024	0.01	NE	NE	NE
silver	7	0	NA	0.003	NE	NE	NE
thallium	7	3	0.009	0.005	NE	NE	NE
zinc	7	7	1.03	NA	NE	**4.8**	105
Conventionals (mg/L)							
chloride	7	7	41.7	NA	NE	**800**	1,750
nitrate as N	8	5	0.615	0.01	NE	NE	NE
nitrite as N	8	1	0.011	0.01	NE	NE	NE
pH	8	8	8.23	NA	NE	NE	NE
sulfate	8	8	329.3	NA	NE	NE	NE
total dissolved solids	8	8	8,523	NA	NE	NE	NE

Notes:
Bolded values indicate the selected Preliminary Cleanup Level for each analyte
MTCA - Model Toxics Control Act
TPH - total petroleum hydrocarbons
EPH - extractable petroleum hydrocarbons
HEPH - heavy extractable petroleum hydrocarbons
LEPH - light extractable petroleum hydrocarbons
VH - volatile hydrocarbons
VPHw - volatile petroleum hydrocarbons in water
VOCs - volatile organic compounds
SVOCs - semivolatile organic compounds
TTEC - total toxicity equivalent concentration
NA - not applicable
NE - not established
mg/L - milligrams per liter
ug/L - micrograms per liter
[1] Gasoline with benzene present/without benzene present
[2] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene.
[3] Carcinogenic value for inorganic arsenic
[4] Chromium III/ChromiumVI

Table 5
Summary Statistics and Potential Cleanup Levels - Surface Water
Laurel Station
Bellingham, Washington

Analyte	Existing Data Summary				Potential Cleanup Levels							
	Number of Samples	Number of Detections	Maximum Detection	Maximum Reporting Limit	MTCA Method A[1]	MTCA Method B	MTCA Method C	CWA Section 304	NRWQC (Water & Org)	NRWQC (Org Only)	SWQC (acute)	SWQC (chronic)
TPH (mg/L)												
TPH - diesel range	48	2	0.35	3	**0.5**	NE	NE	NE	NE	NE	NE	NE
TPH - gasoline range	115	1	0.95	0.5	**0.8/1.0**[2]	NE	NE	NE	NE	NE	NE	NE
TPH by 418.1	190	23	12	1	NE	NE	NE	NE	NE	NE	NE	NE
VOCs (ug/L)												
benzene	222	6	1,400	29.4	NE	23[3]	567[3]	2.2	**1.2**	71	NE	NE
toluene	222	8	2,170	29.4	NE	18,900[4]	47,100[4]	**1,300**	6,800	200,000	NE	NE
ethylbenzene	222	3	2.1	29.4	NE	6,914[4]	17,284[4]	**530**	3,100	29,000	NE	NE
total xylenes	222	10	2,330	58.8	NE	NE	NE	NE	NE	NE	NE	NE
Polycyclic Aromatic Hydrocarbons (PAHs) (ug/L)												
acenapthene	1	0	NA	12	NE	**643**[4]	1,607[4]	670	NE	NE	NE	NE
acenaphthylene	1	0	NA	12	NE	NE	NE	NE	NE	NE	NE	NE
anthracene	1	0	NA	12	NE	25,926[4]	64,815[4]	**8,300**	9,600	110,000	NE	NE
benzo(g,h,i)perylene	1	0	NA	12	NE	NE	NE	NE	NE	NE	NE	NE
fluoranthene	1	0	NA	12	NE	**90**[4]	225[4]	130	300	370	NE	NE
fluorene	1	1	5	NA	NE	3,457[4]	8,642[4]	**1,100**	1,300	14,000	NE	NE
naphthalene	1	1	120	NA	NE	**4,938**[4]	12,346[4]	NE	NE	NE	NE	NE
phenanthrene	1	1	2	NA	NE	NE	NE	NE	NE	NE	NE	NE
pyrene	1	0	NA	12	NE	2,593[4]	6,481[4]	**830**	960	11,000	NE	NE
Carcinogenic PAHs (ug/L)												
benzo(a)pyrene	1	0	NA	12	NE	See Note 5	See Note 5	0.0038	0.0028	0.031	NE	NE
benzo(a)anthracene	1	0	NA	12	NE	See Note 5	See Note 5	0.0038	0.0028	0.031	NE	NE
benzo(b)fluoranthene	1	0	NA	12	NE	See Note 5	See Note 5	0.0038	0.0028	0.031	NE	NE
benzo(k)fluoranthene	1	0	NA	12	NE	See Note 5	See Note 5	0.0038	0.0028	0.031	NE	NE
dibenzo(a,h)anthracene	1	0	NA	12	NE	See Note 5	See Note 5	0.0038	0.0028	0.031	NE	NE
chrysene	1	0	NA	12	NE	See Note 5	See Note 5	0.0038	0.0028	0.031	NE	NE
indeno(1,2,3-c,d)pyrene	1	0	NA	12	NE	See Note 5	See Note 5	0.0038	0.0028	0.031	NE	NE
TTEC cPAH	7	0	NA	NA	NE	NE	NE	NE	**0.0028**	NE	NE	NE

Notes:
Bolded values indicate the selected Preliminary Cleanup Level for each analyte
MTCA - Model Toxics Control Act
CWA Section 304 - Clean Water Act Section 304
NRWQC (Water & Org) - National Recommended Water Quality Criteria (NTR 40 CFR 131.36, 2006) for protection of human health via consumption of water and organisms
NRWQC (Org Only) - National Recommended Water Quality Criteria (NTR 40 CFR 131.36, 2006) for protection of human health via consumption of organisms only
SWQC (acute) - state surface water quality criteria for freshwater acute exposure to toxics substances (WAC 173-201A, Table 240[3]) for protection of aquatic organisms
SWQC (chronic) - state surface water quality criteria for freshwater chronic exposure to toxics substances (WAC 173-201A, Table 240[3]) for protection of aquatic organisms
TPH - total petroleum hydrocarbons
VOCs - volatile organic compounds
mg/L - milligrams per liter
ug/L - micrograms per liter
NE - not established
[1] MTCA Method A values taken from WAC 173-340-900, Table 720-1, Method A Cleanup Levels for Ground Water
[2] Gasoline with benzene present/without benzene present
[3] Carcinogenic value
[4] Non-carcinogenic value
[5] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8).
The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene.

Table 6
Potential Cleanup Levels for Air
Laurel Station
Bellingham, Washington

Analyte	Potential Cleanup Levels				
	MTCA Method B (ug/m^3)	**MTCA Method C (ug/m^3)**	**Inhalation Cancer Potency Factor (kg-day/mg)**	**Inhalation Correction Factor (unitless)**	**Inhalation Reference Dose mg/kg-day)**
VOCs					
1,1,1-trichloroethane	**4,800**	10,500	NE	2	3
1,1,2-trichloroethane	**0.15625**	1.5625	0.056	2	NE
1,1,2,2-tetrachloroethane	**0.0431**	0.4310	0.203	2	NE
1,1-dichloroethane	**320**	700	NE	2	0.2
1,2-dichloroethane	**0.0962**	0.9615	0.091	2	0.0014
1,2-dichloropropane	**1.8286**	4	NE	2	0.0011
4-methyl-2-pentanone	**32**	70	NE	2	0.02
acetone	NE	NE	NE	2	NE
benzene	**0.3205**	3.2051	0.0273	2	0.0086
bromodichloromethane	NE	NE	NE	2	NE
bromomethane	**2.2857**	5	NE	2	0.0014
carbon disulfide	**320**	700	NE	2	0.2
carbon tetrachloride	**0.1667**	1.6667	0.0525	2	NE
chlorobenzene	**8**	17.5	NE	2	0.005
chloroform	**0.1087**	1.0870	0.0805	2	NE
chloromethane	**1.3889**	13.8889	0.0063	2	NE
dibromochloromethane	NE	NE	NE	2	NE
ethylbenzene	**457**	1,000	NE	2	0.286
m-xylene	**46.4**	102	NE	2	0.029
methyl tert-butyl ether	**9.62**	96.2	NE	2	0.8571
methylene chloride	**5.3191**	53.1915	0.0016	2	0.8571
o-xylene	**46.4**	102	NE	2	0.029
p-xylene	NE	NE	NE	2	NE
styrene	**4.375**	43.75	0.002	2	0.2857
toluene	**2,240**	4,900	NE	2	1.4
trichlorofluoromethane	**320**	700	NE	2	0.2
vinyl acetate	**91.4286**	200	NE	2	0.0571
vinyl chloride	**0.2841**	2.8409	0.0308	2	0.0286
xylenes (total)	**46**	102	NE	2	0
SVOCs					
1-methylnaphthalene	NE	NE	NE	2	NE
1,2,4-trichlorobenzene	**91.4286**	200	NE	2	0.0571
2-methylnaphthalene	NE	NE	NE	2	NE
2-chlorophenol	NE	NE	NE	2	NE
1,2-dichlorobenzene	**64**	140	NE	2	0.04
1,4-dichlorobenzene	**365.7143**	800	NE	2	0.2286
bis(2-chloroethyl)ether	**0.0076**	0.0758	1.155	2	NE
acenaphthene	NE	NE	NE	1	NE
anthracene	NE	NE	NE	1	NE
fluorene	NE	NE	NE	1	NE
naphthalene	**1.3714**	3	NE	2	0.0009
nitrobenzene	**0.2743**	0.6	NE	2	0.0002
pyrene	NE	NE	NE	1	NE
Metals					
mercury	**0.1371**	0.3	NE	1	8.5714E-05

Notes:
Method B values are selected as preliminary air cleanup values for all potential contaminants, because of the potential for future residential use of the property.
MTCA - Model Toxics Control Act
ug/m^3 - micrograms per cubic meter

Table 7
Summary of Soil Analytical Results – Historic Spills and Releases
Laurel Station
Bellingham, Washington

			Field Analyses (mg/kg)	VOCs (ug/kg)				TPH (mg/kg)		
Sample ID	**Sample Depth (feet bgs)**	**Sample Date**	**TPH - field screen**	**Benzene**	**Toluene**	**Ethylbenzene**	**Xylenes**	**Gasoline Range**	**Diesel Range**	**Heavy Oil Range**
HA-3-1	0.3	1/8/1992	25 U	--	--	--	--	--	--	--
HA-3-2	0.3	1/8/1992	200 J	--	--	--	--	--	--	--
HA-3-3	0.3	1/8/1992	25 U	--	--	--	--	--	--	10 U[1]
HA-3-4	0.5	1/28/1992	25 U	--	--	--	--	--	--	--
	5		25 U	--	--	--	--	--	--	--
	8		25 U	--	--	--	--	--	--	--
HA-3-5	0.5	1/28/1992	25 U	--	--	--	--	--	--	--
	5		25 U	--	--	--	--	--	--	--
	8		25 U	--	--	--	--	--	--	--
TM-B7	3	12/10/1991	25 U	--	--	--	--	--	--	--
	8		25 U	--	--	--	--	--	--	10 U[1]
TM-B8	4	12/11/1991	25 U	--	--	--	--	--	--	--
	9		140 J	--	--	--	--	--	--	--
	34		25 U	--	--	--	--	--	--	--
TM-B13	9	2/20/1992	25 U	--	--	--	--	--	--	--
	24		25 U	--	--	--	--	--	10 U	--
TP-19	1	1/15/1992	25 U	--	--	--	--	--	--	--
	5		25 U	--	--	--	--	--	--	--
	10		25 U	--	--	--	--	--	--	--
TP-20	1	1/15/1992	40	--	--	--	--	--	--	--
	5		25 U	--	--	--	--	--	--	--
	10		25 U	--	--	--	--	--	10 U	10 U[1]
TP-21	1	1/15/1992	50	--	--	--	--	--	16	--
	5		25 U	--	--	--	--	--	--	--
	10		25 U	--	--	--	--	--	--	--
TP-22	1	1/16/1992	25 U	--	--	--	--	--	--	--
	5		25 U	--	--	--	--	--	10 U	--
	10		25 U	--	--	--	--	--	--	--
TP-23	1	1/16/1992	30	--	--	--	--	--	--	--
	5		25 U	--	--	--	--	--	--	--
	10		25 U	--	--	--	--	--	--	--
Preliminary Cleanup Level[2]			**460**	**30**	**7,000**	**6,000**	**9,000**	**100/30[3]**	**460**	**2,000**

Table 7
Summary of Soil Analytical Results – Historic Spills and Releases
Laurel Station
Bellingham, Washington

			Field Analyses (mg/kg)	VOCs (ug/kg)				TPH (mg/kg)		
Sample ID	**Sample Depth (feet bgs)**	**Sample Date**	**TPH - field screen**	**Benzene**	**Toluene**	**Ethylbenzene**	**Xylenes**	**Gasoline Range**	**Diesel Range**	**Heavy Oil Range**
TP-24	1	1/16/1992	25 U	--	--	--	--	--	7.6 J	--
	5		25 U	--	--	--	--	--	--	--
	10		25 U	--	--	--	--	--	--	--
TP-3-1	0.5	1/29/1992	80 E	--	--	--	--	--	--	--
	5		25 U	--	--	--	--	--	--	--
	10		25 U	--	--	--	--	--	--	--
TP-3-2	0.5	1/29/1992	5.5 EJ	--	--	--	--	--	--	--
	5		**4,000 E**	--	--	--	--	--	--	--
	10		25 U	--	--	--	--	--	--	--
TP-3-3	0.5	1/29/1992	25 U	--	--	--	--	--	--	--
	5		15 J	--	--	--	--	--	--	--
	10		25 U	--	--	--	--	--	--	--
TP-5-1	1	1/22/1992	25 U	--	--	--	--	--	--	--
	5		25 U	--	--	--	--	--	--	--
	10		25 U	--	--	--	--	--	--	--
TP-5-2	1	1/22/1992	25 U	--	--	--	--	--	--	--
	5		25 U	--	--	--	--	--	--	--
	10		25 U	--	--	--	--	--	--	--
TP-5-3	1	1/22/1992	25 U	--	--	--	--	--	--	--
	5		25 U	--	--	--	--	--	--	--
	10		25 U	--	--	--	--	--	--	--
TP-5-4	1	1/22/1992	25 U	--	--	--	--	--	--	--
	5		25 U	--	--	--	--	--	--	--
	10		25 U	--	--	--	--	--	--	--
	14		--	--	--	--	--	--	--	10 U[1]
TP-5-5	1	1/22/1992	25 U	--	--	--	--	--	--	--
	5		25 U	--	--	--	--	--	--	--
	10		25 U	--	--	--	--	--	--	--
TP-5-6	1	1/22/1992	25 U	--	--	--	--	--	--	--
	5		25 U	--	--	--	--	--	--	--
	10		25 U	--	--	--	--	--	--	--
Preliminary Cleanup Level[2]			**460**	**30**	**7,000**	**6,000**	**9,000**	**100/30[3]**	**460**	**2,000**

Table 7
Summary of Soil Analytical Results – Historic Spills and Releases
Laurel Station
Bellingham, Washington

			Field Analyses (mg/kg)	VOCs (ug/kg)				TPH (mg/kg)		
Sample ID	**Sample Depth (feet bgs)**	**Sample Date**	**TPH - field screen**	**Benzene**	**Toluene**	**Ethylbenzene**	**Xylenes**	**Gasoline Range**	**Diesel Range**	**Heavy Oil Range**
08-B2	1	3/3/2008	--	14 U	14 U	14 U	28 U	5.6 U	5.6 U	11
	3		--	11 U	11 U	11 U	22 U	4.5 U	5.4 U	11 U
	4.5		--	18 U	18 U	18 U	36 U	7.3 U	6.8 U	14 U
08-B3	1	3/3/2008	--	23 U	23 U	23 U	46 U	9.1 U	19	51
	3		--	32 U[4]	32 U	32 U	64 U	13 U	41	60
	4.5		--	**33**	28 U	28 U	58	11 U	8.7	13 U
08-B4	1	3/3/2008	--	20 U	20 U	20 U	39 U	38	6.3 U	15
	3	3/13/2008	--	18 U	18 U	18 U	36 U	7.1 U	6.0 U	12 U
	4.5		--	16 U	16 U	16 U	32 U	6.4 U	6.0 U	12 U
08-B5	1	3/3/2008	--	17 U	17 U	17 U	35 U	6.9 U	6.2 U	12 U
	3		--	16 U	16 U	16 U	32 U	6.3 U	6.3 U	13 U
	4.5		--	14 U	14 U	14 U	28 U	5.7 U	5.8 U	12 U
08-B6	1	3/3/2008	--	18 U	18 U	18 U	35 U	7.0 U	6.0 U	12 U
	3		--	13 U	13 U	13 U	26 U	5.1 U	5.3 U	10 U
Tank 170-1	0.5	3/3/2008	--	11 U	11 U	11 U	22 U	6.2	130	190
	2		--	14 U	14 U	14 U	28 U	7.8	36	34
Tank 170-2	0.5	3/3/2008	--	15 U	15 U	15 U	29 U	8.4	25	21
	2		--	20 U	20 U	20 U	40 U	7.9 U	5.8 U	12 U
	3.5		--	35 U[4]	35 U	35 U	70 U	14 U	5.5 U	11 U
Tank 180-1	0.5	3/3/2008	--	20 U	21	20 U	30	**150**	**1,900**	**2,500**
	2		--	14 U	14 U	14 U	27 U	**300**	**2,200**	**2,300**
	3		--	16 U	16 U	16 U	33 U	**350**	**3,100**	**3,500**
Tank 180-2	0.5	3/19/2008	--	14 U	14 U	14 U	28 U	5.6 U	5.3 U	11 U
	1.5		--	13 U	13 U	13 U	25 U	5.1 U	6.0 U	12 U
	4		--	14 U	14 U	14 U	29 U	5.8 U	6.1 U	12 U
Tank 180-3	0.5	3/19/2008	--	14 U	14 U	14 U	29 U	5.8 U	6.0 U	12 U
	1.5		--	16 U	16 U	16 U	32 U	9.1	5.3 U	11 U
	3		--	11 U	11 U	11 U	23 U	4.5 U	5.4 U	11 U
Preliminary Cleanup Level[2]			**460**	**30**	**7,000**	**6,000**	**9,000**	**100/30[3]**	**460**	**2,000**

Notes:

Bolded values indicate the Preliminary Cleanup Level was exceeded
VOCs - volatile organic compounds
TPH - total petroleum hydrocarbons
ug/kg - micrograms per kilogram
mg/kg - milligrams per kilogram
bgs - below ground surface
NA - not available
-- - not analyzed
U - not detected above the reporting limit shown
E or J - estimated
[1] Detected by Method 418.1
[2] See Table 3 for Preliminary Cleanup Level rationale
[3] Gasoline mixtures without benzene/gasoline mixtures with benzene
[4] Not detected; however, laboratory reporting limit exceeds the Preliminary Cleanup Level.

Table 8
Summary of Soil Analytical Results -
1991 Purnell Investigation (Area 1 and Area 2)
Laurel Station
Bellingham, Washington

AREA	STUDY UNIT 1			AREA 1										Preliminary Cleanup Level[1]
Sample ID	**TH-1**	**TH-3**	**TH-4**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	
Sample Depth (inches bgs)	63	56	54	0-10	10-36	10-20	10-20	0-10	0-10	0-10	0-10	0-10	10-16	
Sample Date	2/1/1991	2/1/1991	2/1/1991	2/18/1991	2/18/1991	2/18/1991	2/18/1991	2/18/1991	2/18/1991	2/18/1991	2/18/1991	2/18/1991	2/18/1991	
Total Petroleum Hydrocarbons (mg/kg)														
Diesel-range	10 U	72	12	**3,976**	**4,215**	78	10 U	**2,946**	**8,085**	**1,863**	**1,551**	10 U	**857**	**460**
Volatile Organic Compounds (ug/kg)														
Benzene	--	--	--	**6,830**	**260**	50 U[2]	--	50 U[2]	50 U[2]	50 U[2]	50 U[2]	--	**860**	**30**
Toluene	--	--	--	**57,300**	5,800	50 U	--	50 U	1,680	210	280	--	**8,300**	**7,000**
Ethylbenzene	--	--	--	**8,640**	670	50 U	--	70	210	80	240	--	420	**6,000**
Xylenes (total)	--	--	--	**89,900**	**17,900**	80	--	880	3,730	1,540	5,000	--	**16,800**	**9,000**
Polycyclic Aromatic Hydrocarbons (PAHs) (ug/kg)														
Naphthalene	--	--	--	--	--	--	--	--	--	--	--	--	--	**1,600**
2-Methylnaphthalene	--	--	--	--	--	--	--	--	--	--	--	--	--	**320**
Fluoranthene	--	--	--	--	--	--	--	--	--	--	--	--	--	**3,200**
Fluorene	--	--	--	--	--	--	--	--	--	--	--	--	--	**3,200**
Pyrene	--	--	--	--	--	--	--	--	--	--	--	--	--	**2,400**
Phenanthrene	--	--	--	--	--	--	--	--	--	--	--	--	--	**NE**
Carcinogenic PAHs (ug/kg)														
Benzo(a)pyrene	--	--	--	--	--	--	--	--	--	--	--	--	--	**See Note[3]**
Benzo(a)anthracene	--	--	--	--	--	--	--	--	--	--	--	--	--	**See Note[3]**
Benzo(b)fluoranthene	--	--	--	--	--	--	--	--	--	--	--	--	--	**See Note[3]**
Benzo(k)fluoranthene	--	--	--	--	--	--	--	--	--	--	--	--	--	**See Note[3]**
Dibenz(a,h)anthracene	--	--	--	--	--	--	--	--	--	--	--	--	--	**See Note[3]**
Chrysene	--	--	--	--	--	--	--	--	--	--	--	--	--	**See Note[3]**
Indeno(1,2,3-c,d)pyrene	--	--	--	--	--	--	--	--	--	--	--	--	--	**See Note[3]**
TTEC	--	--	--	--	--	--	--	--	--	--	--	--	--	**100**

Notes:
Bolded values indicate the Preliminary Cleanup Level was exceeded.
U - not detected above the reporting limit shown
UJ - compound was analyzed for but not detected above the reporting limit shown. Reporting limit is estimated.
J - estimated
NA - not available
NC - not calculated
NE - not established
TTEC - total toxicity equivalency concentration
-- - not analyzed
bgs - below ground surface
mg/kg - milligrams per kilogram
TPH - total petroleum hydrocarbons
ug/kg - micrograms per kilogram
VOCs - volatile organic compounds

[1] See Table 3 for Preliminary Cleanup Level rationale

[2] Not detected; however, laboratory reporting limit exceeds the Preliminary Cleanup Level.

[3] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8).
The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene.

Table 8
Summary of Soil Analytical Results -
1991 Purnell Investigation (Area 1 and Area 2)
Laurel Station
Bellingham, Washington

AREA	AREA 1										
Sample ID	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**Preliminary Cleanup Level[1]**
Sample Depth (inches bgs)	0-10	0-10	10-14	0-10	0-10	0-10	10-24	0-10	6-10	10-24	
Sample Date	2/18/1991	2/18/1991	2/18/1991	2/18/1991	2/18/1991	2/18/1991	2/18/1991	2/18/1991	2/18/1991	2/18/1991	
Total Petroleum Hydrocarbons (mg/kg)											
Diesel-range	**1,222**	10 U	**15,411**	10 U	**1,501**	**4,169**	10 U	10 U	344	50	**460**
Volatile Organic Compounds (ug/kg)											
Benzene	50 U[2]	--	**1,940**	--	50 U[2]	**130**	--	--	50 U[2]	--	**30**
Toluene	50 U	--	**31,400**	--	120	3,700	--	--	50 U	--	**7,000**
Ethylbenzene	80	--	**6,010**	--	50 U	1,050	--	--	50 U	--	**6,000**
Xylenes (total)	1,050	--	**109,000**	--	450	**19,800**	--	--	180	--	**9,000**
Polycyclic Aromatic Hydrocarbons (PAHs) (ug/kg)											
Naphthalene	--	--	--	--	--	--	--	--	--	--	**1,600**
2-Methylnaphthalene	--	--	--	--	--	--	--	--	--	--	**320**
Fluoranthene	--	--	--	--	--	--	--	--	--	--	**3,200**
Fluorene	--	--	--	--	--	--	--	--	--	--	**3,200**
Pyrene	--	--	--	--	--	--	--	--	--	--	**2,400**
Phenanthrene	--	--	--	--	--	--	--	--	--	--	**NE**
Carcinogenic PAHs (ug/kg)											
Benzo(a)pyrene	--	--	--	--	--	--	--	--	--	--	**See Note[3]**
Benzo(a)anthracene	--	--	--	--	--	--	--	--	--	--	**See Note[3]**
Benzo(b)fluoranthene	--	--	--	--	--	--	--	--	--	--	**See Note[3]**
Benzo(k)fluoranthene	--	--	--	--	--	--	--	--	--	--	**See Note[3]**
Dibenz(a,h)anthracene	--	--	--	--	--	--	--	--	--	--	**See Note[3]**
Chrysene	--	--	--	--	--	--	--	--	--	--	**See Note[3]**
Indeno(1,2,3-c,d)pyrene	--	--	--	--	--	--	--	--	--	--	**See Note[3]**
TTEC	--	--	--	--	--	--	--	--	--	--	**100**

Notes:
Bolded values indicate the Preliminary Cleanup Level was exceeded.
U - not detected above the reporting limit shown
UJ - compound was analyzed for but not detected above the reporting limit shown. Reporting limit is estimated.
J - estimated
NA - not available
NC - not calculated
NE - not established
TTEC - total toxicity equivalency concentration
-- - not analyzed
bgs - below ground surface
mg/kg - milligrams per kilogram
TPH - total petroleum hydrocarbons
ug/kg - micrograms per kilogram
VOCs - volatile organic compounds

[1] See Table 3 for Preliminary Cleanup Level rationale

[2] Not detected; however, laboratory reporting limit exceeds the Preliminary Cleanup Level.

[3] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8).
The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene.

Table 8
Summary of Soil Analytical Results -
1991 Purnell Investigation (Area 1 and Area 2)
Laurel Station
Bellingham, Washington

AREA	AREA 1										Preliminary Cleanup Level[1]
Sample ID	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	
Sample Depth (inches bgs)	10-20	0-10	0-10	0-10	0-10	0-10	0-10	0-10	0-10	0-10	
Sample Date	2/18/1991	2/18/1991	2/18/1991	2/18/1991	2/18/1991	2/19/1991	2/19/1991	2/19/1991	2/19/1991	2/19/1991	
Total Petroleum Hydrocarbons (mg/kg)											
Diesel-range	**12,523**	**3,649**	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	**460**
Volatile Organic Compounds (ug/kg)											
Benzene	**980**	50 U[2]	--	--	--	--	--	--	--	--	**30**
Toluene	**16,100**	420	--	--	--	--	--	--	--	--	**7,000**
Ethylbenzene	1,750	130	--	--	--	--	--	--	--	--	**6,000**
Xylenes (total)	**51,300**	2,470	--	--	--	--	--	--	--	--	**9,000**
Polycyclic Aromatic Hydrocarbons (PAHs) (ug/kg)											
Naphthalene	--	--	--	--	--	--	--	--	--	--	**1,600**
2-Methylnaphthalene	--	--	--	--	--	--	--	--	--	--	**320**
Fluoranthene	--	--	--	--	--	--	--	--	--	--	**3,200**
Fluorene	--	--	--	--	--	--	--	--	--	--	**3,200**
Pyrene	--	--	--	--	--	--	--	--	--	--	**2,400**
Phenanthrene	--	--	--	--	--	--	--	--	--	--	**NE**
Carcinogenic PAHs (ug/kg)											
Benzo(a)pyrene	--	--	--	--	--	--	--	--	--	--	**See Note[3]**
Benzo(a)anthracene	--	--	--	--	--	--	--	--	--	--	**See Note[3]**
Benzo(b)fluoranthene	--	--	--	--	--	--	--	--	--	--	**See Note[3]**
Benzo(k)fluoranthene	--	--	--	--	--	--	--	--	--	--	**See Note[3]**
Dibenz(a,h)anthracene	--	--	--	--	--	--	--	--	--	--	**See Note[3]**
Chrysene	--	--	--	--	--	--	--	--	--	--	**See Note[3]**
Indeno(1,2,3-c,d)pyrene	--	--	--	--	--	--	--	--	--	--	**See Note[3]**
TTEC	--	--	--	--	--	--	--	--	--	--	**100**

Notes:
Bolded values indicate the Preliminary Cleanup Level was exceeded.
U - not detected above the reporting limit shown
UJ - compound was analyzed for but not detected above the reporting limit shown. Reporting limit is estimated.
J - estimated
NA - not available
NC - not calculated
NE - not established
TTEC - total toxicity equivalency concentration
-- - not analyzed
bgs - below ground surface
mg/kg - milligrams per kilogram
TPH - total petroleum hydrocarbons
ug/kg - micrograms per kilogram
VOCs - volatile organic compounds

[1] See Table 3 for Preliminary Cleanup Level rationale

[2] Not detected; however, laboratory reporting limit exceeds the Preliminary Cleanup Level.

[3] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8).
The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene.

Table 8
Summary of Soil Analytical Results -
1991 Purnell Investigation (Area 1 and Area 2)
Laurel Station
Bellingham, Washington

AREA	AREA 1									
Sample ID	**31**	**36**	**37**	**38**	**39**	**47**	**48**	**49**	**50**	**Preliminary Cleanup Level[1]**
Sample Depth (inches bgs)	0-10	0-10	0-10	0-10	0-10	6-12	10-12	18-20	14-16	
Sample Date	2/19/1991	2/19/1991	2/19/1991	2/19/1991	2/19/1991	2/19/1991	2/19/1991	2/19/1991	2/19/1991	
Total Petroleum Hydrocarbons (mg/kg)										
Diesel-range	**863**	45	194	10 U	10 U	**1,395**	10 U	10 U	10 U	**460**
Volatile Organic Compounds (ug/kg)										
Benzene	--	--	--	--	--	--	--	--	--	**30**
Toluene	--	--	--	--	--	--	--	--	--	**7,000**
Ethylbenzene	--	--	--	--	--	--	--	--	--	**6,000**
Xylenes (total)	--	--	--	--	--	--	--	--	--	**9,000**
Polycyclic Aromatic Hydrocarbons (PAHs) (ug/kg)										
Naphthalene	--	--	--	--	--	810	--	--	--	**1,600**
2-Methylnaphthalene	--	--	--	--	--	--	--	--	--	**320**
Fluoranthene	--	--	--	--	--	1,000 U	--	--	--	**3,200**
Fluorene	--	--	--	--	--	400	--	--	--	**3,200**
Pyrene	--	--	--	--	--	1,000 U	--	--	--	**2,400**
Phenanthrene	--	--	--	--	--	250	--	--	--	**NE**
Carcinogenic PAHs (ug/kg)										
Benzo(a)pyrene	--	--	--	--	--	1,000 U	--	--	--	**See Note[3]**
Benzo(a)anthracene	--	--	--	--	--	1,000 U	--	--	--	**See Note[3]**
Benzo(b)fluoranthene	--	--	--	--	--	1,000 U	--	--	--	**See Note[3]**
Benzo(k)fluoranthene	--	--	--	--	--	1,000 U	--	--	--	**See Note[3]**
Dibenz(a,h)anthracene	--	--	--	--	--	1,000 U	--	--	--	**See Note[3]**
Chrysene	--	--	--	--	--	1,000 U	--	--	--	**See Note[3]**
Indeno(1,2,3-c,d)pyrene	--	--	--	--	--	1,000 U	--	--	--	**See Note[3]**
TTEC	--	--	--	--	--	NC	--	--	--	**100**

Notes:
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TTEC - total toxicity equivalency concentration
-- - not analyzed
bgs - below ground surface
mg/kg - milligrams per kilogram
TPH - total petroleum hydrocarbons
ug/kg - micrograms per kilogram
VOCs - volatile organic compounds

[1] See Table 3 for Preliminary Cleanup Level rationale

[2] Not detected; however, laboratory reporting limit exceeds the Preliminary Cleanup Level.

[3] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8).
The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene.

Table 8
Summary of Soil Analytical Results -
1991 Purnell Investigation (Area 1 and Area 2)
Laurel Station
Bellingham, Washington

AREA	AREA 1													Preliminary Cleanup Level[1]
Sample ID	SH-1			SH-2					SH-3					
Sample Depth (inches bgs)	4-6	16-18	28-30	4-6	10-12	16-18	22-24	28-30	4-6	10-12	16-18	22-24	28-30	
Sample Date	4/8/1991	4/8/1991	4/8/1991	4/8/1991	4/8/1991	4/8/1991	4/8/1991	4/8/1991	4/8/1991	4/8/1991	4/8/1991	4/8/1991	4/8/1991	
Total Petroleum Hydrocarbons (mg/kg)														
Diesel-range	**843**	10 U	10 U	**2,053**	**4,907**	**1,667**	10 U	10 U	10 U	10 U	10 U	10 U	10 U	**460**
Volatile Organic Compounds (ug/kg)														
Benzene	--	--	--	--	--	--	--	--	--	--	--	--	--	**30**
Toluene	--	--	--	--	--	--	--	--	--	--	--	--	--	**7,000**
Ethylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	**6,000**
Xylenes (total)	--	--	--	--	--	--	--	--	--	--	--	--	--	**9,000**
Polycyclic Aromatic Hydrocarbons (PAHs) (ug/kg)														
Naphthalene	**5,500**	--	--	500	**3,700**	**3,000**	--	--	--	--	--	--	--	**1,600**
2-Methylnaphthalene	--	--	--	--	--	--	--	--	--	--	--	--	--	**320**
Fluoranthene	1,000 U	--	--	900 U	900 U	800 U	--	--	--	--	--	--	--	**3,200**
Fluorene	1,200	--	--	500	1,100	500	--	--	--	--	--	--	--	**3,200**
Pyrene	1,000 U	--	--	900 U	900 U	800 U	--	--	--	--	--	--	--	**2,400**
Phenanthrene	800	--	--	400	600	300	--	--	--	--	--	--	--	**NE**
Carcinogenic PAHs (ug/kg)														
Benzo(a)pyrene	1,000 U	--	--	900 U	900 U	800 U	--	--	--	--	--	--	--	**See Note[3]**
Benzo(a)anthracene	1,000 U	--	--	900 U	900 U	800 U	--	--	--	--	--	--	--	**See Note[3]**
Benzo(b)fluoranthene	100	--	--	900 U	900 U	800 U	--	--	--	--	--	--	--	**See Note[3]**
Benzo(k)fluoranthene	1,000 U	--	--	900 U	900 U	800 U	--	--	--	--	--	--	--	**See Note[3]**
Dibenz(a,h)anthracene	1,000 U	--	--	900 U	900 U	800 U	--	--	--	--	--	--	--	**See Note[3]**
Chrysene	1,000 U	--	--	900 U	900 U	800 U	--	--	--	--	--	--	--	**See Note[3]**
Indeno(1,2,3-c,d)pyrene	1,000 U	--	--	900 U	900 U	800 U	--	--	--	--	--	--	--	**See Note[3]**
TTEC	10	--	--	NC	NC	NC	--	--	--	--	--	--	--	**100**

Notes:
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TTEC - total toxicity equivalency concentration
-- - not analyzed
bgs - below ground surface
mg/kg - milligrams per kilogram
TPH - total petroleum hydrocarbons
ug/kg - micrograms per kilogram
VOCs - volatile organic compounds

[1] See Table 3 for Preliminary Cleanup Level rationale

[2] Not detected; however, laboratory reporting limit exceeds the Preliminary Cleanup Level.

[3] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8).
The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene.

Table 8
Summary of Soil Analytical Results -
1991 Purnell Investigation (Area 1 and Area 2)
Laurel Station
Bellingham, Washington

AREA	AREA 2													
Sample ID	**32**	**33**	**34**	**35**	**40**	**41**	**51**	**52**	**53**	**54**	**SH-4**			**Preliminary Cleanup Level[1]**
Sample Depth (inches bgs)	0-10	0-10	0-10	0-10	0-10	0-10	0-4	0-4	0-4	12-18	4-6	18-20	28-30	
Sample Date	2/19/1991	2/19/1991	2/19/1991	2/19/1991	2/19/1991	2/19/1991	4/8/1991	4/8/1991	4/8/1991	4/8/1991	4/8/1991	4/8/1991	4/8/1991	
Total Petroleum Hydrocarbons (mg/kg)														
Diesel-range	10 U	35	65	18	10 U	439	10 U	10 U	38	10 U	10 U	10 U	10 U	**460**
Volatile Organic Compounds (ug/kg)														
Benzene	--	--	--	--	--	--	--	--	--	--	--	--	--	**30**
Toluene	--	--	--	--	--	--	--	--	--	--	--	--	--	**7,000**
Ethylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	**6,000**
Xylenes (total)	--	--	--	--	--	--	--	--	--	--	--	--	--	**9,000**
Polycyclic Aromatic Hydrocarbons (PAHs) (ug/kg)														
Naphthalene	--	--	--	--	--	--	--	--	1,000 U	--	--	--	--	**1,600**
2-Methylnaphthalene	--	--	--	--	--	--	--	--	--	--	--	--	--	**320**
Fluoranthene	--	--	--	--	--	--	--	--	1,000 U	--	--	--	--	**3,200**
Fluorene	--	--	--	--	--	--	--	--	1,000 U	--	--	--	--	**3,200**
Pyrene	--	--	--	--	--	--	--	--	1,000 U	--	--	--	--	**2,400**
Phenanthrene	--	--	--	--	--	--	--	--	1,000 U	--	--	--	--	**NE**
Carcinogenic PAHs (ug/kg)														
Benzo(a)pyrene	--	--	--	--	--	--	--	--	1,000 U	--	--	--	--	**See Note[3]**
Benzo(a)anthracene	--	--	--	--	--	--	--	--	1,000 U	--	--	--	--	**See Note[3]**
Benzo(b)fluoranthene	--	--	--	--	--	--	--	--	1,000 U	--	--	--	--	**See Note[3]**
Benzo(k)fluoranthene	--	--	--	--	--	--	--	--	1,000 U	--	--	--	--	**See Note[3]**
Dibenz(a,h)anthracene	--	--	--	--	--	--	--	--	1,000 U	--	--	--	--	**See Note[3]**
Chrysene	--	--	--	--	--	--	--	--	1,000 U	--	--	--	--	**See Note[3]**
Indeno(1,2,3-c,d)pyrene	--	--	--	--	--	--	--	--	1,000 U	--	--	--	--	**See Note[3]**
TTEC	--	--	--	--	--	--	--	--	NC	--	--	--	--	**100**

Notes:
Bolded values indicate the Preliminary Cleanup Level was exceeded.
U - not detected above the reporting limit shown
UJ - compound was analyzed for but not detected above the reporting limit shown. Reporting limit is estimated.
J - estimated
NA - not available
NC - not calculated
NE - not established
TTEC - total toxicity equivalency concentration
-- - not analyzed
bgs - below ground surface
mg/kg - milligrams per kilogram
TPH - total petroleum hydrocarbons
ug/kg - micrograms per kilogram
VOCs - volatile organic compounds

[1] See Table 3 for Preliminary Cleanup Level rationale

[2] Not detected; however, laboratory reporting limit exceeds the Preliminary Cleanup Level.

[3] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8).
The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene.

Table 9
Summary of Soil Analytical Results – Pump Station Area (Study Unit 1)
Laurel Station
Bellingham, Washington

			Field Analysis (mg/kg)	TPH (mg/kg)[1]
Sample ID	**Sample Depth (feet bgs)**	**Sample Date**	**TPH - field screen**	**Diesel Range**
PB-1	5	11/19/1991	25 U	--
	7		25 U	--
	9		25 U	--
	11		17 J	--
	13		25 U	--
	15		25 U	--
	17		20 J	--
PB-2	12	11/20/1991	**5,300 J[2]**	--
PB-4	6	11/19/1991	**1,900 J[2]**	--
	8		25 U	--
	10		64 J[2]	--
	12		25 U	--
TM-B10	15	2/17/1992	25 U	10 U
	25		28 E	--
	40		25 U	--
TM-B14	13	2/20/1992	430	--
	34		25 U	20
	54		25 U	--
TM-B15	29	2/24/1992	**1,600 E**	--
	30		--	50
TP-1	4	11/15/1991	25 U	--
TP-2	4	11/15/1991	25 U	--
TP-18	4	12/4/1991	25 U	--
Preliminary Cleanup Level [3]			**460**	

Notes:
Bolded values indicate the Preliminary Cleanup Level was exceeded
mg/kg - milligrams per kilogram
TPH - total petroleum hydrocarbons
bgs - below ground surface
-- - not analyzed
U - not detected above the reporting limit shown
E or J - estimated
[1] Method WTPH-HCID
[2] Identified as crude oil range
[3] See Table 3 for Preliminary Cleanup Level rationale

Table 10
Summary of Soil Analytical Results – Former Oily Water Sump (Study Unit 1)
Laurel Station
Bellingham, Washington

			Field Analysis (mg/kg)	TPH (mg/kg)		VOCs (ug/kg)				Metals (mg/kg)						
Sample ID	**Sample Depth (feet bgs)**	**Sample Date**	**TPH - field screen**	**Diesel Range[1]**	**TPH (Method 418.1)**	**Benzene**	**Toluene**	**Ethylbenzene**	**Xylenes**	**Arsenic**	**Beryllium**	**Chromium**	**Copper**	**Lead**	**Nickel**	**Zinc**
TM-B4	3	12/5/1991	100 J[2] / 25 U[3]	--	--	--	--	--	--	--	--	--	--	--	--	--
	8		25 UJ	--	--	--	--	--	--	--	--	--	--	--	--	--
	13		25 U	--	--	--	--	--	--	--	--	--	--	--	--	--
	18[4]		400 J[2] / 25 U[3]	320	1,200	53 U[5]	53 U	190 U	980	1.99	0.2	17.6	15.3	2.9	16	29.2
	23		**1,300 J**[2] / 25 U[3]	--	--	--	--	--	--	--	--	--	--	--	--	--
	28		25 UJ	--	--	--	--	--	--	--	--	--	--	--	--	--
TM-B16	13	2/25/1992	--	**3,100**	--	--	--	--	--	--	--	--	--	--	--	--
	19		--	**510**	--	--	--	--	--	--	--	--	--	--	--	--
	24		25 U	--	--	--	--	--	--	--	--	--	--	--	--	--
	29		--	30	--	--	--	--	--	--	--	--	--	--	--	--
	34		25 U	--	--	--	--	--	--	--	--	--	--	--	--	--
	39		--	10 U	--	--	--	--	--	--	--	--	--	--	--	--
Preliminary Cleanup Level [6]			**460**		**2,000**	**30**	**7,000**	**6,000**	**9,000**	**20**	**160**	**61[7]**	**2,960**	**250**	**48**	**24,000**

Notes

Bolded values indicate the Preliminary Cleanup Level was exceeded

-- - not analyzed

bgs - below ground surface

mg/kg - milligrams per kilogram

TPH - total petroleum hydrocarbons

ug/kg - micrograms per kilogram

U - not detected above the reporting limit shown

E or J - estimated

[1] Method WTPH-HCID

[2] Identified as crude oil range

[3] Identified as natural gas condensate range

[4] This sample was also analyzed for SVOCs, which were not detected above their respective Preliminary Cleanup Levels with the exception of 2-methylnaphthalene (1,300 ug/kg).

[5] Not detected; however, laboratory reporting limit exceeds the Preliminary Cleanup Level.

[6] See Table 3 for Preliminary Cleanup Level rationale

[7] Chromium III

Table 11
Summary of Soil Analytical Results – Former Burn Pit and Former Oil/Water Separator (Study Unit 1)
Laurel Station
Bellingham, Washington

			Field Analysis (mg/kg)	TPH (mg/kg)			VOCs (ug/kg)				Polycyclic Aromatic Hydrocarbons (PAHs) (ug/kg)					Carcinogenic PAHs (ug/kg)								Metals (mg/kg)												
Sample ID	**Sample Depth (feet bgs)**	**Sample Date**	**TPH - field screen**	**Diesel Range[1]**	**Gasoline Range[1]**	**TPH (Method 418.1)**	**Benzene**	**Toluene**	**Ethylbenzene**	**Xylenes**	**2-Methylnaphthalene**	**Fluorene**	**Naphthalene**	**Phenanthrene**	**Pyrene**	**Benzo(a) pyrene**	**Benzo(a) anthracene**	**Benzo(b) fluoranthene**	**Benzo(k) fluoranthene**	**Dibenz(a,h) anthracene**	**Chrysene**	**Indeno (1,2,3-c,d) pyrene**	**TTEC**	**Antimony**	**Arsenic**	**Beryllium**	**Cadmium**	**Chromium**	**Copper**	**Lead**	**Mercury**	**Nickel**	**Selenium**	**Silver**	**Thallium**	**Zinc**
Burnpit #1	3	2/19/1992	--	170	--	--	160 U[5]	630 U	830 J	2,100	**750**	82 J	150	180	77	74 U	74 U	74 U	74 U	46 J	55 J	70 J	12.15	6 U	6.4	0.3	0.2 U	52.2	31	4.7	0.07	45	0.1 U	0.3 U	0.1 U	53.6
TM-B2	5	12/2/1991	25 J	--	--	21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10		25 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	15		25 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	20		25 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TM-B3	22	12/3/1991	25 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	32		25 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	37		25 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	47		25 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TM-B6	8	12/9/1991	25 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	13		25 U	--	--	10 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	18		25 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	23		25 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	28		25 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	33	12/10/1991	25 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	38		25 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	43		25 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	48		25 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	58		25 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TP-10	5	11/26/1991	25 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10		25 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	15		25 J	--	--	10 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TP-6	1	11/22/1991	17 J[2] / 25 U[3]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	5		11 J[2] / 25 U[3]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10		**900 J[2]** / 330 J[4]	330	12	80	55 U[5]	55 U	55 U	110 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	13		**1,200 J[2] / 700 J[3]**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	15		57[2] / 220 J[3]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TP-7	1	11/22/1991	25 U[2,3]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	5		**13,200 J[2] / 5,700 J[3]**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	7		**600 J[2]** / 25 U[3]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10		25 U[2,3]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	15		51 J[2] / 25 U[3]	--	--	38	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Preliminary Cleanup Level[6]			**460**	**460**	**100 / 30[7]**	**2,000**	**30**	**7,000**	**6,000**	**9,000**	**320**	**3,200**	**1,600**	**NE**	**2,400**	**See Note[8]**	**See Note[8]**	**See Note[8]**	**See Note[8]**	**See Note[8]**	**See Note[8]**	**See Note[8]**	**100**	**32**	**20**	**160**	**2**	**61/0.12**	**2,960**	**250**	**2**	**48**	**38**	**400**	**5.6**	**24,000**

Notes
Bolded values indicate the Preliminary Cleanup Level was exceeded
TPH - total petroleum hydrocarbons
VOCs - volatile organic compounds
[1] Method WTPH-HCID
[2] Identified as crude oil range
[3] Identified as natural gas condensate range
[4] Identified as both diesel range and natural gas condensate range
[5] Not detected; however, laboratory reporting limit exceeds the Preliminary Cleanup Level.
[6] See Table 3 for Preliminary Cleanup Level rationale
[7] Gasoline mixtures without benzene/gasoline mixutre with benzene
[8] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene.
[9] ChromiumIII/ChromiumVI

mg/kg - milligrams per kilogram
ug/kg - micrograms per kilogram
TTEC - total toxicity equivalency concentration
bgs - below ground surface
-- - not analyzed
U - not detected above the reporting limit shown
J - estimated

Table 12
Summary of Soil Analytical Results – Former Drain Line Between Oily Water Sump and Burn Pit (Study Unit 1)
Laurel Station
Bellingham, Washington

			Field Analysis (mg/kg)	TPH (mg/kg)			VOCs (ug/kg)			
Sample ID	**Sample Depth (feet bgs)**	**Sample Date**	**TPH - field screen**	**Diesel Range**	**Gasoline Range**	**TPH (Method 418.1)**	**Benzene**	**Toluene**	**Ethylbenzene**	**Xylenes**
TM-B18	9	2/26/1992	25 U	--	--	--	--	--	--	--
	24		--	10 U	--	--	--	--	--	--
	29		25 U	--	--	--	--	--	--	--
TM-B20	4	2/26/1992	25 U	--	--	--	--	--	--	--
	9		25 U	--	--	--	--	--	--	--
	24		25 U	--	--	--	--	--	--	--
TM-B21	15	2/27/1992	25 U	--	--	--	--	--	--	--
TM-B22	5	2/27/1992	25 U	--	--	--	--	--	--	--
TM-B23	13.5	2/27/1992	25 U	--	--	--	--	--	--	--
TM-B24	10	2/27/1992	25 U	--	--	--	--	--	--	--
TP-8	6	11/22/1991	100 J[2]	49	38	140	52 U[3]	52 U	52 U	100 U
	8		69 J	--	--	--	--	--	--	--
	10		25 U	--	--	--	--	--	--	--
	15		25 U	--	--	--	--	--	--	--
Preliminary Cleanup Level[4]			**460**	**460**	**100 / 30[5]**	**2,000**	**30**	**7,000**	**6,000**	**9,000**

Notes

Bolded values indicate the Preliminary Cleanup Level was exceeded

-- - not analyzed

bgs - below ground surface

E or J - estimated

mg/kg - milligrams per kilogram

NA - not available

TPH - total petroleum hydrocarbons

ug/kg - micrograms per kilogram

U - not detected above the reporting limit shown

VOCs - volatile organic compounds

[1]Method WTPH-HCID

[2] TPH in natural gas condensate range

[3] Not detected; however, laboratory reporting limit exceeds the Preliminary Cleanup Level.

[4] See Table 3 for Preliminary Cleanup Level rationale

[5] Gasoline mixtures without benzene/gasoline mixture with benzene

Table 13
Summary of Soil Analytical Results – Former Drain Tile Excavation (Study Unit 1)
Laurel Station
Bellingham, Washington

			Field Analysis (mg/kg)	TPH (mg/kg)	
Sample ID[1]	**Sample Depth (feet bgs)**	**Sample Date**	**TPH - field screen**	**Diesel Range[2]**	**TPH (Method 418.1)**
DTE-1	1	2/25/1992	**680 E**	460	--
DTE-2	NA	2/25/1992	25 U	15 U	--
DTE-3	NA	2/25/1992	36	15 U	--
DTE-4	NA	2/25/1992	25 U	--	--
DTE-5	NA	2/25/1992	25 U	--	--
DTE-6	NA	2/25/1992	25 U	--	--
DTE-7	NA	2/25/1992	25 U	--	--
EXFERN-5	NA	1/25/1992	25 U	--	--
EXFERN-7	NA	1/25/1992	25 U	--	--
TM-B5	8	12/6/1991	25 U	--	--
	13		25 U	--	10 U
	18		25 U	--	--
Preliminary Cleanup Level[3]			**460**	**460**	**2,000**

Notes:
Bolded values indicate the Preliminary Cleanup Level was exceeded
bgs - below ground surface
TPH - total petroleum hydrocarbons
mg/kg - milligrams per kilogram
NA - not available
U - not detected above the reporting limit shown
E - estimated
-- - not analyzed
[1] Samples DTE-1, -2, -4, and -6 were collected from the base of excavation.
Samples DTE-3, -5, and -7 were collected from the sidewall of the excavation approximately 12 inches above the base of the excavation.
Samples EXFERN-5 and EXFERN-7 are post excavation samples.
[2] Method WTPH-HCID
[3] See Table 3 for Preliminary Cleanup Level rationale

Table 14
Summary of Soil Analytical Results - Former Waste Pit (Study Unit 1)
Laurel Station
Bellingham, Washington

Sample ID	Pit #1	TM-B19		TM-B25	TP-4				TP-5		Preliminary Cleanup Level[1]
Sample Depth (feet bgs)	15	4	14	15	2	4	6	8	5	14	
Sample Date	2/27/1992	2/26/1992		2/27/1992	11/20/1991				11/21/1991		
Total Petroleum Hydrocarbons (TPH) (mg/kg)											
TPH Field Screening	--	25 U	25 U	25 U	25 U	25 U	25 U	25 U	50 J[2]	--	**460**
Diesel-range	--	--	--	--	--	--	--	--	--	10 U[3]	**460**
Volatile Organic Compounds (ug/kg)											
Benzene	190 U[6]	--	--	--	--	--	--	--	--	--	**30**
Toluene	450	--	--	--	--	--	--	--	--	--	**7,000**
Ethylbenzene	190 U	--	--	--	--	--	--	--	--	--	**6,000**
Xylenes (total)	330 U	--	--	--	--	--	--	--	--	--	**9,000**
Polycyclic Aromatic Hydrocarbons (PAHs) (ug/kg)											
Naphthalene	79 J	--	--	--	--	--	--	--	--	--	**1,600**
2-Methylnaphthalene	200	--	--	--	--	--	--	--	--	--	**320**
Fluoranthene	86 U	--	--	--	--	--	--	--	--	--	**3,200**
Fluorene	86 U	--	--	--	--	--	--	--	--	--	**3,200**
Pyrene	86 U	--	--	--	--	--	--	--	--	--	**2,400**
Phenanthrene	47 J	--	--	--	--	--	--	--	--	--	**NE**
Carcinogenic PAHs (ug/kg)											
Benzo(a)pyrene	86 U	--	--	--	--	--	--	--	--	--	**See Note[4]**
Benzo(a)anthracene	86 U	--	--	--	--	--	--	--	--	--	**See Note[4]**
Benzo(b)fluoranthene	86 U	--	--	--	--	--	--	--	--	--	**See Note[4]**
Benzo(k)fluoranthene	86 U	--	--	--	--	--	--	--	--	--	**See Note[4]**
Dibenz(a,h)anthracene	86 U	--	--	--	--	--	--	--	--	--	**See Note[4]**
Chrysene	86 U	--	--	--	--	--	--	--	--	--	**See Note[4]**
Indeno(1,2,3-c,d)pyrene	86 U	--	--	--	--	--	--	--	--	--	**See Note[4]**
TTEC	NC	--	--	--	--	--	--	--	--	--	**100**
Metals (mg/kg)											
Antimony	7 U	--	--	--	--	--	--	--	--	--	**32**
Arsenic	3.4	--	--	--	--	--	--	--	--	--	**20**
Beryllium	0.5	--	--	--	--	--	--	--	--	--	**160**
Cadmium	0.3 U	--	--	--	--	--	--	--	--	--	**2**
Chromium	44.6	--	--	--	--	--	--	--	--	--	**61[5]**
Copper	21.4	--	--	--	--	--	--	--	--	--	**2,960**
Lead	6.4	--	--	--	--	--	--	--	--	--	**250**
Mercury	0.07 U	--	--	--	--	--	--	--	--	--	**2**
Nickel	45	--	--	--	--	--	--	--	--	--	**48**
Selenium	0.3	--	--	--	--	--	--	--	--	--	**38**
Silver	0.5	--	--	--	--	--	--	--	--	--	**400**
Thallium	0.1 U	--	--	--	--	--	--	--	--	--	**5.6**
Zinc	119	--	--	--	--	--	--	--	--	--	**24,000**

Notes:
Bolded values indicate the Preliminary Cleanup Level was exceeded
bgs - below ground surface
mg/kg - milligrams per kilogram
ug/kg - micrograms per kilogram
TTEC - total toxicity equivalency concentration
-- - not analyzed
U - not detected above the reporting limit shown
J - estimated
NC - not calculated
NE - not established

[1] See Table 3 for Preliminary Cleanup Level rationale

[2] TPH detected in natural gas condensate range

[3] TPH by method 418.1

[4] Carcinogenic PAH (cPAH) cleanup levels under MTCA (Model Toxins Control Act) are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene.

[5] Chromium III

[6] Not detected, however, laboratory reporting limit exceeds the Preliminary Cleanup Level

Table 15
Summary of Soil Analytical Results – 20-Inch Main Pipeline (Study Unit 1)
Laurel Station
Bellingham, Washington

		Field Analysis (mg/kg)	TPH (mg/kg)	
Sample ID	**Sample Date**	**TPH - field screen**	**Diesel Range[1]**	**TPH (418.1)**
PLB-1-1-7'	1/14/1992	25 U	110	15
PLB-1-2-5'	1/14/1992	25 U	--	--
PLB-1-3-7'	1/14/1992	25 U	--	--
PLB-1-4-10'	1/14/1992	20	--	--
PLB-1-5-12'	1/14/1992	25 U	10 U	13
PLB-1-6-10'	1/14/1992	25 U	--	--
PLB-1-10-4'	1/15/1992	25U	--	--
PLB-1-11	1/17/1992	25 U	--	--
PLB-1-12	1/17/1992	25 U	--	--
PLB-1-13	1/17/1992	25 U	--	--
PLB-1-14	1/17/1992	25 U	--	--
PLB-1-15	1/17/1992	25 U	10 U	--
PLB-1-16	1/21/1992	25 U	--	--
PLB-1-17	1/17/1992	25 U	--	--
PLB-1-18	1/21/1992	25 U	--	--
PLB-1-19	1/21/1992	25 U	--	--
PLB-1-21	1/21/1992	25 U	--	--
PLB-1-22	1/21/1992	25 U	10 U	--
PLS-1-1-5'	1/14/1992	25 U	--	--
PLS-1-2-2'	1/14/1992	25 U	--	--
PLS-1-3-3'	1/14/1992	25 U	--	--
PLS-1-4-8'	1/14/1992	25 U	--	--
PLS-1-5-9'	1/14/1992	25U	--	--
PLS-1-10	1/17/1992	25 U	--	--
PLS-1-11	1/17/1992	25 U	--	--
PLS-1-12	1/17/1992	25 U	--	--
PLS-1-13	1/17/1992	25 U	--	--
PLS-1-14	1/17/1992	25 U	10 U	--
PLS-1-15	1/17/1992	25 U	--	--
PLS-1-16	1/21/1992	25 U	--	--
PLS-1-17	1/21/1992	25 U	--	--
PLS-1-18	1/21/1992	25 U	--	--
PLS-1-19	1/21/1992	25 U	--	--
PLS-1-20	1/21/1992	25 U	10 U	--
Preliminary Cleanup Level[3]		**460**	**460**	**2,000**

Notes:
Bolded values indicate the Preliminary Cleanup Level was exceeded
TPH - total petroleum hydrocarbons
mg/kg - milligrams per kilogram
U - undetected
-- - not analyzed
[1] Method WTPH-HCID
[2] Sample prefix PLB indicates base sample and PLS indicates sidewall sample
[3] See Table 3 for Preliminary Cleanup Level rationale

Table 16
Summary of Soil Analytical Results – Former PSE Electrical Substation (Study Unit 1)
Laurel Station
Bellingham, Washington

			PCBs (mg/kg)			
Sample ID	**Sample Depth (inches bgs)**	**Sample Date**	**Aroclor 1016/1242**	**Aroclor 1248**	**Aroclor 1254**	**Aroclor 1260**
ES-1	4	3/25/1992	0.05 U	0.05 U	0.05 U	0.05 U
	10		0.05 U	0.05 U	0.05 U	0.05 U
ES-2	6	3/25/1992	0.05 U	0.05 U	0.05 U	0.05 U
	12		0.05 U	0.05 U	0.05 U	0.05 U
ES-3	4	3/25/1992	0.05 U	0.05 U	0.05 U	0.05 U
	8		0.05 U	0.05 U	0.05 U	0.05 U
ES-4	6	3/25/1992	0.05 U	0.05 U	0.05 U	0.05 U
	12		0.05 U	0.05 U	0.05 U	0.05 U
ES-5	6	3/25/1992	0.05 U	0.05 U	0.05 U	0.05 U
	10		0.05 U	0.05 U	0.05 U	0.05 U
Preliminary Cleanup Level[1]			**1**	**1**	**1**	**1**

Notes

Bolded values indicate the Preliminary Cleanup Level was exceeded

-- - not analyzed

bgs - below ground surface

mg/kg - milligrams per kilogram

PCBs - polychlorinated biphenyls

U - not detected above the reporting limit shown

[1] See Table 3 for Preliminary Cleanup Level rationale

Table 17
Summary of Soil Analytical Results – December 11, 1991 Spill (Study Units 1, 5, and 6)
Laurel Station
Bellingham, Washington

			Field Analysis (mg/kg)	TPH (mg/kg)[1]
Sample ID	**Sample Depth (inches bgs)**	**Sample Date**	**TPH - field screen**	**Diesel Range**
EX-10	NA	12/17/1991	25 U	--
EX-11	NA	12/17/1991	25 U	--
EX-13	NA	12/17/1991	25 U	--
EX-15	NA	12/17/1991	61	--
EX-16	NA	12/17/1991	15 J	--
EX-17	NA	12/17/1991	25 U	--
HA-6-1	0-4	1/6/1992	25 U	--
HA-6-2	0-4	1/6/1992	25 U	--
HA-6-3	0-4	1/6/1992	25 U	--
HA-6-4	0-4	1/6/1992	25 U	--
HA-6-5	0-4	1/6/1992	25 U	10 U
HA-6-6	0-4	1/6/1992	25 U	--
HA-6-7	0-4	1/6/1992	25 U	--
HA-6-8	0-4	1/6/1992	25 U	--
HA-6-9	0-4	1/6/1992	25 U	10 U
HA-6-10	0-4	1/7/1992	25 U	--
HA-6-11	0-4	1/8/1992	25 U	10 U
HA-6-12	0-4	1/8/1992	25 U	--
HA-6-13	0-4	1/8/1992	25 U	--
HA-6-14	0-4	1/8/1992	25 U	--
HA-6-15	0-4	1/8/1992	25 U	--
HA-6-16	0-4	1/8/1992	11 J	--
HA-6-17	0-4	1/8/1992	25 U	--
HA-6-18	0-4	1/8/1992	25 U	--
HA-6-19	0-4	1/8/1992	25 U	--
HA-6-20	0-4	1/8/1992	25 U	10 U
SS-6-1	0-4	1/24/1992	25 U	--
SS-6-2	0-4	1/24/1992	25 U	--
SS-6-3	0-4	1/24/1992	25 U	--
SS-6-4	0-4	1/24/1992	25 U	--
SS-6-5	0-4	1/24/1992	25 U	--
SS-6-6	0-4	1/24/1992	25 U	--
SS-6-7	0-4	1/24/1992	25 U	10 U
SS-6-8	0-4	1/24/1992	25 U	--
SS-6-11	0-4	1/24/1992	25 U	--
SS-6-12	0-4	1/24/1992	25 U	--
SS-6-13	0-4	1/24/1992	25 U	--
SS-6-14	0-4	1/24/1992	25 U	--
SS-6-15	0-4	1/24/1992	25 U	10 U
SS-6-16	0-4	1/24/1992	25 U	--
SS-6-17	0-4	1/24/1992	25 U	--
SS-6-18	0-4	1/24/1992	25 U	--
SS-6-19	0-4	1/24/1992	25 U	--
SS-6-20	0-4	1/24/1992	25 U	--
Preliminary Cleanup Level[2]			**460**	

Notes

Bolded values indicate the Preliminary Cleanup Level was exceeded

TPH - total petroleum hydrocarbons

mg/kg - milligrams per kilogram

bgs - below ground surface

NA - not available

-- - not analyzed

U - not detected above the reporting limit shown

J - estimated

[1] Method WTPH-HCID

[2] See Table 3 for Preliminary Cleanup Level rationale

Table 18
Summary of Soil Analytical Results – March 7, 1992 Spill (Study Unit 3)
Laurel Station
Bellingham, Washington

Sample ID	Sample Depth (feet bgs)	Sample Date	TPH (mg/kg)	
			Diesel Range[1]	Gasoline Range[1]
PRT-1	2	3/20/1992	**16,000**	--
PRT-2	2	3/20/1992	**10,000**	--
PRT-3	NA	3/20/1992	10 U	--
PRT-4	NA	3/20/1992	10 U	--
PRT-5	NA	3/20/1992	10 U	--
PRT0-1	NA	3/23/1992	10 U	--
PRT0-2	NA	3/23/1992	10 U	--
Preliminary Cleanup Level [2]			**460**	**100 / 30[3]**

Notes
Bolded values indicate the Preliminary Cleanup Level was exceeded
TPH - total petroleum hydrocarbons
mg/kg - milligrams per kilogram
bgs - below ground surface
NA - not available
-- - not analyzed
U - undetected
[1] Method WTPH-HCID
[2] See Table 3 for Preliminary Cleanup Level rationale
[3] Gasoline mixtures without benzene/gasoline mixtures with benzene

Table 19
Summary of Soil Analytical Results - October 26, 2000 Spill (Study Unit 1)
Laurel Station
Bellingham, Washington

Sample ID	Sample Type	Sample Date	Sample Depth (feet bgs)	NWTPH-Dx (mg/kg)		NWTPH-Gx (mg/kg)	VOCs (ug/kg)			
				Diesel/Fuel Oil-Range	Heavy Oil-Range	Gasoline-Range	Benzene	Toluene	Ethylbenzene	Xylenes
A	Stockpile	10/28/2000	NA	**830**	730	--	--	--	--	--
B	Stockpile	10/28/2000	NA	**910**	720	**280**	**680**	4,100	1,800	**12,000**
C	Stockpile	10/28/2000	NA	**1,300**	1,000	--	--	--	--	--
D	Stockpile	10/28/2000	NA	**1,500**	1,100	--	--	--	--	--
E	Stockpile	10/28/2000	NA	**1,300**	980	**720**	**2,700**	**16,000**	5,200	**36,000**
F	Stockpile	10/28/2000	NA	310	150	--	--	--	--	--
STOCK-1	Stockpile	11/16/2000	NA	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
STOCK-2	Stockpile	11/16/2000	NA	10 U	25 U	6.67	50 U[1]	50 U	50 U	100 U
CELL2-G	Stockpile	11/16/2000	NA	86.2	72.1	56.6	50 U[1]	117 U	149	881
CELL2-H	Stockpile	11/16/2000	NA	113	75.4	26.9	50 U[1]	50 U	52.1	231 U
CELL2-J	Stockpile	11/16/2000	NA	82	54.1	41.3	50 U[1]	84.4 U	92.5	484
CELL2-K	Stockpile	11/16/2000	NA	92.4	41.5	**115**	85.1 U[1]	205 U	296	1,230
CELL2-L	Stockpile	11/16/2000	NA	169	94.7	73.2	50 U[1]	84.9 U	149 U	656 U
CELL2-M	Stockpile	11/16/2000	NA	60.4	30	**62.7**	**56.7**	171 U	158	919 U
CELL2-N	Stockpile	11/16/2000	NA	42.4	27.1	69.3	50 U[1]	114 U	146 U	513 U
PEX-1-11	Post-Excavation	11/2/2000	11	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-6-S-5[2]	Post-Excavation	11/2/2000	5	**767**	503	5.41	50 U[1]	50 U	50 U	100 U
PEX-8-B-10	Post-Excavation	11/3/2000	10	21.9	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-9-B-10[3]	Post-Excavation	11/3/2000	10	157	25 U	**129**	100 U[1]	100 U	840 U	1,340
PEX-10-B-6	Post-Excavation	11/3/2000	6	29.4	25 U	17.6	50 U[1]	50 U	50 U	100 U
PEX-11-S-7[4]	Post-Excavation	11/3/2000	7	**670**	30	**997**	2,000 U[1]	50 U	7,000 U[1]	**45,000**
PEX-12-S-7[3]	Post-Excavation	11/3/2000	7	431	25 U	**869**	1,000 U[1]	1,000 U	6,000 U	**32,300**
PEX-13-S-5[5]	Post-Excavation	11/3/2000	5	28.8	25 U	**38.2**	**573**	50 U	150 U	**25,700**
PEX-14-S-1[6]	Post-Excavation	11/3/2000	1	**681**	392	**190**	400 U[1]	**12,700**	800 U	**37,900**
PEX-15-S-2	Post-Excavation	11/6/2000	2	73.9	33.3	5 U	50 U[1]	50 U	50 U	100 U
PEX-16-S-3	Post-Excavation	11/9/2000	3	88.6	92	25.2	50 U[1]	52 U	50 U	166
PEX-17-B-5	Post-Excavation	11/9/2000	5	13.1	19.1	11.3	**139**	50 U	224	1,650
PEX-18-S-3	Post-Excavation	11/9/2000	3	18.5	31.7	8.68	**96.1**	50 U	50 U	461
PEX-19-S-3	Post-Excavation	11/9/2000	3	38.3	48.7	5 U	50 U[1]	50 U	50 U	100 U
PEX-20-B-5	Post-Excavation	11/9/2000	5	16.1	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-21-S-3	Post-Excavation	11/9/2000	3	18.3	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-22-S-4	Post-Excavation	11/9/2000	4	28.4	34	5 U	50 U[1]	50 U	50 U	107
Preliminary Cleanup Level[7]				**460**	**2,000**	**100 / 30[8]**	**30**	**7,000**	**6,000**	**9,000**

Table 19
Summary of Soil Analytical Results - October 26, 2000 Spill (Study Unit 1)
Laurel Station
Bellingham, Washington

Sample ID	Sample Type	Sample Date	Sample Depth (feet bgs)	NWTPH-Dx (mg/kg)		NWTPH-Gx (mg/kg)	VOCs (ug/kg)			
				Diesel/Fuel Oil-Range	Heavy Oil-Range	Gasoline-Range	Benzene	Toluene	Ethylbenzene	Xylenes
PEX-23-B-6	Post-Excavation	11/9/2000	6	10.1	12.5 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-24-S-4	Post-Excavation	11/9/2000	4	23.4	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-25-S-3	Post-Excavation	11/13/2000	3	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-26-S-3	Post-Excavation	11/13/2000	3	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-27-S-3	Post-Excavation	11/13/2000	3	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-28-S-3	Post-Excavation	11/13/2000	3	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-29-S-1.5	Post-Excavation	11/13/2000	1.5	16.8	27.9	5 U	50 U[1]	50 U	50 U	100 U
PEX-30-S-2	Post-Excavation	11/13/2000	2	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-31-S-2	Post-Excavation	11/13/2000	2	10.7	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-32-S-1.5	Post-Excavation	11/13/2000	1.5	10.3	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-33-S-1.5	Post-Excavation	11/13/2000	1.5	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-34-S-1	Post-Excavation	11/13/2000	1	69.2	45.4	11.5	**125**	332	89.6	605
PEX-35-S-1	Post-Excavation	11/13/2000	1	14	30.5	5 U	50 U[1]	50 U	50 U	100 U
PEX-36-S-1	Post-Excavation	11/13/2000	1	20.6	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-37-S-3	Post-Excavation	11/13/2000	3	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-38-S-4	Post-Excavation	11/13/2000	4	20.7	41.1	5 U	50 U[1]	50 U	50 U	100 U
PEX-39-B-10	Post-Excavation	11/13/2000	10	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-40-B-4	Post-Excavation	11/13/2000	4	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-41-B-4	Post-Excavation	11/13/2000	4	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-42-B-4	Post-Excavation	11/13/2000	4	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-43-B-4	Post-Excavation	11/13/2000	4	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-44-B-4	Post-Excavation	11/13/2000	4	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-45-B-3	Post-Excavation	11/13/2000	3	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-46-B-11	Post-Excavation	11/13/2000	11	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-47-S-4.5	Post-Excavation	11/13/2000	4.5	16.7	31.5	5 U	50 U[1]	50 U	50 U	100 U
PEX-48-S-4	Post-Excavation	11/13/2000	4	57.8	76.4	5 U	50 U[1]	50 U	50 U	100 U
PEX-49-S-7	Post-Excavation	11/14/2000	7	17.6	25 U	21.5	50 U[1]	50 U	50 U	100 U
PEX-50-S-1	Post-Excavation	11/14/2000	1	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-51-S-2	Post-Excavation	11/14/2000	2	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
Preliminary Cleanup Level[7]				**460**	**2,000**	**100 / 30[8]**	**30**	**7,000**	**6,000**	**9,000**

Table 19
Summary of Soil Analytical Results - October 26, 2000 Spill (Study Unit 1)
Laurel Station
Bellingham, Washington

Sample ID	Sample Type	Sample Date	Sample Depth (feet bgs)	NWTPH-Dx (mg/kg)		NWTPH-Gx (mg/kg)	VOCs (ug/kg)			
				Diesel/Fuel Oil-Range	Heavy Oil-Range	Gasoline-Range	Benzene	Toluene	Ethylbenzene	Xylenes
PEX-52-S-1.5	Post-Excavation	11/14/2000	1.5	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-53-S-1.5	Post-Excavation	11/14/2000	1.5	16.2	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-54-B-8	Post-Excavation	11/14/2000	8	113	25 U	30.5	50 U[1]	50 U	50 U	100 U
PEX-55-S-2	Post-Excavation	11/14/2000	2	22.4	28.3	5 U	50 U[1]	50 U	50 U	100 U
PEX-56-B-5	Post-Excavation	11/14/2000	5	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-57-B-8	Post-Excavation	11/14/2000	8	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-58-S-3	Post-Excavation	11/14/2000	3	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-59-S-2	Post-Excavation	11/14/2000	2	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-60-B-4	Post-Excavation	11/14/2000	4	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-61-S-1.5	Post-Excavation	11/14/2000	1.5	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-62-B-6	Post-Excavation	11/14/2000	6	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-63-B-6	Post-Excavation	11/14/2000	6	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-64-S-4	Post-Excavation	11/14/2000	4	15.2	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-65-S-4	Post-Excavation	11/14/2000	4	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-66-S-3.5	Post-Excavation	11/14/2000	3.5	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-67-S-2	Post-Excavation	11/14/2000	2	50.6	25	69.5	50 U[1]	120 U	154 U	585 U
PEX-68-B-2	Post-Excavation	11/14/2000	2	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-69-B-2.5	Post-Excavation	11/14/2000	2.5	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-70-B-3	Post-Excavation	11/14/2000	3	18.8	25 U	6.76	50 U[1]	50 U	50 U	100 U
PEX-71-B-3	Post-Excavation	11/14/2000	3	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
Preliminary Cleanup Level[7]				**460**	**2,000**	**100 / 30[8]**	**30**	**7,000**	**6,000**	**9,000**

Table 19
Summary of Soil Analytical Results - October 26, 2000 Spill (Study Unit 1)
Laurel Station
Bellingham, Washington

Sample ID	Sample Type	Sample Date	Sample Depth (feet bgs)	NWTPH-Dx (mg/kg)		NWTPH-Gx (mg/kg)	VOCs (ug/kg)			
				Diesel/Fuel Oil-Range	Heavy Oil-Range	Gasoline-Range	Benzene	Toluene	Ethylbenzene	Xylenes
PEX-72-B-1[9]	Post-Excavation	11/14/2000	1	270	173	**97.1**	**181**	1,060	580	**37,700**
PEX-73-B-1.5	Post-Excavation	11/14/2000	1.5	50.8	41.7	10.2	50 U[1]	50 U	50 U	100 U
PEX-74-B-4	Post-Excavation	11/16/2000	4	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-75-B-4	Post-Excavation	11/16/2000	4	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-76-B-4	Post-Excavation	11/22/2006	4	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
PEX-77-B-11	Post-Excavation	11/22/2006	11	10 U	25 U	5 U	50 U[1]	50 U	50 U	100 U
Preliminary Cleanup Level[7]				**460**	**2,000**	**100 / 30[8]**	**30**	**7,000**	**6,000**	**9,000**

Notes:

Bolded values indicate the Preliminary Cleanup Level was exceeded

NWTPH-Dx - Northwest total petroleum hydrocarbons - diesel range

NWTPH-Gx - Northwest total petroleum hydrocarbons - gasoline range

bgs - below ground surface

mg/kg - milligrams per kilogram

ug/kg - micrograms per kilogram

VOCs - volatile organic compounds

-- - not analyzed

U - not detected above the reporting limit shown

[1] Not detected; however, laboratory reporting limit exceeds Preliminary Cleanup Level

[2] Additional soil excavation was completed at this location and re-sampled as PEX-48-S-4

[3] Additional soil excavation was completed at this location and re-sampled as PEX-77-B-11

[4] Additional soil excavation was completed at this location and re-sampled as PEX-38-S-4

[5] Additional soil excavation was completed at this location and re-sampled as PEX-55-S-2

[6] Additional soil excavation was completed at this location and re-sampled as PEX-53-S-1.5

[7] See Table 3 for Preliminary Cleanup Level rationale

[8] Gasoline mixtures without benzene/gasoline mixtures with benzene

[9] An additional soil excavation was completed at this location and re-sampled as PEX-76-B-4

Table 20
Summary of Soil Analytical Results
PCS Storage Cells (Study Units 3 and 7)
Laurel Station
Bellingham, Washington

Sample ID	2-1A	2-2D	2-3B	2-4C	2-6A	2-6C	2-7B	3-1C	3-2D	3-3A	3-4B	Preliminary Cleanup Level[1]
Sample Type	**Stockpile**	**Stockpile**	**Stockpile**	**Stockpile**	**Stockpile**	**Stockpile**	**Stockpile**	**Stockpile**	**Stockpile**	**Stockpile**	**Stockpile**	
Sample Date	7/7/1993	7/7/1993	7/7/1993	7/7/1993	7/8/1993	7/8/1993	7/8/1993	7/8/1993	7/8/1993	7/8/1993	7/8/1993	
Total Petroleum Hydrocarbons (mg/kg)												
Diesel/Fuel Oil-Range	150	400	400	38	420	350	67	25	280 J	400	240	**460**
Heavy Oil-Range	55	140	130	50 U	160	50 U	50 U	50 U	120 J	160	100	**2,000**
Gasoline-Range	49	91	**120**	23	**120**	78	22	20 U	55 J	71	**66**	**100 / 30[2]**
Volatile Organic Compounds (ug/kg)												
Benzene	62 U[3]	58 U[3]	**180**	57 U[3]	61 U[3]	58 U[3]	59 U	58 U[3]	58 U[3]	57 U[3]	**720 J**	**30**
Toluene	62 U	58 U	58 U	57 U	61 U	58 U	59 U	58 U	58 U	57 U	59 UJ	**7,000**
Ethylbenzene	62 U	88	520	89	130	72	71	77	58 U	100 J	1,400 J	**6,000**
Xylenes (total)	120 U	120	2,200	220	340	110 J	89 J	120	72 J	220 J	1,100 J	**9,000**
1,1,2-Trichlorotrifluoroethane	--	--	--	--	--	--	--	--	--	--	--	**NE**
Acetone	--	--	--	--	--	--	--	--	--	--	--	**8,000,000**
Methylene Chloride	--	--	--	--	--	--	--	--	--	--	--	**20**
Polycyclic Aromatic Hydrocarbons (PAHs) (ug/kg)												
Naphthalene	--	--	--	--	--	--	--	--	--	--	--	**1,600**
2-Methylnaphthalene	--	--	--	--	--	--	--	--	--	--	--	**320**
Fluoranthene	--	--	--	--	--	--	--	--	--	--	--	**3,200**
Fluorene	--	--	--	--	--	--	--	--	--	--	--	**3,200**
Pyrene	--	--	--	--	--	--	--	--	--	--	--	**2,400**
Phenanthrene	--	--	--	--	--	--	--	--	--	--	--	**NE**
Acenaphthene	--	--	--	--	--	--	--	--	--	--	--	**4,800**
Anthracene	--	--	--	--	--	--	--	--	--	--	--	**24,000**
Dibenzofuran	--	--	--	--	--	--	--	--	--	--	--	**160**
Carcinogenic PAHs (ug/kg)												
Benzo(a)pyrene	--	--	--	--	--	--	--	--	--	--	--	**See Note[4]**
Benzo(a)anthracene	--	--	--	--	--	--	--	--	--	--	--	**See Note[4]**
Benzo(b)fluoranthene	--	--	--	--	--	--	--	--	--	--	--	**See Note[4]**
Benzo(k)fluoranthene	--	--	--	--	--	--	--	--	--	--	--	**See Note[4]**
Dibenz(a,h)anthracene	--	--	--	--	--	--	--	--	--	--	--	**See Note[4]**
Chrysene	--	--	--	--	--	--	--	--	--	--	--	**See Note[4]**
Indeno(1,2,3-c,d)pyrene	--	--	--	--	--	--	--	--	--	--	--	**See Note[4]**
TTEC	--	--	--	--	--	--	--	--	--	--	--	**100**

Notes:
Bolded values indicate the Preliminary Cleanup Level was exceeded
mg/kg - milligrams per kilogram
ug/kg - micrograms per kilogram
TTEC - total toxicity equivalency concentration
U - not detected above the reporting limit shown
J - estimated
M - estimated value found with low spectral match parameters
-- - not analyzed
NE - not established
[1] See Table 3 for Preliminary Cleanup Level rationale
[2] Gasoline mixtures without benzene/gasoline mixtures with benzene
[3] Not detected; however, laboratory reporting limit exceeds the Preliminary Cleanup Level.
[4] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8).
The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene.
Samples 4-3C, 5-1A, 5-2C, 5-3B, 5-4D, and 5-5B were also analyzed for RCRA TCLP metals, which were not detected above waste criteria.

Table 20
Summary of Soil Analytical Results
PCS Storage Cells (Study Units 3 and 7)
Laurel Station
Bellingham, Washington

Sample ID	4-1B	4-2D	4-2 DUP	4-3C	4-4A	4-5C	4-6B	4-6 DUP	5-1A	5-2C	5-3B	5-4D	5-5B	4S-1	Preliminary Cleanup Level[1]
Sample Type	Stockpile	Stockpile	Stockpile	Stockpile	Stockpile	Stockpile	Stockpile	Stockpile	Stockpile	Stockpile	Stockpile	Stockpile	Stockpile	Post-Consolidatio	
Sample Date	7/9/1993	7/9/1993	7/9/1993	7/9/1993	7/9/1993	7/9/1993	7/9/1993	7/9/1993	7/9/1993	7/9/1993	7/9/1993	7/9/1993	7/9/1993	10/16/1992	
Total Petroleum Hydrocarbons (mg/kg)															
Diesel/Fuel Oil-Range	210	37	130	**22,000**	400	25 U	25 U	430	**7,500**	**1,500**	**1,700**	**4,400**	**1,200**	10 U	**460**
Heavy Oil-Range	78	50 U	110	**7,800**	290	50 U	50 U	320	**2,800**	660	68	1,800	360	10 U	**2,000**
Gasoline-Range	58	20 U	53	**7,200**	75	20 U	20 U	20 U	**2,400**	**440**	**570**	**1,700**	**450**	10 U	**100 / 30[2]**
Volatile Organic Compounds (ug/kg)															
Benzene	60 U[3]	57 U[3]	--	**1,200**	60 U[3]	60 U[3]	61 U[3]	--	**1,200**	**910 J**	**1,700 J**	**5,400**	**110**	1 U	**30**
Toluene	60 U	57 U	--	**21,000**	60 U	60 U	61 U	--	4,400	1,300 J	6,800 J	**17,000**	150 U	1 U	**7,000**
Ethylbenzene	60 U	160	--	**12,000**	60 U	60 U	61 U	--	**1,800**	1,600 J	2,500 J	5,100	2,000	1 U	**6,000**
Xylenes (total)	110 J	190	--	**52,000**	120 U	120 U	120 U	--	**19,000**	**13,000 J**	**22,000 J**	**39,000**	6,600	2 U	**9,000**
1,1,2-Trichlorotrifluoroethane	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**NE**
Acetone	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**8,000,000**
Methylene Chloride	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**20**
Polycyclic Aromatic Hydrocarbons (PAHs) (ug/kg)															
Naphthalene	--	--	--	**8,600**	--	--	--	--	1,400	--	--	**2,500**	--	--	**1,600**
2-Methylnaphthalene	--	--	--	**25,000**	--	--	--	--	**7,500**	--	--	**11,000**	--	--	**320**
Fluoranthene	--	--	--	**3,400**	--	--	--	--	160 U	--	--	390	--	--	**3,200**
Fluorene	--	--	--	**3,300 J**	--	--	--	--	1,100	--	--	1,000	--	--	**3,200**
Pyrene	--	--	--	**3,300**	--	--	--	--	360	--	--	560	--	--	**2,400**
Phenanthrene	--	--	--	5,700	--	--	--	--	1,800	--	--	2,000	--	--	**NE**
Acenaphthene	--	--	--	840 J	--	--	--	--	160 U	--	--	340 U	--	--	**4,800**
Anthracene	--	--	--	1,200 J	--	--	--	--	160 U	--	--	340 U	--	--	**24,000**
Dibenzofuran	--	--	--	**3,000**	--	--	--	--	**320 J**	--	--	**320 J**	--	--	**160**
Carcinogenic PAHs (ug/kg)															
Benzo(a)pyrene	--	--	--	1,300 U	--	--	--	--	160 U	--	--	85 J	--	--	**See Note[4]**
Benzo(a)anthracene	--	--	--	940 J	--	--	--	--	160 U	--	--	150 J	--	--	**See Note[4]**
Benzo(b)fluoranthene	--	--	--	1,300 U	--	--	--	--	160 U	--	--	230	--	--	**See Note[4]**
Benzo(k)fluoranthene	--	--	--	1,300 U	--	--	--	--	160 U	--	--	230	--	--	**See Note[4]**
Dibenz(a,h)anthracene	--	--	--	1,300 U	--	--	--	--	160 U	--	--	340 U	--	--	**See Note[4]**
Chrysene	--	--	--	1,900	--	--	--	--	720	--	--	750	--	--	**See Note[4]**
Indeno(1,2,3-c,d)pyrene	--	--	--	1,300 U	--	--	--	--	160 U	--	--	340 U	--	--	**See Note[4]**
TTEC	--	--	--	**113**	--	--	--	--	19	--	--	**153.5**	--	--	**100**

Notes:
Bolded values indicate the Preliminary Cleanup Level was exceeded
mg/kg - milligrams per kilogram
ug/kg - micrograms per kilogram
TTEC - total toxicity equivalency concentration
U - not detected above the reporting limit shown
J - estimated
M - estimated value found with low spectral match parameters
-- - not analyzed
NE - not established

[1] See Table 3 for Preliminary Cleanup Level rationale

[2] Gasoline mixtures without benzene/gasoline mixtures with benzene

[3] Not detected; however, laboratory reporting limit exceeds the Preliminary Cleanup Level.

[4] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8).
The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene.
Samples 4-3C, 5-1A, 5-2C, 5-3B, 5-4D, and 5-5B were also analyzed for RCRA TCLP metals, which were not detected above waste criteria.

Table 20
Summary of Soil Analytical Results
PCS Storage Cells (Study Units 3 and 7)
Laurel Station
Bellingham, Washington

Sample ID	4S-2	4S-3	4S-4	4S-5	BT-1	BT-2	BT-3	BT-4	SC-1A	SC-1B	SC-1C	SC-1D	SC-1E	Preliminary Cleanup Level[1]
Sample Type	Post-Consolidation	Post-Consolidation	Post-Consolidation	Post-Consolidation	Post-Consolidation	Post-Consolidation	Post-Consolidation	Post-Consolidation	Post-Consolidation	Post-Consolidation	Post-Consolidation	Post-Consolidation	Post-Consolidation	
Sample Date	10/16/1992	10/16/1992	10/16/1992	10/16/1992	10/16/1992	10/16/1992	10/16/1992	10/16/1992	10/16/1992	10/16/1992	10/16/1992	10/16/1992	10/16/1992	
Total Petroleum Hydrocarbons (mg/kg)														
Diesel/Fuel Oil-Range	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	**460**
Heavy Oil-Range	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	**2,000**
Gasoline-Range	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	**100 / 30[2]**
Volatile Organic Compounds (ug/kg)														
Benzene	1 U	2 U	4 U	--	--	29	--	--	--	--	--	--	--	**30**
Toluene	1 U	2 U	4 U	--	--	--	--	--	--	--	--	--	--	**7,000**
Ethylbenzene	1 U	2 U	4 U	--	--	180	--	--	--	--	--	--	--	**6,000**
Xylenes (total)	2 U	1.6 J	14	--	--	150	--	--	--	--	--	--	--	**9,000**
1,1,2-Trichlorotrifluoroethane	--	--	--	--	3	14 M	--	--	--	--	--	--	--	**NE**
Acetone	--	--	--	--	--	140	--	--	--	--	--	--	--	**8,000,000**
Methylene Chloride	--	--	--	--	4.7	--	--	--	--	--	--	--	--	**20**
Polycyclic Aromatic Hydrocarbons (PAHs) (ug/kg)														
Naphthalene	--	--	--	--	--	--	--	--	--	--	--	--	--	**1,600**
2-Methylnaphthalene	--	--	--	--	--	--	--	--	--	--	--	--	--	**320**
Fluoranthene	--	--	--	--	--	--	--	--	--	--	--	--	--	**3,200**
Fluorene	--	--	--	--	--	--	--	--	--	--	--	--	--	**3,200**
Pyrene	--	--	--	--	--	--	--	--	--	--	--	--	--	**2,400**
Phenanthrene	--	--	--	--	--	--	--	--	--	--	--	--	--	**NE**
Acenaphthene	--	--	--	--	--	--	--	--	--	--	--	--	--	**4,800**
Anthracene	--	--	--	--	--	--	--	--	--	--	--	--	--	**24,000**
Dibenzofuran	--	--	--	--	--	--	--	--	--	--	--	--	--	**160**
Carcinogenic PAHs (ug/kg)														
Benzo(a)pyrene	--	--	--	--	--	--	--	--	--	--	--	--	--	**See Note[4]**
Benzo(a)anthracene	--	--	--	--	--	--	--	--	--	--	--	--	--	**See Note[4]**
Benzo(b)fluoranthene	--	--	--	--	--	--	--	--	--	--	--	--	--	**See Note[4]**
Benzo(k)fluoranthene	--	--	--	--	--	--	--	--	--	--	--	--	--	**See Note[4]**
Dibenz(a,h)anthracene	--	--	--	--	--	--	--	--	--	--	--	--	--	**See Note[4]**
Chrysene	--	--	--	--	--	--	--	--	--	--	--	--	--	**See Note[4]**
Indeno(1,2,3-c,d)pyrene	--	--	--	--	--	--	--	--	--	--	--	--	--	**See Note[4]**
TTEC	--	--	--	--	--	--	--	--	--	--	--	--	--	**100**

Notes:
Bolded values indicate the Preliminary Cleanup Level was exceeded
mg/kg - milligrams per kilogram
ug/kg - micrograms per kilogram
TTEC - total toxicity equivalency concentration
U - not detected above the reporting limit shown
J - estimated
M - estimated value found with low spectral match parameters
-- - not analyzed
NE - not established
[1] See Table 3 for Preliminary Cleanup Level rationale
[2] Gasoline mixtures without benzene/gasoline mixtures with benzene
[3] Not detected; however, laboratory reporting limit exceeds the Preliminary Cleanup Level.
[4] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8).
The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene.
Samples 4-3C, 5-1A, 5-2C, 5-3B, 5-4D, and 5-5B were also analyzed for RCRA TCLP metals, which were not detected above waste criteria.

Table 20
Summary of Soil Analytical Results
PCS Storage Cells (Study Units 3 and 7)
Laurel Station
Bellingham, Washington

Sample ID	SC-1F	SC-1G	SC-1H	P5-2	P5-3	P5-4	P5-5	P5-6	P5-7	P5-8	Preliminary Cleanup Level[1]
Sample Type	Post-Consolidation	Post-Consolidation	Post-Consolidation	Post-Consolidation	Post-Consolidation	Post-Consolidation	Post-Consolidation	Post-Consolidation	Post-Consolidation	Post-Consolidation	
Sample Date	10/16/1992	10/16/1992	10/16/1992	11/25/1992	11/25/1992	11/25/1992	11/25/1992	11/25/1992	12/1/1992	12/1/1992	
Total Petroleum Hydrocarbons (mg/kg)											
Diesel/Fuel Oil-Range	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	**460**
Heavy Oil-Range	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	**2,000**
Gasoline-Range	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	**100 / 30[2]**
Volatile Organic Compounds (ug/kg)											
Benzene	--	--	--	--	--	--	--	--	--	--	**30**
Toluene	--	--	--	--	--	--	--	--	--	--	**7,000**
Ethylbenzene	--	--	--	--	--	--	--	--	--	--	**6,000**
Xylenes (total)	--	--	--	--	--	--	--	--	--	--	**9,000**
1,1,2-Trichlorotrifluoroethane	--	--	--	--	--	--	--	--	--	--	**NE**
Acetone	--	--	--	--	--	--	--	--	--	--	**8,000,000**
Methylene Chloride	--	--	--	--	--	--	--	--	--	--	**20**
Polycyclic Aromatic Hydrocarbons (PAHs) (ug/kg)											
Naphthalene	--	--	--	--	--	--	--	--	--	--	**1,600**
2-Methylnaphthalene	--	--	--	--	--	--	--	--	--	--	**320**
Fluoranthene	--	--	--	--	--	--	--	--	--	--	**3,200**
Fluorene	--	--	--	--	--	--	--	--	--	--	**3,200**
Pyrene	--	--	--	--	--	--	--	--	--	--	**2,400**
Phenanthrene	--	--	--	--	--	--	--	--	--	--	**NE**
Acenaphthene	--	--	--	--	--	--	--	--	--	--	**4,800**
Anthracene	--	--	--	--	--	--	--	--	--	--	**24,000**
Dibenzofuran	--	--	--	--	--	--	--	--	--	--	**160**
Carcinogenic PAHs (ug/kg)											
Benzo(a)pyrene	--	--	--	--	--	--	--	--	--	--	**See Note[4]**
Benzo(a)anthracene	--	--	--	--	--	--	--	--	--	--	**See Note[4]**
Benzo(b)fluoranthene	--	--	--	--	--	--	--	--	--	--	**See Note[4]**
Benzo(k)fluoranthene	--	--	--	--	--	--	--	--	--	--	**See Note[4]**
Dibenz(a,h)anthracene	--	--	--	--	--	--	--	--	--	--	**See Note[4]**
Chrysene	--	--	--	--	--	--	--	--	--	--	**See Note[4]**
Indeno(1,2,3-c,d)pyrene	--	--	--	--	--	--	--	--	--	--	**See Note[4]**
TTEC	--	--	--	--	--	--	--	--	--	--	**100**

Notes:
Bolded values indicate the Preliminary Cleanup Level was exceeded
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ug/kg - micrograms per kilogram
TTEC - total toxicity equivalency concentration
U - not detected above the reporting limit shown
J - estimated
M - estimated value found with low spectral match parameters
-- - not analyzed
NE - not established
[1] See Table 3 for Preliminary Cleanup Level rationale
[2] Gasoline mixtures without benzene/gasoline mixtures with benzene
[3] Not detected; however, laboratory reporting limit exceeds the Preliminary Cleanup Level.
[4] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8).
The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene.
Samples 4-3C, 5-1A, 5-2C, 5-3B, 5-4D, and 5-5B were also analyzed for RCRA TCLP metals, which were not detected above waste criteria.

Table 20
Summary of Soil Analytical Results
PCS Storage Cells (Study Units 3 and 7)
Laurel Station
Bellingham, Washington

Sample ID	P5-9	P5-10	P5-11	P5-12	P5-13	P5-14	P5-15	P5-16	P5-17	P5-18	P5-19	Preliminary Cleanup Level[1]
Sample Type	Post-Consolidation	Post-Consolidation	Post-Consolidation	Post-Consolidation	Post-Consolidation	Post-Consolidation	Post-Consolidation	Post-Consolidation	Post-Consolidation	Post-Consolidation	Post-Consolidation	
Sample Date	12/1/1992	12/1/1992	12/1/1992	12/1/1992	12/1/1992	12/1/1992	12/1/1992	12/1/1992	12/1/1992	12/1/1992	12/1/1992	
Total Petroleum Hydrocarbons (mg/kg)												
Diesel/Fuel Oil-Range	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	**460**
Heavy Oil-Range	10 U	10 U	10 U	10 U	12	10 U	10 U	10 U	10 U	10 U	10 U	**2,000**
Gasoline-Range	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	**100 / 30[2]**
Volatile Organic Compounds (ug/kg)												
Benzene	--	--	--	--	--	--	--	--	--	--	--	**30**
Toluene	--	--	--	--	--	--	--	--	--	--	--	**7,000**
Ethylbenzene	--	--	--	--	--	--	--	--	--	--	--	**6,000**
Xylenes (total)	--	--	--	--	--	--	--	--	--	--	--	**9,000**
1,1,2-Trichlorotrifluoroethane	--	--	--	--	--	--	--	--	--	--	--	**NE**
Acetone	--	--	--	--	--	--	--	--	--	--	--	**8,000,000**
Methylene Chloride	--	--	--	--	--	--	--	--	--	--	--	**20**
Polycyclic Aromatic Hydrocarbons (PAHs) (ug/kg)												
Naphthalene	--	--	--	--	--	--	--	--	--	--	--	**1,600**
2-Methylnaphthalene	--	--	--	--	--	--	--	--	--	--	--	**320**
Fluoranthene	--	--	--	--	--	--	--	--	--	--	--	**3,200**
Fluorene	--	--	--	--	--	--	--	--	--	--	--	**3,200**
Pyrene	--	--	--	--	--	--	--	--	--	--	--	**2,400**
Phenanthrene	--	--	--	--	--	--	--	--	--	--	--	**NE**
Acenaphthene	--	--	--	--	--	--	--	--	--	--	--	**4,800**
Anthracene	--	--	--	--	--	--	--	--	--	--	--	**24,000**
Dibenzofuran	--	--	--	--	--	--	--	--	--	--	--	**160**
Carcinogenic PAHs (ug/kg)												
Benzo(a)pyrene	--	--	--	--	--	--	--	--	--	--	--	**See Note[4]**
Benzo(a)anthracene	--	--	--	--	--	--	--	--	--	--	--	**See Note[4]**
Benzo(b)fluoranthene	--	--	--	--	--	--	--	--	--	--	--	**See Note[4]**
Benzo(k)fluoranthene	--	--	--	--	--	--	--	--	--	--	--	**See Note[4]**
Dibenz(a,h)anthracene	--	--	--	--	--	--	--	--	--	--	--	**See Note[4]**
Chrysene	--	--	--	--	--	--	--	--	--	--	--	**See Note[4]**
Indeno(1,2,3-c,d)pyrene	--	--	--	--	--	--	--	--	--	--	--	**See Note[4]**
TTEC	--	--	--	--	--	--	--	--	--	--	--	**100**

Notes:
Bolded values indicate the Preliminary Cleanup Level was exceeded
mg/kg - milligrams per kilogram
ug/kg - micrograms per kilogram
TTEC - total toxicity equivalency concentration
U - not detected above the reporting limit shown
J - estimated
M - estimated value found with low spectral match parameters
-- - not analyzed
NE - not established
[1] See Table 3 for Preliminary Cleanup Level rationale
[2] Gasoline mixtures without benzene/gasoline mixtures with benzene
[3] Not detected; however, laboratory reporting limit exceeds the Preliminary Cleanup Level.
[4] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8).
The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene.
Samples 4-3C, 5-1A, 5-2C, 5-3B, 5-4D, and 5-5B were also analyzed for RCRA TCLP metals, which were not detected above waste criteria.

Table 21
Summary of Surface Water Analytical Results (Study Units 2, 3, Area 1, and Area 3)
Laurel Station
Bellingham, Washington

		VOCs (ug/L)				TPH (mg/L)		
Sample ID	**Sample Date**	**Benzene**	**Toluene**	**Ethylbenzene**	**Xylenes**	**Diesel Range**	**Gasoline Range**	**TPH (Method 418.1)**
OWS-1	12/4/1991	1 U	1 U	1 U	2 U	--	0.95	1 U
	8/6/1992	1 U	1 U	1 U	2 U	0.25 U	0.25 U	1 U
OWS-170	1/8/1992	1 U	2.6	1 U	2 U	--	--	1 U
	1/27/1992	**14**	16	1 U	7.3	--	--	1 U
	11/10/1992	1 U	1 U	1 U	2 U	0.25 U	0.25 U	1 U
OWS-180	8/27/1991	1 U	1 U	1 U	2 U	0.25 U	0.25 U	1 U
	1/8/1992	1 U	1 U	1 U	2 U	--	--	1 U
	1/21/1992	1 U	1 U	1 U	2 U	--	--	1 U
	11/10/1992	1 U	1 U	1 U	2 U	0.25 U	0.25 U	1 U
OWS-PR	1/8/1992	1 U	1 U	1 U	1.2 J	--	--	1.7
SW-1	3/10/1992	1 U	1 U	1 U	2 U	--	--	1 U
	3/11/1992	--	--	--	--	--	--	1 U
	3/11/1992	1 U	1 U	1 U	2 U	--	--	1 U
	3/12/1992	1 U	1 U	1 U	2 U	--	--	1 U
	3/12/1992	1 U	1 U	1 U	2 U	--	--	--
	3/13/1992	1 U	1 U	1 U	2 U	--	--	1.1
	3/13/1992	1 U	1 U	1 U	2 U	--	--	--
	3/14/1992	1 U	1 U	1 U	2 U	--	--	1 U
	3/15/1992	1 U	1 U	1 U	2 U	--	--	1 U
	3/16/1992	1 U	1 U	1 U	2 U	--	--	1 U
	3/17/1992	29.4 U[2]	29.4 U	29.4 U	58.8 U	--	--	1 U
	3/18/1992	1 U	1 U	1 U	2 U	--	--	1 U
	4/28/1992	1 U	1 U	1 U	2 U	--	0.25 U	1 U
SW-2	3/10/1992	**5.4**	2.1	14	22	--	--	1 U
	3/11/1992	1 U	1 U	1 U	2 U	--	--	1 U
SW-3	3/12/1992	1 U	1 U	1 U	2 U	--	--	1 U
	3/13/1992	1 U	1 U	1 U	2 U	--	--	1 U
	3/14/1992	1 U	1 U	1 U	2 U	--	--	1 U
	3/15/1992	1 U	1 U	1 U	2 U	--	--	1 U
	3/16/1992	1 U	1 U	1 U	2 U	--	--	1 U
	3/17/1992	1 U	1 U	1 U	2 U	--	--	1 U
	3/18/1992	1 U	1 U	1 U	2 U	--	--	1 U
	3/19/1992	1 U	1 U	1 U	2 U	--	--	1 U
	3/20/1992	1 U	1 U	1 U	2 U	--	--	1 U
	3/24/1992	1 U	1 U	1 U	2 U	--	--	1 U
	4/1/1992	1 U	1 U	1 U	2 U	--	--	1 U
	4/8/1992	1 U	1 U	1 U	2 U	--	--	1 U
	4/15/1992	1 U	1 U	1 U	2 U	--	--	1 U
	4/22/1992	1 U	1 U	1 U	2 U	--	0.25 U	1 U
	4/28/1992	1 U	1 U	1 U	2 U	--	0.25 U	1 U
	5/7/1992	1 U	1 U	1 U	2 U	--	0.25 U	1 U
	5/13/1992	1 U	1 U	1 U	2 U	--	--	1 U
	5/20/1992	1 U	1 U	1 U	2 U	0.25 U	--	--
	5/27/1992	1 U	1 U	1 U	2 U	--	--	1 U
	7/15/1992	1 U	1 U	1 U	2 U	0.25 U	0.25 U	1 U
	11/4/1992	1 U	1 U	1 U	2 U	0.25 U	0.25 U	1 U
SPILL-1	10/22/1992	1 U	1 U	1 U	2 U	0.25 U	0.25 U	1 U
SPILL-2	10/22/1992	1 U	1 U	1 U	2 U	0.25 U	0.25 U	1 U
	11/4/1992	1 U	1 U	1 U	2 U	0.25 U	0.25 U	1 U
SPILL-3	10/22/1992	1 U	1 U	1 U	2 U	0.35	0.25 U	1 U
	11/4/1992	**1.8**	1 U	1 U	2 U	0.33	0.25 U	1 U
SPILL-4/SPILL-6	11/4/1992	1 U	1 U	1 U	2 U	0.25 U	0.25 U	1 U
	11/10/1992	1 U	1 U	1 U	2 U	0.25 U	0.25 U	1 U
SPILL-5	11/4/1992	1 U	1 U	1 U	2 U	0.25 U	0.25 U	1 U
SPILL-7	11/10/1992	1 U	1 U	1 U	2 U	0.25 U	0.25 U	1 U
Preliminary Cleanup Level[1]		**1.2**	**1,300**	**530**	**NE**	**0.5**	**0.8/1.0[3]**	**NE**

Table 21
Summary of Surface Water Analytical Results (Study Units 2, 3, Area 1, and Area 3)
Laurel Station
Bellingham, Washington

		VOCs (ug/L)				TPH (mg/L)		
Sample ID	**Sample Date**	**Benzene**	**Toluene**	**Ethylbenzene**	**Xylenes**	**Diesel Range**	**Gasoline Range**	**TPH (Method 418.1)**
MW-1	3/15/1991	--	--	--	--	**4**	--	1 U
	4/17/1991	**57**	1 U	1 U	21	1 U[2]	--	--
	5/30/1991	--	--	--	--	**3.1**	--	--
	6/18/1991	--	--	--	--	1 U[2]	--	--
MW-2[4]	3/15/1991	--	--	--	--	**21**	--	25.8
	4/8/1991	--	--	--	--	--	--	--
	4/17/1991	**290**	66	37	632	**7.3**	--	--
	5/22/1991	1 U	1 U	1 U	1 U	**8.9**	--	--
	6/12/1991	--	--	--	--	**8.1**	--	--
	6/18/1991	--	--	--	--	**6.6**	--	--
MW-3	3/15/1991	--	--	--	--	1 U[2]	--	1 U
	4/17/1991	**21**	15	1 U	10	1 U[2]	--	--
	6/18/1991	--	--	--	--	1 U[2]	--	--
SWRO-C	4/12/1991	1 U	1 U	1 U	1 U	--	--	1 U
	4/24/1991	1	1 U	3	3	--	--	1 U
	5/15/1991	1 U	1 U	1 U	1 U	--	--	--
	5/22/1991	1 U	1 U	1 U	1 U	--	--	3.8
	5/30/1991	1 U	1 U	1 U	1 U	--	--	1 U
	6/5/1991	--	1 U	1 U	1 U	--	--	1 U
	6/12/1991	1 U	1 U	1 U	1 U	--	--	2
	6/18/1991	1 U	1 U	1 U	1 U	--	--	1 U
	6/26/1991	5 U[2]	5 U	5 U	5 U	--	--	5.9
	7/1/1991	1 U	1 U	1 U	1 U	--	--	2.3
	8/13/1991	1 U	1 U	1 U	1 U	--	--	1 U
	8/21/1991	1 U	1 U	1 U	1 U	--	--	1 U
	9/4/1991	1 U	1 U	1 U	1 U	--	--	2.2
	9/19/1991	1 U	1 U	1 U	1 U	--	--	0.5 U
	12/11/1991	**2**	2.2	1 U	1.7 J	--	--	1 U
	12/11/1991	1 U	1 U	1 U	2 U	--	--	1 U
	12/11/1991	1 U	1 U	1 U	2 U	--	--	1 U
	12/11/1991	1 U	1 U	1 U	2 U	--	--	1 U
	12/11/1991	1 U	1 U	1 U	2 U	--	--	1 U
	12/11/1991	1 U	1 U	1 U	2 U	--	--	1 U
	12/12/1991	1 U	1 U	1 U	2 U	--	--	1 U
	12/12/1991	1 U	1 U	1 U	2 U	--	--	1 U
	12/12/1991	1 U	1 U	1 U	2 U	--	--	1 U
	12/12/1991	1 U	1 U	1 U	2 U	--	--	1 U
	12/12/1991	1 U	1 U	1 U	2 U	--	--	1 U
	12/12/1991	1 U	1 U	1 U	2 U	--	--	1 U
	12/12/1991	1 U	1 U	1 U	2 U	--	--	1 U
	12/12/1991	1 U	1 U	1 U	2 U	--	--	1 U
	12/13/1991	1 U	1 U	1 U	2 U	--	0.5 U	1 U
	12/13/1991	1 U	1 U	1 U	2 U	--	--	1 U
	12/17/1991	1 U	1 U	1 U	2 U	--	--	1 U
	12/18/1991	1 U	1 U	1 U	2 U	--	0.5 U	1 U
	12/24/1991	1 U	1 U	1 U	2 U	--	0.5 U	1 U
	1/2/1992	1 U	1 U	1 U	2 U	--	0.5 U	1 U
	1/8/1992	--	--	--	--	1 U[2]	--	--
	1/15/1992	--	--	--	--	--	0.25 U	--
	1/22/1992	--	--	--	--	--	0.25 U	--
	1/29/1992	--	--	--	--	--	0.25 U	--
	2/6/1992	--	--	--	--	--	0.25 U	--
	2/12/1992	--	--	--	--	--	0.25 U	--
	2/20/1992	--	--	--	--	--	0.25 U	--
	2/26/1992	--	--	--	--	--	0.25 U	--
	3/3/1992	--	--	--	--	--	0.25 U	--
	3/11/1992	1 U	1 U	1 U	2 U	--	0.25 U	--
	3/18/1992	--	--	--	--	--	0.25 U	--
	3/25/1992	--	--	--	--	--	0.25 U	--
	4/1/1992	1 U	1 U	1 U	2 U	--	0.25 U	--
	4/8/1992	1 U	1 U	1 U	2 U	--	0.25 U	--
	4/15/1992	--	--	--	--	--	0.25 U	--
	4/22/1992	1 U	1 U	1 U	2 U	0.25 U	0.25 U	--
	4/28/1992	1 U	1 U	1 U	2 U	0.25 U	0.25 U	--
	5/7/1992	1 U	1 U	1 U	2 U	0.25 U	0.25 U	--
	5/13/1992	1 U	1 U	1 U	2 U	3 U[2]	0.25 U	--
	5/20/1992	1 U	1 U	1 U	2 U	0.25 U	0.25 U	--
	7/15/1992	1 U	0.64 J	1 U	2 U	0.25 U	0.25 U	1 U
	7/22/1992	1 U	1 U	1 U	2 U	0.25 U	0.25 U	1 U
	8/6/1992	1 U	1 U	1 U	2 U	0.25 U	0.25 U	1 U
	10/19/1992	1 U	1 U	1 U	2 U	0.25 U	0.25 U	1 U
Preliminary Cleanup Level[1]		**1.2**	**1,300**	**530**	**NE**	**0.5**	**0.8/1.0[3]**	**NE**

Table 21
Summary of Surface Water Analytical Results (Study Units 2, 3, Area 1, and Area 3)
Laurel Station
Bellingham, Washington

		VOCs (ug/L)				TPH (mg/L)		
Sample ID	**Sample Date**	**Benzene**	**Toluene**	**Ethylbenzene**	**Xylenes**	**Diesel Range**	**Gasoline Range**	**TPH (Method 418.1)**
SWRO-D2	1/17/1991	--	--	--	--	**3.9**[5]	--	--
	1/19/1991	--	--	--	--	**2.4**[5]	--	--
	1/21/1991	--	--	--	--	1 U[2]	--	--
	1/23/1991	--	--	--	--	1 U[2]	--	--
	1/28/1991	1 U	1 U	1 U	2	1 U[2]	--	--
	2/1/1991	--	--	--	--	1 U[2]	--	--
	2/8/1991	--	--	--	--	1 U[2]	--	--
	2/15/1991	--	--	--	--	1 U[2]	--	--
	2/18/1991	--	--	--	--	1 U[2]	--	--
	2/22/1991	--	--	--	--	1 U[2]	--	--
	3/3/1991	--	--	--	--	1 U[2]	--	--
	3/8/1991	--	--	--	--	1 U[2]	--	--
	3/12/1991	--	--	--	--	1 U[2]	--	--
	3/15/1991	--	--	--	--	1 U[2]	--	--
	3/22/1991	--	--	--	--	1 U[2]	--	--
	3/29/1991	--	--	--	--	1 U[2]	--	--
	4/12/1991	1 U	1 U	1 U	1 U	1 U[2]	--	--
	4/17/1991	1 U	1 U	1 U	1 U	1 U[2]	--	--
	4/24/1991	1 U	1 U	1 U	1 U	--	--	1 U
	5/15/1991	1 U	1 U	1 U	1 U	--	--	--
	5/22/1991	1 U	1 U	1 U	1 U	--	--	1 U
	5/30/1991	1 U	1 U	1 U	1 U	--	--	1 U
	6/5/1991	1 U	1 U	1 U	1 U	--	--	1 U
	6/12/1991	1 U	1 U	1 U	1 U	--	--	2.8
	6/18/1991	1 U	1 U	1 U	1 U	--	--	1.3
	6/26/1991	5 U[2]	5 U	5 U	5 U	--	--	1.1
	7/1/1991	1 U	1 U	1 U	1 U	--	--	1 U
	7/10/1991	1 U	1 U	1 U	1 U	--	--	4.4
	7/21/1991	1 U	1 U	1 U	26	--	--	3.5
	8/8/1991	1 U	1 U	1 U	1 U	--	--	1 U
	8/13/1991	1 U	1 U	1 U	1 U	--	--	1 U
	8/21/1991	1 U	1 U	1 U	1 U	--	--	1 U
	8/28/1991	1 U	1 U	1 U	1 U	--	--	1 U
	9/4/1991	1 U	1 U	1 U	1 U	--	--	5.6
	9/12/1991	1 U	1 U	1 U	1 U	--	--	1 U
	9/19/1991	1 U	1 U	1 U	1 U	--	--	4.1
	10/3/1991	1 U	1 U	1 U	1 U	--	--	1 U
	10/10/1991	1 U	1 U	1 U	1 U	--	--	1 U
	10/17/1991	1 U	1 U	1 U	1 U	--	--	1 U
	10/24/1991	1 U	1 U	1 U	1 U	--	--	1 U
	12/12/1991	1 U	1 U	1 U	2 U	--	--	1 U
	12/12/1991	1 U	1 U	1 U	2 U	--	--	1 U
	12/13/1991	1 U	1 U	1 U	2 U	--	0.5 U	1 U
	12/14/1991	1 U	1 U	1 U	2 U	--	--	1 U
	12/15/1991	1 U	1 U	1 U	2 U	--	--	1 U
	12/17/1991	1 U	1 U	1 U	2 U	--	--	1 U
	12/18/1991	1 U	1 U	1 U	2 U	--	0.5 U	1 U
	12/24/1991	1 U	1 U	1 U	2 U	--	0.5 U	1 U
	1/2/1992	1 U	1 U	1 U	2 U	--	0.5 U	1 U
	1/8/1992	--	--	--	--	1 U[2]	--	--
	1/22/1992	--	--	--	--	--	0.25 U	--
	1/29/1992	--	--	--	--	--	0.25 U	--
	2/6/1992	--	--	--	--	--	0.25 U	--
	2/12/1992	--	--	--	--	--	0.25 U	--
	2/20/1992	--	--	--	--	--	0.25 U	--
	2/26/1992	--	--	--	--	--	0.25 U	--
	3/3/1992	--	--	--	--	--	0.25 U	--
	3/11/1992	1 U	1 U	1 U	2 U	--	0.25 U	--
	3/18/1992	--	--	--	--	--	0.25 U	--
	3/25/1992	--	--	--	--	--	0.25 U	--
	4/1/1992	1 U	1 U	1 U	2 U	--	0.25 U	--
	4/1/1992	1 U	1 U	1 U	2 U	--	0.25 U	--
	4/15/1992	--	--	--	--	--	0.25 U	--
	4/22/1992	1 U	1 U	1 U	2 U	0.25 U	0.25 U	--
	4/28/1992	1 U	1 U	1 U	2 U	0.25 U	0.25 U	--
	5/7/1992	1 U	1 U	1 U	2 U	0.25 U	0.25 U	--
	5/13/1992	1 U	1 U	1 U	2 U	3 U[2]	0.25 U	--
	5/20/1992	1 U	1 U	1 U	2 U	0.25 U	0.25 U	--
	6/30/1992	1 U	1 U	1 U	2 U	--	0.25 U	1 U
	6/30/1992	1 U	1 U	1 U	2 U	--	0.25 U	--
	7/22/1992	1 U	1 U	1 U	2 U	0.25 U	0.25 U	1 U
	10/19/1992	1 U	1 U	1 U	2 U	0.25 U	0.25 U	1 U
Preliminary Cleanup Level[1]		**1.2**	**1,300**	**530**	**NE**	**0.5**	**0.8/1.0**[3]	**NE**

Table 21
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Laurel Station
Bellingham, Washington

		VOCs (ug/L)				TPH (mg/L)		
Sample ID	**Sample Date**	**Benzene**	**Toluene**	**Ethylbenzene**	**Xylenes**	**Diesel Range**	**Gasoline Range**	**TPH (Method 418.1)**
SWRO-D3	1/17/1991	--	--	--	--	**1.6**[5]	--	--
	1/19/1991	--	--	--	--	**2.3**[5]	--	--
	1/21/1991	--	--	--	--	1 U[2]	--	--
	1/23/1991	--	--	--	--	**2.2**[5]	--	--
	1/28/1991	1 U	4	1	11	1 U[2]	--	--
	2/1/1991	1 U	1 U	1 U	1 U	1 U[2]	--	--
	2/4/1991	1 U	1 U	1 U	1 U	1 U[2]	--	--
	2/8/1991	1 U	1 U	1 U	1 U	1 U[2]	--	--
	2/11/1991	1 U	1 U	1 U	1 U	1 U[2]	--	--
	2/15/1991	--	--	--	--	1 U[2]	--	--
	2/18/1991	1 U	1 U	1 U	1 U	1 U[2]	--	--
	2/22/1991	1 U	1 U	1 U	1 U	1 U[2]	--	--
	2/25/1991	1 U	1 U	1 U	1 U	1 U[2]	--	--
	3/3/1991	--	--	--	--	1 U[2]	--	--
	3/4/1991	1 U	1 U	1 U	1 U	1 U[2]	--	--
	3/8/1991	1 U	1 U	1 U	1 U	1 U[2]	--	--
	3/12/1991	1 U	1 U	1 U	1 U	1 U[2]	--	--
	3/15/1991	1 U	1 U	1 U	1 U	1 U[2]	--	--
	3/20/1991	1 U	1 U	1 U	1 U	1 U[2]	--	--
	3/22/1991	1 U	1 U	1 U	1 U	1 U[2]	--	--
	3/25/1991	1 U	1 U	1 U	1 U	1 U[2]	--	--
	3/29/1991	1 U	1 U	1 U	1 U	1 U[2]	--	--
	4/12/1991	1 U	1 U	1 U	1 U	1 U[2]	--	--
	4/17/1991	1 U	1 U	1 U	1 U	1 U[2]	--	--
	4/24/1991	1 U	1 U	1 U	1 U	--	--	1 U
	5/15/1991	1 U	1 U	1 U	1 U	--	--	--
	5/22/1991	1 U	1 U	1 U	1 U	--	--	1 U
	5/30/1991	1 U	1 U	1 U	1 U	--	--	1 U
	6/5/1991	1 U	1 U	1 U	1 U	--	--	1 U
	6/12/1991	1 U	1 U	1 U	1 U	--	--	1.5
	6/18/1991	1 U	1 U	1 U	1 U	--	--	1 U
	6/26/1991	5 U[2]	5 U	5 U	5 U	--	--	1 U
	7/1/1991	1 U	1 U	1 U	1 U	--	--	1 U
	7/10/1991	1 U	1 U	1 U	1 U	--	--	1 U
	7/21/1991	1 U	1 U	1 U	14	--	--	1 U
	7/30/1991	1 U	1 U	1 U	1 U	--	--	1 U
	8/13/1991	1 U	1 U	1 U	1 U	--	--	1 U
	8/28/1991	1 U	1 U	1 U	1 U	--	--	1 U
	9/4/1991	1 U	1 U	1 U	1 U	--	--	1 U
	9/12/1991	1 U	1 U	1 U	1 U	--	--	1 U
	9/19/1991	1 U	1 U	1 U	1 U	--	--	0.5 U
	10/3/1991	1 U	1 U	1 U	1 U	--	--	1 U
Preliminary Cleanup Level[1]		**1.2**	**1,300**	**530**	**NE**	**0.5**	**0.8/1.0**[3]	**NE**

Table 21
Summary of Surface Water Analytical Results (Study Units 2, 3, Area 1, and Area 3)
Laurel Station
Bellingham, Washington

		VOCs (ug/L)				TPH (mg/L)		
Sample ID	**Sample Date**	**Benzene**	**Toluene**	**Ethylbenzene**	**Xylenes**	**Diesel Range**	**Gasoline Range**	**TPH (Method 418.1)**
SWRO-D3 (continued)	10/10/1991	1 U	1 U	1 U	1 U	--	--	1 U
	10/17/1991	1 U	1 U	1 U	1 U	--	--	1 U
	10/24/1991	1 U	1 U	1 U	1 U	--	--	1 U
	12/11/1991	1 U	1 U	1 U	2 U	--	--	1 U
	12/12/1991	1 U	1 U	1 U	2 U	--	--	1 U
	12/12/1991	1 U	1 U	1 U	2 U	--	--	1 U
	12/13/1991	1 U	1 U	1 U	2 U	--	0.5 U	1 U
	12/15/1991	1 U	1 U	1 U	2 U	--	--	1 U
	12/17/1991	1 U	1 U	1 U	2 U	--	--	1 U
	12/18/1991	1 U	1 U	1 U	2 U	--	0.5 U	1 U
	12/24/1991	1 U	1 U	1 U	2 U	--	0.5 U	1 U
	1/2/1992	1 U	1 U	1 U	2 U	--	0.5 U	1 U
	1/8/1992	--	--	--	--	1 U[2]	--	--
	1/15/1992	--	--	--	--	--	0.25 U	--
	1/22/1992	--	--	--	--	--	0.25 U	--
	1/29/1992	--	--	--	--	--	0.25 U	--
	2/6/1992	--	--	--	--	--	0.25 U	--
	2/12/1992	--	--	--	--	--	0.25 U	--
	2/20/1992	--	--	--	--	--	0.25 U	--
	2/26/1992	--	--	--	--	--	0.25 U	--
	3/3/1992	--	--	--	--	--	0.25 U	--
	3/11/1992	1 U	1 U	1 U	2 U	--	0.25 U	--
	3/18/1992	--	--	--	--	--	0.25 U	--
	3/25/1992	--	--	--	--	--	0.25 U	--
	4/1/1992	1 U	1 U	1 U	2 U	--	0.25 U	--
	4/8/1992	1 U	1 U	1 U	2 U	--	0.25 U	--
	4/15/1992	--	--	--	--	--	0.25 U	--
	4/22/1992	1 U	1 U	1 U	2 U	0.25 U	0.25 U	--
	4/28/1992	1 U	1 U	1 U	2 U	0.25 U	0.25 U	--
	5/7/1992	1 U	1 U	1 U	2 U	0.25 U	0.25 U	--
	5/13/1992	1 U	1 U	1 U	2 U	3 U[2]	0.25 U	--
	5/20/1992	1 U	1 U	1 U	2 U	0.25 U	0.25 U	--
	10/19/1992	1 U	1 U	1 U	2 U	0.25 U	0.25 U	1 U
Preliminary Cleanup Level[1]		**1.2**	**1,300**	**530**	**NE**	**0.5**	**0.8/1.0[3]**	**NE**

Notes

Bolded values indicate the Preliminary Cleanup Level was exceeded

VOCs - volatile organic compounds

TPH - total petroleum hydrocarbons

ug/L - micrograms per liter

mg/L - milligrams per liter

-- - not analyzed

U - not detected above the reportling limit shown

J - estimated

OWS-1 - Oil/water separator near PSE substation

OWS-170 - Oil/water separator east of Tank No. 170

OWS-180 - Oil/water separator east of Tank No. 180

OWS-PR - Oil/water separator east of pressure relief tank

SWRO-C - Culvert adjacent to East Smith Road

SWRO-D2 - Dam 2

SWRO-D3 - Dam 3

[1] See Table 5 for Preliminary Cleanup Level rationale

[2] Not detected; however, laboratory reporting limit exceeds the Preliminary Cleanup Level.

[3] Gasoline with benzene present/gasoline without benzene

[4] MW-2 also analyzed for polycyclic aromatic hydrocarbons (PAHs) during the April 8, 1991 sampling event. Fluorene, naphthalene, and phenanthrene were detected at concentrations of 5 ug 120 ug/L, and 2 ug/L, respectively. Other PAHs were not detected above their respective laboratory reporting limits.

[5] Reported as a combination of diesel and gasoline range hydrocarbons by EPA Modified Method 8015.

Table 22
Summary of Groundwater Analytical Results - Shallow Aquifer
Laurel Station
Bellingham, Washington

Compound	Sample Date	Shallow Wells																		Preliminary Cleanup Levels [2]
		SW-1 [1]						SW-2						SW-3 [1]		SW-4		SW-5 [1]			
		4/15/1992	10/31/2000	9/1/2004	5/10/2006	3/13/2008	Duplicate	4/15/1992	10/31/2000	9/1/2004	5/10/2006	12/8/2006	3/13/2008	4/15/1992	5/10/2006	11/7/2006	3/13/2008	4/15/1992	9/1/2004	5/10/2006	
Total Petroleum Hydrocarbons (mg/L)																				
Gasoline-range		--	0.05 U	0.1 U	0.1 U	--	--	--	0.05 U	0.1 U	0.1 U	0.25 U	--	--	0.1 U	--	--	--	0.1 U	0.1 U	**0.8 / 1.0** [3]
Diesel-range (C_{12}-C_{24})		--	0.37	--	0.08 U	0.25 U	0.25 U	--	0.253	--	0.08 U	0.25 U	0.25 U	--	0.08 U	0.25 U	0.25 U	--	--	0.08 U	**0.5**
Motor Oil-range (C_{24}-C_{38})		--	0.5 U	--	0.08 U	0.5 U	0.5 U	--	0.05 U	--	0.08 U	0.5 U	0.5 U	--	0.08 U	0.5 U	0.5 U	--	--	0.08 U	**0.5**
Oil and Grease		1.0 U	--	--	--	--	--	1.0 U	--	--	--	--	--	--	--	--	--	18.0	--	--	**NE**
Volatile Organic Compounds (ug/L)																				
Benzene		1.0 U [4]	0.50 U	0.50 U	0.50 U	0.2 U	0.2 U	1.0 U [4]	0.50 U	0.50 U	0.50 U	0.2 U	0.2 U	1.0 U [4]	0.50 U	0.2 U	0.2 U	**1.3 J**	0.50 U	0.50 U	**0.795**
Chloroform		**14**	--	--	--	0.2	0.2 U	1.0 U	--	--	--	0.2 U	0.2 U	1.0 U	--	0.2 U	0.2 U	2.0 UJ	--	--	**7.2**
Toluene		1.0 U	0.50 U	0.50 U	0.50 U	0.2 U	0.2 U	1.0 U	0.50 U	0.50 U	0.50 U	0.2 U	0.2 U	1.0 U	0.50 U	0.2 U	0.2 U	2.0 UJ	0.50 U	0.50 U	**640**
Ethylbenzene		1.0 U	0.50 U	0.50 U	0.50 U	0.2 U	0.2 U	1.0 U	0.50 U	0.50 U	0.50 U	0.2 U	0.2 U	1.0 U	0.50 U	0.2 U	0.2 U	2.0 UJ	0.50 U	0.50 U	**700**
Xylenes (total)		2.0 U	1.0 U	0.50 U	0.50 U	0.4 U	0.4 U	2.0 U	1.0 U	0.50 U	0.50 U	0.4 U	0.4 U	2.0 U	0.50 U	0.4 U	0.4 U	4.0 UJ	0.50 U	0.50 U	**1,000**
Polycyclic Aromatic Hydrocarbons (PAHs) (ug/L)																				
Naphthalene		--	--	--	0.08	0.01 U	0.01 U	--	--	--	0.11	0.01	0.01 U	--	0.01 U	0.011 UJ	0.012	--	--	0.02	**160**
1-Methylnaphthalene		--	--	--	--	0.023	0.011	--	--	--	--	--	0.01 U	--	--	--	0.01 U	--	--	--	**NE**
2-Methylnaphthalene		--	--	--	0.43	0.027	0.013	--	--	--	0.22	0.01 U	0.01 U	--	0.01	0.01 U	0.01 U	--	--	0.01	**32**
Fluoranthene		--	--	--	0.02	0.01 U	0.01 U	--	--	--	0.01 U	0.01 U	0.01 U	--	0.01 U	0.01 U	0.01 U	--	--	0.01	**640**
Fluorene		--	--	--	0.04	0.01 U	0.01 U	--	--	--	0.02	0.01 U	0.01 U	--	0.01 U	0.01 U	0.01 U	--	--	0.01 U	**640**
Pyrene		--	--	--	0.02	0.01 U	0.01 U	--	--	--	0.02	0.01 U	0.01 U	--	0.01	0.01 U	0.01 U	--	--	0.03	**480**
Phenanthrene		--	--	--	0.12	0.01 U	0.01 U	--	--	--	0.06	0.01 U	0.01 U	--	0.02	0.01 U	0.01 U	--	--	0.02	**NE**
Carcinogenic PAHs (ug/L)																				
Benzo(a)pyrene		--	--	--	0.02	0.01 U	0.01 U	--	--	--	0.01 U	0.01 U	0.01 U	--	0.01 U	0.01 U	0.01 U	--	--	0.01	**See Note 5**
Benzo(a)anthracene		--	--	--	0.01	0.01 U	0.01 U	--	--	--	0.01 U	0.01 U	0.01 U	--	0.01 U	0.01 U	0.01 U	--	--	0.01 U	**See Note 5**
Benzo(b)fluoranthene		--	--	--	0.01	0.01 U	0.01 U	--	--	--	0.01 U	0.01 U	0.01 U	--	0.01 U	0.01 U	0.01 U	--	--	0.01 U	**See Note 5**
Benzo(k)fluoranthene		--	--	--	0.01	0.01 U	0.01 U	--	--	--	0.01 U	0.01 U	0.01 U	--	0.01 U	0.01 U	0.01 U	--	--	0.01 U	**See Note 5**
Dibenz(a,h)anthracene		--	--	--	0.02 U	0.01 U	0.01 U	--	--	--	0.02 U	0.01 U	0.01 U	--	0.02 U	0.01 U	0.01 U	--	--	0.02 U	**See Note 5**
Chrysene		--	--	--	0.02	0.01 U	0.01 U	--	--	--	0.01 U	0.01 U	0.01 U	--	0.01 U	0.01 U	0.01 U	--	--	0.04	**See Note 5**
Indeno(1,2,3-c,d)pyrene		--	--	--	0.02 U	0.01 U	0.01 U	--	--	--	0.02 U	0.01 U	0.01 U	--	0.02 U	0.01 U	0.01 U	--	--	0.02 U	**See Note 5**
TTEC		--	--	--	**0.023**	NC	NC	--	--	--	NC	NC	NC	--	NC	NC	NC	--	--	0.0104	**0.012**
Metals (mg/L)																				
Antimony		0.001	--	--	--	--	--	0.003	--	--	--	--	--	--	--	--	--	--	--	--	**NE**
Arsenic		**0.007**	--	--	--	--	--	0.005	--	--	--	--	--	--	--	--	--	--	--	--	**0.005**
Beryllium		0.002	--	--	--	--	--	0.004	--	--	--	--	--	--	--	--	--	--	--	--	**0.032**
Chromium		**0.179**	--	--	--	--	--	**0.767**	--	--	--	--	--	--	--	--	--	--	--	--	**0.05** [6]
Copper		0.207	--	--	--	--	--	0.523	--	--	--	--	--	--	--	--	--	--	--	--	**0.59**
Lead		**0.031**	--	--	--	--	--	**0.090**	--	--	--	--	--	--	--	--	--	--	--	--	**0.015**
Mercury		0.001 U	--	--	--	--	--	0.0002	--	--	--	--	--	--	--	--	--	--	--	--	**0.002**
Nickel		0.23	--	--	--	--	--	**0.60**	--	--	--	--	--	--	--	--	--	--	--	--	**0.32**
Thallium		0.005 U	--	--	--	--	--	0.008	--	--	--	--	--	--	--	--	--	--	--	--	**NE**
Zinc		0.279	--	--	--	--	--	1.03	--	--	--	--	--	--	--	--	--	--	--	--	**4.8**

Notes:
Bolded values indicate the Preliminary Cleanup Level was exceeded
NWTPH-Gx - Northwest total petroleum hydrocarbons - gasoline range
NWTPH-Dx - Northwest total petroleum hydrocarbons - diesel range
ug/L - micrograms per liter
U - not detected above the reporting limit showl
UJ - not detected above the reporting limit shown. Reporting limit is estimated.
J - estimated
NC - not calculated
NE - not established
TTEC - total toxicity equivalency concentration
-- - not analyzed

[1] During November-December 2006 sampling event, SW-1 was not accessible and wells SW-3 and SW-5 were dry. In March 2008, SW-3 was damaged and SW-5 was dry.

[2] See Table 4 for Preliminary Cleanup Level rationale.

[3] In water, the cleanup level is 1 mg/L if benzene is not present, and the total of ethylbenzene, toluene, and xylenes is less than 1% of the gasoline mixture. The cleanup level for all other gasoline mixtures is 0.8 mg/L.

[4] Not detected; however, laboratory reporting limit exceeds the Preliminary Cleanup Level.

[5] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8).
The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene.

[6] Total Chromium

Table 23
Summary of Groundwater Analytical Results - Deep Aquifer
Laurel Station
Bellingham, Washington

Compound	Sample Date	Deep Wells												Preliminary Cleanup Levels [1]
		DW-1		DW-2			DW-3			DW-4			DW-5	
		4/22/1992	12/7/2006	4/16/1992	10/31/2000	12/8/2006	4/16/1992	10/31/2000	12/8/2006	4/16/1992	12/8/2006	Field Dup	4/17/1992	12/8/2006	
Total Petroleum Hydrocarbons (mg/L)															
Gasoline-range		--	0.25 U	--	0.05 U	0.25 U	--	0.05 U	0.25 U	--	0.25 U	0.25 U	--	0.25 U	**0.8 / 1.0 [2]**
Diesel-range (C_{12}-C_{24})		--	0.25 U	--	0.25 U	0.25 U	--	0.25 U	0.25 U	--	0.25 U	0.25 U	--	0.25 U	**0.5**
Motor Oil-range (C_{24}-C_{38})		--	0.5 U	--	0.5 U	0.5 U	--	0.25 U	0.5 U	--	0.5 U	0.5 U	--	0.5 U	**0.5**
Oil and Grease		1.0 U	--	1.0 U	--	--	1.0 U	--	--	1.0 U	--	--	1.0 U	--	**NE**
Volatile Organic Compounds (ug/L)															
Benzene		1.0 U [3]	0.2 U	1.0 U [3]	0.50 U	0.2 U	1.0 U [3]	0.50 U	0.2 U	1.0 U [3]	0.2 U	0.2 U	1.0 U [3]	0.2 U	**0.795**
Toluene		1.0 U	0.2 U	1.0 U	0.50 U	0.2 U	1.0 U	0.771	0.2 U	1.0 U	0.2 U	0.2 U	1.0 U	0.2 U	**640**
Ethylbenzene		1.0 U	0.2 U	1.0 U	0.50 U	0.2 U	1.0 U	0.50 U	0.2 U	1.0 U	0.2 U	0.2 U	1.0 U	0.2 U	**700**
Xylenes (total)		2.0 U	0.4 U	2.0 U	1.0 U	0.4 U	2.0 U	1.25	0.4 U	2.0 U	0.4 U	0.4 U	2.0 U	0.4 U	**1,000**
Polycyclic Aromatic Hydrocarbons (ug/L)															
Naphthalene		--	0.01 U	--	--	0.01 U	--	--	0.01 U	--	0.02	0.01 U	--	0.01 U	**160**
2-Methylnaphthalene		--	0.01 U	--	--	0.01 U	--	--	0.01 U	--	0.01 U	0.01 U	--	0.01 U	**32**
Carcinogenic PAHs (ug/L)															
Benzo (a) pyrene		--	0.01 U	--	--	0.01 U	--	--	0.01 U	--	0.01 U	0.01 U	--	0.01 U	**See Note 4**
Benzo(a)anthracene		--	0.01 U	--	--	0.01 U	--	--	0.01 U	--	0.01 U	0.01 U	--	0.01 U	**See Note 4**
Benzo(b)fluoranthene		--	0.01 U	--	--	0.01 U	--	--	0.01 U	--	0.01 U	0.01 U	--	0.01 U	**See Note 4**
Benzo(k)fluoranthene		--	0.01 U	--	--	0.01 U	--	--	0.01 U	--	0.01 U	0.01 U	--	0.01 U	**See Note 4**
Dibenz(a,h)anthracene		--	0.01 U	--	--	0.01 U	--	--	0.01 U	--	0.01 U	0.01 U	--	0.01 U	**See Note 4**
Chrysene		--	0.01 U	--	--	0.01 U	--	--	0.01 U	--	0.01 U	0.01 U	--	0.01 U	**See Note 4**
Indeno(1,2,3-c,d)pyrene		--	0.01 U	--	--	0.01 U	--	--	0.01 U	--	0.01 U	0.01 U	--	0.01 U	**See Note 4**
TTEC		--	NC	--	--	NC	--	--	NC	--	NC	NC	--	NC	**0.012**
Metals (mg/L)															
Antimony		0.003	--	0.001 U	--	--	0.002	--	--	0.001 U	--	--	0.002	--	**NE**
Arsenic		**0.083**	--	0.002 U	--	--	**0.018**	--	--	**0.014**	--	--	**0.019**	--	**0.005**
Beryllium		0.001 U	--	0.006	--	--	0.001	--	--	0.001 U	--	--	0.001 U	--	**0.032**
Chromium		0.038	--	**0.154**	--	--	0.036	--	--	0.014	--	--	0.042	--	**0.05/0.1 [5]**
Copper		0.010	--	0.209	--	--	0.080	--	--	0.017	--	--	0.041	--	**0.592**
Lead		0.009	--	**0.167**	--	--	**0.028**	--	--	**0.021**	--	--	0.013	--	**0.015**
Nickel		0.03	--	0.08	--	--	0.03	--	--	0.020	--	--	0.05	--	**0.32**
Selenium		0.001 U	--	0.005 U	--	--	0.005 U	--	--	0.001 U	--	--	0.024	--	**NE**
Thallium		0.001 U	--	0.009	--	--	0.002	--	--	0.001 U	--	--	0.001 U	--	**NE**
Zinc		0.028	--	0.243	--	--	0.218	--	--	0.045	--	--	0.079	--	**4.8**

Notes:
Bolded values indicate the Preliminary Cleanup Level was exceeded
NWTPH-Gx - Northwest total petroleum hydrocarbons - gasoline range
NWTPH-Dx - Northwest total petroleum hydrocarbons - diesel range
ug/L - micrograms per liter
mg/L - milligrams per liter
TTEC - total toxicity equivalency concentration
-- - not analyzed
U - not detected above the reporting limit shown
NC - not calculated
NE - not established
[1] See Table 4 for Preliminary Cleanup Level rationale
[2] In water, the cleanup level is 1 mg/L if benzene is not present, and the total of ethylbenzene, toluene, and xylenes is less than 1% of the gasoline mixture. The cleanup level for all other gasoline mixtures is 0.8 mg/L.
[3] Not detected; however, laboratory reporting limit exceeds the Preliminary Cleanup Level.
[4] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8).
The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene.
[5] Total Chromium

Table 24
Data Gaps Summary
Laurel Station
Bellingham, Washington

Area of Concern	Media	Sample Location(s)	Reference Figure	Data Gap
Area 1	Soil	1, 2, 5, 6, 7, 8, 10, 11, 13, 15, 16, 21, 22, 31, and 47	Figure 13	Vertical extent of petroleum hydrocarbons exceeding the PCL not defined beyond 3 feet bgs
		1, 2, 10, 13, 16, and 21	Figure 13	Vertical extent of BTEX exceeding PCLs not defined beyond 2 - 3 feet bgs
		SH-1	Figure 13	Vertical extent of naphthalene exceeding the PCL not defined beyond 0.5 foot bgs
Area 2	Soil	41	Figure 14	Vertical extent of petroleum hydrocarbons exceeding the PCL not defined beyond 1 foot bgs; BTEX not assessed
Study Unit 1 - Former Pump Station Area	Soil	PB-2	Figure 15	Vertical and lateral extent of petroleum hydrocarbons exceeding the PCL not defined beyond 12 feet bgs
Study Unit 1 - Former Oily Water Sump	Soil	TM-B4 and TM-B16	Figure 16	Lateral extent of petroleum hydrocarbons exceeding the PCL not defined between 13 and 23 feet bgs
Study Unit 1 - Former Burn Pit	Soil	TP-6 and TP-7	Figure 17	Lateral extent of petroleum hydrocarbons exceeding the PCL not defined between 5 and 13 feet bgs
Study Unit 1 - Former Drain Tile	Soil	DTE-1	Figure 19	Vertical and lateral extent of petroleum hydrocarbons exceeding the applicable PCL not defined beyond 1 foot bgs
Study Unit 1 - December 2000 Spill	Soil	PEX-17-B-5, PEX-18-S-3, and PEX-34-S-1	Figure 25	Vertical and lateral extent of benzene exceeding the PCL not defined beyond depths ranging between 1 and 5 feet bgs
Study Unit 2 - Bulk Storage Tank Area (Tank No. 170)	Soil	08-B3	Figure 10	Vertical and lateral extent of benzene exceeding the PCL not defined beyond 4.5 feet bgs
Study Unit 2 - Bulk Storage Tank Area (Tank No. 180)	Soil	Tank 180-1 (beneath Tank No. 180)	Figure 10	Vertical and lateral extent of petroleum hydrocarbons exceeding PCLs not defined beyond 3 feet bgs
Study Unit 3 - Relief Tank	Soil	PRT-1 and PRT-2	Figure 24	Vertical and lateral extent of petroleum hydrocarbons exceeding the PCL within the relief tank containment berm not defined at or beyond 2 feet bgs
Areas 1, 2, and 3	Surface Water	Wetlands and Tributary to Deer Creek	Figure 28	Current surface water quality
Study Unit 3	Surface Water	Wetlands and March 7, 1992 Spill Containment Dam	Figure 29	Current surface water quality
Areas 1, 2, and 3	Wetland Sediment/Soil	Wetlands and Tributary to Deer Creek	Figure 28	Current wetland sediment/soil quality
Study Unit 3	Wetland Sediment/Soil	Wetlands and March 7, 1992 Spill Containment Dam	Figure 29	Current wetland sediment/soil quality
Study Unit 3	NA	Wetland Area Affected by March 7, 1992 Spill	Figure 24	Outer boundaries of this wetland have not yet been delineated.

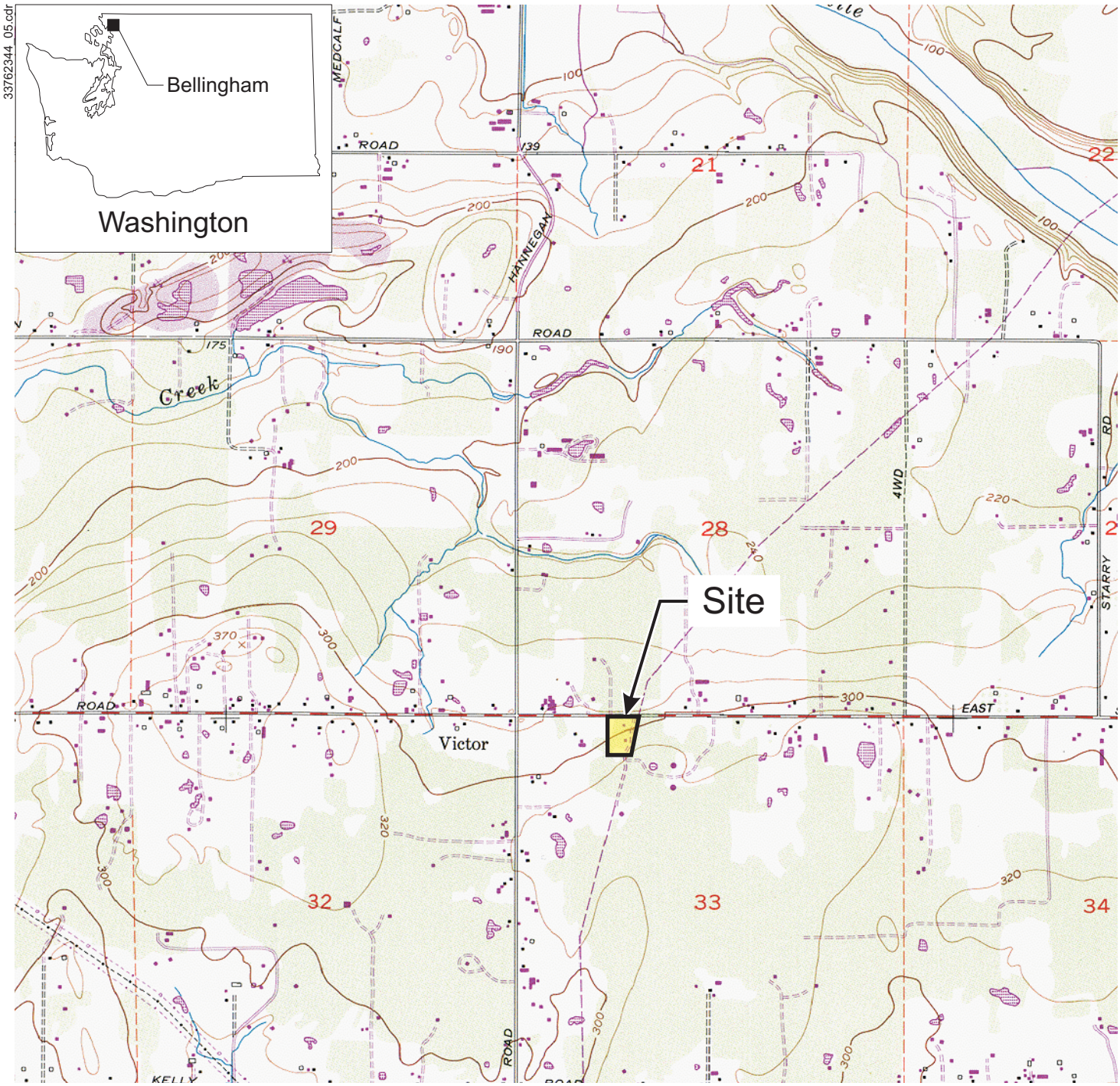
Notes:
PCL - Preliminary Cleanup Level
BTEX - Benzene, toluene, ethylbenzene, and xylenes
bgs - below ground surface
NA - not applicable

Table 25
Proposed Sampling Locations and Rationale
Laurel Station
Bellingham, Washington

Area of Concern	Proposed Sample Location/Sample ID	Reference Figure	Media	Proposed Sampling Depth (feet bgs)	Analytical Parameters	Rationale
Area 1	A1-B1 through A1-B25	Figure 34	Soil	3 and 5	NWTPH-Gx, NWTPH-Dx[1], and BTEX. PAHs for A1-B1, A1-B9, A1-B12, A1-B16, A1-B17, and A1-B20.	Characterization of the vertical and lateral extent of hydrocarbon impacts exceeding the PCL in Area 1. Characterization of the vertical extent of PAHs where TPH elevated. Assessment of BTEX.
Area 2	A2-B1	Figure 35	Soil	1, 2, and 3	NWTPH-Gx, NWTPH-Dx[1], BTEX, and PAHs[3]	Characterization of the vertical extent of hydrocarbon impacts exceeding the PCL in Area 2. Assessment of BTEX.
Study Unit 1	SU1-B1 through SU1-B4	Figure 36	Soil	5, 10 and 15	NWTPH-Gx, NWTPH-Dx, BTEX, and PAHs[3]	Characterization of the lateral extent of hydrocarbon impacts exceeding the PCL at test pits TP-6 and TP-7.
	SU1-B5	Figure 36	Soil	2 and 5	NWTPH-Gx, NWTPH-Dx, BTEX, and PAHs[3]	Characterization of the vertical extent of hydrocarbon impacts exceeding the PCL at sample location DTE-1.
	SU1-B6 through SU1-B9, SU1-B17 and SU1-B18	Figure 36	Soil	3, 5 and 10	NWTPH-Gx, NWTPH-Dx, BTEX, and PAHs[3]	Characterization of the vertical and lateral extent of hydrocarbon impacts exceeding the PCL at sample locations PEX-11-S-7, PEX-17-B-5, PEX-18-S-3, and PEX-34-S-1.
	SU1-B10 and SU1-B11	Figure 36	Soil	5, 10 and 15	NWTPH-Gx, NWTPH-Dx, BTEX, and PAHs[3]	Characterization of the vertical and lateral extent of hydrocarbon impacts exceeding the PCL at sample location PB-2.
	SU1-B12 through SU1-B16	Figure 36	Soil	5, 10, 15, 20 and 25	NWTPH-Gx, NWTPH-Dx, BTEX, and PAHs[3]	Characterization of the lateral extent of hydrocarbon impacts exceeding the PCL at soil borings TM-B4 and TM-B16.
	SU1-B19	Figure 36	Soil	6, 8 and 10	NWTPH-Gx, NWTPH-Dx, BTEX, and PAHs[3]	Confirmatory sampling at sample location PB-4.
	SU1-B20	Figure 36	Soil	29 and 30	NWTPH-Gx, NWTPH-Dx, BTEX, and PAHs[3]	Confirmatory sampling at boring TM-B15.
Study Unit 2	SU2-B1 through SU2-B8	Figure 37	Soil	2, 5 and 10	NWTPH-Gx, NWTPH-Dx, BTEX, and PAHs[3]	Characterization of the vertical and lateral extent of hydrocarbon impacts exceeding the PCL within the bulk storage tank containment berms.
Study Unit 3	SU3-B1 through SU3-B6	Figure 38	Soil	2 and 4	NWTPH-Gx, NWTPH-Dx, BTEX, and PAHs[3]	Characterization of the vertical and lateral extent of hydrocarbon impacts exceeding the PCL within the former relief tank containment berm.
	SU3-B7	Figure 38	Soil	5 and 7	NWTPH-Gx, NWTPH-Dx, BTEX, and PAHs[3]	Confirmatory sampling at test pit TP-3-2.
Areas 1, 2, and 3	A1-SW1 through A1-SW3	Figure 39	Surface Water	NA	NWTPH-Gx, NWTPH-Dx, and BTEX	Establish current surface water quality within Area 1.
	A2-SW1	Figure 39	Surface Water	NA	NWTPH-Gx, NWTPH-Dx, and BTEX	Establish current surface water quality within Area 2.
	A3-DAM2 and A3-DAM3	Figure 39	Surface Water	NA	NWTPH-Gx, NWTPH-Dx, and BTEX	Establish current surface water quality within Area 3.
Study Unit 3	SU3-SW1 through SU3-SW3	Figure 40	Surface Water	NA	NWTPH-Gx, NWTPH-Dx, and BTEX	Establish current surface water quality within Study Unit 3.
Areas 1, 2, and 3	A1-SED1 through A1-SED3[2]	Figure 39	Wetland Sediment/Soil	0-1	NWTPH-Gx, NWTPH-Dx[1], and BTEX	Establish current wetland sediment/soil quality within Area 1.
	A2-SED1[2]	Figure 39	Wetland Sediment/Soil	0-1	NWTPH-Gx, NWTPH-Dx[1], and BTEX	Establish current wetland sediment/soil quality within Area 2.
	A3-SED1 through A3-SED3[2]	Figure 39	Wetland Sediment/Soil	0-1	NWTPH-Gx, NWTPH-Dx[1], and BTEX	Establish current wetland sediment/soil quality within Area 3.
Study Unit 3	SU3-SED1 through SU3-SED3[2]	Figure 40	Wetland Sediment/Soil	0-1	NWTPH-Gx, NWTPH-Dx[1], and BTEX	Establish current wetland sediment/soil quality within Study Unit 3.

Notes:
PCL - Preliminary Cleanup Level
NWTPH-Gx - Northwest Total Petroleum Hydrocarbons Gasoline
NWTPH-Dx - Northwest Total Petroleum Hydrocarbons Diesel extended (diesel and oil-range)
BTEX - Benzene, toluene, ethylbenzene, and xylenes
PAHs - Polycyclic aromatic hydrocarbons
bgs - below ground surface
NA - not applicable
NWTPH-HCID analyses will be performed on selected samples to assess type of TPH for comparison to PCLs as described in the Sampling and Analysis Plan (Appendix G)
[1] Acid and/or silica gel cleanup
[2] Three samples per location: (a) mid-drainage, (b) right bank, and (c) left bank
[3] PAH analysis will be conducted where NWTPH-Dx exceeds the Preliminary Cleanup Level of 460 milligrams per kilogram

FIGURES



Map created with TOPO!™ © 1997 Wildflower Productions, www.topo.com, based on USGS topographic map

0 0.5 1.0

Approximate Scale in Miles

Figure 1

Site Location Map

URS

Laurel Station
Bellingham, Washington

Bellinger Road
Deer Creek
Dam #3
East 54th Terrace
Deer Creek Tributary
Dam #2
Area 3
20-Inch Main Pipeline
Study Unit 5
Hannegan Road
Area 2
East Smith Road
Outfall 001
Outfall 002
Interceptor Trench (Typ)
(Installed after January 15, 1991 Spill)
Study Unit 6
1971 Spill
January 15,
1991 Spill
December 11, 1991 Spill
Boneyard
Area 1
Study Unit 4
16-Inch Ferndale Pipeline
Study Unit 1
October 26,
2000 Spill
Water
Tank
Tank #170
1979 Spill
Property Line
Tank #180
20-Inch Main Pipeline
Study Unit 7
Study Unit 2
Relief Tank
Outfall 003
March 7, 1992 Spill
Study Unit 3
March 7, 1992 Spill Containment Dam

Legend

- Study Unit
- Enforcement Order-Defined Area
- 1 Laurel Station Office
- 2 Electric Building
- 3 MCC Buildings
- 4 Maintenance Shop
- 5 Former Pump Station
- 6 Cold Storage Building
- 7 Former PSE Substation
- 10 Former Oily Water Sump
- 11 Former Drain Tile
- 12 Former Drain Line
- 13 Former Burn Pit
- 14 Former Oil/Water Separator
- 15 Former Waste Pit
- 16 Former PCS Storage Cell Locations

NT

0 80 160
SCALE IN FEET

Figure 2A
Site Plan - Historic Features

URS

Laurel Station
Bellingham, Washington

Aerial Source: Microsoft Virtual Earth, Microsoft Corp.

O:\geol\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 2A (Site Plan_Historic).dwg
Mod: 04/30/2010, 15:01 | Plotted: 04/30/2010, 15:03 | john_knobbs

Bellinger Road
Dam #3
Deer Creek
East 54th Terrace
Deer Creek Tributary
Dam #2
Area 3
20-Inch Main Pipeline
Study Unit 5
Hannegan Road
Outfall 001
Outfall 002
Area 2
East Smith Road
Study Unit 6
Boneyard
1971 Spill
December 11, 1991 Spill
Area 1
Study Unit 4
16-Inch Femdale Pipeline
Study Unit 1
October 26, 2000 Spill
January 15, 1991 Spill
Water Tank
Tank #170
1979 Spill
Property Line
Tank #180
Study Unit 7
Study Unit 2
Relief Tank
Outfall 003
March 7, 1992 Spill
Study Unit 3
March 7, 1992 Spill Containment Dam

Legend

- Study Unit
- Enforcement Order-Defined Area
- 1 Laurel Station Office
- 2 Electric Building
- 3 MCC Buildings
- 4 Maintenance Shop
- 8 Cold Storage Building
- 8 PSE Substation
- 9 Piping Manifold
- 17 Retention Pond
- 18 Pump Station

N

0 80 160
SCALE IN FEET

Figure 2B
Site Plan - Current Features

URS

Laurel Station
Bellingham, Washington

Aerial Source: I-Cubed nformation Integration & Imaging LLC May 15, 2009

Q:\geol\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 2B (Site Plan_Current).dwg
Mod: 05/28/2010, 09:20 | Plotted: 05/28/2010, 14:04 | john_knobbs

33762344_02.cdr

A
North

A'
South

Former Pump Station Area

Former PCS Storage Cell No. 4

Relief Tank #120

20" Product Line

DW-4 | TM-B10 | TM-B14 | TM-B15 | DW-1 | DW-5

FILL

ML/CL

SP/SM/GM

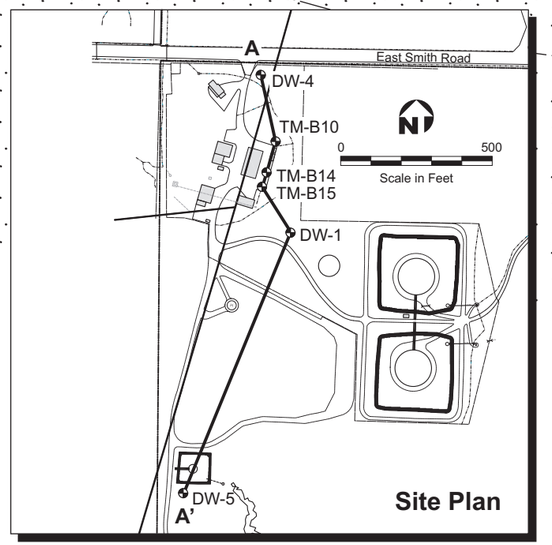
GM/SM

SP/GP/GM

ML/CL/GC

Elevation (Feet MSL)

340
300
260
220
180
140
100
60



Site Plan

LEGEND

- Boring with screened well interval
- SM — USCS classification
- Geologic unit boundary
- Groundwater elevation at time of drilling
- Static groundwater elevation (December 2006)
- Containment berm
- Fill
- Silty clay
- Bellingham Drift

0 100 200

Horizontal Scale in Feet
Vertical Exaggeration = 2.5x

Figure 3
North-South Geologic Cross Section A-A'

URS

Laurel Station
Bellingham, Washington

33762344_03.cdr

B
East

B'
West

Tank #170

TM-B8

TM-B12

DW-1

DW-2

DW-3

(TM-B4)
SW-4

(TM-B3)
SW-2

20" Product Line

Fill

FILL

ML/CL/GM

SM/GM/SP

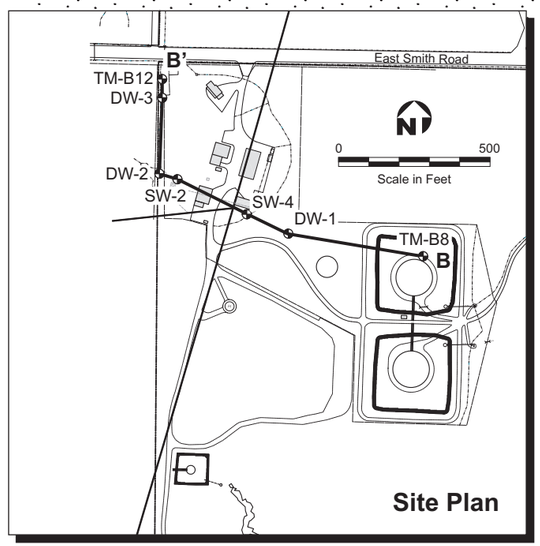
SP

SP/GP

GM/ML

Elevation (Feet MSL)

340
300
260
220
180
140
100
60



LEGEND

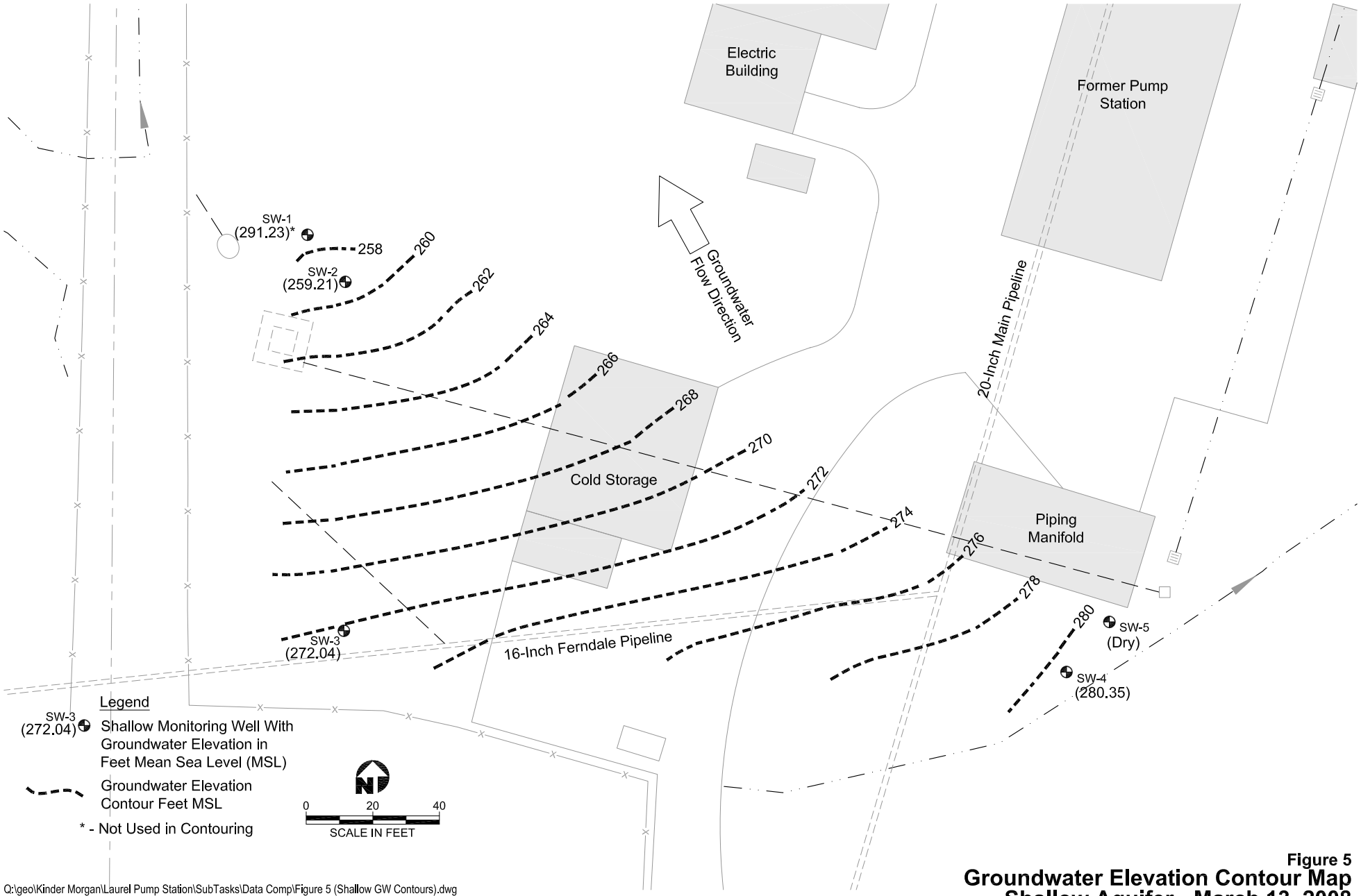
- Boring with screened well interval
- SM — USCS classification
- Geologic unit boundary
- Groundwater elevation at time of drilling
- Static groundwater elevation (December 2006 [deep wells]; March 2008 [shallow wells])
- Containment berm
- Fill
- Silty clay
- Bellingham Drift

0 100 200
Horizontal Scale in Feet
Vertical Exaggeration = 2.5x

Figure 4
East-West Geologic Cross Section B-B'

URS

Laurel Station
Bellingham, Washington



Q:\geo\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 5 (Shallow GW Contours).dwg
Mod: 04/07/2010, 16:19 | Plotted: 04/30/2010, 11:36 | john_knobbs

Figure 5
Groundwater Elevation Contour Map
Shallow Aquifer - March 13, 2008

URS

Laurel Station
Bellingham, Washington

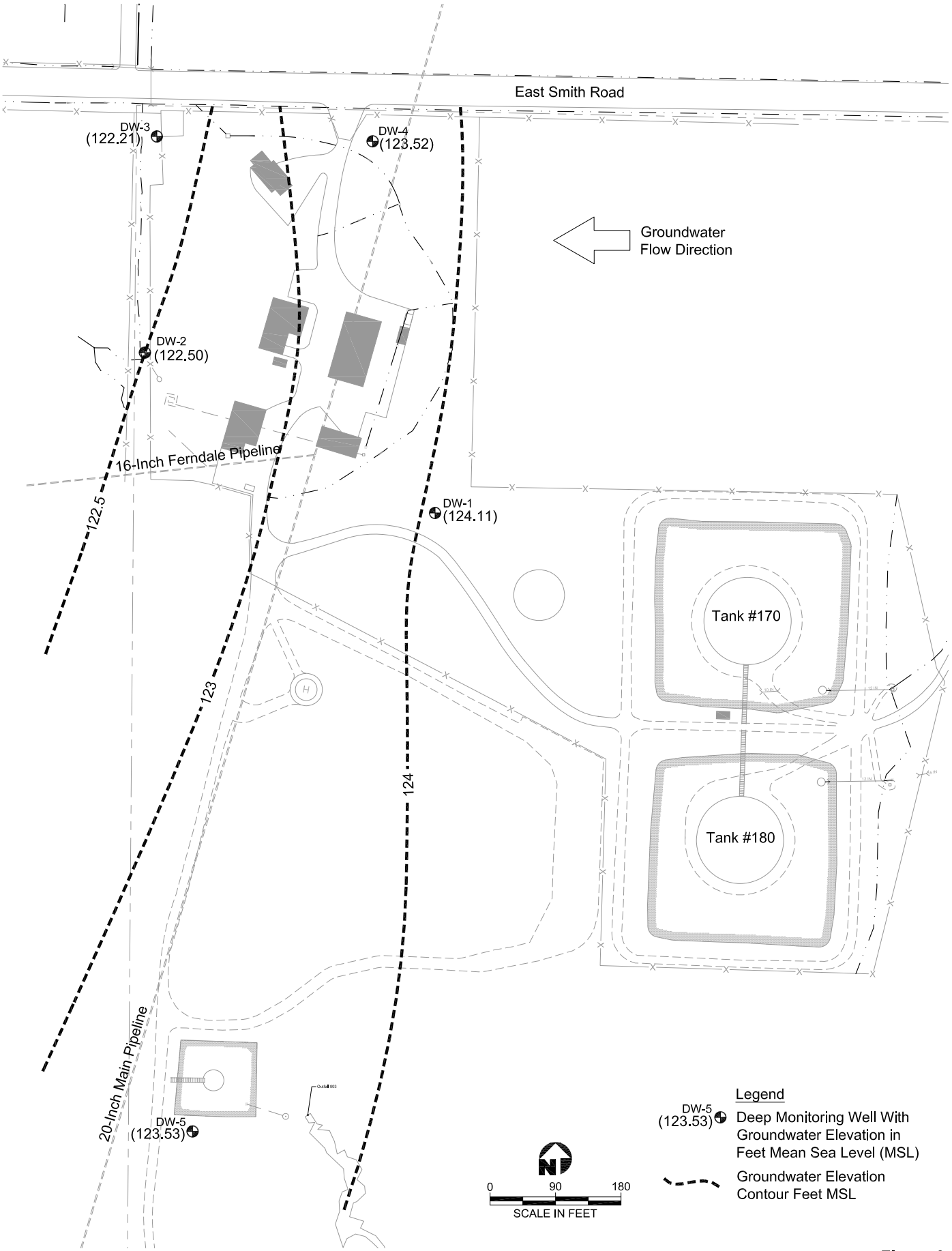


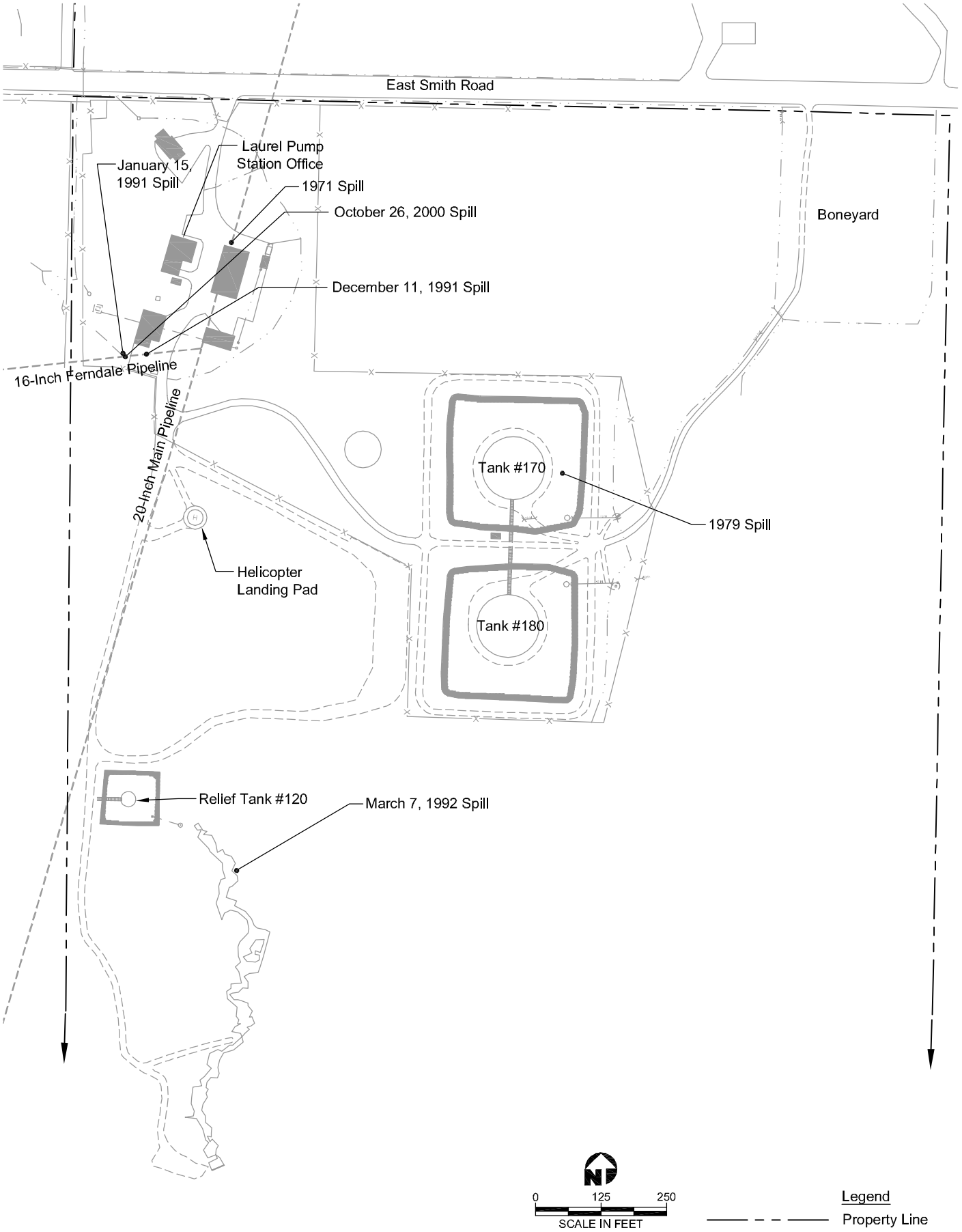
Figure 6

Groundwater Elevation Contour Map
Deep Aquifer - December 7-8, 2006

Laurel Station
Bellingham, Washington

Q:\geo\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 6 (Deep GW Contours).dwg
Mod: 04/16/2010, 11:37 | Plotted: 04/30/2010, 11:37 | john_knobbs

URS



Q:\geo\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 7 (Spill Area Map).dwg
Mod: 04/29/2010, 09:43 | Plotted: 04/30/2010, 11:37 | john_knobbs

URS

Figure 7
Spill Area Map
Laurel Station
Bellingham, Washington

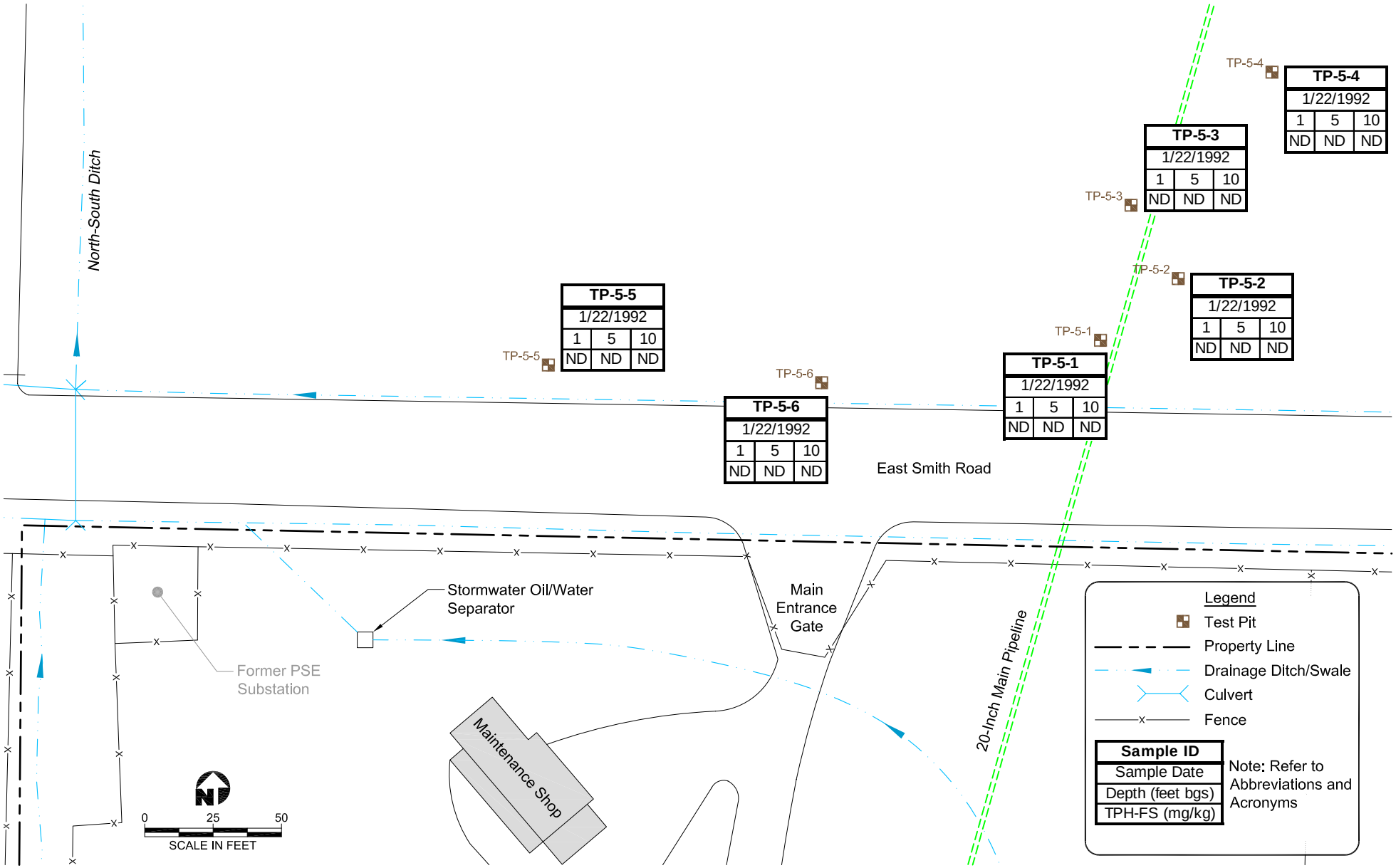


Figure 8

Soil Sample Locations - 1971 Spill (Study Unit 5)

Laurel Station
Bellingham, Washington

Q:\geo\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 8 1971 Spill.dwg
Mod: 04/29/2010, 09:43 | Plotted: 04/30/2010, 11:38 | john_knobbs

URS

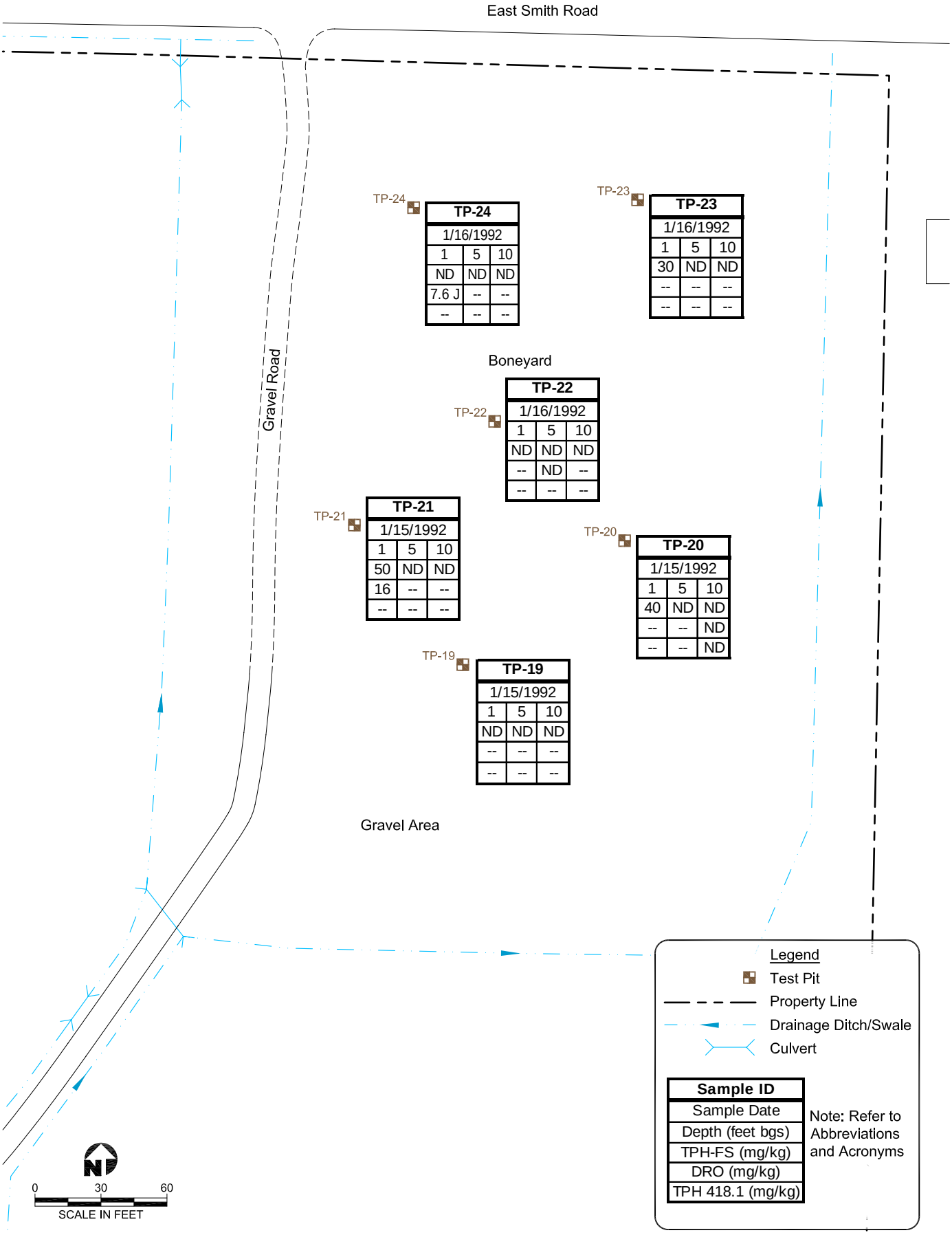


Figure 9

Soil Sample Locations (Boneyard/Study Unit 4)

Laurel Station
Bellingham, Washington

Q:\geo\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 9 1971 Spill Unit 4.dwg
Mod: 01/14/2010, 12:28 | Plotted: 04/30/2010, 11:41 | john_knobbs

URS

TM-B8		
12/11/1991		
4	9	34
ND	140 J	ND
--	--	--
--	--	--
--	--	--
--	--	--
--	--	--
--	--	--
--	--	--
--	--	--

08-B2		
3/3/2008		
1	3	4.5
--	--	--
ND	ND	ND
11	ND	ND
ND	ND	ND
--	--	--
ND	ND	ND
ND	ND	ND
ND	ND	ND
ND	ND	ND

Tank 170-1	
3/3/2008	
0.5	2
--	--
6.2	7.8
190	34
130	36
--	--
ND	ND
ND	ND
ND	ND
ND	ND

Tank 170-2		
3/3/2008		
0.5	2	3.5
--	--	--
8.4	ND	ND
21	ND	ND
25	ND	ND
--	--	--
ND	ND	ND[#]
ND	ND	ND
ND	ND	ND
ND	ND	ND

TM-B7	
12/10/1991	
3	8
ND	ND
--	--
--	--
--	--
--	ND
--	--
--	--
--	--
--	--

TM-B13	
2/20/1992	
9	24
ND	ND
--	--
--	--
--	ND
--	--
--	--
--	--
--	--
--	--

08-B3		
3/3/2008		
1	3	4.5
--	--	--
ND	ND	ND
51	60	ND
19	41	8.7
--	--	--
ND	ND[#]	**33**
ND	ND	ND
ND	ND	ND
ND	ND	58

Tank 180-1		
3/3/2008		
0.5	2	3
--	--	--
150	**300**	**350**
2,500	**2,300**	**3,500**
1,900	**2,200**	**3,100**
--	--	--
ND	ND	ND
21	ND	ND
ND	ND	ND
30	ND	ND

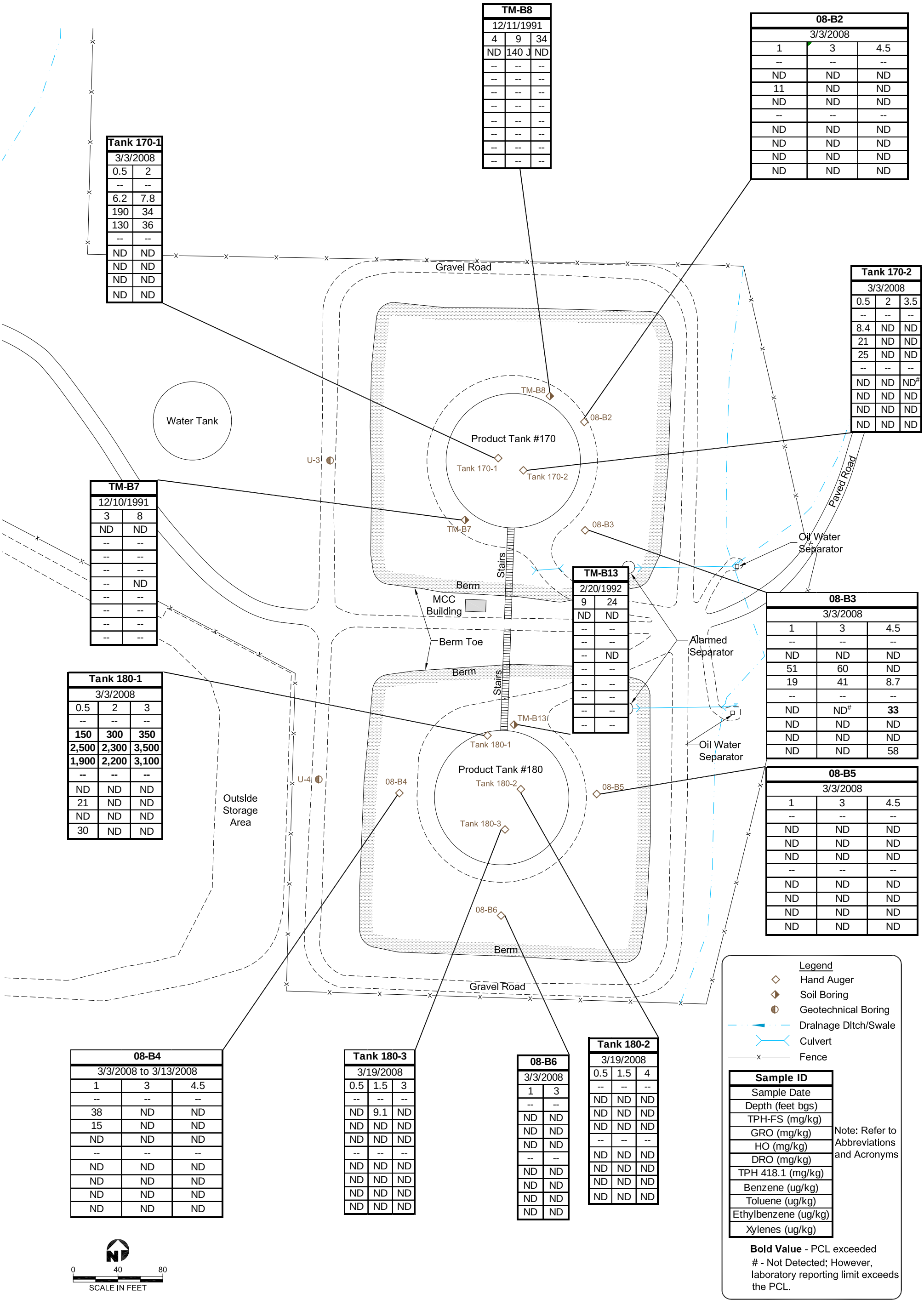
08-B5		
3/3/2008		
1	3	4.5
--	--	--
ND	ND	ND
ND	ND	ND
ND	ND	ND
--	--	--
ND	ND	ND
ND	ND	ND
ND	ND	ND
ND	ND	ND

08-B4		
3/3/2008 to 3/13/2008		
1	3	4.5
--	--	--
38	ND	ND
15	ND	ND
ND	ND	ND
--	--	--
ND	ND	ND
ND	ND	ND
ND	ND	ND
ND	ND	ND

Tank 180-3		
3/19/2008		
0.5	1.5	3
--	--	--
ND	9.1	ND
ND	ND	ND
ND	ND	ND
--	--	--
ND	ND	ND
ND	ND	ND
ND	ND	ND
ND	ND	ND

08-B6	
3/3/2008	
1	3
--	--
ND	ND
ND	ND
ND	ND
--	--
ND	ND
ND	ND
ND	ND
ND	ND

Tank 180-2		
3/19/2008		
0.5	1.5	4
--	--	--
ND	ND	ND
ND	ND	ND
ND	ND	ND
--	--	--
ND	ND	ND
ND	ND	ND
ND	ND	ND
ND	ND	ND



Legend

- Hand Auger
- Soil Boring
- Geotechnical Boring
- Drainage Ditch/Swale
- Culvert
- Fence

Sample ID
Sample Date
Depth (feet bgs)
TPH-FS (mg/kg)
GRO (mg/kg)
HO (mg/kg)
DRO (mg/kg)
TPH 418.1 (mg/kg)
Benzene (ug/kg)
Toluene (ug/kg)
Ethylbenzene (ug/kg)
Xylenes (ug/kg)

Note: Refer to Abbreviations and Acronyms

Bold Value - PCL exceeded

- Not Detected; However, laboratory reporting limit exceeds the PCL.

Figure 10

Soil Sample Locations - 1979 Spill (Study Unit 2)

Laurel Station
Bellingham, Washington

Q:\geo\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 10 1979 Spill Unit 2.dwg
Mod: 01/14/2010, 15:00 | Plotted: 04/30/2010, 11:40 | john_knobbs

URS

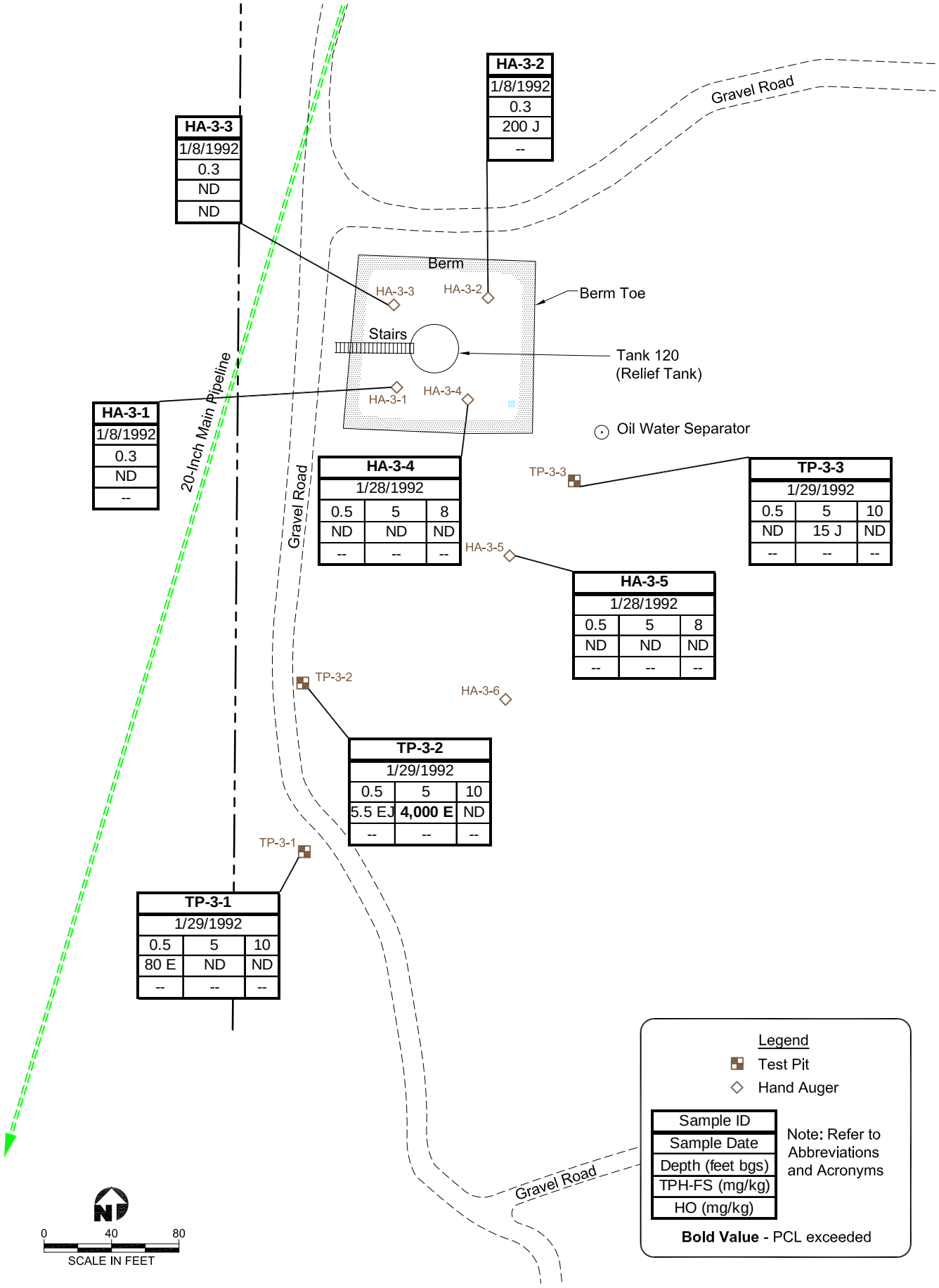


Figure 11

Soil Sample Locations- Historical Spills and Releases (Study Unit 3)

Laurel Station
Bellingham, Washington

Q:\geo\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 11 Hist Spills Unit 3.dwg
Mod: 04/29/2010, 15:54 | Plotted: 04/30/2010, 11:40 | john_knobbs

URS

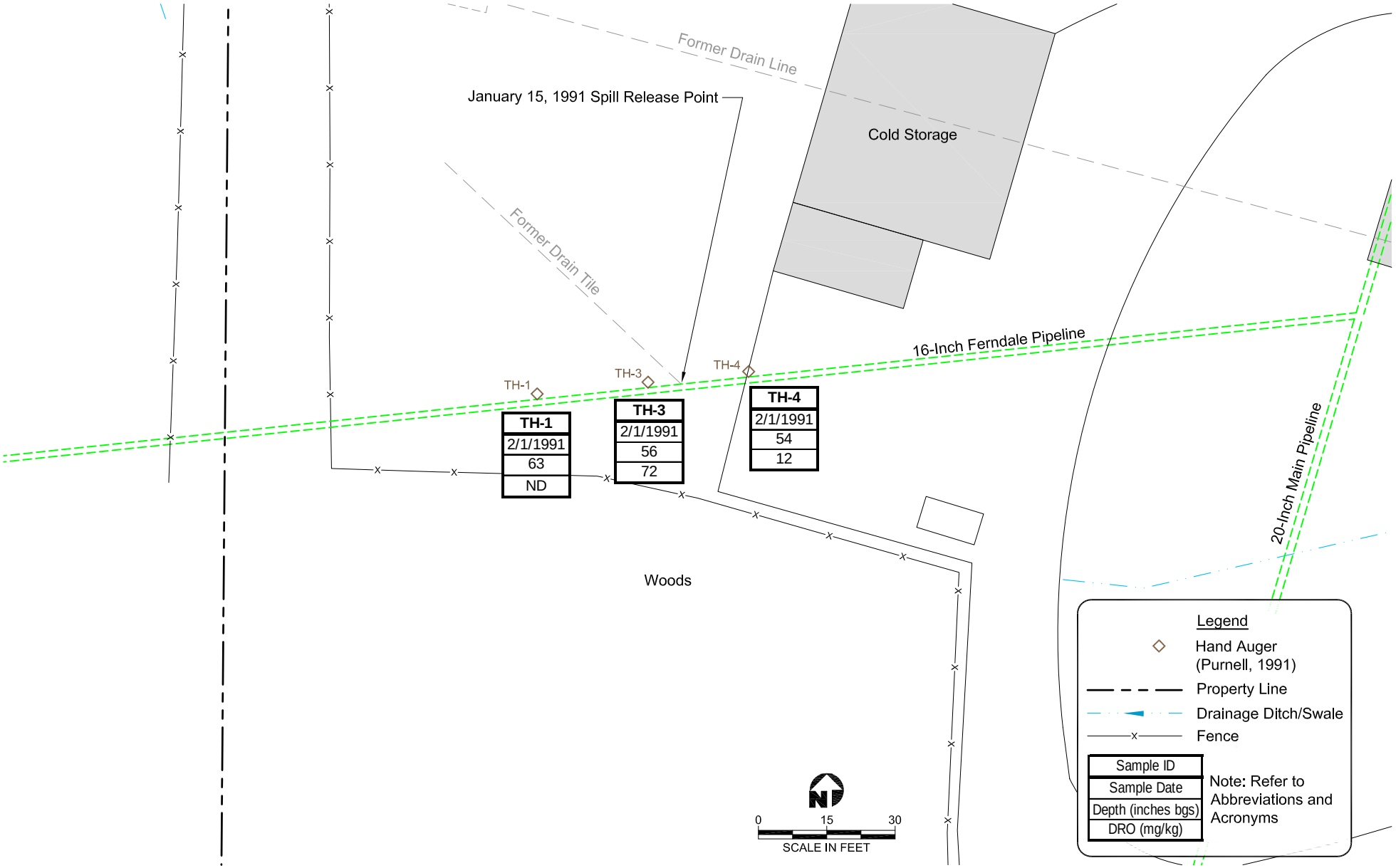


Figure 12

16-Inch Ferndale Pipeline Sample Locations (Purnell Investigation)

Laurel Station
Bellingham, Washington

Q:\geo\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 12 16 In Fern Pipe.dwg
Mod: 04/29/2010, 09:43 | Plotted: 04/30/2010, 11:39 | john_knobbs

URS

East Smith Road

Former PSE Substation

Former Oil Water Separator

Former Burn Pit

Former Drain

Former Drain Tile

16-Inch Ferndale Pipeline

January 15, 1991 Spill Release Point

SH-1

SH-2

SH-3

29
2/19/1991
0-10
ND
--
--
--
--

28
2/19/1991
0-10
ND
--
--
--
--

30
2/19/1991
0-10
ND
--
--
--
--

31
2/19/1991
0-10
863
--
--
--
--

SH-3				
4/8/1991				
4-6	10-12	16-18	22-24	28-30
ND	ND	ND	ND	ND
--	--	--	--	--
--	--	--	--	--
--	--	--	--	--
--	--	--	--	--

47
2/19/1991
6-12
1,395
--
--
--
--

48
2/19/1991
10-12
ND
--
--
--
--

20
2/18/1991
10-24
50
--
--
--
--

21
2/18/1991
10-20
12,523
980
16,100
1,750
51,300

49
2/19/1991
18-20
ND
--
--
--
--

50
2/19/1991
14-16
ND
--
--
--
--

27
2/19/1991
0-10
ND
--
--
--
--

26
2/19/1991
0-10
ND
--
--
--
--

25
2/18/1991
0-10
ND
--
--
--
--

24
2/18/1991
0-10
ND
--
--
--
--

23
2/18/1991
0-10
ND
--
--
--
--

22
2/18/1991
0-10
3,649
ND#
420
130
2,470

18
2/18/1991
0-10
ND
--
--
--
--

19
2/18/1991
6-10
344
ND#
ND
ND
180

15
2/18/1991
0-10
1,501
ND#
120
ND
450

14
2/18/1991
0-10
ND
--
--
--
--

16
2/18/1991
0-10
4,169
130
3,700
1,050
19,800

13
2/18/1991
10-14
15,411
1,940
31,400
6,010
109,000

38
2/19/1991
0-10
ND
--
--
--
--

17
2/18/1991
10-24
ND
--
--
--
--

SH-2				
4/8/1991				
4-6	10-12	16-18	22-24	28-30
2,053	**4,907**	**1,667**	ND	ND
--	--	--	--	--
--	--	--	--	--
--	--	--	--	--
--	--	--	--	--

12
2/18/1991
0-10
ND
--
--
--
--

10
2/18/1991
10-16
857
860
8,300
420
16,800

11
2/18/1991
0-10
1,222
ND#
ND
80
1,050

37
2/19/1991
0-10
194
--
--
--
--

9
2/18/1991
0-10
ND
--
--
--
--

8
2/18/1991
0-10
1,551
ND#
280
240
5,000

7
2/18/1991
0-10
1,863
ND#
210
80
1,540

36
2/19/1991
0-10
45
--
--
--
--

6
2/18/1991
0-10
8,085
ND#
1,680
210
3,730

39
2/19/1991
0-10
ND
--
--
--
--

5
2/18/1991
0-10
2,946
ND#
ND
70
880

4
2/18/1991
10-20
ND
--
--
--
--

3
2/18/1991
10-20
78
ND#
ND
ND
80

2
2/18/1991
10-36
4,215
260
5,800
670
17,900

SH-1		
4/8/1991		
4-6	16-18	28-30
843	ND	ND
--	--	--
--	--	--
--	--	--
--	--	--

1
2/18/1991
0-10
3,976
6,830
57,300
8,640
89,900

Legend

- Soil Sample (Purnell, 1991)
- Property Line
- Drainage Ditch/Swale
- Culvert
- Fence

Sample ID
Sample Date
Depth (inches bgs)
DRO (mg/kg)
Benzene (ug/kg)
Toluene (ug/kg)
Ethylbenzene (ug/kg)
Xylenes (ug/kg)

Note: Refer to Abbreviations and Acronyms

Extent of Contamination Exceeding PCL

Bold Value - PCL Exceeded

*Samples 47, SH-1, and SH-2 were also analyzed for PAHs. PAHs were not detected above their respective PCL with the exception of naphthalene in 4-6 inch bgs sample collected from SH-1 (5,500 ug/kg) and the 10-12 inch bgs and 16-18 inch bgs samples collected from SH-2 (3,700 ug/kg and 3,000 ug/kg).

- Not Detected; However, laboratory reporting limit exceeds the PCL.

0 20 40
SCALE IN FEET

Q:\geo\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 13 Area 1.dwg
Mod: 05/28/2010, 11:32 | Plotted: 05/28/2010, 13:49 | john_knobbs

URS

FIgure 13

Area 1 Sample Locations (Purnell Investigation)

Laurel Station
Bellingham, Washington

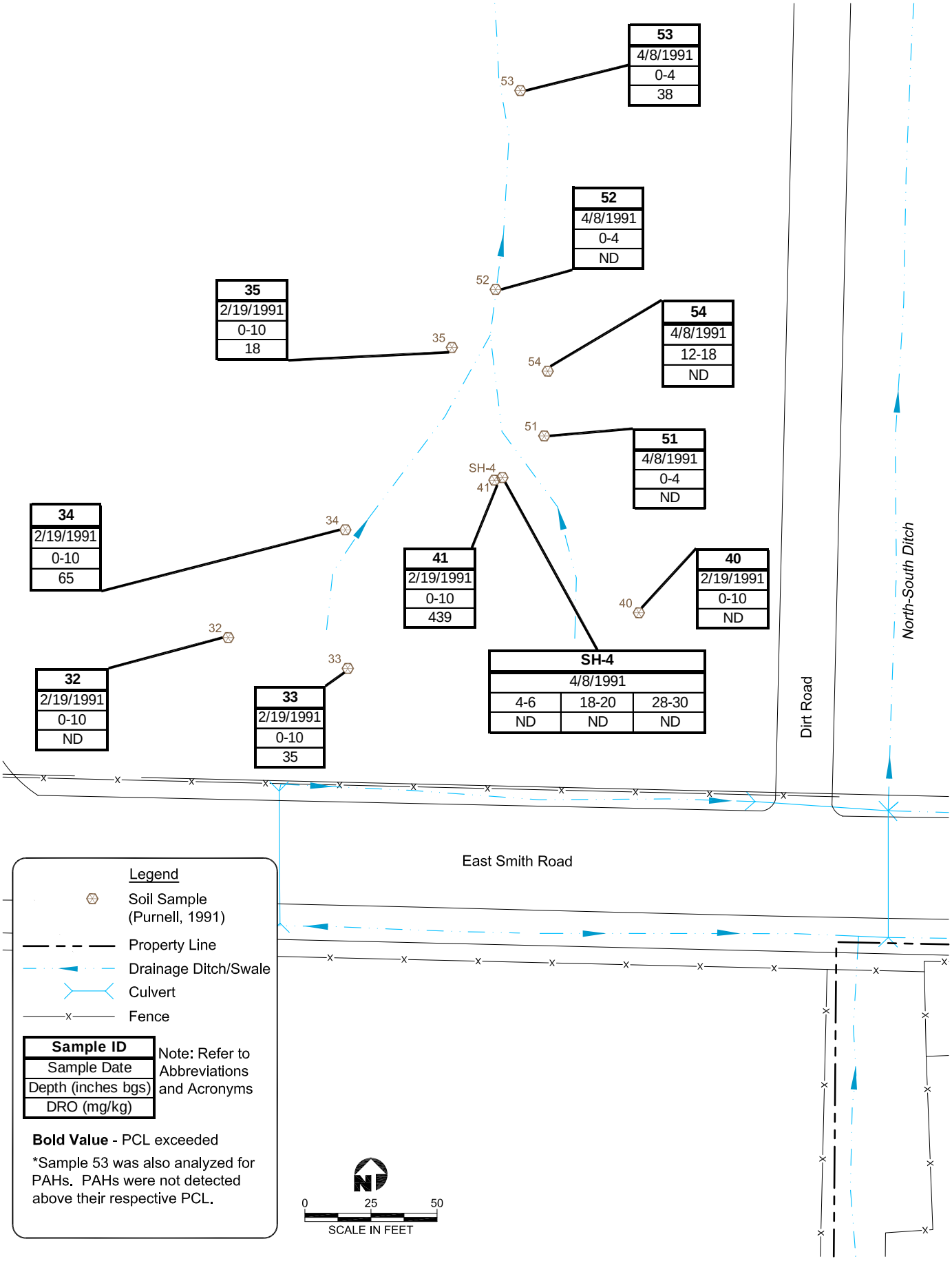


Figure 14

Area 2 Sample Locations (Purnell Investigation)

Laurel Station
Bellingham, Washington

Q:\geo\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 14 Area 2 Samp.dwg
Mod: 04/29/2010, 10:08 | Plotted: 04/30/2010, 11:38 | john_knobbs

URS

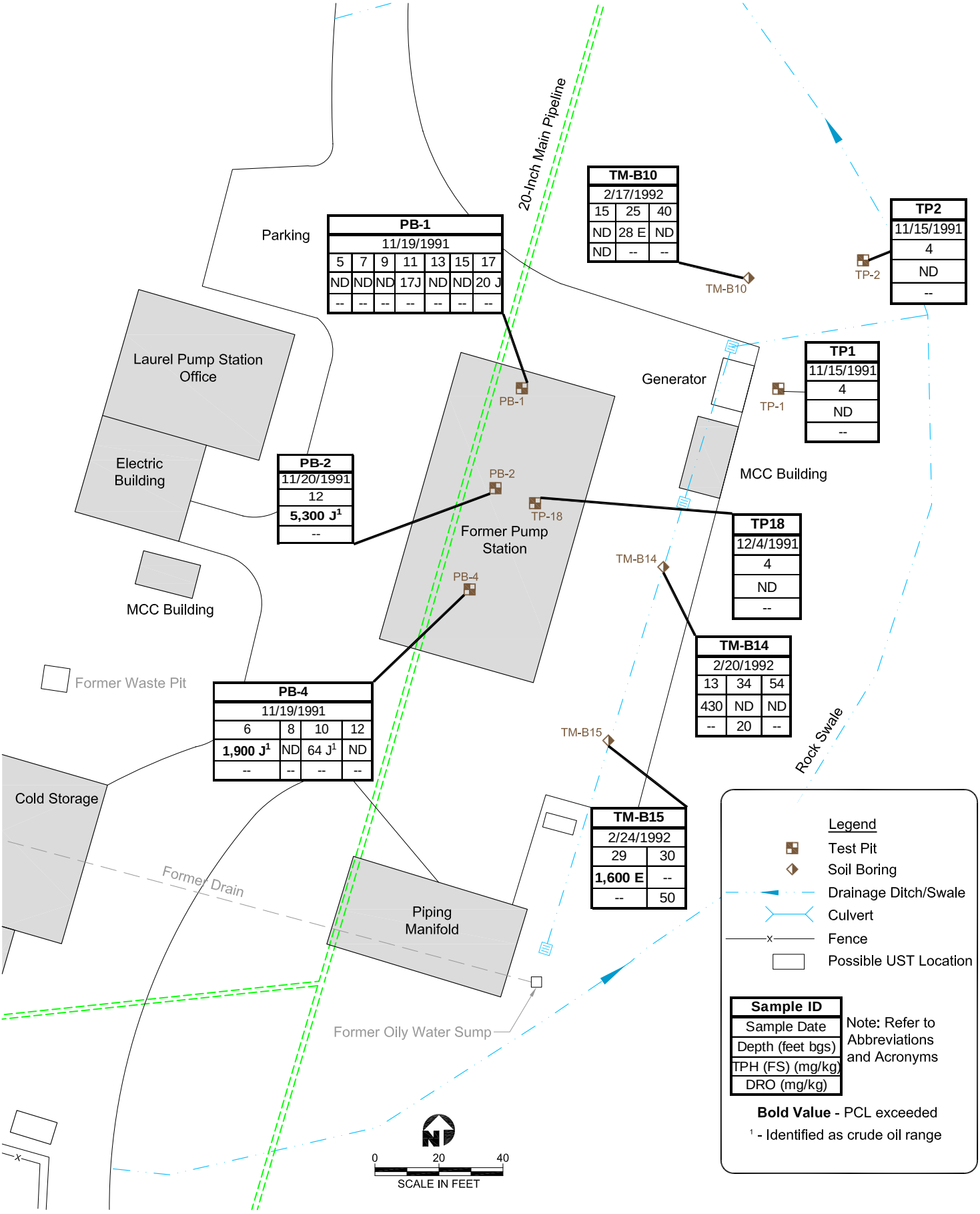


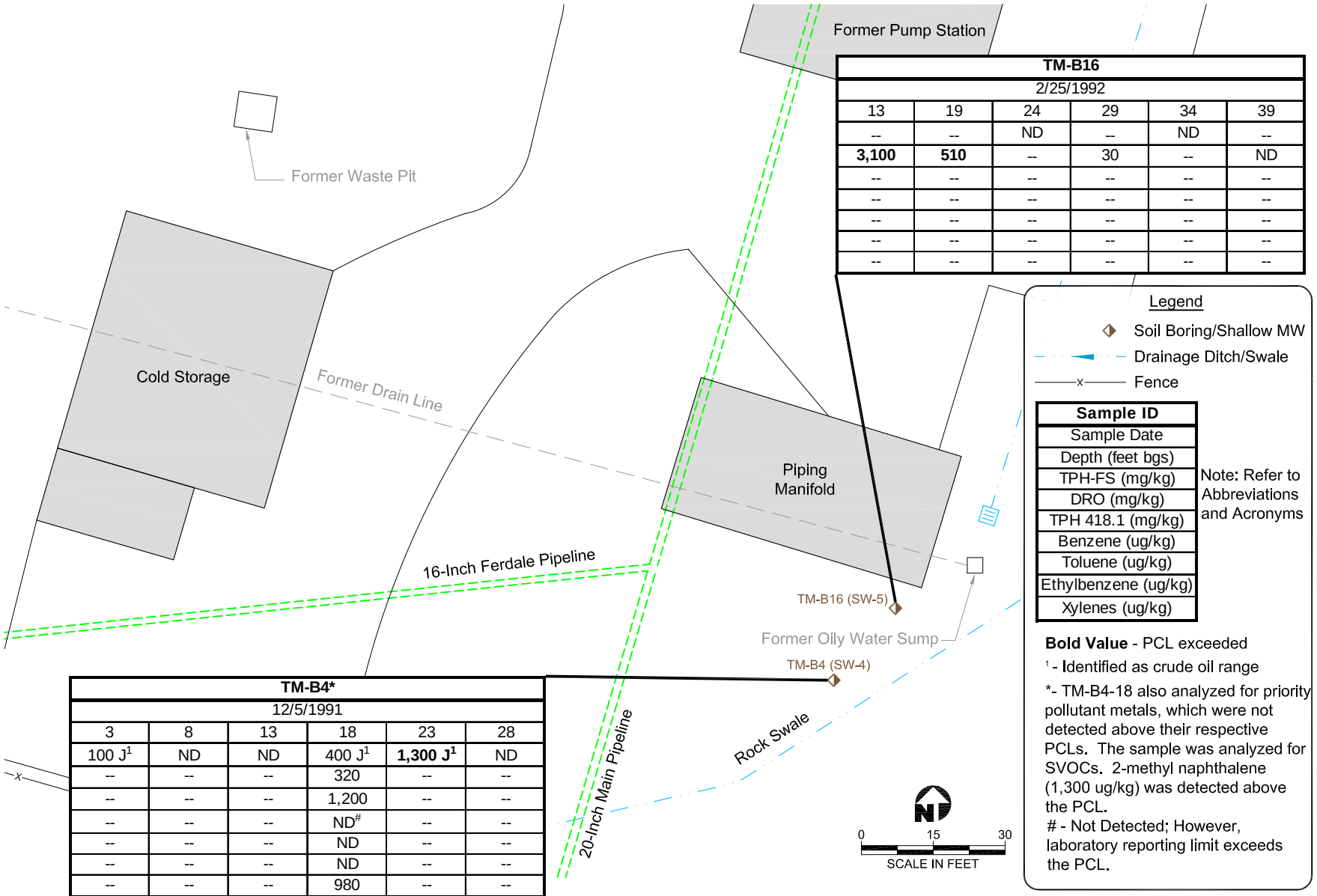
Figure 15

Pump Station Area Sample Locations (Study Unit 1)

Laurel Station
Bellingham, Washington

Q:\geo\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 15 Pump Sta.dwg
Mod: 05/28/2010, 10:41 | Plotted: 05/28/2010, 13:50 | john_knobbs

URS



TM-B16					
2/25/1992					
13	19	24	29	34	39
--	--	ND	--	ND	--
3,100	**510**	--	30	--	ND
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--

TM-B4*					
12/5/1991					
3	8	13	18	23	28
100 J[1]	ND	ND	400 J[1]	**1,300 J[1]**	ND
--	--	--	320	--	--
--	--	--	1,200	--	--
--	--	--	ND[#]	--	--
--	--	--	ND	--	--
--	--	--	ND	--	--
--	--	--	980	--	--

Legend

- Soil Boring/Shallow MW
- Drainage Ditch/Swale
- Fence

Sample ID
Sample Date
Depth (feet bgs)
TPH-FS (mg/kg)
DRO (mg/kg)
TPH 418.1 (mg/kg)
Benzene (ug/kg)
Toluene (ug/kg)
Ethylbenzene (ug/kg)
Xylenes (ug/kg)

Note: Refer to Abbreviations and Acronyms

Bold Value - PCL exceeded

[1] - Identified as crude oil range

*- TM-B4-18 also analyzed for priority pollutant metals, which were not detected above their respective PCLs. The sample was analyzed for SVOCs. 2-methyl naphthalene (1,300 ug/kg) was detected above the PCL.

- Not Detected; However, laboratory reporting limit exceeds the PCL.

Figure 16

Former Oily Water Sump Sample Locations (Study Unit 1)

Q:\geo\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 16 Form Oily Wat.dwg
Mod: 04/29/2010, 10:08 | Plotted: 04/30/2010, 13:24 | john_knobbs

URS

Laurel Station
Bellingham, Washington

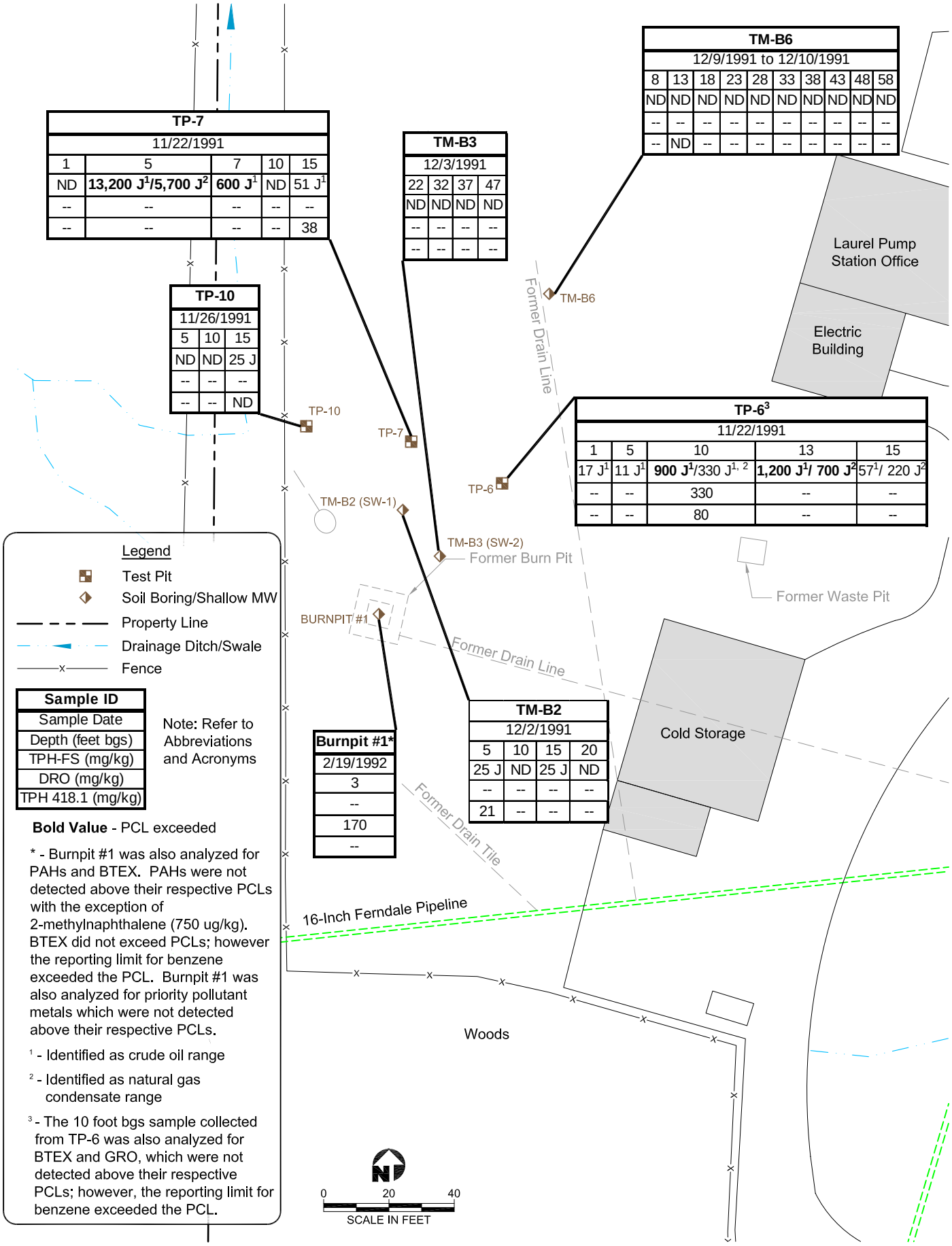


Figure 17

Former Burn Pit and Former Oil/Water Separator Sample Locations (Study Unit 1)

Laurel Station
Bellingham, Washington

Q:\geo\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 17 Former Burn Pit.dwg
Mod: 05/28/2010, 10:39 | Plotted: 05/28/2010, 13:51 | john_knobbs

URS

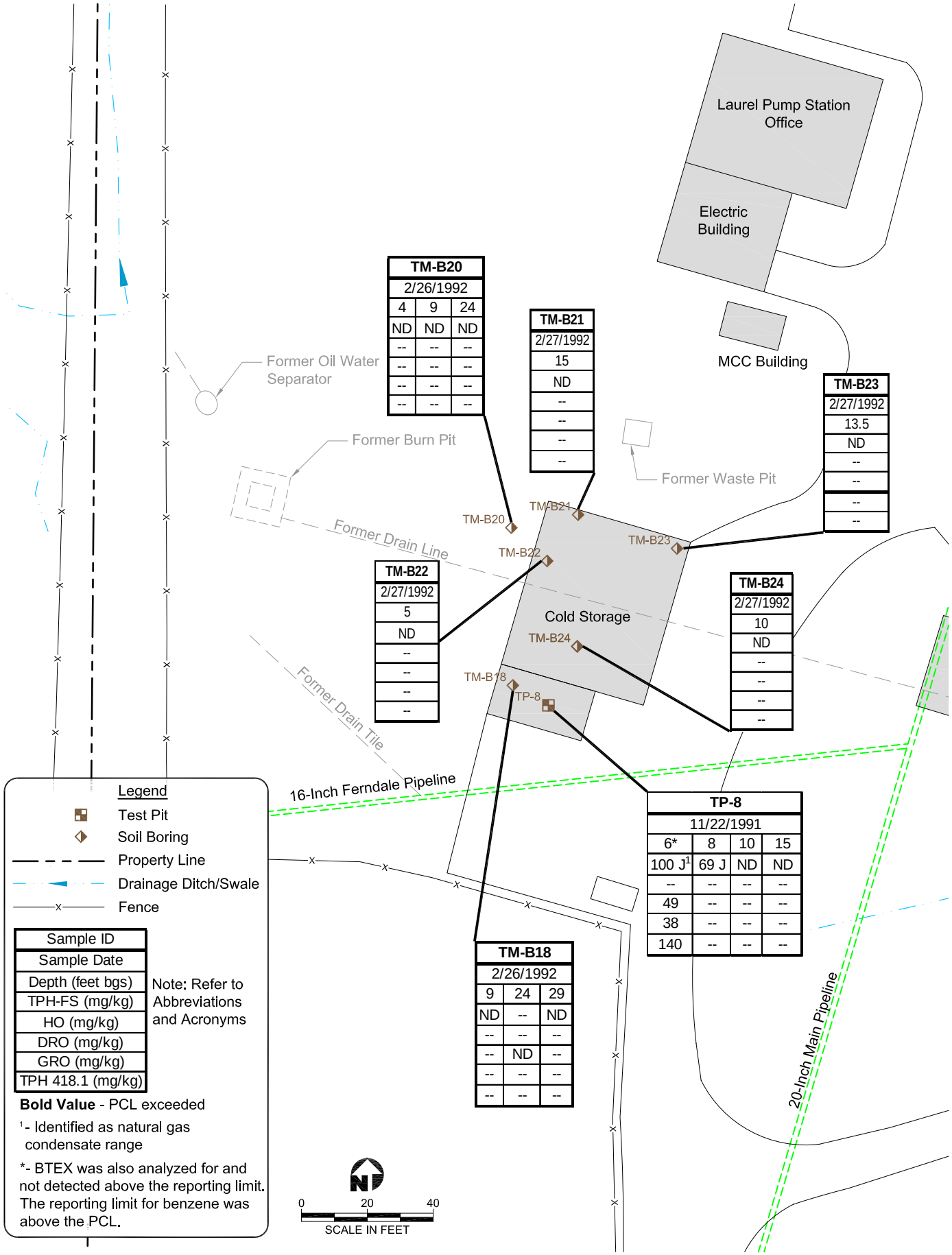


Figure 18

Former Drain Line Between Oily Water Sump and Burn Pit Sample Locations (Study Unit 1)

Laurel Station
Bellingham, Washington

Q:\geo\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 18 Former Drain Line.dwg
Mod: 05/28/2010, 10:37 | Plotted: 05/28/2010, 13:52 | john_knobbs

URS

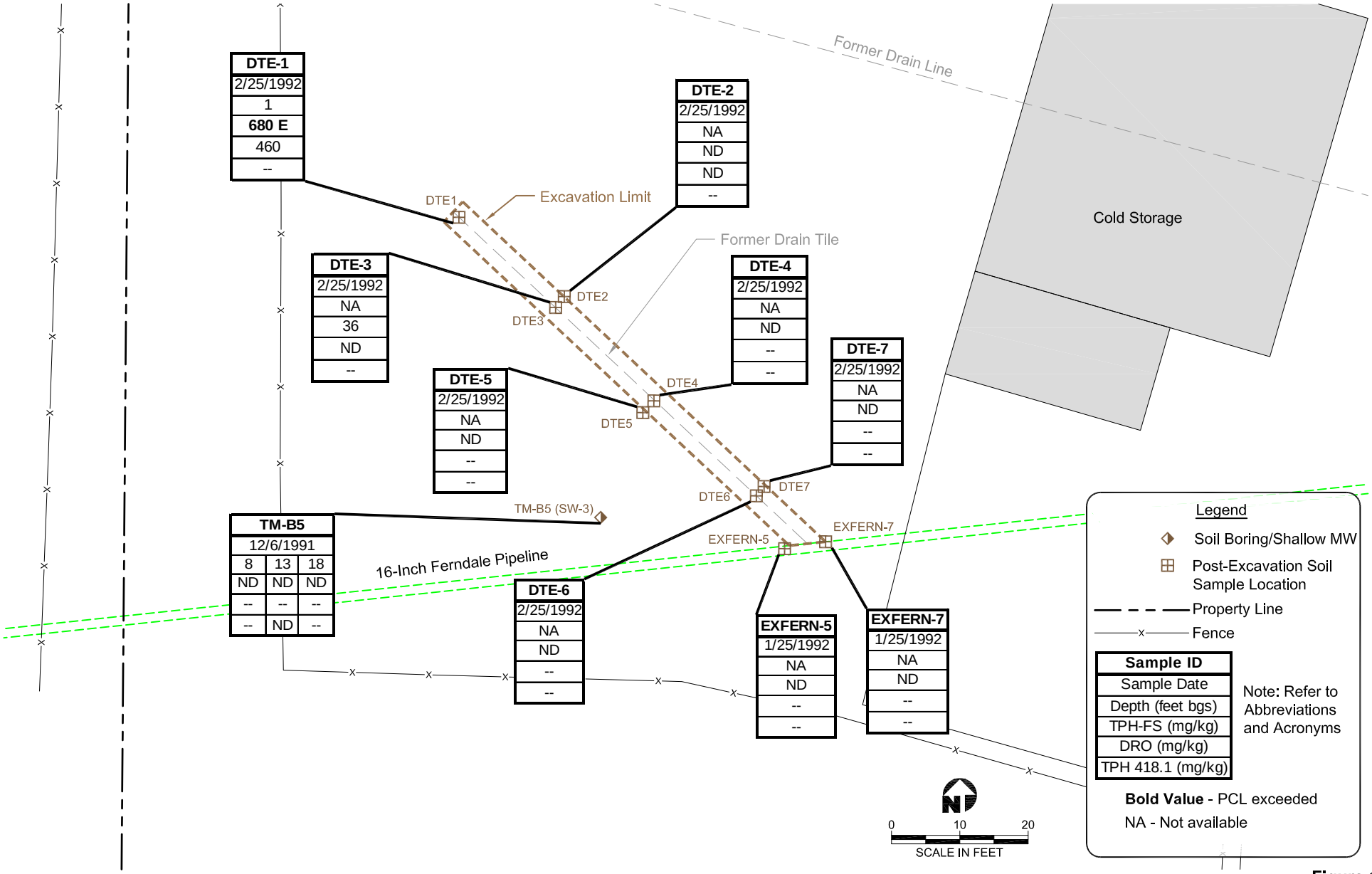


Figure 19

Former Drain Tile Excavation Sample Locations (Study Unit 1)

Laurel Station
Bellingham, Washington

Q:\geo\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 19 Former Drain Tile.dwg
Mod: 01/14/2010, 12:36 | Plotted: 04/30/2010, 11:45 | john_knobbs

URS

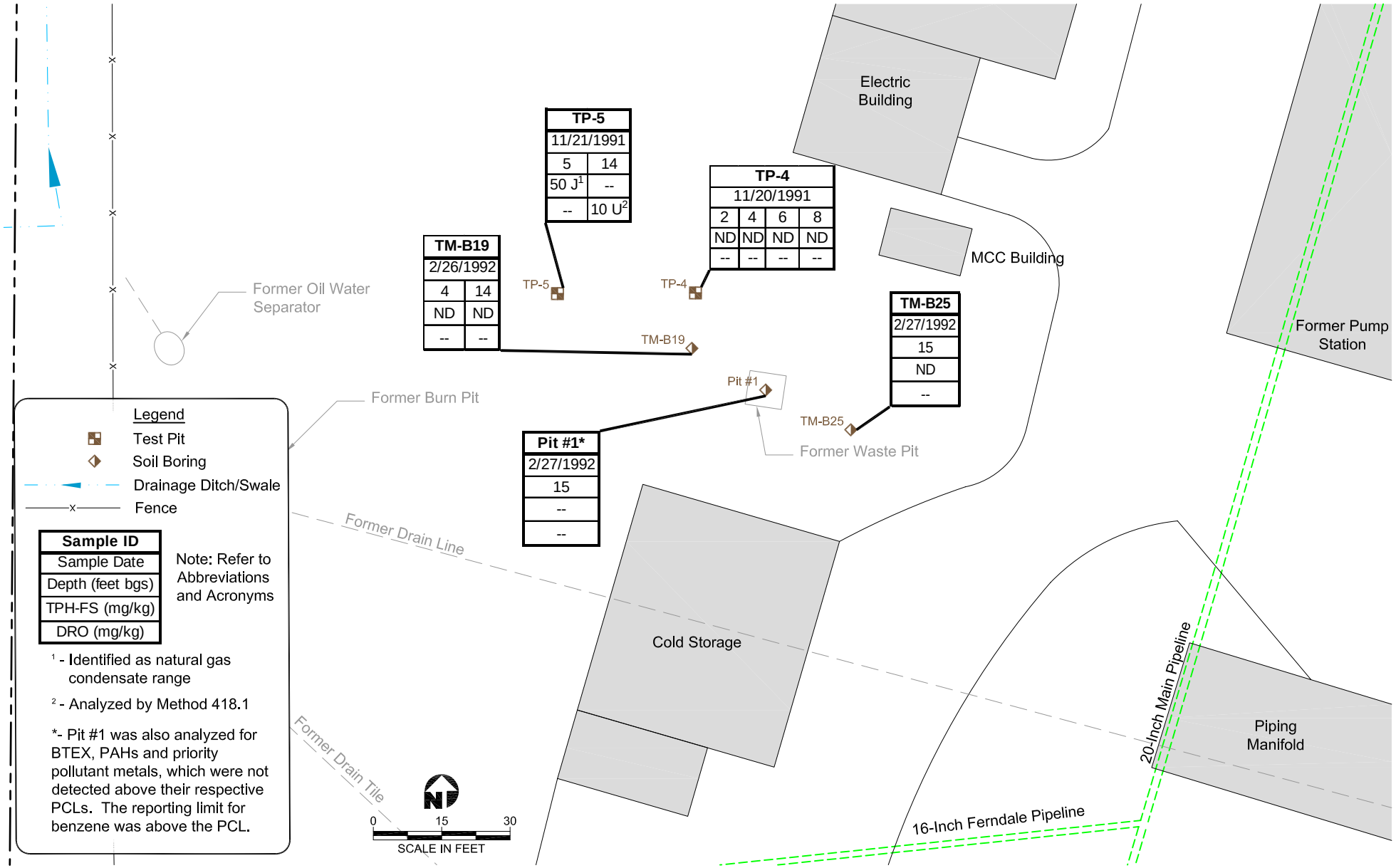


Figure 20

Former Waste Pit Sample Locations (Study Unit 1)

Laurel Station
Bellingham, Washington

Q:\geo\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 20 Former Waste Pit.dwg
Mod: 05/28/2010, 09:53 | Plotted: 05/28/2010, 13:52 | john_knobbs

URS

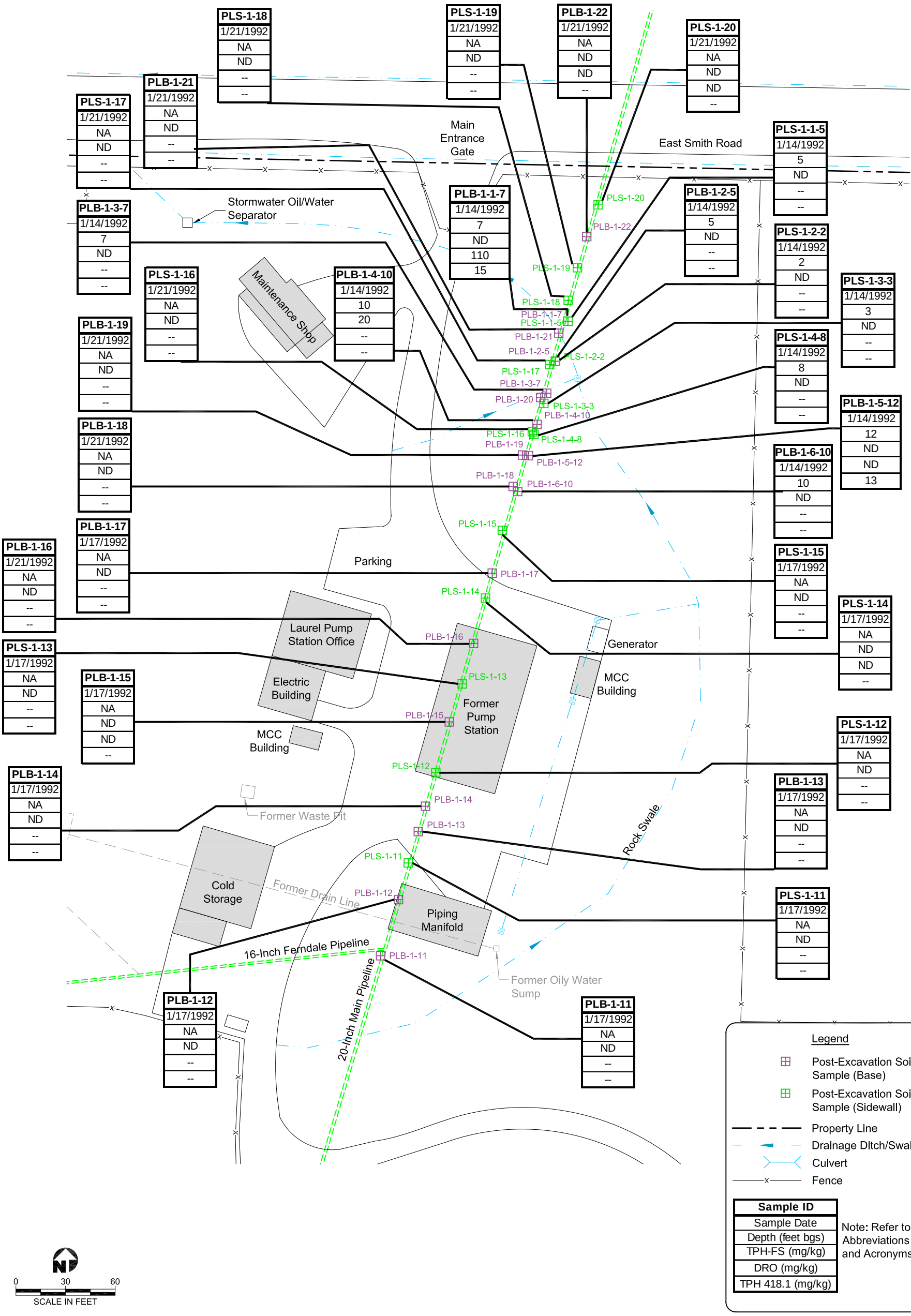


Figure 21

20-Inch Main Pipeline Sample Locations (Study Unit 1)

Laurel Station
Bellingham, Washington

Q:\geo\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 21 20 In Main.dwg
Mod: 04/29/2010, 10:45 | Plotted: 04/30/2010, 11:45 | john_knobbs

URS

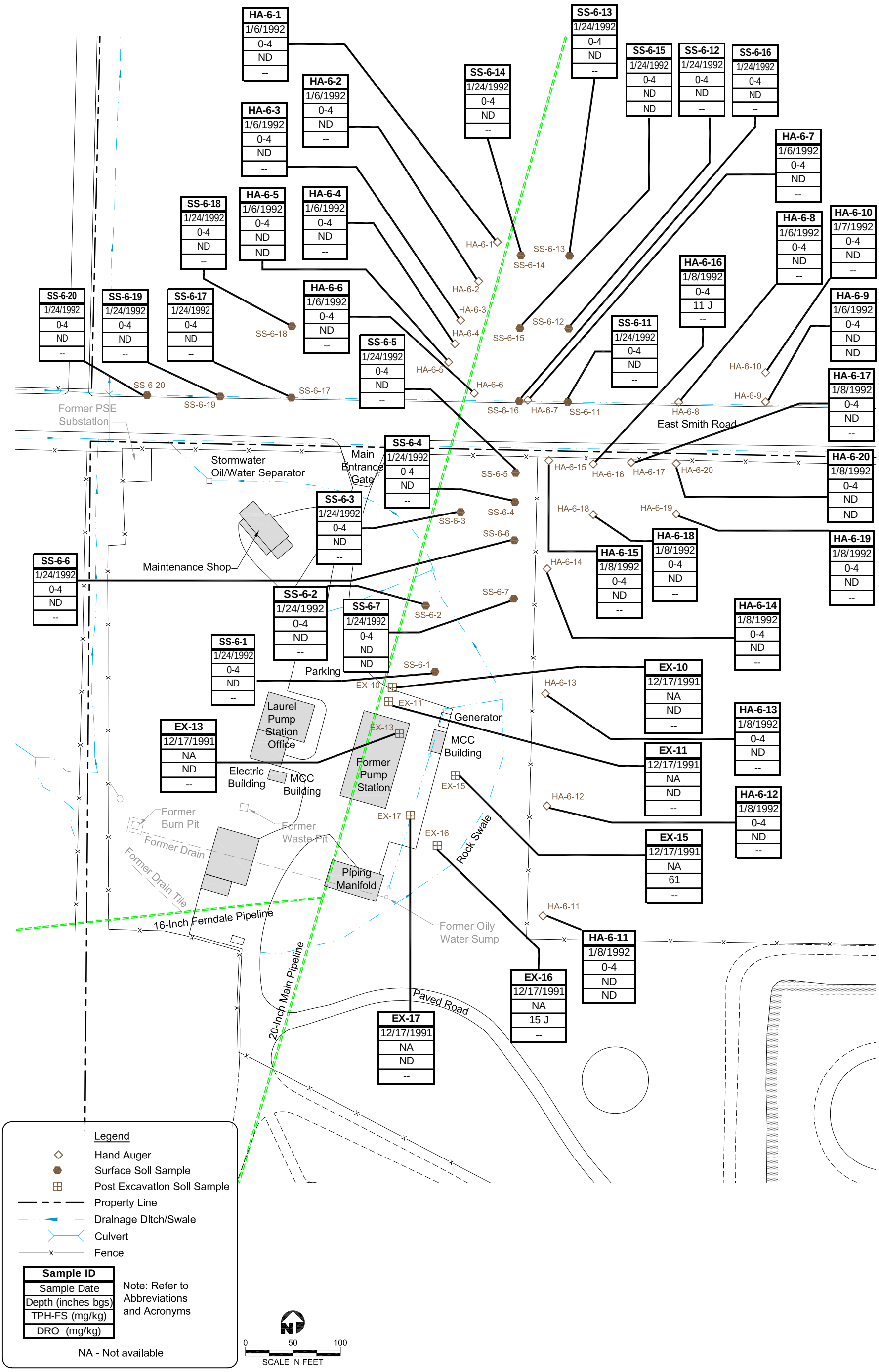


Figure 23

December 11, 1991 Spill Sample Locations (Study Units 1, 5, and 6)

Laurel Station
Bellingham, Washington

Q:\geo\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 23 Dec 1991 Spill.dwg
Mod: 04/29/2010, 10:45 | Plotted: 04/30/2010, 13:31 | john_knobbs

URS

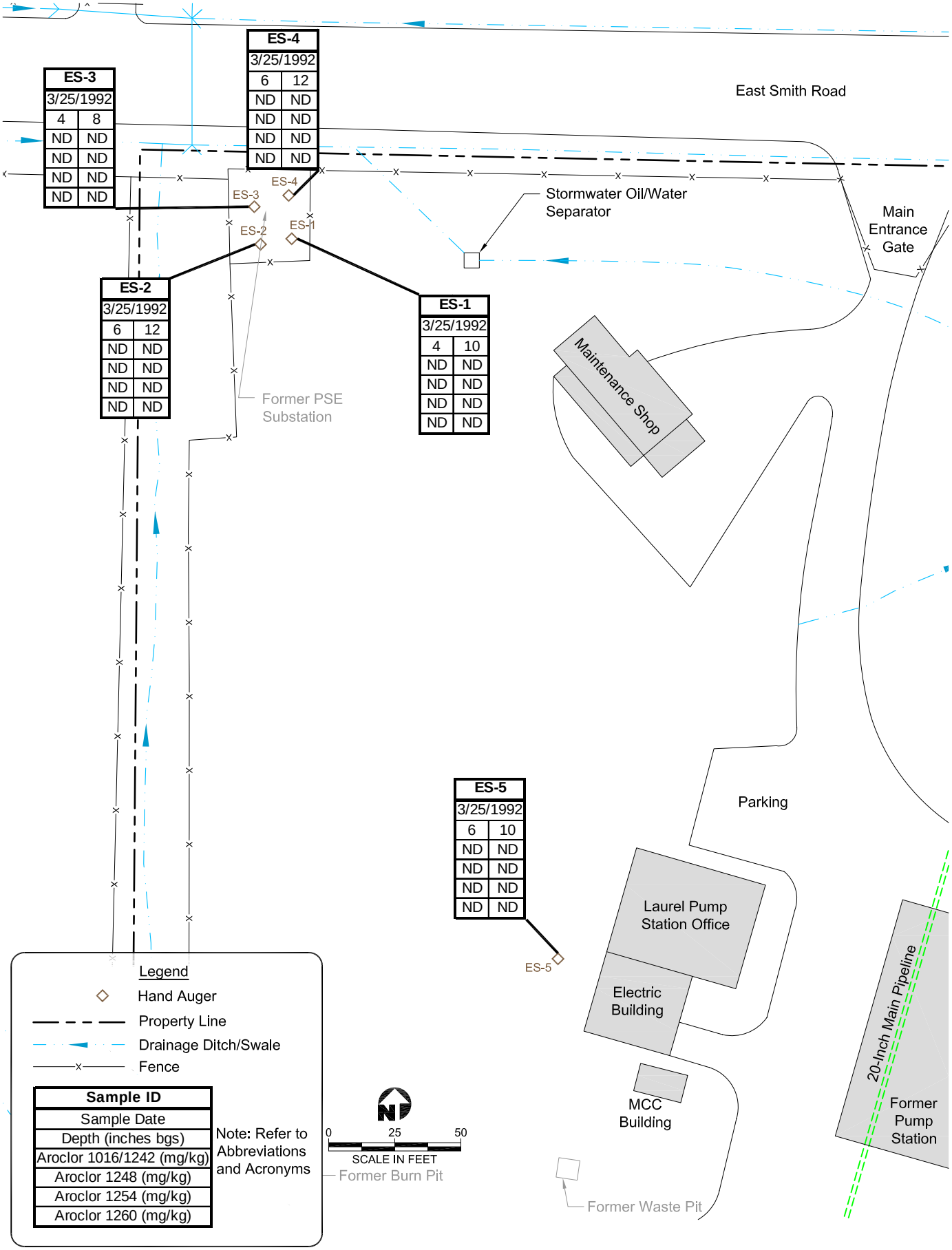


Figure 22

Former PSE Electrical Substation Sample Locations (Study Unit 1)

Laurel Station
Bellingham, Washington

Q:\geo\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 22 PSE.dwg
Mod: 04/29/2010, 10:45 | Plotted: 04/30/2010, 11:44 | john_knobbs

URS

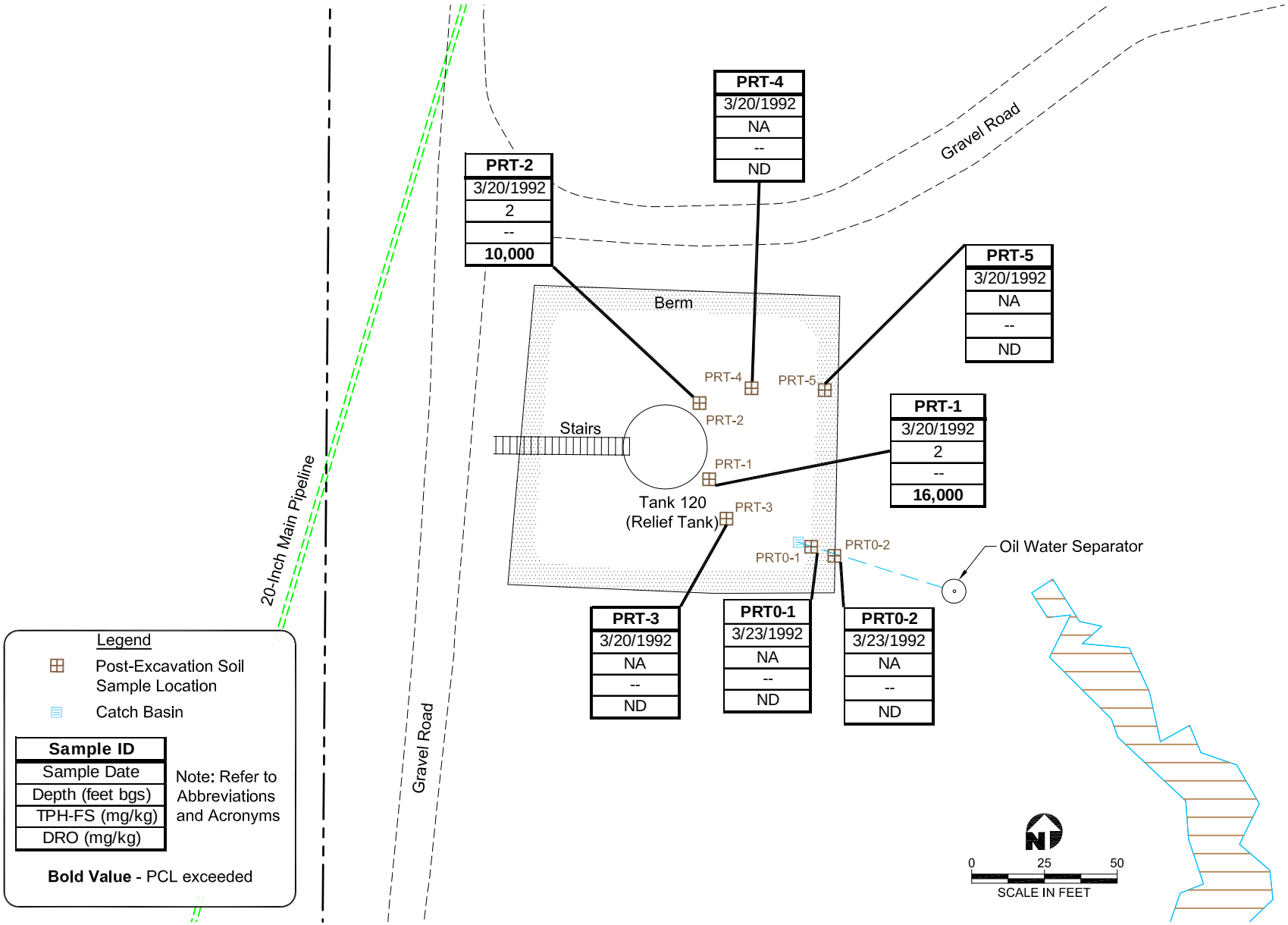


Figure 24

March 7, 1992 Spill Soil Sample Locations (Study Unit 3)

Laurel Station
Bellingham, Washington

Q:\geo\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 24 Mar 7 1991 Spill.dwg
Mod: 04/29/2010, 15:54 | Plotted: 04/30/2010, 13:31 | john_knobbs

URS

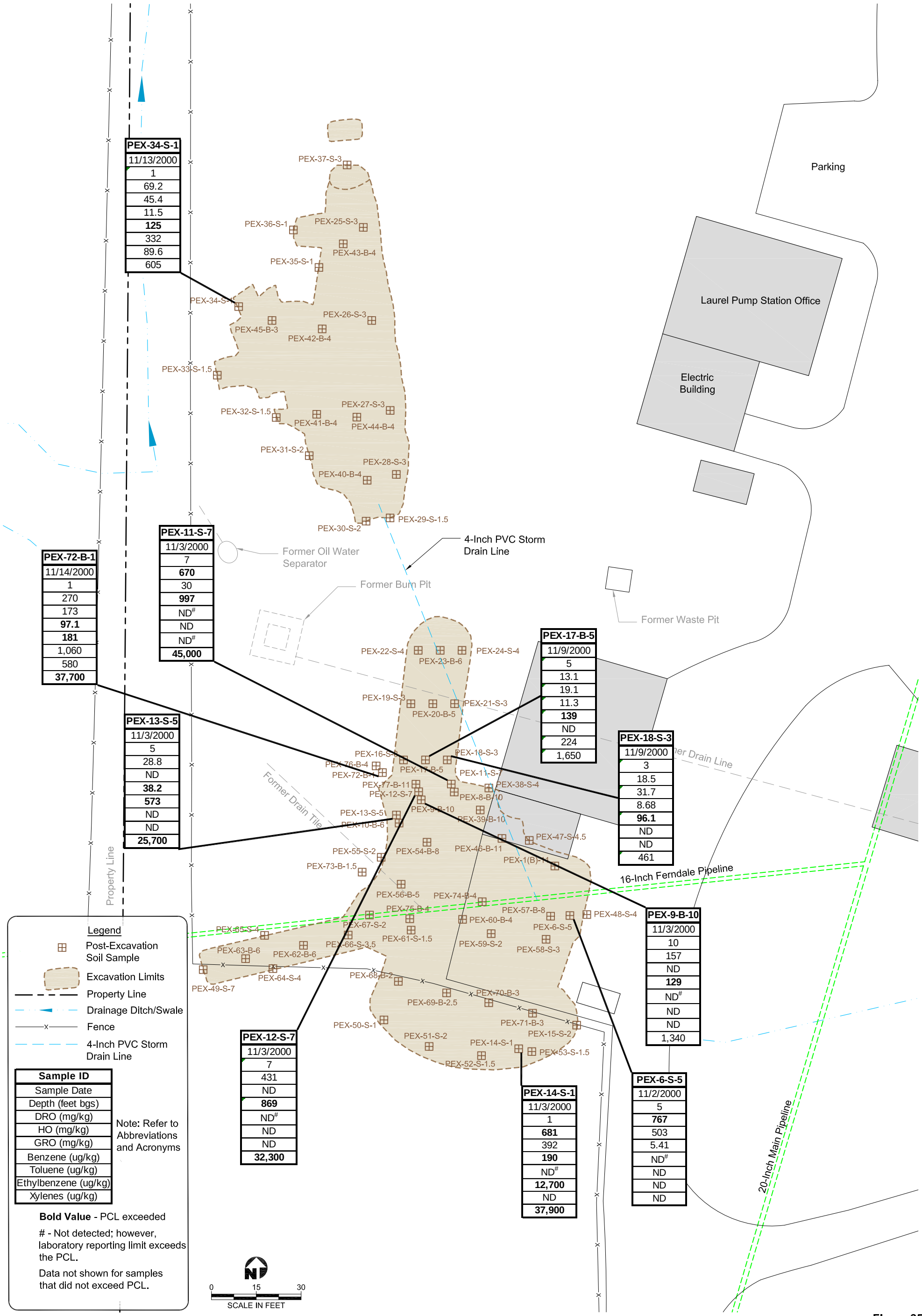


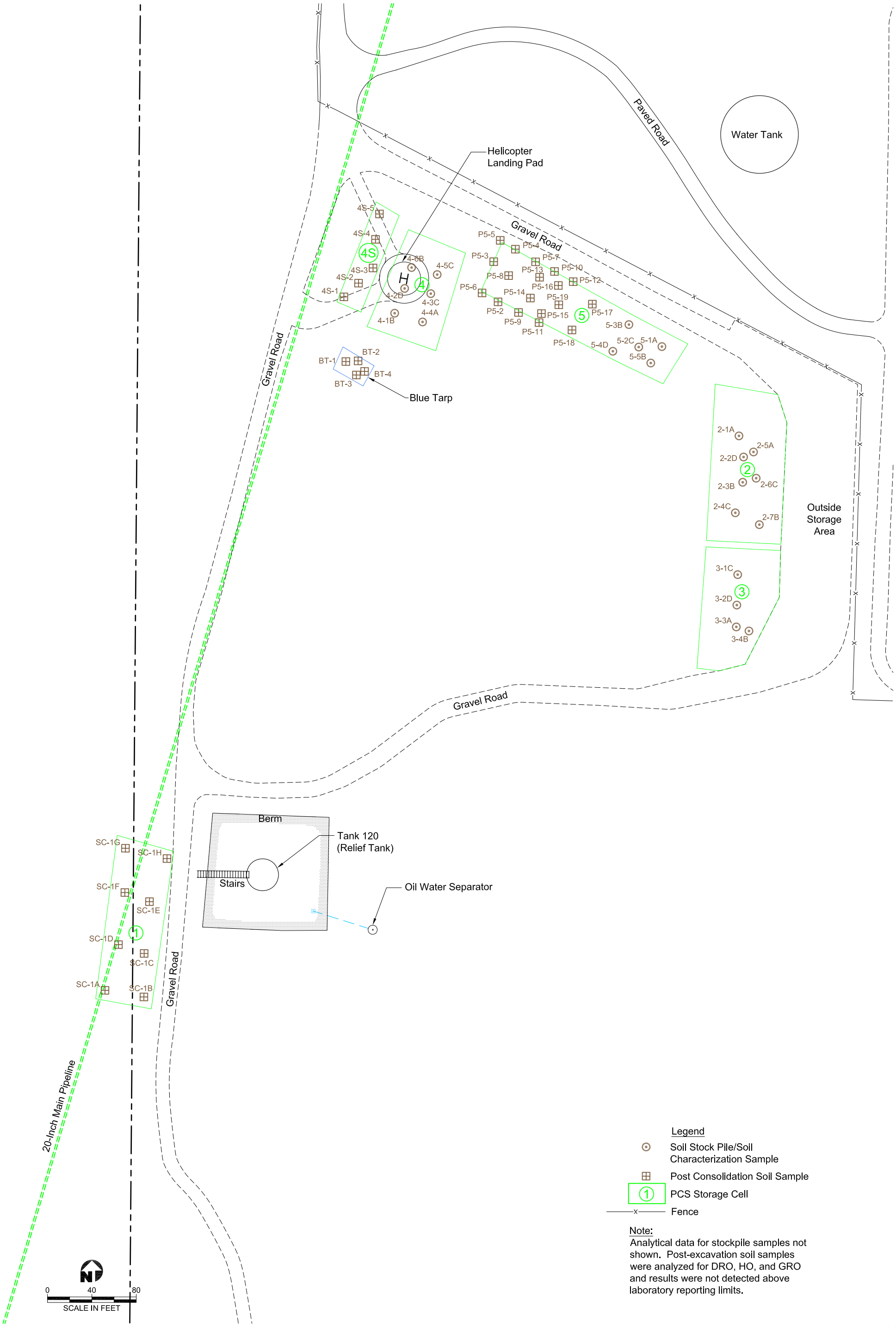
FIgure 25

October 26, 2000 Spill Sample Locations (Study Unit 1)

Laurel Station
Bellingham, Washington

Q:\geo\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 25 Dec 26 Spill.dwg
Mod: 05/28/2010, 09:55 | Plotted: 05/28/2010, 13:53 | john_knobbs

URS



Legend

- Soil Stock Pile/Soil Characterization Sample
- Post Consolidation Soil Sample
- ① PCS Storage Cell
- Fence

Note:
Analytical data for stockpile samples not shown. Post-excavation soil samples were analyzed for DRO, HO, and GRO and results were not detected above laboratory reporting limits.

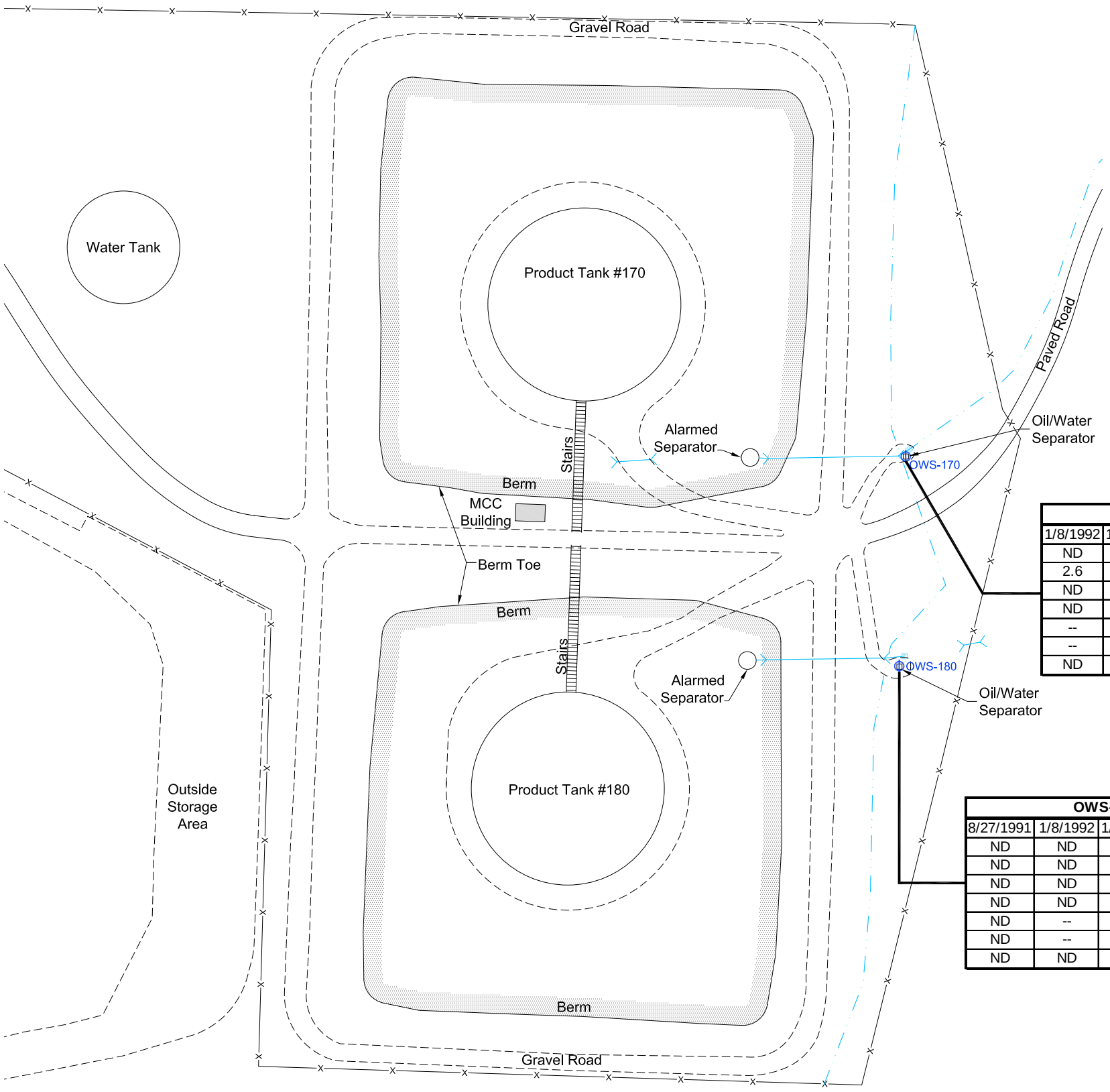
Q:\geo\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 26 PCS Storage Cell.dwg
Mod: 04/29/2010, 15:53 | Plotted: 04/30/2010, 13:30 | john_knobbs

URS

Figure 26

PCS Storage Cell Sample Locations (Study Units 3 and 7)

Laurel Station
Bellingham, Washington



OWS-170		
1/8/1992	1/27/1992	11/10/1992
ND	**14**	ND
2.6	16	ND
ND	ND	ND
ND	7.3	ND
--	--	ND
--	--	ND
ND	ND	ND

OWS-180			
8/27/1991	1/8/1992	1/21/1992	11/10/1992
ND	ND	ND	ND
ND	ND	ND	ND
ND	ND	ND	ND
ND	ND	ND	ND
ND	--	--	ND
ND	--	--	ND
ND	ND	ND	ND

Legend

- Surface Water Sample
- Drainage Ditch/Swale
- Culvert
- Fence

Sample ID
Sample Date
Benzene (ug/L)
Toluene (ug/L)
Ethylbenzene (ug/L)
Xylenes (ug/L)
DRO (mg/L)
GRO (mg/L)
TPH 418.1 (mg/L)

Note: Refer to Abbreviations and Acronyms

Bold Value - PCL exceeded

NT

0 40 80

SCALE IN FEET

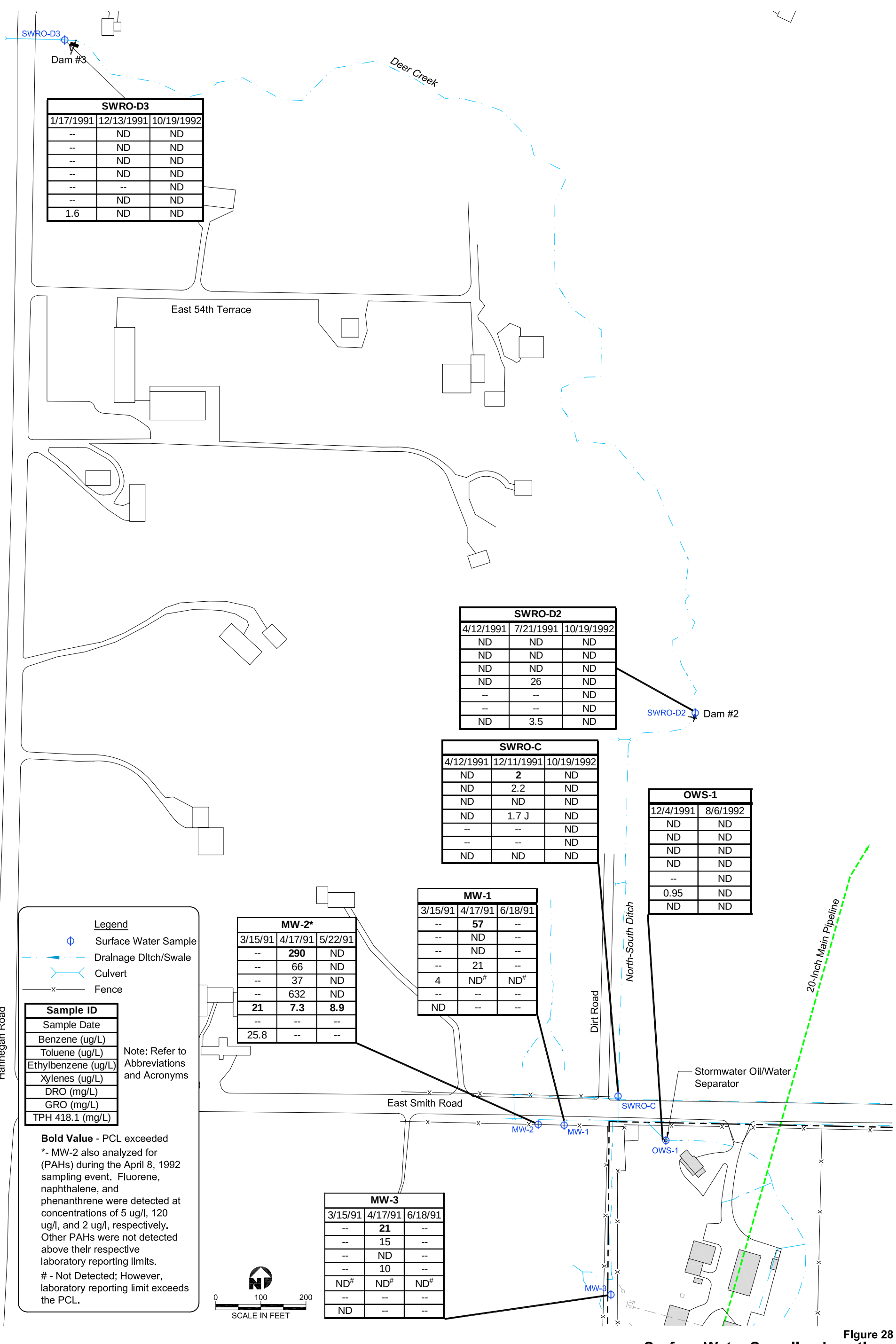
Q:\geo\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 27 1979 Spill Unit 2.dwg
Mod: 05/28/2010, 10:21 | Plotted: 05/28/2010, 13:55 | john_knobbs

URS

Figure 27

Surface Water Sampling Locations (Study Unit 2)

Laurel Station
Bellingham, Washington



SWRO-D3		
1/17/1991	12/13/1991	10/19/1992
--	ND	ND
--	ND	ND
--	ND	ND
--	ND	ND
--	--	ND
--	ND	ND
1.6	ND	ND

SWRO-D2		
4/12/1991	7/21/1991	10/19/1992
ND	ND	ND
ND	ND	ND
ND	ND	ND
ND	26	ND
--	--	ND
--	--	ND
ND	3.5	ND

SWRO-C		
4/12/1991	12/11/1991	10/19/1992
ND	**2**	ND
ND	2.2	ND
ND	ND	ND
ND	1.7 J	ND
--	--	ND
--	--	ND
ND	ND	ND

OWS-1	
12/4/1991	8/6/1992
ND	ND
ND	ND
ND	ND
ND	ND
--	ND
0.95	ND
ND	ND

MW-1		
3/15/91	4/17/91	6/18/91
--	**57**	--
--	ND	--
--	ND	--
--	21	--
4	ND#	ND#
--	--	--
ND	--	--

MW-2*		
3/15/91	4/17/91	5/22/91
--	**290**	ND
--	66	ND
--	37	ND
--	632	ND
21	**7.3**	**8.9**
--	--	--
25.8	--	--

MW-3		
3/15/91	4/17/91	6/18/91
--	**21**	--
--	15	--
--	ND	--
--	10	--
ND#	ND#	ND#
--	--	--
ND	--	--

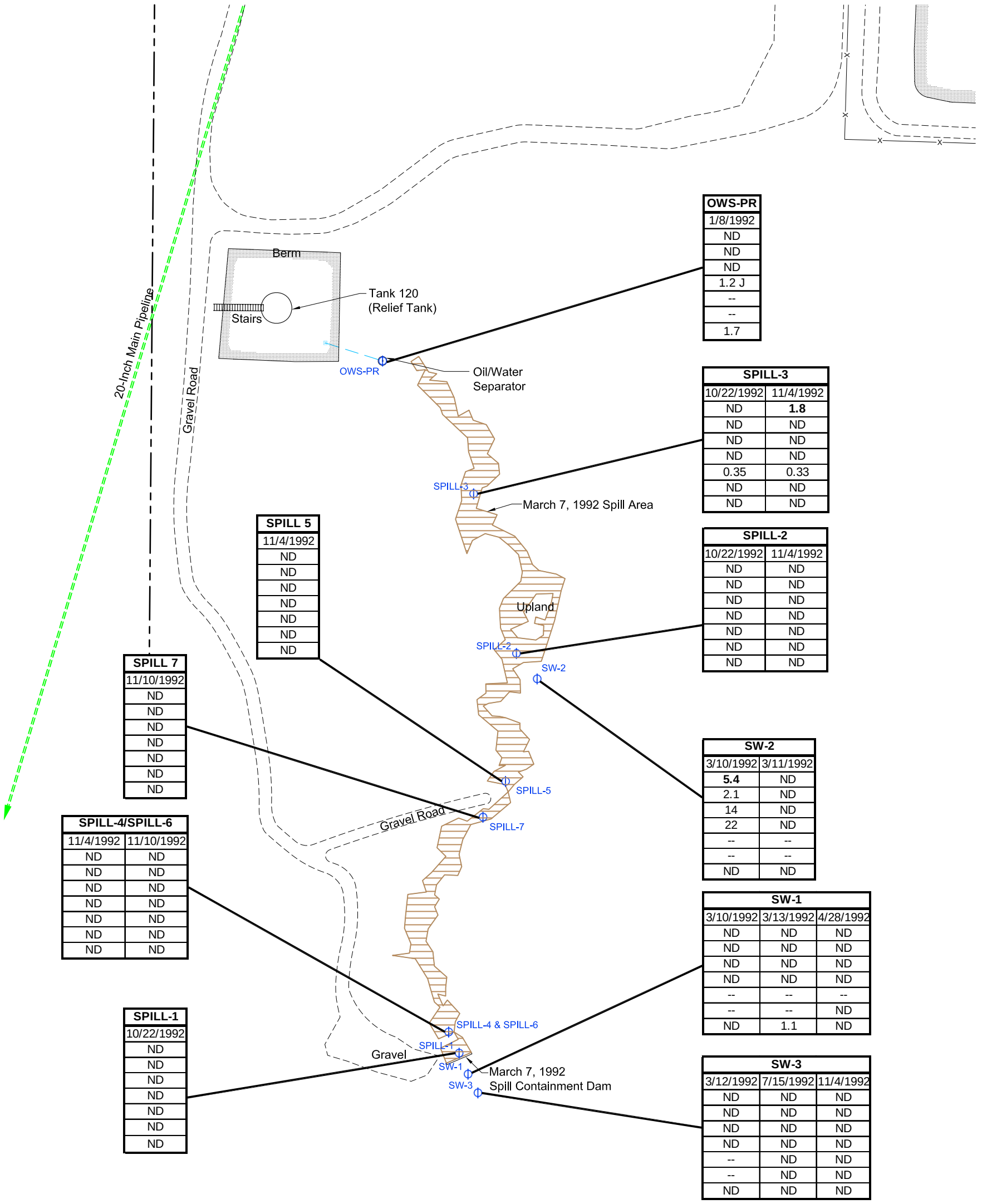
Figure 28

Surface Water Sampling Locations (Area 3 and Study Unit 1)

Laurel Station
Bellingham, Washington

Q:\geo\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 28 Sur Wat Area 3.dwg
Mod: 05/28/2010, 10:16 | Plotted: 05/28/2010, 13:57 | john_knobbs

URS



OWS-PR
1/8/1992
ND
ND
ND
1.2 J
--
--
1.7

SPILL-3	
10/22/1992	11/4/1992
ND	**1.8**
ND	ND
ND	ND
ND	ND
0.35	0.33
ND	ND
ND	ND

SPILL 5
11/4/1992
ND
ND
ND
ND
ND
ND
ND

SPILL-2	
10/22/1992	11/4/1992
ND	ND
ND	ND
ND	ND
ND	ND
ND	ND
ND	ND
ND	ND

SPILL 7
11/10/1992
ND
ND
ND
ND
ND
ND
ND

SW-2	
3/10/1992	3/11/1992
5.4	ND
2.1	ND
14	ND
22	ND
--	--
--	--
ND	ND

SPILL-4/SPILL-6	
11/4/1992	11/10/1992
ND	ND
ND	ND
ND	ND
ND	ND
ND	ND
ND	ND
ND	ND

SW-1		
3/10/1992	3/13/1992	4/28/1992
ND	ND	ND
ND	ND	ND
ND	ND	ND
ND	ND	ND
--	--	--
--	--	ND
ND	1.1	ND

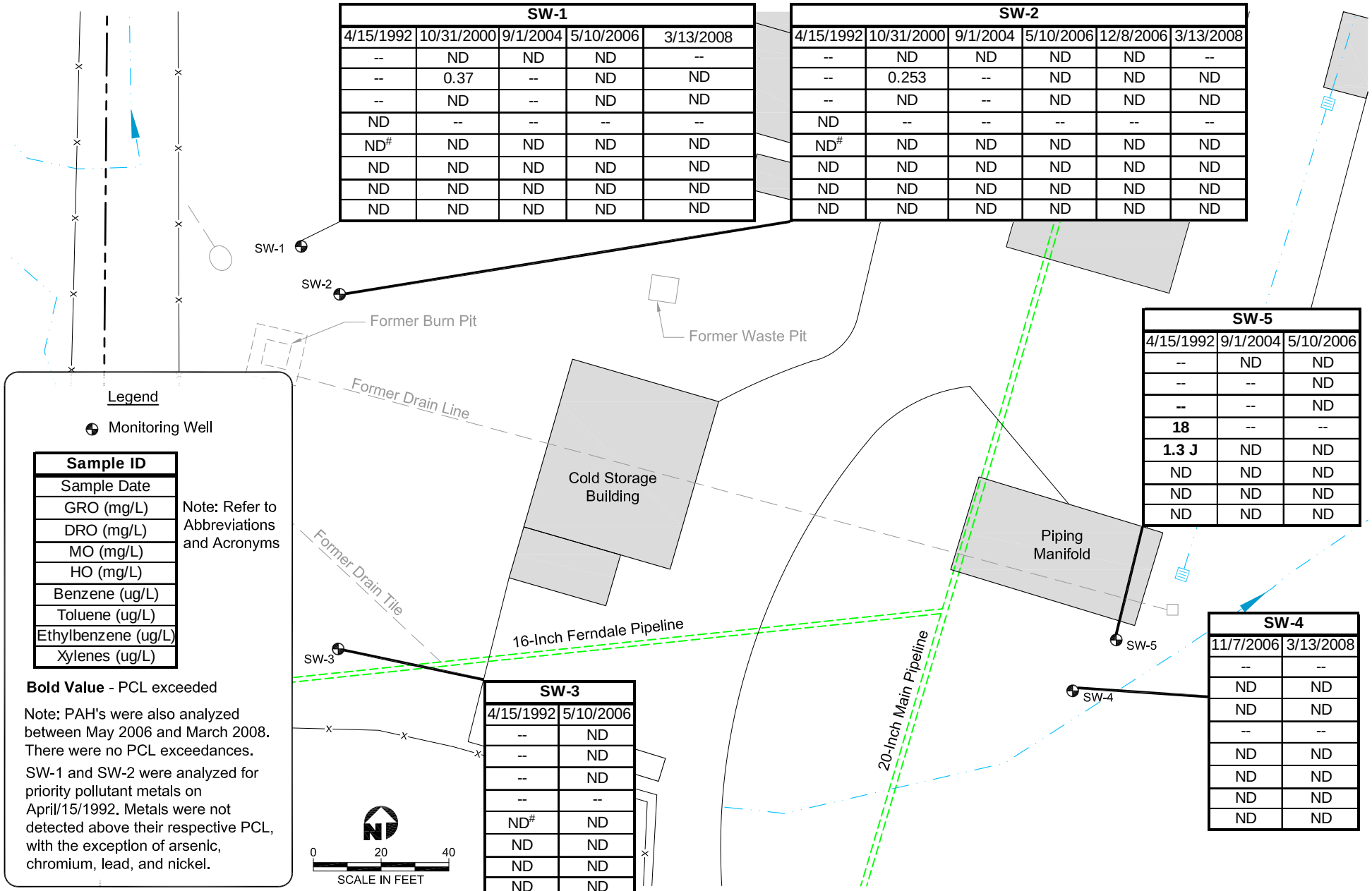
SPILL-1
10/22/1992
ND
ND
ND
ND
ND
ND
ND
ND

SW-3		
3/12/1992	7/15/1992	11/4/1992
ND	ND	ND
ND	ND	ND
ND	ND	ND
ND	ND	ND
--	ND	ND
--	ND	ND
ND	ND	ND

Q:\geo\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 29 (SW Locs SU 3).dwg
Mod: 05/28/2010, 10:25 | Plotted: 05/28/2010, 13:59 | john_knobbs

URS

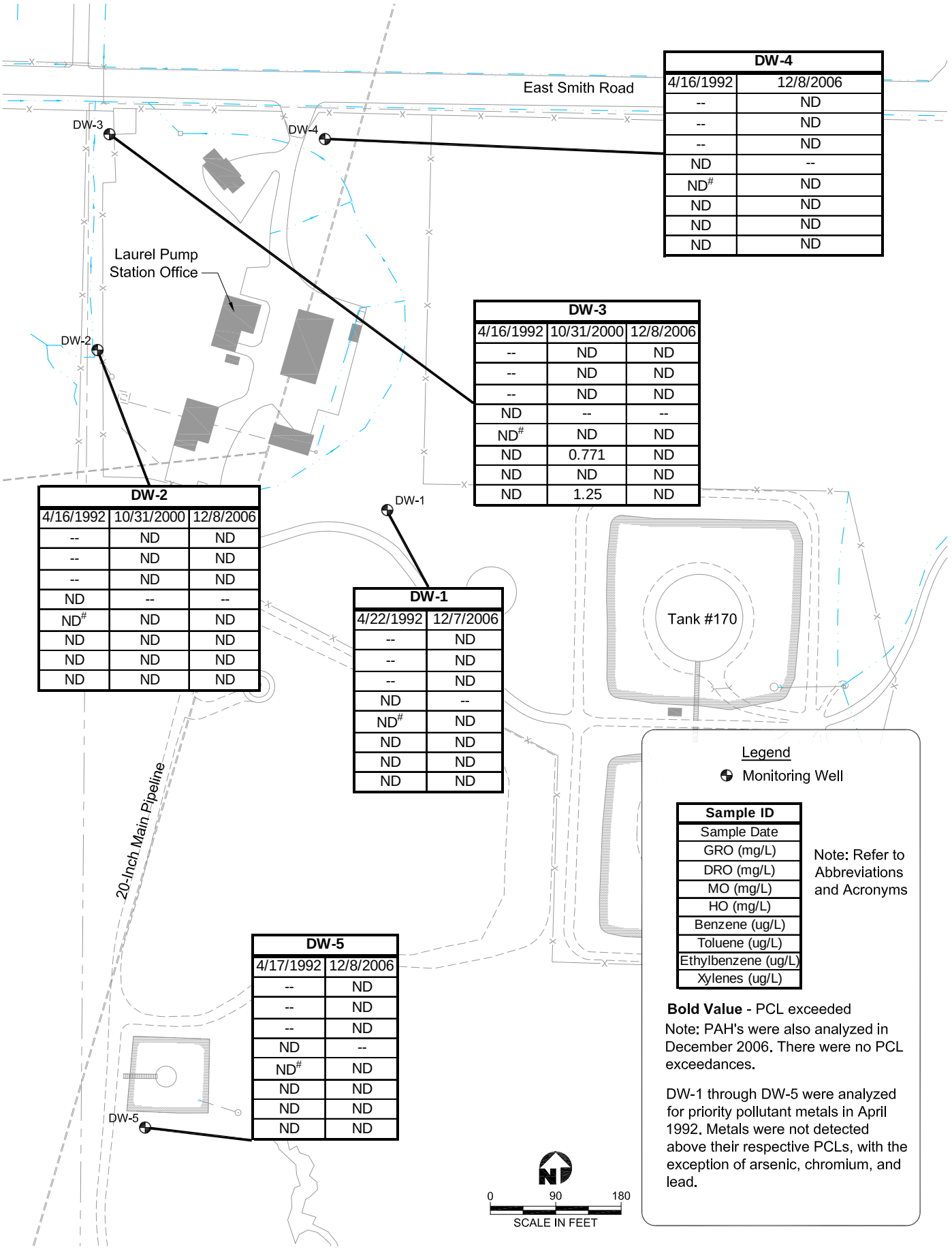
Figure 29
Surface Water Sampling Locations (Study Unit 3)
Laurel Station
Bellingham, Washington



Q:\geo\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 30 (Shallow GW Contours).dwg
Mod: 04/08/2010, 11:07 | Plotted: 04/30/2010, 13:26 | john_knobbs

Figure 30
Shallow Aquifer Analytical Results

Laurel Station
Bellingham, Washington



DW-4	
4/16/1992	12/8/2006
--	ND
--	ND
--	ND
ND	--
ND#	ND
ND	ND
ND	ND
ND	ND

DW-3		
4/16/1992	10/31/2000	12/8/2006
--	ND	ND
--	ND	ND
--	ND	ND
ND	--	--
ND#	ND	ND
ND	0.771	ND
ND	ND	ND
ND	1.25	ND

DW-2		
4/16/1992	10/31/2000	12/8/2006
--	ND	ND
--	ND	ND
--	ND	ND
ND	--	--
ND#	ND	ND
ND	ND	ND
ND	ND	ND
ND	ND	ND

DW-1	
4/22/1992	12/7/2006
--	ND
--	ND
--	ND
ND	--
ND#	ND
ND	ND
ND	ND
ND	ND

DW-5	
4/17/1992	12/8/2006
--	ND
--	ND
--	ND
ND	--
ND#	ND
ND	ND
ND	ND
ND	ND

Legend

Monitoring Well

Sample ID
Sample Date
GRO (mg/L)
DRO (mg/L)
MO (mg/L)
HO (mg/L)
Benzene (ug/L)
Toluene (ug/L)
Ethylbenzene (ug/L)
Xylenes (ug/L)

Note: Refer to Abbreviations and Acronyms

Bold Value - PCL exceeded

Note: PAH's were also analyzed in December 2006. There were no PCL exceedances.

DW-1 through DW-5 were analyzed for priority pollutant metals in April 1992. Metals were not detected above their respective PCLs, with the exception of arsenic, chromium, and lead.

Q:\geo\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 31 (Deep GW Contours).dwg
Mod: 04/08/2010, 11:17 | Plotted: 04/30/2010, 13:39 | john_knobbs

URS

Figure 31
Deep Aquifer Analytical Results

Laurel Station
Bellingham, Washington

33761832_04.cdr

C
North

C'
South

Former Pump Station

Former Oily Water Sump

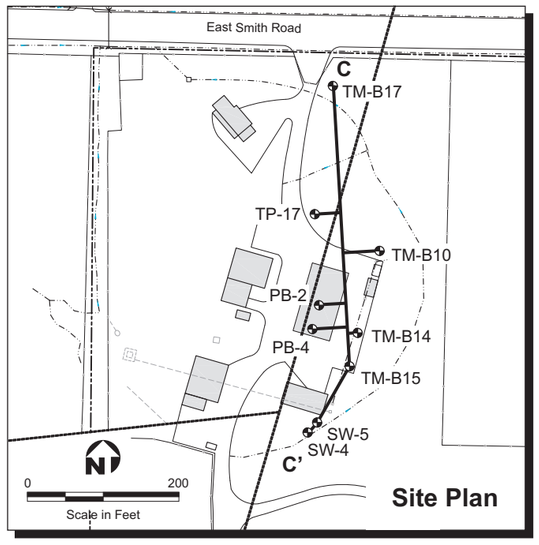
TM-B17 TP-17 TM-B10 PB-2 TM-B14 PB-4 TM-B15 (TM-B16)(TM-B4) SW-5 SW-4

Elevation (Feet MSL)

310 300 290 280 270 260 250 240 230

Horizontal Scale in Feet
Vertical Exaggeration = 5x

0 50 100



LEGEND

- Boring with screened well interval
- SM — USCS classification
- Geologic unit boundary
- Groundwater elevation at time of drilling
- Static groundwater elevation (March 2008)
- [1]Diesel-range hydrocarbons
- [2]TPH by Method 418.1
- [3]Crude oil-range hydrocarbons
- 3,100 — TPH concentration in mg/kg
- **Bold** — Bolded values indicate the PCL was exceeded
- ND — Not detected above reporting limit
- Area of residual contamination exceeding PCLs
- Fill
- Silty clay
- Bellingham Drift

Figure 32

North - South Geologic Cross Section C-C'

URS

Laurel Station
Bellingham, Washington

33762344_01.CDR

D East — **D'** West

Former Oily Water Sump; (TM-B16) SW-5; (TM-B4) SW-4; TM-B18; (TM-B5) SW-3; Burn Pit #1; Former Burn Pit; (TM-B3) SW-2; Former Oil/Water Separator; TP-7; TM-B6; TM-B12

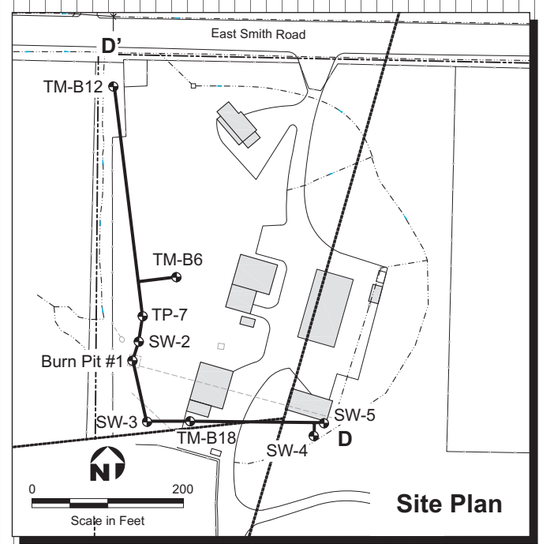
Elevation (Feet MSL): 300, 290, 280, 270, 260, 250, 240, 230, 220

20" Product Line

ML/CL/GM; SM/GM/SP; CL/GC; GP/GM; Fill; GP

SP/GP; GM; GM/ML; ML; CL; SP/GM; SP

100[3]; ND; 3,100[1]; 1,200[2]/320[1]; 510[1]; 1,300[3]; 30[1]; 170[1]; 13,200[3]/5,700[4]; 600[3]; 51[3]



LEGEND

- Boring with screened well interval
- SM — USCS classification
- Geologic unit boundary
- Groundwater elevation at time of drilling
- Static groundwater elevation (March 2008)
- [1]Diesel-range hydrocarbons
- [2]TPH by Method 418.1
- [3]Crude oil-range hydrocarbons
- [4]Natural gas condensate-range hydrocarbons

- 3,100 — TPH concentration in mg/kg
- **Bold** — Bolded valued indicate the PCL was exceeded
- ND — Not detected above reporting limit
- Area of residual contamination exceeding PCLs
- Fill
- Silty clay
- Bellingham Drift

0 50 100

Horizontal Scale in Feet
Vertical Exaggeration = 5x

Figure 33

East-West Geologic Cross Section D-D'

URS

Laurel Station
Bellingham, Washington

East Smith Road

Outfall 001

Former PSE Substation

Retention Pond

A1-B20
A1-B18
A1-B19
SH-3
A1-B25
A1-B24
A1-B17
A1-B16
A1-B23
A1-B15
A1-B14
SH-2
A1-B12
A1-B13
A1-B22
A1-B11
A1-B9
A1-B10
A1-B8
A1-B7
A1-B6
A1-B5
A1-B21
SH-1
A1-B4
A1-B3
A1-B2
A1-B1

Former Oil Water Separator

Former Burn Pit

Former Drain

Former Drain Tile

January 15, 1991
Spill Release Point

16-Inch Ferndale Pipeline

Legend

- Soil Sample (Purnell, 1991)
- Property Line
- Drainage Ditch/Swale
- Culvert
- Fence
- Extent of contamination exceeding PCL
- Proposed Geoprobe boring location

0 20 40
SCALE IN FEET

Figure 34
Proposed Soil Sample Locations (Area 1)

Laurel Station
Bellingham, Washington

Q:\geo\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 34 Proposed Samps Area 1.dwg
Mod: 04/29/2010, 13:41 | Plotted: 04/30/2010, 13:38 | john_knobbs

URS

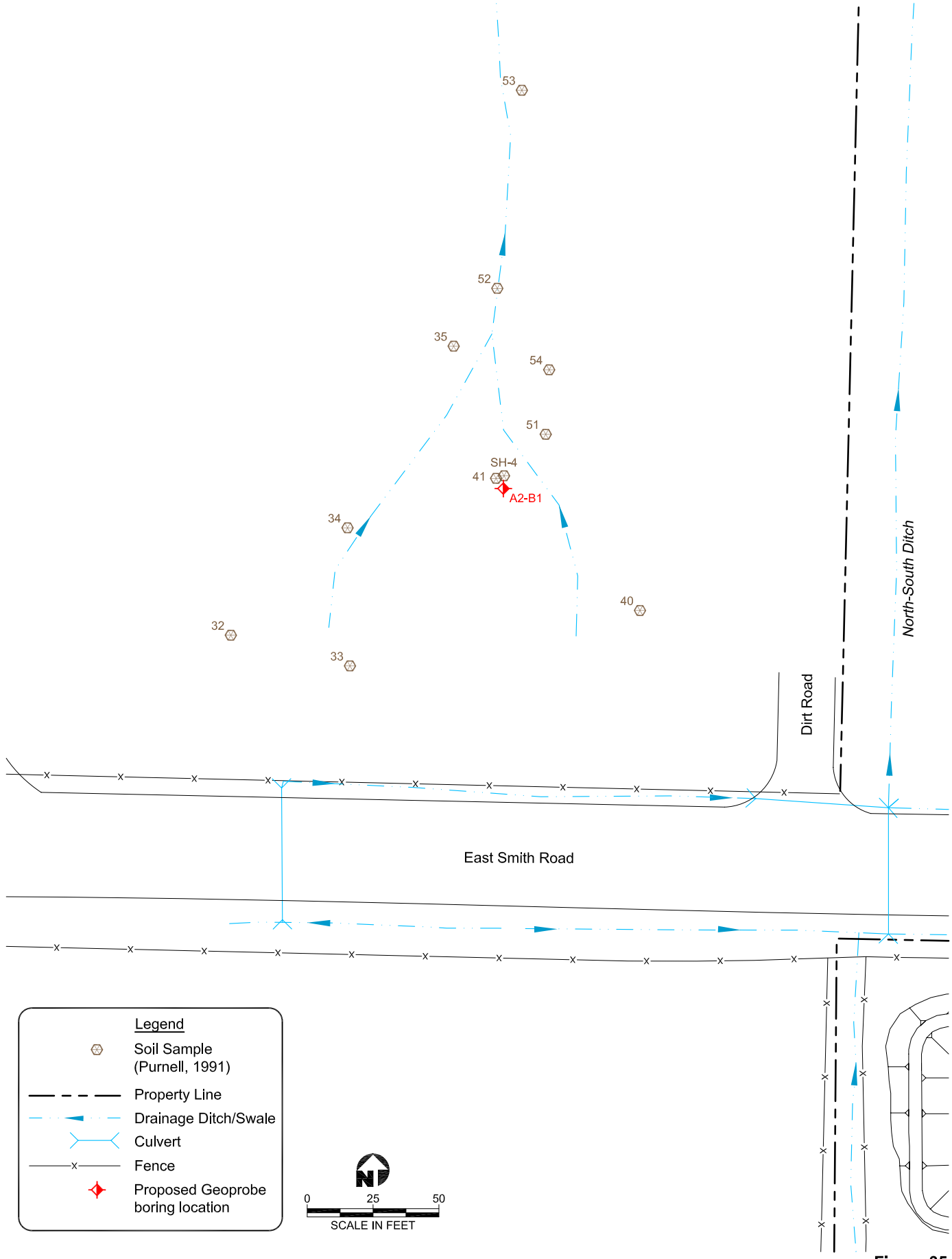


Figure 35

Proposed Soil Sample Locations (Area 2)

Laurel Station
Bellingham, Washington

Q:\geo\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 35 Proposed Samps Area 2.dwg
Mod: 04/29/2010, 10:45 | Plotted: 04/30/2010, 13:35 | john_knobbs

URS

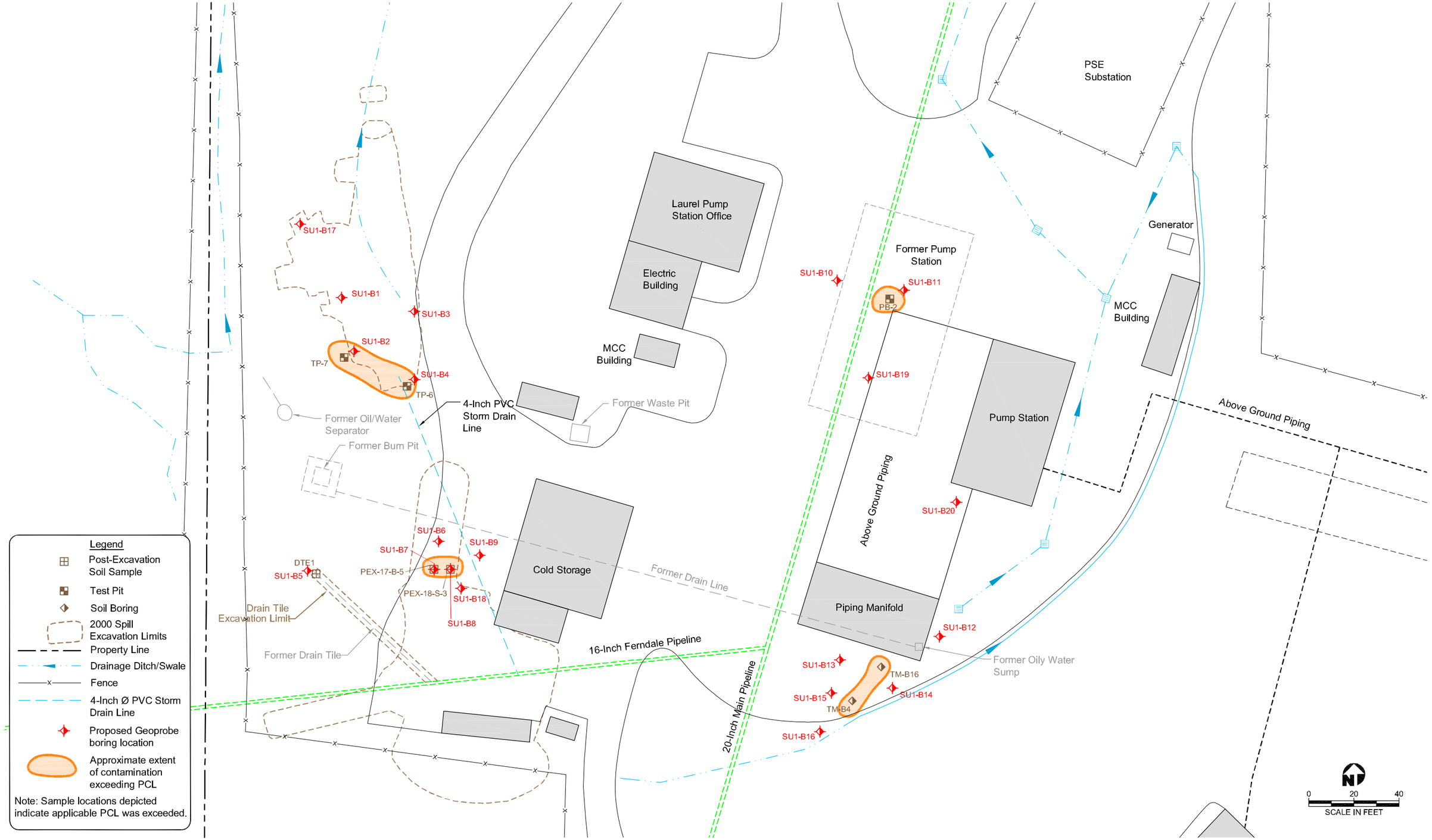


Figure 36
Proposed Soil Sample Locations (Study Unit 1)

Laurel Station
Bellingham, Washington

Q:\geo\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 36 Proposed Samp Unit 1.dwg
Mod: 04/29/2010, 14:54 | Plotted: 04/30/2010, 13:35 | john_knobbs

URS

08-B3	
3/3/2008	
3	4.5
--	--
ND	ND
60	ND
41	8.7
--	--
ND#	**33**
ND	ND
ND	ND
ND	58

Tank 180-1		
3/3/2008		
0.5	2	3
--	--	--
150	**300**	**350**
2,500	**2,300**	**3,500**
1,900	**2,200**	**3,100**
--	--	--
ND	ND	ND
21	ND	ND
ND	ND	ND
30	ND	ND

Water Tank
Product Tank #170
Tank 170-1
Tank 170-2
Product Tank #180
Tank 180-1
Tank 180-2
Tank 180-3
Outside Storage Area
MCC Building
Berm
Stairs
Gravel Road
Paved Road
Oil/Water Separator
Alarmed Separator
Oil/Water Separator
10 IN
12 IN
15 IN
U-3
U-4
TM-B8
08-B2
TM-B7
08-B3
TMB-13
08-B4
08-B5
08-B6
SU2-B1
SU2-B2
SU2-B3
SU2-B4
SU2-B5
SU2-B6
SU2-B7
SU2-B8

Legend

- Hand Auger
- Soil Boring
- Geotechnical Boring
- Drainage Ditch/Swale
- Culvert
- Fence

Sample ID
Sample Date
Depth (feet bgs)
TPH (FS) (mg/kg)
GRO (mg/kg)
HO (mg/kg)
DRO (mg/kg)
TPH 418.1 (mg/kg)
Benzene (ug/kg)
Toluene (ug/kg)
Ethylbenzene (ug/kg)
Xylenes (ug/kg)

Note: Refer to Abbreviations and Acronyms

Bold Value - PCL exceeded

- Not Detected; However, laboratory reporting limit exceeds the PCL.

Proposed Geoprobe Boring Location

Approximate extent of contamination exceeding PCL

0 40 80
SCALE IN FEET

Q:\geo\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 37 Proposed Samps Unit 2.dwg
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URS

Figure 37
Proposed Soil Sample Locations - 1979 Spill (Study Unit 2)
Laurel Station
Bellingham, Washington

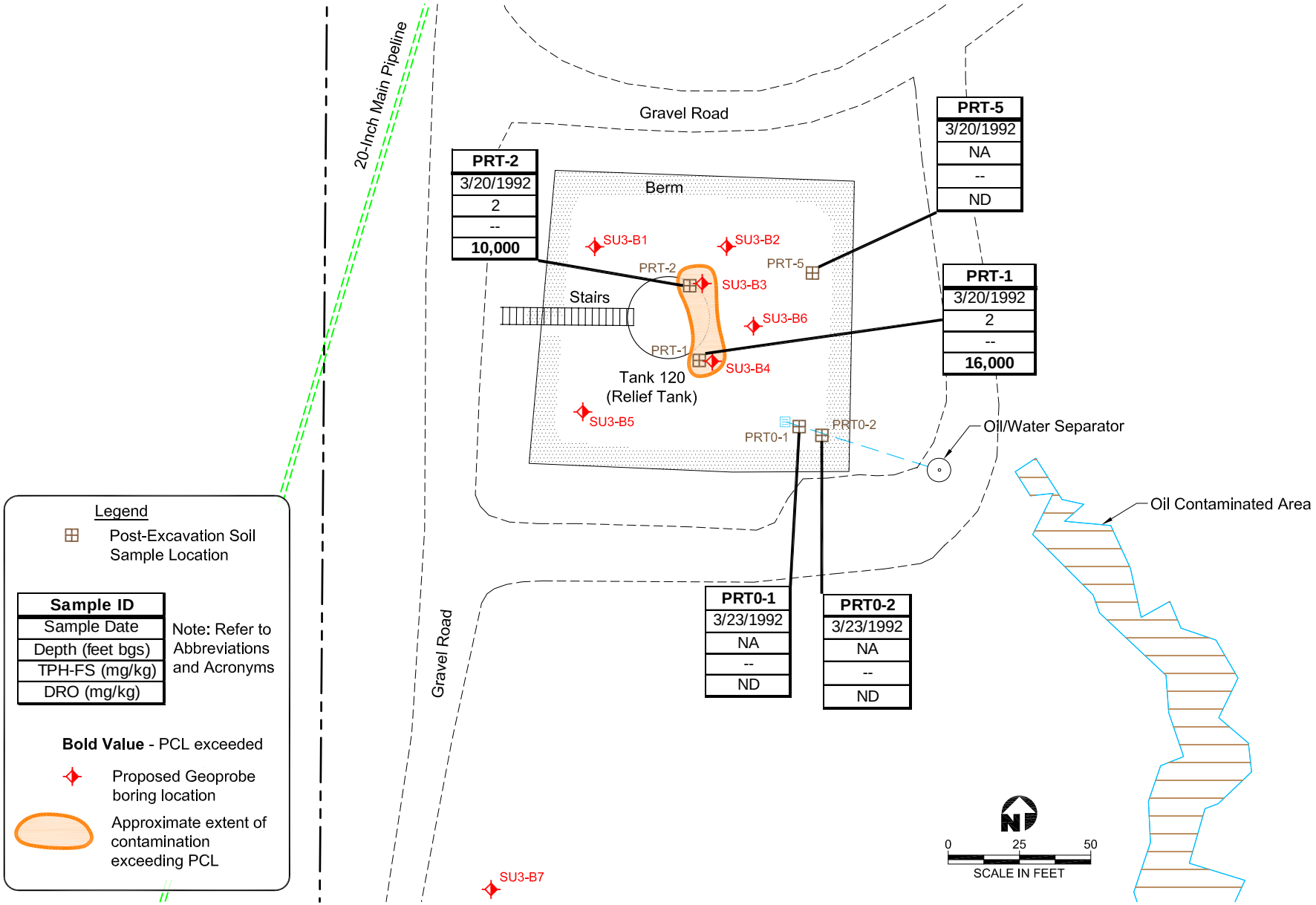

Figure 38

Proposed Soil Sample Locations (Study Unit 3)

Laurel Station
Bellingham, Washington

Q:\geo\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 38 Proposed Samps Unit 3.dwg
Mod: 05/28/2010, 13:47 | Plotted: 05/28/2010, 14:15 | john_knobbs

URS

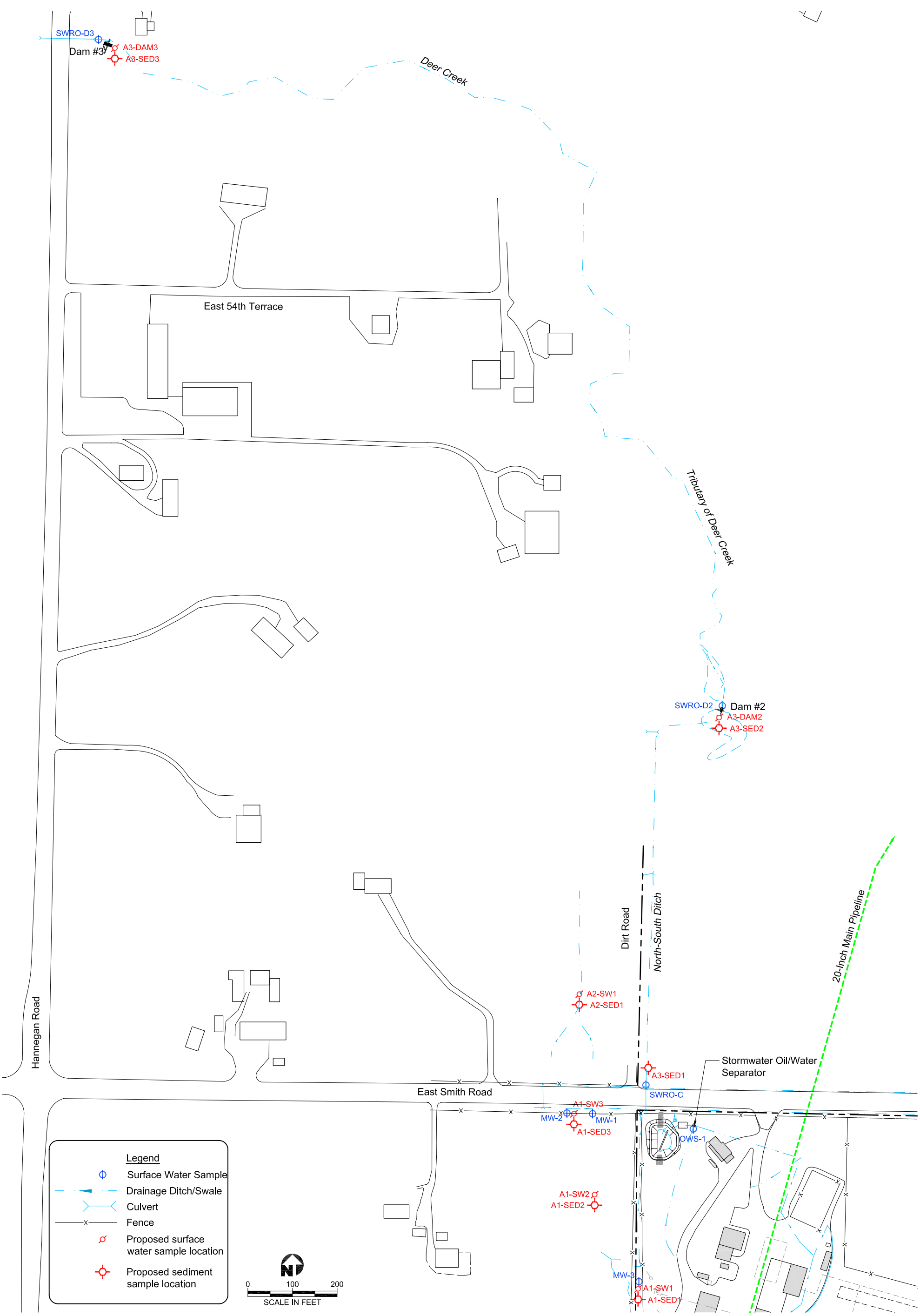

Figure 39

Proposed Surface Water and Sediment Sampling Locations (Areas 1, 2 and 3)

Laurel Station
Bellingham, Washington

Q:\geo\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 39 Proposed Areas 1_3.dwg
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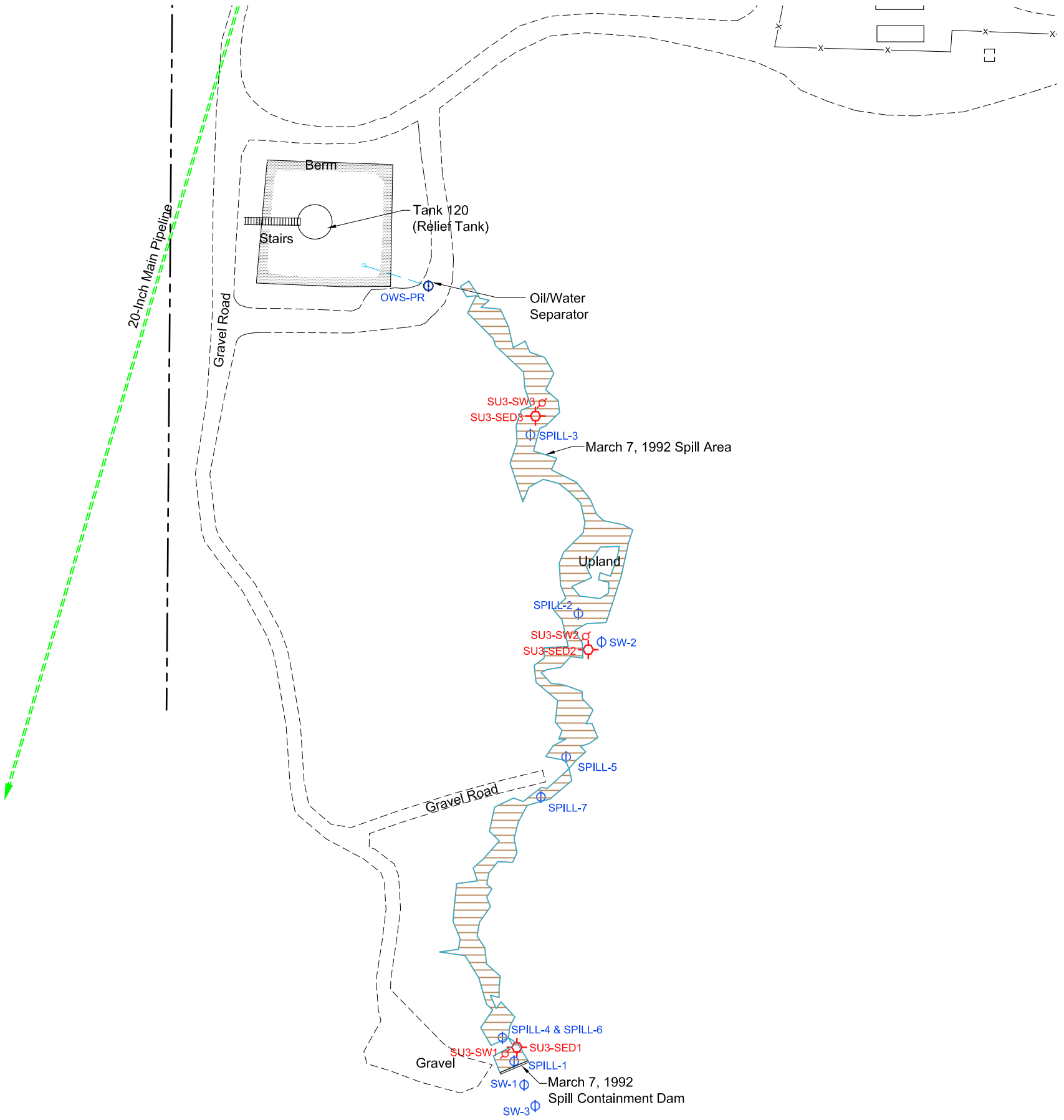

Figure 40

Proposed Surface Water and Sediment Sampling Locations (Study Unit 3)

Laurel Station
Bellingham, Washington

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Bellinger Road
East 54th Terrace
Deer Creek
Dam #3
Deer Creek Tributary
Dam #2
A3-DAM2
A3-SED2
Area 3
20-Inch Main Pipeline
Hannegan Road
A2-SW1
A2-SED1
A2-B1
Area 2
A3-SED1
Outfall 001
Outfall 002
Study Unit 5
East Smith Road
A1-SW3
A1-SED3
A1-B24
A1-B16
A1-B14
A1-SW2
A1-SED2
A1-B22
A1-B8
A1-B7
A1-SW1
A1-SED1
Area 1
Study Unit 6
1971 Spill
December 11, 1991 Spill
Boneyard
Study Unit 4
16-Inch Femdale Pipeline
Study Unit 1
January 15, 1991 Spill
October 26, 2000 Spill
Water Tank
Tank #170
Tank #180
1979 Spill
Property Line
Study Unit 7
Study Unit 2
Outfall 003
March 7, 1992 Spill
Relief Tank
Study Unit 3
March 7, 1992 Spill Containment Dam

Legend

- Study Unit
- Enforcement Order-Defined Area

1. Laurel Station Office
2. Electric Building
3. MCC Buildings
4. Maintenance Shop
5. Former Pump Station
6. Cold Storage Building
7. Former PSE Substation
8. PSE Substation
9. Piping Manifold
10. Former Oily Water Sump
11. Former Drain Tile
12. Former Drain Line
13. Former Burn Pit
14. Former Oil/Water Separator
15. Former Waste Pit
16. Former PCS Storage Cell Locations
17. Retention Pond
18. Pump Station

0 80 160
SCALE IN FEET

- Proposed surface water sample location
- Proposed Geoprobe boring location
- Proposed sediment sample location
- Approximate extent of contamination exceeding PCL

Figure 41
Site Plan and Proposed Data Gap Sampling Locations

URS

Laurel Station
Bellingham, Washington

Aerial Source: I-Cubed nformation Integration & Imaging LLC May 15, 2009

O:\geol\Kinder Morgan\Laurel Pump Station\SubTasks\Data Comp\Figure 41 (Site_Data Gap).dwg
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APPENDIX A
ENFORCEMENT ORDER MATRIX, SUPPORTING BIBLIOGRAPHIES, AND AMENDED ORDER

Enforcement Order No. DE 91-N192						
			STATUS			
E.O. Exhibit A Item - First Amended EO No 91-N192 (effective 6-15-92)	Associated Documentation	Ecology Correspondence	Completed / acknowledged by Ecology	Completed/not acknowledged by Ecology	Completed / Not Submitted to Ecology	Actions Pending / Not Completed
I. PRE-REMEDIAL INVESTIGATION REPORT						
Submit to Ecology for review an independent pre-remedial investigation report for all the investigation work performed by Trans Mountain which has not previously been submitted to Ecology in a report format including the information obtained during Trans Mountain's 1991-1992 upgrade of the pump station.	61, 96, 106	71		✓		
II. REMEDIAL INVESTIGATION AND FEASIBILITY STUDY						
Conduct a remedial investigation and feasibility study (RI/FS) pursuant to WAC 173-340-350. The RI/FS shall address known or potential contamination resulting form the January 1991, December 1991, and March 1992 petroleum spills as well as known or potential contamination resulting from current and historic operations including spills or leaks at and from the pump station. The RI/FS shall also include information to determine the impact or potential impact of releases of hazardous substances at the facility on the natural resources and ecology of the area, and ecological and human risk assessment, wetland delineation, and an evaluation of interim cleanup actions.						✓
A. Submit to Ecology for review and approval a RI/FS Work plan pursuant to WAC 173-340-350. The work plan format shall follow the general format presented in the EPA Superfund Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA. The work plan shall include a health & safety plan (WAC 173-340-810), sampling and analysis plan (WAC 173-340-820), wetland delineation plan, a natural resource damage assessment plan, and a discussion of data gaps associated with each item described in WAC 173-340-350(6). If Trans Mountain believes that an item described in WAC 173-340-350(6) is not applicable to the site, a brief explanation about why it is not applicable shall be included in the work plan.	12, 41, 88	25, 36		✓		
The health & safety plan is reviewed but not approved by Ecology. If Trans Mountain believes that the existing health & safety plan (Amended Health and Safety Plan For Trans Mountain Oil Pipe Line Corporation, Laurel Station RI/FS, March 20, 1992, prepared by Dames and Moore) meets the legal requirements for worker health and safety (WAC 173-340-810) for the work to be completed for the RI/FS described above, Ecology shall be notified by Trans Mountain, in writing, the basis for its decision about the adequacy of the health & safety plan. If the existing plan does not meet the legal requirements for worker health & safety, Trans Mountain shall include a revised health & safety plan which shall be submitted with the work plan.	12, 41, 88	25, 36, E47		✓		
B. Submit to Ecology for review and approval a RI/FS report. The report shall follow the EPA suggested RI/FS format.						✓
III. INTERIM ACTIONS						
A. Submit a written response to each comment included in Ecology's June 19, 1991 comment letter on Purnell & Associates' May 17, 1991, Site Assessment Report - Soil and Water Analysis, Laurel Pump Station Natural Gas Condensate Spill, East Smith Road, Whatcom County, Washington and the Seymour & Associates' May 16, 1991, Laurel Pump Station Condensate Spill: Fisheries Assessment. The written response shall include responses made prior to the issuance of this Order.	19, 20, 37, E8			✓		
B. Surface Water Monitoring						
1. Submit to Ecology for review biweekly surface water sampling results obtained by Trans Mountain at surface water monitoring stations established by Trans Mountain to monitor surface water quality from areas contaminated by hazardous substances. The water quality parameters to be analyzed shall include but not be limited to the volatile organics: benzene, toluene, ethylbenzene, and xylene (BETX); the full range of petroleum hydrocarbons; pH; conductivity; and temperature. The Washington Department of Ecology analytical procedures for petroleum hydrocarbon analysis for water (WTPH-G, WTPH-D, WTPH-418.1) shall be used to analyze the full petroleum hydrocarbon range. The analytical method selected for BETX shall be in compliance with WAC 173-340-830, analytical procedures. The water quality sampling result submittals shall include but not be limited to a surface water station location map, a summary of surface water sampling results, copies of the laboratory data sheets, and a description of any water quality sampling results which exceed groundwater or surface water quality criteria.	12, 13, 26, 50, 95, 101, T19, T22, T24, T26, T27, T28, T29, T38, T42			✓		
C. Submit to Ecology for review detailed hydrogeological cross sections which cover the area within a one-mile radius of the January 15, 1991, leak site to confirm Purnell & Associates hypothesis that no aquifer other than the shallow aquifer is contaminated with natural gas condensate or other contaminants related to the Laurel Pump Station and that no drinking water wells are affected. Logs from registered and unregistered wells identified within a one-mile radius of the January 15, 1991, leak site as well as any other information available to Trans Mountain or their consultants shall be used to develop the cross sections.	22, 94, 96, 100			✓		

Enforcement Order No. DE 91-N192						
			STATUS			
E.O. Exhibit A Item - First Amended EO No 91-N192 (effective 6-15-92)	Associated Documentation	Ecology Correspondence	Completed / acknowledged by Ecology	Completed/not acknowledged by Ecology	Completed / Not Submitted to Ecology	Actions Pending / Not Completed
D. Dam and Surface Water Maintenance						
1. Submit to Ecology for review a plan for maintaining and operating Dam #2, located downstream of Smith Road, Dam #3, east of Hannegan Road, and the dam constructed by Trans Mountain for the March 1992 petroleum spill. The plan shall also include a discussion of the cleanup of visible contamination on the surface water. A copy of the plan shall also be sent by certified or registered mail to the Department of Wildlife and Mark Schuller, Department of Fisheries (Fisheries), 333 E. Blackburn Road, Mt. Vernon, Washington for Fisheries files.	69, 83 18, 32, 92	21, 75, 93	✓E22			
2. Begin implementation of the Dam #2 and Dam #3 dam and surface water maintenance plan.	E26			✓		
3. Begin implementation of the dam and surface water maintenance plan for the dam constructed by Trans Mountain for the March 1992 petroleum spill.	72	77, E19		✓		
4. Submit to Ecology for review and comment an evaluation of the feasibility of removing Dam #2, Dam #3, and the dam constructed by Trans Mountain for the March 1992 petroleum leak. The evaluation shall include but not be limited to a discussion of potential environmental impacts such as migration of contaminants or contaminated sediments as a result of the dam removal, a summary of surface water testing, and visual and olfactory contamination observations.	T17, T18		✓E27 (Dam 3)			
5. Submit to Ecology for review a Dam Removal Plan if the evaluation described in D.4., above, indicates that dam removal is feasible and Ecology agrees with the evaluation. The plan shall provide detailed steps for completing the dam removal including a discussion of any SEPA or other permit requirements such as a hydraulic permit, water permit requirements and specific requirements for preventing further environmental damage as a result of the dam removal.						✓
E. Spill Prevention Plan						
1. Submit to Ecology for review a spill prevention plan which shall address future potential leaks, spills, or unauthorized discharges from the Laurel Pump Station site. The plan shall include but not be limited to the following information and procedures:	24, 42, 51, 57, E12	48	✓E14, E18			
a. A description of a reporting system to be used to notify immediately persons responsible for the management of the facility and appropriate state, federal, and local authorities;	24, 42, 51, E16			✓		
b. A description and a site plan showing equipment or facilities for the prevention, containment or treatment of leaks, spills, and unauthorized discharges;	24, 42, 51			✓		
c. A list of all hazardous substances as defined in Chapter 70.105D RCW, Hazardous Waste Cleanup - Model Toxics Control Act which are used, processed or stored at the facility including the normal quantity maintained on the premises. The applicable Material Safety Data Sheets (MSDS) shall be included as an appendix to the plan.	24, 42, 51			✓		
d. A brief description of any leaks, spills, or unauthorized discharges which occurred during the 36-month period preceding the effective date of this Order and subsequent measures taken by Trans Mountain Oil Pipe Line Corporation to prevent or to reduce the possibility of further leaks, spills, or unauthorized discharges; and	24, 42, 118			✓		
e. An implementation schedule for additional equipment or facilities which might be required for E.1.b, above, but which are not yet operational. The Spill Prevention Plan must be reviewed and certified by a professional engineer registered in the State of Washington. Such certification shall in no way relieve Trans Mountain Oil Pipe Line Corporation of its duty to prepare and fully implement the Spill Prevention Plan for the Laurel Pump Station.	24, 42, 51 (D&M copy not signed by PE)			✓		
2. Begin the Spill Prevention Plan implementation.	24, 79			✓		
3. Submit to Ecology the results of the studies, evaluations, or other items outlined by Trans Mountain in its Spill Prevention Plan implementation schedule.	67, 79	68		✓		
F. Oil/Water Separator						
1. Submit to Ecology as-builts of the Laurel Pump Station Oil/Water separators along with a list of hazardous substances that historically may have been discharged. The as-builts shall identify historic sources connected to the separators as well as current sources.	9, 15, 30, 68, E2	11, E1		✓		
2. Submit a sampling and analysis plan for water samples to be collected from the separators. The initial sampling round shall include the priority pollutant and petroleum hydrocarbon analyses if the sources which discharge to the separators cannot be determined. If the sources discharging to the separators have been identified then the sampling may be limited to those hazardous substances associated with each source. The sampling and analysis plan shall meet the submittal requirements of WAC 173-340-430(6).	14, 37, 38, 68, 84	62, 65, 76	✓86			
3. Collect water samples from the oil/water separator outlets.	95, 101			✓		
4. Submit to Ecology a written report of the chemical analytical results for each separator sampling event. The report shall include a summary of the analytical and quality control/quality assurance results, copies of all laboratory analytical and quality control/quality assurance data, and describe any changes to the procedures described in the sampling and analysis plan prepared for F.2, above.	95, 101, T28, T32, T42, T46, T47, T52, T53, T55, T56, T59			✓ T53, T63		

Enforcement Order No. DE 91-N192						
			STATUS			
E.O. Exhibit A Item - First Amended EO No 91-N192 (effective 6-15-92)	**Associated Documentation**	**Ecology Correspondence**	**Completed / acknowledged by Ecology**	**Completed/not acknowledged by Ecology**	**Completed / Not Submitted to Ecology**	**Actions Pending / Not Completed**
G. Wetlands Delineation and Mitigation						
A wetland mitigation plan shall be required for cleanup actions in wetland areas of the site. Appropriate wetland delineation shall be accomplished in advance of the wetland mitigation plan. Attachment 1, Report Recommendations For Wetland Determinations/Delineations and Compensatory Wetlands Mitigation Plans provides general guidelines for wetland determinations/delineations and mitigation plans.						
1. Submit to Ecology for review and comment a wetland determination/delineation for the following areas:	52, T12, T13, T16	45				
a. Laurel Pump Station property; Area 1; Area 2; and the portions of Area 3 upstream of Hannegan Road, which have been affected by the January 1991 natural gas condensate leak.	52, T12, T13, T16	45, E7, E17		✓		
b. All other areas of the site which have been identified as affected or potentially affected by the pump station operation in the Ecology reviewed and approved wetland delineation plan required under section II.A. Pump station operations include but are not limited to historic and current operations, upgrading, spill responses, interim actions, final remedial actions.		E7				✓
2. Submit to Ecology a Wetland Mitigation Plan for the site.						✓
3. Implement the wetland mitigation plan.						✓
H. Interim Cleanup Action - Laurel Pump Station Property: Non-Wetland Areas Affected by the January 15, 1991 Natural Gas Condensate Leak						
1. Submit to Ecology a work plan and a sampling and analysis plan for the following interim cleanup actions for non-wetland areas of the Laurel Pump Station property affected by the January 15, 1991 natural gas condensate leak:	33, 46, 47, 55	40, T31		✓		
a. Removal of the existing drain tile;	44, 55	E34	✓ E34			
b. Excavation of any contaminated non-wetland soils which exceed the cleanup criteria for the contaminants of concern. Contaminated non-wetland soils and any stockpiled soils from the January 15, 1991 leak site excavation shall be immediately moved to onsite treatment beds for bioremediation immediately after excavation.	44, 55 115			✓		
c. Backfilling of the excavations completed for H.1.a and H.1.b with clean native soil or structural fill. Compacted native soils or structural fill used for backfilling must have hydraulic conductivity values less than or equal to the insitu native soils to prevent this area from acting as a conduit for any potential future leaks, spills, or discharges from this site unless the backfill cannot be placed to meet hydraulic conductivity values due to limitations imposed by the pipe line submittal requirements. The backfilled areas must immediately be reseeded with the appropriate fast growing native vegetation to prevent sedimentation to nearby surface waters.	44, 55			✓		
d. Evaluate whether a new drainage system should be installed to replace the drain tile. Install the new drainage system as required. The new system shall contain any future potential leaks or discharges of hazardous substances. The work plan and sampling and analysis plan shall include the appropriate items in the WAC 173-340-430 (6). In addition to the items identified in WAC 173-340-430 (6). the following shall be included in the plans:	44			✓		
(1) An evaluation of the feasibility of conducting the work described in H.1.a and H.1.d, above, during the different seasons when precipitation varies;						✓
(2) A State Environmental Policy Act (SEPA) checklist or environmental impact statement (EIS) for all interim actions which require a state, county, or city permit and/or National Environmental Policy Act (NEPA) documents for federal permits;	114			✓		
(3) An application for a Water Quality Modification from the Department of Ecology - Water Quality Section, if required; and						
(4) A sediment/drainage control plan which shall allow no sediments to be discharged to any surface water body including but not limited to wetlands, drainage ditches, creeks, streams, and ponds.						
(5) A plan which describes how bioremediation will be accomplished. The on-site bioremediation must be managed to maximize bioremediation (destruction) of hazardous substances rather than aeration (volatilization). While volatization will occur during excavation and treatment, it should be minimized. Therefore, the following must be accomplished as part of the bioremediation at the site:						
(a) Excavate and place soil in the lined, covered treatment beds;						
(b) Control and manage all runoff related to the bioremediation treatment beds; and						
(c) properly manage the soil moisture, pH, temperature, and nutrient additions to maximize the bioremediation time frame.						
2. Begin Interim Cleanup Actions.	44, T23			✓		
3. Submit report of interim cleanup actions to Ecology.	44, 59, T23, T40	66		✓		

Enforcement Order No. DE 91-N192						
			STATUS			
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I. Contaminated Soil Stockpiles						
Trans Mountain has generated contaminated soil stockpiles at the pump station as a result of upgrading their facility. These stockpiles shall be monitored, sampled, and evaluated for interim cleanup action options pursuant to WAC 173-340-430, Interim Actions.						
1. Submit to Ecology for review and comment an Operation and Maintenance Plan for the soil stockpiles pursuant to WAC 173-340-400 (4) (b) and (c). The plan shall include air monitoring based on requirements or recommendations from appropriate regulatory agencies.	73, 85, 89, 111, 112	80, 107, E40 (Whatcom Co. Health Dept. letter), E44 (NWAPA letter)	✓ E32			
2. Submit to Ecology for review and approval an interim cleanup action plan for the remediation of contaminated soil stockpiles pursuant to WAC 340-430. The proposed cleanup action shall use permanent solutions to the maximum extent practicable (WAC 173-340-360). The cleanup options evaluated as well as the proposed cleanup action shall be presented in the plan.	78, 112, 113, 115, E29, E30, E51	E28, E31, E33, E43, E49, E50		✓		
3. Implement the approved interim cleanup action plan.	108, 115		✓			
4. Submit to Ecology for review and approval a report of the results of the soil stockpile cleanup action.	115, E25		✓ T64			
IV. SELECTION OF CLEANUP ACTIONS						
A. Trans Mountain shall submit a SEPA checklist or EIS to Ecology or other appropriate local or state agency and/or NEPA documents, if required, to appropriate federal agencies for the proposed draft cleanup action plan proposed by Ecology. The checklist, EIS, and/or other documents or copies shall be included, as a minimum, with the draft cleanup action plan for public comment. Ecology shall prepare and issue a draft cleanup action plan for the proposed cleanup actions at the site. The draft cleanup action plan shall meet the requirements under WAC 173-340-360(10) and (11).	114 (submittal of SEPA checklist)	16, E50		✓		
V. CLEANUP ACTIONS						
A. Cleanup actions shall be accomplished by Trans Mountain in compliance with WAC 173-340-400, Cleanup Actions. Submit to Ecology for review and approval all plans, specifications, and other documents required under WAC 173-340-400 (4). In addition to the requirements under WAC 173-340-400(4), Trans Mountain shall prepare a wetland mitigation plan, other mitigation plans determined to be appropriate based on the results of the RI/FS, and an evaluation of the feasibility of completing the cleanup action during the different seasons when precipitation varies. The evaluation shall be submitted with the plans, specifications, and other documents.	58, 70	60		✓		
B. Implement cleanup actions after Ecology reviews and approves plans, specifications, wetland or other mitigation plans, and other documents.						✓

BIBLIOGRAPHY - URS (FORMERLY DAMES & MOORE)
LAUREL STATION FACILITY

1.	01-24-1991	Dames & Moore, Amended Health and Safety Plan, Trans Mountain Oil Pipeline Corporation, Laurel Station RI/FS, dated January 24, 1991.
2.	02-01-1991	Trans Mountain Oil Pipe Line Corporation, Report, Proposed Site Assessment Plan for the Condensate Spill at Laurel Pump Station.
3.	02-27-1991	Washington State Department of Ecology (Ecology), Letter, Michael Gallagher (Ecology) to G.R. Miller (TMOPL), Re: A reported release of hazardous substances at Trans Mountain Oil Pipe Line Corporation – Laurel Pump Station, 1009 East Smith Road, Bellingham, Washington and Potential Liability for the Release.
4.	05-16-1991	Seymour & Associates, Report, Laurel Pump Station Condensate Spill: Fisheries Assessment.
5.	05-17-1991	W.D. Purnell & Associates, Inc., Site Assessment Report – Soil & Water Analysis, Laurel Pump Station Natural Gas Condensate Spill, East Smith Road, Whatcom County, Washington.
6.	06-19-1991	Washington State Department of Ecology (Ecology), Letter, Barbara Trejo (Ecology) to Gary Miller (TMOPL), Re: Trans Mountain Oil Pipe Line Corporation, Laurel Pump Station, 1009 East Smith Road, Bellingham, Washington [Ecology comments, Purnell & Associates, Site Assessment Report – Soil and Water Analysis, Laurel Pump Station Natural Gas Condensate Spill, East Smith Road, Whatcom County, Washington, dated May 17, 1991 and Seymour & Associates report Laurel Pump Station Condensate Spill: Fisheries Assessment, dated May 16, 1991].
7.	08-20-1991	W.D. Purnell & Associates, Inc., Sampling and Analysis Plan, Trans Mountain, Laurel Pump Station Condensate Spill, Area I, II, III.
8.	10-28-1991	Enforcement Order DE 91-N192
9.	11-05-1991	Trans Mountain Oil Pipe Line Corporation (TMOPL), Letter, Dan O'Rourke (TMOPL) to Barbara Trejo (Ecology), Re: Enforcement Order Item F.1 – Oil/Water Separator.
10.	11-07-1991	W.D. Purnell & Associates, Inc., Response to Enforcement Order No. DE 91-N192; Item No. I.G.1.D, Trans Mountain Oil Pipe Line Corporation, Laurel Pump Station Spill Site.

11.	11-14-1991	Washington State Department of Ecology (Ecology), Letter, Barbara Trejo (Ecology) to Dan O'Rourke (TMOPL), Re: Enforcement Order No. DE 91-N192, Trans Mountain Oil Pipe Line Corporation, Laurel Pump Station.
12.	11-14-1991	W.D. Purnell & Associates, Inc., Report, Health and Safety Plan, Trans Mountain Oil Pipe Line Corporation, Laurel Pump Station Natural Gas Condensate Spill.
13.	11-15-1991	W.D. Purnell & Associates, Inc., Response to Enforcement Order No. DE 91-N192; Items No. I.B.1 and I.B.5.
14.	11-15-1991	W.D. Purnell & Associates, Inc., Response to Enforcement Order No. DE 91-N192; Item No. I.F.2.
15.	11-22-1991	Trans Mountain Oil Pipe Line Corporation (TMOPL), Letter, Dan O'Rourke (TMOPL) to Barbara Trejo (Ecology), Re: Laurel Pump Station C3 Separator Information.
16.	11-22-1991	Washington State Department of Ecology (Ecology), Letter, Barbara Trejo (Ecology) to Dan O'Rourke (TMOPL), Re: Trans Mountain Oil Pipe Line Corporation, Enforcement Order No. DE 91-N192, Exhibit A and B, Item II.A, Selection of Proposed Cleanup Actions, Area 1, Area 2, and Laurel Pump Station Wetlands.
17.	11-25-1991	W.D. Purnell & Associates, Inc., November 25, 1991, Response to Enforcement Order No. DE 91-N192; Items No. I.G.1.A, I.G.1.B and I.G.1.C., Trans Mountain Oil Pipeline Corporation, Laurel Pump Station, Natural Gas Condensate Spill.
18.	11-26-1991	W.D. Purnell & Associates, Inc., Response to Enforcement Order No. DE 91-N192; Item No. I.D.1.
19.	11-27-1991	W.D. Purnell & Associates, Inc., November 27, 1991, Response to Enforcement Order No. DE 91-N192; Item No. I.A., Trans Mountain Oil Pipe Line Corporation, Laurel Pump Station Spill Site.
20.	11-27-1991	Trans Mountain Oil Pipe Line Corporation (TMOPL), Letter, Dan O'Rourke (TMOPL) to Barbara Trejo (Ecology), Re: Enforcement Order #DE91-N192-Laurel Pump Station.
21.	12-10-1991	Washington State Department of Ecology (Ecology), Letter, Barbara Trejo (Ecology) to Dan O'Rourke (TMOPL), Re: Dam and Surface Water Maintenance Plan, Enforcement Order No. DE 91-N192, Trans Mountain Oil Pipe Line Corporation, Laurel Pump Station, [Review of Purnell & Associates Dam and Surface Water Maintenance Plan, dated November 26, 1991].

22.	12-11-1991	W.D. Purnell & Associates, Inc., Response to Enforcement Order DE 91-N192; Item No. 1.C.
23.	12-19-1991	Trans Mountain Oil Pipe Line Corporation (TMOPL), Letter, Dan O'Rourke (TMOPL) to Michael Gallageher (Ecology), Re: Enforcement Order No. DE 91-N192, Trans Mountain Oil Pipe Line Corporation Laurel Station Cleanup [summary of December 11, 1991 release].
24.	01-02-1992	Washington State Department of Ecology (Ecology), Letter, Kirk Smith (Ecology) to Dan O'Rourke (TMOPL), Re: Trans Mountain Oil Pipe Line Corporation – Laurel Pump Station, Whatcom County, Washington [request for information on December 11, 1991].
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E27.	02-22-1993	Washington State Department of Ecology (Ecology), Letter, Barbara Trejo (Ecology) to Dan O'Rourke (TMOPL), Re: Trans Mountain Oil Pipe Line Corporation, Laurel Pump Station – Dam 3.
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E29.	02-26-1993	Dames & Moore, Letter, David Raubvogel (Dames & Moore) to Barbara Trejo (Ecology), Re: Hand Auger Boring Program at PCS Storage Cells, Trans Mountain Oil Pipe Line Corp., Laurel Pump Station.

E30.	02-26-1993	Dames & Moore, Letter, David Raubvogel (Dames & Moore) to Barbara Trejo (Ecology), Re: Responses to Ecology's February 24, 1993 Letter, Trans Mountain Oil Pipe Line Corp., Laurel Pump Station.
E31.	03-09-1993	Washington State Department of Ecology (Ecology), Facsimile, Barbara Trejo (Ecology) to Dan O'Rourke (TMOPL), Re: Trans Mountain Oil Pipe Line Corporation, Laurel Pump Station – PCS Cells.
E32.	03-18-1993	Washington State Department of Ecology (Ecology), Letter, Barbara Trejo (Ecology) to Dan O'Rourke (TMOPL), Re: PCS Storage Cell Operation & Maintenance Manual, First Amended Enforcement Order No. DE 91-N192, Trans Mountain Oil Pipe Line Corporation – Laurel Pump Station.
E33.	05-14-1993	Washington State Department of Ecology (Ecology), Letter, Barbara Trejo (Ecology) to Dan O'Rourke (TMOPL), Re: Phase I Interim Action Plan, Laurel Pump Station [comments from Ecology].
E34.	05-28-1993	Washington State Department of Ecology (Ecology), Letter, Barbara Trejo (Ecology) to Dan O'Rourke (TMOPL), Re: Trans Mountain Oil Pipe Line Corporation, Laurel Pump Station, Interim Action – Drain Tile Excavation [review by Ecology].
E35.	06-17-1993	Dames & Moore, Letter, David Raubvogel (Dames & Moore) to Barbara Trejo (Ecology), Re: Revisions to Figure, Report on the Drain Tile Excavation, Trans Mountain Oil Pipe Line Corp., Laurel Pump Station.
E36.	06-21-1993	Trans Mountain Oil Pipe Line Corporation (TMOPL), Letter, Dan O'Rourke (TMOPL) to Barbara Trejo (Ecology), Re: Laurel Pump Station Contaminated Soil Stockpile Remediation Meeting May 27, 1993.
E37.	06-22-1993	Dames & Moore, Letter, David Raubvogel (Dames & Moore) to Barbara Trejo (Ecology), Re: Final Phase I Interim Action Plan Dated June 14, 1993, Trans Mountain Oil Pipe Line Corp., Laurel Pump Station.
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		Disturbance Application, Trans Mountain Oil Pipe Line Corporation, Laurel Station.
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E42.	08-11-1993	Washington State Department of Ecology (Ecology), Letter, Barbara Trejo (Ecology) to Dan O'Rourke (TMOPL), Re: Trans Mountain Oil Pipe Line Corporation, Laurel Pump Station.
E43.	08-20-1993	Washington State Department of Ecology (Ecology), Letter, Barbara Trejo (Ecology) to Jeanne Funsch (Whatcom County Health Department) and Julie Elsbree (Northwest Air Pollution Authority), Re: Trans Mountain – Laurel Pump Station, Soil Stockpile Remediation.
E44.	08-20-1993	Northwest Air Pollution Authority (NAPP), Letter, Terry L. Nyman (NAPP) to David Raubvogel (Dames & Moore), Re. Proposed excavation, screening, and transportation of petroleum contaminated soil.
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E46.	09-07-1993	Washington State Department of Health, Office of Toxic Substances, Hazardous Waste Section – Trans Mountain Pipeline, Bellingham, Washington.
E47.	09-10-1993	Washington State Department of Ecology (Ecology), Letter, Scott Mosley (Ecology) to Barbara Trejo (Ecology), Re: Comments on Health & Safety Plan, Trans Mountain Oil Pipe Line Corporation, Laurel Pump Station.
E48.	10-05-1993	Trans Mountain Oil Pipe Line Corporation (TMOPL), Letter, Dan Knight (TMOPL) to Barbara Trejo (Ecology), Re: Open House on Saturday, October 23.
E49.	10-25-1993	Washington State Department of Ecology (Ecology), Letter, Barbara Trejo (Ecology) to Dan O'Rourke (TMOPL), Re: Split Sample Analytical Results, July 1993 PCS Soil Characterization, Trans Mountain Oil Pipe Line Corporation, Laurel Pump Station.
E50.	11-01-1993	Washington State Department of Ecology (Ecology), Letter, Barbara Trejo (Ecology) to Dan O'Rourke (TMOPL), Re: Draft Phase II Interim Action Report, Trans Mountain Oil Pipe Line Corporation, Laurel Pump Station.
E51.	11-24-1993	Dames & Moore, Letter, David Raubvogel and David Keller (Dames & Moore) to Barbara Trejo (Ecology), Re: Responses to Ecology Comments, Draft Phase II

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T1.	02-01-1991	Trans Mountain Oil Pipe Line Corporation (TMOPLC), Letter, G.R. Miller (TMOPLC) to Chang-Pi Wang (Ecology), Re: Laurel Station Condensate Spill – Site Assessment Plan.
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T9.	06-18-1991	W.D. Purnell & Associates, Inc., Soil Logs of Monitoring Wells At the Trans Mountain Oil Pipe Line Corporation, Laurel Pump Station Condensate Spill Site.

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T67.	07-10-1997	Analytical Resources, Inc. (ARI), Letter, Jeff J. Reitan (ARI) to Jacki Schneider (TMOPLC), Re: Laurel Station Hydrocarbon Tests.
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T71.	07-30-1997	Soil Sampling – East Smith Road Widening.
T72.	06-20-2002	GeoEngineers, Report, Hydrogeologic Services, Well Safe Yield Evaluation, Laurel Facility, Bellingham, Washington.
T73.	11-05-2002	GeoEngineers, Groundwater Monitoring Results, Trans Mountain Laurel Pumping Station, 1009 East Smith Road, Bellingham, Washington.
T74.	05-17-2006	Maxxam Analytics Inc., Laboratory Analysis Results.

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Northwest Regional Office, 3190 - 160th Ave S.E. • Bellevue, Washington 98008-5452 • (206) 649-7000

June 11, 1992

RECORDED DELIVERY

Mr. Michael Boyle
Trans Mountain Oil Pipe Line Corporation
1333 West Broadway, Suite 900
Vancouver, B.C. V6H 4C2 Canada

RE: First Amended Enforcement Order No. DE 91-N192

Dear Mr. Boyle:

The First Amended Enforcement Order No. DE 91-N192 (Amended Order) issued by the Washington Department of Ecology (Ecology) to Trans Mountain Oil Pipe Line Corporation (Trans Mountain) is enclosed. As indicated, the effective date of the Amended Order is June 15, 1992.

If you have any questions or would like to meet with Ecology to discuss the Amended Order, please feel free to contact me at (206) 649-7206.

Sincerely,

Barbara J. Trejo

Barbara J. Trejo
Project Manager

BJT:bt

Enclosure

cc: Tanya Barnett, AAG
Glenn A. Irving, Trans Mountain

State of Washington
Department of Ecology

In the Matter of Remedial Action by: Trans Mountain Oil Pipe Line Corporation 1333 West Broadway, Suite 900 Vancouver, B.C. V6H 4C2 Canada	)	First Amended Enforcement Order No. DE 91-N192

To: Glenn A. Irving
Vice President, Secretary, and General Counsel

Michael Boyle
Corporate Solicitor and Assistant Secretary

I.

Jurisdiction

This Order is issued pursuant to the authority of RCW 70.105D.050(1).

II.

Statement of Facts

1. The Department of Ecology (Ecology) observed releases of petroleum product on January 15, 1991; December 11, 1991; and March 7, 1992 from the Trans Mountain Oil Pipe Line Corporation - Laurel Pump Station, 1009 East Smith Road near the City of Bellingham in Whatcom County, Washington.

2. Trans Mountain Oil Pipe Line Corporation notified Ecology (letter to B. Trejo, Ecology, dated November 27, 1991) that soil contamination, not related to the petroleum product releases described above, was identified by Trans Mountain Oil Pipe Line Corporation on October 25, 1991 during an upgrade of the Laurel Pump Station.

3. Trans Mountain Oil Pipe Line Corporation responded to the reported releases and commenced containment and cleanup operations. Trans Mountain Oil Pipe Line Corporation also retained geotechnical and environmental consulting firms to perform preliminary contamination assessments. On June 19, 1991, Trans Mountain Oil Pipe Line Corporation concurred with Ecology's decision to issue an Enforcement Order to expedite remedial actions at the facility.

4. Soil, sediments, groundwater, and surface water have been demonstrated to be contaminated or are potentially contaminated as a result of the petroleum releases from the Trans Mountain Oil Pipe Line Corporation - Laurel Pump Station based on the results presented in the following plans and reports: (1) Proposed Site Assessment Plan For The Condensate Spill At Laurel Pump Station, January 15, 1991, Trans Mountain Oil Pipe Line Corporation, February 1, 1991; (2) Laurel Pump Station Condensate Spill: Fisheries Assessment, Seymour & Associates, May 16, 1991; (3) Site Assessment Report - Soil & Water Analysis, Laurel Pump Station Natural Gas Condensate Spill, East Smith Road, Whatcom County, Washington, Purnell & Associates, May 17, 1991; and (4) Work Plan, Remedial Investigation/Feasibility Study, Laurel Pump Station, Laurel, Washington for Trans Mountain Oil Pipe Line Corporation, Dames & Moore, January 6, 1992.

III.

Ecology Determinations

1. The Trans Mountain Oil Pipe Line Corporation is an "owner and operator" as defined in RCW 70.105D.020(6) of a portion of a "facility" as defined in RCW 70.105D.020(3).

2. The facility or "site" is defined as the Laurel Pump Station property located at 1009 East Smith Road, Bellingham, Washington and all other properties in the vicinity of the pump station property which have been affected or are potentially affected by spills, leaks, or discharges of petroleum products or other hazardous substances from the pump station, if any, including the following areas: (1) Area 1 - all property located up to 350 feet west of the pump station property line, south of Smith Road, including the portion of the access easement located west of the pump station property line; (2) Area 2 - all property located north of Area 1 including the adjacent eastern access road, north of Smith Road; (3) Area 3 - Deer Creek and its tributaries including all wetlands, ditches, culverts, streams, ponds, creeks, and other surface water bodies and uplands adjacent to Deer Creek and its tributaries from the southern Smith Road culvert, immediately north of Area 1, downstream to Guide Meridian Road. The facility or site definition may be expanded based on the results of future remedial actions.

3. The substances found at the facility as described above are "hazardous substances" as defined in RCW 70.105D.020(5).

4. Based on the presence of these hazardous substances at the facility and all factors known to the Department, there is a release or threatened release of hazardous substances from the facility, as defined in RCW 70.105D.020(10).

5. By a letter of April 1, 1991, Trans Mountain Oil Pipe Line Corporation voluntarily waived its rights to notice and comment and accepted Ecology's determination that Trans Mountain Oil Pipe Line Corporation is a "potentially liable person" under RCW 70.105D.040 with respect to the site.

6. Pursuant to RCW 70.105D.030(1) and 70.105D.050, the Department may require potentially liable persons to investigate or conduct other remedial actions with respect to the release or threatened release of hazardous substances, whenever it believes such action to be in the public interest.

7. Based on the foregoing facts, Ecology believes the remedial action required by this Order is in the public interest.

IV.

Work to be Performed

Based on the foregoing Facts and Determinations, it is hereby ordered that Trans Mountain Oil Pipe Line Corporation take the remedial actions described in the attached Exhibit A, Scope of Remedial Actions, and Exhibit B, Performance Schedule for Remedial Actions in accordance with Chapter 173-340 WAC unless otherwise specifically provided for herein. Exhibits A and B are incorporated by reference and are integral and enforceable parts of this Enforcement Order.

V.

Terms and Conditions of Order

1. Definitions

Unless otherwise specified, the definitions set forth in Chapter 70.105D RCW and Chapter 173-340 WAC shall control the meanings of the terms used in this Order.

2. Public Notice

RCW 70.105D.030(2)(a) requires that, at a minimum, this Order be subject to concurrent public notice. Ecology shall be responsible for providing such public notice and reserves the right to modify or withdraw any provisions of this Order should public comment disclose facts or considerations which indicate to Ecology that the Order is inadequate or improper in any respect.

3. Remedial Action Costs.

Trans Mountain Oil Pipe Line Corporation shall pay to Ecology costs incurred by Ecology prior to the effective date of the Order and costs incurred by Ecology pursuant to this Order. These costs shall include work performed by Ecology or its contractors for investigations, remedial actions, and Order preparation, oversight and administration. Ecology costs shall include costs of direct activities; e.g., employee salary, laboratory costs, travel costs, contractor fees, and employee benefit packages; and agency indirect costs of direct activities. Trans Mountain Oil Pipe Line Corporation shall pay the required amount within 90 days of receiving from Ecology an itemized statement of costs that includes a summary of costs incurred, a general description of work performed, an identification of involved staff, and the amount of time spent by involved staff members on the project. Failure to pay Ecology's costs within 90 days of receipt of the itemized statement of costs may result in interest charges.

4. Designated Project Coordinators.

The project coordinator for Ecology is:

Name Barbara J. Trejo
Washington State Department of Ecology
Address 3190 - 160th Avenue Southeast
Bellevue, Washington 98008-5452

The project coordinator for Trans Mountain Oil Pipe Line Corporation is:

Name Dan O'Rourke

Trans Mountain Oil Pipe Line Corporation

Address 1333 West Broadway, Suite 900

Vancouver, B.C. V6H 4C2 Canada

The project coordinators shall be responsible for overseeing the implementation of this Order. To the maximum extent possible, communications between Ecology and Trans Mountain Oil Pipe Line Corporation, and all documents, including reports, approvals, and other correspondence concerning the activities performed pursuant to the terms and conditions of this Order, shall be directed through the project coordinators. Should Ecology or Trans Mountain Oil Pipe Line Corporation change project coordinators, written notification shall be provided to Ecology or Trans Mountain Oil Pipe Line Corporation at least ten (10) calendar days prior to the change.

5. Performance. All work performed pursuant to this Order shall be under the direction and supervision, as necessary, of a professional engineer or hydrogeologist, or similar expert, with appropriate training, experience and expertise in hazardous waste site investigation and cleanup. Trans Mountain Oil Pipe Line Corporation shall notify Ecology as to the identity of such engineer(s) or hydrogeologist(s), and of any contractors and subcontractors to be used in

carrying out the terms of this Order, in advance of their involvement at the Site. Trans Mountain Oil Pipe Line Corporation shall provide a copy of this Order to all agents, contractors or subcontractors retained to perform work required by this Order and shall ensure that all work undertaken by such agents, contractors and subcontractors will be in compliance with this Order.

Except when necessary to abate an emergency situation, Trans Mountain Oil Pipe Line Corporation shall not perform any remedial actions at the Trans Mountain Oil Pipe Line Corporation - Laurel Pump Station and adjacent properties affected by the pump station operation outside that required by this Order unless Ecology concurs, in writing, with such additional remedial actions.

WAC 173-340-400(7)(b)(i) requires that "construction" that is required under this Order and is performed on the Site must be under the supervision of a professional engineer registered in Washington.

6. Access

Ecology or any Ecology authorized representative shall have the authority to enter and freely move about all property at the Site at all reasonable times for the purposes of, inter alia: inspecting records, operation logs, and contracts related to the work being performed pursuant to this Order; reviewing the progress in carrying out the terms of this Order; conducting such tests or collecting samples as

Ecology or the project coordinator may deem necessary; using a camera, sound recording, or other documentary type equipment to record work done pursuant to this Order; and verifying the data submitted to Ecology by Trans Mountain Oil Pipe Line Corporation. Ecology shall provide reasonable notice before entering property unless an emergency prevents notice. While at the Site, Ecology and any Ecology authorized representatives shall observe reasonable safety requirements imposed by Trans Mountain Oil Pipe Line Corporation, provided that such requirements are brought to the attention of Ecology and any Ecology authorized representatives. Ecology shall allow split or replicate samples to be taken by Trans Mountain Oil Pipe Line Corporation during an inspection unless doing so would interfere with Ecology's sampling. Trans Mountain Oil Pipe Line Corporation shall allow split or replicate samples to be taken by Ecology and shall provide Ecology seven (7) days notice before any sampling activity. However, Trans Mountain shall provide Ecology only as much advance notice as is practical under the circumstances when (1) sampling becomes necessary due to unforeseen circumstances or (2) sampling is to occur during a rain event.

To the extent that compliance with this Order requires access to property not owned or controlled by Trans Mountain Oil Pipe Line Corporation, Trans Mountain Oil Pipe Line Corporation shall make every reasonable effort to obtain

signed access agreements for itself, its contractors, and agents, and provide Ecology with copies of such agreements. With respect to non-Trans Mountain Oil Pipe Line Corporation property upon which monitoring wells, pumping wells, treatment facilities, or other response actions are to be located, the access agreements to the extent practicable shall also provide that no conveyance of title, easement, or other interest in the property shall be consummated without provisions for the continued operation of such wells, treatment facilities, or other response actions on the property. The access agreements should also provide to the extent practicable that the owners of any property where monitoring wells, pumping wells, treatment facilities, or other response actions are located shall notify Ecology by certified mail at least thirty (30) days prior to any conveyance, of the property owner's intent to convey any interest in the property and of the provisions made for the continued operation of the monitoring wells, treatment facilities, or other response actions installed pursuant to this Order.

7. Public Participation

Trans Mountain Oil Pipe Line Corporation shall assist Ecology in preparing and/or updating a public participation plan for the Site. Trans Mountain Oil Pipe Line Corporation may assist Ecology with the plan preparation prior to the issuance of the Order. Ecology shall maintain the

responsibility for public participation at the Site. Trans Mountain Oil Pipe Line Corporation shall help coordinate and implement public participation for the Site.

8. Retention of Records

Trans Mountain Oil Pipe Line Corporation shall preserve in a readily retrievable fashion, during the pendency of this Order and for ten (10) years from the date of completion of the work performed pursuant to this Order, all records, reports, documents, and underlying data in its possession relevant to this Order. Should any portion of the work performed hereunder be undertaken through contractors or agents of Trans Mountain Oil Pipe Line Corporation, a record retention requirement meeting the terms of this paragraph shall be required of such contractors and/or agents.

9. Dispute Resolution

Trans Mountain Oil Pipe Line Corporation may request Ecology to resolve factual or technical disputes which may arise during the implementation of this Order. Such request shall be in writing and directed to the signatory of this Order. Ecology resolution of the dispute shall be binding and final. Trans Mountain Oil Pipe Line Corporation is not relieved of any requirement of this Order during the pendency of the dispute and remains responsible for timely compliance with the terms of the Order unless otherwise provided by Ecology in writing.

10. Reservation of Rights

Ecology reserves all rights to issue additional orders or take any action authorized by law in the event or upon the discovery of a release or threatened release of hazardous substances not addressed by this Order, upon discovery of any factors not known at the time of issuance of this Order, in order to abate an emergency, or under any other circumstances deemed appropriate by Ecology.

Ecology also reserves all rights regarding the injury to, destruction of, or loss of natural resources resulting from the release or threatened release of hazardous substances from the Trans Mountain oil Pipe Line Corporation - Laurel Pump Station.

In the event Ecology determines that conditions at the Site are creating or have the potential to create a danger to the health or welfare of the people on the Site or in the surrounding area or to the environment, Ecology may Order Trans Mountain Oil Pipe Line Corporation to stop further implementation of this Order for such period of time as needed to abate the danger.

11. Transference of Property

No voluntary or involuntary conveyance or relinquishment of title, easement, leasehold, or other interest in any portion of the Site shall be consummated by Trans Mountain Oil Pipe Line Corporation without provision for continued implementation of all requirements of this Order and

implementation of any remedial actions found to be necessary as a result of this Order.

Prior to transfer of any legal or equitable interest Trans Mountain Oil Pipe Line Corporation may have in the Site or any portions thereof, Trans Mountain Oil Pipe Line Corporation shall serve a copy of this Order upon any prospective purchaser, lessee, transferee, assignee, or other successor in such interest. At least thirty (30) days prior to finalization of any transfer, Trans Mountain Oil Pipe Line Corporation shall notify Ecology of the contemplated transfer.

12. Compliance With Other Applicable Laws

All actions carried out by Trans Mountain Oil Pipe Line Corporation pursuant to this Order shall be done in accordance with all applicable federal, state, and local requirements.

13. Revisions to the Scope of Work and Schedule

Revisions to the scope of work or to the schedule shall be granted only when a request for revision is submitted to the Ecology project coordinator within five business days after Trans Mountain Oil Pipe Line Corporation knew or should have known of the need for the revision, and when good cause exists for granting the revision. All revision shall be requested in writing. The request shall specify the reason(s) the revision is needed. A revision of schedule shall be granted only for such period as Ecology determines

is reasonable under the circumstances. A requested revision shall not be effective until approved by Ecology, which approval shall be confirmed in writing.

The burden shall be on Trans Mountain Oil Pipe Line Corporation to demonstrate to the satisfaction of Ecology that good cause exists for granting a revision. Good cause includes, but is not limited to, the following:

1. Circumstances entirely beyond the control and despite the due diligence of Trans Mountain Oil Pipe Line Corporation such as difficulty in obtaining access to property not owned or controlled by Trans Mountain Oil Pipe Line Corporation;

2. Delays directly attributable to any changes in or need to comply with permit terms or conditions or to appeals on or lack of a permit, concurrence, or approval needed to implement the terms of this Order, provided that Trans Mountain Oil Pipe Line Corporation filed a timely application for such a permit, concurrence or approval; and

3. Acts of God, including fire, flood, blizzard, extreme temperatures, storm, earthquake, wave or water conditions, strikes or other labor disputes or other unavoidable casualty.

However, neither increased costs of performance of the terms of this Order, nor changed economic circumstances, nor unavailability of qualified personnel to perform work

required by the terms of this Order shall be considered good cause for granting a revision.

VI.

Satisfaction of this Order

The provisions of this Order shall be deemed satisfied upon Trans Mountain Oil Pipe Line Corporation's receipt of written notice from Ecology that Trans Mountain Oil Pipe Line Corporation has completed the remedial activity required by this Order, as amended by any modifications, and that all other provisions of this Enforcement Order have been complied with.

VII.

Enforcement

1. Pursuant to RCW 70.105D.050, this Order may be enforced as follows:

   A. The Attorney General may bring an action to enforce this Order in a state or federal court.

   B. The Attorney General may seek, by filing an action, if necessary, to recover amounts spent by Ecology for investigative and remedial actions and orders related to the Site.

   C. In the event Trans Mountain Oil Pipe Line Corporation refuses, without sufficient cause, to comply with any term of this Order, Trans Mountain Oil Pipe Line Corporation will be liable for:

      (1) up to three times the amount of any costs

incurred by the state of Washington as a result of its refusal to comply; and

(2) civil penalties of up to $25,000 per day for each day it refuses to comply.

D. This Order is not appealable to the Washington Pollution Control Hearings Board. This Order may be reviewed only as provided under RCW 70.105D.060.

Effective date of this Order: June 15, 1992

Michael J. Gallagher

Michael J. Gallagher

EXHIBIT A

SCOPE OF REMEDIAL ACTIONS

I. PRE-REMEDIAL INVESTIGATION REPORT

Submit to Ecology for review an independent pre-remedial investigation report for all the investigation work performed by Trans Mountain which has not previously been submitted to Ecology in a report format including the information obtained during Trans Mountain's 1991 - 1992 upgrade of the pump station.

II. REMEDIAL INVESTIGATION AND FEASIBILITY STUDY

Conduct a remedial investigation and feasibility study (RI/FS) pursuant to WAC 173-340-350. The RI/FS shall address known or potential contamination resulting from the January 1991, December 1991, and March 1992 petroleum spills as well as known or potential contamination resulting from current and historic operations including spills or leaks at and from the pump station. The RI/FS shall also include information to determine the impact or potential impact of releases of hazardous substances at the facility on the natural resources and ecology of the area, an ecological and human health risk assessment, wetland delineation, and an evaluation of interim cleanup actions.

A. Submit to Ecology for review and approval a RI/FS work plan pursuant to WAC 173-340-350. The work plan format shall follow the general format presented in the EPA Superfund Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA. The work plan shall include a health & safety plan (WAC 173-340-810), sampling and analysis plan (WAC 173-340-820), wetland delineation plan, a natural resource damage assessment plan, and a discussion of data gaps associated with each item described in WAC 173-340-350(6). If Trans Mountain believes that an item described in WAC 173-340-350(6) is not applicable to the site, a brief explanation about why it is not applicable shall be included in the work plan.

The health & safety plan is reviewed but not approved by Ecology. If Trans Mountain believes that the existing health & safety plan (Amended Health and Safety Plan For Trans Mountain Oil Pipe Line Corporation, Laurel Station RI/FS, March 20, 1992, prepared by Dames & Moore) meets the legal requirements for worker health and safety (WAC 173-340-810) for the work to be completed for the RI/FS described above, Ecology shall be notified by Trans Mountain, in writing, the basis for its decision about the adequacy of the health & safety plan. If the existing plan does not meet the legal requirements for worker health &

safety, Trans Mountain shall include a revised health & safety plan which shall be submitted with the work plan.

B. Submit to Ecology for review and approval a RI/FS report. The report shall follow the EPA suggested RI/FS format.

III. INTERIM ACTIONS

A. Submit a written response to each comment included in Ecology's June 19, 1991 comment letter on Purnell & Associates' May 17, 1991, Site Assessment Report - Soil and Water Analysis, Laurel Pump Station Natural Gas Condensate Spill, East Smith Road, Whatcom County, Washington and the Seymour & Associates' May 16, 1991, Laurel Pump Station Condensate Spill: Fisheries Assessment. The written response shall be in a report or letter format and shall include responses made prior to the issuance of this Order.

B. Surface Water Monitoring ~~System~~

1. Submit to Ecology for review biweekly surface water sampling results obtained by Trans Mountain at surface water monitoring stations established by Trans Mountain to monitor surface water quality from areas contaminated by hazardous substances.

   The water quality parameters to be analyzed shall include but not be limited to the volatile organics: benzene, toluene, ethylbenzene, and xylene (BETX); the full range of petroleum hydrocarbons; pH; conductivity; and temperature. The Washington Department of Ecology analytical procedures for petroleum hydrocarbon analysis for water (WTPH-G, WTPH-D, WTPH-418.1) shall be used to analyze the full petroleum hydrocarbon range. The analytical method selected for BETX shall be in compliance with WAC 173-340-830, analytical procedures.

   The water quality sampling result submittals shall include but not be limited to a surface water station location map, a summary of surface water sampling results, copies of the laboratory data sheets, and a description of any water quality sampling results which exceed groundwater or surface water quality criteria.

C. Submit to Ecology for review detailed hydrogeological cross sections which cover the area within a one-mile radius of the January 15, 1991, leak site to confirm Purnell & Associates hypothesis that no aquifer other

than the shallow aquifer is contaminated with natural gas condensate or other contaminants related to the Laurel Pump Station and that no drinking water wells are affected. Logs from registered and unregistered wells identified within a one-mile radius of the January 15, 1991, leak site as well as any other information available to Trans Mountain or their consultants shall be used to develop the cross sections.

D. Dam and Surface Water Maintenance

1. Submit to Ecology for review a plan for maintaining and operating Dam #2, located downstream of Smith Road, ~~and~~ Dam #3, east of Hannegan Road, and the dam constructed by Trans Mountain for the March 1992 petroleum spill. The plan shall also include a discussion of the cleanup of visible contamination on the surface water. A copy of the plan shall also be sent by certified or registered mail to the Department of Wildlife and Mark Schuller, Department of Fisheries (Fisheries), 333 E. Blackburn Road, Mt. Vernon, Washington for Fisheries files.

2. Begin implementation of the Dam #2 and Dam #3 dam and surface water maintenance plan.

3. Begin implementation of the dam and surface water maintenance plan for the dam constructed by Trans Mountain for the March 1992 petroleum spill.

4. Submit to Ecology for review and comment an evaluation of the feasibility of removing Dam #2, Dam #3, and the dam constructed by Trans Mountain for the March 1992 petroleum leak. The evaluation shall include but not be limited to a discussion of potential environmental impacts such as migration of contaminants or contaminated sediments as a result of the dam removal, a summary of surface water testing, and visual and olfactory contamination observations.

5. Submit to Ecology for review a Dam Removal Plan if the evaluation described in D.4., above, indicates that dam removal is feasible and Ecology agrees with the evaluation. The plan shall provide detailed steps for completing the dam removal including a discussion of any SEPA or other permit requirements such as a hydraulic permit, water quality modification permit, or other applicable permit requirements and specific requirements for preventing further environmental damage as a result of the dam removal.

E. Spill Prevention Plan

1. Submit to Ecology for review a spill prevention plan which shall address future potential leaks, spills, or unauthorized discharges from the Laurel Pump Station site. The plan shall include but not be limited to the following information and procedures:

   a. A description of a reporting system to be used to notify immediately persons responsible for the management of the facility and appropriate state, federal, and local authorities;

   b. A description and a site plan showing equipment or facilities for the prevention, containment or treatment of leaks, spills, and unauthorized discharges;

   c. A list of all hazardous substances as defined in Chapter 70.105D RCW, Hazardous Waste Cleanup - Model Toxics Control Act which are used, processed, or stored at the facility including the normal quantity maintained on the premises. The applicable Material Safety Data Sheets (MSDS) shall be included as an appendix to the plan.

   d. A brief description of any leaks, spills, or unauthorized discharges which occurred during the 36-month period preceding the effective date of this Order and subsequent measures taken by Trans Mountain Oil Pipe Line Corporation to prevent or to reduce the possibility of further leaks, spills, or unauthorized discharges; and

   e. An implementation schedule for additional equipment or facilities which might be required for E.1.b, above, but which are not yet operational.

   The Spill Prevention Plan must be reviewed and certified by a professional engineer registered in the State of Washington. Such certification shall in no way relieve Trans Mountain Oil Pipe Line Corporation of its duty to prepare and fully implement the Spill Prevention Plan for the Laurel Pump Station.

2. Begin the Spill Prevention Plan implementation.

3. Submit to Ecology the results of the studies, evaluations, or other items outlined by Trans Mountain in its Spill Prevention Plan implementation schedule.

F. Oil/Water Separator

1. Submit to Ecology as-builts of the Laurel Pump Station oil/water separators along with a list of hazardous substances that historically may have been discharged. The as-builts shall identify historic sources connected to the separators as well as current sources.

2. Submit a sampling and analysis plan for water samples to be collected from the separators. The initial sampling round shall include priority pollutant and petroleum hydrocarbon analyses if the sources which discharge to the separators cannot be determined. If the sources discharging to the separators have been identified then the sampling may be limited to those hazardous substances associated with each source. The sampling and analysis plan shall meet the submittal requirements of WAC 173-340-430(6).

3. Collect water samples from the oil/water separator outlets.

4. Submit to Ecology a written report of the chemical analytical results for each separator sampling event. The report shall include a summary of the analytical and quality control/quality assurance results, copies of all laboratory analytical and quality control/quality assurance data, and describe any changes to the procedures described in the sampling and analysis plan prepared for F.2, above.

G. Wetlands Delineation and Mitigation

A wetland mitigation plan shall be required for cleanup actions in wetland areas of the site. Appropriate wetland delineation shall be accomplished in advance of the wetland mitigation plan. Attachment 1, Report Recommendations For Wetland Determinations/Delineations and Compensatory Wetlands Mitigation Plans provides general guidelines for wetland determinations/delineations and mitigation plans.

1. Submit to Ecology for review and comment a wetland determination/delineation for the following areas:

   a. Laurel Pump Station property; Area 1; Area 2; and the portions of Area 3 upstream of

Hannegan Road, which have been affected by the January 1991 natural gas condensate leak.

b. All other areas of the site which have been identified as affected or potentially affected by the pump station operation in the Ecology reviewed and approved wetland delineation plan required under section II.A. Pump station operations include but are not limited to historic and current operations, upgrading, spill responses, interim actions, final remedial actions.

2. Submit to Ecology a Wetland Mitigation Plan for the site.

3. Implement the wetland mitigation plan.

H. Interim Cleanup Action - Laurel Pump Station Property: Non-Wetland Areas Affected by the January 15, 1991 Natural Gas Condensate Leak

1. Submit to Ecology a work plan and a sampling and analysis plan for the following interim cleanup actions for non-wetland areas of the Laurel Pump Station property affected by the January 15, 1991 natural gas condensate leak:

a. Removal of the existing drain tile;

b. Excavation of any contaminated non-wetland soils which exceed the cleanup criteria for the contaminants of concern. Contaminated non-wetland soils and any stockpiled soils from the January 15, 1991 leak site excavation shall be immediately moved to on-site treatment beds for bioremediation immediately after excavation.

c. Backfilling of the excavations completed for H.1.a and H.1.b with clean native soil or structural fill. Compacted native soils or structural fill used for backfilling must have hydraulic conductivity values less than or equal to the in-situ native soils to prevent this area from acting as a conduit for any potential future leaks, spills, or discharges from this site unless the backfill cannot be placed to meet hydraulic conductivity values due to limitations imposed by the pipe line. The backfilled areas must immediately be reseeded with appropriate fast growing native vegetation to prevent sedimentation to nearby surface

waters.

d. Evaluate whether a new drainage system should be installed to replace the drain tile. Install the new drainage system as required. The new system shall contain any future potential leaks or discharges of hazardous substances.

The work plan and sampling and analysis plan shall include the appropriate items in WAC 173-340-430(6), Submittal Requirements. In addition to the items identified in WAC 173-340-430(6), the following shall be included in the plans:

(1) An evaluation of the feasibility of conducting the work described in H.1.a to H.1.d., above, during the different seasons when precipitation varies;

(2) A State Environmental Policy Act (SEPA) checklist or environmental impact statement (EIS) for all interim actions which require a state, county, or city permit and/or National Environmental Policy Act (NEPA) documents for federal permits;

(3) An application for a Water Quality Modification from the Department of Ecology - Water Quality Section, if required; and

(4) A sediment/drainage control plan which shall allow no sediments to be discharged to any surface water body including but not limited to wetlands, drainage ditches, creeks, streams, and ponds.

(5) A plan which describes how bioremediation will be accomplished. The on-site bioremediation must be managed to maximize bioremediation (destruction) of hazardous substances rather than aeration (volatilization). While volatilization will occur during excavation and treatment, it should be minimized. Therefore, the following must be accomplished as part of the bioremediation at the site:

(a) Excavate and place soil in lined, covered treatment beds;

(b) Control and manage all runoff related to the bioremediation treatment beds; and

(c) properly manage the soil moisture, pH, temperature, and nutrient additions to maximize the bioremediation time frame.

2. Begin Interim Cleanup Actions

3. Submit report of interim cleanup actions to Ecology.

I. Contaminated Soil Stockpiles

Trans Mountain has generated contaminated soil stockpiles at the pump station as a result of the upgrading of their facility. These stockpiles shall be monitored, sampled, and evaluated for interim cleanup action options pursuant to WAC 173-340-430, Interim Actions.

1. Submit to Ecology for review and comment an Operation and Maintenance Plan for the soil stockpiles pursuant to WAC 173-340-400(4)(b) and (c). The plan shall include air monitoring based on requirements or recommendations from appropriate regulatory agencies.

2. Submit to Ecology for review and approval an interim cleanup action plan for the remediation of contaminated soil stockpiles pursuant to WAC 173-340-430. The proposed cleanup action shall use permanent solutions to the maximum extent practicable (WAC 173-340-360). The cleanup options evaluated as well as the proposed cleanup action shall be presented in the plan.

3. Implement the approved interim cleanup action plan.

4. Submit to Ecology for review and approval a report of the results of the soil stockpile cleanup action.

IV. SELECTION OF CLEANUP ACTIONS

A. Trans Mountain shall submit a SEPA checklist or EIS to Ecology or other appropriate local or state agency and/or NEPA documents, if required, to appropriate federal agencies for the proposed draft cleanup action plan proposed by Ecology. The checklist, EIS, and/or other documents or copies shall be included, as a minimum, with the draft cleanup action plan for public comment.

Ecology shall prepare and issue a draft cleanup action plan for the proposed cleanup actions at the site. The draft cleanup action plan shall meet the requirements under WAC 173-340-360(10) and (11).

V. CLEANUP ACTIONS

A. Cleanup actions shall be accomplished by Trans Mountain in compliance with WAC 173-340-400, Cleanup Actions. Submit to Ecology for review and approval all plans, specifications, and other documents required under WAC 173-340-400(4). In addition to the requirements under WAC 173-340-400(4), Trans Mountain shall prepare a wetland mitigation plan, other mitigation plans determined to be appropriate based on the results of the RI/FS, and an evaluation of the feasibility of completing the cleanup action during the different seasons when precipitation varies. The evaluation shall be submitted with the plans, specifications, and other documents.

B. Implement cleanup actions after Ecology reviews and approves plans, specifications, wetland or other mitigation plans, and other documents.

EXHIBIT B

PERFORMANCE SCHEDULE FOR REMEDIAL ACTIONS

The performance schedule for remedial actions, below, follows the format established in Exhibit A, Scope of Remedial Actions.

The actual start date or the maximum number of days after the effective date of the First Amended Enforcement Order for submittals or actions follows each item. Draft plans, reports, or other documents shall be submitted at least 60 days in advance of the final submittal dates to allow Ecology time to review and comment on documents and Trans Mountain time to revise documents based on Ecology's comments.

Ecology's failure to perform any obligation undertaken in this Order within the time specified in Exhibit B shall not excuse Trans Mountain Oil Pipe Line Corporation from performing any of its obligations under this Order. However, the time allowed for Trans Mountain Oil Pipe Line Corporation to perform any obligation that is dependent on the review or approval of Ecology shall be extended by the number of days that Ecology is late in completing such review or approval.

PERFORMANCE SCHEDULE

		NUMBER OF DAYS AFTER THE EFFECTIVE DATE OF ORDER		
ITEM	START OR DUE DATE	START	DRAFT	FINAL
I. Pre-Remedial Report	6/12/92			
II. RI/FS				
A. Work Plan			90 days	30 days after receipt of Ecology's comments on draft

		NUMBER OF DAYS AFTER THE EFFECTIVE DATE OF ORDER		
B. Report			330 days	30 days after receipt of Ecology's comments on draft
III. Interim Actions				
A. Response	Complete			
B. Monitoring		7 days		
C. Cross Sections	Complete			
D. Dam Maintenance				
1. Plan			21 days	30 days after receipt of Ecology's comments on draft
2. Implementation	12/27/91			
3. Implementation		21 days		
4. Evaluation			60 days	30 days after receipt of Ecology's comments on draft
5. Removal Plan			130 days	30 days after receipt of Ecology's comments on draft
E. Spill Prevention Plan				

		NUMBER OF DAYS AFTER THE EFFECTIVE DATE OF ORDER		
1. Plan	6/30/92			
2. Implementation	4/27/92			
3. Study Results	8/01/92			
F. Oil/Water Separator				
1. As-builts	7/01/92			
2. Plan	6/15/92			
3. Sampling	14 days after the plan approved			
4. Results	15 days after each sampling event			
G. Wetlands				
1. Delineation			330 days	30 days after receipt of Ecology's comments on draft
2. Mitigation Plan			570 days	30 days after receipt of Ecology's comments on draft
3. Mitigation Plan Implementation		To be determined		
H. Interim Action - Non Wetland				
1. Work Plan	6/1/92			
2. Interim Cleanup Action	Complete			

		NUMBER OF DAYS AFTER THE EFFECTIVE DATE OF ORDER		
3. Report	6/30/92			
I. Contaminated Soil Stockpiles				
1. O & M Plan			45 days	30 days after receipt of Ecology's comments on draft
a. implementation		45 days		
2. Work Plan			75 days	30 days after receipt of Ecology's comments on draft
3. Implement cleanup action	30 days after the plan approved			
4. Report	60 days after III.I.3 work complete			
IV. Cleanup Action Selection				
SEPA/NEPA Checklist or EIS			450 days	30 days after receipt of Ecology's comments on draft

				NUMBER OF DAYS AFTER THE EFFECTIVE DATE OF ORDER	
	Ecology issues draft cleanup plan			480 days	30 days after receipt of Ecology's comments on draft
V.	Cleanup Actions				
	Submit plans, specifications, or other documents			570 days	30 days after receipt of Ecology's comments on draft
	Begin cleanup action		To be determined		

Note: Items listed as "complete" were completed under the original Enforcement Order.

REPORT RECOMMENDATIONS FOR WETLAND DETERMINATIONS/DELINEATIONS

1. General location map, using USGS Quadrangle, *(1": 2,000')*, with site clearly defined. If a site is not associated with easily recognizable landmarks, a smaller scale map may be appropriate.

2. Topographic map of area, preferably with two foot contour intervals.

3. Site map *(large scale – no smaller than 1": 400')*.

4. For large and/or complex projects, a large scale *(1": 400' to 1": 100')* air photo with overlays displaying site property and wetland boundaries. An orthophotograph displaying 2 foot contour intervals is preferred. If an orthophotograph is not available, have the center of a small scale *(e.g. 1": 3,333' to 1": 5,000')* air photograph enlarged to 1": 400'.

5. Site designated on a National Wetland Inventory Map.

6. Site designated on a Soil Survey Report soils map with proximate soil series profile descriptions appended.

7. Discussion in text regarding methods and results with special emphasis on whether approach was simple, intermediate, or complex as described in the 1989 Federal Manual for Identifying and Delineating Jurisdictional Wetlands.

8. Any previous site documentation and/or analysis including but not limited to SEPA checklist, soils engineering analysis, plant and/or wetland inventories, Washington Natural Heritage Program data, threatened and endangered species, etc.

9. All completed field data sheets *(Corps format for 3 parameter application)* numbered to correspond with each sample site.

10. Map of numbered sample sites *(large scale and superimposed on topographic map and/or air photograph)*. The report should identify sites where one or more of the three parameters were not sampled.

11. Field stakes should be placed marking each sample site for agency verification.

12. The wetland boundary should be staked and flagged in the field and accurately mapped on a large scale map *(e.g., county assessor's map)* or on a large scale air photograph.

13. For difficult boundary determinations, at least three samples should be taken; one in the nonwetland, one in the wetland, and one at the boundary. All three wetland parameters *(soil, plants, hydrology)* should be displayed for each sample.

ATTACHMENT 1

REPORT RECOMMENDATIONS
For Compensatory Wetlands Mitigation Plans

A. INTRODUCTION

Mitigation for creation, restoration or enhancement of wetlands should compensate for lost functions and values. Wetlands should be designed to be **persistent** features in the landscape, negating the need for continued water level manipulation, revegetation or other types of management. An available water supply is crucial to wetland development. Design should also consider relationships of the wetland to the watershed, other wetlands, adjacent uplands and deep water habitats.

B. THE WETLAND MITIGATION PLAN

(to be prepared by a qualified wetlands consultant)

1) **Conduct a thorough ecological assessment** of the impacted wetland. Compare the values and functions of the impacted wetland to the wetland to be created, restored or enhanced.

2) **Establish goals and objectives** for the mitigation site. Goals are broad and non-specific, objectives are site specific and direct the actions of the project. Include performance standards with specific criteria for measuring project success.

3) **Prepare detailed construction and revegetation plans.** Include where species are being planted, what is being planted and the size and density of plantings. Include the same information for the buffer area. Indicate drainages and topography to 2 ft. intervals. Specify a time schedule for construction events. Site work should include the following:

- erosion control, natural contouring, proper elevations
- plant only native species, control exotic species
- fertilize and irrigate as needed to increase plant survival
- have a biologist on site during all phases of construction

4) **Develop a monitoring plan** that will measure project success through sampling of specific criteria (eg. % plant cover, %plant survival). Use a standardized sampling technique to determine whether criteria have been met. Monitoring should be done at least annually and for a minimum for 5 years. Prepare a "time-zero" report which includes an as-built survey and photographs of the established wetland. Include a signed contract with a qualified consultant to ensure monitoring is conducted.

5) **Develop a contingency plan** for corrective actions to be taken if objectives are not met. The contingency plan should be enforced with a bond to ensure successful mitigation.

** *These are general guidelines only. For the complete guidelines, call the Department of Ecology at 493-9260.*

APPENDIX B
BORING LOGS

APPENDIX B – BORING LOGS

Study Unit 1

TP-1
TP-2
TP-4
TP-5
TP-6
TP-7
TP-8
TP-9
TP-10
TP-11
TP-12
TP-13
TP-14
TP-15
TP-16
TP-17
TP-18
PB-1
PB-2
PB-4
TM-B2
TM-B3
TM-B4
TM-B5
TM-B6
TM-B10
TM-B11
TM-B12
TM-B14
TM-B15
TM-B16
TM-B17
TM-B18
TM-B19
TM-B20
TM-B21
TM-B22
TM-B23
TM-B24

APPENDIX B – BORING LOGS

Study Unit 1 (continued)

TM-B25
DW-1
DW-2
DW-3
DW-4

Study Unit 2

TM-B7
TM-B8
TM-B13
U-3
U-4

Study Unit 3

TP3-1
TP3-2
TP3-3
DW-5

Study Unit 4

TP-19
TP-20
TP-21
TP-22
TP-23
TP-24

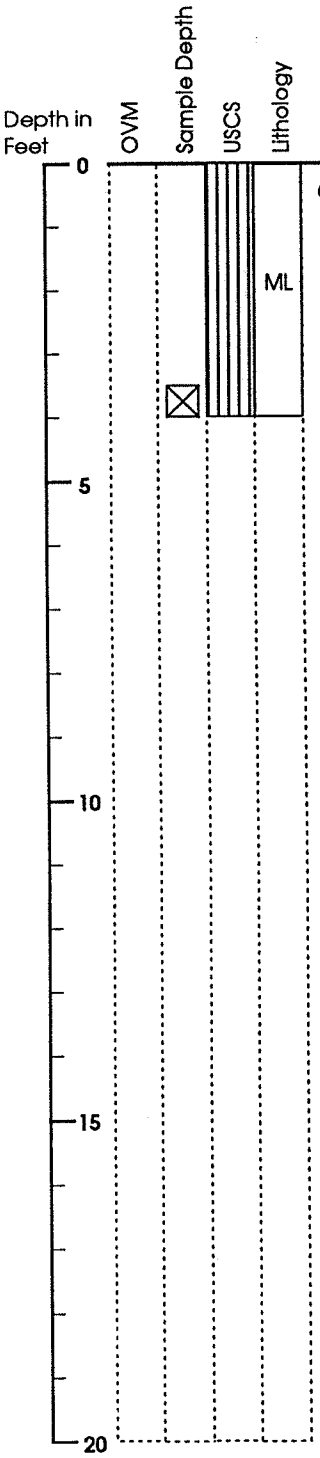
Study Unit 5

TP5-1
TP5-2
TP5-3
TP5-4
TP5-5
TP5-6

Borings Outside of Area of Concern Boundaries

TM-B1
TM-B9

Geological Test Pit Log

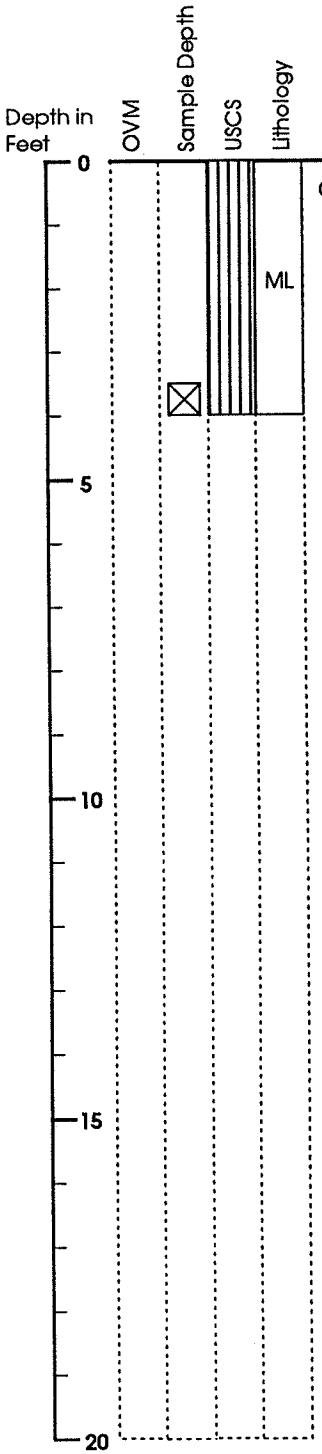


Client:	Trans Mountain Pipe Line Co.	Boring No:	TP-1
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	Laurel Pump Station	Sample Method:	Test Pit
Geologist:	BAU	Drill Date:	11/15/91

Dames & Moore

FILENAME: TRSM-TP.DRW

Geological Test Pit Log



Lithologic Description

Clayey SILT; dense, 10 -20% cobbles.

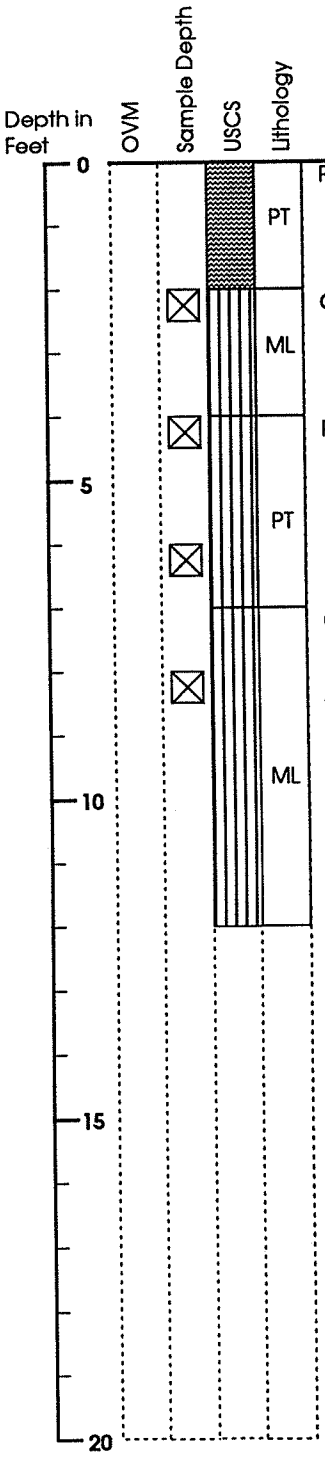
Terminated pit at 4' bgs on 11/15/91.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TP-2
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	Laurel Pump Station	Sample Method:	Test Pit
Geologist:	BAU	Drill Date:	11/15/91

Dames & Moore

FILENAME: TRSM-TP.DRW

Geological Test Pit Log



Lithologic Description

PEAT; brown, highly organic, moist, topsoil.

Clayey SILT; grey, organics, dry to damp, medium plasticity, medium stiff to soft.

PEAT; brown, highly organic, moist, medium plasticity, soft, abundant dark rootlets.

Clayey SILT; grey, organics, dry to damp, medium plasticity, medium stiff to soft.

- increasing stiffness with depth.

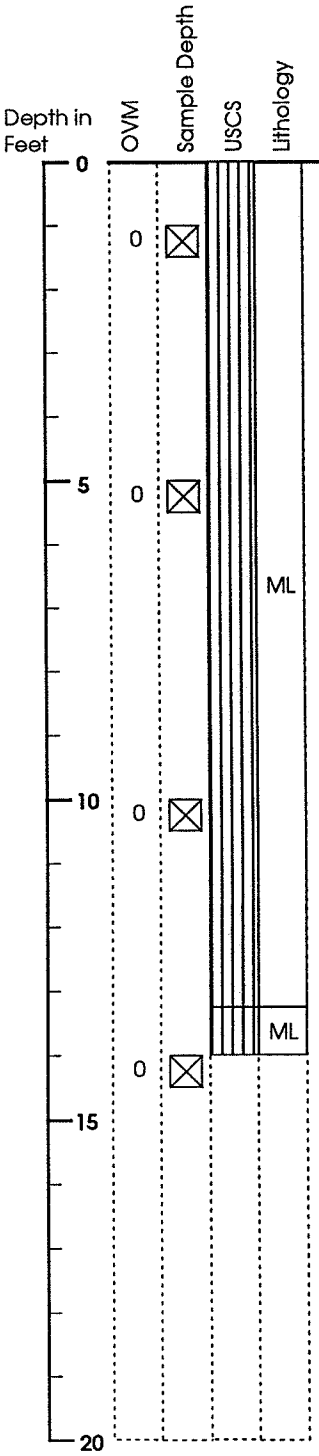
Terminated pit at 12' bgs on 11/20/91.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TP-4
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	Laurel Pump Station	Sample Method:	Test Pit
Geologist:	BAU	Drill Date:	11/20/91

Dames & Moore

FILENAME: TRSM-TP.DRW

Geological Test Pit Log



Lithologic Description

Clayey SILT/Silty CLAY; brown, topsoil, moist, loose; pockets of clayey clayey silt; greenish gray, abundant rootlets, organic; caving to 5' bgs.

Water coming in at 13' bgs.
Sandy SILT; oilve gray, dry to wet.

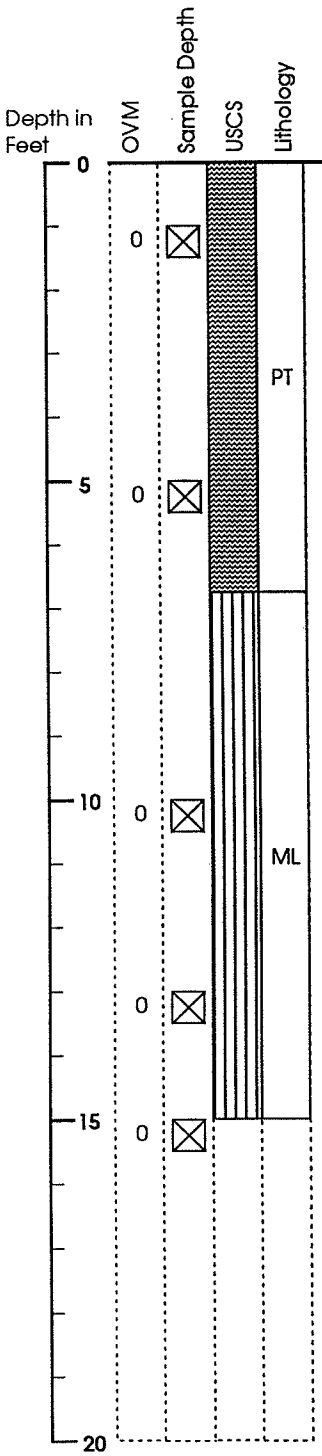
Terminated pit at 14' bgs on 11/21/91.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TP-5
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	Laurel Pump Station	Sample Method:	Test Pit
Geologist:	BU	Drill Date:	11/21/91

Dames & Moore

FILENAME: TRMTN-TP.DRW

Geological Test Pit Log



Lithologic Description

PEAT; brown, organic topsoil, moist, loose; scattered rounded gravels and cobbles, abundant rootlets.

Clayey SILT; greenish gray, dry to damp; some fine sand, moderately hard to stiff.

- distinct hydrocarbon odor noted.

- distinct hydrocarbon odor noted.

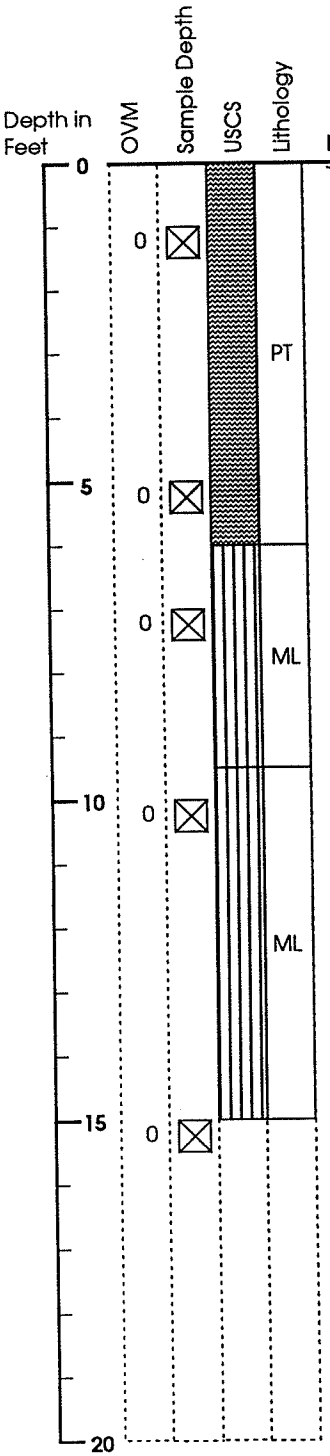
- distinct hydrocarbon odor noted.
Terminated pit at 15' bgs on 11/22/91

Client:	Trans Mountain Pipe Line Co.	Boring No:	TP-6
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	Laurel Pump Station	Sample Method:	Test Pit
Geologist:	BU	Drill Date:	11/22/91

Dames & Moore

FILENAME: TRMTN-TP.DRW

Geological Test Pit Log



Lithologic Description

Topsoil; brown, moist, organic; occasional gravels, cobbles and abundant rootlets.

Water entering hole at approximately 4' bgs from a hole in side of excavation.

Clayey SILT; greenish gray, medium plasticity, soft, moist to wet from water entering from above, distinct hydrocarbon odor noted.

Clayey SILT; olive gray, less plastic; increase in sand fraction, moderately hard.

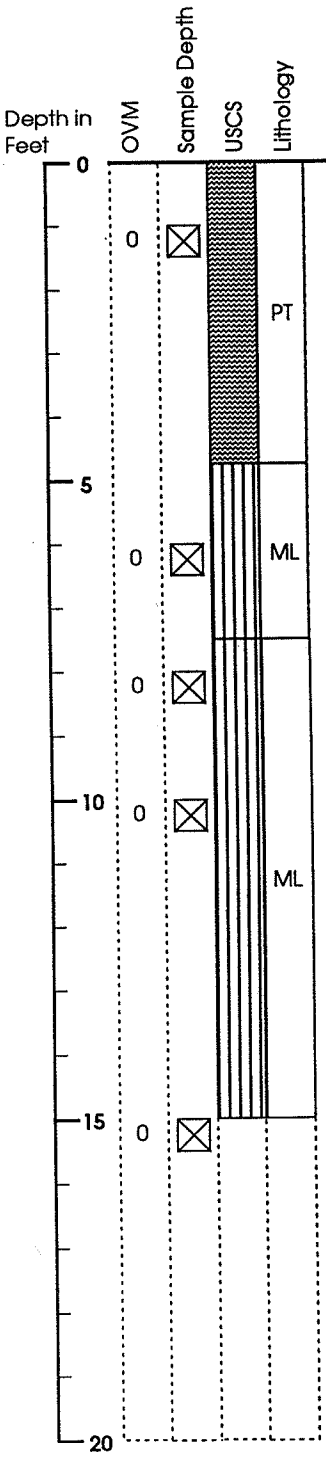
Terminated pit at 15' bgs on 11/22/91.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TP-7
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	Laurel Pump Station	Sample Method:	Test Pit
Geologist:	BU	Drill Date:	11/22/91

Dames & Moore

FILENAME: TRMTN-TP.DRW

Geological Test Pit Log



Lithologic Description

PEAT; brown, moist, organic; scattered rounded gravels and cobbles, topsoil.

Clayey SILT; greenish gray, moist, medium plasticity, soft, distinct hydrocarbon odor noted and yellowish stain.

Clayey SILT; olive gray, moist, low plasticity, increase in sand fraction, moderately hard to stiff, moderate hydrocarbon odor noted, some staining.

- mild hydrocarbon odor.

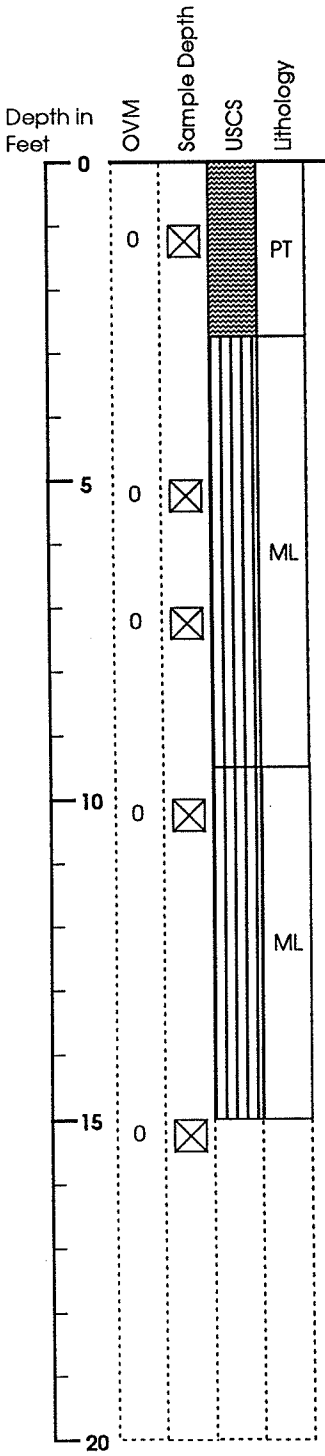
Terminated pit at 15' bgs on 11/22/91.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TP-8
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	Laurel Pump Station	Sample Method:	Test Pit
Geologist:	BU	Drill Date:	11/22/91

Dames & Moore

FILENAME: TRMTN-TP.DRW

Geological Test Pit Log



Lithologic Description

Topsoil; brown, organic, soft, loose, moist, abundant rootlets.

Clayey SILT; greenish gray, moist, soft, medium plasticity, hydrocarbon odor and staining noted, hydrocarbon noted seeping into pit from wall of excavation.

Clayey SILT; olive gray, dry to damp, medium hard to stiff, low plasticity, increase in sand fraction, faint hydrocarbon odor noted.

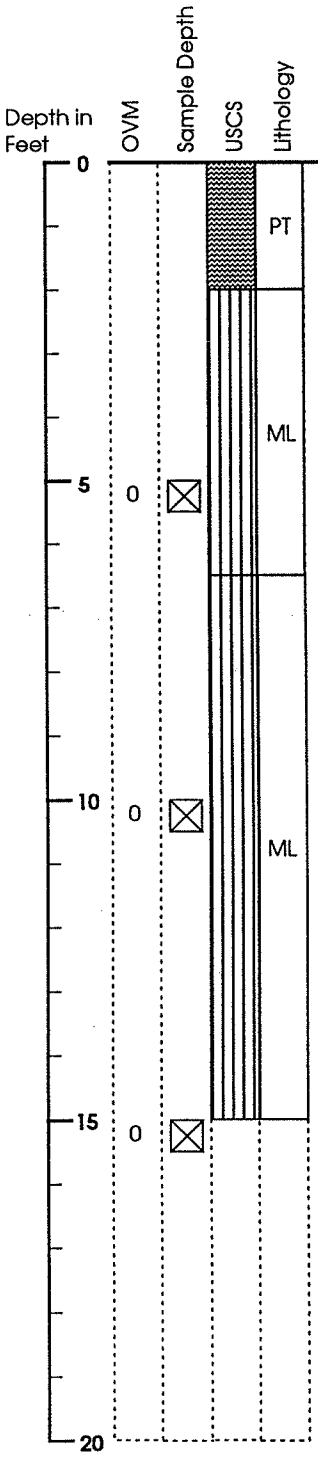
Terminated pit at 15' bgs on 11/22/91.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TP-9
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	Laurel Pump Station	Sample Method:	Test Pit
Geologist:	BU	Drill Date:	11/22/91

Dames & Moore

FILENAME: TRMTN-TP.DRW

Geological Test Pit Log



Lithologic Description

PEAT; brown, moist, soft, abundant rootlets, topsoil.

Clayey SILT; greenish gray, soft, medium plasticity, moist.

Clayey SILT; olive gray becoming greenish grey at 12' bgs, hard, low plasticity, dry to damp, scattered cobbles and boulders at 12' bgs to total depth.

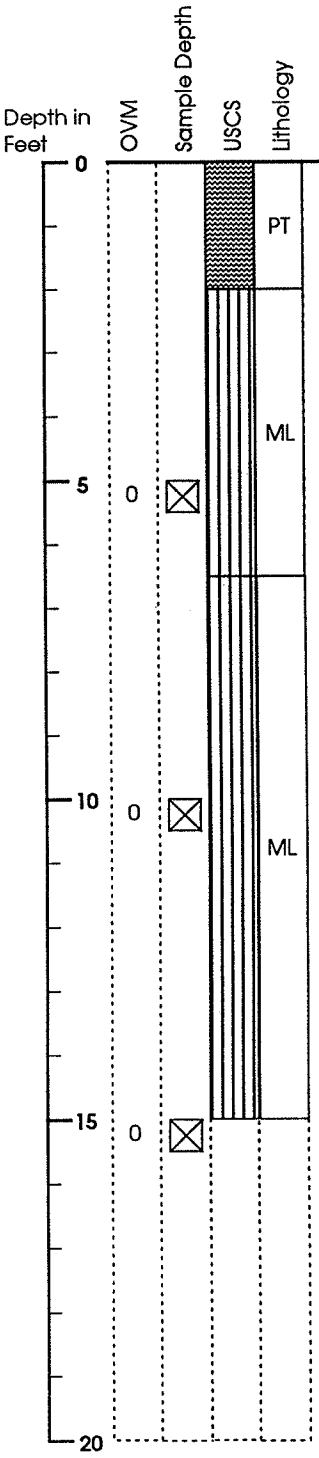
Terminated pit at 15' bgs on 11/26/91.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TP-10
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	Laurel Pump Station	Sample Method:	Test Pit
Geologist:	BU	Drill Date:	11/26/91

Dames & Moore

FILENAME: TRMTN-TP.DRW

Geological Test Pit Log



Lithologic Description

PEAT; brown, moist, soft, abundant rootlets, topsoil.

Clayey SILT; greenish gray, soft, medium plasticity, moist.

Clayey SILT; olive gray becoming greenish grey at 12' bgs, hard, low plasticity, dry to damp, scattered cobbles and boulders at 12' bgs to total depth.

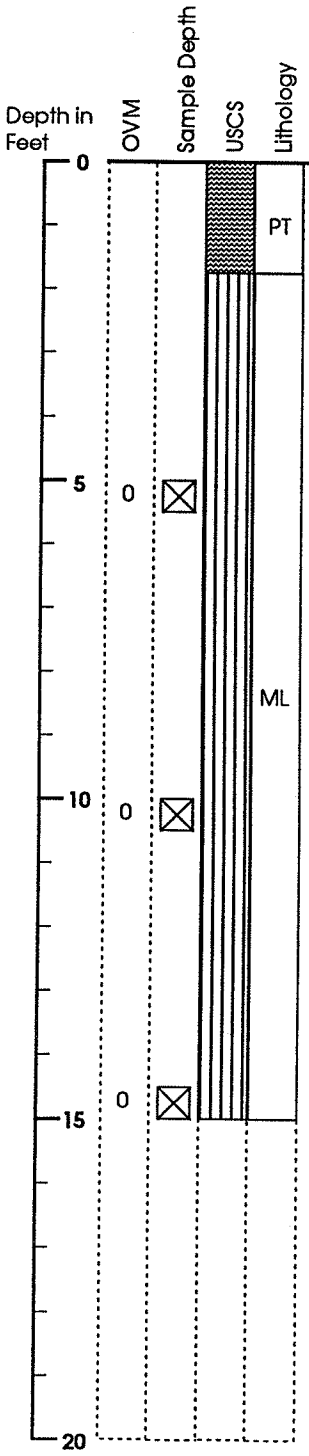
Terminated pit at 15' bgs on 11/26/91.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TP-10
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	Laurel Pump Station	Sample Method:	Test Pit
Geologist:	BU	Drill Date:	11/26/91

Dames & Moore

FILENAME: TRMTN-TP.DRW

Geological Test Pit Log



Lithologic Description

PEAT; brown, topsoil, moist, soft, abundant rootlets, scattered gravel.

Clayey SILT; olive gray, dry to damp, hard, low plasticity, scattered sands.

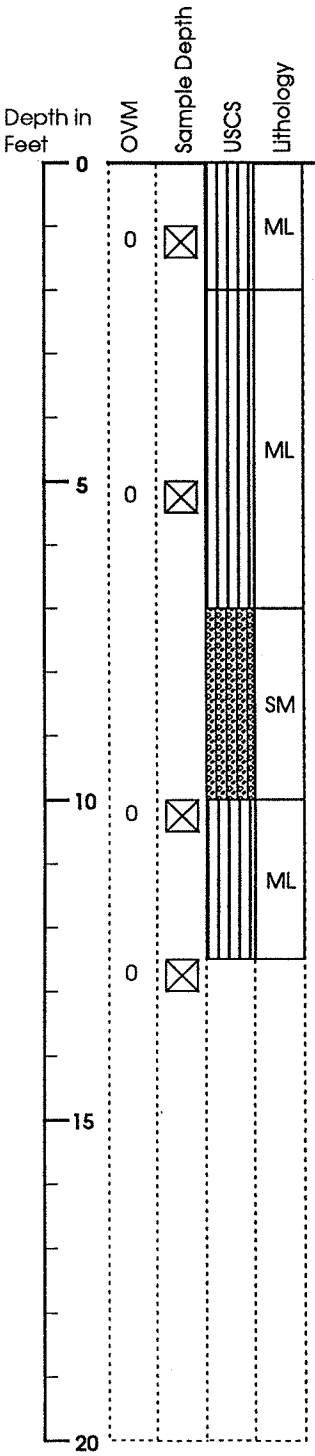
Terminated pit at 15' bgs on 11/26/91.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TP-11
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	Laurel Pump Station	Sample Method:	Test Pit
Geologist:	BU	Drill Date:	11/26/91

FILENAME: TRMTN-TP.DRW

Dames & Moore

Geological Test Pit Log



Lithologic Description

SILT; dark brown, (topsoil), rootlets, discrete red brown oxidation patches.

Sandy SILT; brown (10yr 5/3), sand fine with race coarse sand, scattered rounded pebbles to 0.5", moist to damp, moderately stiff, rust staining evident - not pervasive.

- water seeping into pit.

Silty SAND; brown (10yr 5/3); scattered gravels (subangular cobbles up to 4 - 5"), damp, sands coarse to medium coarse.

Sandy SILT; gray; trace rounded fine sand and pebbles, moderately dense to dense, stiff, dry.

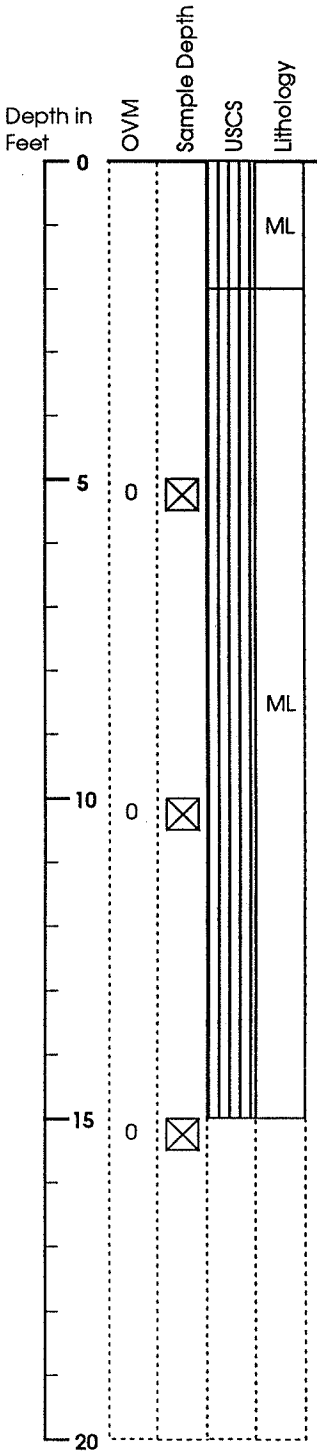
Terminated pit at 12.5' bgs on 12/2/91.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TP-12
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	Laurel Pump Station	Sample Method:	Test Pit
Geologist:	PC	Drill Date:	12/2/91

Dames & Moore

FILENAME: TRMTN-TP.DRW

Geological Test Pit Log



Lithologic Description

SILT; dark brown, (topsoil), abundant rootlets, saturated to moist, trace clay, very low plasticity, surface water seeping through.

Sandy SILT; light brown (10yr 5/3), fine sand with trace coarse sand, moist, trace clay, low plasticity, oxidation apparent through rust brown mottling.

- becoming stiff to hard with trace gravel, subrounded pebbles up to 3", rootlets and oxidation visible.

- rare subrounded boulders up to 7" to 12".

- becoming gray with depth, increasing stiffness (shale like).

Sandy SILT; gray, fine sand, hard with trace pebbles and rare boulders, (mudstone like).

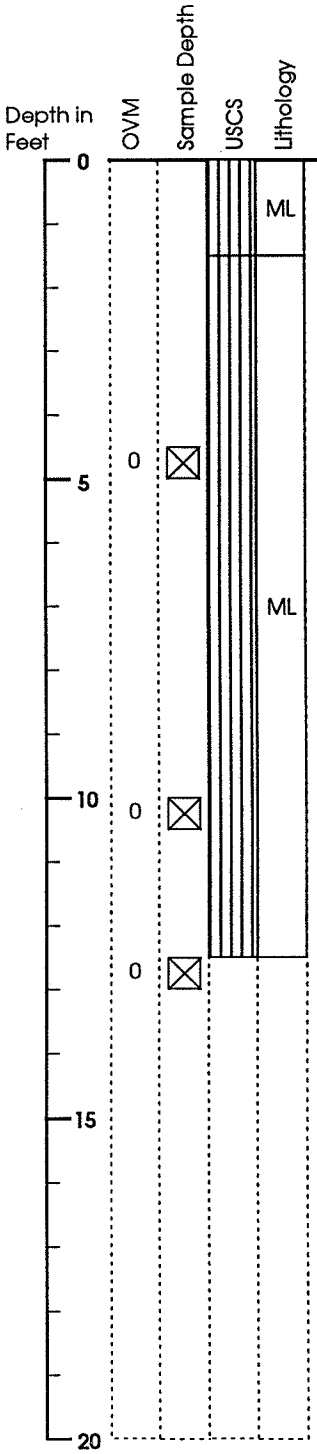
Terminated pit at 15' bgs on 12/2/91.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TP-13
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	Laurel Pump Station	Sample Method:	Test Pit
Geologist:	PC	Drill Date:	12/2/91

Dames & Moore

FILENAME: TRMTN-TP.DRW

Geological Test Pit Log



Lithologic Description

SILT; dark brown, (topsoil), few rounded pebbles, dark wood fragments, rootlets, moist.

- water seeping in - rust coloration throughout.

Sandy SILT; brown (10yr 5/3), fine sand, rust oxidation throughout cuttings, few rounded pebbles up to 1", dry.

- becoming slightly stiff to hard, lighter brown, rare cobble up to 8"; subrounded.

- more stiff / dense.

SILT; dark gray, hard, few subangular pebbles up to 0.5", rare sunrounded boulders up to 24 - 30", dry.

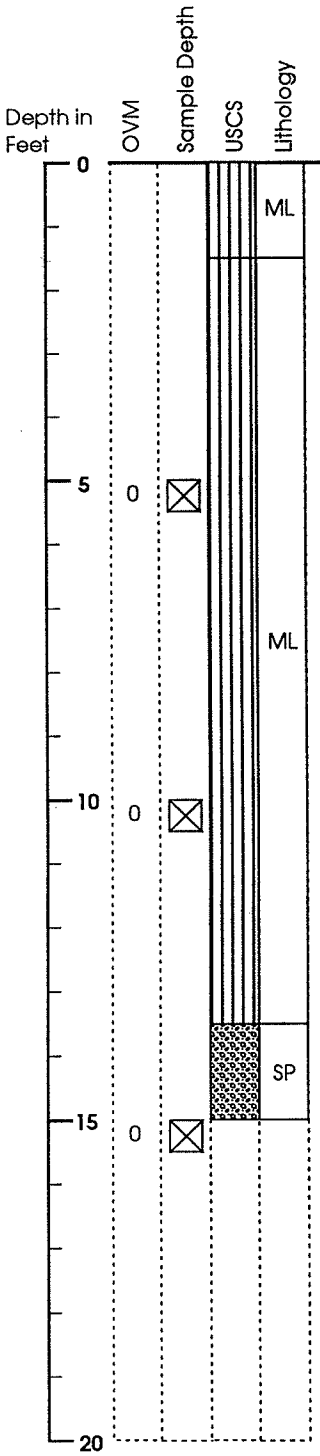
Terminated pit at 12.5' bgs due to large (30") boulder.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TP-14
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	Laurel Pump Station	Sample Method:	Test Pit
Geologist:	PC	Drill Date:	12/2/91

Dames & Moore

FILENAME: TRMTN-TP.DRW

Geological Test Pit Log



Lithologic Description

SILT; dark brown (topsoil), dry to damp, abundant rootlets.

- minor seepage of water.

Sandy SILT; brown, few rounded pebbles, 5 - 10% fine sand, medium stiff, seams of oxidation throughout, damp.

- rare rounded cobble up to 6" diameter.

- decrease in sand content, becoming stiff to hard in areas, moist.

SILT; gray, minor coarse sand and trace gravel (cobbles up to 8"), hard, dense, dry.

SAND; gray brown, medium grained, poorly graded with large cobbles up to 8", moist.

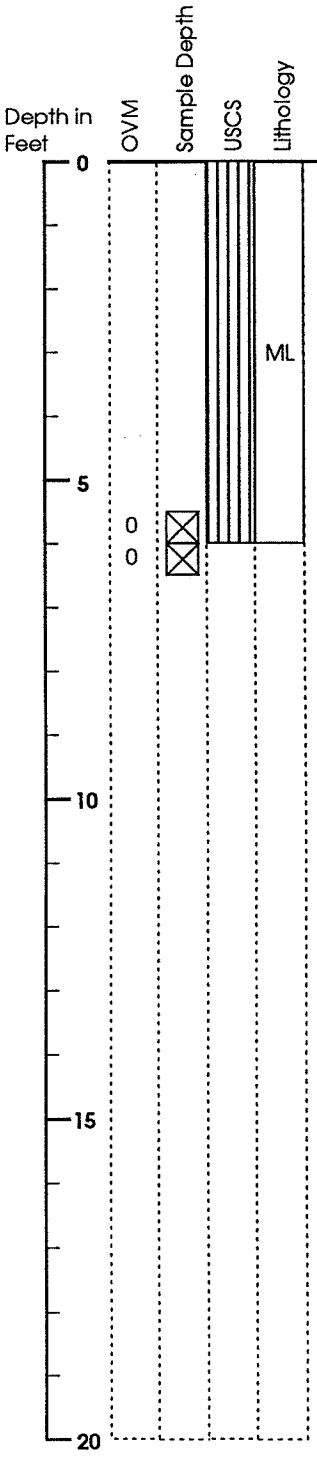
Terminated pit at 15' bgs on 12/2/91.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TP-15
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	Laurel Pump Station	Sample Method:	Test Pit
Geologist:	PC	Drill Date:	12/2/91

Dames & Moore

FILENAME: TRMTN-TP.DRW

Geological Test Pit Log



Lithologic Description

SILT; brown (10yr 5/3), minor fine sand and pebbles, rare large cobbles, oxidation seams throughout, abundant rootlets and wood fragments, dry.

- becoming lighter in color, rare 20" boulder encountered, becoming more dense.

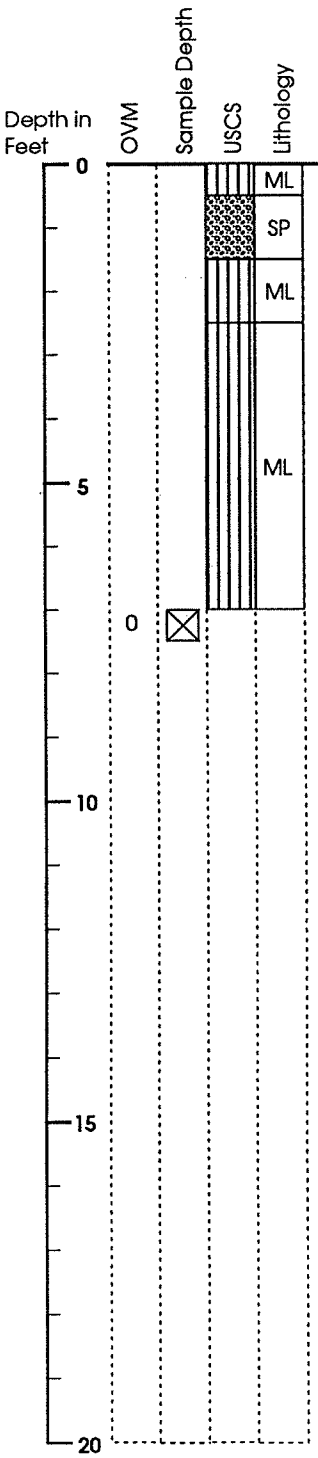
Terminated pit at 6' bgs on 12/3/91.
Pipe encountered at 5 - 6' bgs, soils around pipe did not show signs of petroleum hydrocarbons, black and rust weathering did appear on fractured surfaces.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TP-16
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	Laurel Pump Station	Sample Method:	Test Pit
Geologist:	PC	Drill Date:	12/3/91

Dames & Moore

FILENAME: TRMTN-TP.DRW

Geological Test Pit Log



Lithologic Description

SILT; dark brown (topsoil), abundant rootlets, dry.

Gravelly SAND; brown, medium to coarse with rounded cobbles, wet.

SILT; brown, wood fragments, dry, becoming more grey with depth.

Clayey SILT; gray with few rounded pebbles up to 1" diameter, wood chips, dense, moderate plasticy.

- encountered decomposing log and 20 - 24" boulder.

- no sign of petroleum hydrocarbons. encountered pipe at 6.5' bgs.

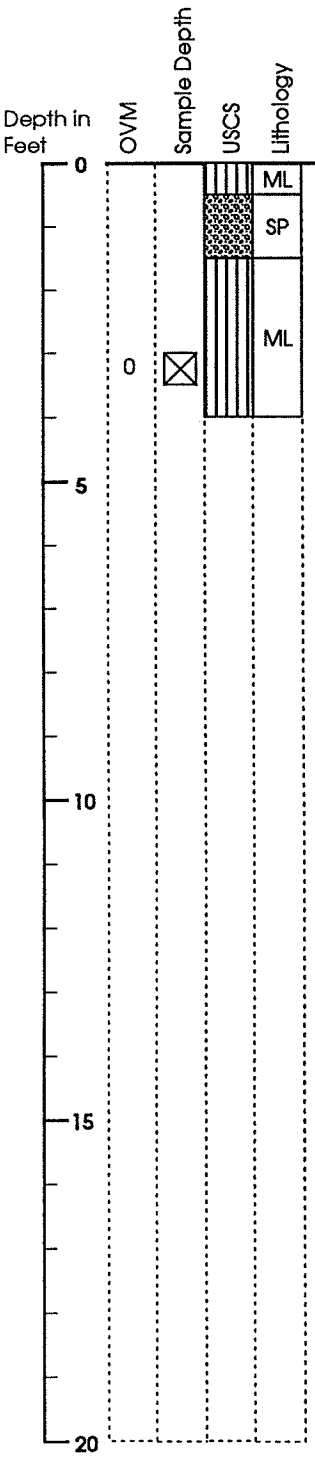
Terminated test pit at 7' bgs.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TP-17
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	Laurel Pump Station	Sample Method:	Test Pit
Geologist:	PC	Drill Date:	12/3/91

Dames & Moore

FILENAME: TRMTN-TP.DRW

Geological Test Pit Log



Lithologic Description

SILT; dark brown (topsoil), abundant rootlets.

Gravelly SAND; brown, round cobbles and medium to coarse sand, moist.

SILT; brown, slightly clayey, stiff, signs of water seepage.
- no signs of petroleum hydrocarbons.

Pipe encountered at 2.5' bgs.

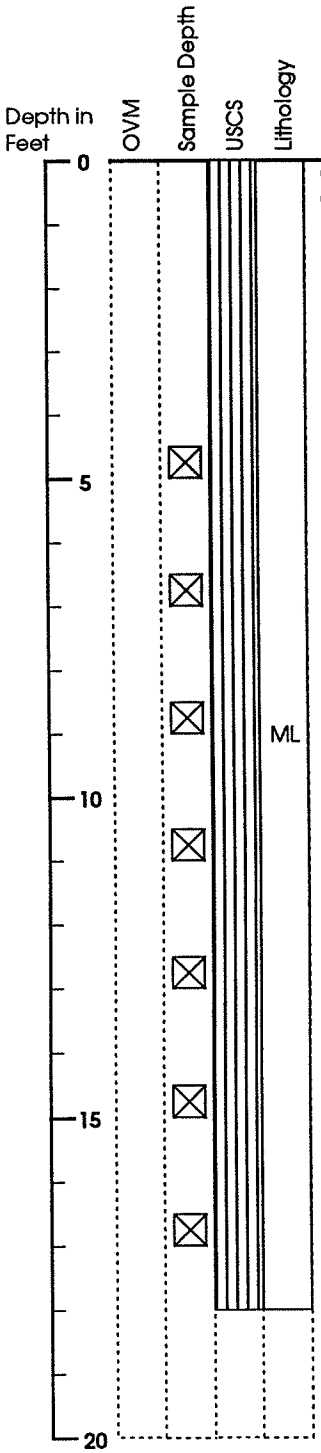
Terminated test pit at approximately 4' bgs on 12/4/91.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TP-18
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	Laurel Pump Station	Sample Method:	Test Pit
Geologist:	PC	Drill Date:	12/4/91

Dames & Moore

FILENAME: TRMTN-TP.DRW

Geological Test Pit Log



Lithologic Description

Gravel fill.

Clayey SILT; olive grey / brown becoming darker with depth, dense, very stiff / hard, low plasticity, moist.

(Base of pump)

- becoming grey / dark grey.

Clayey SILT; as above, relatively dry.

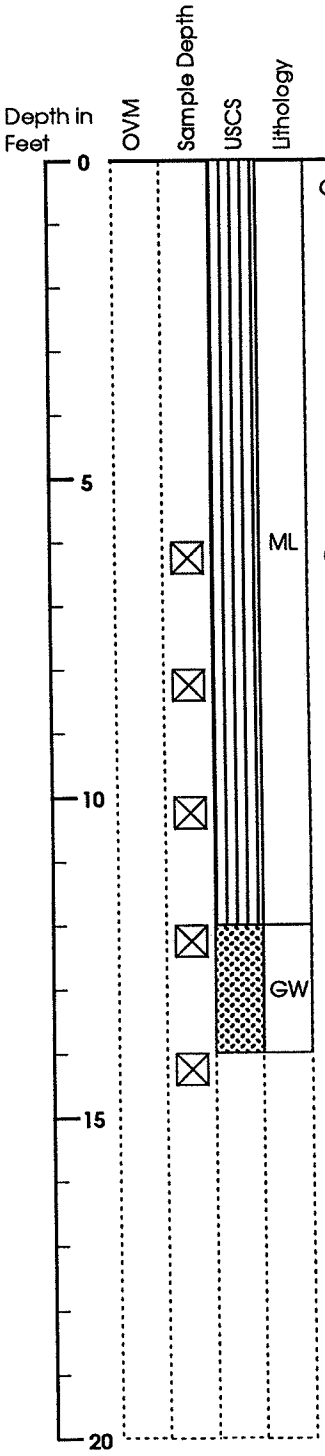
Terminated pit at 18' bgs on 11/19/92.
No odors encountered in any samples.

Client:	Trans Mountain Pipe Line Co.	Boring No:	PB-1
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	Laurel Pump Station	Sample Method:	Test Pit
Geologist:	BAU	Drill Date:	11/19/91

Dames & Moore

FILENAME: TRSM-TP.DRW

Geological Test Pit Log



Lithologic Description

Clayey SILT; olive grey / brown dry to damp, occasional rounded sand to cobble size particles, very stiff, low plasticity.

(Base of pump)

- becoming grey / dark grey.

Sandy GRAVEL; olive grey, wet, well graded, rounded gravels and occasional cobbles, obvious hydrocarbon odor / sheen / stain, water filling up bottom of pit at contact between ML and GW.

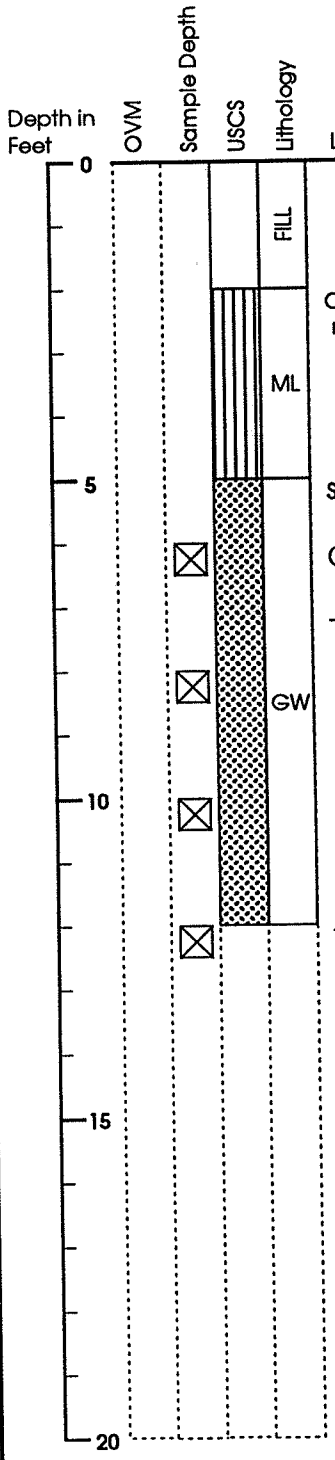
Terminated boring at 14' bgs on 11/20/92.

Client:	Trans Mountain Pipe Line Co.	Boring No:	PB-2
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	Laurel Pump Station	Sample Method:	Test Pit
Geologist:	BAU	Drill Date:	11/20/91

Dames & Moore

FILENAME: TRSM-TP.DRW

Geological Test Pit Log



Lithologic Description

Clayey SILT; olive grey, moist, dense, very hard / stiff, low plasticity, occasional sands and rounded cobbles.

Sandy GRAVEL; olive grey, moist, well graded, rounded gravels and occasional cobbles.

(Base of pump)

- obvious hydrocarbon odor and staining throughout interval.

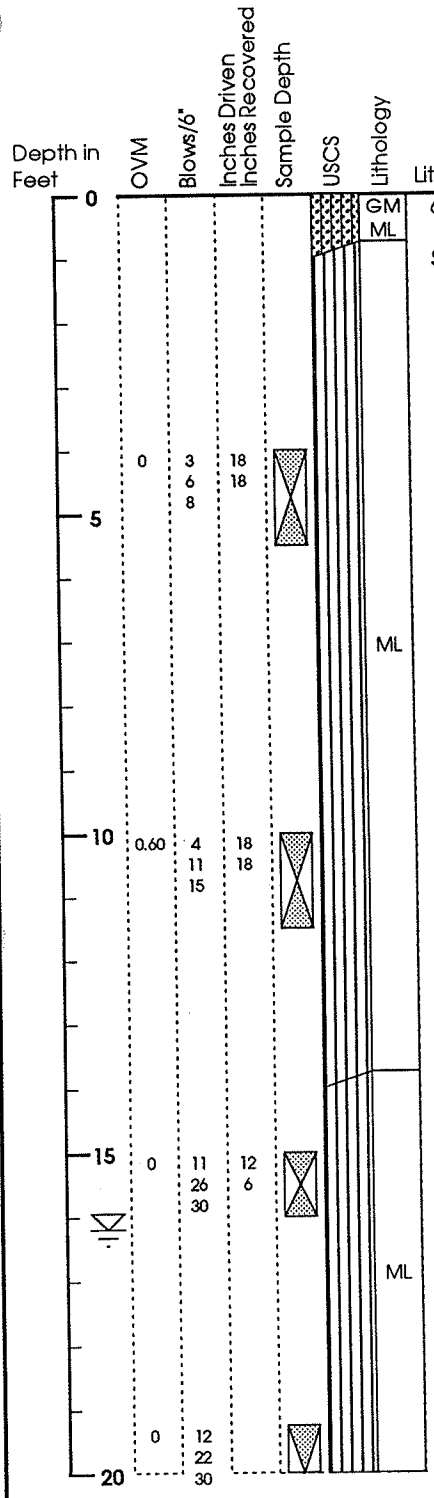
Terminated boring at 12' bgs on 11/19/92.

Client:	Trans Mountain Pipe Line Co.	Boring No:	PB-4
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	Laurel Pump Station	Sample Method:	Test Pit
Geologist:	BAU	Drill Date:	11/19/91

Dames & Moore

FILENAME: TRSM-TP.DRW

Geological Boring Log



Lithologic Description

6" dark brown topsoil, roots, organic, some gravel.

Silty GRAVEL; 50% silt, 50% gravel; moist, loose.

OVM: 0 | Blows/6": 3, 6, 8 | Inches Driven: 18 | Inches Recovered: 18

Clayey SILT; dark brown (7.5yr 3/2); scattered 1" well rounded gravels; moist, poorly graded, non plastic, medium stiff, small fragments of burnt wood, twigs, slightly organic (fill).

OVM: 0.60 | Blows/6": 4, 11, 15 | Inches Driven: 18 | Inches Recovered: 18

SILT; gray brown (5yr 5/2); scattered 1" well rounded gravels; moist, non plastic, poorly graded, very stiff, occasional wood chips.

Cuttings become saturated.

OVM: 0 | Blows/6": 11, 26, 30 | Inches Driven: 12 | Inches Recovered: 6

Gravely SILT; brown (7.5yr 4/2); 55% silt, 40% gravel with trace fine to medium sand; 1/2" subangular fragments of basalt and granite; saturated, non plastic, dense.

OVM: 0 | Blows/6": 12, 22, 30

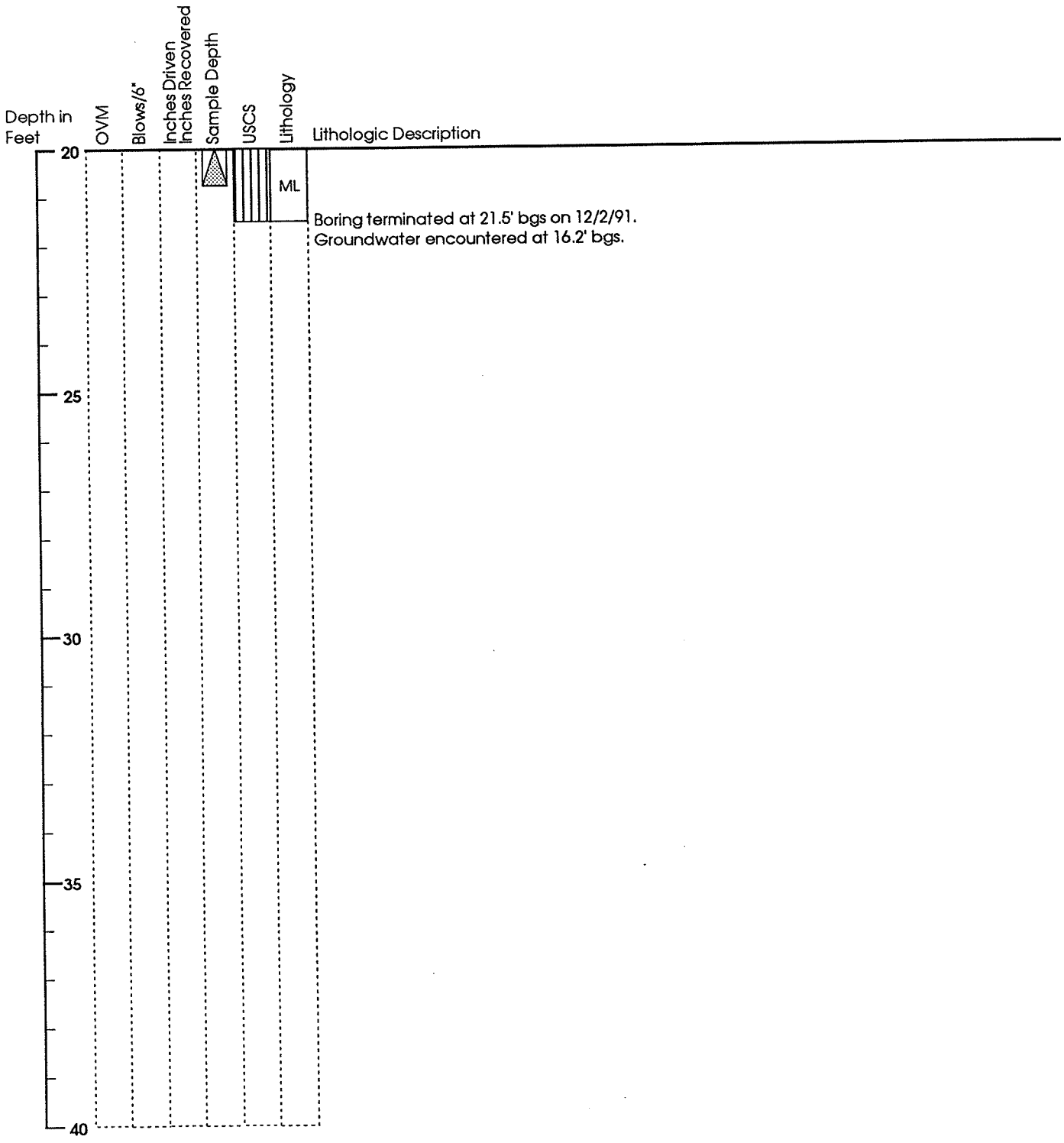
Gravely SILT; grayish brown (5yr 5/2); 55% silt, 40% gravel with trace fine to medium sand; moist, non plastic, very dense, gravel fragments include basalt and granite.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B2
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Bellingham, WA	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	MAO	Drill Contractor:	Hays Drilling
		Drill Date:	12/2/91

Dames & Moore

FILENAME: TM-B2.DRW

Geological Boring Log

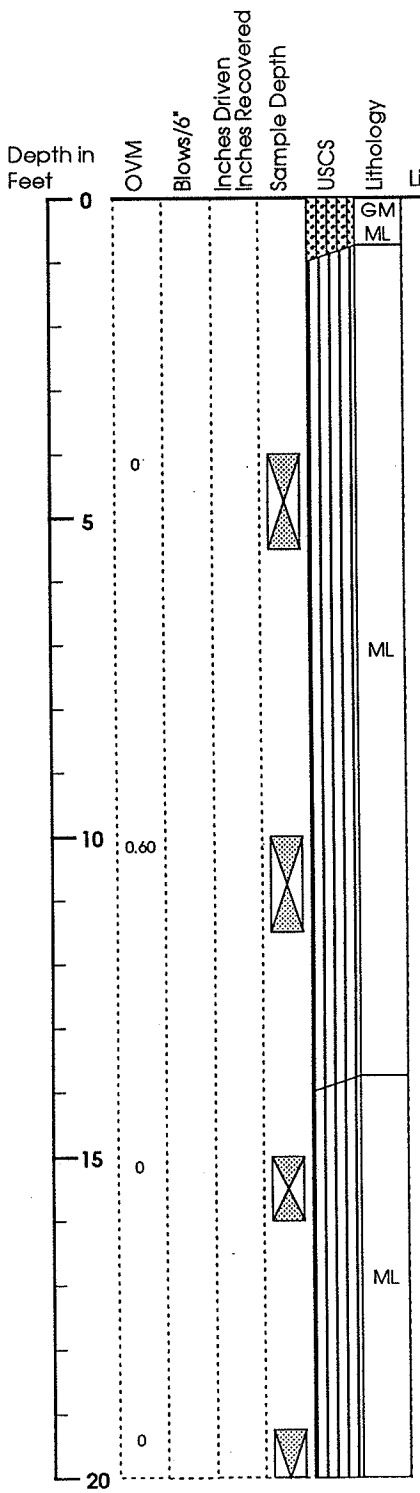


Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B2
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Bellingham, WA	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	MAO	Drill Contractor:	Hays Drilling
		Drill Date:	12/2/91

Dames & Moore

FILENAME: TM-B2.DRW

Geological Boring Log



Lithologic Description

6" dark brown topsoil, roots, organic, some gravel.

Silty GRAVEL; 50% silt, 50% gravel; moist, loose.

Clayey SILT; dark brown (7.5yr 3/2); scattered 1" well rounded gravels; moist, well sorted, non plastic, medium stiff, small fragments of burnt wood, twigs, slightly organic (fill).

SILT; gray brown (5yr 5/2); scattered 1" well rounded gravels; moist, non plastic, well sorted, very stiff, occasional wood chips.

Cuttings become saturated.

Gravely SILT; brown (7.5yr 4/2); 55% silt, 40% gravel with trace fine to medium sand; 1/2" subangular fragments of basalt and granite; saturated, non plastic, dense.

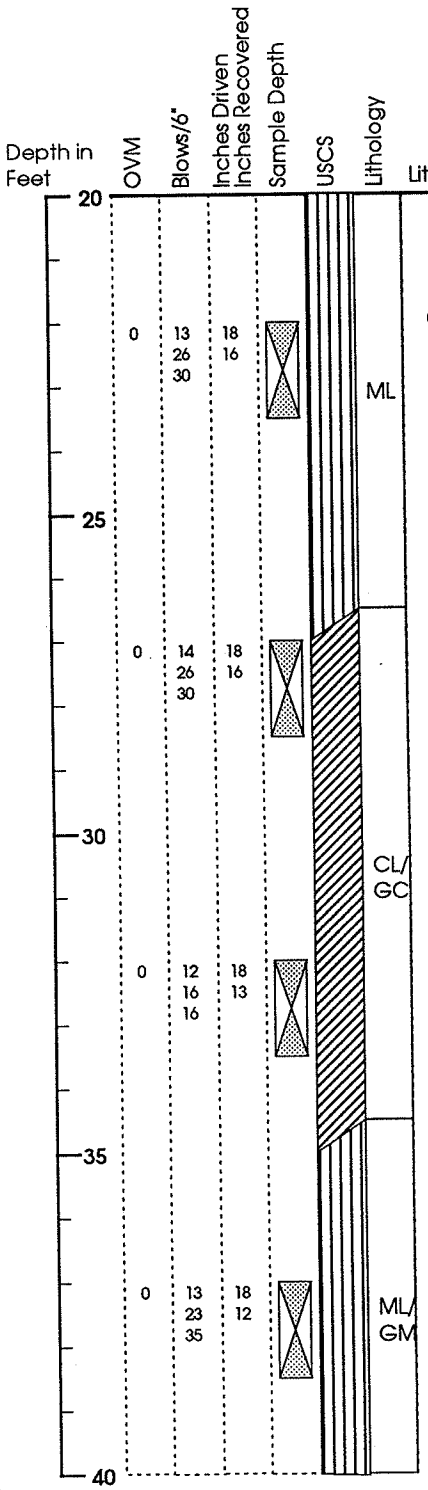
Gravely SILT; grayish brown (5yr 5/2); 55% silt, 40% gravel with trace fine to medium sand; moist, non plastic, very dense, gravel fragments include basalt and granite.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B3
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Bellingham, WA	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	MAO	Drill Contractor:	Hays Drilling
		Drill Date:	12/3/91

Dames & Moore

FILENAME: TM-B3.DRW

Geological Boring Log



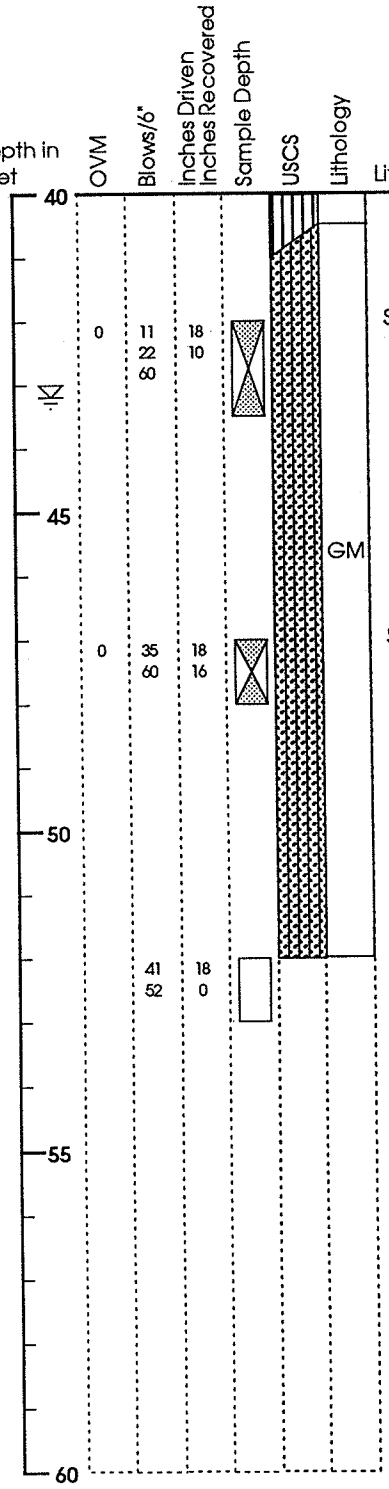
OVM	Blows/6"	Inches Driven	Inches Recovered	Lithologic Description
0	13 26 30	18	16	Gravelly clayey SILT; dark gray (2.5yr 4/0); 70% fines, 30% gravel; well sorted, moist, gravels fine to medium, subangular, very stiff.
0	14 26 30	18	16	Silty gravelly CLAY; dark gray (2.5 4/0); 10% gravel with trace of fine sand and well rounded clasts of granite; moist, slight plasticity, very stiff, some small wood splinters in nose of sample.
0	12 16 16	18	13	Silty CLAY; grayish brown (10yr 5/2); as above; very stiff.
				Drillers indicate gravel begins at 35.0' bgs.
0	13 23 35	18	12	Gravelly SILT; grayish brown (10yr 5/2); 50% silt, 45% gravel and 5% clay; moist, 1/4 to 3" angular gravels (granite), very dense; bottom 3" of sample contains poorly sorted gravels with fine to coarse sand; glacial drift.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B3
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Bellingham, WA	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	MAO	Drill Contractor:	Hays Drilling
		Drill Date:	12/3/91

Dames & Moore

FILENAME: TM-B3.DRW

Geological Boring Log



Silty sandy GRAVEL; gray (2.5 yr 4/0); 50 - 55% gravel, 25% silt, 20% sand with trace clay; 1 - 2" subangular gravels (granite), sands fine to medium, saturated, poorly sorted, very dense.

Silty sandy GRAVEL; gray (2.5yr 5/0); 60% gravel, 30% silt, 10% sand; 1 - 2" angular basalt and granite clasts; saturated, well sorted, very dense.

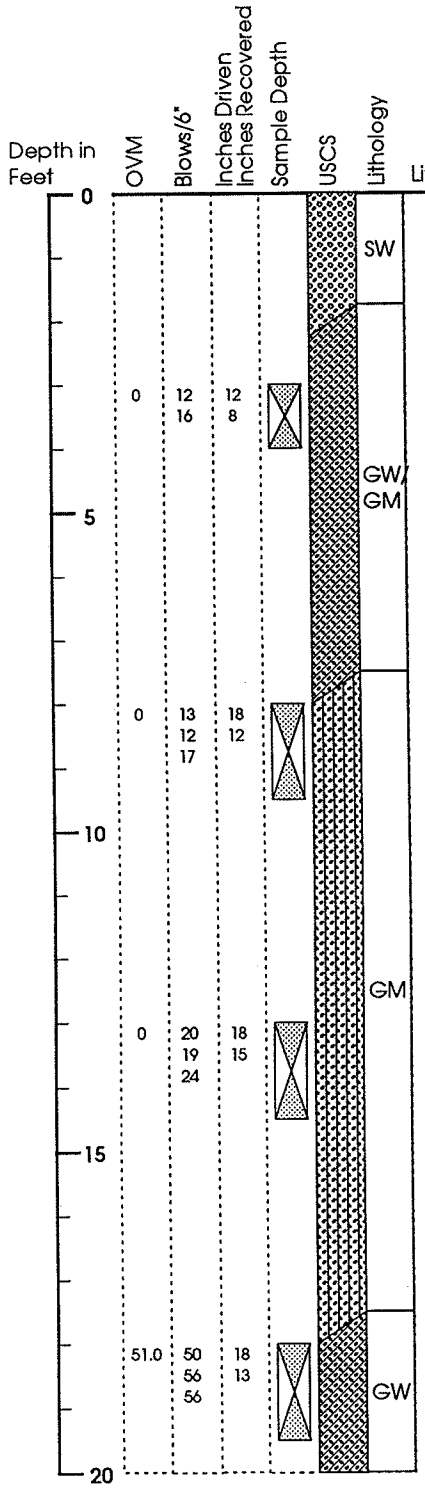
No recovery.
Boring terminated at 52.0' bgs on 12/3/91.
Groundwater encountered at 43.3' bgs.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B3
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Bellingham, WA	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	MAO	Drill Contractor:	Hays Drilling
		Drill Date:	12/3/91

Dames & Moore

FILENAME: TM-B3.DRW

Geological Boring Log



Lithologic Description

Gravelly SAND; gray (10yr 4/0); 80% fine to medium sand, 20% gravel; 1/2 - 1" well rounded gravels, poorly sorted.

Silty sandy GRAVEL; brownish gray (10yr 6/2); 60% gravel, 25% silt, 15% fine to medium sand; moist, poorly sorted, very dense, no bedding observed.

Silty sandy GRAVEL; light gray (10yr 7/2); 35% gravel, 35% silt, 30% fine to medium sand; well sorted, saturated, non plastic; gravels fine to medium, very dense, no bedding observed.

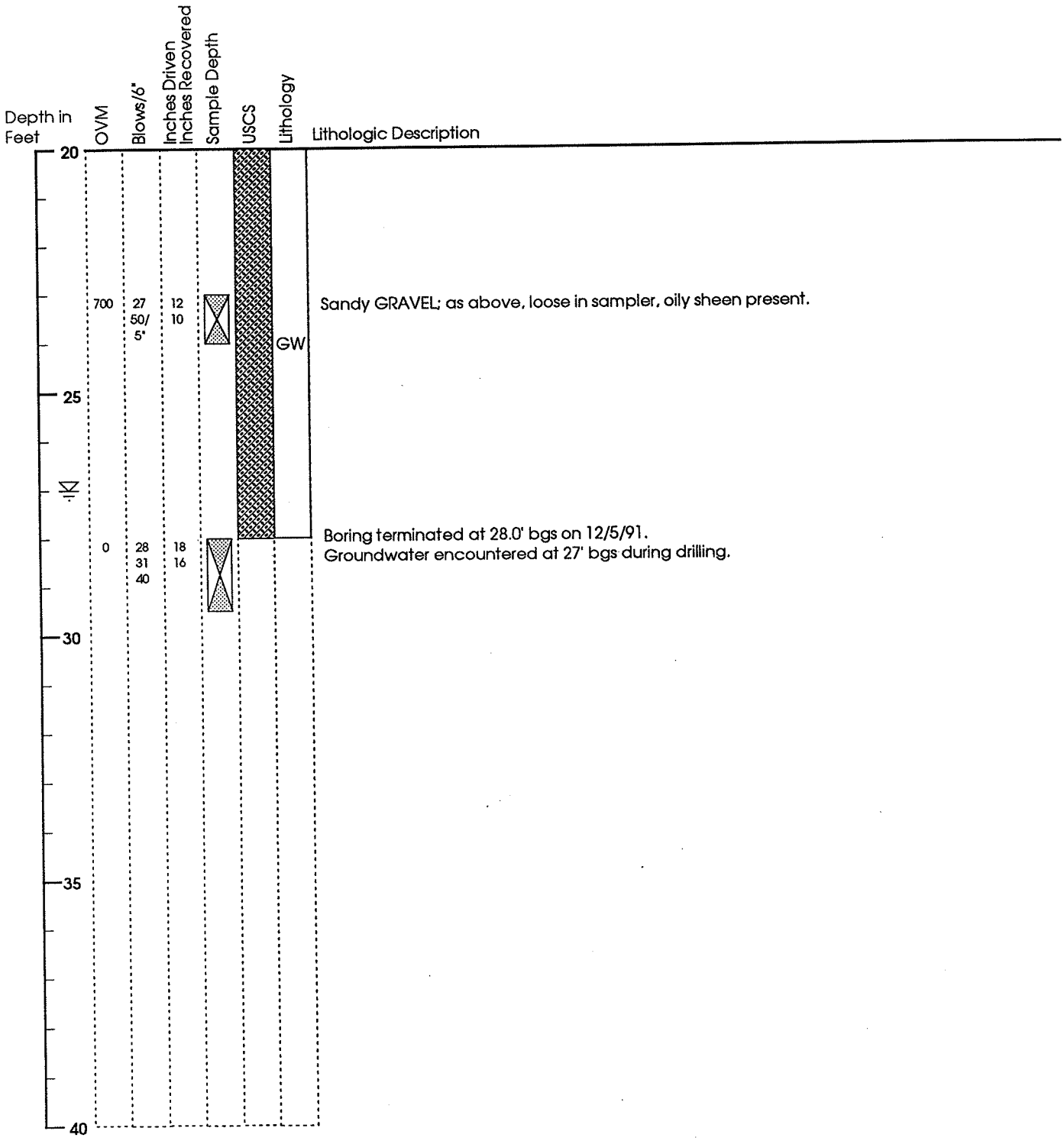
Silty sandy GRAVEL; gray (7.5yr 6/0); 40% gravel, 40% sand, 20% silt; well sorted, moist, very dense.

Stopped drilling at 18.0'-1535 ppm hits and 20% lpl.

Sandy GRAVEL; dark gray (7.5yr 4/0); 70% fine gravels, 30% fine to coarse sand; saturated, oily sheen apparent, poorly sorted, very dense.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B4
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Bellingham, WA	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	MAO	Drill Contractor:	Hays Drilling
		Drill Date:	12/5/91

Geological Boring Log

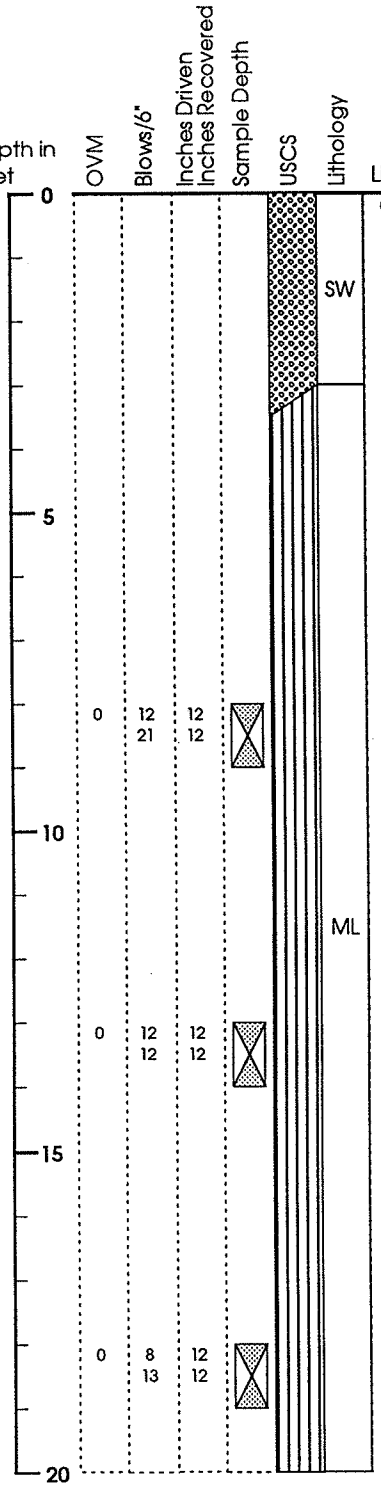


Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B4
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Bellingham, WA	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	MAO	Drill Contractor:	Hays Drilling
		Drill Date:	12/5/91

Dames & Moore

FILENAME: TM-B4.DRW

Geological Boring Log



Gravelly SAND; 70% fine to coarse poorly sorted sand, 30% gravel with trace silt, 1 - 3" rounded gravels, scattered 6" cobbles (well rounded), loose, moist, no bedding (fill).

Sandy SILT; brown (10yr 5/3); moist.

OVM	Blows/6"	Inches Driven	Inches Recovered	Sample Depth
0	12	12	12	
	21		12	

Sandy SILT; brown (10yr 5/3); 70% silt, 30% sand with scattered 1/2" rounded gravels; well sorted, moist, non plastic, slightly organic, stiff, no bedding, small zones of oxidation staining.

OVM	Blows/6"	Inches Driven	Inches Recovered	Sample Depth
0	12	12	12	
	12		12	

Sandy SILT; brownish gray (2.5 5/2); 75% silt, 25% sand with scattered fine basalt clasts; dense, moist, well sorted, stiff, no bedding observed, non plastic.

OVM	Blows/6"	Inches Driven	Inches Recovered	Sample Depth
0	8	12	12	
	13		12	

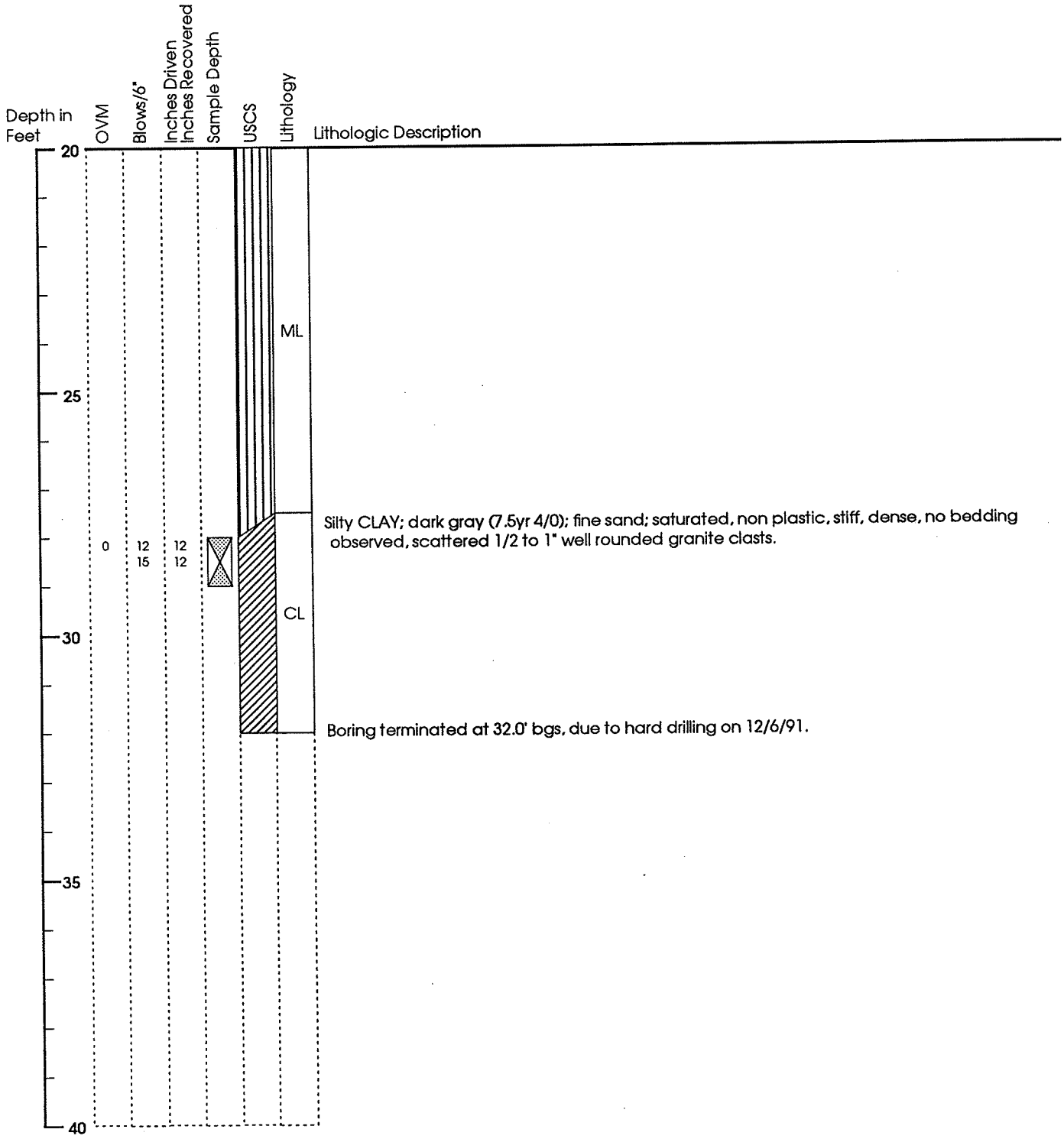
Sandy SILT; gray (7.5yr 4/0); 80% silt, 20% sand; moist, sampler saturated due to 2" of water in bottom of hole, non plastic, no bedding, stiff, scattered fine gravels of basalt.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B5
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Bellingham, WA	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	MAO	Drill Contractor:	Hays Drilling
		Drill Date:	12/6/91

Dames & Moore

FILENAME: TM-B5.DRW

Geological Boring Log

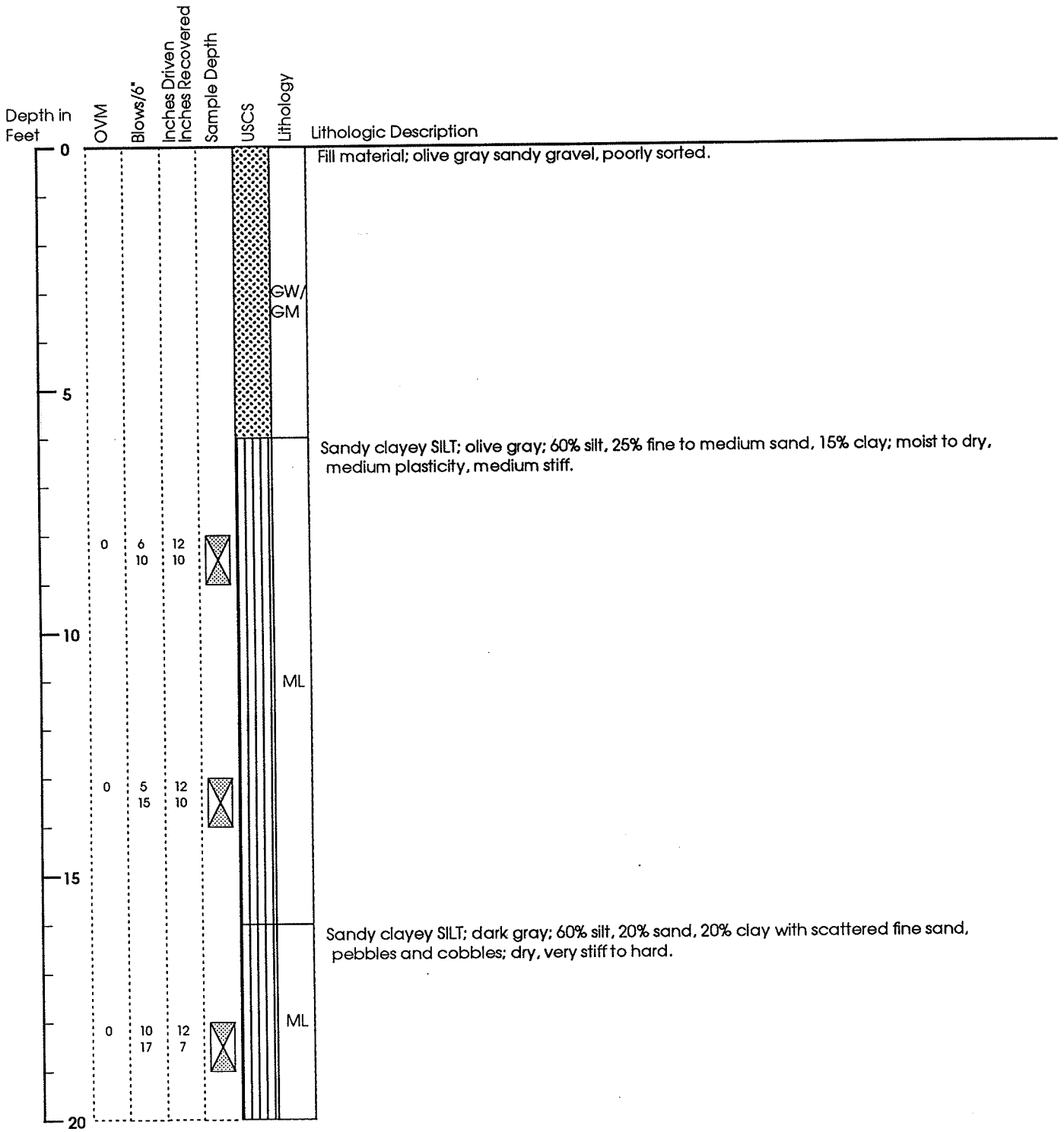


Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B5
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Bellingham, WA	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	MAO	Drill Contractor:	Hays Drilling
		Drill Date:	12/6/91

Dames & Moore

FILENAME: TM-B5.DRW

Geological Boring Log

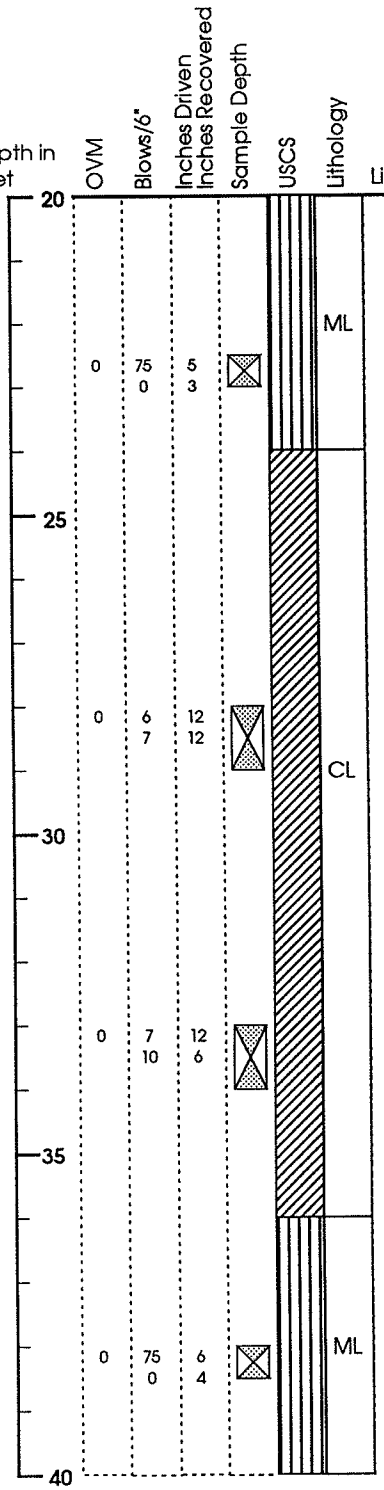


Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B6
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	MAO	Drill Contractor:	Hays Drilling
		Drill Date:	12/9/91

Dames & Moore

FILENAME: TM-B6.DRW

Geological Boring Log



Very hard drilling due to boulders, must move and reattempt boring.

Silty CLAY; dark grey; dry, medium to high plasticity, moderately stiff to soft, scattered sand, less pebbles than above.

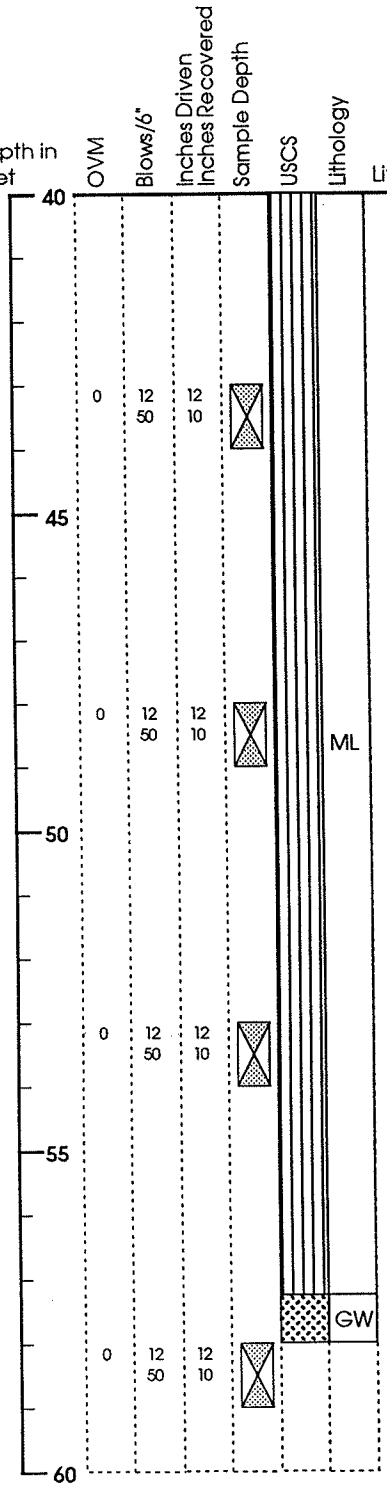
Poor recovery in sample.

Sandy gravelly SILT; gray; 45% silt, 40% medium to coarse sand, 15% gravel; wet.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B6
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	MAO	Drill Contractor:	Hays Drilling
		Drill Date:	12/9/91

FILENAME: TM-B6.DRW

Geological Boring Log



Lithologic Description

Clayey sandy SILT; gray; 70% silt, 15% clay, 15% sand; dry, moderately stiff to hard, medium plasticity.

Clayey SILT; 60% silt, 15% clay, 5% sand with scattered pebbles; dry, moderate to very stiff, medium plasticity.

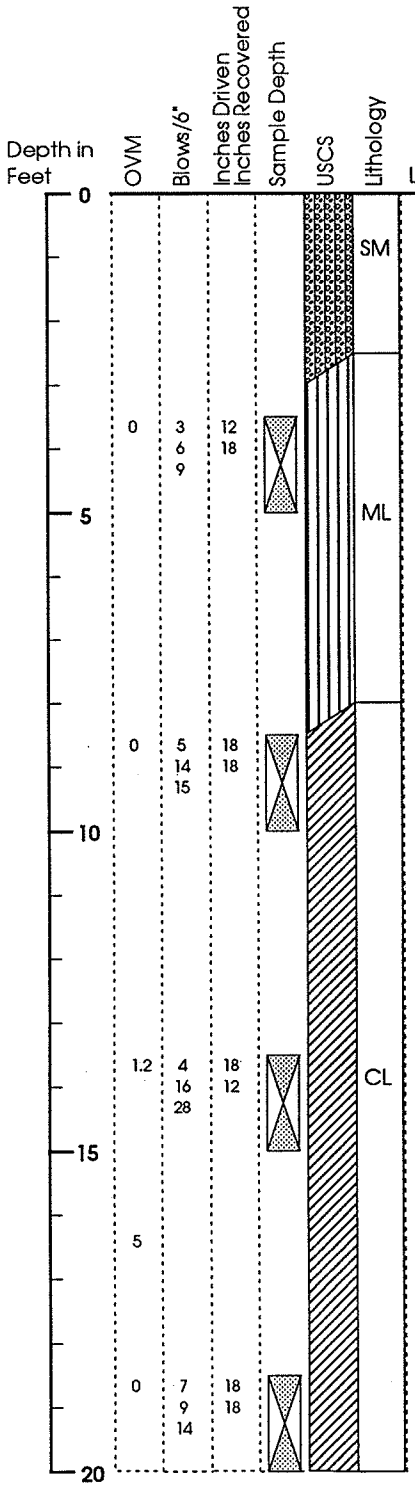
Sandy GRAVEL; gray; 60% gravel, 40% medium sand; moist, poorly sorted, subrounded.
Boring terminated at 58' bgs on 12/10/91.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B6
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	MAO	Drill Contractor:	Hays Drilling
		Drill Date:	12/9/91

Dames & Moore

FILENAME: TM-B6.DRW

Geological Boring Log



Lithologic Description

Silty clayey SAND; gray; moist, moderate plasticity, fill material.

Clayey sandy SILT; dark gray; 40 - 50% silt, 30 - 40% fine sand, 10% clay; damp, moderately stiff, low plasticity.

Silty sandy CLAY; gray to brown; 80 - 85% clay, 10 - 15% silt, 5 - 10% fine sand with trace gravel; damp, stiff to hard, high pasticity; gravels to 1", rounded; no odor.

Silty sandy CLAY; gray to brown; 80 - 85% clay, 10 - 15% silt, 5 - 10% fine sand with trace gravel; moist, moderately stiff, moderate plasticity.

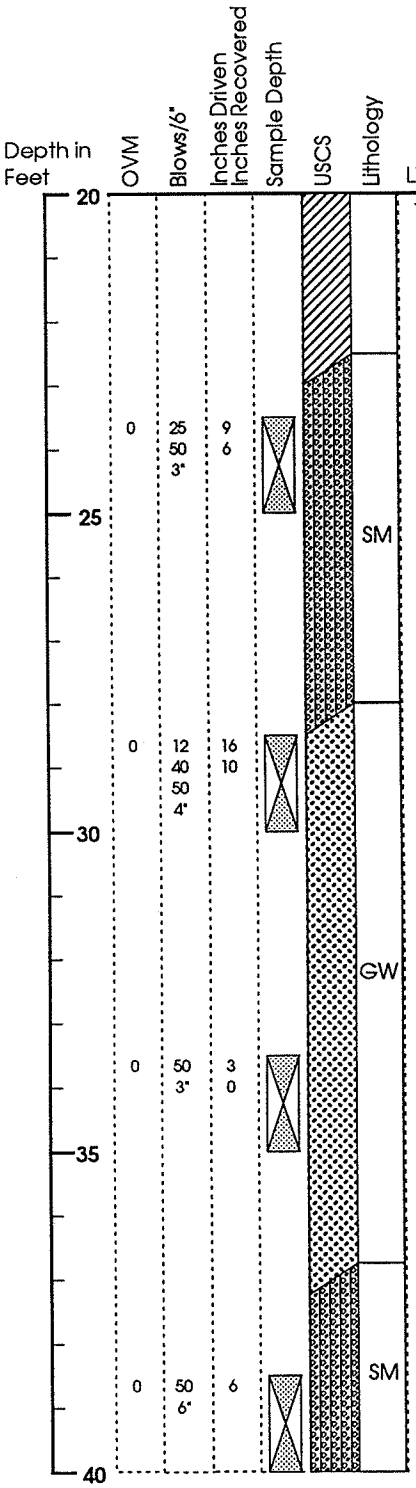
Silty CLAY; dark gray; trace fine sand and gravel; damp, very stiff, low plasticity, no odor.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B10
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	DSW	Drill Contractor:	Hayes Drilling
		Drill Date:	2/17/92

Dames & Moore

FILENAME: TM-B10.DRW

Geological Boring Log



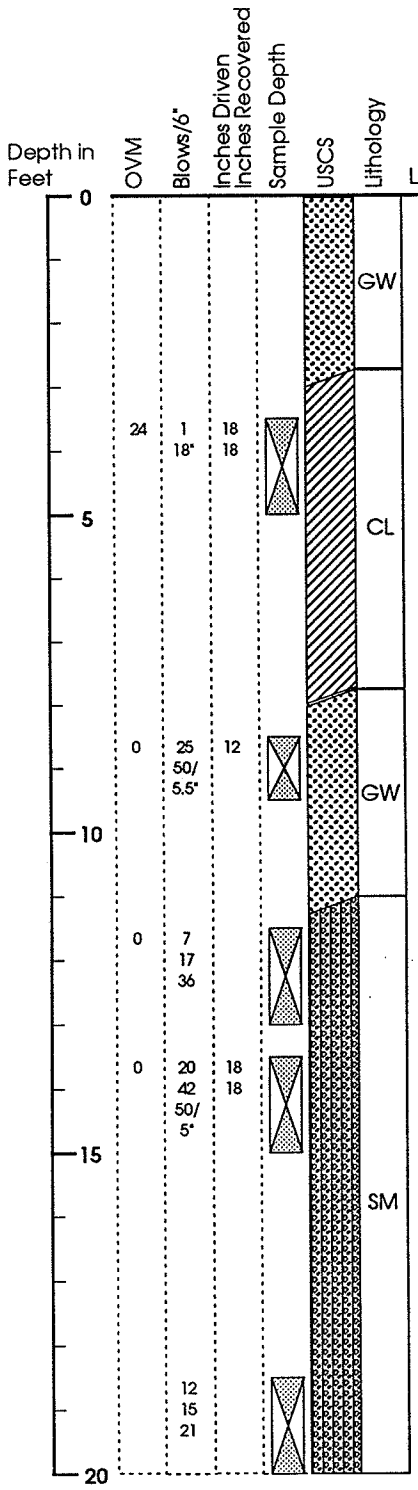
OVM	Blows/6"	Inches Driven	Inches Recovered	Sample Depth	USCS	Lithology	Lithologic Description
							- hard drilling.
0	25 50 3"	9	6			SM	Silty gravelly SAND; gray; 70% medium to coarse sand, 20 - 25% gravel, 5 - 10% silt; saturated, poorly sorted, medium dense to dense; gravels to 3", rounded.
							- hard drilling.
							- soft drilling.
0	12 40 50 4"	16	10			GW	Sandy GRAVEL / gravelly SAND; gray; 50% medium to coarse sand, 50% gravel with trace silt; damp to wet, dense, poorly sorted; gravels to 3", rounded.
0	50 3"	3	0				- no recovery.
0	50 6"	6				SM	Silty gravelly SAND; dark brown to gray; dense to loose; gravels to 4".
							Boring completed at 40' bgs on 2/17/92. No groundwater encountered during drilling.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B10
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	DSW	Drill Contractor:	Hayes Drilling
		Drill Date:	2/17/92

Dames & Moore

FILENAME: TM-B10.DRW

Geological Boring Log



GRAVEL ROAD - FILL

Silty sandy CLAY; gray and brown with greenish gray pockets; sand fine, saturated, moderately plastic.

- no recovery.
Silty sandy GRAVEL and cobbles; brown; saturated, low plasticity; sands fine to coarse.

- resampled 11.5 - 13' bgs.
Silty SAND with trace gravel and cobbles; mottled brown and gray; moist, slight plasticity; sands predominately fine, very compact (possibly till?).

As above; very dense, dry.

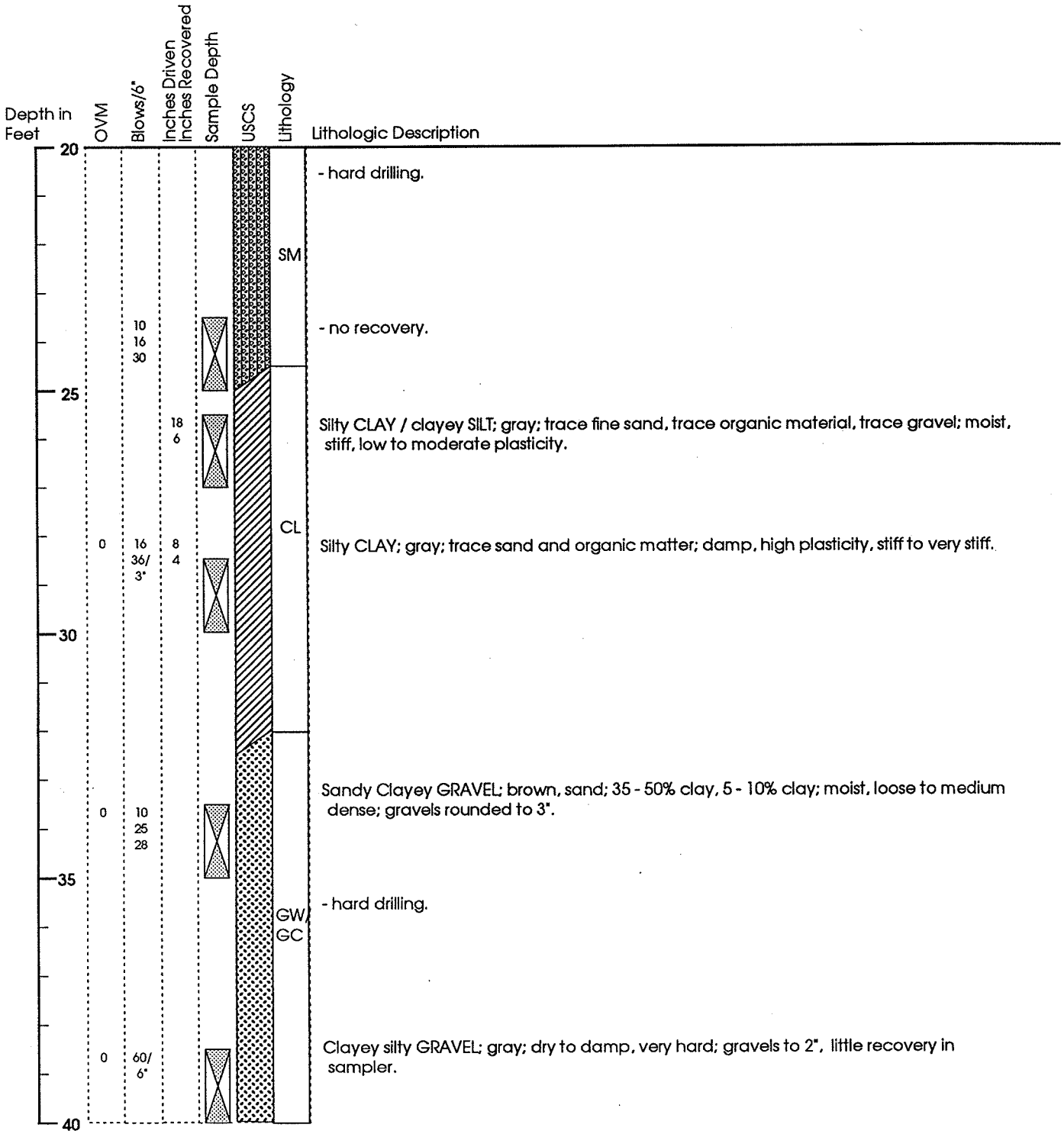
- no recovery.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B11
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	JKM / DSW	Drill Contractor:	Hayes Drilling
		Drill Date:	2/18/92

FILENAME: TM-B11.DRW

Dames & Moore

Geological Boring Log

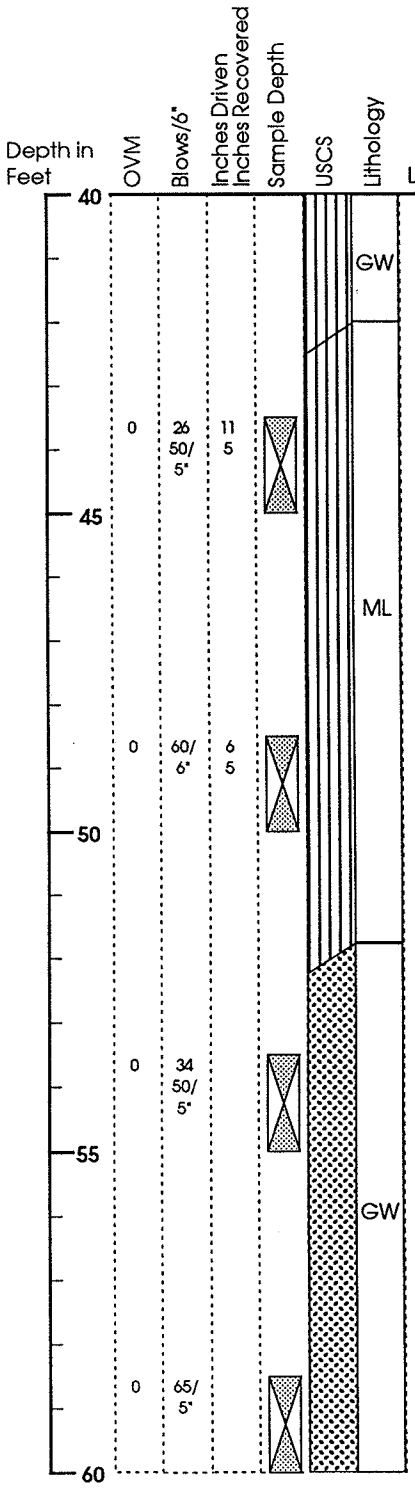


Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B11
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	JKM / DSW	Drill Contractor:	Hayes Drilling
		Drill Date:	2/18/92

FILENAME: TM-B11.DRW

Dames & Moore

Geological Boring Log



Lithologic Description

- very hard drilling.

Clayey SILT; gray; <10% fine sand and <5% gravel; damp, low plasticity

Gravelly sandy SILT; brown to gray; moist to wet, dense, poorly sorted; gravels to 2".

Silty sandy GRAVEL; brown to gray; 5 - 10% silt, 5 - 10% coarse sand; dry to damp, dense, poorly sorted; gravels to 3".

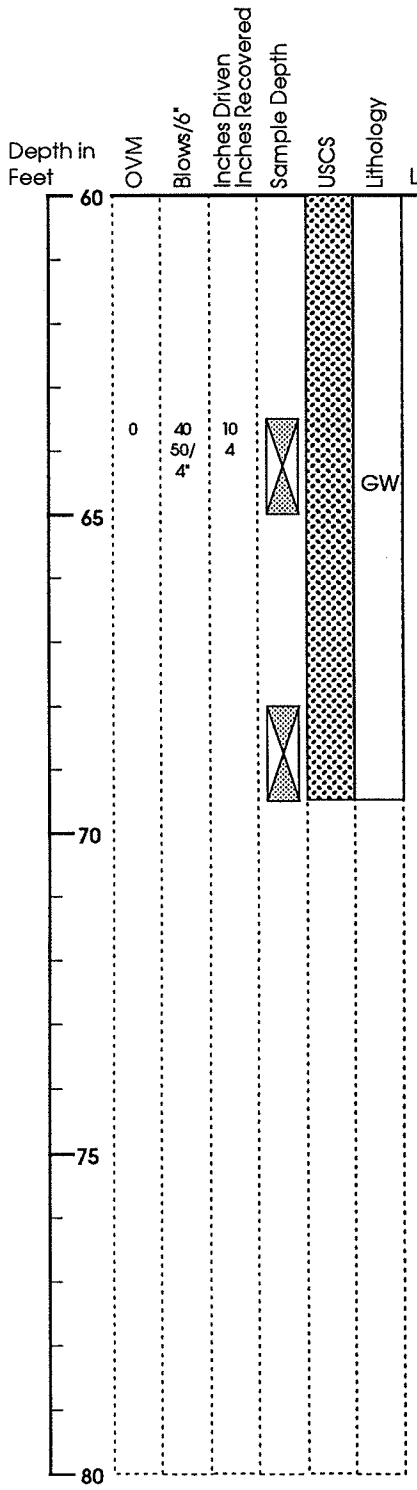
- no recovery.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B11
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	JKM / DSW	Drill Contractor:	Hayes Drilling
		Drill Date:	2/18/92

FILENAME: TM-B11.DRW

Dames & Moore

Geological Boring Log

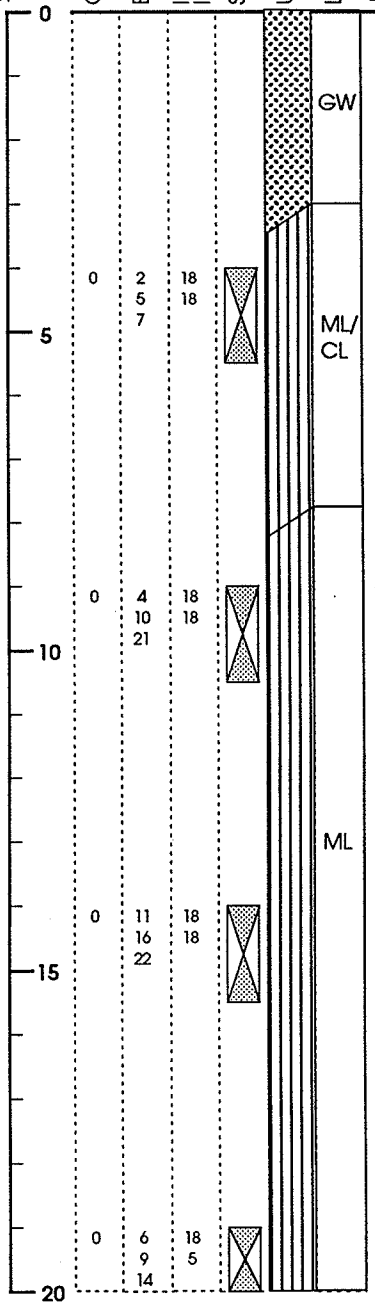


Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B11
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	JKM / DSW	Drill Contractor:	Hayes Drilling
		Drill Date:	2/18/92

FILENAME: TM-B11.DRW

Dames & Moore

Geological Boring Log



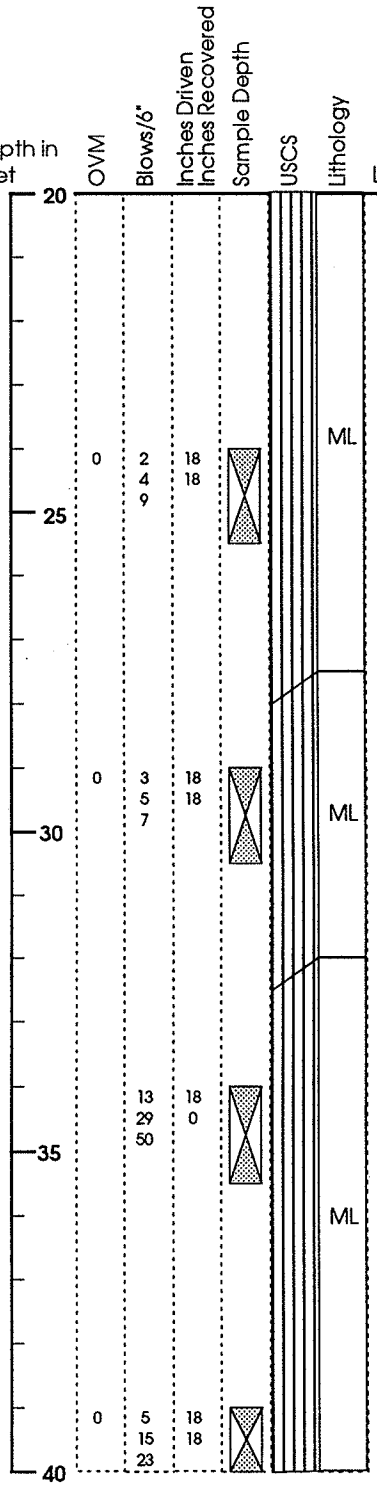
OVM	Blows/6"	Inches Driven	Inches Recovered	Lithologic Description
				GRAVEL; dark gray, very soft, fill.
0	2 5 7	18	18	Clayey SILT / silty CLAY; brown; trace fine sand with lense of medium sand, organic matter; moist, to wet, stiff, well sorted, iron stained, medium plasticity; gravels to 1" rounded.
0	4 10 21	18	18	Clayey SILT; brown; 25 - 40% clay, trace sand and gravel; moist, medium stiff, moderate to high plasticity, increasing stiffness / density with depth, grading to till.
0	11 16 22	18	18	Clayey SILT / silty CLAY; gray, trace fine sand and gravel, dry to damp, low plasticity, very stiff, micaceous.
0	6 9 14	18	5	Clayey SILT; gray; trace fine sand, gravel; moist, stiff, softer than previous sample, scattered iron staining, moderate to high plasticity.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B12
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	DSW	Drill Contractor:	Hayes Drilling
		Drill Date:	2/19/92

Dames & Moore

FILENAME: TM-B12.DRW

Geological Boring Log



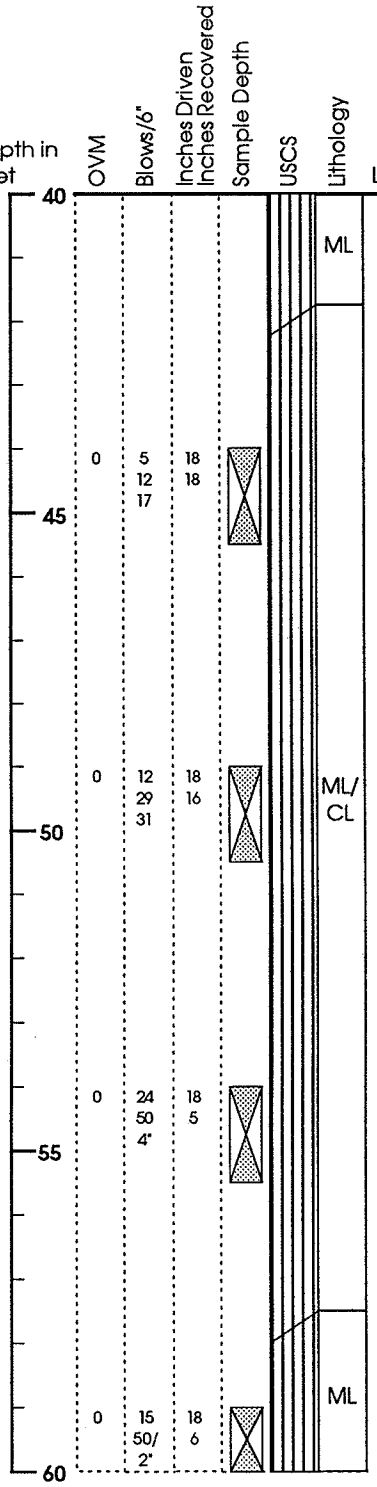
OVM	Blows/6"	Inches Driven	Inches Recovered	Sample Depth	USCS	Lithology	Lithologic Description
0	2 4 9	18	18			ML	Clayey SILT; as above, slightly more dense, scattered gravel.
0	3 5 7	18	18			ML	Silty CLAY / clayey SILT; gray; trace fine sand and gravel; moist, stiff, moderate to high plasticity; gravels to 1", rounded.
	13 29 50	18	0			ML	- no recovery
0	5 15 23	18	18			ML	Clayey SILT; grey; 10 - 15% fine sand; moist, low plasticity, no odor; gravels to 2", rounded, shell (clam?).

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B12
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	DSW	Drill Contractor:	Hayes Drilling
		Drill Date:	2/19/92

Dames & Moore

FILENAME: TM-B12.DRW

Geological Boring Log



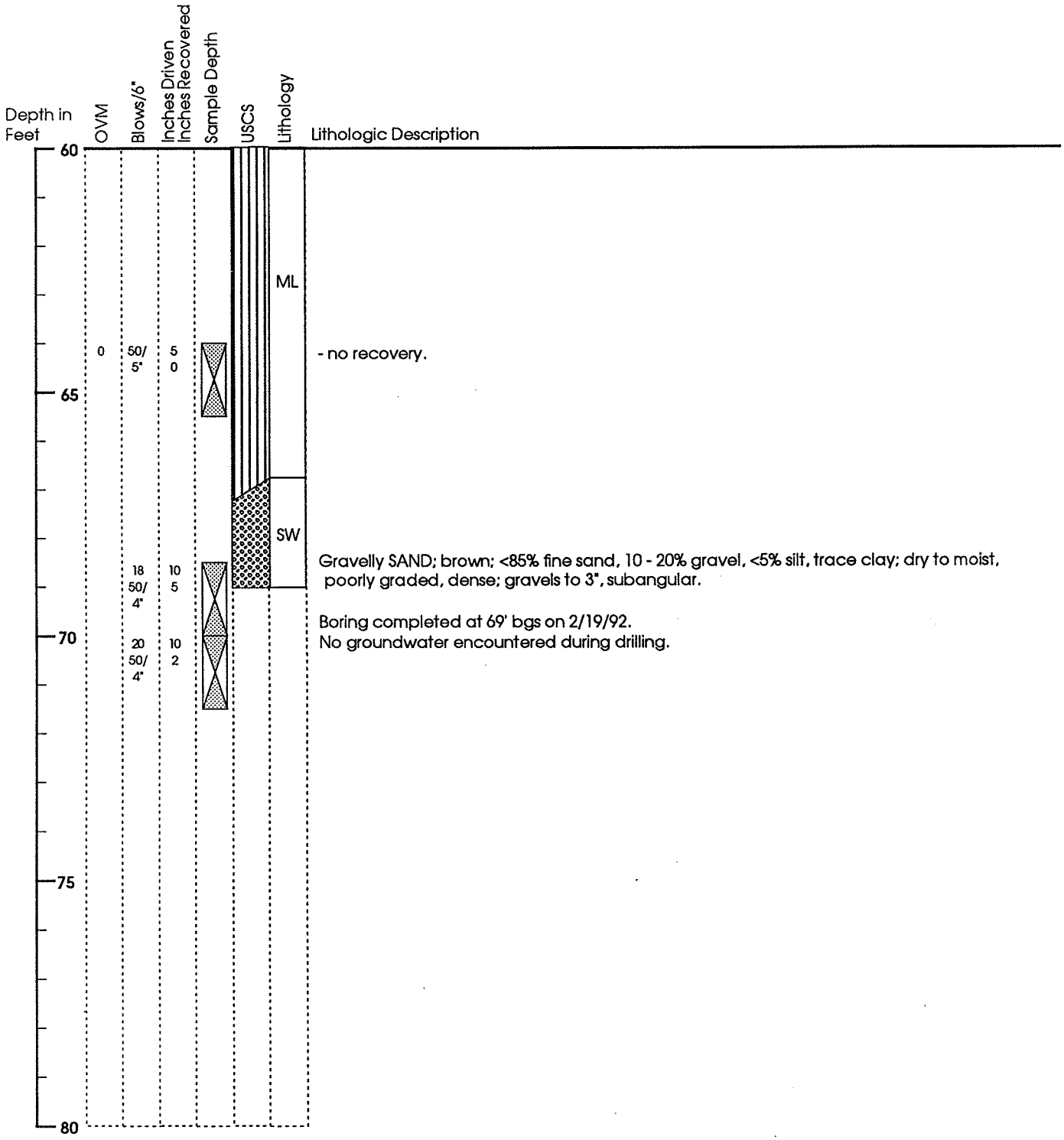
OVM	Blows/6"	Inches Driven / Recovered	Lithologic Description
			- increasing moisture in cuttings with depth.
0	5 12 17	18 18	Clayey SILT / silty CLAY; gray; trace fine sand and gravel; moist, very stiff, high plasticity, no odor; gravels to 2", rounded, micaceous.
0	12 29 31	18 16	Clayey SILT / silty CLAY; as above, slightly less plastic.
0	24 50 4"	18 5	Clayey SILT / silty CLAY; as above, less moist.
			- increasing gravel with deoth.
0	15 50/ 2"	18 6	Clayey SILT; gray; 25 - 40% clay; dry to moist, very stiff, low plasticity.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B12
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	DSW	Drill Contractor:	Hayes Drilling
		Drill Date:	2/19/92

Dames & Moore

FILENAME: TM-B12.DRW

Geological Boring Log

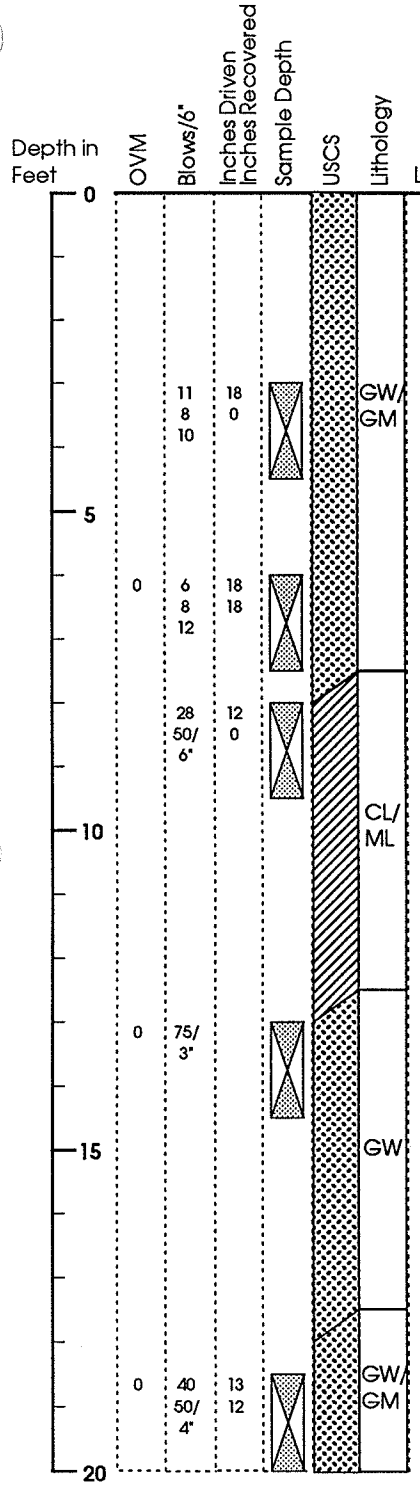


Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B12
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	DSW	Drill Contractor:	Hayes Drilling
		Drill Date:	2/19/92

Dames & Moore

FILENAME: TM-B12.DRW

Geological Boring Log



Lithologic Description

Packed gravel fill.

- no recovery.

Silty CLAY / clayey SILT; dark gray; trace fine sand, gravel and minor organic material; moist, very stiff to hard, low to moderate plasticity.

Drill rig breakdown, began drilling on 2/21/92. Borehole was full of water from overnight rain.
Sandy GRAVEL; gray; 10 - 15% silt; saturated.
Suspect recovered material is sluff from above.

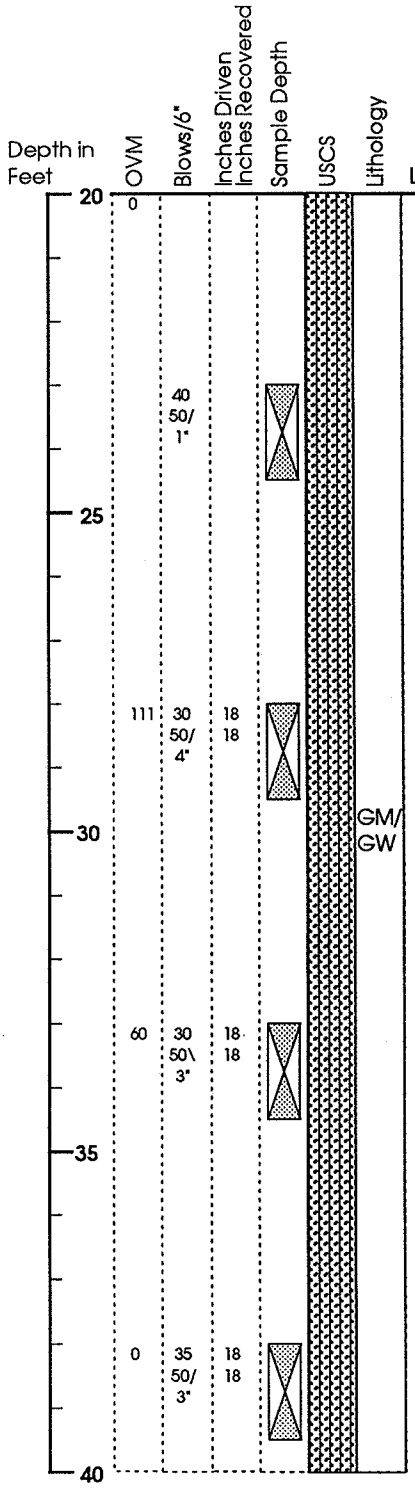
Silty sandy GRAVEL; gray with mottled brown; 30% fine to medium sand, 15% silt; saturated; gravels to 2".

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B14
Job No:	.21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	DSW / JKM	Drill Contractor:	Hayes Drilling
		Drill Date:	2/20/92

Dames & Moore

FILENAME: TM-B14.DRW

Geological Boring Log



Lithologic Description

Silty sandy GRAVEL; as above, moist, very dense.

Silty sandy GRAVEL; as above.

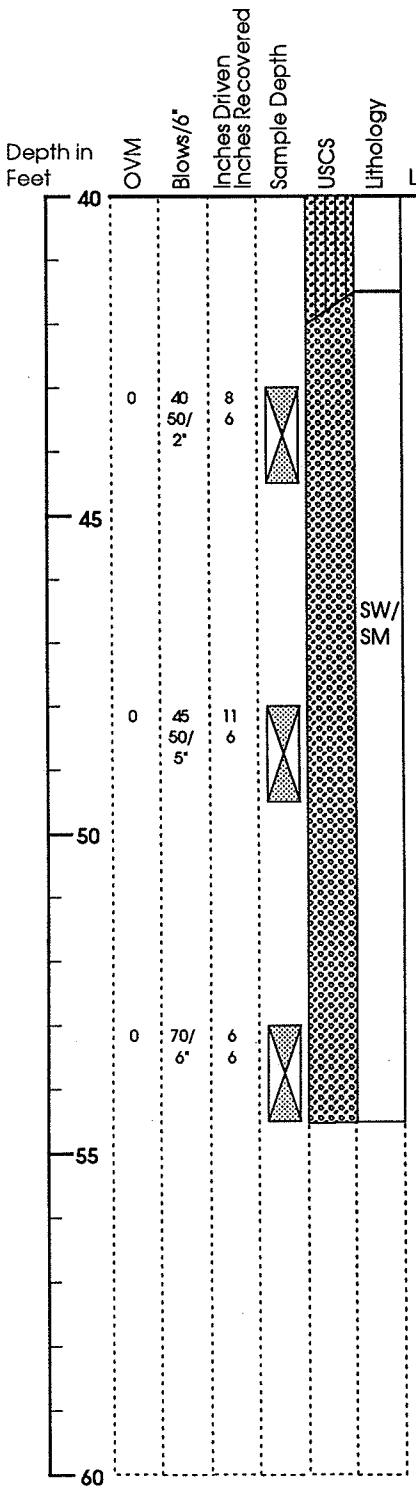
Silty sandy GRAVEL; as above, large quartzite cobble broken-up in sampler.

Silty sandy GRAVEL; as above, large quartzite cobble broken-up in sampler.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B14
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	DSW / JKM	Drill Contractor:	Hayes Drilling
		Drill Date:	2/20/92

FILENAME: TM-B14.DRW

Geological Boring Log



Silty gravelly SAND; brown; 75% medium and coarse sand, 20% gravel and cobbles; trace silt, moist; sands mixed lithology, subangular.

Silty gravelly SAND; brown; 75% medium and coarse sand, 20% gravel and cobbles; trace silt, moist; sands mixed lithology, subangular.

Silty gravelly SAND; grayish brown; 75% medium and coarse sand, 20% gravel and cobbles; trace silt, moist; sands mixed lithology, subangular.

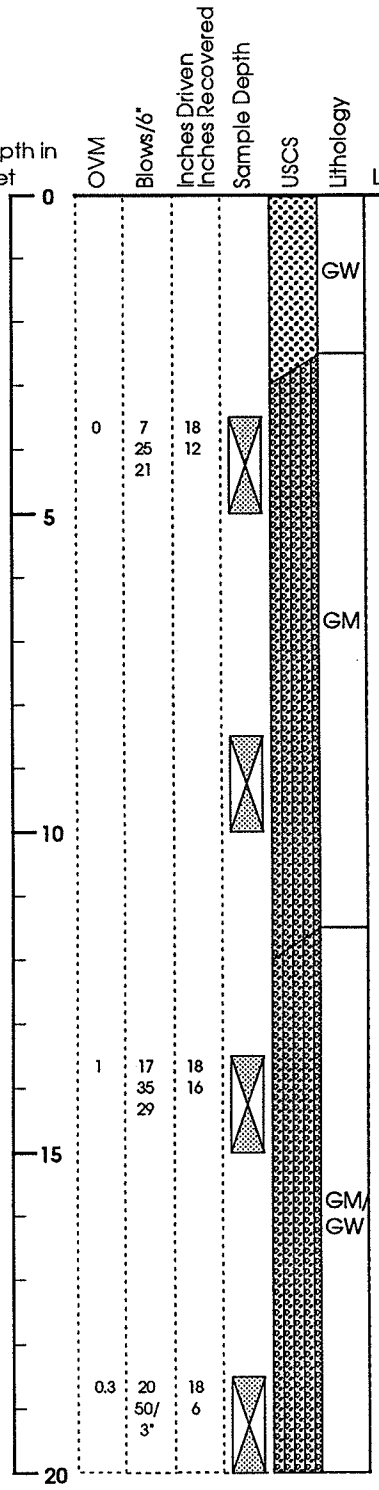
Boring completed at 54.5' bgs on 2/21/92.
No groundwater encountered during drilling.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B14
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	DSW / JKM	Drill Contractor:	Hayes Drilling
		Drill Date:	2/20/92

Dames & Moore

FILENAME: TM-B14.DRW

Geological Boring Log



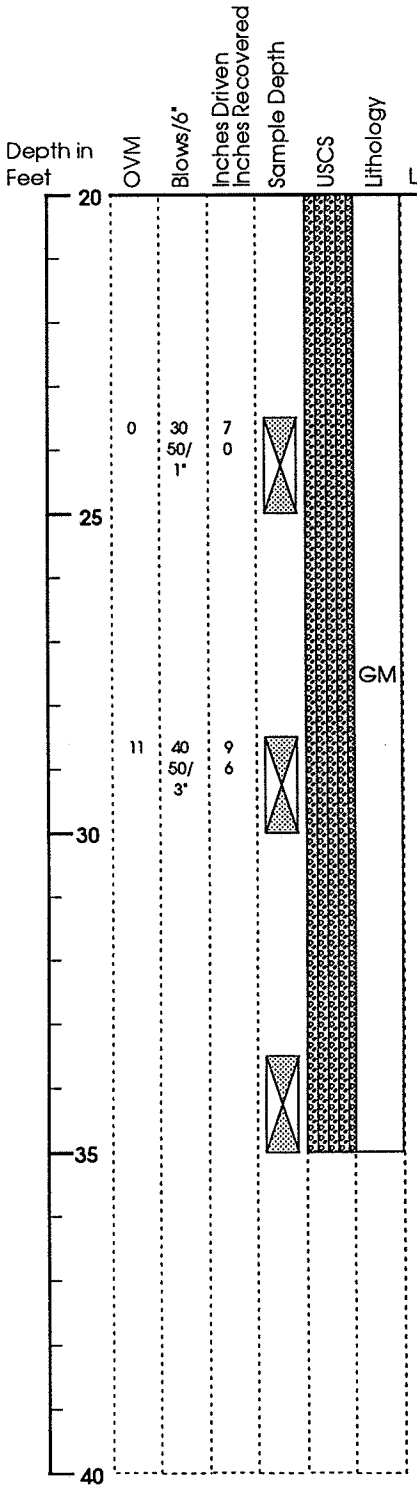
OVM	Blows/6"	Inches Driven / Recovered	Lithologic Description
			GRAVEL; fill material.
0	7 25 21	18 12	Silty GRAVEL; 5 - 10% silt; wet, poorly sorted; gravels to 3", rounded.
			- no recovery.
1	17 35 29	18 16	Silty sandy GRAVEL; gray; 20 - 40% medium to coarse sand, 10 - 15% silt; wet, poorly sorted; gravels to 2", rounded.
0.3	20 50/ 3"	18 6	Silty sandy GRAVEL; as above.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B15
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	DSW / JKM	Drill Contractor:	Hayes Drilling
		Drill Date:	2/24/92

Dames & Moore

FILENAME: TM-B15.DRW

Geological Boring Log



- no recovery, sampler saturated, very faint oil sheen on water from sampler, no petroleum odor.

Silty GRAVEL; gray with yellow mottling; moist, poorly sorted, faint petroleum odor; gravels to 2".

- very hard drilling.

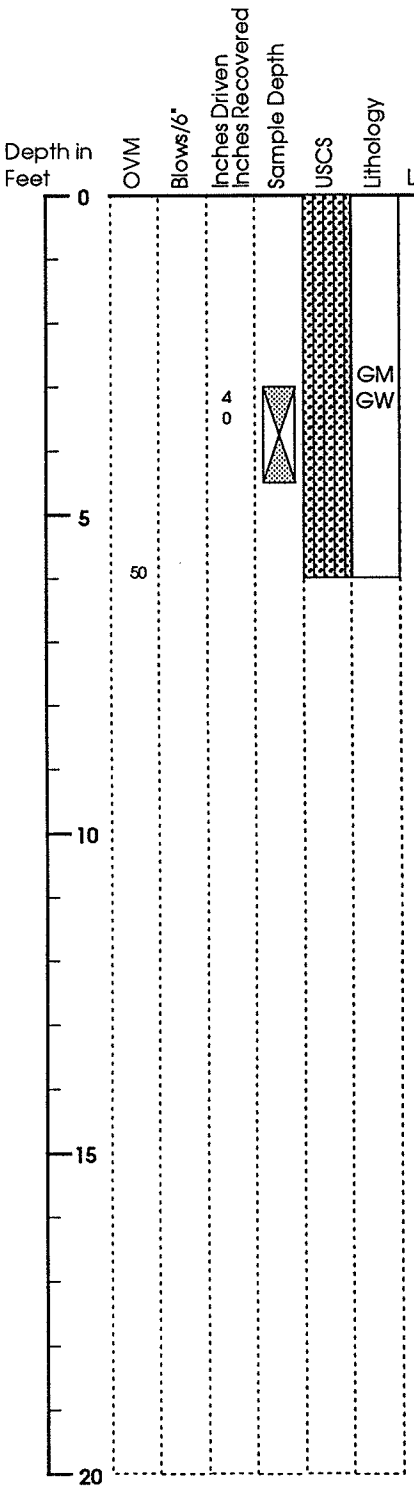
Boring terminated at 35' bgs on 2/24/92.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B15
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	DSW / JKM	Drill Contractor:	Hayes Drilling
		Drill Date:	2/24/92

Dames & Moore

FILENAME: TM-B15.DRW

Geological Boring Log



Lithologic Description

Gravel fill, pack.

- no recovery, hit rock.

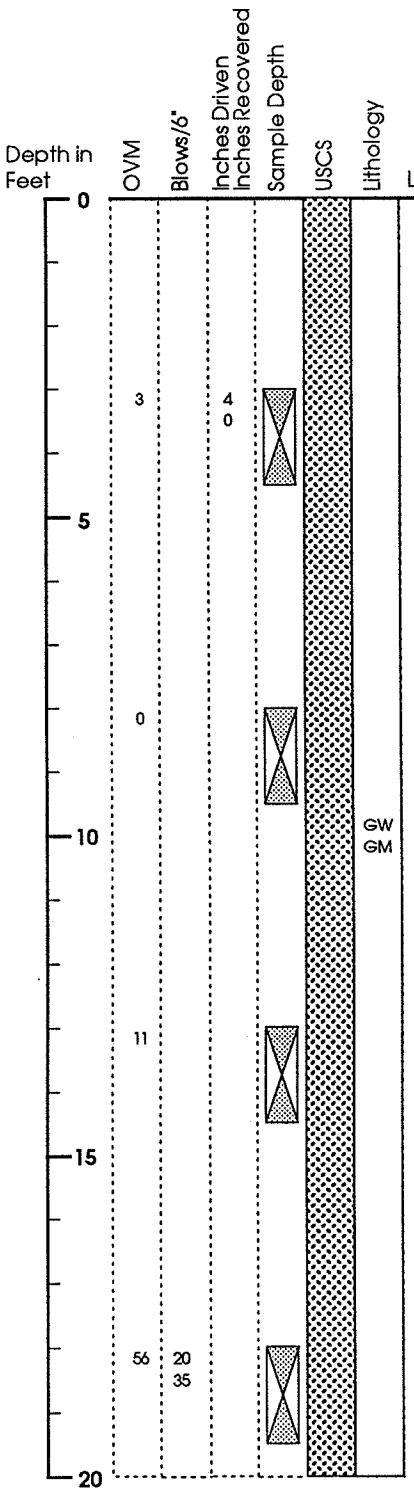
Silty sandy GRAVEL; gray; 10 - 20% sand, 5 - 10% silt; poorly sorted, compact to dense, no petroleum odor.
Boring terminated at 6'bgs due to large rock, moved hole one foot west. OVM 50 ppm in auger

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B16A
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	DSW / JKM	Drill Contractor:	Hayes Drilling
		Drill Date:	2/25/92

Dames & Moore

FILENAME: TM-B16A.DRW

Geological Boring Log



Lithologic Description

- no recovery, hit rock.

Silty sandy GRAVEL; gray, fill material (from cuttings).

- no recovery, hit rock.

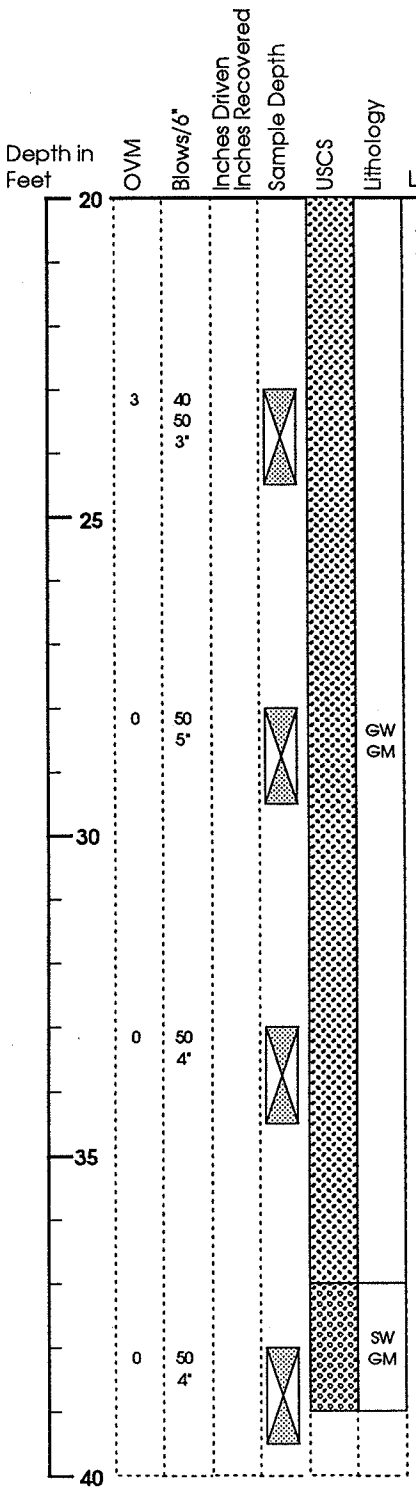
Silty sandy GRAVEL; gray, moist, poorly sorted, fill material (from cuttings).

- sampler returned wet.
Silty sandy GRAVEL; gray with greenish tint, moist to saturated.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B16
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	DSW / JKM	Drill Contractor:	Hayes Drilling
		Drill Date:	2/25/92

FILENAME: TM-B16.DRW

Geological Boring Log



Lithologic Description

Silty sandy GRAVEL with occasional cobbles; gray with greenish tint, moist, poorly sorted.
- very hard drilling.
- put in new bit, re-entered hole

- increasing density with depth.

Sandy silty GRAVEL; gray, moist, poorly sorted; dense, gravel to 3", 10-20% silt, 20-30% sand, faint petroleum odor.

Silty gravelly SAND; brownish grey well sorted sand, poorly sorted gravel, angular sand grains, 10% gravel, 20% silt, 70% sand, moist, gravel to 1".
Boring terminated at 39'

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B16
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	DSW / JKM	Drill Contractor:	Hayes Drilling
		Drill Date:	2/25/92

FILENAME: TM-B16.DRW

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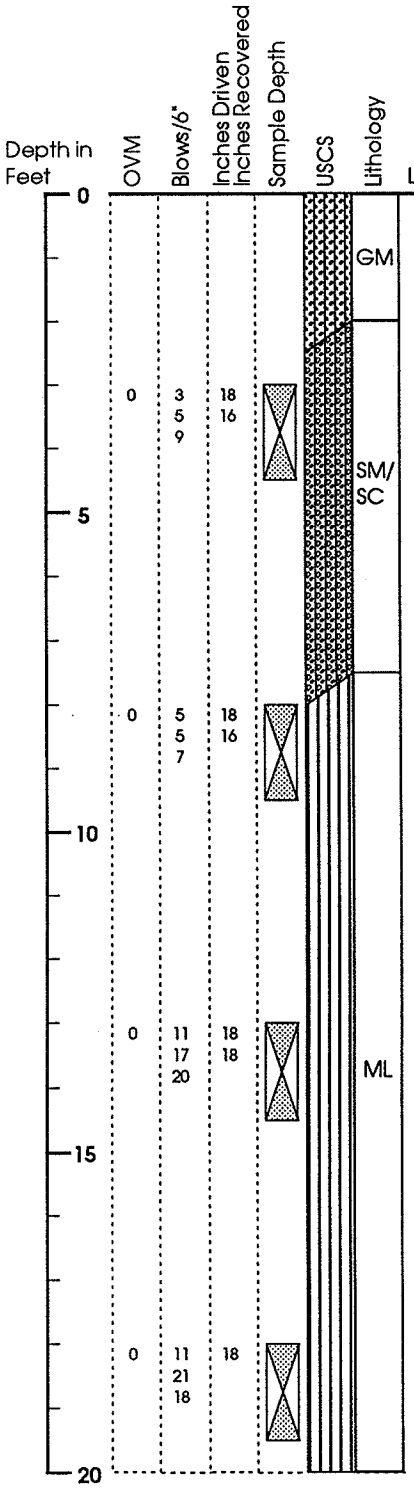
Geological Boring Log



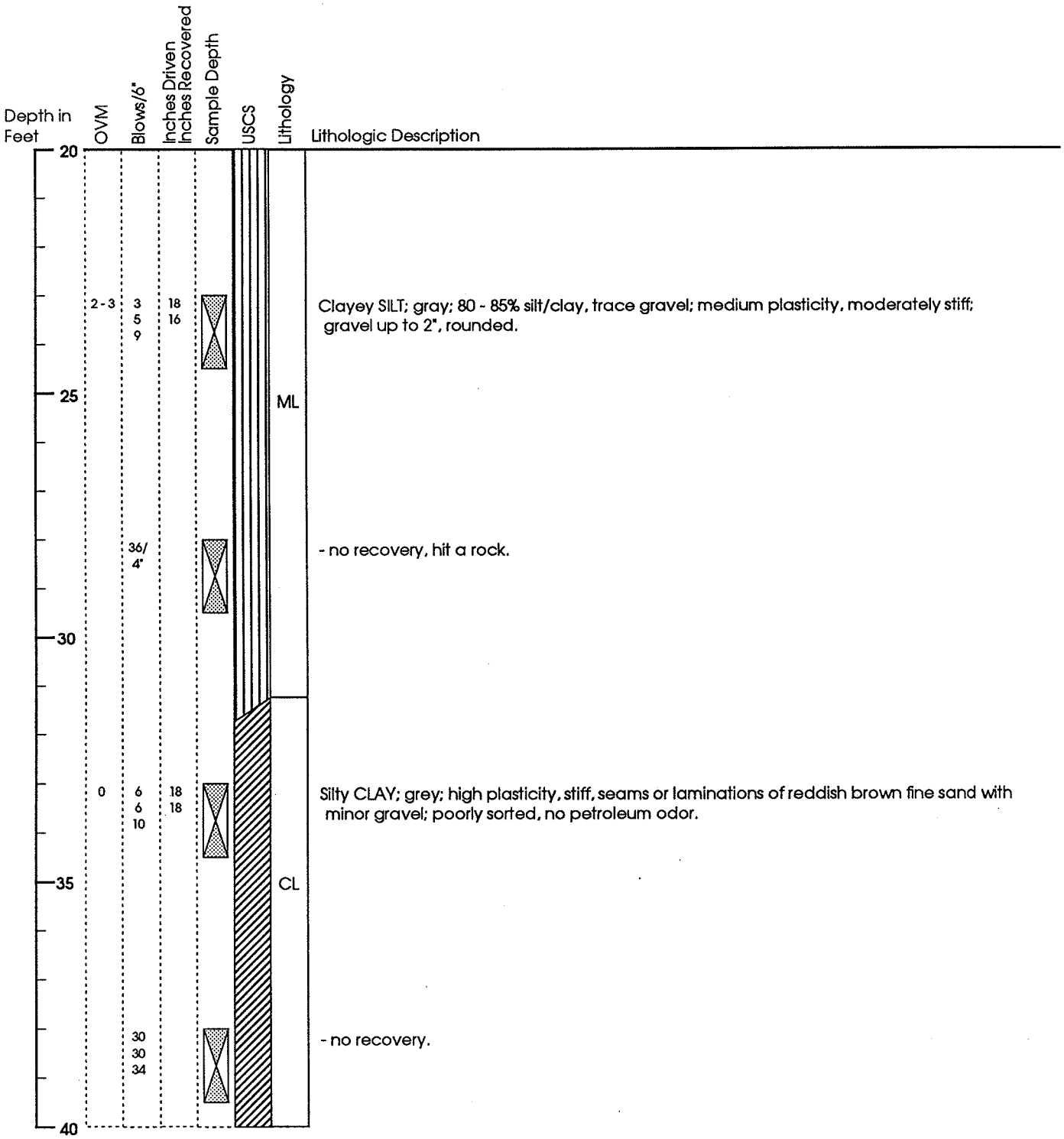
OVM	Blows/6"	Inches Driven / Recovered	Lithologic Description
			Silty sandy GRAVEL; fill.
0	3 5 9	18 16	Silty clayey SAND; grayish brown; fine sand, minor gravel, minor organic material; moist, medium plasticity, medium stiff, no petroleum odor.
0	5 5 7	18 16	Sandy clayey SILT; tan / gray; 70% silt, 10% fine sand, 15% clay, 5% gravel, trace organic material; well sorted; gravels to 2".
0	11 17 20	18 18	Sandy clayey SILT; tan / gray; 70 - 80% silt, 10% very fine sand, 10% clay, trace gravel; dry, very stiff, low plasticity, poorly sorted; gravels to 1".
0	11 21 18	18	Sandy clayey SILT; gray; 80 - 85% silt, trace gravel; dry, very stiff, non plastic, poorly sorted, no petroleum odor; gravels to 1".

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B17
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	DSW	Drill Contractor:	Hayes Drilling
		Drill Date:	2/24/92

Dames & Moore

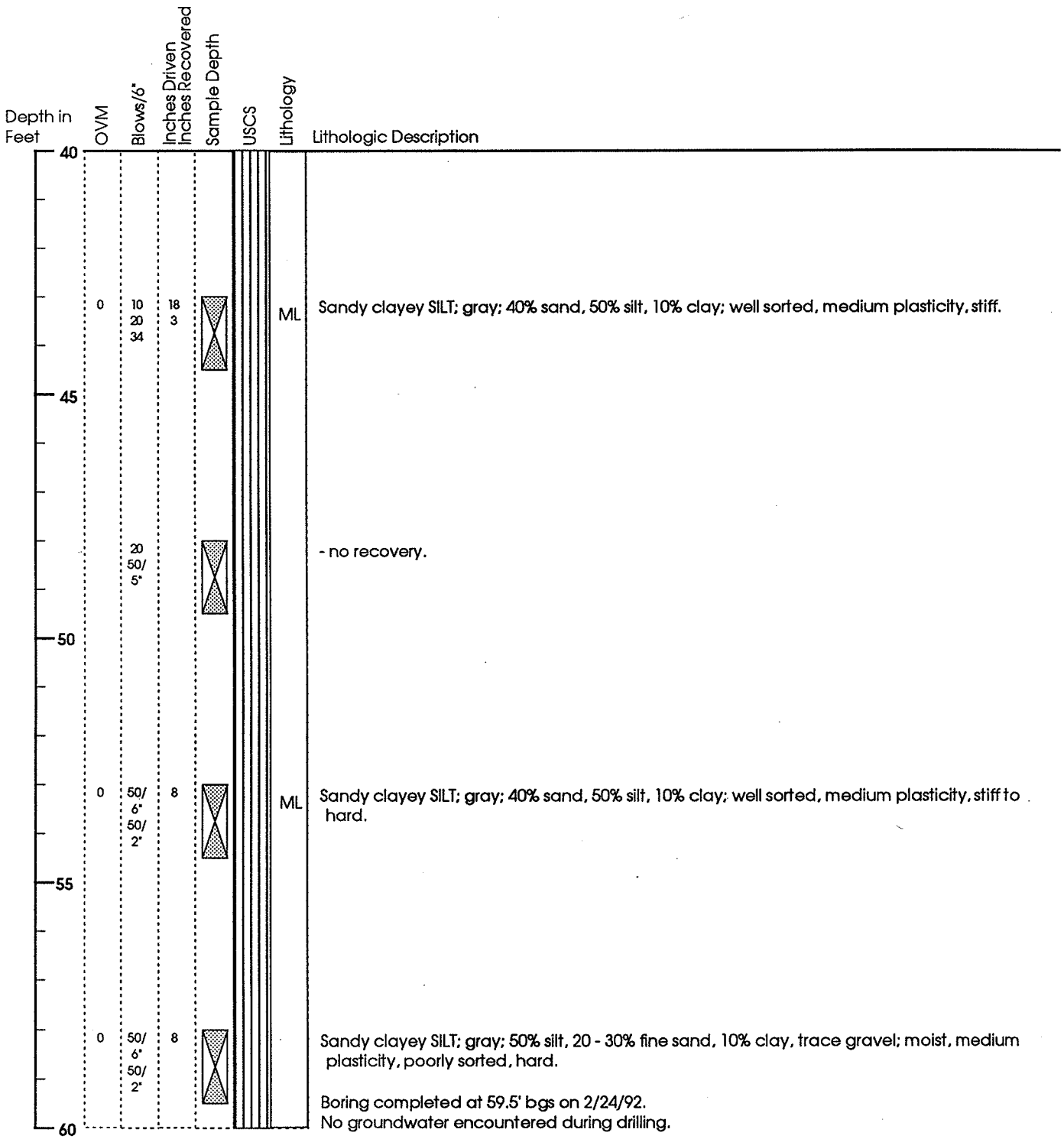
FILENAME: TM-B17.DRW

Geological Boring Log



Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B17
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	DSW	Drill Contractor:	Hayes Drilling
		Drill Date:	2/24/92

Geological Boring Log

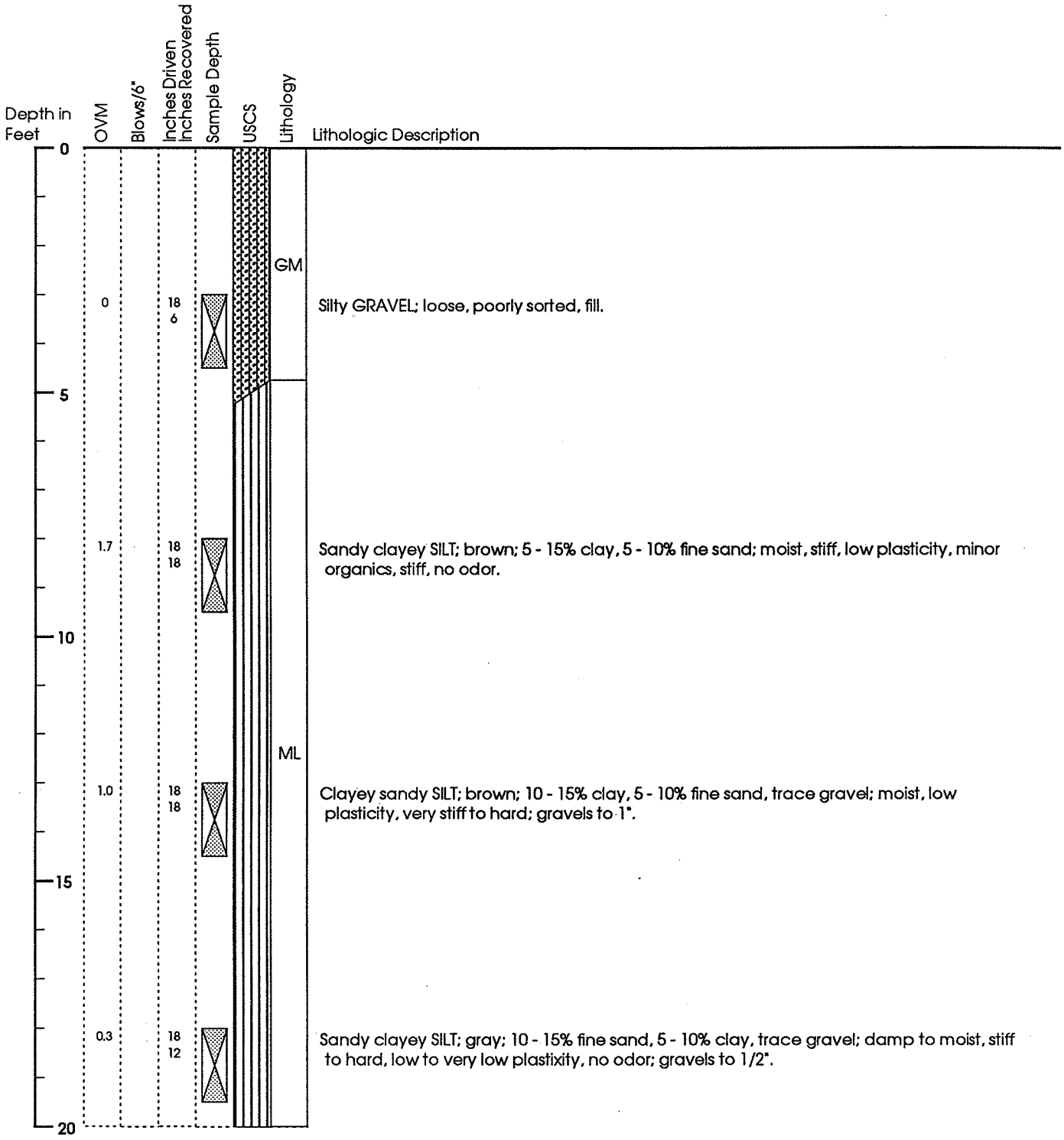


Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B17
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	DSW	Drill Contractor:	Hayes Drilling
		Drill Date:	2/24/92

FILENAME: TM-B17.DRW

Dames & Moore

Geological Boring Log

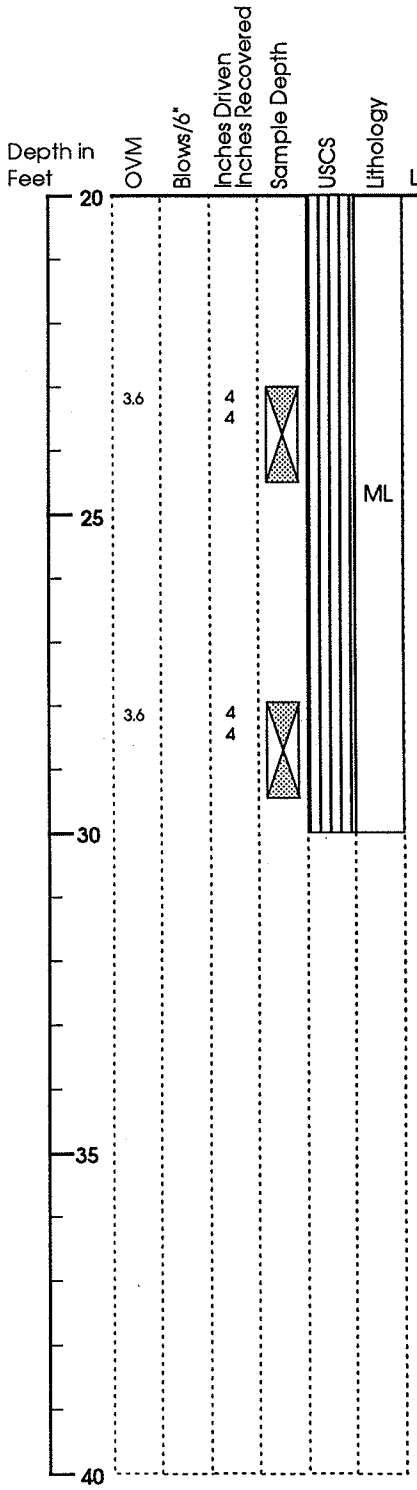


Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B18
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	DSW / JKM	Drill Contractor:	Hayes Drilling
		Drill Date:	2/26/92

FILENAME: TM-B18.DRW

Dames & Moore

Geological Boring Log



Lithologic Description

Sandy clayey SILT; as before.

Gravelly sandy SILT; gray; fine to medium sand, 5 - 10% gravel; dry to slightly moist, dense, no odor; gravel to 2", subrounded.

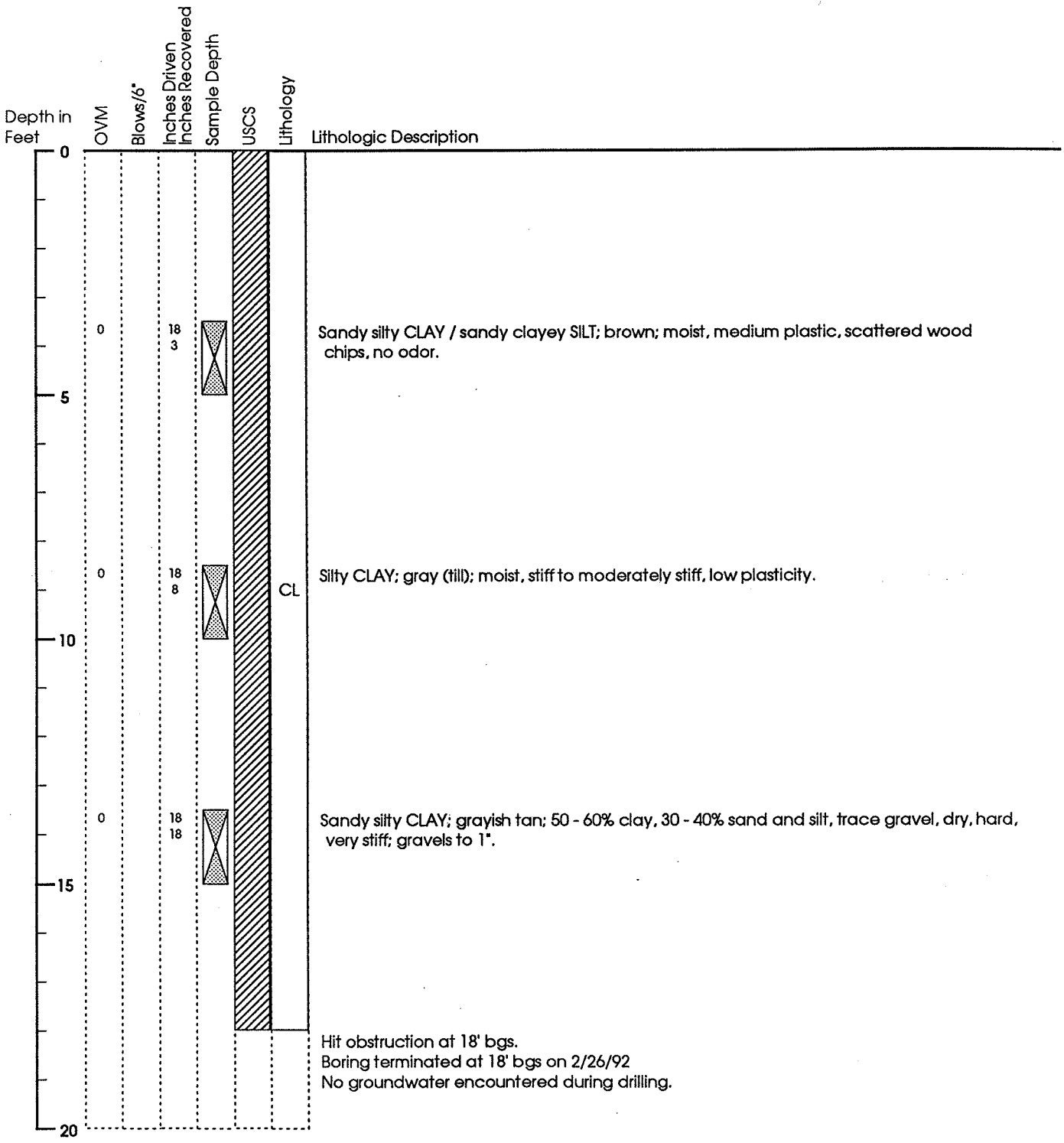
Boring terminated due to boulder at 30' bgs on 2/26/92.
No groundwater encountered during drilling.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B18
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	DSW / JKM	Drill Contractor:	Hayes Drilling
		Drill Date:	2/26/92

Dames & Moore

FILENAME: TM-B18.DRW

Geological Boring Log

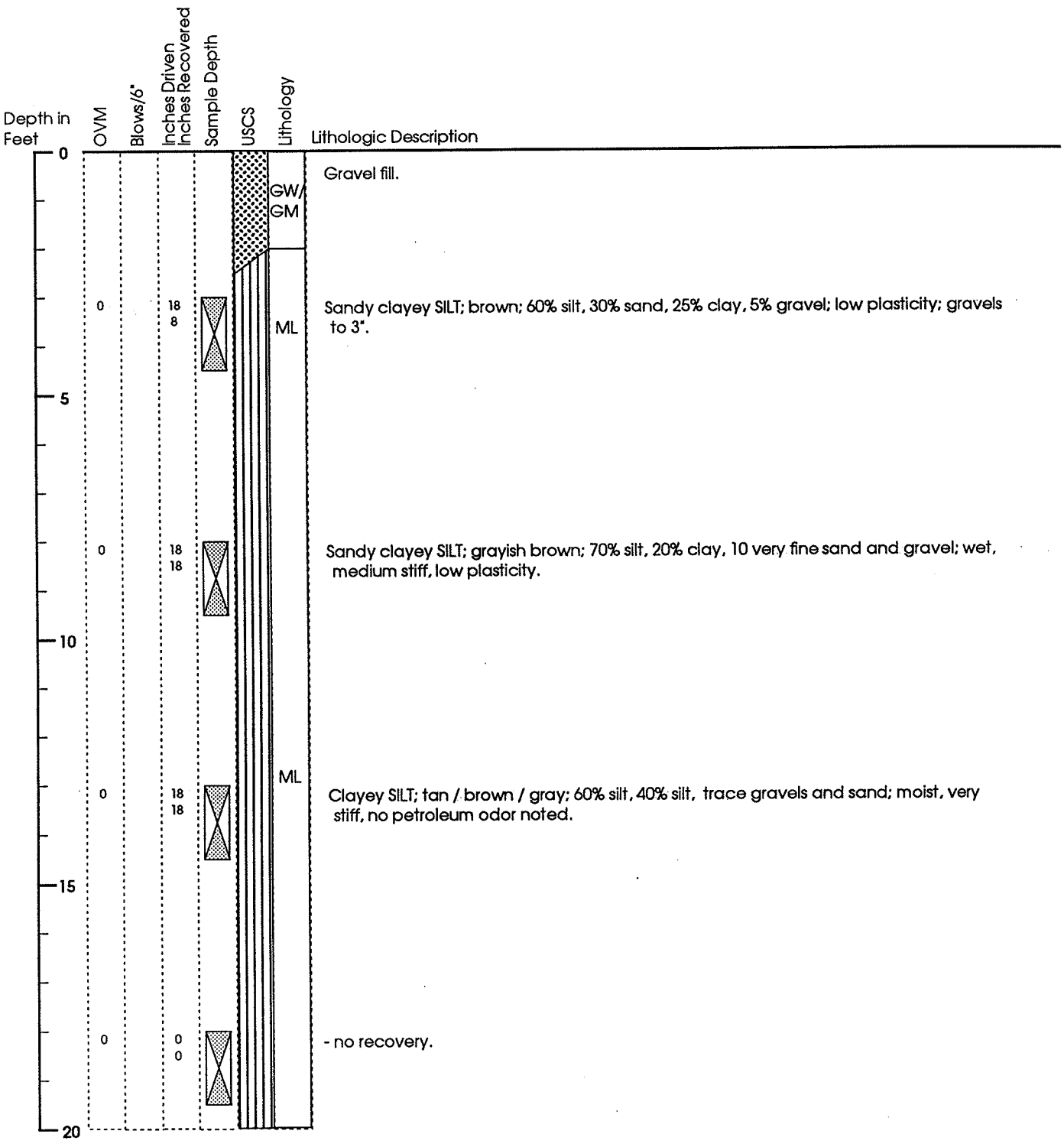


Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B19
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	IMW	Drill Contractor:	Hayes Drilling
		Drill Date:	2/26/92

FILENAME: TM-B19.DRW

Dames & Moore

Geological Boring Log

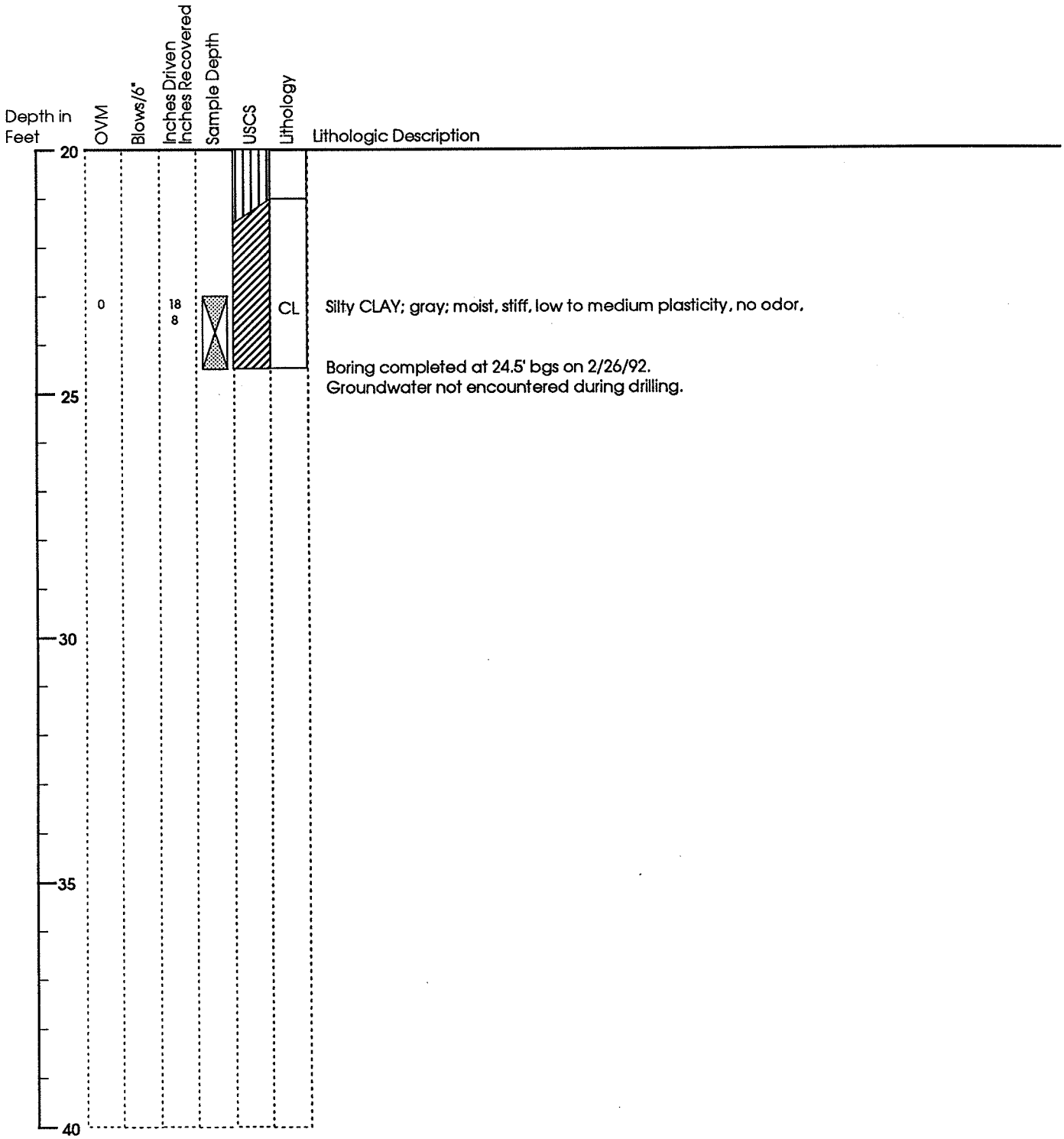


Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B20
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	IMW	Drill Contractor:	Hayes Drilling
		Drill Date:	2/26/92

Dames & Moore

FILENAME: TM-B20.DRW

Geological Boring Log

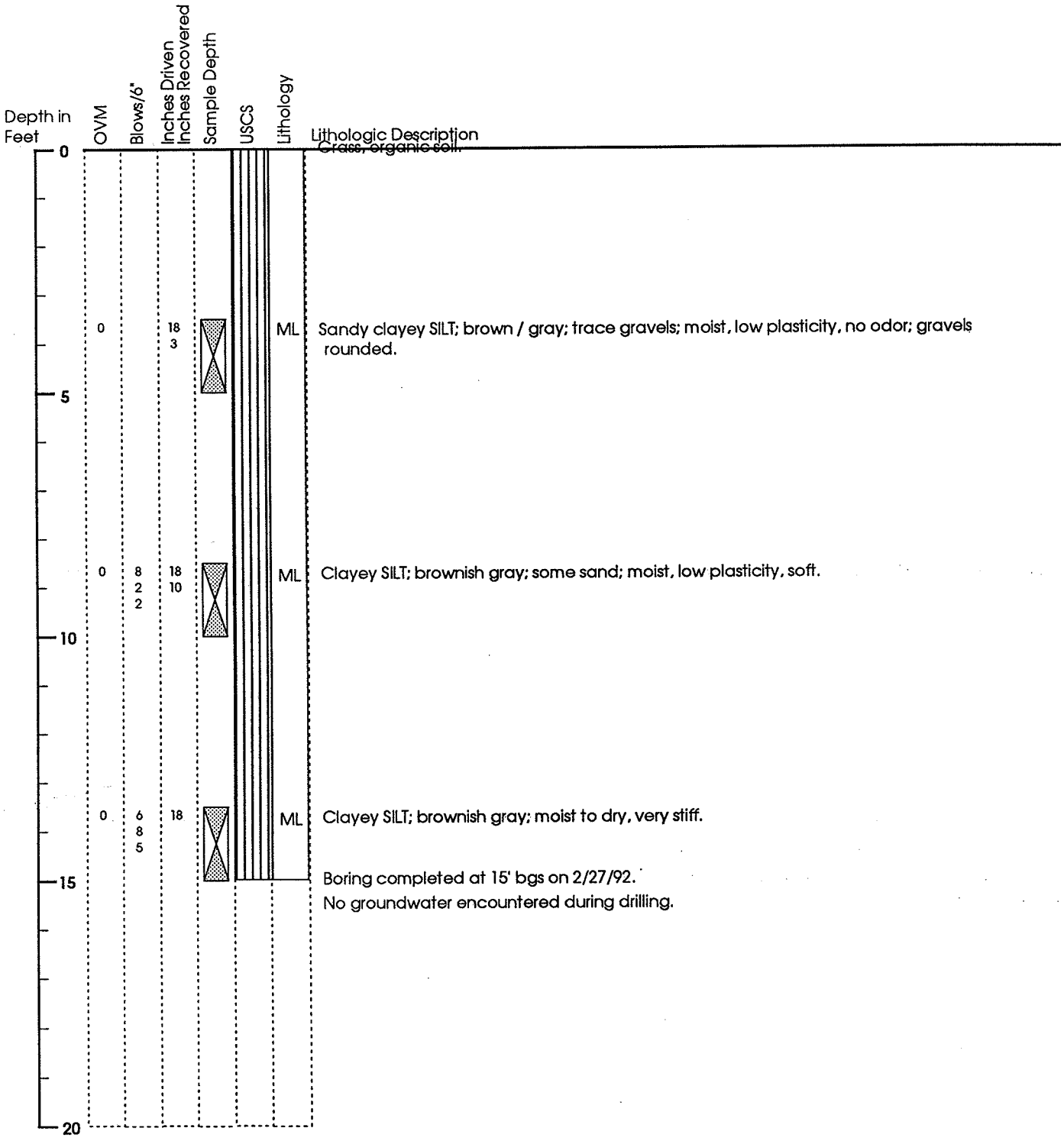


Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B20
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	IMW	Drill Contractor:	Hayes Drilling
		Drill Date:	2/26/92

Dames & Moore

FILENAME: TM-B20.DRW

Geological Boring Log

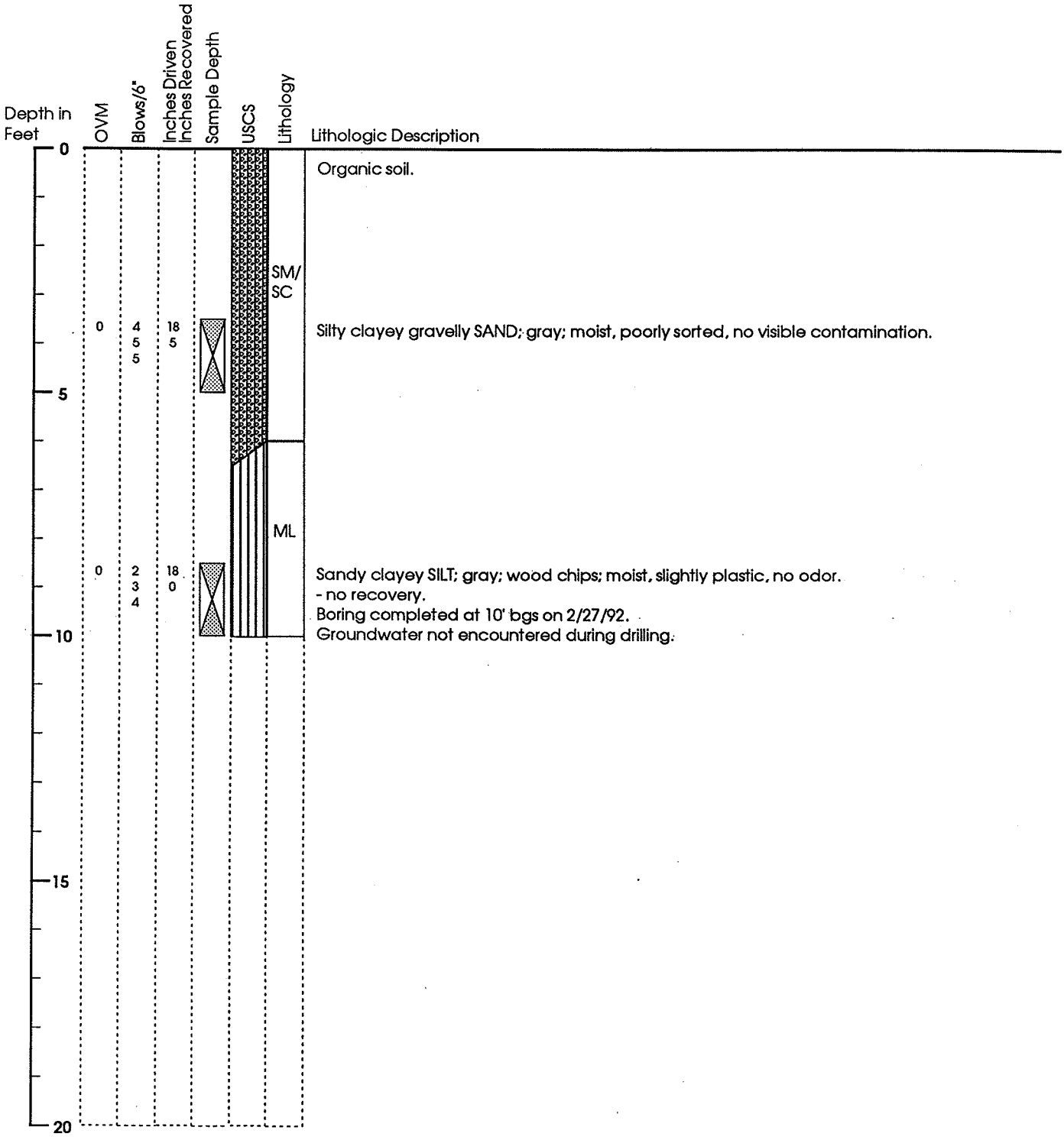


Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B21
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	IMW	Drill Contractor:	Hayes Drilling
		Drill Date:	2/27/92

FILENAME: TM-B21.DRW

Dames & Moore

Geological Boring Log

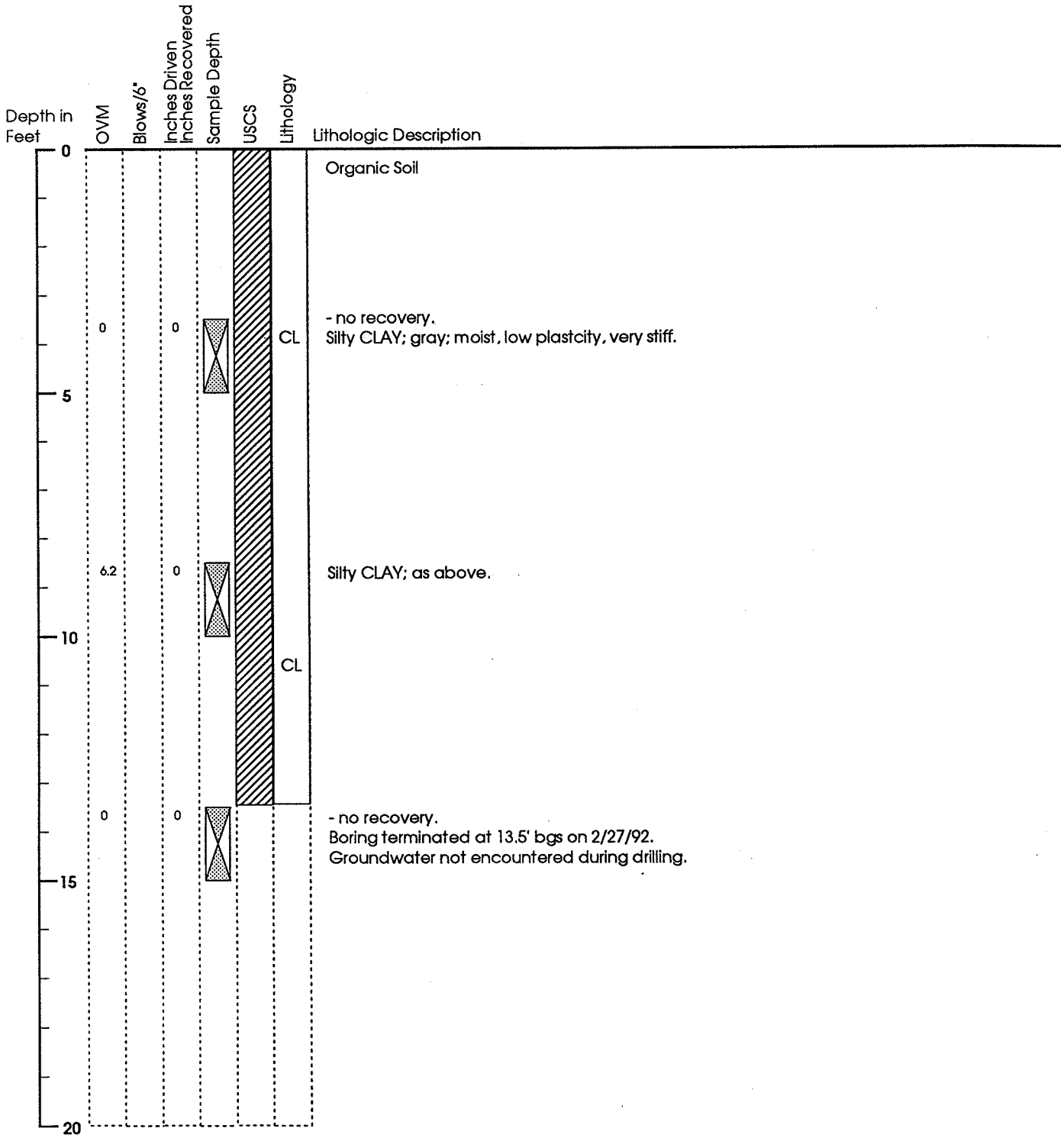


Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B22
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	IMW	Drill Contractor:	Hayes Drilling
		Drill Date:	2/27/92

FILENAME: TM-B22.DRW

Dames & Moore

Geological Boring Log

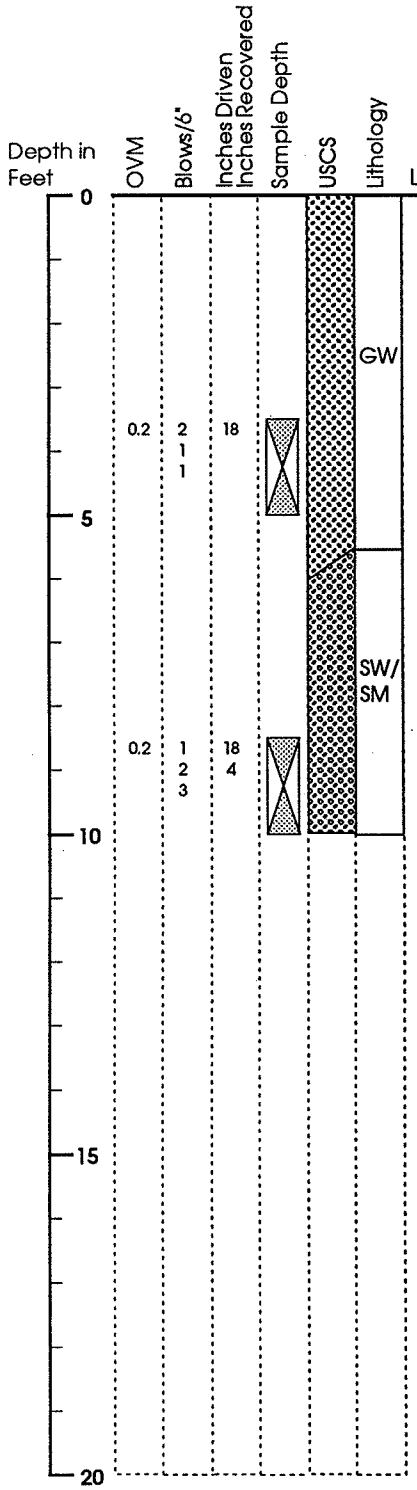


Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B23
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	IMW	Drill Contractor:	Hayes Drilling
		Drill Date:	2/27/92

Dames & Moore

FILENAME: TM-B23.DRW

Geological Boring Log



Lithologic Description

Organic soil.

Sandy GRAVEL; brown; 50% gravel, 50% sand; moist, poorly sorted, loose (fill).

Silty gravelly SAND; 50% coarse sand, 30% gravel, 20% silt; well sorted, loose.

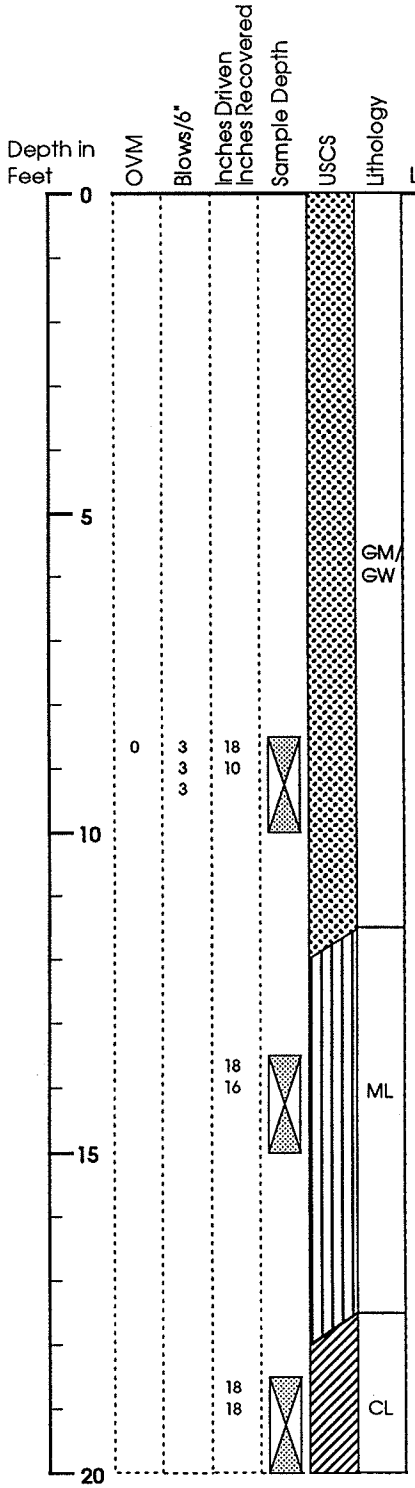
Boring terminated at 10' bgs on 2/27/92.
No groundwater encountered during drilling.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B24
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	IMW	Drill Contractor:	Hayes Drilling
		Drill Date:	2/27/92

FILENAME: TM-B24.DRW

Dames & Moore

Geological Boring Log



Lithologic Description

No samples collected.

Silty clayey sandy GRAVEL (fill); brown; moist, poorly sorted, no odor or contamination evident.

Clayey gravelly SILT; moist, low plasticity; gravels to 2", rounded.

Silty CLAY; gray; dry, very stiff.

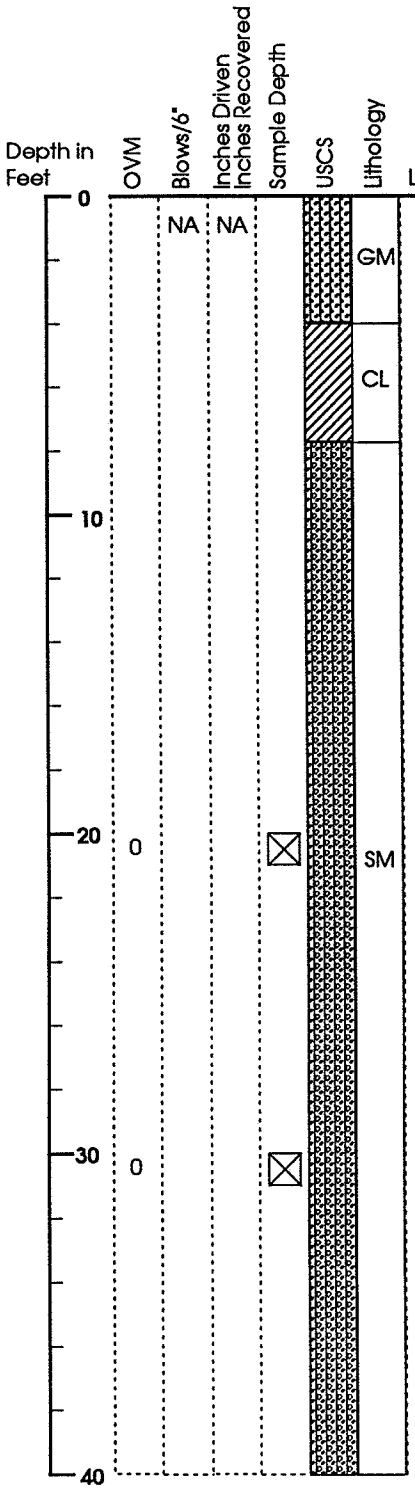
Boring terminated at 20' bgs on 2/27/92.
No groundwater encountered during drilling.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B25
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	IMW	Drill Contractor:	Hayes Drilling
		Drill Date:	2/27/92

FILENAME: TM-B25.DRW

Dames & Moore

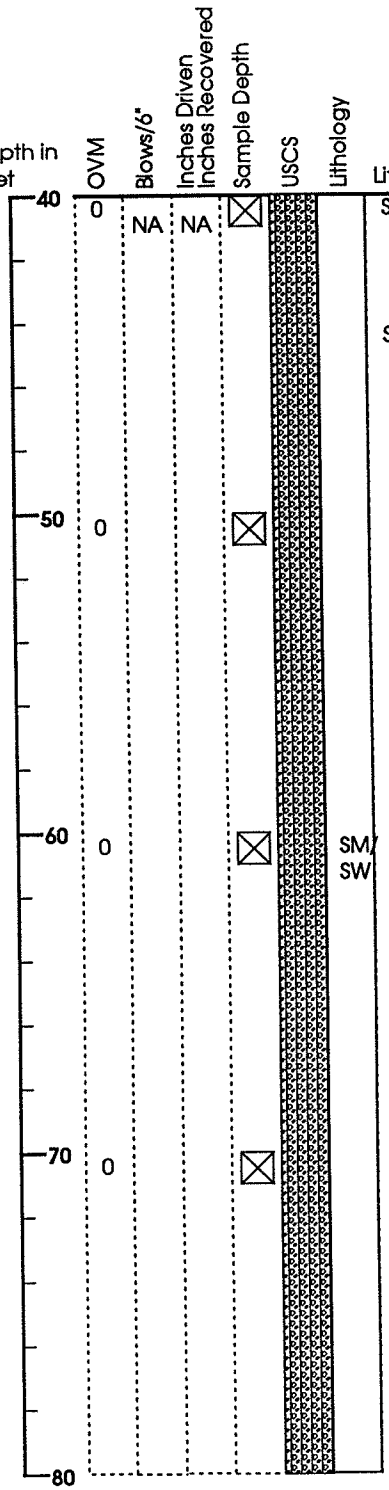
Geological Boring Log



Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-DW1
Job No:	21199-032-005	Drilling Method:	ODEX with 6" casing.
Location:	Laurel Pump Station	Sample Method:	Grab sample of cuttings.
Geologist:	JKM/DSW	Drill Contractor:	PC Exploration
		Drill Date:	2/18/92 to 2/27/92

FILENAME: TM-DW1.DRW

Geological Boring Log



Lithologic Description

Silty SAND; brown; fine to coarse sand with 15% silt and occasional gravels; moist; gravels rounded to subangular.

Silty gravelly SAND; brown to gray; 50% fine, 30% medium and 20% coarse sand with 20% gravel, scattered cobbles and <5% silt; moist, medium dense, sands subrounded to angular, predominately fine, mixed lithology; gravels prdominately fine (up to 3/4" dia.), subangular to subrounded, mixed lithology.

Silty gravelly SAND; as above.

- dry at 67' bgs.

Silty gravelly SAND; as above.

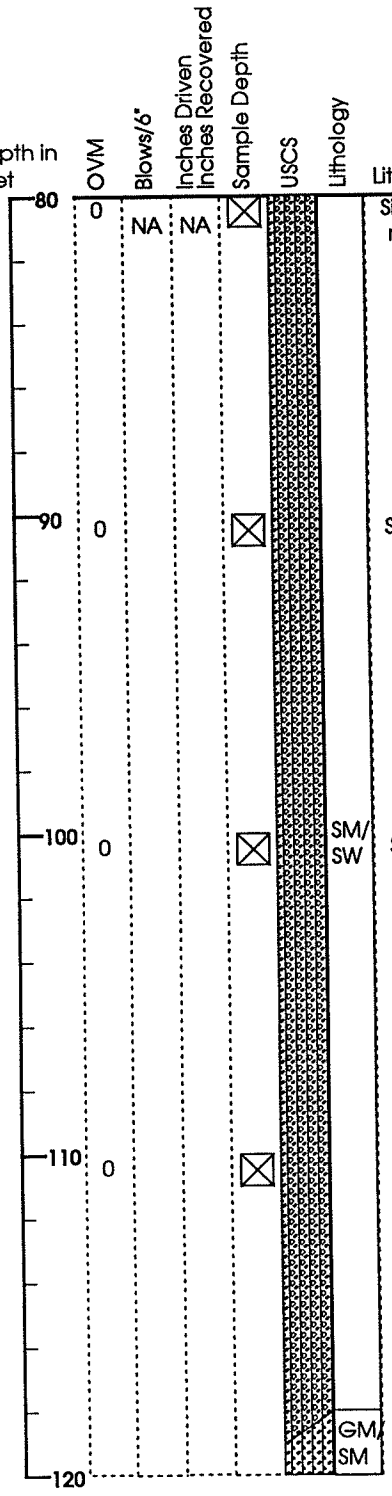
Silty gravelly SAND; as above.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-DW1
Job No:	21199-032-005	Drilling Method:	ODEX with 6" casing.
Location:	Laurel Pump Station	Sample Method:	Grab sample of cuttings.
Geologist:	JKM/DSW	Drill Contractor:	PC Exploration
		Drill Date:	2/18/92 TO 2/27/92

Dames & Moore

FILENAME: TM-DW1.DRW

Geological Boring Log

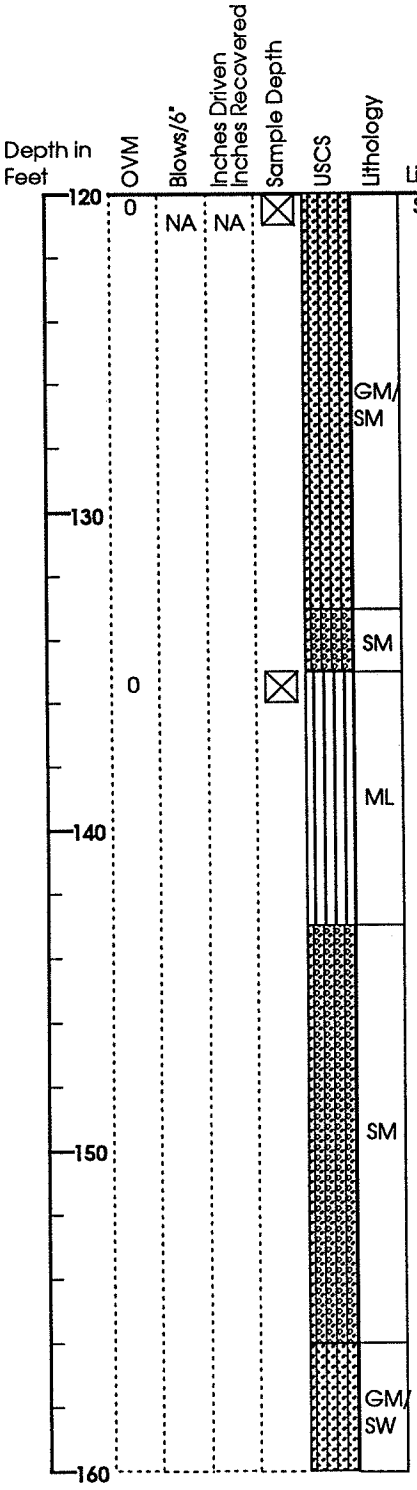


Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-DW1
Job No:	21199-032-005	Drilling Method:	ODEX with 6" casing.
Location:	Laurel Pump Station	Sample Method:	Grab sample of cuttings.
Geologist:	JKM/DSW	Drill Contractor:	PC Exploration
		Drill Date:	2/18/92 to 2/27/92

Dames & Moore

FILENAME: TM-DW1.DRW

Geological Boring Log



Lithologic Description

Silty sandy GRAVEL; dry.

Silty SAND; brown; fine sand with 5% silt; moist, mixed lithology.

Clayey sandy SILT; brown; 10% fine sand; moist, moderate plasticity.

Clayey sandy SILT; gray; 5 - 10% fine sand; moist, low plasticity.

Sandy SILT; brown; dry; sands very fine.

Silty SAND; brown; very fine sand with 5% silt; dry.

- increase in medium sand content to 5% and silt to 10% - 15% at 153' bgs.

- slight reddish tint increase in medium to coarse sand content to 10% with scattered gravels at 155 - 156'bgs

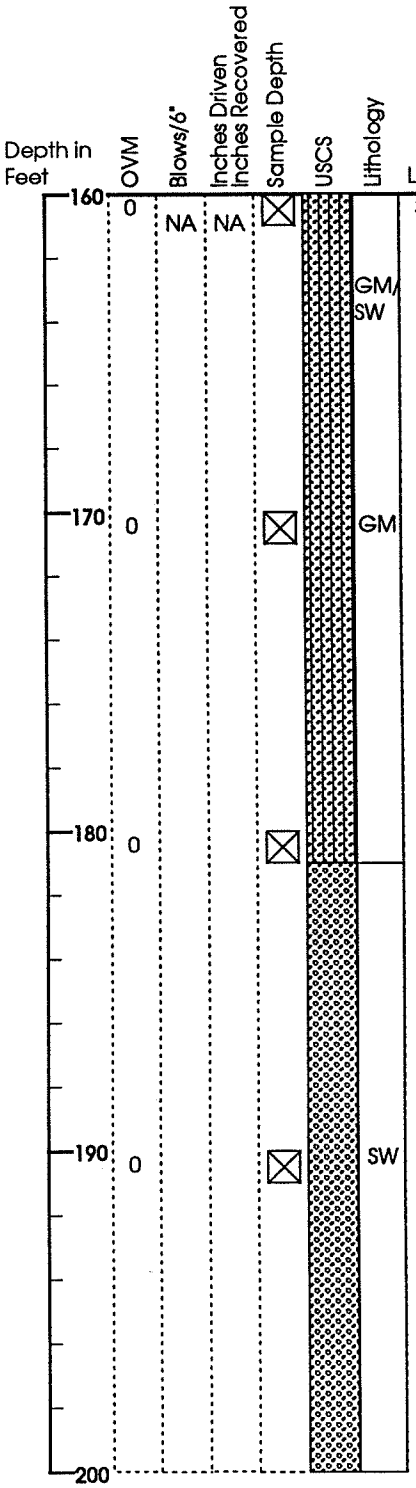
Silty sandy GRAVEL / gravelly SAND.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-DW1
Job No:	21199-032-005	Drilling Method:	ODEX with 6" casing.
Location:	Laurel Pump Station	Sample Method:	Grab sample of cuttings.
Geologist:	JKM/DSW	Drill Contractor:	PC Exploration
		Drill Date:	2/18/92 to 2/27/92

Dames & Moore

FILENAME: TM-DW1.DRW

Geological Boring Log



Lithologic Description

Silty sandy GRAVEL / gravelly SAND; gray to brown; 50% Gravel, 40% fine to coarse sand, 0% silt; dry, dense; gravels up to 2" dia., subrounded to subangular, mixed lithology.

- decreasing sand.

Silty sandy GRAVEL / gravelly SAND; as above.

Silty sandy GRAVEL / gravelly SAND; as above.

SAND; brown; fine sand; dry.

- increase in coarse to medium sand; subangular.

Gravelly SAND; brown; fine to coarse sand with 10 - 15% gravel and trace silt; dry, dense; gravels to 1" dia.

- increase in gravel - amount and size, hard drilling.

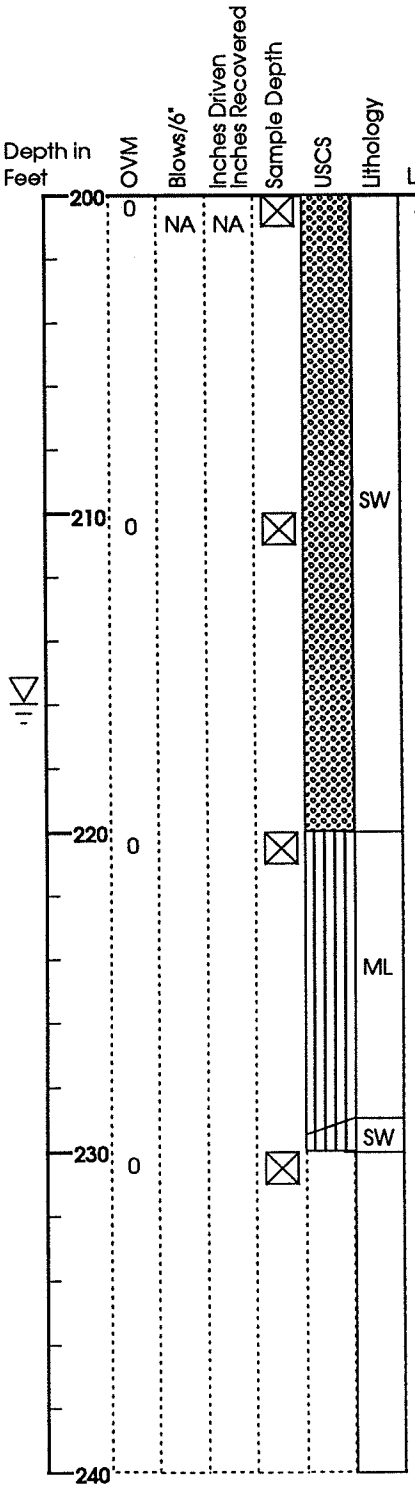
Gravelly SAND; brown; fine sand with 5 - 15% gravel and trace silt; dry to damp; gravels to 1" dia., rounded.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-DW1
Job No:	21199-032-005	Drilling Method:	ODEX with 6" casing.
Location:	Laurel Pump Station	Sample Method:	Grab sample of cuttings.
Geologist:	JKM/DSW	Drill Contractor:	PC Exploration
		Drill Date:	2/18/92 to 2/27/92

Dames & Moore

FILENAME: TM-DW1.DRW

Geological Boring Log



Lithologic Description

SAND; brown; fine sand with very little gravel; damp.

- very poor cuttings, drill lines plugging.

- fast drilling, driller indicates water at 209'.

SAND; fine sand with trace silt; damp.

- wet cuttings at 217' bgs.

Sandy clayey SILT; gray; saturated, soft.
- poor cuttings returns.

Gravelly SAND; brown to gray; fine to medium sand; damp, moderate dense, well sorted; gravels to 1/4" dia.

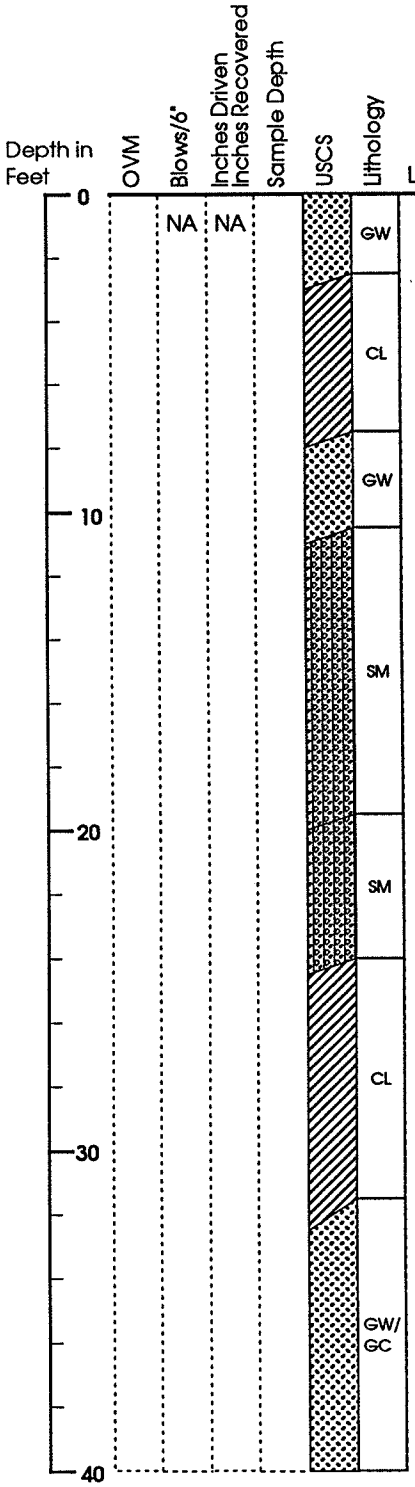
Terminated borehole at 230' on 2/27/92.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-DW1
Job No:	21199-032-005	Drilling Method:	ODEX with 6" casing.
Location:	Laurel Pump Station	Sample Method:	Grab sample of cuttings.
Geologist:	JKM/DSW	Drill Contractor:	PC Exploration
		Drill Date:	2/18/92 to 2/27/92

Dames & Moore

FILENAME: TM-DW1.DRW

Geological Boring Log



Lithologic Description

GRAVEL ROAD - FILL

Silty sandy CLAY; gray and brown with greenish gray pockets; sand fine, saturated, moderately plastic.

- no recovery.

Silty sandy GRAVEL and cobbles; brown; saturated, low plasticity; sands fine to coarse.

- resampled 11.5 - 13' bgs.

Silty SAND with trace gravel and cobbles; mottled brown and gray; moist, slight plasticity; sands predominately fine, very compact (possibly till?).

As above; very dense, dry.

- no recovery.

- hard drilling.

- no recovery.

Silty CLAY / clayey SILT; gray; trace fine sand, trace organic material, trace gravel; moist, stiff, low to moderate plasticity.

Silty CLAY; gray; trace sand and organic matter; damp, high plasticity, stiff to very stiff.

Sandy Clayey GRAVEL; brown, sand; 35 - 50% clay, 5 - 10% clay; moist, loose to medium dense; gravels rounded to 3".

- hard drilling.

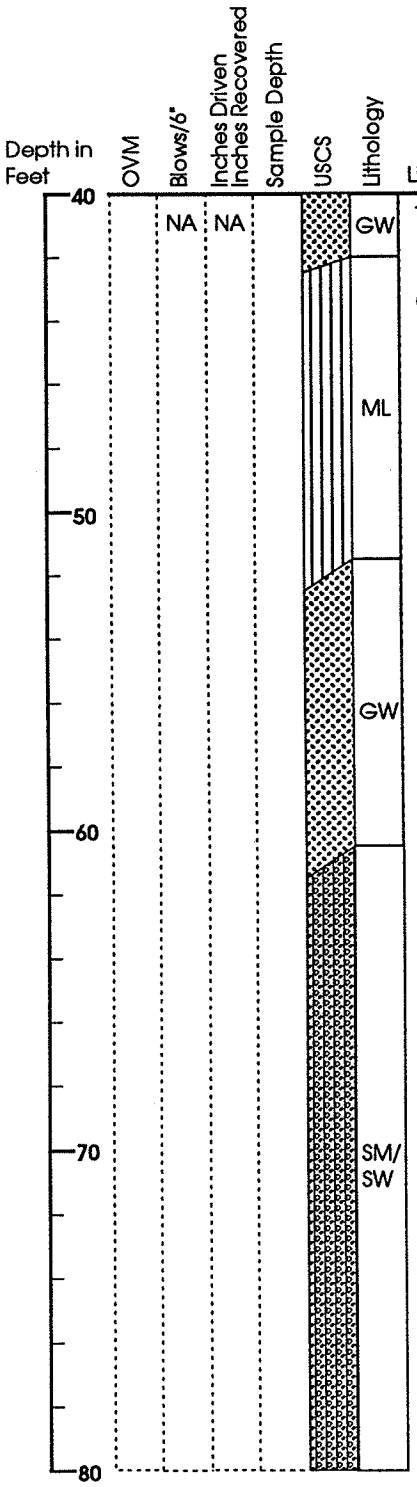
Clayey silty GRAVEL; gray; dry to damp, very hard; gravels to 2", little recovery in sampler.

Client:	Trans Mountain Pipe Line Co.	Boring No:	DW-2
Job No:	21199-032-005	Drilling Method:	ODEX with 6" casing.
Location:	Laurel Pump Station	Sample Method:	Grab sample of cuttings.
Geologist:	IMW	Drill Contractor:	Hayes Drilling
		Drill Date:	3/19 - 3/20/92

FILENAME: TM-DW2.DRW

Dames & Moore

Geological Boring Log



Lithologic Description

- very hard drilling.

Clayey SILT; gray; <10% fine sand and <5% gravel; damp, low plasticity

Gravelly sandy SILT; brown to gray; moist to wet, dense, poorly sorted; gravels to 2".

Silty sandy GRAVEL; brown to gray; 5 - 10% silt, 5 - 10% coarse sand; dry to damp, dense, poorly sorted; gravels to 3".

- no recovery.

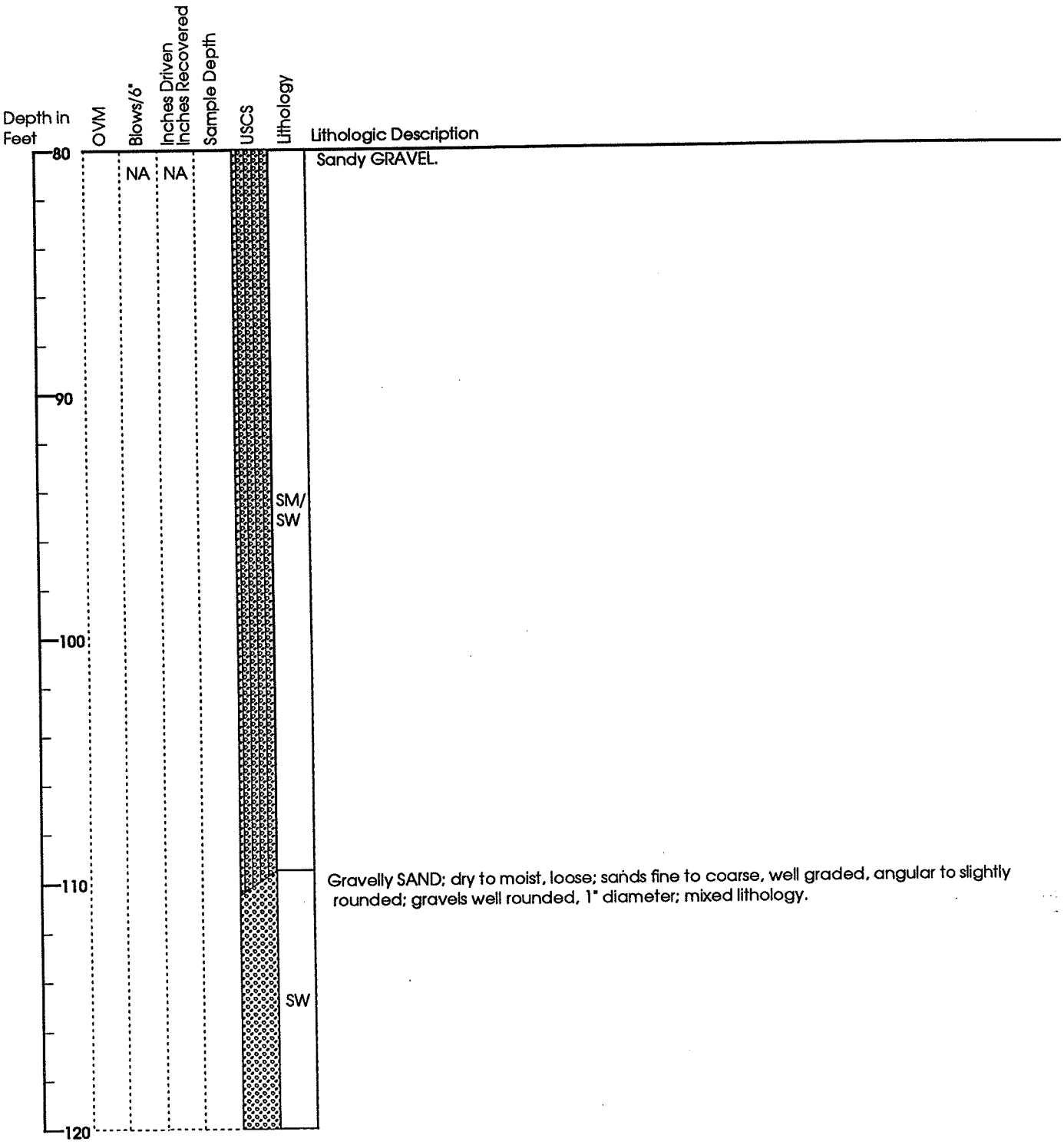
Silty SAND with gravel; brown, fine to coarse SAND; gravel is rounded; sand 50 - 60%; moist, poorly graded.

Silty SAND with gravel; brown, moist, loose, moserately graded; gravel <40% sand <40%, silt <20%.

Client:	Trans Mountain Pipe Line Co.	Boring No:	DW-2
Job No:	21199-032-005	Drilling Method:	ODEX with 6" casing.
Location:	Laurel Pump Station	Sample Method:	Grab sample of cuttings.
Geologist:	IMW	Drill Contractor:	Hayes Drilling
		Drill Date:	3/19 - 3/20/92

FILENAME: TM-DW2.DRW

Geological Boring Log

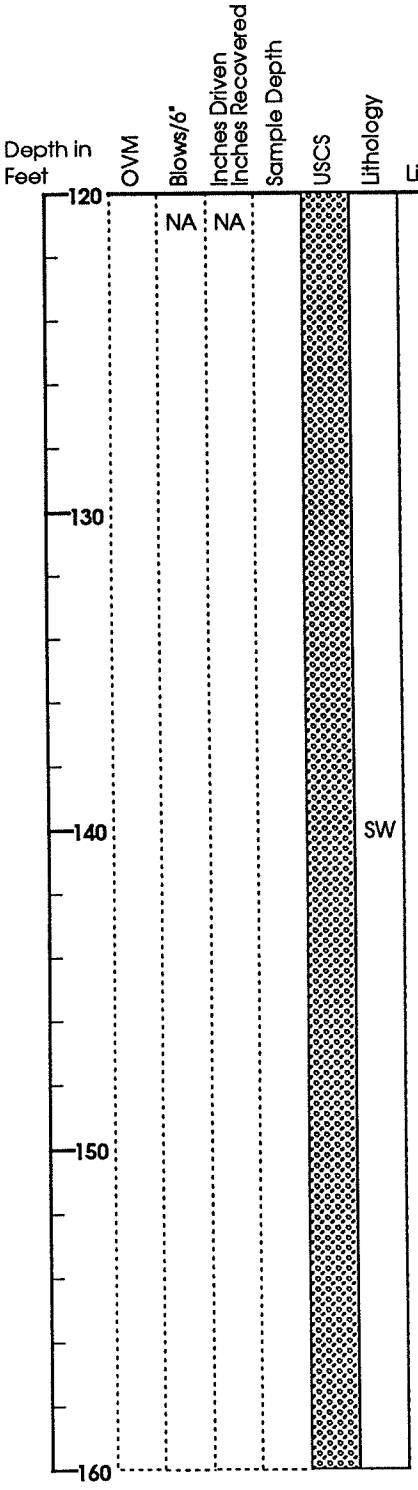


Client:	Trans Mountain Pipe Line Co.	Boring No:	DW-2
Job No:	21199-032-005	Drilling Method:	ODEX with 6" casing.
Location:	Laurel Pump Station	Sample Method:	Grab sample of cuttings.
Geologist:	IMW	Drill Contractor:	Hayes Drilling
		Drill Date:	3/19 - 3/20/92

Dames & Moore

FILENAME: TM-DW2.DRW

Geological Boring Log



Lithologic Description

SAND; medium to fine sand with no coarse fraction, no gravel, moist, well graded, loose.

- increase gravels at 125' bgs.

Silty gravelly SAND; moist, medium graded, loose; sands fine to coarse with trace silt; gravels rounded, 0.5 - 0.75" diameter.

Gravelly SAND; fine to medium sand, moist, moderately graded, loose, gravels rounded.

SAND; medium to fine, medium grained, subangular to subrounded, moist, moderately graded, loose.

Client:	Trans Mountain Pipe Line Co.	Boring No:	DW-2
Job No:	21199-032-005	Drilling Method:	ODEX with 6" casing.
Location:	Laurel Pump Station	Sample Method:	Grab sample of cuttings.
Geologist:	IMW	Drill Contractor:	Hayes Drilling
		Drill Date:	3/19 - 3/20/92

FILENAME: TM-DW2.DRW

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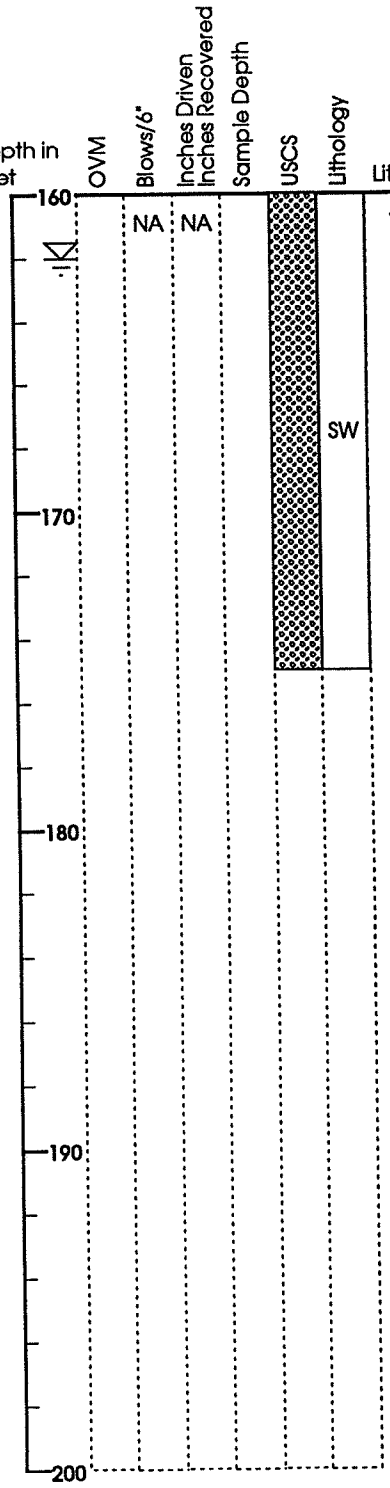
Geological Boring Log



Lithologic Description

Very fine SAND; moist, medium graded, subrounded to subangular.

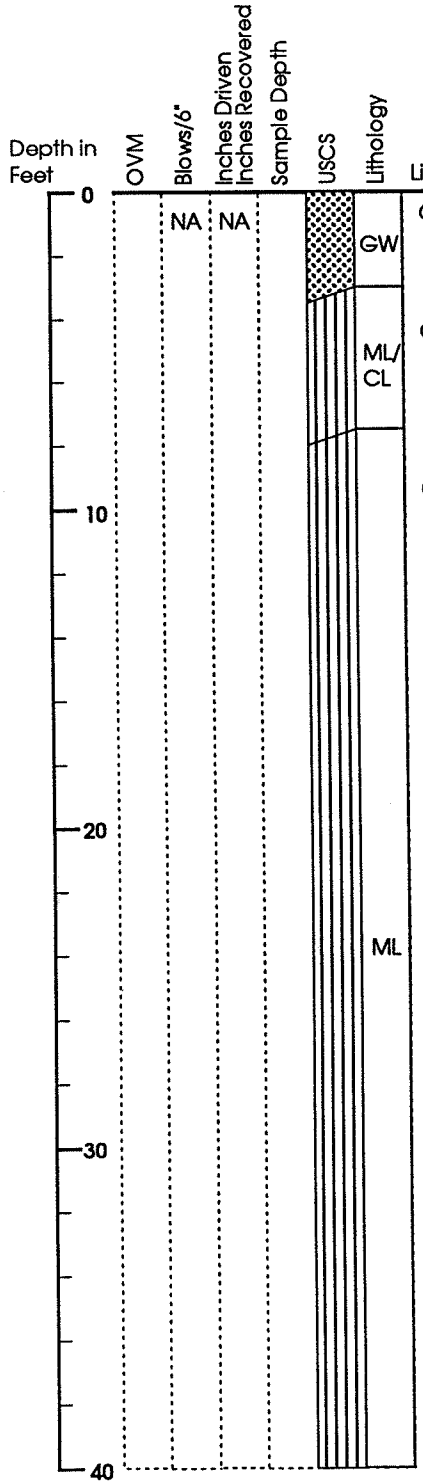
Fine SAND; saturated to moist, very clean, poorly graded, salt and pepper appearance, rounded.

Boring completed at 175' bgs on 3/20/92.

Client:	Trans Mountain Pipe Line Co.	Boring No:	DW-2
Job No:	21199-032-005	Drilling Method:	ODEX with 6" casing.
Location:	Laurel Pump Station	Sample Method:	Grab sample of cuttings.
Geologist:	IMW	Drill Contractor:	Hayes Drilling
		Drill Date:	3/19 - 3/20/92

FILENAME: TM-DW2.DRW

Geological Boring Log



Lithologic Description

GRAVEL; dark gray, very soft, fill.

Clayey SILT / silty CLAY; brown; trace fine sand with lense of medium sand, organic matter; moist, to wet, stiff, well sorted, iron stained, medium plasticity; gravels to 1" rounded.

Clayey SILT; brown; 25 - 40% clay, trace sand and gravel; moist, medium stiff, moderate to high plasticity, increasing stiffness / density with depth, grading to till.

Clayey SILT / silty CLAY; gray, trace fine sand and gravel, dry to damp, low plasticity, very stiff, micaceous.

Clayey SILT; gray; trace fine sand, gravel; moist, stiff, softer than previous sample, scattered iron staining, moderate to high plasticity.

Clayey SILT; as above, slightly more dense, scattered gravel.

Silty CLAY / clayey SILT; gray; trace fine sand and gravel; moist, stiff, moderate to high plasticity; gravels to 1", rounded.

- no recovery

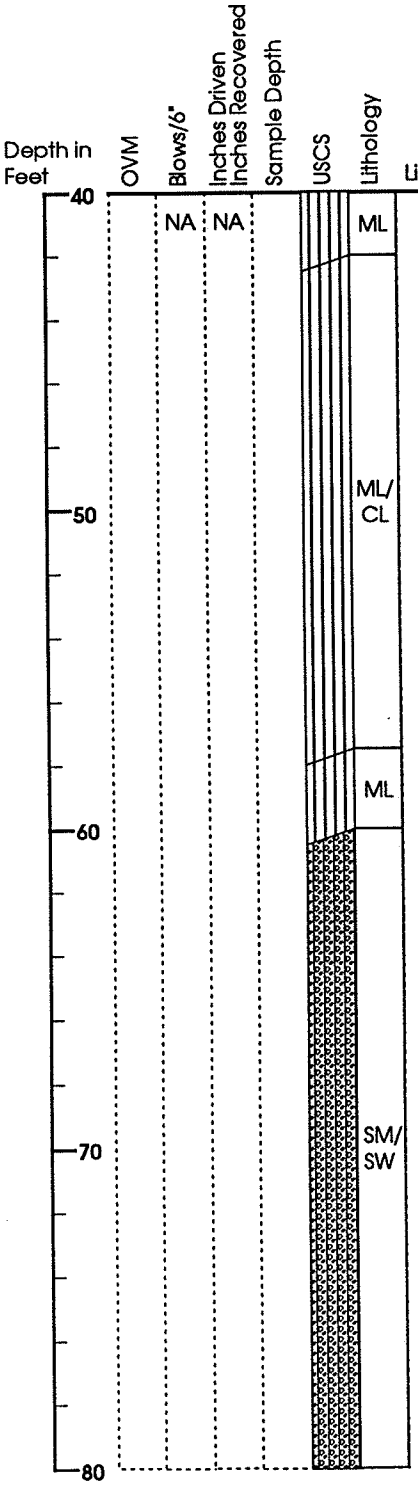
Clayey SILT; grey; 10 - 15% fine sand; moist, low plasticity, no odor; gravels to 2", rounded, shell (clam?).

Client:	Trans Mountain Pipe Line Co.	Boring No:	DW-3
Job No:	21199-032-005	Drilling Method:	ODEX with 6" casing.
Location:	Laurel Pump Station	Sample Method:	Grab sample of cuttings.
Geologist:	JKM/DSW	Drill Contractor:	Hayes Drilling
		Drill Date:	3/24/92

Dames & Moore

FILENAME: TM-DW3.DRW

Geological Boring Log



Lithologic Description

- increasing moisture in cuttings with depth.

Clayey SILT / silty CLAY; gray; trace fine sand and gravel; moist, very stiff, high plasticity, no odor; gravels to 2", rounded, micaceous.

Clayey SILT / silty CLAY; as above, slightly less plastic.

Clayey SILT / silty CLAY; as above, less moist.

- increasing gravel with deoth.

Clayey SILT; gray; 25 - 40% clay; dry to moist, very stiff, low plasticity.

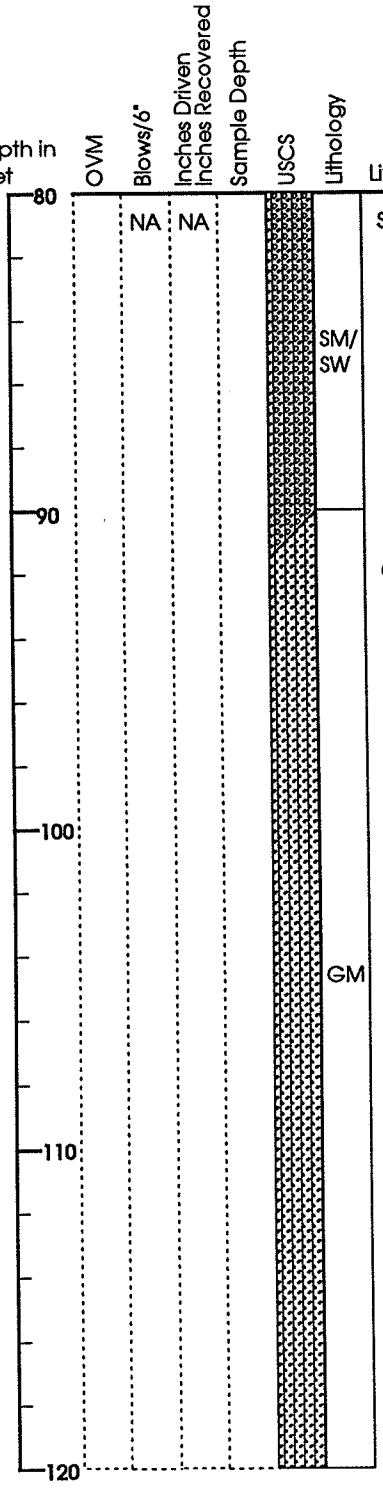
Silty gravelly SAND; brown to grey; fine to coarse sand with some gravel, scattered cobbles and trace silt; moist, medium dense; sands subrounded to angular, predominately fine, mixed lithology; gravels predominately fine (up to 3/4" dia.), subangular to subrounded, mixed lithology.

Client:	Trans Mountain Pipe Line Co.	Boring No:	DW-3
Job No:	21199-032-005	Drilling Method:	ODEX with 6" casing.
Location:	Laurel Pump Station	Sample Method:	Grab sample of cuttings.
Geologist:	JKM/DSW	Drill Contractor:	Hayes Drilling
		Drill Date:	3/24/92

Dames & Moore

FILENAME: TM-DW3.DRW

Geological Boring Log



Lithologic Description

Silty gravelly SAND; brown; fine to coarse sand with gravel, scattered cobbles and 5% silt; moist, medium dense; sand content from 80 - 85' bgs fine.

Gravelly silty SAND; dark brown to black, fine to medium sand with some silt, moist, well graded, no odor.

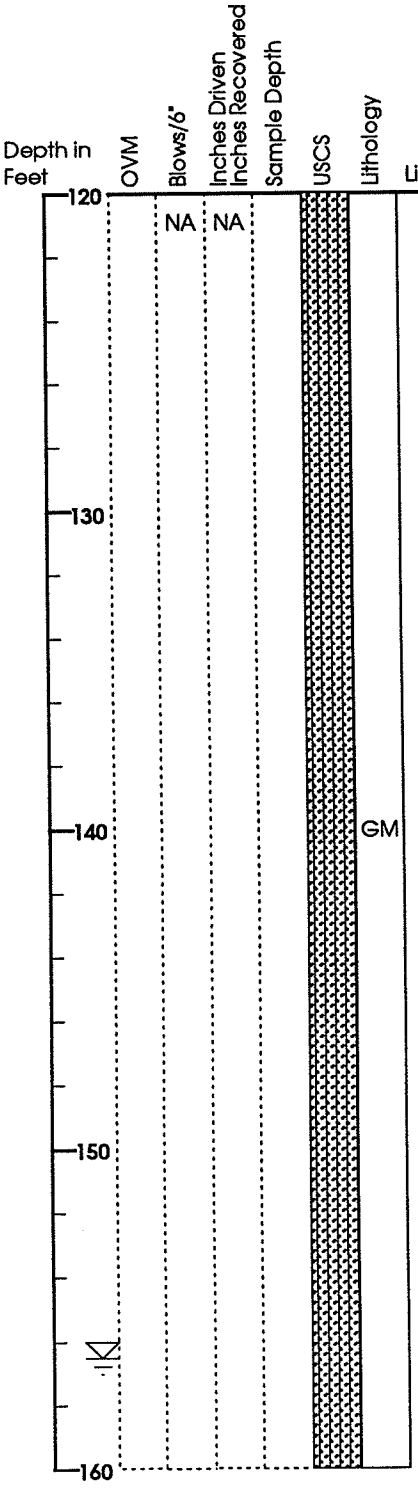
Silty gravelly SAND; dark brown, fine to coarse sand and gravel with trace silt; moist, poorly graded, loose, no odor; gravels rounded, 0.75" diameter.

Client:	Trans Mountain Pipe Line Co.	Boring No:	DW-3
Job No:	21199-032-005	Drilling Method:	ODEX with 6" casing.
Location:	Laurel Pump Station	Sample Method:	Grab sample of cuttings.
Geologist:	JKM/DSW	Drill Contractor:	Hayes Drilling
		Drill Date:	3/24/92

Dames & Moore

FILENAME: TM-DW3.DRW

Geological Boring Log



Lithologic Description

Silty gravelly SAND; greyish black, fine to coarse sand and gravel with trace silt; moist, poorly graded, loose, no odor; gravels rounded, 0.75" diameter.

Sandy silty GRAVEL; moist, poorly graded, loose, no odor; sands very fine to fine; gravels medium to coarse grained <0.75" diameter, subrounded to subangular.

Silty gravelly SAND; moist, moderate graded, loose no odor; gravels fine to coarse, rounded.

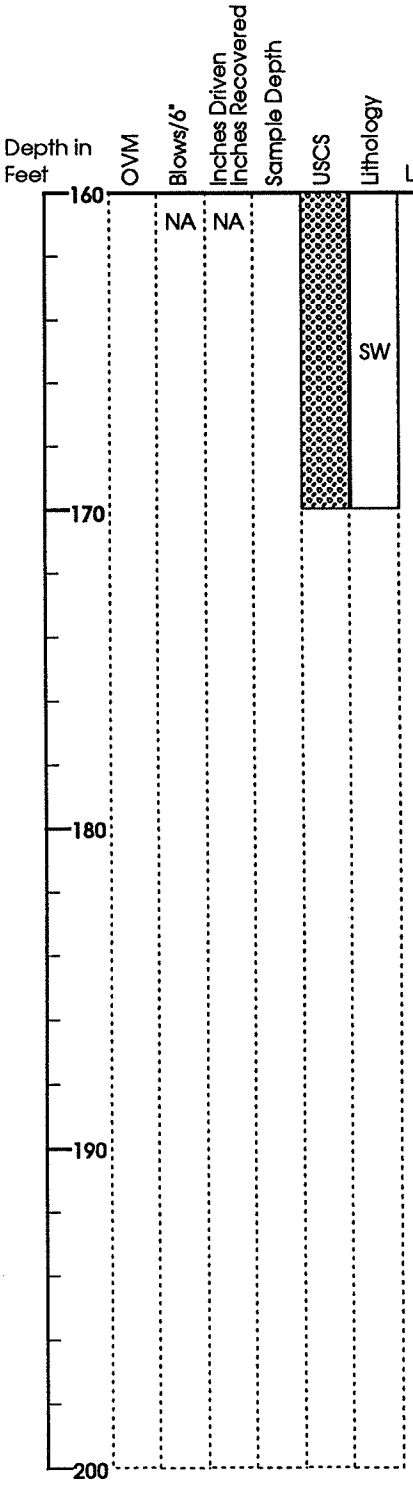
Slightly silty SAND; medium to fine sand with trace silt; brown, moist, poorly graded, loose, no odor.

Client:	Trans Mountain Pipe Line Co.	Boring No:	DW-3
Job No:	21199-032-005	Drilling Method:	ODEX with 6" casing.
Location:	Laurel Pump Station	Sample Method:	Grab sample of cuttings.
Geologist:	JKM/DSW	Drill Contractor:	Hayes Drilling
		Drill Date:	3/24/92

Dames & Moore

FILENAME: TM-DW3.DRW

Geological Boring Log

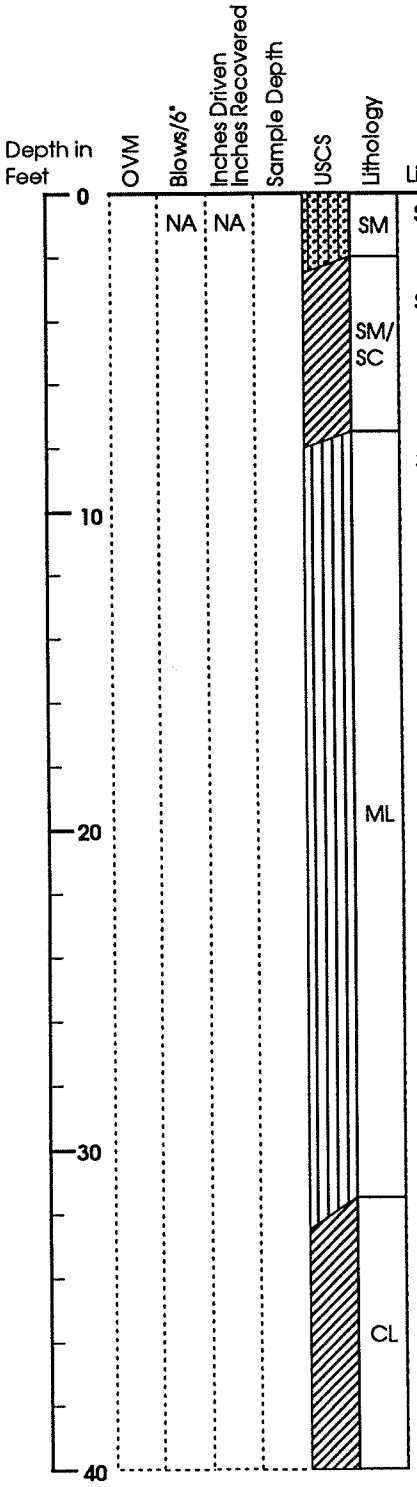


Client:	Trans Mountain Pipe Line Co.	Boring No:	DW-3
Job No:	21199-032-005	Drilling Method:	ODEX with 6" casing.
Location:	Laurel Pump Station	Sample Method:	Grab sample of cuttings.
Geologist:	JKM/DSW	Drill Contractor:	Hayes Drilling
		Drill Date:	3/24/92

Dames & Moore

FILENAME: TM-DW3.DRW

Geological Boring Log



Lithologic Description

Silty sandy GRAVEL; fill.

Silty clayey SAND; grayish brown; fine sand, minor gravel, minor organic material; moist, medium plasticity, medium stiff, no petroleum odor.

Sandy clayey SILT; tan / gray; 70% silt, 10% fine sand, 15% clay, 5% gravel, trace organic material; well sorted; gravels to 2".

Sandy clayey SILT; tan / gray; 70 - 80% silt, 10% very fine sand, 10% clay, trace gravel; dry, very stiff, low plasticity, poorly sorted; gravels to 1".

Sandy clayey SILT; gray; 80 - 85% silt, trace gravel; dry, very stiff, non plastic, poorly sorted, no petroleum odor; gravels to 1".

Clayey SILT; gray; 80 - 85% silt/clay, trace gravel; medium plasticity, moderately stiff; gravel up to 2", rounded.

- no recovery, hit a rock.

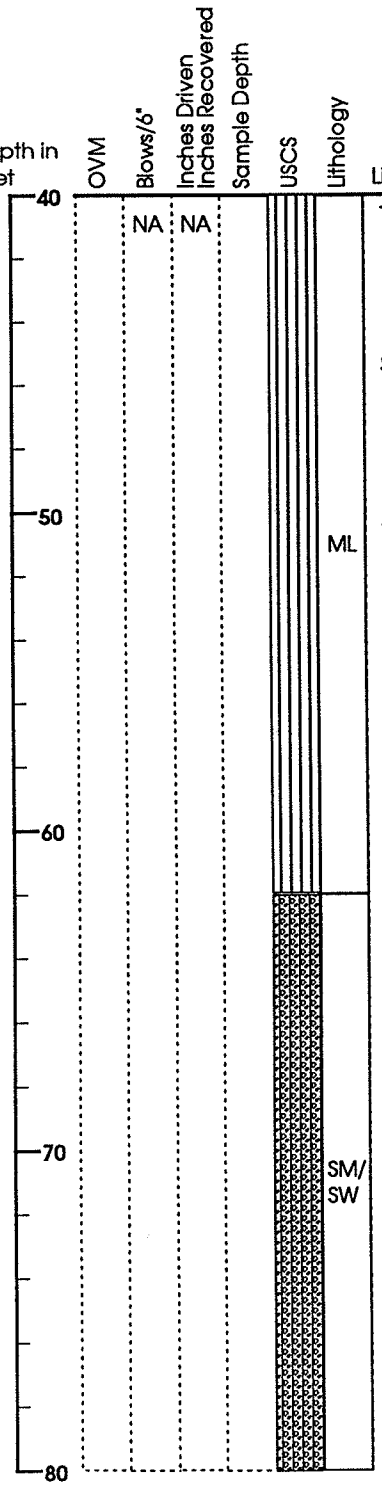
Silty CLAY; grey; high plasticity, stiff, seams or laminations of reddish brown fine sand with minor gravel; poorly sorted, no petroleum odor.

Client:	Trans Mountain Pipe Line Co.	Boring No:	DW-4
Job No:	21199-032-005	Drilling Method:	ODEX with 6" casing.
Location:	Laurel Pump Station	Sample Method:	Grab sample of cuttings.
Geologist:	IMW	Drill Contractor:	Hayes Drilling
		Drill Date:	3/30/92

Dames & Moore

FILENAME: TM-DW4.DRW

Geological Boring Log



Lithologic Description

- no recovery.

Sandy clayey SILT; gray; 40% sand, 50% silt, 10% clay; well sorted, medium plasticity, stiff.

- no recovery.

Sandy clayey SILT; gray; 40% sand, 50% silt, 10% clay; well sorted, medium plasticity, stiff to hard.

Sandy clayey SILT; gray; 50% silt, 20 - 30% fine sand, 10% clay, trace gravel; moist, medium plasticity, poorly sorted, hard.

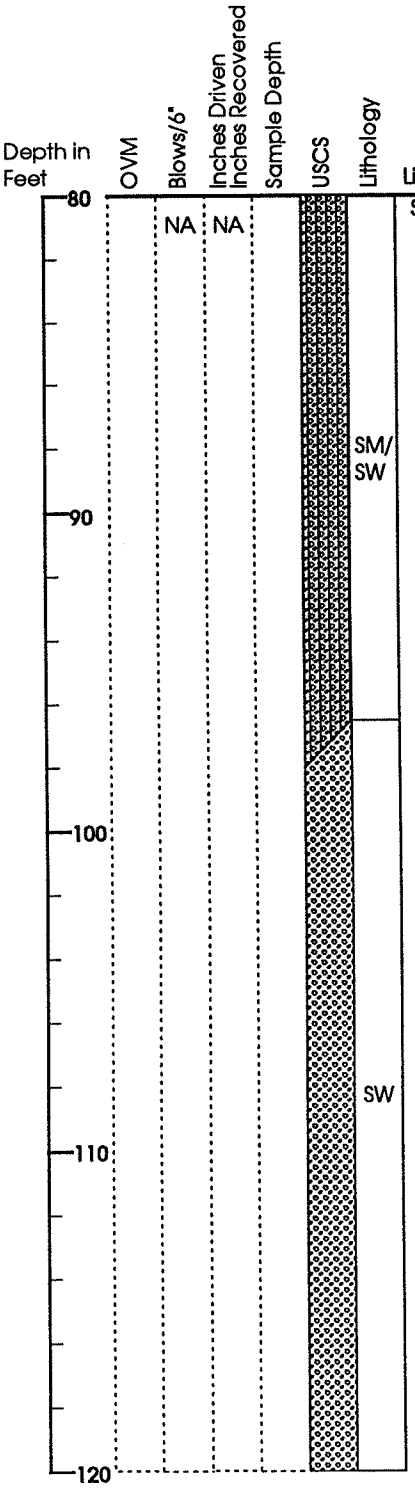
Silty gravelly SAND; brown to gray; fine to coarse sand with some gravel, scattered cobbles and trace silt; moist, medium dense, sands subrounded to angular, predominately fine, mixed lithology; gravels predominately fine (up to 3/4" dia.), subangular to subrounded, mixed lithology.

Client:	Trans Mountain Pipe Line Co.	Boring No:	DW-4
Job No:	21199-032-005	Drilling Method:	ODEX with 6" casing.
Location:	Laurel Pump Station	Sample Method:	Grab sample of cuttings.
Geologist:	IMW	Drill Contractor:	Hayes Drilling
		Drill Date:	3/30/92

Dames & Moore

FILENAME: TM-DW4.DRW

Geological Boring Log



Silty gravelly SAND; brown; fine to coarse sand with gravel, scattered cobbles and 5% silt; moist, medium dense; sand content from 80 - 85' bgs fine.

Very fine to fine SAND; moist, mediom graded, loose.

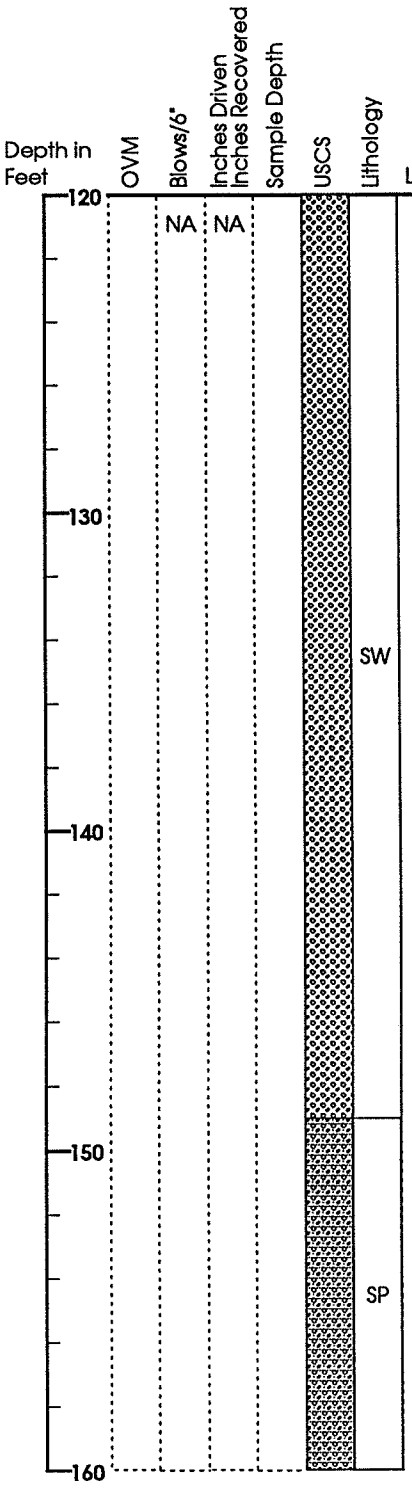
Gravelly fine SAND; moist, loose; gravels fine to meidum, rounded to subangular.

Client:	Trans Mountain Pipe Line Co.	Boring No:	DW-4
Job No:	21199-032-005	Drilling Method:	ODEX with 6" casing.
Location:	Laurel Pump Station	Sample Method:	Grab sample of cuttings.
Geologist:	IMW	Drill Contractor:	Hayes Drilling
		Drill Date:	3/30/92

Dames & Moore

FILENAME: TM-DW4.DRW

Geological Boring Log



Lithologic Description

Gravelly fine to coarse SAND; moist, loose.

- increase in gravel content.

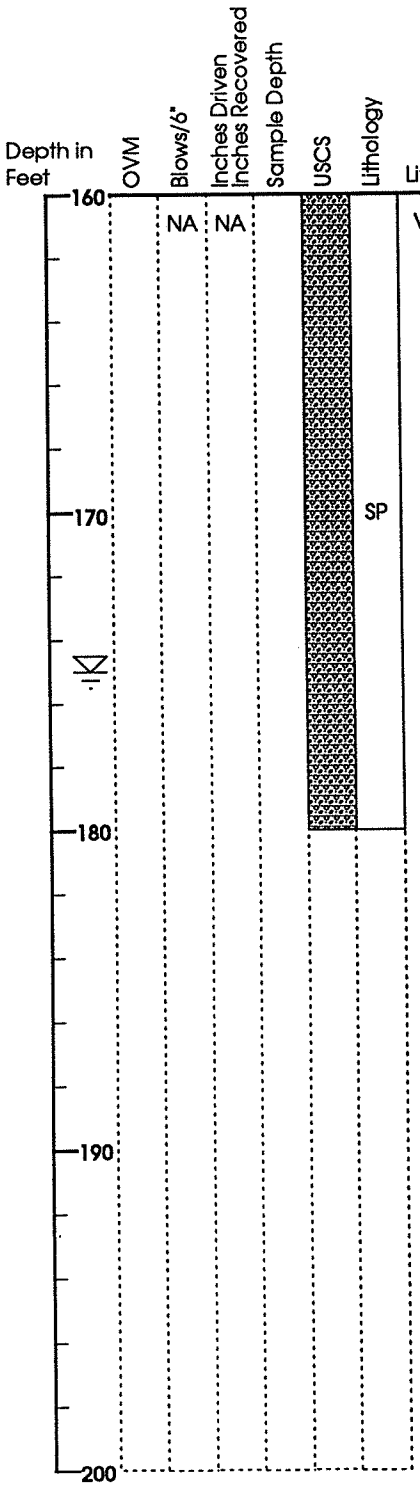
Gravelly fine to medium SAND; black / dark brown, moist, loose, clumps of fine grained black sand (?) possible organic material.

Coarse SAND; some fine to medium sands and gravel; moist, loose.

Very fine SAND; tan, dry to moist, loose, uniform very fine to fine sands.

Client:	Trans Mountain Pipe Line Co.	Boring No:	DW-4
Job No:	21199-032-005	Drilling Method:	ODEX with 6" casing.
Location:	Laurel Pump Station	Sample Method:	Grab sample of cuttings.
Geologist:	IMW	Drill Contractor:	Hayes Drilling
		Drill Date:	3/30/92

Geological Boring Log



Lithologic Description

Very fine SAND; tan, dry to moist, loose, uniform very fine to fine sands.

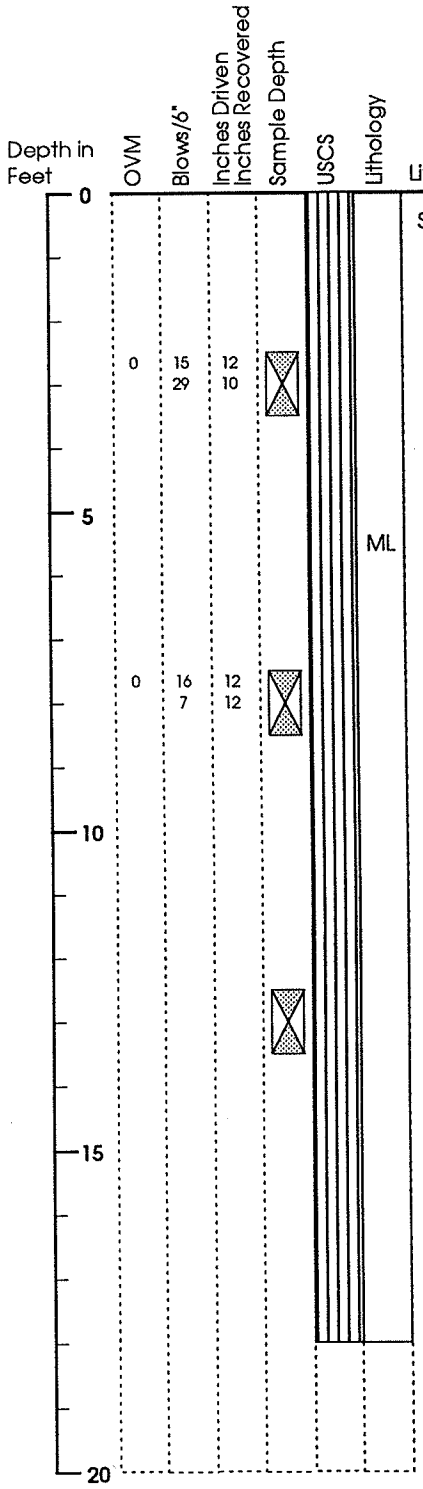
Boring completed at 180' bgs on 3/30/92.
Groundwater encountered at 175' bgs during drilling.

Client:	Trans Mountain Pipe Line Co.	Boring No:	DW-4
Job No:	21199-032-005	Drilling Method:	ODEX with 6" casing.
Location:	Laurel Pump Station	Sample Method:	Grab sample of cuttings.
Geologist:	IMW	Drill Contractor:	Hayes Drilling
		Drill Date:	3/30/92

Dames & Moore

FILENAME: TM-DW4.DRW

Geological Boring Log



Sandy SILT; brown with some rust staining; 90% silt, 10% medium to coarse sand, trace clay and scattered gravels; dry, slight plasticity, possibly organic, stiff to hard.

- no recovery from sampler.

- no recovery from sampler.

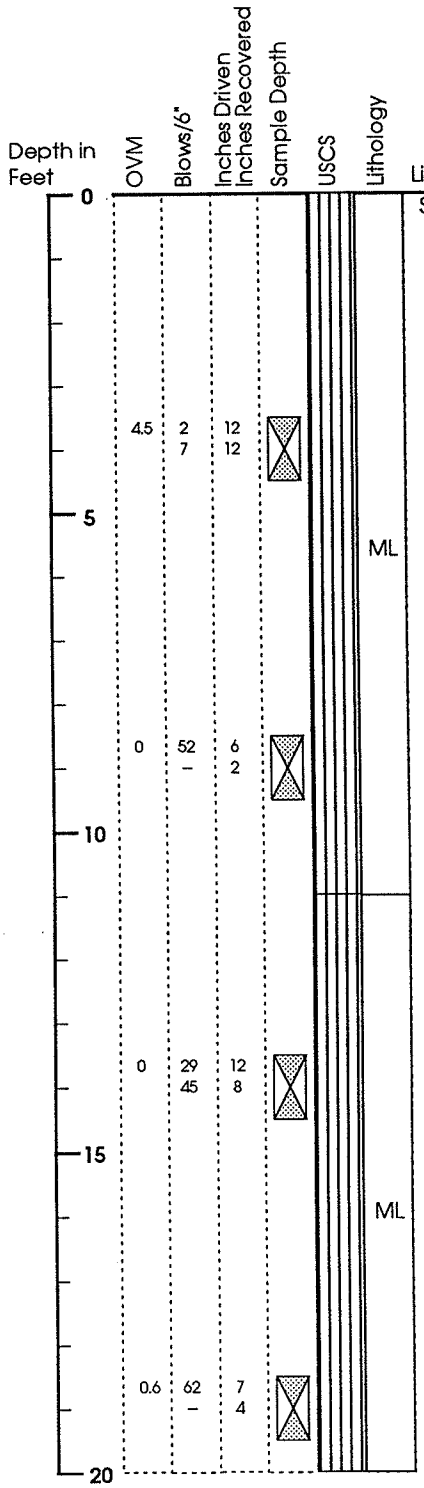
Terminated boring at 18' bgs on 12/10/92.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B7
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	BU	Drill Contractor:	Hays Drilling
		Drill Date:	12/10/91

Dames & Moore

FILENAME: TM-B07.DRW

Geological Boring Log



SILT; brown; 90% silt with scattered medium to coarse sand, gravel and trace clay; moist to dry, stiff, slight plasticity.

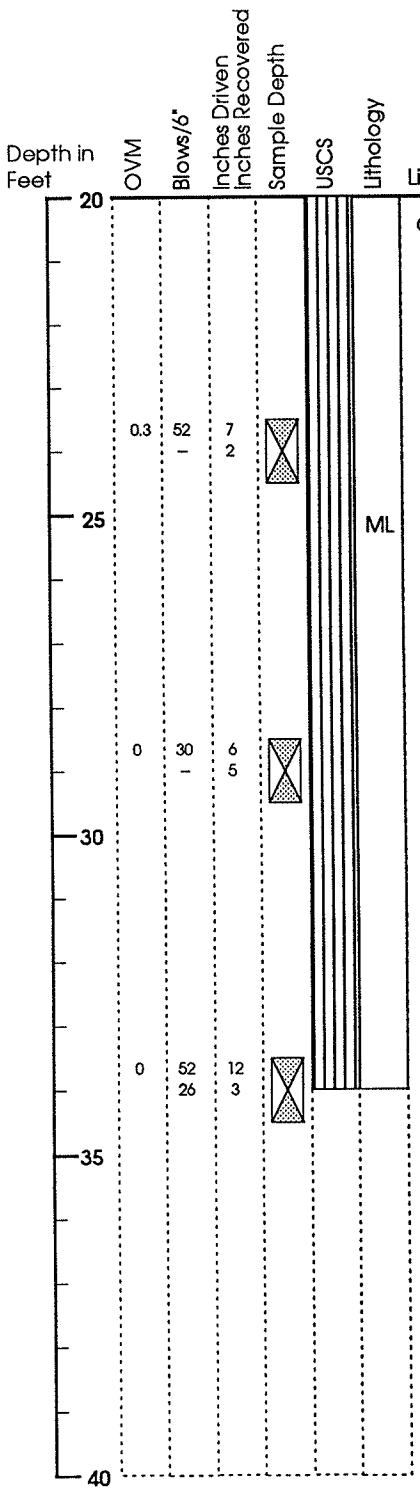
Gravelly sandy SILT; brown to olive gray with depth; 70% silt and fine sand, 30% coarse sand and gravel with scattered cobbles; dry, well sorted, loose to medium stiff, little to no plasticity.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B8
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	BU	Drill Contractor:	Hayes Drilling
		Drill Date:	12/11/91

Dames & Moore

FILENAME: TM-B08.DRW

Geological Boring Log



Gravelly sandy SILT; as above.

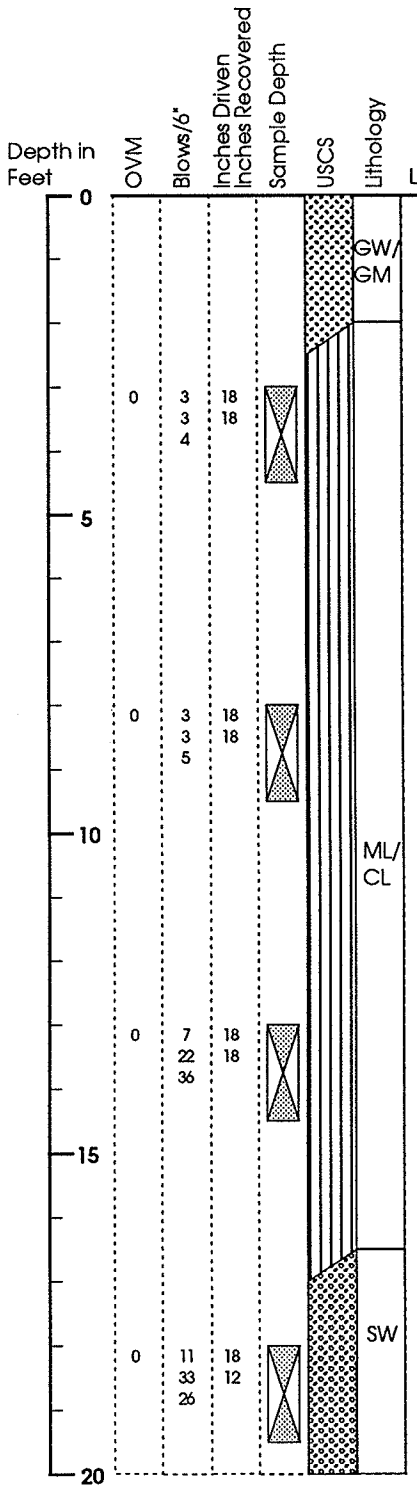
Terminated boring at 34' bgs on 12/11/92.
Groundwater not encountered during drilling.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B8
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	BU	Drill Contractor:	Hayes Drilling
		Drill Date:	12/11/91

FILENAME: TM-B08.DRW

Dames & Moore

Geological Boring Log



Silty GRAVEL; fill material.

Clayey SILT / silty CLAY; gray with iron staining; scattered coarse sand and gravel, trace organic matter; moist, moderate plasticity, stiff.

Clayey SILT / silty CLAY; gray; trace fine sand, trace organic debris; very stiff, high plasticity.

Clayey SILT / silty CLAY; gray; trace fine to coarse sand and gravel; dry to moist, very stiff to hard, low plasticity.

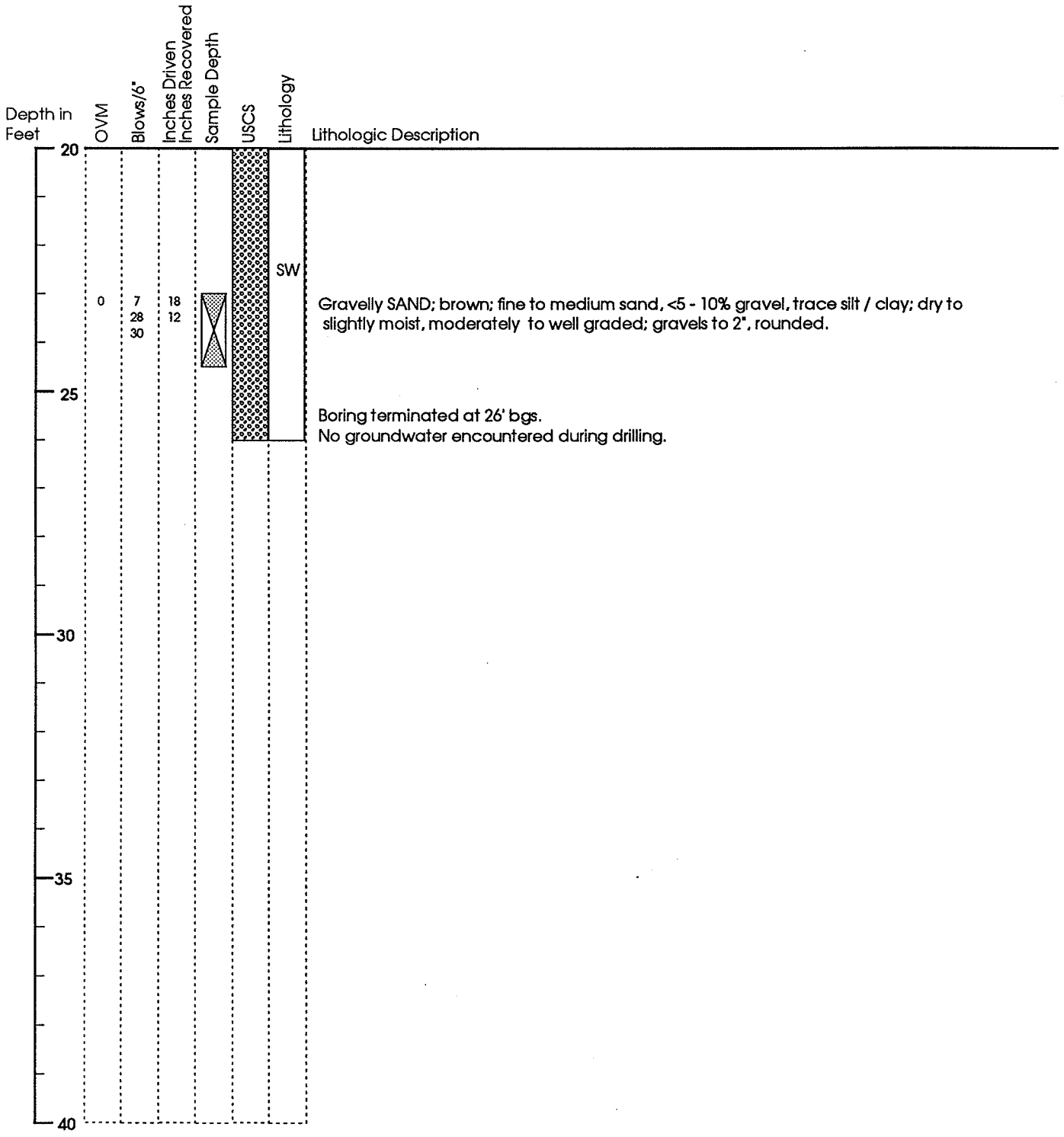
Gravelly SAND; brown; fine sand with gravel and trace silt; dry to slightly moist, loose to medium dense, well sorted, no odor.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B13
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	DSW / JKM	Drill Contractor:	Hayes Drilling
		Drill Date:	2/30/92

Dames & Moore

FILENAME: TM-B13.DRW

Geological Boring Log



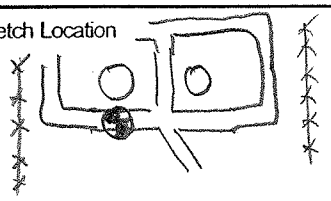
Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B13
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	DSW / JKM	Drill Contractor:	Hayes Drilling
		Drill Date:	2/30/92

Dames & Moore

FILENAME: TM-B13.DRW

Project: BE9333-2 Puget Sound Reactivation	Boring No. U-3
Project Location: Bellingham, WA	Sheet 1 of 2
Project Number: 33759847.00001	

Sketch Location



Date(s) Drilled	3/13/2006	Logged By	E. LENZ
Drilling Method / Drill Bit Size/Type	HSA	Total Depth of Borehole	~~24 ft~~ 23.5 ft
Drilling Contractor	Boart	Drill Rig Type	B-61 Mobile
Sampling Method(s)	SPT	Hammer Data	SPT: 140lb - 30-in
Groundwater Level and Date Measured		Surface Elevation	

Elevation feet	Depth, feet	SAMPLES Type	Number	Blows/ft.	Number of Rings	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
	0						Gravel surface: 1-2" thick	
							[ML] Brown to orange brown slightly Gravelly SILT, moist, m. stiff (fill)	Start: 1:15 PM
	2.5	SPT	S-1	1/3/3 (6)	18"/18"		[ML] Brown to orange brown sandy (fine) SILT, moist, medium stiff, NON-plastic (fill)	PP = N/a
	5							
	7.5	SPT	S-2	8/22/34 (56)	18/18"		- becomes hard, gray to brown to olive in color, dry, with some sandy zones of < 1" thick	
	0						[GP] Gray with tan colored gravel slightly silty to trace fines, sandy (fine to coarse) GRAVEL, moist to wet, becoming dry to moist, very dense	
	2.5	SPT	S-3	32/36/43 (79)	8"/18"			
	5							
	7.5	SPT	S-4	50 for 6"	6"/6"		[ML/SM] Gray silty SAND / sandy SILT, moist to dry, v. dense / hard, NON-plastic, trace gravel	
	0							

URS

Project: BE9333-2 Puget Sound Reactivation	Boring No. U-3
Project Location: Bellingham, WA	Sheet 2 of 2
Project Number: 33759847.00001	

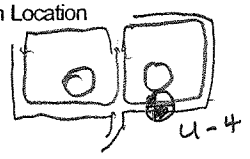
Sketch Location	Date(s) Drilled	Logged By
	Drilling Method Drill Bit Size/Type — See Sheet 1 of 2	Total Depth of Borehole
	Drilling Contractor	Drill Rig Type
	Sampling Method(s)	Hammer Data
	Groundwater Level and Date Measured	Surface Elevation

Elevation feet	Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Blows/ft.	Number of Rings	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
	0							
	2.5	SPT	S-5	50 For 5"	4"/5"		[GM] Gray to brown silty and sandy coarse gravel, moist to dry, v. dense	
	5							
	7.5							
0								
2.5								
5								
7.5								
0								

URS

Project: BE9333-2 Puget Sound Reactivation	Boring No. U-4
Project Location: Bellingham, WA	Sheet 1 of 2
Project Number: 33759847.00001	

Sketch Location



Date(s) Drilled	3/13/2007	Logged By	E. Lenz
Drilling Method Drill Bit Size/Type	HSA	Total Depth of Borehole	24 ft
Drilling Contractor	Boart	Drill Rig Type	Mobile B-61
Sampling Method(s)	SPT	Hammer Data	SPT: 140 lb, 30 in
Groundwater Level and Date Measured	N/O	Surface Elevation	

Elevation feet	Depth, feet	SAMPLES Type	Number	Blows/ft.	Number of Rings	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
	0						[ML-SM] Orangeish-brown to brown and gray, sandy SILT/silty fine SAND, v. soft/v. loose, moist to wet, low plasticity (fill - embankment)	Start at 3:30 PM
	2.5	SPT	S-1	1/0/1 (1)	18"/18"			
	5							
	7.5	SPT	S-2	7/8/13 (21)	18"/18"		[ML] Tanish-light-brown slightly silty sandy SILT with trace gravel, moist, v. stiff	pp = ~~0.4~~ 4.5 to > 4.5 tsf
	0							
	2.5	SPT	S-3	11/15/20 (35)	12/18"		[ML] (same above)	driller notes gravelly zone pp = 4.0 to > 4.5 tsf
	5							
	7.5	SPT	S-4	7/12/20 (32)	18"/18"			pp > 4.5 tsf
	0							

URS

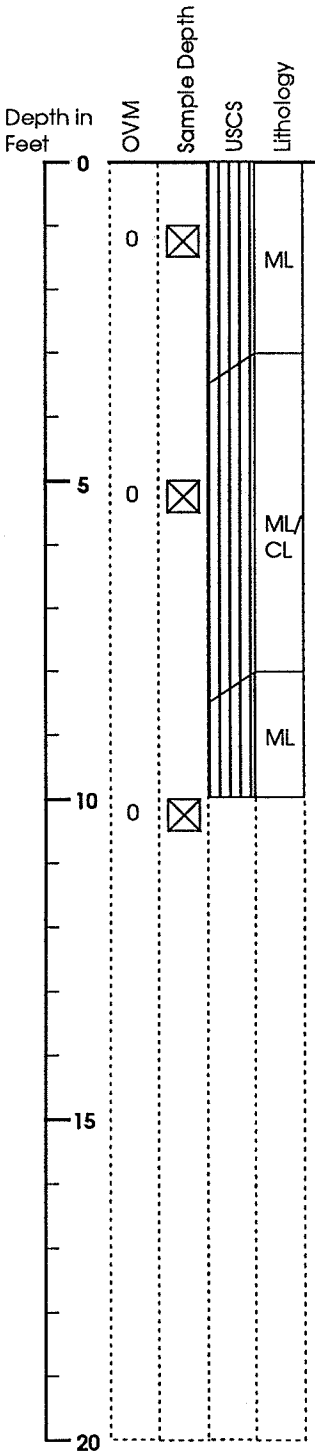
Project: BE9333-2 Puget Sound Reactivation	Boring No. U-4
Project Location: Bellingham, WA	Sheet 2 of 2
Project Number: 33759847.00001	

Sketch Location	Date(s) Drilled	Logged By
	Drilling Method / Drill Bit Size/Type	Total Depth of Borehole
	Drilling Contractor (see Sheet 1 of 2)	Drill Rig Type
	Sampling Method(s)	Hammer Data
	Groundwater Level and Date Measured	Surface Elevation

Elevation feet	Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Blows/ft.	Number of Rings	USCS	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
	0							
	2.5	SPT	23/34/50	S-5A / S5B	18"/18"		[ML] (see prev. sheet)	PP > 4.5 tsf
							[GM/SC] Gray to tan with tan colored gravel, sandy and slightly silty GRAVEL/ gravelly SAND with trace fines, moist, v. dense	End drilling at 4:25, leave site at 5:00 PM
	5							
	7.5							
	0							
	2.5							
	5							
	7.5							
	0							

URS

Geological Test Pit Log



Lithologic Description

Clayey sandy SILT; light brown, moist, medium plasticity, soft, organic material (rootlets).

- odor detected at 3' bgs, water seeping into pit.

Clayey SILT to silty CLAY; stained gray, moist, odor noted.

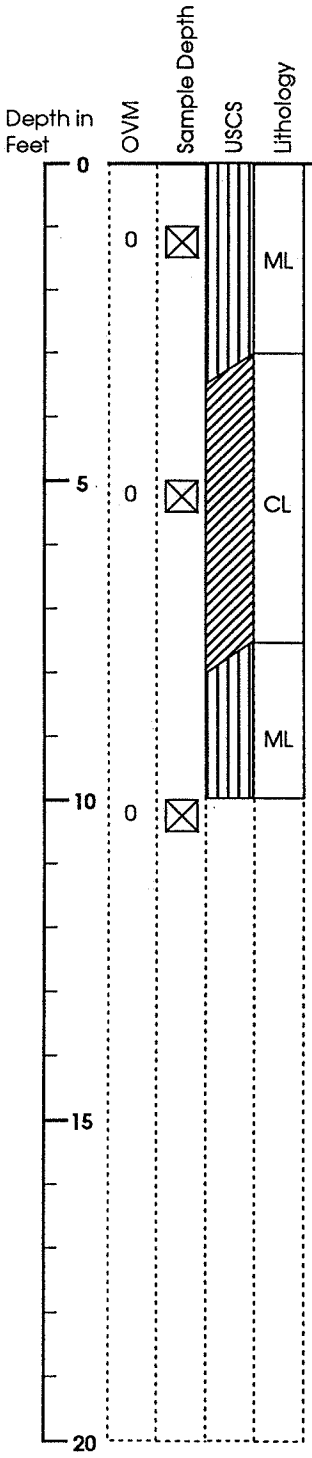
Clayey SILT; brown, low plasticity, very stiff, organic material, no staining.
Terminated pit at 10' bgs on 1/29/92.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TP3-1
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	Pressure Relief Tank	Sample Method:	Test Pit
Geologist:	IMW	Drill Date:	1/29/92

FILENAME: TP-2.DRW

Dames & Moore

Geological Test Pit Log



Lithologic Description

Clayey sandy SILT; brown, moist, medium plasticity, soft, organic material.

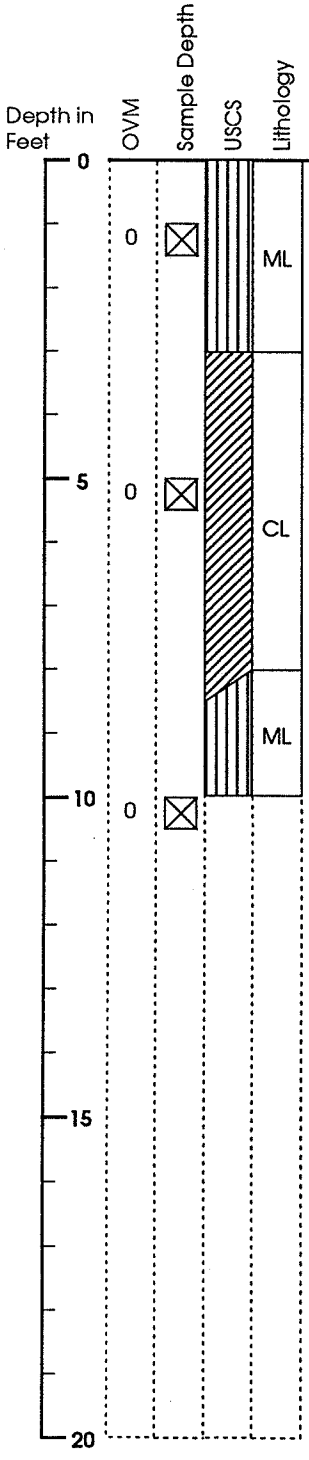
- moisture seeping into pit at 3' bgs.

Silty CLAY; gray, medium to high plasticity, stained with odor.

Clayey SILT; gray / brown, moderate to low plasticity, very stiff.
Terminated pit at 10' bgs on 1/29/92.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TP3-2
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	Pressure Relief Tank	Sample Method:	Test Pit
Geologist:	IMW	Drill Date:	1/29/92

Geological Test Pit Log



Lithologic Description

Clayey sandy SILT with gravel; brown, medium plasticity, soft, organic material; gravels to 1", angular.

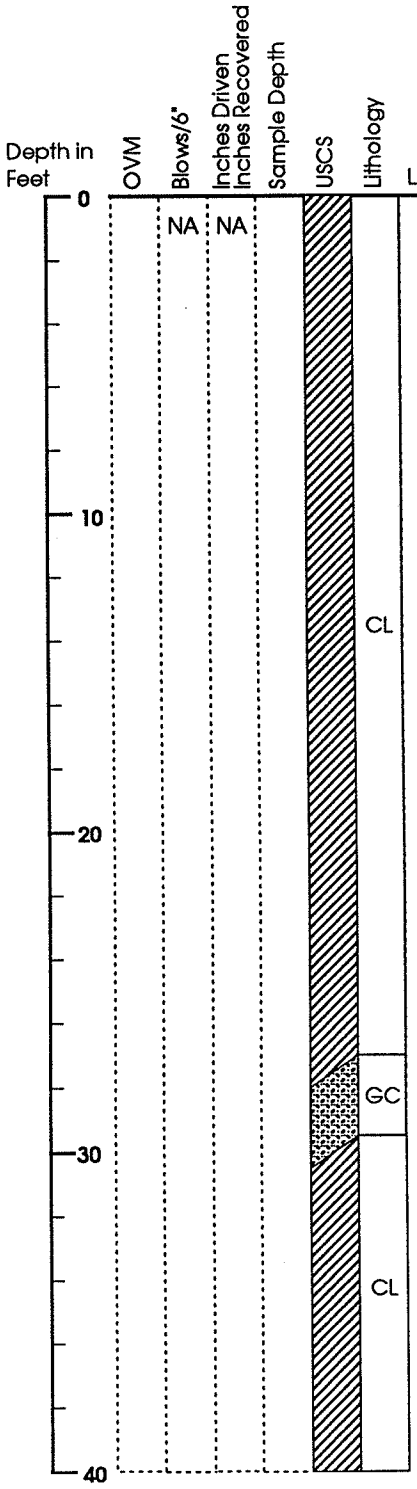
- water seeping into pit at 3' bgs.

Silty CLAY; gray / brown (stained), moist.

Clayey SILT; brown / gray, dry to moist, low plasticity, stiff.
Terminated pit at 10' bgs on 1/29/92.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TP3-3
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	Pressure Relief Tank	Sample Method:	Test Pit
Geologist:	IMW	Drill Date:	1/29/92

Geological Boring Log



Lithologic Description

Silty gravelly CLAY; tan, moderately plastic.

- water added by driller.

Silty gravelly CLAY, grey to black, increasing gravel content to 30%, gravels <0.5" diameter, angular.

Silty sandy GRAVEL with trace clay; gravels fine to coarse up to 1" diameter.

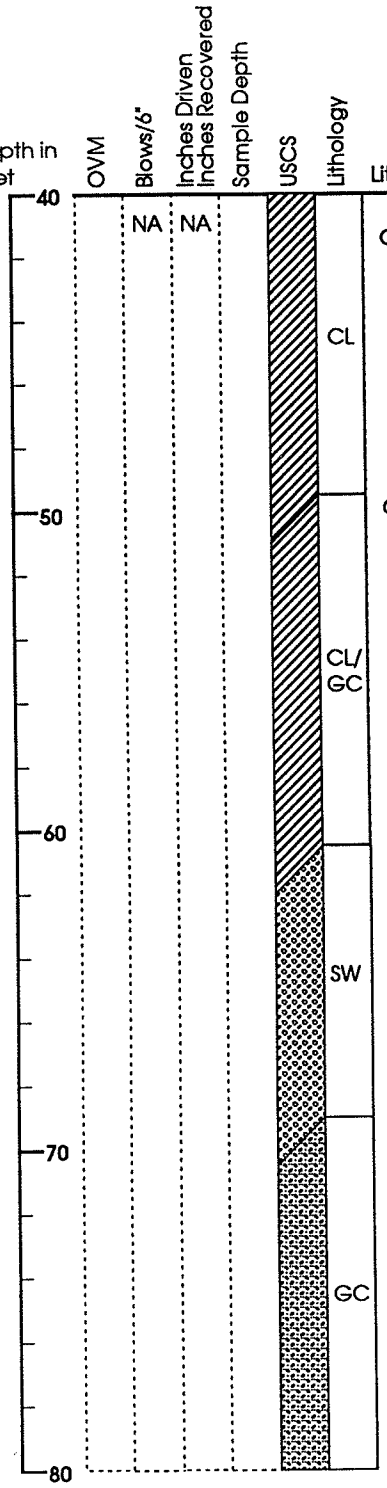
Gravelly CLAY; brown, low plasticity, gravels angular to subrounded.

Client:	Trans Mountain Pipe Line Co.	Boring No:	DW-5
Job No:	21199-032-005	Drilling Method:	ODEX with 6" casing.
Location:	Laurel Pump Station	Sample Method:	Grab sample of cuttings.
Geologist:	IMW	Drill Contractor:	Hayes Drilling
		Drill Date:	4/1 - 4/2/92

Dames & Moore

FILENAME: TM-DW5.DRW

Geological Boring Log

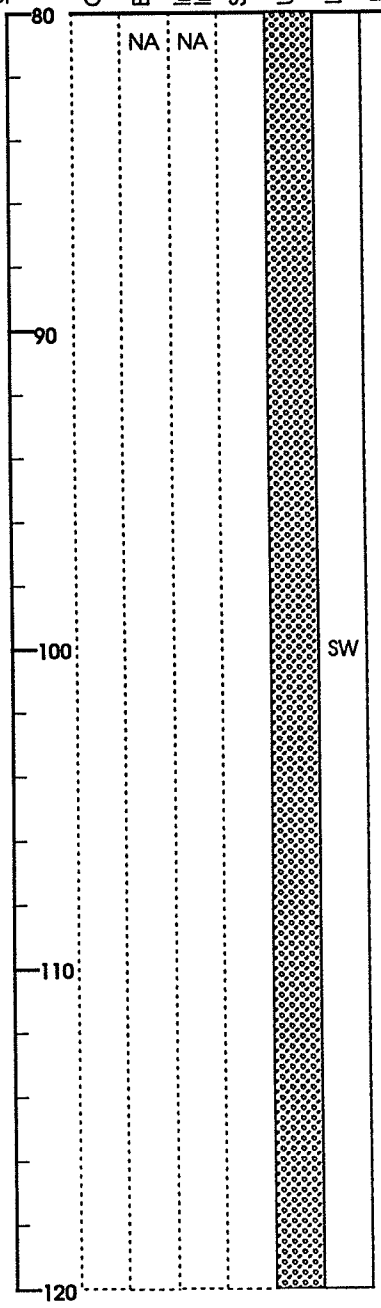


Client:	Trans Mountain Pipe Line Co.	Boring No:	DW-5
Job No:	21199-032-005	Drilling Method:	ODEX with 6" casing.
Location:	Laurel Pump Station	Sample Method:	Grab sample of cuttings.
Geologist:	IMW	Drill Contractor:	Hayes Drilling
		Drill Date:	4/1 - 4/2/92

Dames & Moore

FILENAME: TM-DW5.DRW

Geological Boring Log



Lithologic Description

Sandy GRAVEL; moist, moderately graded; sands very fine to fine; gravels angular to subrounded < 0.5" to <1" diameter.

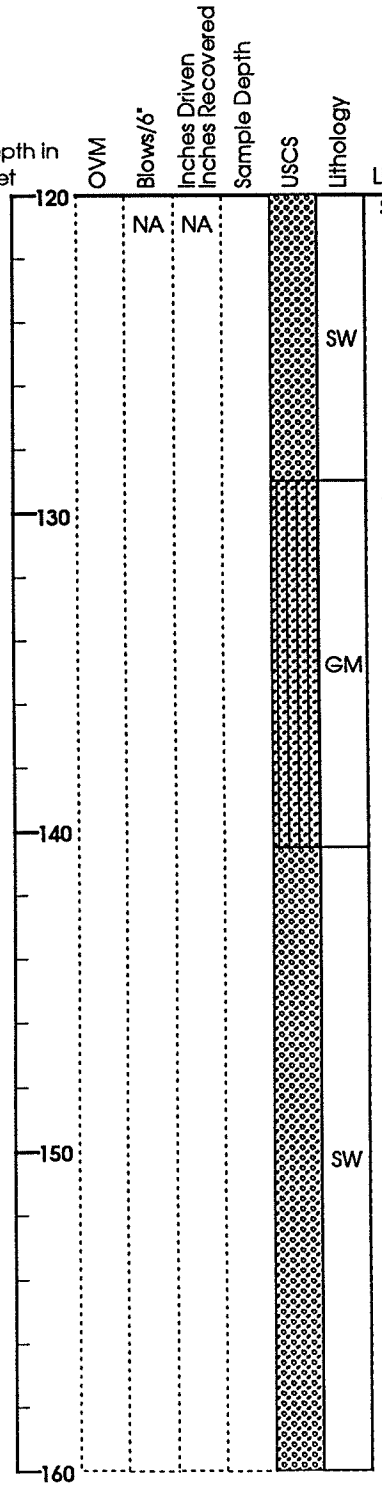
Silty sandy GRAVEL; greyish brown, moist, poorly graded; sands fine to medium grained; gravels rounded, fine to coarse grained.

Client:	Trans Mountain Pipe Line Co.	Boring No:	DW-5
Job No:	21199-032-005	Drilling Method:	ODEX with 6" casing.
Location:	Laurel Pump Station	Sample Method:	Grab sample of cuttings.
Geologist:	IMW	Drill Contractor:	Hayes Drilling
		Drill Date:	4/1 - 4/2/92

Dames & Moore

FILENAME: TM-DW5.DRW

Geological Boring Log



Lithologic Description

Silty sandy GRAVEL; greyish brown, moist, poorly graded; sands fine to medium grained; gravels rounded, fine to coarse grained.

Silty sandy GRAVEL; moist, loose; sands fine to very fine; gravels rounded to sub angular, <1" diameter.

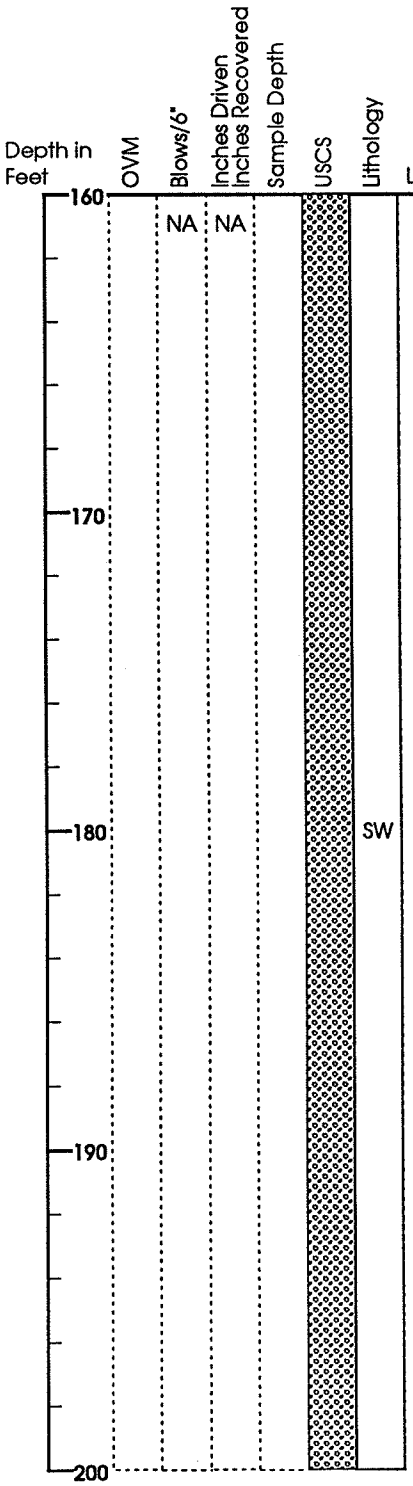
Fine to coarse SAND with some gravel; moist, loose, moderately graded.

Client:	Trans Mountain Pipe Line Co.	Boring No:	DW-5
Job No:	21199-032-005	Drilling Method:	ODEX with 6" casing.
Location:	Laurel Pump Station	Sample Method:	Grab sample of cuttings.
Geologist:	IMW	Drill Contractor:	Hayes Drilling
		Drill Date:	4/1 - 4/2/92

Dames & Moore

FILENAME: TM-DW5.DRW

Geological Boring Log



Lithologic Description

Fine to very fine SAND; moist, loose, moderately graded.

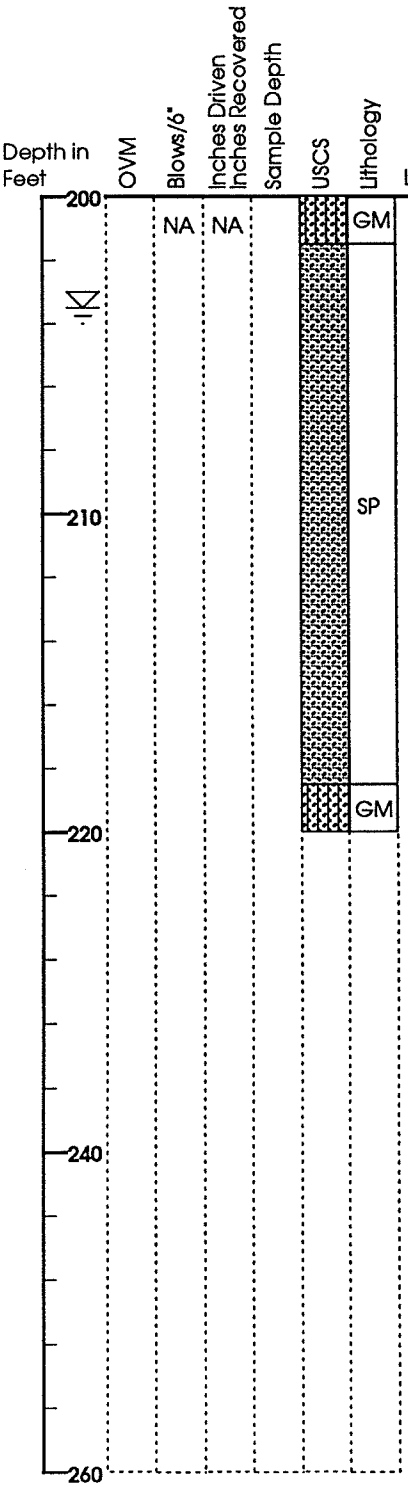
Fine SAND with occasional gravel; moist, loose, moderately grade; gravels rounded, subangular.

Client:	Trans Mountain Pipe Line Co.	Boring No:	DW-5
Job No:	21199-032-005	Drilling Method:	ODEX with 6" casing.
Location:	Laurel Pump Station	Sample Method:	Grab sample of cuttings.
Geologist:	IMW	Drill Contractor:	Hayes Drilling
		Drill Date:	4/1 - 4/2/92

Dames & Moore

FILENAME: TM-DW5.DRW

Geological Boring Log



Lithologic Description

Fine to coarse SAND with occasional gravel; moist, loose.

Very fine to fine SAND; saturated, well graded.

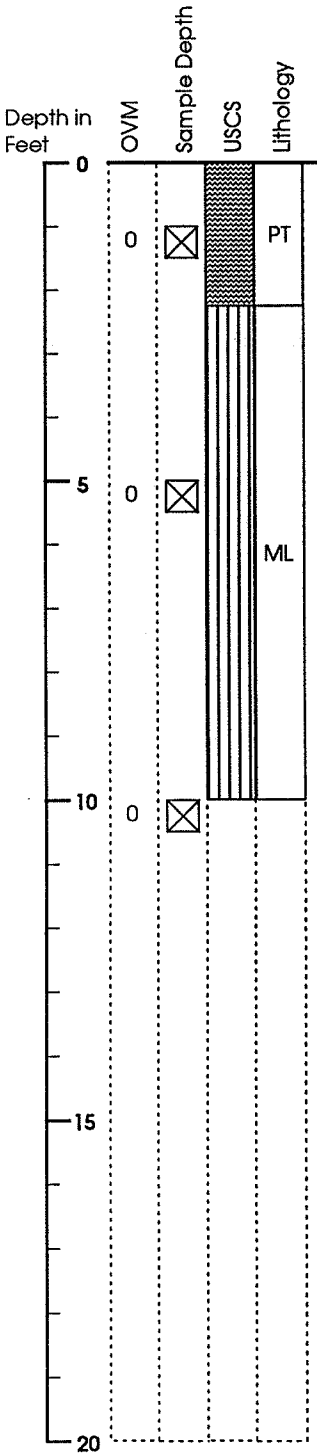
Boring completed at 220' bgs on 4/2/92.
Groundwater encountered at 204' bgs during drilling.

Client:	Trans Mountain Pipe Line Co.	Boring No:	DW-5
Job No:	21199-032-005	Drilling Method:	ODEX with 6" casing.
Location:	Laurel Pump Station	Sample Method:	Grab sample of cuttings.
Geologist:	IMW	Drill Contractor:	Hayes Drilling
		Drill Date:	4/1 - 4/2/92

Dames & Moore

FILENAME: TM-DW5.DRW

Geological Test Pit Log



Lithologic Description

PEAT; brown, moist, highly organic, loose.

Clayey SILT; 85% silt, 10% clay, 5% sand; olive gray, dry to damp, scattered medium to coarse sand, low to moderately stiff, low plasticity, some mottled rust staining noted throughout interval.

- becomes denser / harder with depth.

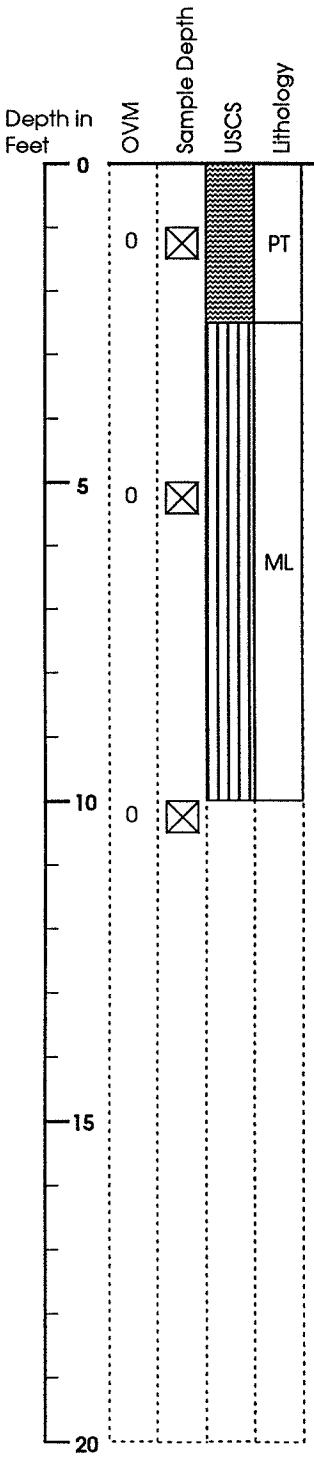
Terminated test pit at approximately 10' bgs on 1/15/91.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TP-19
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	Laurel Pump Station	Sample Method:	Test Pit
Geologist:	PC	Drill Date:	12/4/91

Dames & Moore

FILENAME: TRMTN-TP.DRW

Geological Test Pit Log



Lithologic Description

PEAT; brown, moist, highly organic, loose.

Clayey SILT; 85% silt, 10% clay, 5% sand; olive gray, dry to damp, low to moderately stiff, low plasticity, scattered medium to coarse sand, mottled rust staining noted throughout interval.

- becomes denser / harder with depth.

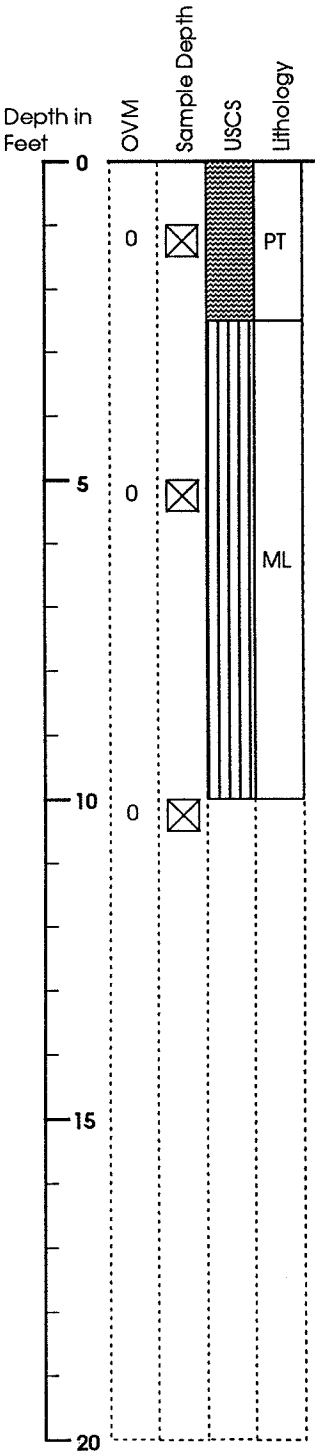
Terminated test pit at 10' bgs on 1/15/91.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TP-20
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	Laurel Pump Station	Sample Method:	Test Pit
Geologist:	PC	Drill Date:	1/15/92

Dames & Moore

FILENAME: TRMTN-TP.DRW

Geological Test Pit Log



Lithologic Description

PEAT; brown, moist, loose.

Clayey SILT; 85% silt, 10% clay, 5% sand; olive gray, dry to damp, low to moderately stiff, increasing hardness with depth, low plasticity, scattered medium to coarse sand, rust colored mottling noted throughout interval.

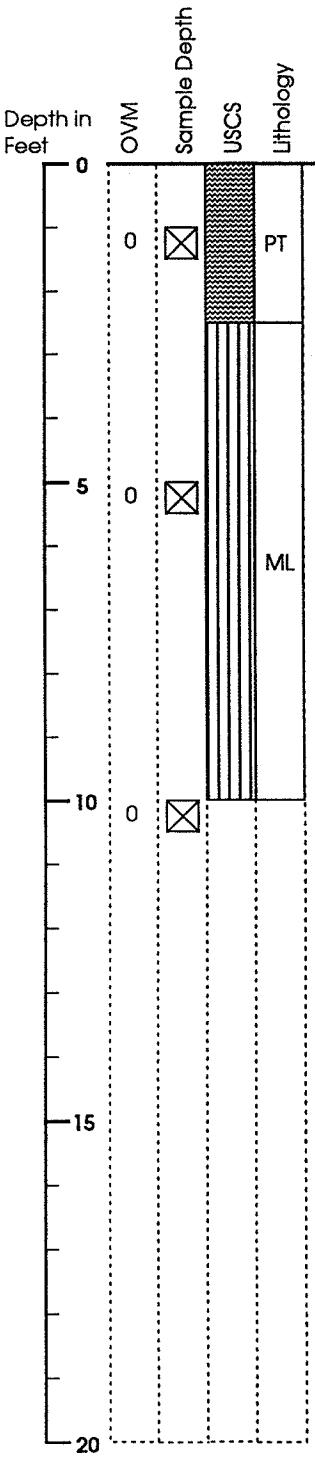
Terminated test pit at 10' bgs on 1/15/91.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TP-21
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	Laurel Pump Station	Sample Method:	Test Pit
Geologist:	PC	Drill Date:	1/15/92

Dames & Moore

FILENAME: TRMTN-TP.DRW

Geological Test Pit Log



Lithologic Description

PEAT; brown, moist, highly organic, loose.

Clayey SILT; 85% silt, 10% clay, 5% sand; olive grey, dry to damp, low to medium stiffness with increasing stiffness with depth, low plasticity, scattered medium to coarse sand, rust colored mottling noted throughout interval.

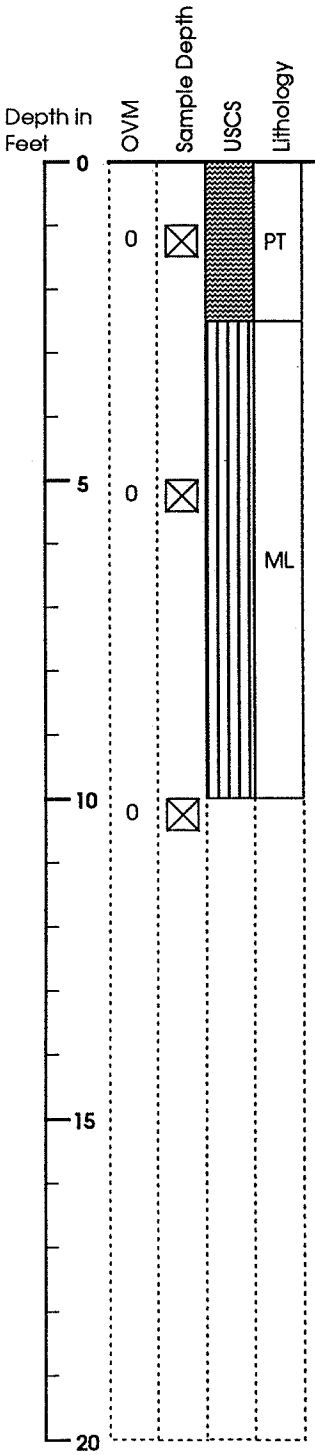
Terminated test pit at 10' bgs on 1/15/91.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TP-22
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	Laurel Pump Station	Sample Method:	Test Pit
Geologist:	PC	Drill Date:	1/16/92

Dames & Moore

FILENAME: TRMTN-TP.DRW

Geological Test Pit Log



Lithologic Description

PEAT; brown, moist, highly organic, loose.

Clayey SILT; 85% silt, 10% clay, 5% sand; olive gray, dry to damp, low to medium stiff with increasing stiffness with depth, low plasticity, scattered medium to coarse sand, rust colored mottling noted throughout interval.

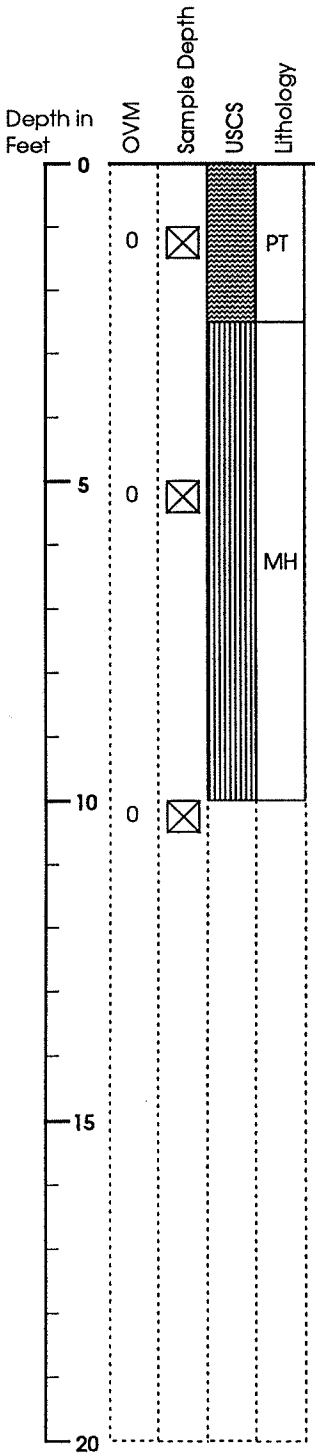
Terminated test pit at 10' bgs on 1/16/91.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TP-23
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	Laurel Pump Station	Sample Method:	Test Pit
Geologist:	PC	Drill Date:	1/16/92

Dames & Moore

FILENAME: TRMTN-TP.DRW

Geological Test Pit Log



Lithologic Description

PEAT; brown, moist, highly organic, loose.

Clayey SILT; 85% silt, 10% clay, 5% sand; olive gray, dry to damp, low to medium stiff, low plasticity, scattered medium to coarse sand, rust colored mottling noted throughout interval.

- increasing stiffness with depth

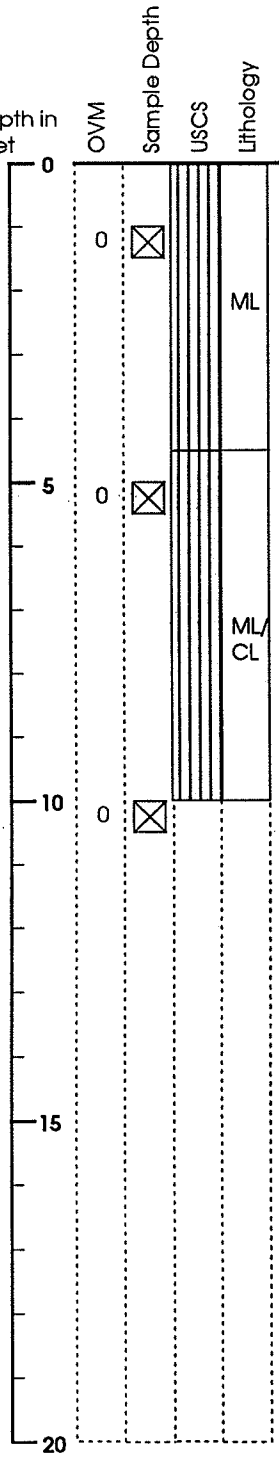
Terminated test pit at 10' bgs on 1/16/91.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TP-24
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	Laurel Pump Station	Sample Method:	Test Pit
Geologist:		Drill Date:	1/16/92

Dames & Moore

FILENAME: TRMTN-TP.DRW

Geological Test Pit Log



Lithologic Description

SILT; dark brown (topsoil) with rootlets, organic material, moist.

- water seepage at 2.5 - 3' bgs.

Silty CLAY; gray / brown / tan, trace gravel, moist, low plasticity.

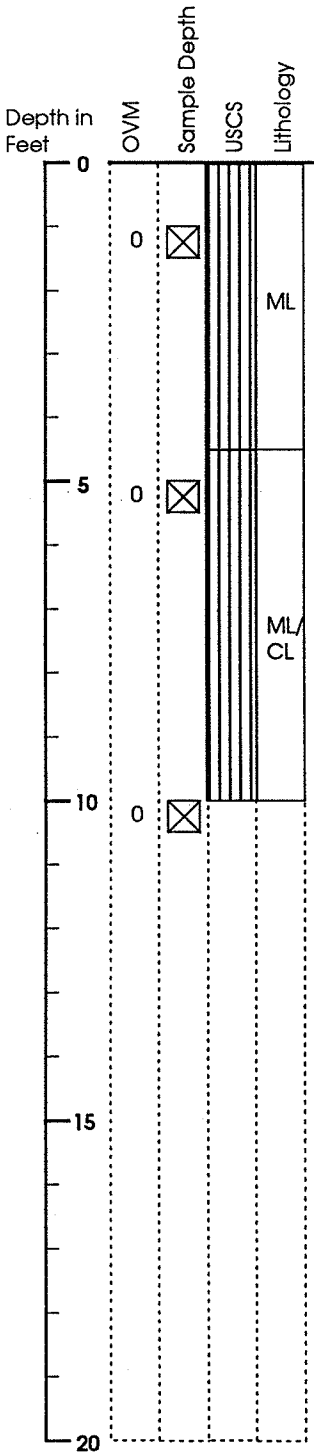
Silty CLAY; gray / brown, saturated, slightly plastic, hard.
Terminated pit at 10' bgs on 1/22/92.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TP5-1
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	Smith Road, Bellingham, WA	Sample Method:	Test Pit
Geologist:	IMW	Drill Date:	1/22/92

FILENAME: TP-2.DRW

Dames & Moore

Geological Test Pit Log



Lithologic Description

SILT; dark brown (topsoil) with rootlets, organic material, moist.

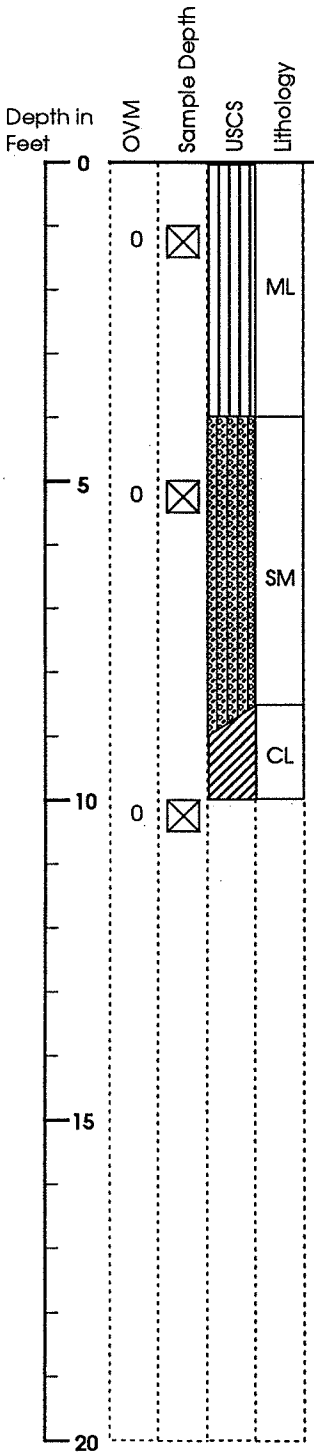
- water seepage at 2.5 - 3' bgs.

Silty CLAY; gray / brown / tan, trace gravel, moist, low plasticity.

Silty CLAY; gray / brown, saturated, slightly plastic, hard.
Terminated pit at 10' bgs on 1/22/92.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TP5-1
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	Smith Road, Bellingham, WA	Sample Method:	Test Pit
Geologist:	IMW	Drill Date:	1/22/92

Geological Test Pit Log



Lithologic Description

Sandy clayey SILT; reddish brown; 50 - 60% silt, 20% fine sand, 20 - 25% clay and 5% gravel; moist, poorly graded.

Silty SAND; light brown; 60 - 70% fine to medium sand, 30 - 40% silt; moist to saturated, low plasticity, moderately graded.

CLAY; blue, moist, no plasticity, very dense.

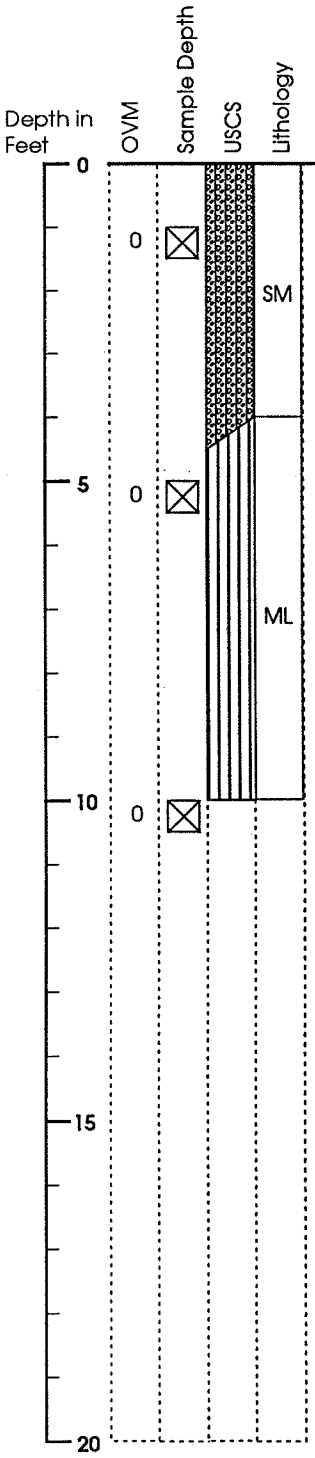
Terminated pit at 10' bgs on 1/22/92.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TP5-2
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	North of Smith Road, Belliingham, WA	Sample Method:	Test Pit
Geologist:	IMW	Drill Date:	1/22/92

FILENAME: TP-2.DRW

Dames & Moore

Geological Test Pit Log



Lithologic Description

Silty SAND; brown (tan), moist, poorly graded with roots.

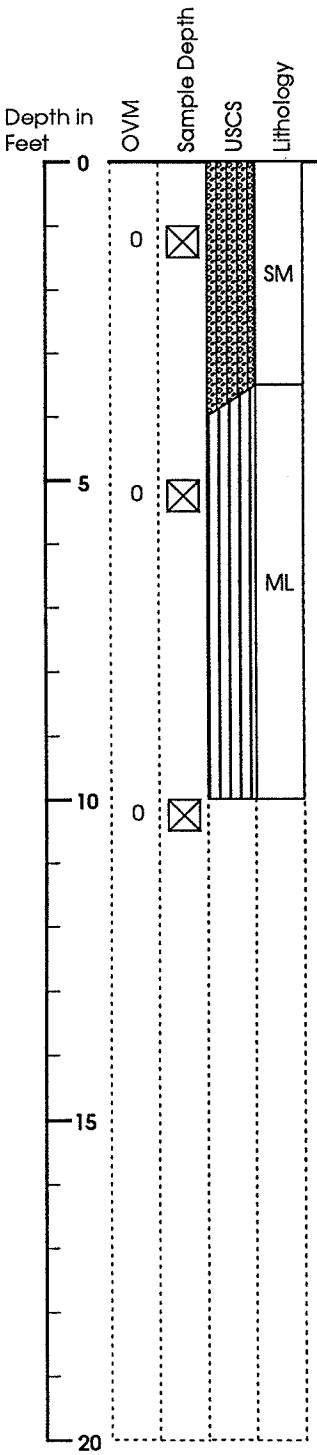
Clayey SILT; grayish brown, moist, low plasticity, trace gravels.

- saturated at 9' bgs.

Clayey SILT; as above, saturated.
Terminated pit at 10' bgs on 1/22/92.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TP5-3
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	North of Smith Road, Belliingham, WA	Sample Method:	Test Pit
Geologist:	IMW	Drill Date:	1/22/92

Geological Test Pit Log



Lithologic Description

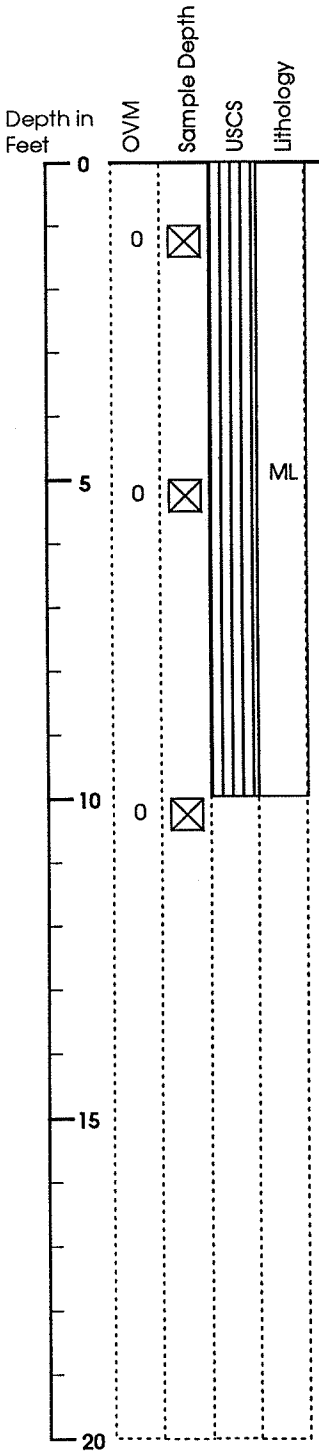
Silty SAND; reddish brown, moist, poorly graded, loose.

Clayey SILT; pale gray, dry, low plasticity, hard packed.

Clayey SILT; greenish black, moist, low plasticity.
Terminated pit at 10' bgs on 1/22/92.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TP5-4
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	Bellingham, WA	Sample Method:	Test Pit
Geologist:	IMW	Drill Date:	1/22/92

Geological Test Pit Log



Lithologic Description

Clayey sandy SILT; dark reddish brown; >60% silt; moist, medium plasticity, poorly graded.

Sandy gravelly SILT; grayish brown, moist, medium plasticity.

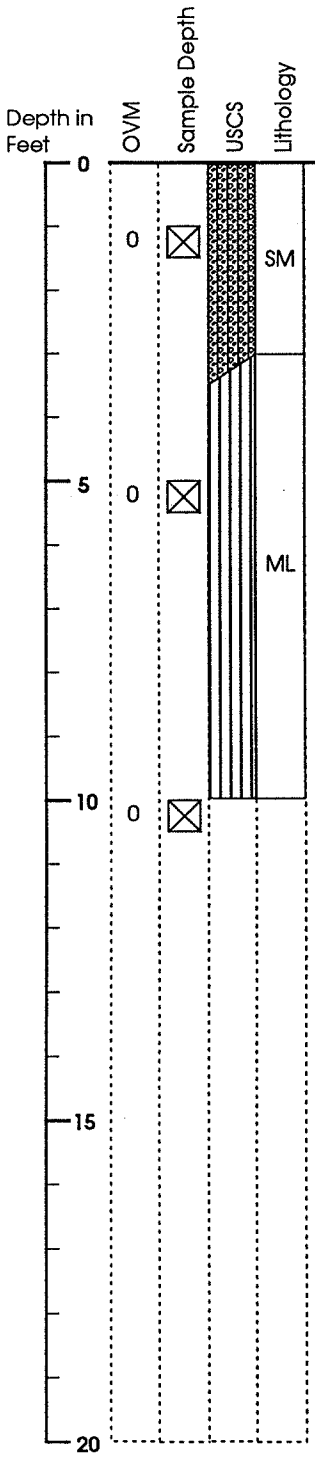
Clayey SILT; gray, moist.
Terminated pit at 10' bgs on 1/22/92.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TP5-5
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	Bellingham, WA	Sample Method:	Test Pit
Geologist:	IMW	Drill Date:	1/22/92

Dames & Moore

FILENAME: TP-2.DRW

Geological Test Pit Log



Lithologic Description

Silty SAND; reddish brown to tan, moist, moderately graded, roots.

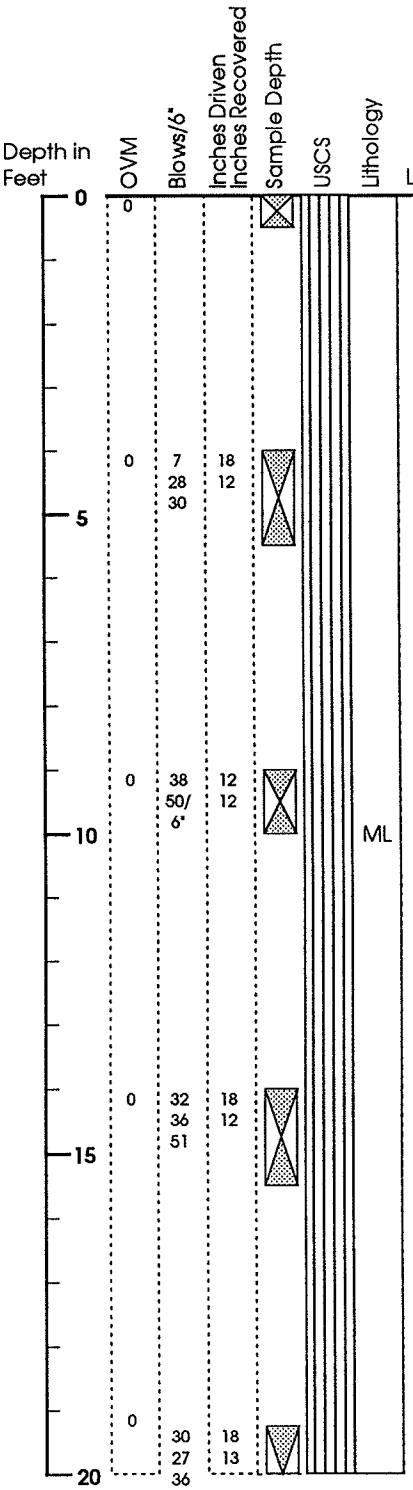
- saturated at 3' bgs, water seeping into pit.

Clayey SILT; gray, moist, no odors.

Clayey SILT; as above.
Terminated pit at 10' bgs on 1/22/92.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TP5-6
Job No:	21199-032-005	Drilling Method:	Backhoe
Location:	North of Smith Road, Bellingham, WA	Sample Method:	Test Pit
Geologist:	IMW	Drill Date:	1/22/92

Geological Boring Log



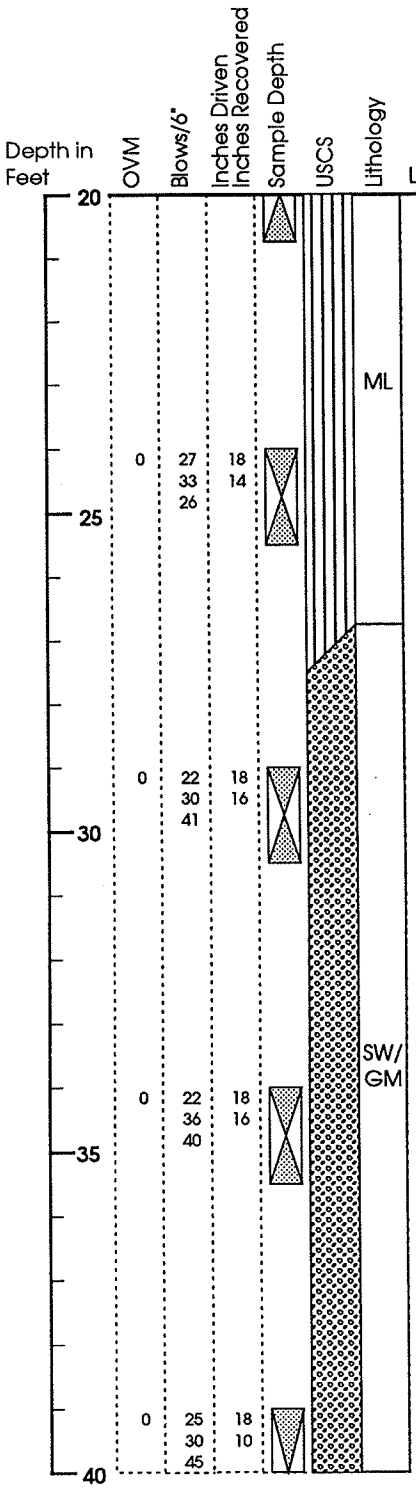
OVM	Blows/6"	Inches Driven	Inches Recovered	Sample Depth	USCS	Lithology	Lithologic Description
0							Gravelly SILT; brown (7.5yr 4/3); 20% gravel, 80% silt; 1 - 2" well rounded gravels; non plastic, well sorted, moist, occasional grass roots and twigs.
0	7 28 30	18	12				Gravelly SILT; As above, very dense.
0	38 50/ 6"	12	12			ML	Gravelly sandy SILT; brown (7.5yr 4/2); 75% silt, 20% gravel, 10 - 15% sand; 1 - 3" well rounded gravels; well sorted, moist, non plastic, very dense; 2" subangular piece of fresh granite in nose of sampler.
0	32 36 51	18	12				Gravelly sandy SILT; 60% silt, 30% gravel, 10% sand; as above.
0	30 27 36	18	13				Gravelly SILT; light brownish gray (10yr 6/2); 70% silt, 20% gravel, 5 - 10% fine to medium sand; 1 - 3" well rounded to subangular fragments of granite (white); well sorted, non plastic, very dense, saturated due to water added to hole from drillers.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B1
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Bellingham	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	MAO	Drill Contractor:	Hays Drilling
		Drill Date:	11/26/91

FILENAME: TM-B1.DRW

Dames & Moore

Geological Boring Log



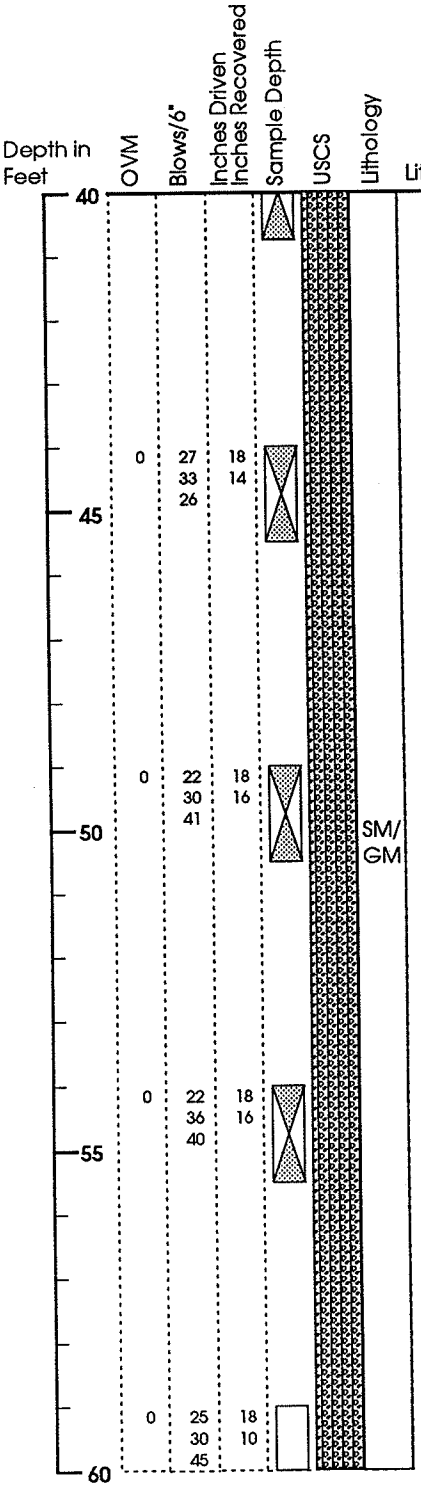
OVM	Blows/6"	Inches Driven	Inches Recovered	Sample Depth	USCS	Lithology	Lithologic Description
						ML	Gravelly SILT; light brownish gray (10yr 6/2); 70% silt, 20% gravel, 5 - 10% fine to medium sand; 1 - 3" well rounded to subangular fragments of granite (white); well sorted, non plastic, very dense, saturated due to water added to hole from drillers.
0	27 33 26	18	14				Gravelly SILT; as above.
0	22 30 41	18	16				Silty sandy GRAVEL; light brownish gray (10yr 6/2); 50% gravels, 30% fine to medium sand, 20% silt; 1 - 3" well rounded gravels (white granite); moist, poorly sorted, very dense, glacial drift.
0	22 36 40	18	16			SW/ GM	Gravelly silty SAND; light brownish gray (10yr 6/2); 45% fine to medium sand, 30% gravels, 25% silt; poorly sorted, dry, moderately weathered, very dense.
0	25 30 45	18	10				Gravelly silty SAND; as above.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B1
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Bellingham	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	MAO	Drill Contractor:	Hays Drilling
		Drill Date:	11/26/91

FILENAME: TM-B1.DRW

Dames & Moore

Geological Boring Log



Gravelly silty SAND; gray (10yr 5/1); 50% fine to medium sand, 30% gravel, 20% silt; 1 - 2" well rounded to subangular granite fragments, dry, poorly graded, very dense.

Silty gravelly SAND; 40% fine to medium sand, 35% silt, 25% gravels, dry, dense, as above.

Silty gravelly SAND; dry, as above.

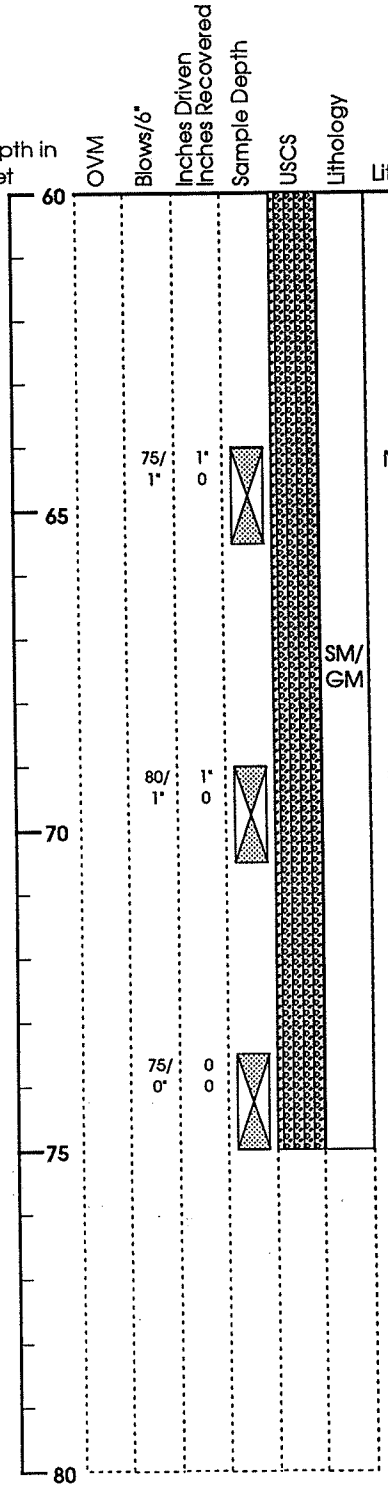
No recovery.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B1
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Bellingham	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	MAO	Drill Contractor:	Hays Drilling
		Drill Date:	11/26/91

Dames & Moore

FILENAME: TM-B1.DRW

Geological Boring Log



Lithologic Description

No recovery.

No recovery.

No recovery.

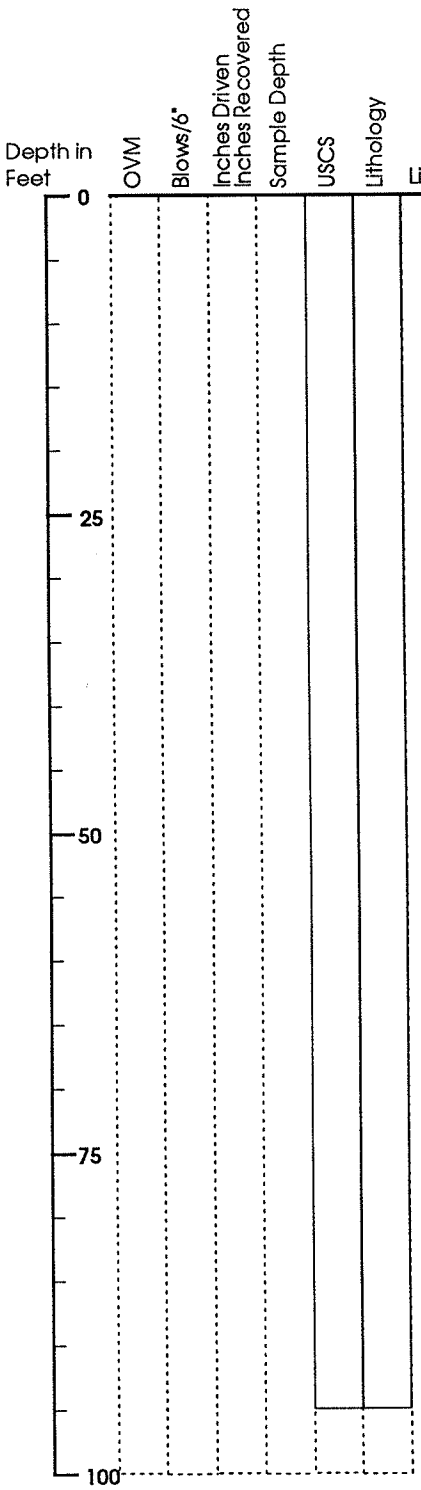
Boring terminated at 75' bgs on 11/27/91.
Groundwater not encountered during drilling.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B1
Job No:	21199-032-005	Drilling Method:	6.25" O.D. Hollow Stem Auger
Location:	Bellingham	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	MAO	Drill Contractor:	Hays Drilling
		Drill Date:	11/26/91

Dames & Moore

FILENAME: TM-B1.DRW

Geological Boring Log

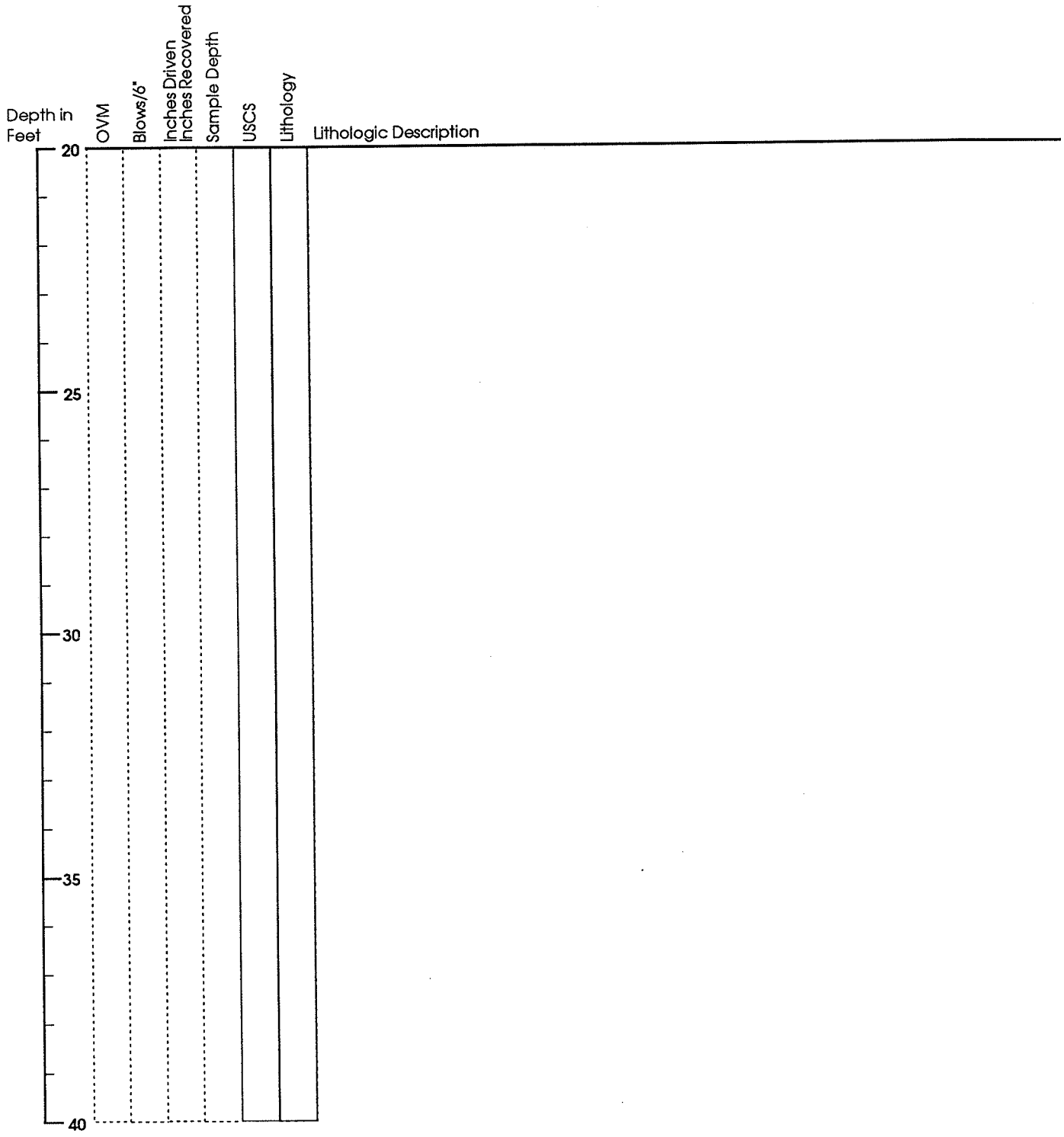


Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B9
Job No:	21199-032-005	Drilling Method:	Track-Mounted Rotary Hammer
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	BAU	Drill Contractor:	P.C. Exploration
		Drill Date:	01/07/92

Dames & Moore

FILENAME: TM-B09.DRW

Geological Boring Log

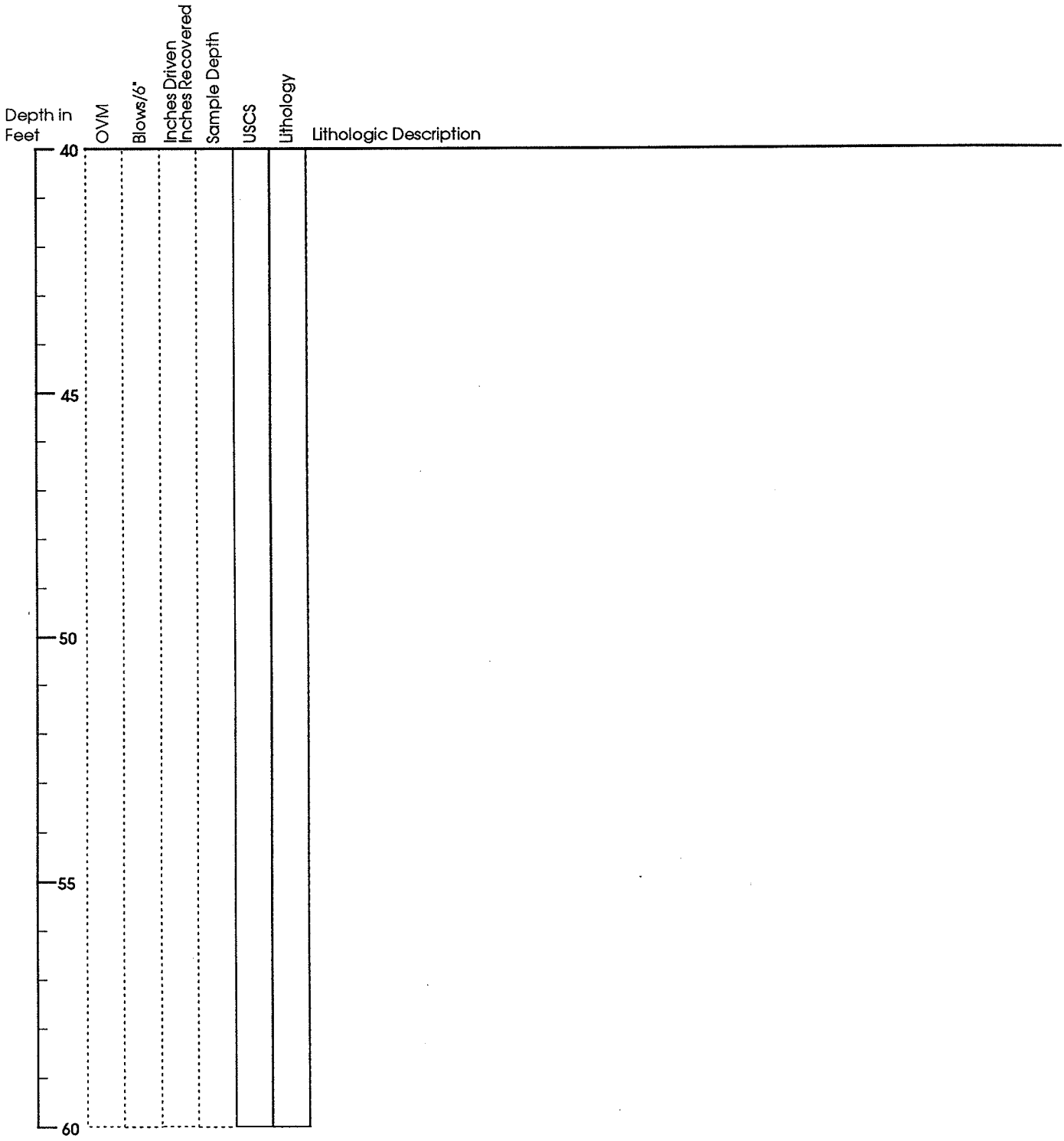


Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B9
Job No:	21199-032-005	Drilling Method:	Track-Mounted Rotary Hammer
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	BAU	Drill Contractor:	P.C. Exploration
		Drill Date:	01/07/92

Dames & Moore

FILENAME: TM-B09.DRW

Geological Boring Log

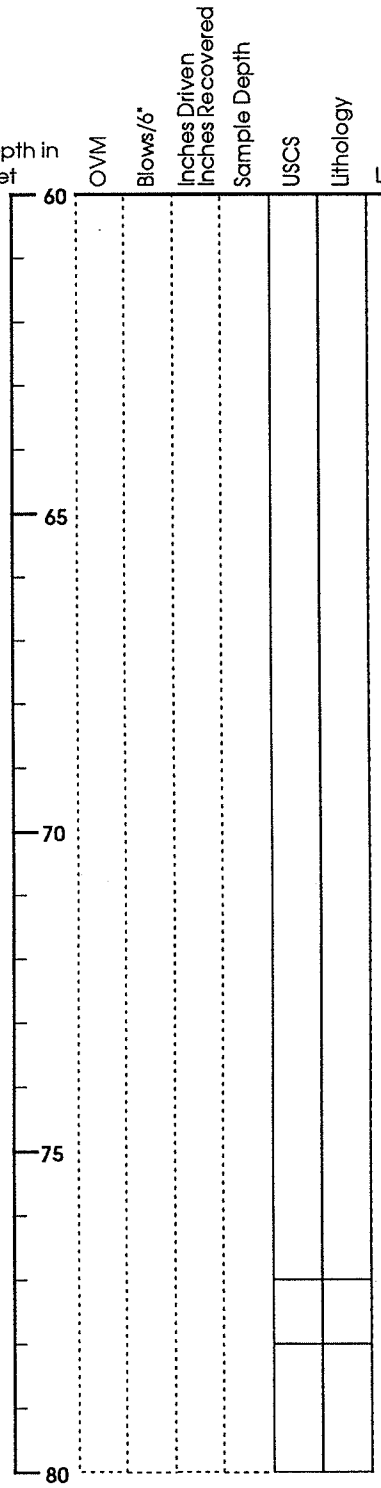


Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B9
Job No:	21199-032-005	Drilling Method:	Track-Mounted Rotary Hammer
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	BAU	Drill Contractor:	P.C. Exploration
		Drill Date:	01/07/92

Dames & Moore

FILENAME: TM-B09.DRW

Geological Boring Log



Lithologic Description

Fine GRAVEL; grey; 90% gravel (pea sized), 10% medium sand; moist, poorly graded.

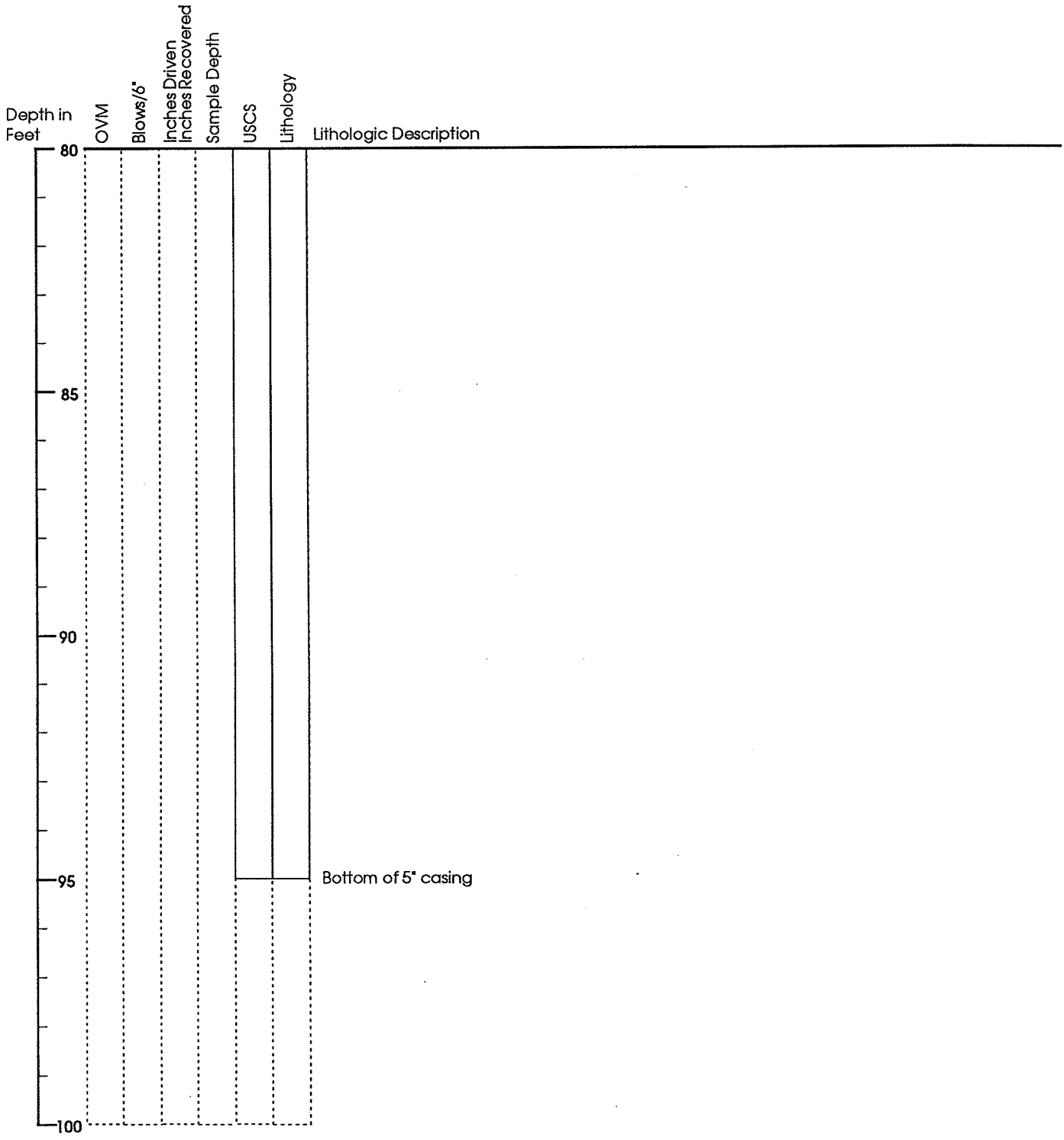
SAND; as reported by driller inferred from a sudden drop of casing of 1'.

Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B9
Job No:	21199-032-005	Drilling Method:	Track-Mounted Rotary Hammer
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	BAU	Drill Contractor:	P.C. Exploration
		Drill Date:	01/07/92

Dames & Moore

FILENAME: TM-B09.DRW

Geological Boring Log



Client:	Trans Mountain Pipe Line Co.	Boring No:	TM-B9
Job No:	21199-032-005	Drilling Method:	Track-Mounted Rotary Hammer
Location:	Laurel Pump Station	Sample Method:	D&M U-type Split Spoon; 300# hammer with 30" drop
Geologist:	BAU	Drill Contractor:	P.C. Exploration
		Drill Date:	01/07/92

Dames & Moore

FILENAME: TM-B09.DRW

APPENDIX C
MONITORING WELL CONSTRUCTION DIAGRAMS AND DECOMMISSIONING RECORDS

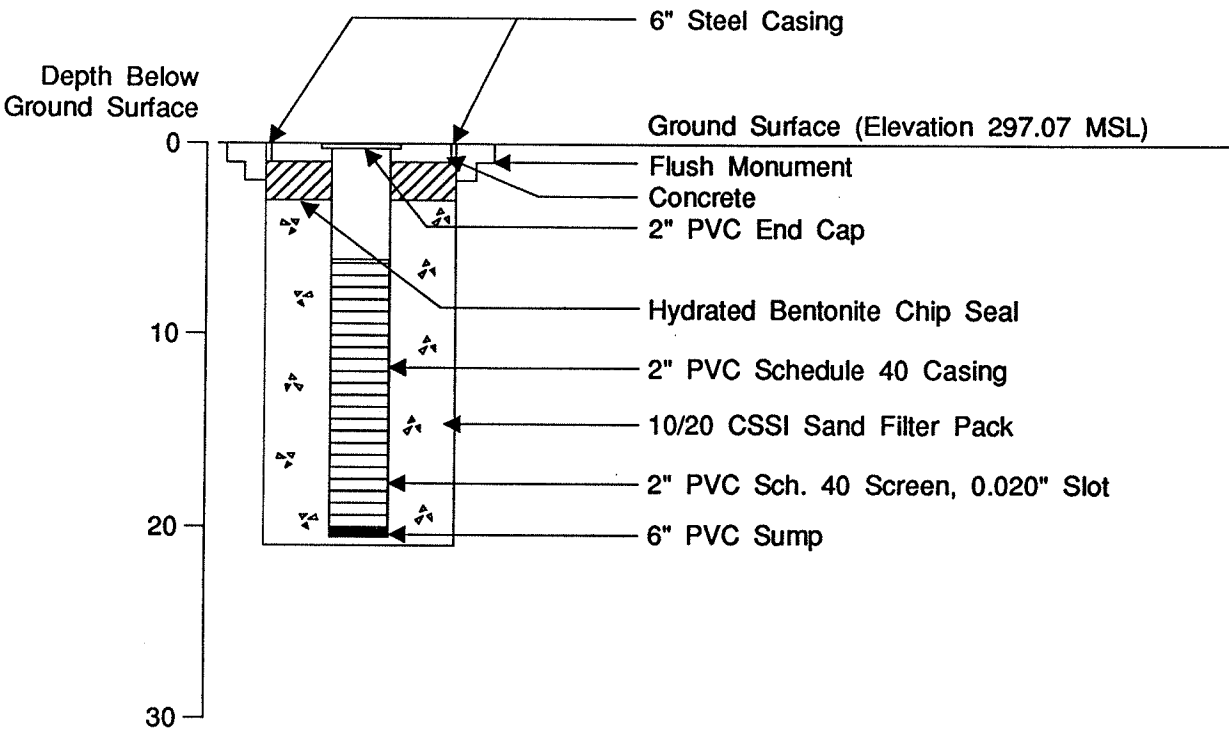
Appendix C – Well Construction Diagrams and Decommissioning Reports

Shallow Wells (Well Construction Diagrams only)

SW-1
SW-2
SW-3
SW-4
SW-5

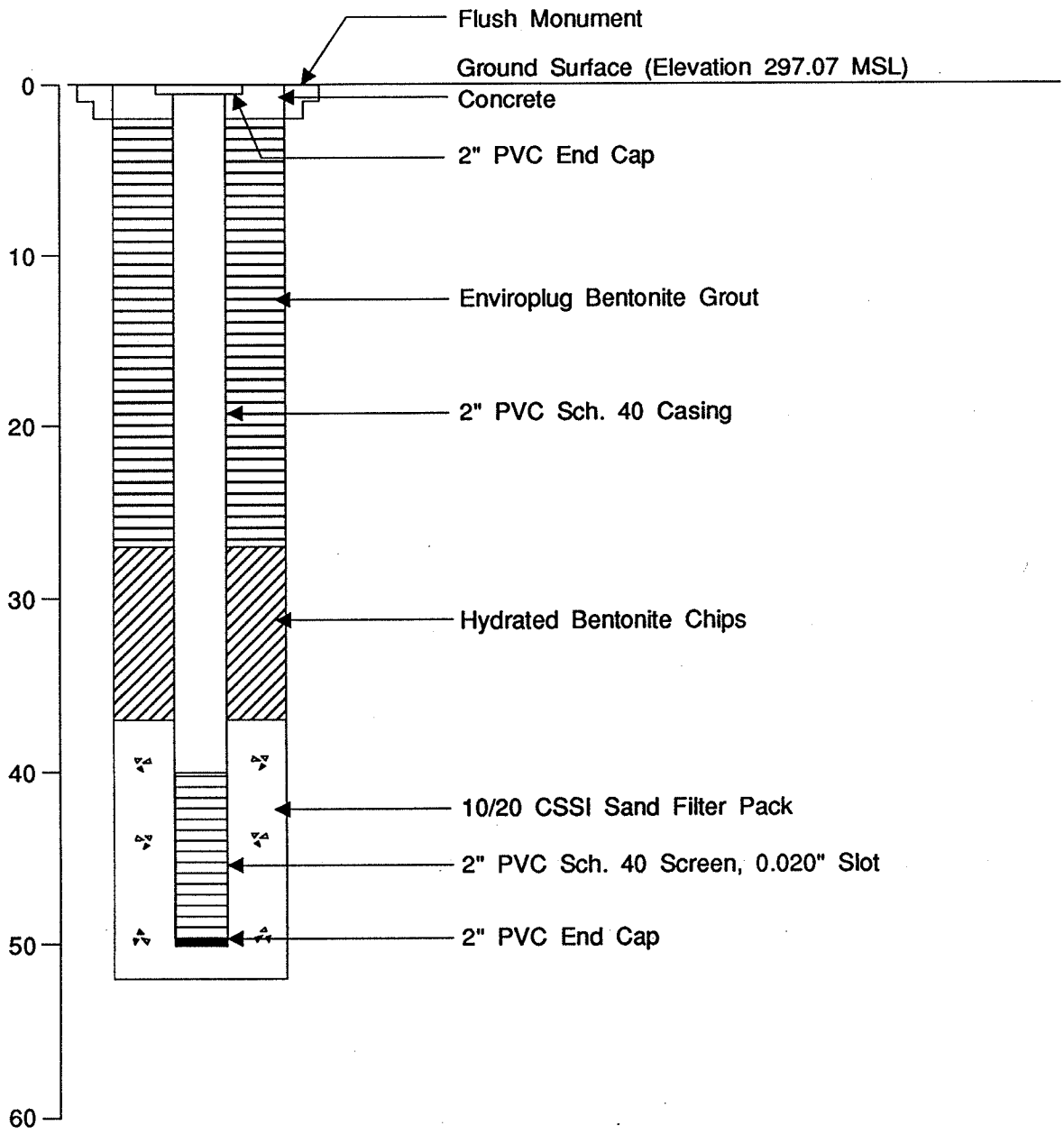
Deep Wells (Well Construction Diagrams and Decommissioning Reports)

DW-1
DW-2
DW-3
DW-4
DW-5



SW-1
Monitoring Well Construction Diagram
Dames & Moore

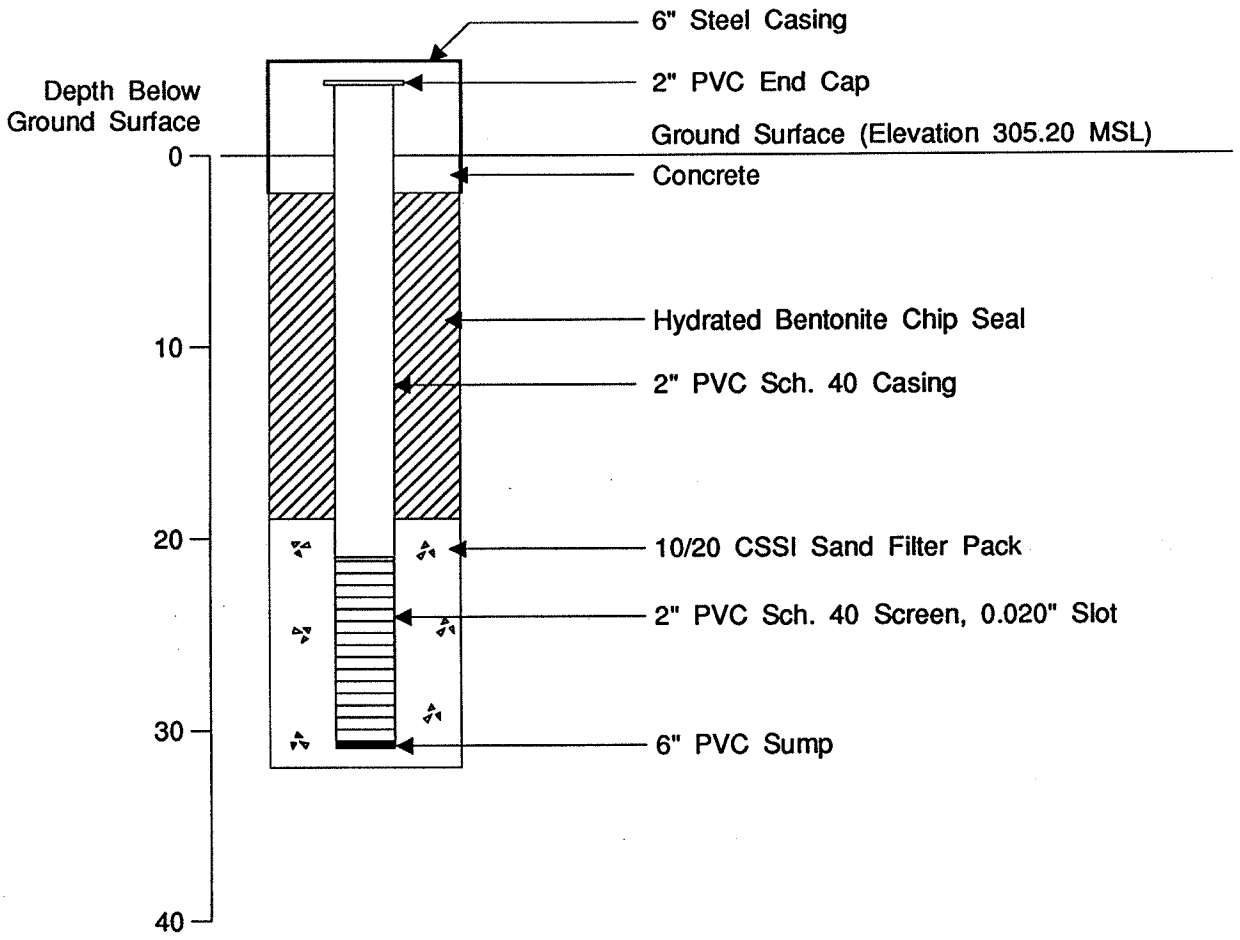
TMMW_04.CDR



Job No. 21 032-005

SW-2
Monitoring Well Construction Diagram
Dames & Moore

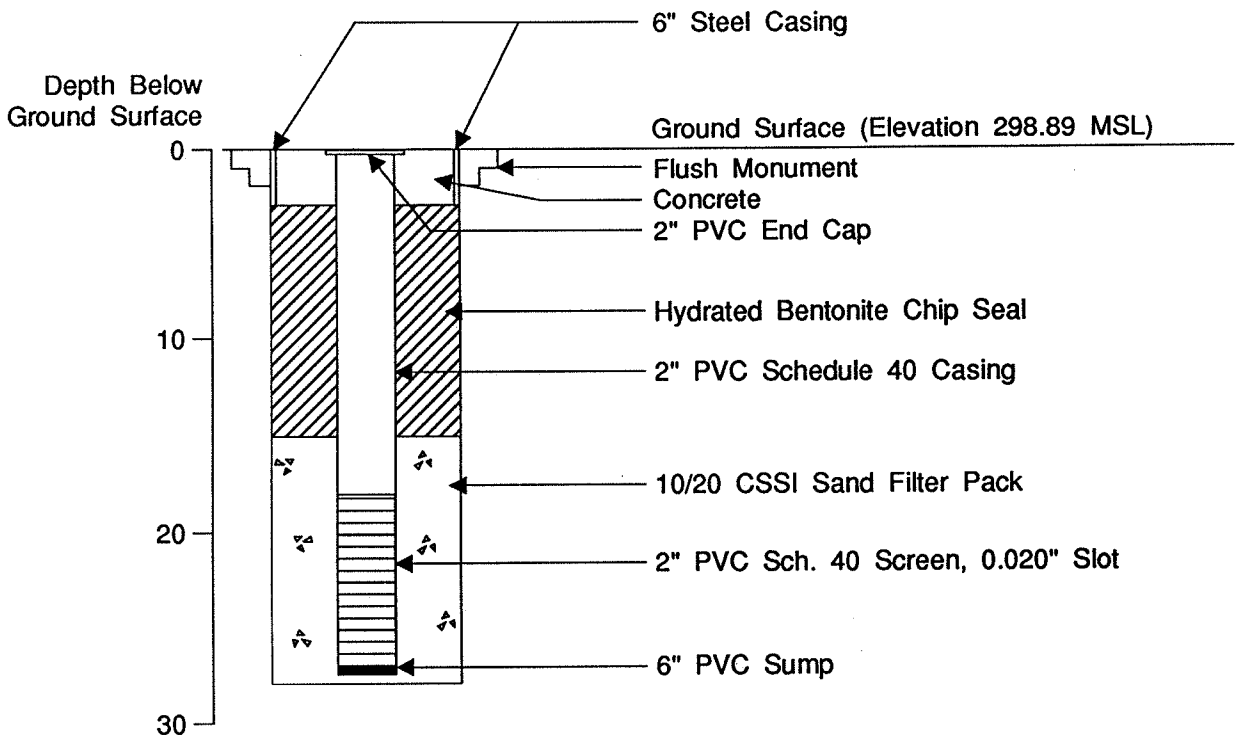
TMMW_03.CDR



Job No. 2; -032-005

SW-3
Monitoring Well Construction Diagram
Dames & Moore

TMMW_02.CDR



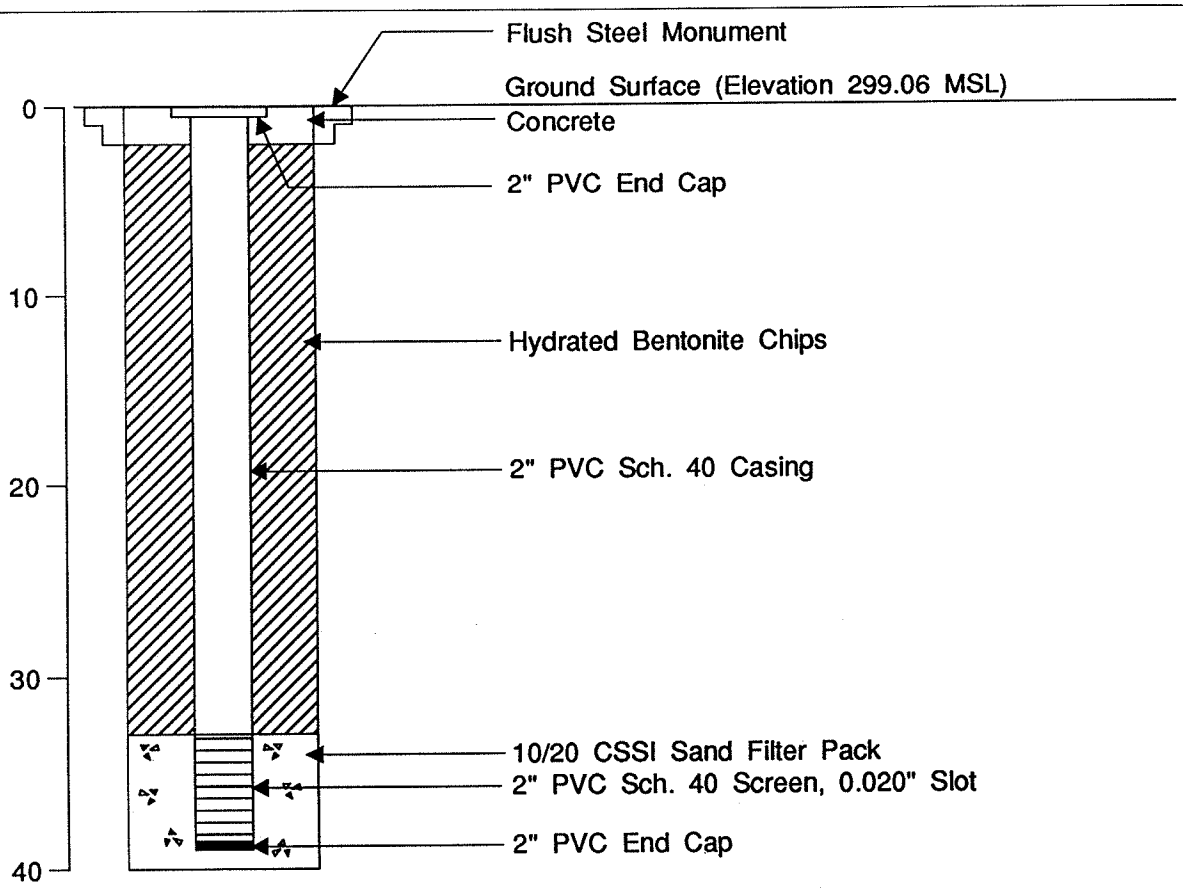
Job No. 2 -032-005

SW-4

Monitoring Well Construction Diagram

Dames & Moore

TMMW_05.CDR



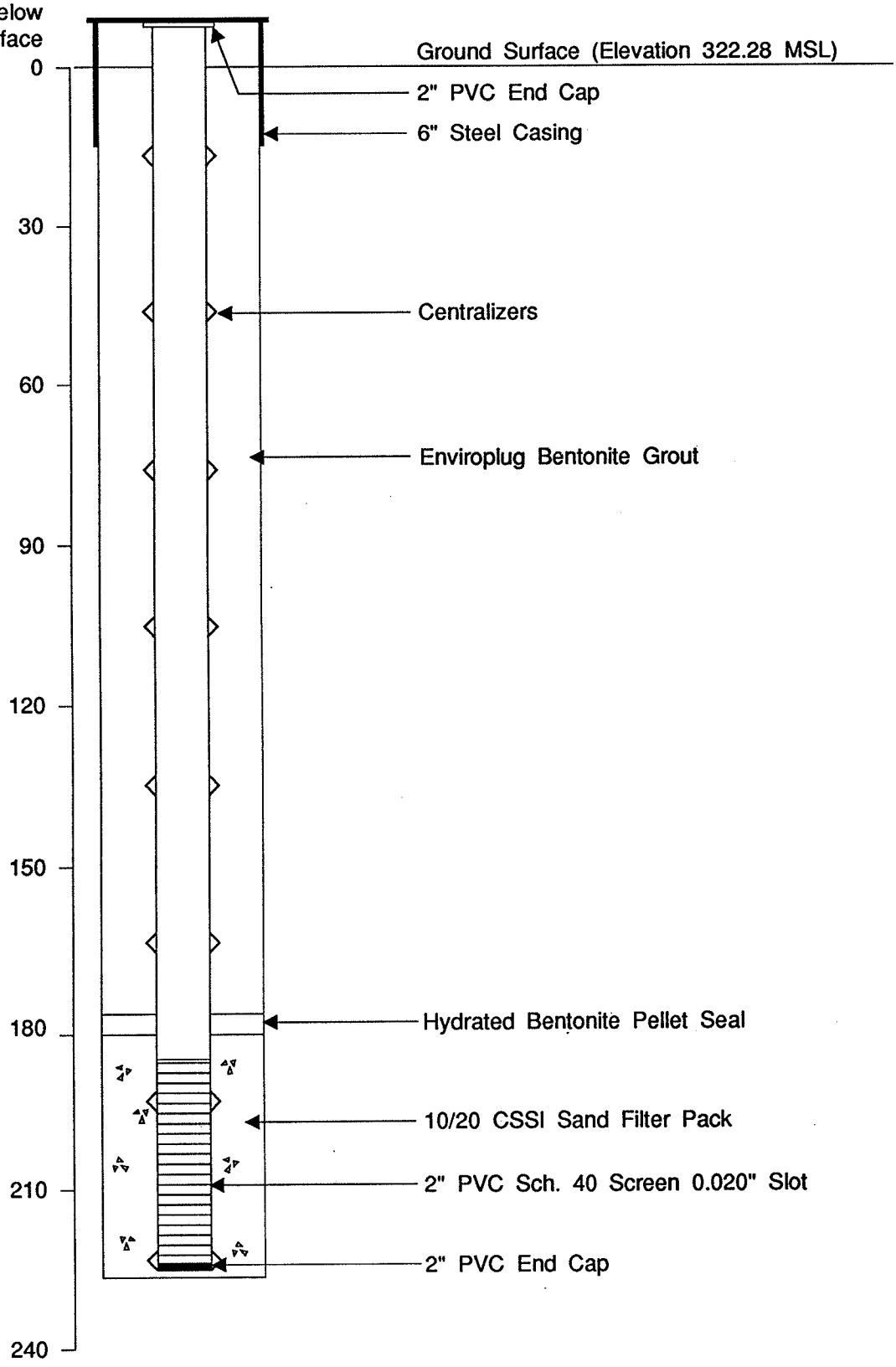
Job No. 2)-032-005

SW-5

Monitoring Well Construction Diagram

Dames & Moore

TMMW_01.CDR



Job No. 2. -032-005

DW-1

Monitoring Well Construction Diagram

Dames & Moore

RESOURCE PROTECTION WELL REPORT

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

CURRENT
Notice of Intent No. A130238

Construction/Decommission

☐ Construction

☒ Decommission *ORIGINAL INSTALLATION Notice of Intent Number* _____

Type of Well

☒ Resource Protection

☐ Geotechnical Soil Boring

Property Owner **Laurel Station**

Site Address **1009 E. Smith Rd.**

Consulting Firm **URS Corporation**

City **Bellingham** County **Whatcom**

EWM

Unique Ecology Well ID
Tag No. _____

Location 1/4 **SW** 1/4 **SW** Sec **28** TWN **39N** R **3E** or _____ WWM

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards

Materials used and the information reported above are true to my best knowledge and belief

Lat/Long (s,t,r still Required) Lat Deg **n/a** Lat Min/Sec **n/a** Long Deg **n/a** Long Min/Sec **n/a**

Tax Parcel No. _____

☒ Driller ☐ Trainee Name (Print) Andy Flagan

Driller/Trainee Signature x _____

Driller/Trainee License No. 2761

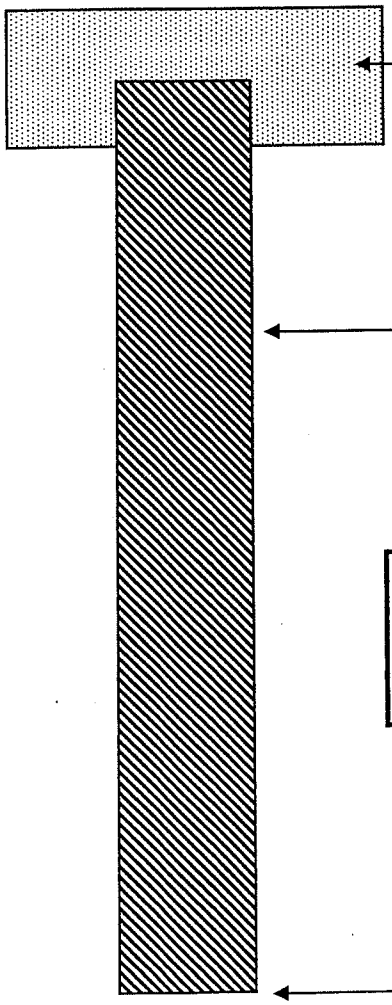
Cased or Uncased Diameter 2" Static Level _____

Work/Decommision Start Date **4/30/2008**

If trainee, licesned drillers' Signature and License No. _____

Work/Decommision Completed Date **5/2/2008**

Construction/Design W08-307 Formation Description



CONCRETE SURFACE SEAL 2' FT — 0 - FT

BACKFILL 224' FT — 0 - FT

grout

DEPTH OF BORING 226' FT

REQUIRED INFORMATION
(Must get one or both if available)

DEPT OF ECOLOGY WELL TAG # : _____

CLIENT WELL ID #: DW-2

Scale 1" = _____

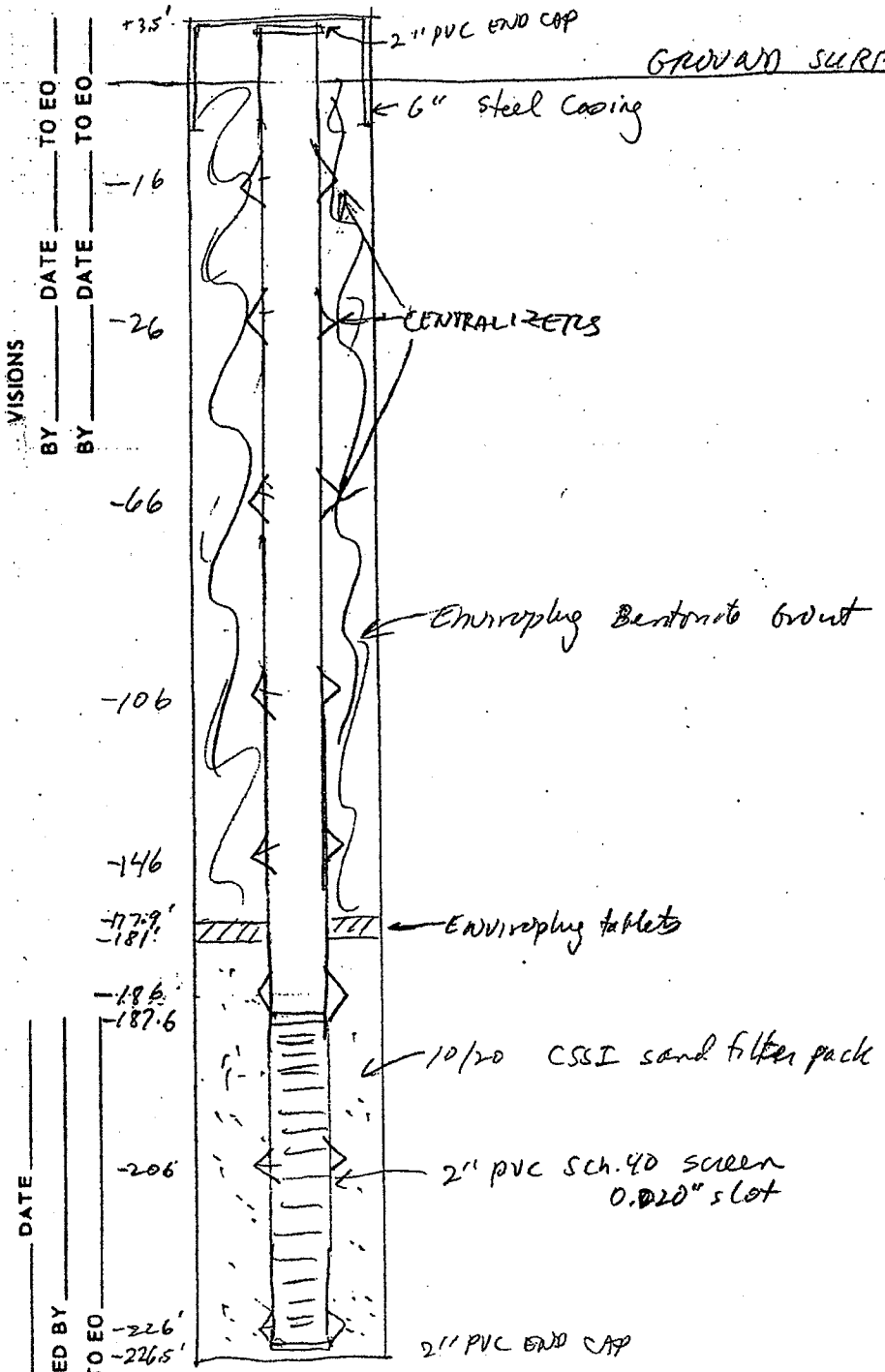
Page _____ of _____

ECY 050-12 (Rev 2/01)

FILE TMOPL 21199-032
SUBJECT 5/6/92
SHEET ___ OF ___

Stickup

MONITORING WELL CONSTRUCTION DIAGRAM
OW-1

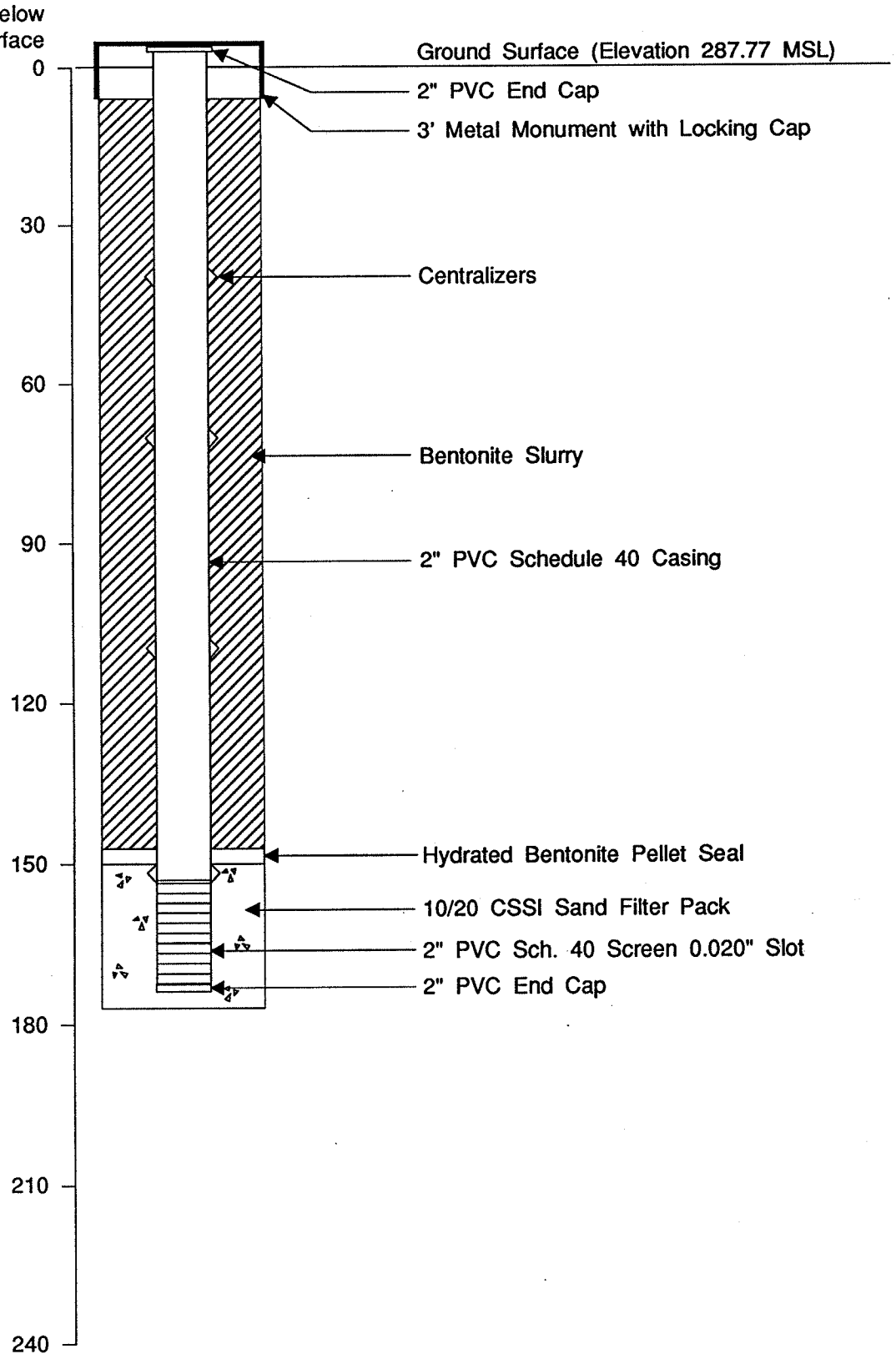


VISIONS
BY ___ DATE ___ TO EO ___
BY ___ DATE ___ TO EO ___
BY ___ DATE ___
CHECKED BY ___
COPY TO EO ___

227.2'
OW

PC EXPLORATION, INC
Dpm Supervision: OW, JKM
Completed 3/3/92

TMMW_06.CDR



Job No. 21 032-005

DW-2

Monitoring Well Construction Diagram

Dames & Moore

RESOURCE PROTECTION WELL REPORT

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

CURRENT
Notice of Intent No. A130238

Construction/Decommission

☐ Construction

☒ Decommission *ORIGINAL INSTALLATION Notice of Intent Number* _____

Type of Well

☒ Resource Protection

☐ Geotechnical Soil Boring

Property Owner **Laurel Station**

Site Address **1009 E. Smith Rd.**

Consulting Firm **URS Corporation**

City **Bellingham** County **Whatcom**

EWM

Unique Ecology Well ID

Tag No. _____

Location 1/4 **SW** 1/4 **SW** Sec **28** TWN **39N** R **3E** or _____ WWM

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards

Materials used and the information reported above are true to my best knowledge and belief

Lat/Long (s,t,r still Required) Lat Deg **n/a** Lat Min/Sec **n/a** Long Deg **n/a** Long Min/Sec **n/a**

Tax Parcel No. _____

☒ Driller ☐ Trainee Name (Print) Andy Flagan

Driller/Trainee Signature x _____

Driller/Trainee License No. **2761**

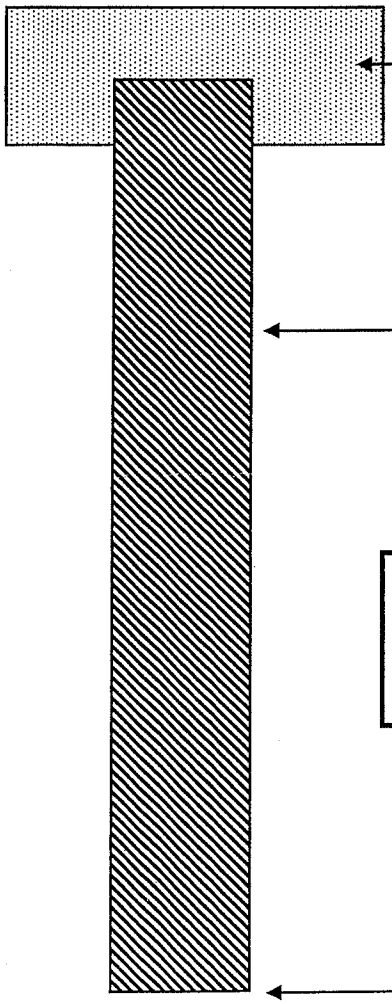
Cased or Uncased Diameter 2" Static Level _____

Work/Decommision Start Date **4/30/2008**

If trainee, licesned drillers' Signature and License No. _____

Work/Decommision Completed Date **5/2/2008**

Construction/Design W08-307 Formation Description



CONCRETE SURFACE SEAL 2' FT — 0 - FT

BACKFILL ~~5~~ 171' FT — 0 - FT

grout

REQUIRED INFORMATION
(Must get one or both if available)

DEPT OF ECOLOGY WELL TAG # : _____

CLIENT WELL ID #: DW-2

DEPTH OF BORING ~~7~~ 173' FT

Scale 1" = _____

Page _____ of _____

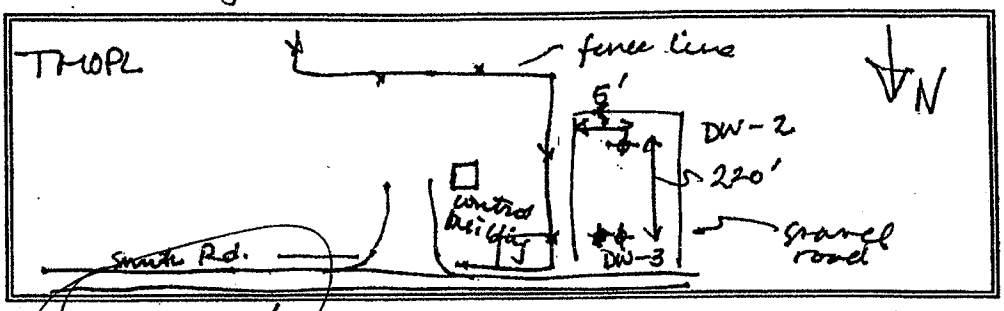
ECY 050-12 (Rev 2/01)

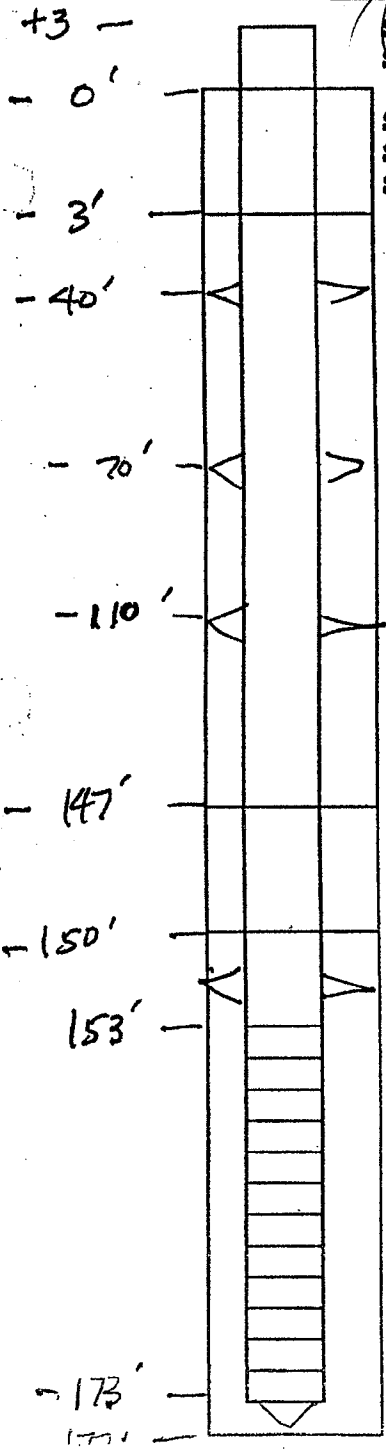
LAUREL PUMP STATION WELL CONSTRUCTION REPORT

WELL ID: DW-2
CONSTRUCTION DATE: 3/23/92
DAMES & MOORE REPRESENTATIVE: TMWilliams
DRILLER: Hayes Drilling Inc. (Brannon)

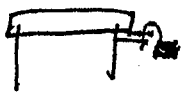
ELEVATION 292.07 MSL

LOCATION





STICK UP 3'
SURFACE CASING TYPE metal monument w/ locking cap.



SURFACE SEAL TYPE cement
SURFACE SEAL FROM 0
SURFACE SEAL TO 3' bgs.

BORE HOLE DIAMETER 6"
CASING TYPE PVC 2" diameter
CASING FROM 3' above surface of ground
CASING TO 153' bgs

BOREHOLE SEAL TYPE Bentonite slurry
SEAL FROM 3' bgs
SEAL TO 147' bgs

BENTONITE PELLET SEAL
FROM 147' bgs
TO 150' bgs

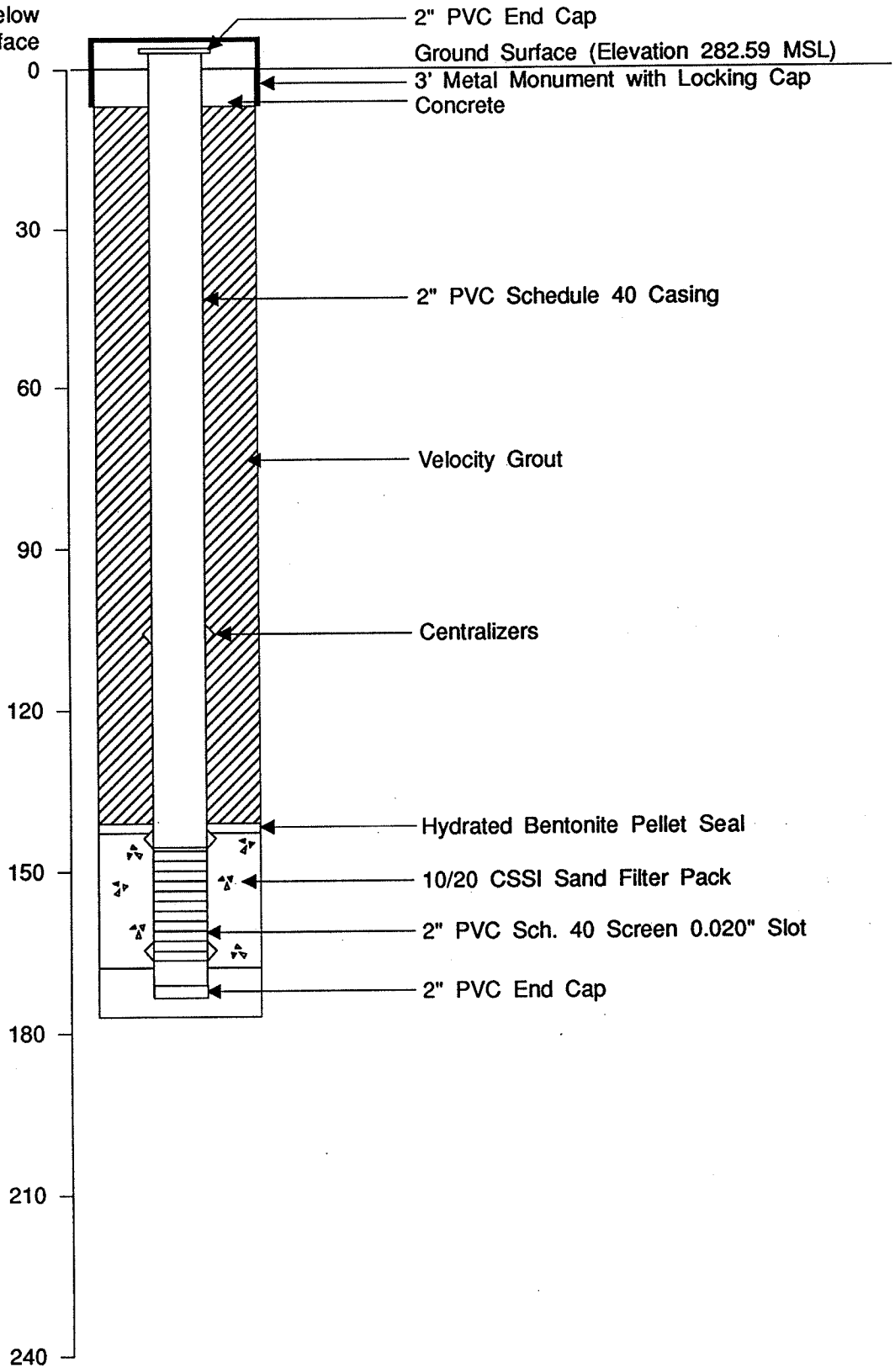
SAND PACK TYPE 10/20 Colorado Silica Sand
SAND PACK FROM 150' bgs
SAND PACK TO 174' bgs

SCREEN TYPE 2", 0.020" slotted PVC
SCREEN FROM 153' bgs
SCREEN TO 173' bgs

173-2"

TOTAL DEPTH OF CASING 173'
TOTAL DEPTH HOLE 177'

TMMW_07.CDR



Job No. 21 -032-005

DW-3

Monitoring Well Construction Diagram

Dames & Moore

RESOURCE PROTECTION WELL REPORT

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

CURRENT
Notice of Intent No. A130238

Construction/Decommission

☐ Construction

☒ Decommission *ORIGINAL INSTALLATION Notice of Intent Number* _____

Type of Well

☒ Resource Protection

☐ Geotechnical Soil Boring

Property Owner **Laurel Station**

Site Address **1009 E. Smith Rd.**

Consulting Firm **URS Corporation**

City **Bellingham** County **Whatcom**

EWM

Unique Ecology Well ID

Tag No. _____

Location 1/4 **SW** 1/4 **SW** Sec **28** TWN **39N** R **3E** or _____ WWM

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards

Materials used and the information reported above are true to my best knowledge and belief

Lat/Long (s,t,r still Required) Lat Deg **n/a** Lat Min/Sec **n/a** Long Deg **n/a** Long Min/Sec **n/a**

☒ Driller ☐ Trainee Name (Print) Andy Flagan

Driller/Trainee Signature x _____

Driller/Trainee License No. **2761**

Tax Parcel No. _____

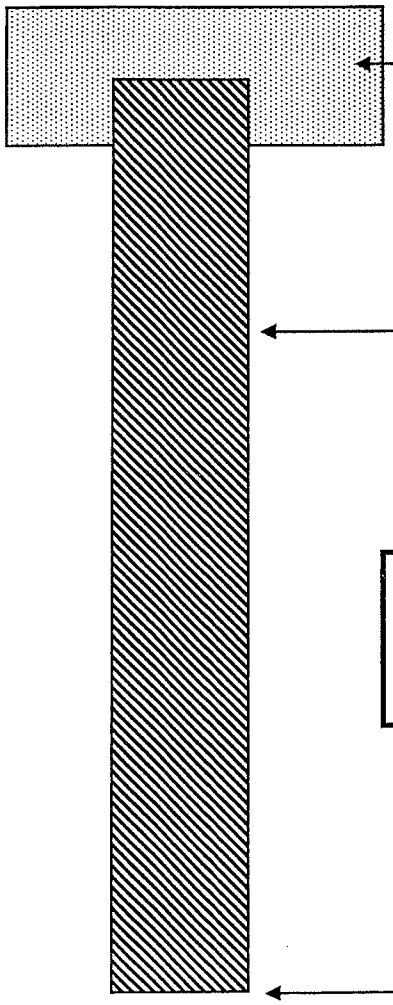
Cased or Uncased Diameter 8" Static Level _____

If trainee, licesned drillers' Signature and License No. _____

Work/Decommision Start Date **4/30/2008**

Work/Decommision Completed Date **5/2/2008**

Construction/Design W08-307 Formation Description



CONCRETE SURFACE SEAL, 2.5 FT — 0 - FT

BACKFILL ~~1~~ 164' FT — 0 - FT

grout

DEPTH OF BORING ~~1~~ 166.5 FT

REQUIRED INFORMATION
(Must get one or both if available)

DEPT OF ECOLOGY WELL TAG # : _____

CLIENT WELL ID #: DW-3

Scale 1" = _____

Page _____ of _____

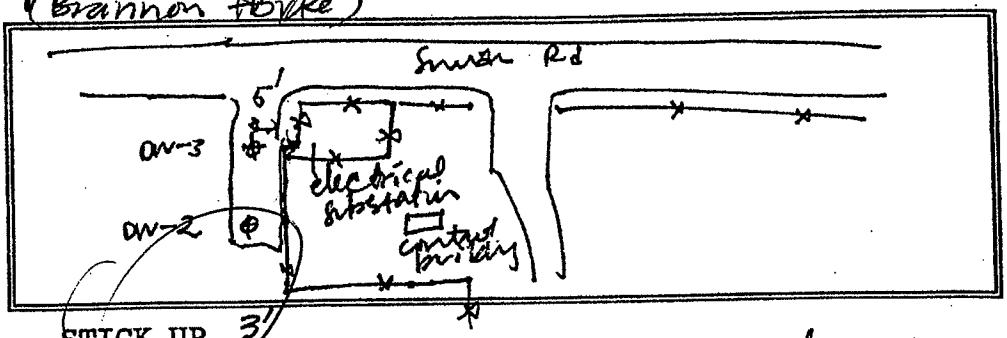
ECY 050-12 (Rev 2/01)

LAUREL PUMP STATION WELL CONSTRUCTION REPORT

WELL ID: DW-3
CONSTRUCTION DATE: 1/25/92
DAMES & MOORE REPRESENTATIVE: Jim Williams
DRILLER: Hayes Drilling Inc (Brannon Hooke)

ELEVATION 282.59 msl

LOCATION



+3' —
0' —
7' —
106' —
141' —
143' —
146.5' —
165' —
166.5' —
177' —

STICK UP 3"
SURFACE CASING TYPE metal monument w/ locking cap
SURFACE SEAL TYPE cement
SURFACE SEAL FROM 0
SURFACE SEAL TO 7' bgs

BORE HOLE DIAMETER 6"
CASING TYPE PVC 2" diameter
CASING FROM +3' (above ground surface)
CASING TO 146.5' bgs

BOREHOLE SEAL TYPE bentonite slurry volclay
SEAL FROM 7' bgs
SEAL TO 141' bgs

BENTONITE PELLET SEAL
FROM 141'
TO 143'

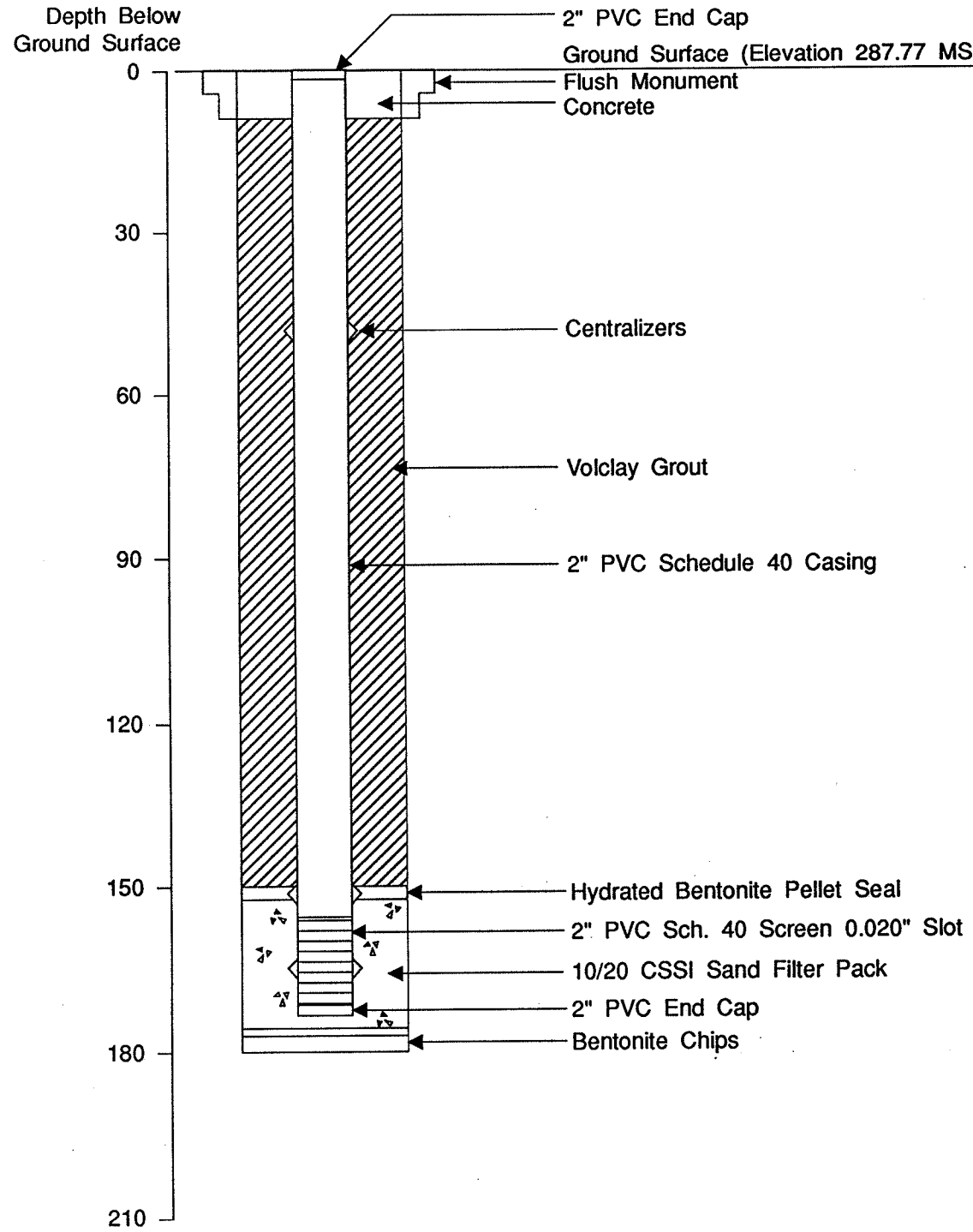
SAND PACK TYPE 10/20 Colorado Silica Sand
SAND PACK FROM 143'
SAND PACK TO 148

SCREEN TYPE 2" diam; 0.020" slot size, PVC
SCREEN FROM 146.5
SCREEN TO 166.5

TOTAL DEPTH OF CASING 166.5
TOTAL DEPTH HOLE 177'

167' 2" OK

TMMW_06.CDR



Job No. 21 -032-005

DW-4
Monitoring Well Construction Diagram
Dames & Moore

RESOURCE PROTECTION WELL REPORT

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

CURRENT

Notice of Intent No. A130238

Construction/Decommission

☐ Construction

☒ Decommission *ORIGINAL INSTALLATION Notice of Intent Number* _____

Type of Well

☒ Resource Protection

☐ Geotechnical Soil Boring

Property Owner **Laurel Station**

Site Address **1009 E. Smith Rd.**

Consulting Firm **URS Corporation**

City **Bellingham** County **Whatcom**

EWM

Unique Ecology Well ID

Tag No. _____

Location 1/4 **SW** 1/4 **SW** Sec **28** TWN **39N** R **3E** or _____ WWM

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards

Materials used and the information reported above are true to my best knowledge and belief

Lat/Long (s,t,r still Required) Lat Deg **n/a** Lat Min/Sec **n/a** Long Deg **n/a** Long Min/Sec **n/a**

Tax Parcel No. _____

☒ Driller ☐ Trainee Name (Print) Andy Flagan

Driller/Trainee Signature x _____

Driller/Trainee License No. **2761**

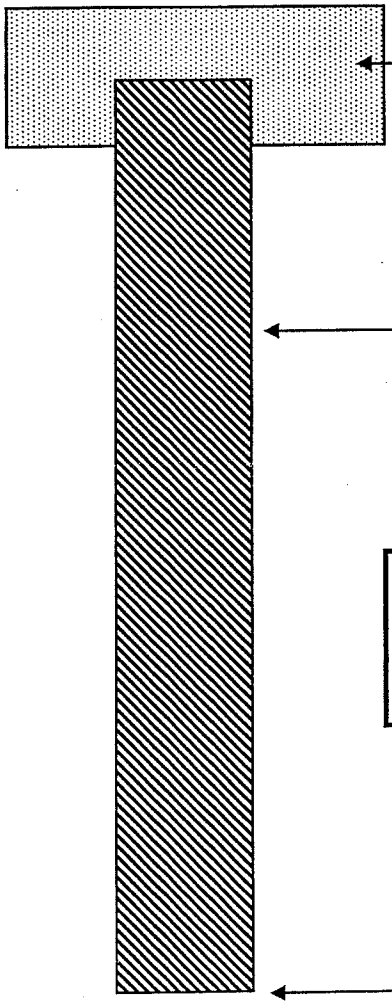
Cased or Uncased Diameter 2" Static Level _____

Work/Decommision Start Date **4/30/2008**

If trainee, licesned drillers' Signature and License No. _____

Work/Decommision Completed Date **5/2/2008**

Construction/Design W08-307 Formation Description



CONCRETE SURFACE SEAL 2' FT — 0 - _____ FT

BACKFILL 173.5 FT — 0 - _____ FT

grout

DEPTH OF BORING 175.5 FT

REQUIRED INFORMATION

(Must get one or both if available)

DEPT OF ECOLOGY WELL TAG # : _____

CLIENT WELL ID #: DW-4

Scale 1" = _____

Page _____ of _____

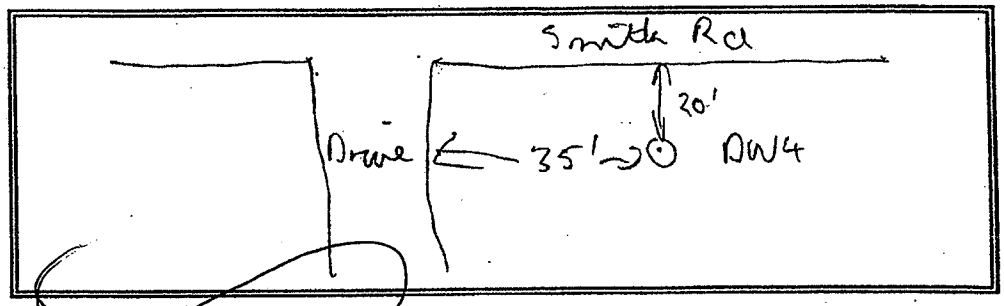
ECY 050-12 (Rev x 2/01)

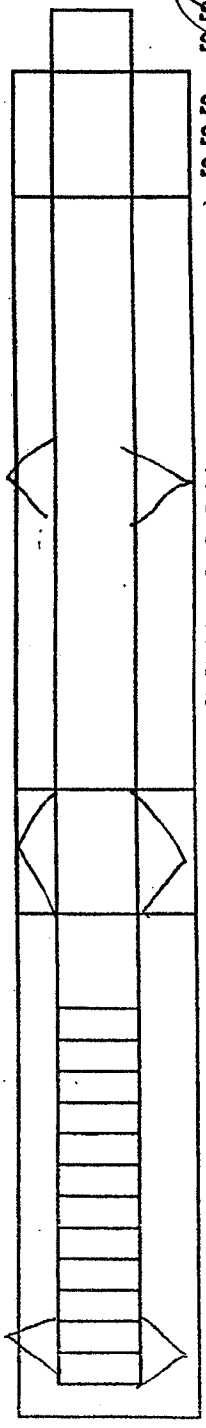
LAUREL PUMP STATION WELL CONSTRUCTION REPORT

WELL ID: DW 4
CONSTRUCTION DATE: 3/31/92
DAMES & MOORE REPRESENTATIVE: D. MALTBY
DRILLER: HAYES

ELEVATION
281.77 MSL

LOCATION





STICK UP Flush
SURFACE CASING TYPE Flush Mount

SURFACE SEAL TYPE Concrete
SURFACE SEAL FROM _____
SURFACE SEAL TO _____

BORE HOLE DIAMETER 6"
CASING TYPE PVC 2"
CASING FROM Surface
CASING TO 155.5'

BOREHOLE SEAL TYPE VOLCLAY
SEAL FROM ~~130'~~
SEAL TO ~~155.5'~~ 150'

BENTONITE PELLET SEAL
FROM 150'
TO 152.5

SAND PACK TYPE ~~155.5~~ 10-20 Colorado Silica Sand
SAND PACK FROM 152.5
SAND PACK TO 177

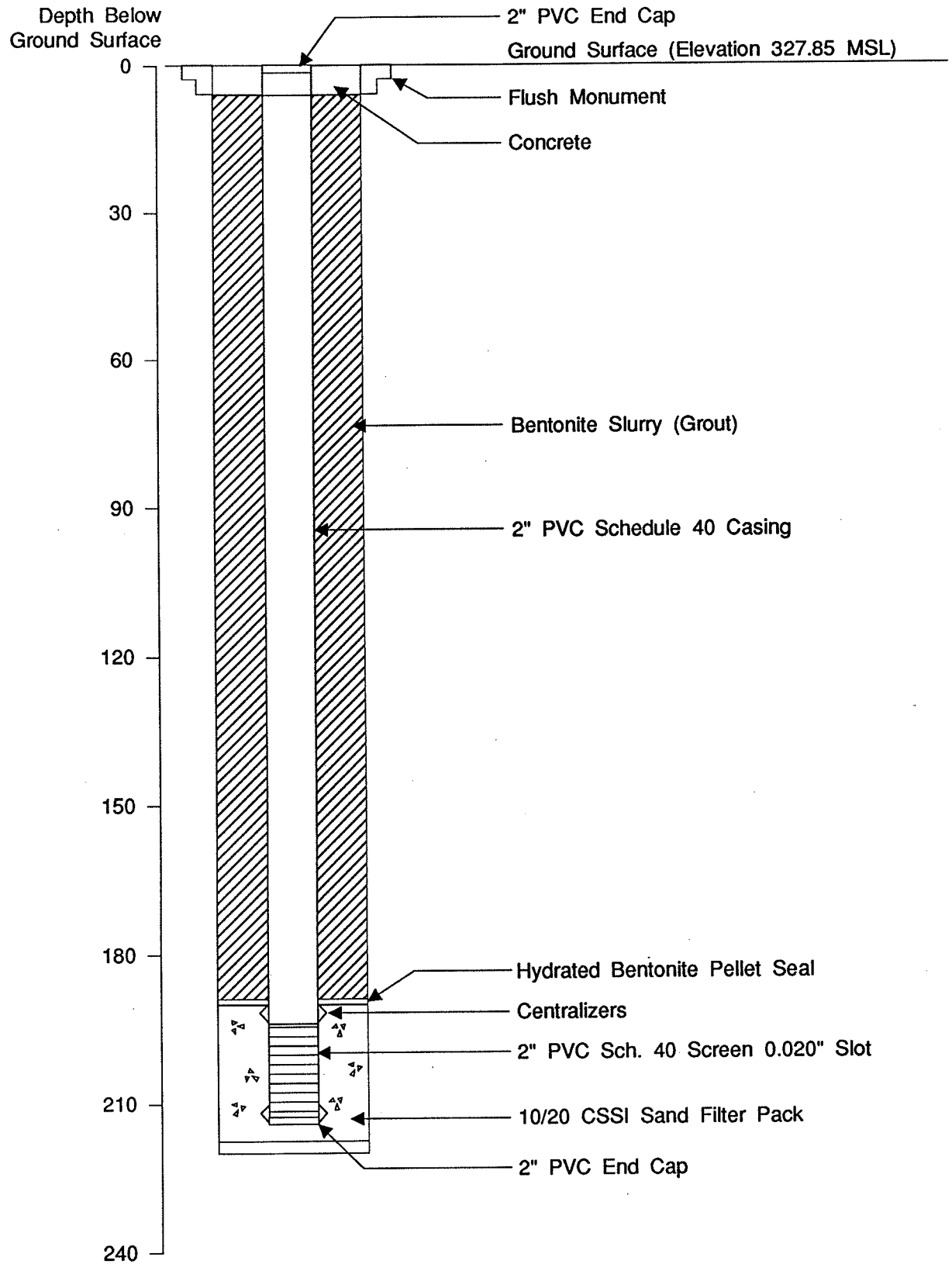
SCREEN TYPE 2" 20 slot PVC
SCRENN FROM 155.5'
SCREEN TO 175.5

175'-2"

TOTAL DEPTH OF CASING 175.5
TOTAL DEPTH HOLE 180'

016

TMMW_09.CDR



Job No. 2: 032-005

DW-5
Monitoring Well Construction Diagram
Dames & Moore

RESOURCE PROTECTION WELL REPORT

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

CURRENT
Notice of Intent No. A130238

Construction/Decommission

☐ Construction

☒ Decommission *ORIGINAL INSTALLATION Notice of Intent Number* _____

Type of Well

☒ Resource Protection

☐ Geotechnical Soil Boring

Consulting Firm **URS Corporation**

Property Owner **Laurel Station**

Site Address **1009 E. Smith Rd.**

City **Bellingham** County **Whatcom**

EWM

Unique Ecology Well ID
Tag No. _____

Location 1/4 **SW** 1/4 **SW** Sec **28** TWN **39N** R **3E** or _____ WWM

Lat/Long (s,t,r still Required) Lat Deg **n/a** Lat Min/Sec **n/a** Long Deg **n/a** Long Min/Sec **n/a**

Tax Parcel No. _____

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards Materials used and the information reported above are true to my best knowledge and belief

☒ Driller ☐ Trainee Name (Print) Andy Flagan

Driller/Trainee Signature x _____

Driller/Trainee License No. 2761

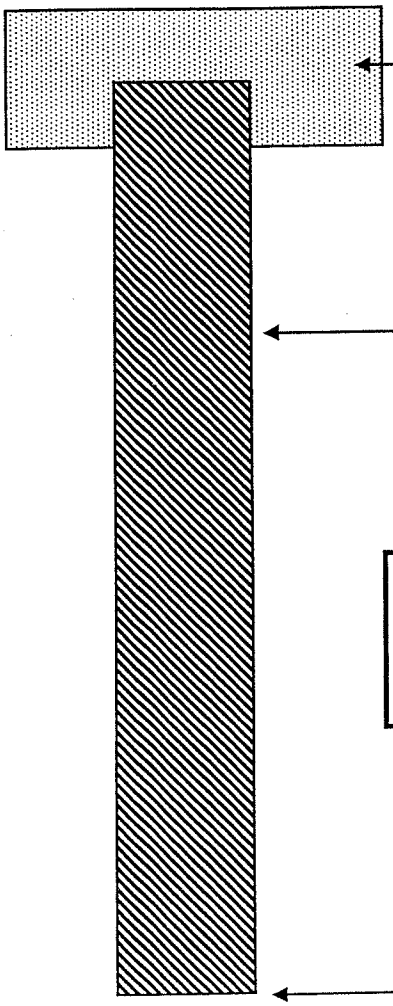
Cased or Uncased Diameter 2" Static Level _____

Work/Decommision Start Date **4/30/2008**

Work/Decommision Completed Date **5/2/2008**

If trainee, licesned drillers' Signature and License No. _____

Construction/Design W08-307 Formation Description



CONCRETE SURFACE SEAL 2' FT — 0 - FT

BACKFILL 212 FT — 0 - FT

grout

REQUIRED INFORMATION
(Must get one or both if available)

DEPT OF ECOLOGY WELL TAG # : _____

CLIENT WELL ID #: DW-5

DEPTH OF BORING 214' FT

Scale 1" = _____

Page _____ of _____

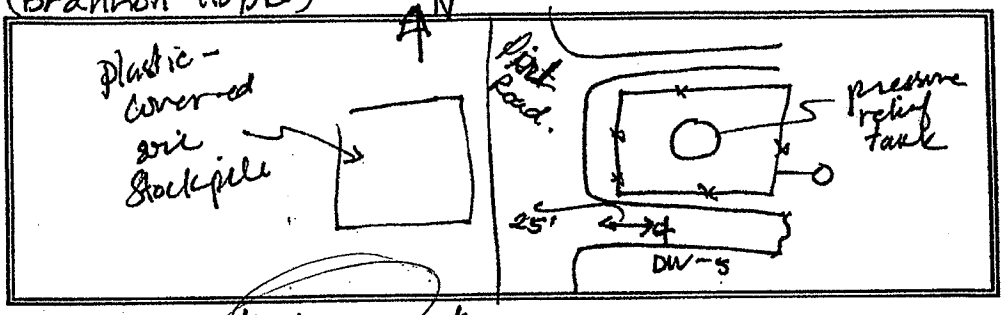
ECY 050-12 (Rev=v 2 01)

LAUREL PUMP STATION WELL CONSTRUCTION REPORT

WELL ID: DW-5
CONSTRUCTION DATE: 4/2 & 3/92
DAMES & MOORE REPRESENTATIVE: LM Williams
DRILLER: Hayes Drilling Inc. (Brannon Hopke)

ELEVATION 327.85 MSL

LOCATION



STICK UP flush mount
SURFACE CASING TYPE metal flush mount

SURFACE SEAL TYPE _____
SURFACE SEAL FROM _____
SURFACE SEAL TO _____

BORE HOLE DIAMETER 6"
CASING TYPE PVC, 2" diameter
CASING FROM 0
CASING TO 194

BOREHOLE SEAL TYPE bentonite slurry (grout) Myo-Ben Enviroplug
SEAL FROM _____
SEAL TO ~~189~~ 199

189 —

BENTONITE PELLET SEAL
FROM 191
TO 189 ~~0~~

191 —

SAND PACK TYPE 10/20 Colorado Silica Seal
SAND PACK FROM 191
SAND PACK TO 216

194 —

SCREEN TYPE 2" diameter, 0.020" slotted PVC
SCREEN FROM 194
SCREEN TO 214

214 — TOTAL DEPTH OF CASING 214

270 — TOTAL DEPTH HOLE 270'

214 - 2" OK

APPENDIX D
LABORATORY ANALYTICAL REPORTS

APPENDIX D – LAB REPORTS

Lab	Work Order	Sample Dates
Analytical Resources Inc.	9553	11/21 – 12/2/1991
Analytical Resources Inc.	9624	12/11/1991
Analytical Resources Inc.	9626	12/5/1991
Analytical Resources Inc.	9641 II	12/11 - 12/13/1991
Analytical Resources Inc.	9671	December 1991
Analytical Resources Inc.	9698	12/17/1991
Analytical Resources Inc.	9714	12/24/1991
Analytical Resources Inc.	9727	1/2/1992
Analytical Resources Inc.	9766	1/6 – 1/8/1992
Analytical Resources Inc.	9809	1/14 – 1/15/1992
Analytical Resources Inc.	9849	1/15 – 1/18/1992
Analytical Resources Inc.	9864	1/17 – 1/21/1992
Analytical Resources Inc.	9880	1/24/1992
Analytical Resources Inc.	9884	1/27/1992
Analytical Resources Inc.	9903	1/29/1992
Analytical Resources Inc.	9954	2/6/1992
Analytical Resources Inc.	9991	2/13/1992
Analytical Resources Inc.	A027	2/17 – 2/21/1992
Analytical Resources Inc.	A068	2/24 – 2/26/1992
Analytical Resources Inc.	A089	2/27/1992
Analytical Resources Inc.	A126	3/3/1992
Analytical Resources Inc.	A134	2/25/1992
Analytical Resources Inc.	A165	3/10/1992
Analytical Resources Inc.	A182	3/11 – 3/12/1992
Analytical Resources Inc.	A210	3/13/1992
Analytical Resources Inc.	A222	3/14 – 3/16/1992
Analytical Resources Inc.	A247	3/17 – 3/18/1992
Analytical Resources Inc.	A285	3/19 – 3/20/1992
Analytical Resources Inc.	A326	3/23/1992
Analytical Resources Inc.	A383	4/1/1992
Analytical Resources Inc.	A422	4/8/1992
Analytical Resources Inc.	A501, A523	4/16 – 4/17/1992
Analytical Resources Inc.	C003	10/16/1992
Analytical Resources Inc.	C332	11/25/1992
Analytical Resources Inc.	C360	12/1/1992
Analytical Resources Inc.	E354	7/7 – 7/8/1993
Analytical Resources Inc.	E367 – E367 IV	7/9/1993
Analytical Resources Inc.	ML21	3/3/2008
Analytical Resources Inc.	MN46	3/13/2008
Analytical Resources Inc.	MN48	3/13/2008
Analytical Resources Inc.	MO08	3/19/2008
Analytical Resources Inc.	KI11, KG83	11/7, 12/7 – 12/8/2008

APPENDIX D – LAB REPORTS (continued)

Lab	Work Order	Sample Dates
NCA Labs	B0J0800	10/31/2000
NCA Labs	B0K0103	11/2/2000
NCA Labs	B0K0106	11/3/2000
NCA Labs	B0K0272	11/9/2000
NCA Labs	B0K0285	11/6/2000
NCA Labs	B0K0337	11/13/2000
NCA Labs	B0K0362	11/14/2000
NCA Labs	B0K0455	11/16/2000
NCA Labs	B0K0591	11/22/2000
Sound Analytical Services	15544	1/17/1991
Sound Analytical Services	15573	1/19/1991
Sound Analytical Services	15645	1/21 – 1/22/1991
Sound Analytical Services	15661	1/23/1991
Sound Analytical Services	15829	1/22/1991
Sound Analytical Services	15834	2/1/1991
Sound Analytical Services	15861	2/4/1991
Sound Analytical Services	15937	2/8/1991
Sound Analytical Services	15964	2/11/1991
Sound Analytical Services	16003	2/13/1991
Sound Analytical Services	16045	2/14 – 2/15/1991
Sound Analytical Services	16046	2/15/1991
Sound Analytical Services	16062	2/18/1991
Sound Analytical Services	16063	2/18/1991
Sound Analytical Services	16127	2/19 – 2/20/1991
Sound Analytical Services	16178	2/22/1991
Sound Analytical Services	16218	2/25/1991
Sound Analytical Services	16308	3/1/1991
Sound Analytical Services	16329	3/4/1991
Sound Analytical Services	16469	3/8/1991
Sound Analytical Services	16483	3/12/1991
Sound Analytical Services	16561	3/15/1991
Sound Analytical Services	16653	3/20/1991
Sound Analytical Services	16695	3/22/1991
Sound Analytical Services	16723	3/25/1991
Sound Analytical Services	16807	3/28 – 3/29/1991
Sound Analytical Services	16854	3/28/1991
Sound Analytical Services	16941	4/8/1991
Sound Analytical Services	17001-1	4/8/1991
Sound Analytical Services	17001- 2	4/8/1991
Sound Analytical Services	17001- 3	4/8/1991
Sound Analytical Services	17001- 4	4/8/1991
Sound Analytical Services	17001- 5	4/8/1991

APPENDIX D – LAB REPORTS (continued)

Lab	Work Order	Sample Dates
Sound Analytical Services	17001-6	4/8/1991
Sound Analytical Services	17001-6D	4/8/1991
Sound Analytical Services	17001-MB	4/8/1991
Sound Analytical Services	17025	4/12/1991
Sound Analytical Services	17151-1	4/17/1991
Sound Analytical Services	17151-2	4/17/1991
Sound Analytical Services	17151-3	4/17/1991
Sound Analytical Services	17151-4	4/17/1991
Sound Analytical Services	17151-5	4/17/1991
Sound Analytical Services	17151-MB	4/17/1991
Sound Analytical Services	17277	4/24/1991

19 December 1991

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

David Maltby
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

DAMES & MOORE
SEATTLE
DEC 20 1991

RE: Client Project: #21199-032 Trans Mtn.
ARI Job #9553

Dear David:

Please find enclosed the results and the original chain-of-custody record for the above referenced project. Samples were received intact on 12/4/91, and analyses proceeded without incident. These results have been faxed to you and/or Jason Ai as they became available.

If you have any questions or need further information, please feel free to call any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller

Kate Stegemoeller
Project Coordinator

KAS/ks

Enclosures

cc: file#9553

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Boring or Well Number	Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	VOA 602/8020	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (M)	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	W/TPH-HCID	WTPH-418.1	8015 Modified (Gasoline)	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
TP-5	TP5-4x	14'	10:20	Soil	glass jar																X				1	
TP-6	TP6-3x	10'	9:30	"	"	X														X	X	X			1	
TP-7	TP7-5x	15'	11:55	"	"																X				1	
TP-8	TP8-2x	6'	13:20	"	"	X														X	X	X			1	
TP-9	TP9-3x	7'	15:10	"	"	X														X	X	X			1	
	EX-5x		14:55	"	"																X				1	
TP10	TP10-3x	15'	14:15	"	"																X				1	
TP11	TP11-2x	10'	15:50	"	"																X				1	
TP13	TP13X2x	10'	11:35	"	"																X				1	
TP15	TP15-3x	15'	17:25	"	"																X				1	
TM-B1	TMB1x-	55'	10:45	"	"																X				1	
TM-B2	TMB2x-	5.0'	14:00	"	"																X				1	

RELINQUISHED BY: (Signature) Jason Ao DATE/TIME 12/3/91 11:40 RECEIVED BY: (Signature) DRmatthy

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

ANALYTICAL LABORATORY: ARI

LABORATORY CONTACT:

D&M CONTACT: David Maltby PHONE:

DAMES & MOORE
500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-9744 Fax No. (206) 448-7994

LABORATORY NOTES:

3 days turn around time for 418.1

WTPH-HCID → need Diesel and heavy ~~fuel~~ HC concentration ~~fraction~~

other turnaround time 14 days.

JOB NO.: 21199-032-005 SHEET 1 OF 1

PROJECT Trans Mountain

LOCATION Laurel Pump Station

COLLECTOR PCarmichael DATE OF COLLECTION

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Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL PETROLEUM HYDROCARBONS by IR Scan
Modified EPA Method 418.1

Matrix: Soil

Project: 21199-032-005
Trans Mountain
QC Report No: 9553 - Dames & Moore
VTSR: 12/04/91

Data Release Authorized _____
Data Prepared: 12/12/91 -MAC:PJW

Date Prepared: 12/11/91
Date of Analysis: 12/12/91

Lab ID	Client Sample ID	Dilution Factor	TPH (ppm)
9553 MB	*METHOD BLANK*	*1*	*10 U*
9553 B	**TP6-3X 10'**	**1**	**80**
9553 B DUP	**TP6-3X 10'**	**1**	**78**
9553 B TRIP	**TP6-3X 10'**	**1**	**79**
9553 D	**TP8-2X 6'**	**1**	**140**
9553 E	**TP9-3X 7'**	**10**	**1000**

Values reported in ppm (mg/Kg) based on wet weight of sample

U Indicates compound was analyzed for but not detected at the given detection limit.

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TOTAL PETROLEUM HYDROCARBONS by IR Scan
Modified EPA Method 418.1

Matrix: Soil

Project: 21199-032-005
Trans Mountain
QC Report No: 9553 - Dames & Moore
VTSR: 12/04/91

Data Release Authorized _____
Data Prepared: 12/13/91 -MAC:PJW

Date Prepared: 12/12/91
Date of Analysis: 12/13/91

Lab ID	Client Sample ID	Dilution Factor	TPH (ppm)
9553 MB	*METHOD BLANK*	*1*	*10 U*
9553 A	TP5-4X 14'	1	10 U
9553 C	**TP7-5X 15'**	**1**	**38**
9553 F	**EX-5X**	**5**	**1700**
9553 G	TP10-3X 15'	1	10 U
9553 H	TP11-2X 10'	1	10 U
9553 I	TP13X-2 10'	1	10 U
9553 J	TP15-3X 15'	1	10 U
9553 K	TM-B1X 55'	1	10 U
9553 L	**TM-B2X 5.0'**	**1**	**21**
9553 L RE *	**TM-B2X 5.0'**	**1**	**17**
9553 L DUP	**TM-B2X 5.0'**	**1**	**11**
9553 L TRIP	**TM-B2X 5.0'**	**1**	**11**

Values reported in ppm (mg/Kg) based on wet weight of sample

U Indicates compound was analyzed for but not detected at the given detection limit.

* Reran with additional silica gel.

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ORGANICS ANALYSIS DATA SHEET - Method 602/8020
GC/PID FOR BETX

Matrix: Soils/Sediments
Level: Low

Project No: Trans Mountain
21199-032-005
QC Report No: 9553 Dames & Mooore
Date Received: 12/04/91

Data Release Authorized: _____
Report prepared: 12/13/91-MAC: RPR

	Sample No.	Meth Blank	TP6 - 3X - 10'	TP6 - 3X - 10'	TP8 - 2X - 6'	TP9 - 3X - 7'
	ARI ID	MB 1210	9553 B	9553 BDup	9553 D	9553 E
	Date Analyzed	12/10/91	12/11/91	12/11/91	12/11/91	12/11/91
	Amt Analyzed	0.100 gm (Eq.)	0.091 gm	0.091 gm	0.096 gm	0.082 gm
CAS Number	Units	µg/Kg	µg/Kg	µg/Kg	µg/Kg	µg/Kg
71-43-2	Benzene	50 U	55 U	55 U	52 U	61 U
108-88-3	Toluene	50 U	55 U	55 U	52 U	**70**
100-41-4	Ethylbenzene	50 U	55 U	55 U	52 U	61 U
1330-20-7	Total Xylenes	100 U	110 U	110 U	100 U	**510**
	Trifluorotoluene	*96.5%*	*104%*	*100%*	*102%*	*106%*
	Bromobenzene	*84.3%*	*103%*	*98.7%*	*107%*	*216%**

Value — If the result is a value greater than or equal to the detection limit, report value.

U — Indicates compound was analyzed for but not detected at the given detection limit.

NR — Analysis not required.

* — Indicates surrogate recovery was enhanced due to matrix interference / coelution.

B — This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.

K — This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

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TOTAL GASOLINE RANGE HYDROCARBONS
WA TPHG Method by GC/FID

QC Report No: 9553 Dames & Moore
Project: **Trans Mountain**
21199-032-005
VTSR: 12/04/91

Matrix: **Soil**

Data Release Authorized
Data Prepared: 12/13/91 - MAC: RPR

Date Extracted: 12/10/91
Date Analyzed: 12/11/91

Lab ID		Client Sample ID	Dilution Factor	Gasoline Range Hydrocarbons †	Gas ID *	Surrogate A	Surrogate B
9553	MB	Method Blank	NA	5.0 U	No	85.9%	80.2%
9553	B	TP6 - 3X - 10'	NA	12	Yes	96.6%	97.2%
9553	B Dup	TP6 - 3X - 10'	NA	12	Yes	93.3%	95.4%
9553	D	TP8 - 2X - 6'	NA	38	Yes	93.5%	115%
9553	E	TP9 - 3X - 7'	NA	180	Yes	99.5%	372%**

Surrogate A = Trifluorotoluene
Surrogate B = Bromobenzene

Values reported in ppm (mg/kg).

U Indicates compound was analyzed for but not detected at the given detection limit.

X Indicates a value above the linear range of the detector. Dilution required.

* In the opinion of the analyst, was there a pattern match for gasoline.

† Value based on total peaks in the range from Toluene to Dodecane.

** Coeluted with another compound.

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TOTAL PETROLEUM HYDROCARBONS
WA HCID Method by GC/FID

QC Report No: 9553-Dames & Moore
Project: Trans Mountain
21199 - 032 - 005
VTSR: 12/04/91

Matrix: Soil

Data Release Authorized
Data Prepared: 12/17/91 - MAC: RPR

Date Extracted: 12/11/91
Dates Analyzed: 12/12/91

Lab ID	Client Sample ID	Dilution Factor	Petroleum Hydrocarbons †	TPH ID *	Surrogate Recovery
MB 1211	Method Blank	-	10 U	-	105%
9553 B	**TP6 - 3X (10')**	-	**330**	Diesel "‡"	81.7%
9553 D	**TP8 - 2X (6')**	-	**49**	No "‡"	104%
9553 E	**TP9 - 3X (7')**	-	**76**	Diesel "‡"	96.9%

Surrogate is Me-Arachidate.

Values reported in ppm (mg/Kg).

U Indicates compound was analyzed for but not detected at the given detection limit.

X Indicates a value above the linear range of the detector. Dilution required.

* In the opinion of the analyst, was there a pattern match for diesel or gasoline (yes or no).

† Value based on total peaks in the range from Toluene to C24.

‡ Value represents Diesel range plus heavier hydrocarbons.

20 December 1991

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David Maltby
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032 Trans Mtn.
ARI Job #9553 II

Dear David:

Please find enclosed the results for sample "TP9-3X 7'" from the above referenced project. The sample was logged-in as part II of job 9553 for "rush" TAT analysis by WA HCID Method for TPH, as per Pauline Roberts' request on 12/13/91. These results have been faxed to you today as well.

If you have any questions or need further information, please feel free to call any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Coordinator

KAS/ks

Enclosures

cc: file#9553 II

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TOTAL PETROLEUM HYDROCARBONS
WA HCID Method by GC/FID

QC Report No: 9553 - Dames & Moore
Project: 21199 - 032 - 005

Matrix: Soil

VTSR: 12/13/91

Data Release Authorized _____
Data Prepared: 12/19/91 - MAC: RPR

Date extracted: 12/17/91
Dates Analyzed: 12/18/91

Lab ID	Client Sample ID	Dilution Factor	Petroleum Hydrocarbons †	TPH ID *	Surrogate Recovery
9649 MB1217	Method Blank	-	20 U	-	91.1%
9553 E	TP9 - 3X 7'	-	170	Diesel	102%

Surrogate is Me-Arachidate.

Values reported in ppm (mg/Kg).

U Indicates compound was analyzed for but not detected at the given detection limit.

X Indicates a value above the linear range of the detector. Dilution required.

* In the opinion of the analyst, was there a pattern match for diesel or gasoline (yes or no).

† Value based on total peaks in the range from Toluene to C24.

27 December 1991

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333 Ninth Ave. North
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(206) 621-6490
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David Maltby
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032 Trans. Mtn.
ARI Job #9553 III

Dear David:

Please find enclosed the results for sample EX-5X from the above referenced project. These were faxed to you 12/24/91.

The analyst notes that there also seems to be some gasoline in the sample, and recommends the tph-gas analysis for better quantitation.

If you have any questions or need further information, please feel free to call any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Coordinator

KAS/ks

Enclosures

cc: file#9553 III

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TOTAL PETROLEUM HYDROCARBONS
WA HCID Method by GC/FID

QC Report No: 9553 III - Dames & Moore
Project: Trans Mtn.

Matrix: Soil

VTSR: 12/18/91

Data Release Authorized _____
Data Prepared: 12/23/91 - MAC: RPR

Date extracted: 12/18/91
Dates Analyzed: 12/19/91

Lab ID		Client Sample ID	Dilution Factor	Petroleum Hydrocarbons †	TPH ID *	Surrogate Recovery
MB	1218	*Method Blank*	-	10 U	-	93.1%
9553	F	EX - 5X	-	360	Diesel	105%
9553	F	EX - 5X	-	140	Gas	-

Surrogate is Me-Arachidate.

Values reported in ppm (mg/Kg).

U Indicates compound was analyzed for but not detected at the given detection limit.

X Indicates a value above the linear range of the detector. Dilution required.

* In the opinion of the analyst, was there a pattern match for diesel or gasoline (yes or no).

† Value based on total peaks in the range from Toluene to C24.

16 December 1991

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Jason Ai
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032
ARI Job #9624

Dear Jason:

Please find enclosed the results and the original chain-of-custody record for the above referenced project. Samples were received intact on 12/12/91 for 24-hr. TAT; analyses proceeded without incident and results were faxed to you 12/13/91.

If you have any questions or need further information, please feel free to call any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Coordinator

KAS/ks

Enclosures

cc: file#9624

Chain of Custody Record & Laboratory Analysis Request

Date: 12/12/91

Page 1 of 1

Number of coolers: _____

ANALYTICAL RESOURCES INCORPORATED
333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

ARI Client: _____ Phone #: _____

Client Contact: Jason Ai

Client Project ID: 2199-032.

Samplers: RB

	Sample ID	Date	Time	Matx	No Cont	Lab ID	EPA-8020	WTPH-418.1	Analysis Required							Notes/Comments
1	SWRO-C1	12/11	13:02	W	3		X	X								
2	SWRO-C2	〃	14:24	W	3		X	X								
3	SWRO-C3	〃	16:21	W	3		X	X								
4	SWRO-C4	〃	18:25	W	3		X	X								
5	SWRO-D1	〃	14:54	W	3		X	X								
6	SWRO-D3-1	12/11	16:02	W	3		X	X								
7	Trip Blank	12/9		W	2		X	X								
8																

Comments/Special Instructions:
Rush 24 hr turn around
Call me if you can't give us result within 24 hr.

Relinquished by: (Signature) Jason Ai	Relinquished by: (Signature)	Relinquished by: (Signature)
Printed Name: Jason Ai	Printed Name:	Printed Name:
Company: Dames & Moore	Company:	Company:
Date: 12/12/91 Time: 8:00	Date: Time:	Date: Time:
Received by: (Signature) Michelle Miller	Received by: (Signature)	Received by: (Signature)
Printed Name: Michelle I. Miller	Printed Name:	Printed Name:
Company: ARI	Company:	Company:
Date: 12/12/91 Time: 8:00	Date: Time:	Date: Time:

A.R.I. # 9624

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(206) 621-6490
(206) 621-7523 (FAX)

TOTAL PETROLEUM HYDROCARBONS by IR Scan
Modified EPA Method 418.1

Matrix: Water

Project: 21199-032
QC Report No: 9624 - Dames & Moore
VTSR: 12/12/91

Data Release Authorized _____
Data Prepared: 12/16/91 -MAC:PJW

Date Prepared: 12/12/91
Date of Analysis: 12/12/91

Lab ID	Client Sample ID	Dilution Factor	TPH (ppm)
9624 MB	*METHOD BLANK*	*1*	*1 U*
9624 A	SWR0-C1	1	1 U
9624 B	SWR0-C2	1	1 U
9624 C	SWR0-C3	1	1 U
9624 D	SWR0-C4	1	1 U
9624 E	SWR0-D1	1	1 U
9624 F	SWR0-D31	1	1 U

Values reported in ppm (mg/L).

U Indicates compound was analyzed for but not detected at the given detection limit.

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ORGANICS ANALYSIS DATA SHEET
BETX by Method 602/8020

Matrix: Waters
Level: Low

Project No: 21199-032
QC Report No: 9624 - D&M
VTSR: 12/12/91

Data Release Authorized: _____
Report prepared: 12/13/91 - MAC:B sdrd

	Sample No.	Meth Blank	SWRO-C1	SWRO-C2	SWRO-C3	SWRO-C4
	ARI ID	mb 12/12	9624A	9624B	9624C	9624D
	Date Analyzed	12/12/91	12/12/91	12/12/91	12/12/91	12/12/91
	Amt Analyzed	5.0 ml	5.0 ml	5.0 ml	5.0 ml	5.0 ml
CAS Number	Units	µg/L	µg/L	µg/L	µg/L	µg/L
71-43-2	Benzene	1.0 U	**2.0**	1.0 U	1.0 U	1.0 U
108-88-3	Toluene	1.0 U	**2.2**	1.0 U	1.0 U	1.0 U
100-41-4	Ethylbenzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1330-20-7	Total Xylenes	2.0 U	**1.7 J**	2.0 U	2.0 U	2.0 U
	Trifluorotoluene	*101%*	*97.2%*	*99.7%*	*94.1%*	*99.1%*
	Bromobenzene	*91.3%*	*91.4%*	*91.4%*	*88.9%*	*98.6%*

	Sample No.	SWRO-D1	SWRO-D-3-1	Trip Blank
	ARI ID	9624E	9624F	9624G
	Date Analyzed	12/12/91	12/12/91	12/12/91
	Amt Analyzed	5.0 ml	5.0 ml	5.0 ml
CAS Number	Units	µg/L	µg/L	µg/L
71-43-2	Benzene	1.0 U	1.0 U	1.0 U
108-88-3	Toluene	1.0 U	1.0 U	1.0 U
100-41-4	Ethylbenzene	1.0 U	1.0 U	1.0 U
1330-20-7	Total Xylenes	2.0 U	2.0 U	2.0 U
	Trifluorotoluene	*92.6%*	*92.7%*	*93.5%*
	Bromobenzene	*89.0%*	*88.0%*	*85.9%*

Value If the result is a value greater than or equal to the detection limit, report value.

U Indicates compound was analyzed for but not detected at the given detection limit.

NR Analysis not required.

B This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.

K This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

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26 December 1991

David Maltby
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032 Laurel Pump Sta.
ARI Job #9626

Dear David:

Please find enclosed the results and original chain-of-custody records for the above referenced project. The 418.1 tph results were faxed to you 12/18/91.

Sample OW5-1204-91 was rerun for tph-gas due to low surrogate recoveries; results were the same the second time, indicating matrix affect. Hydrocarbons in this sample peak in the late gas range. The pattern is not enough to call gas, but possibly highly weathered gas.

If you have any questions or need further information, please feel free to call any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller

Kate Stegemoeller
Project Coordinator

KAS/ks

Enclosures

cc: file#9626

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ORGANICS ANALYSIS DATA SHEET - METHOD 8270

Sample No: Method Blank

Sample ID: MB 1217
Matrix: Soils/Sediments

QC Report No: 9626 Dames & Moore
Project No: 21199 - 032
Laurel Pump Sta.
Date Received: NA

Data Release Authorized: _____
Report prepared: 12/20/91 MAC: RPR

Sample Weight: 30 gm (Equiv. Dry Wt.)
%Moisture: NA
pH: NA
Conc/Dilution: 1 to 1

Date extracted: 12/17/91
Date Analyzed (FINN 6): 12/19/91
GPC Cleanup: Yes (1 of 2)

CAS Number		µg/Kg
108-95-2	Phenol	130 U
111-44-4	bis(2-Chloroethyl)Ether	67 U
95-57-8	2-Chlorophenol	67 U
541-73-1	1,3-Dichlorobenzene	67 U
106-46-7	1,4-Dichlorobenzene	67 U
100-51-6	Benzyl Alcohol	330 U
95-50-1	1,2-Dichlorobenzene	67 U
95-48-7	2-Methylphenol	67 U
108-60-1	2,2'-Oxybis(1-Chloroporpane)	67 U
106-44-5	4-Methylphenol	67 U
621-64-7	N-Nitroso-Di-n-Propylamine	67 U
67-72-1	Hexachloroethane	130 U
98-95-3	Nitrobenzene	67 U
78-59-1	Isophorone	67 U
88-75-5	2-Nitrophenol	330 U
105-67-9	2,4-Dimethylphenol	130 U
65-85-0	Benzoic Acid	670 U
111-91-1	bis(2-Chloroethoxy)Methane	67 U
120-83-2	2,4-Dichlorophenol	200 U
120-82-1	1,2,4-Trichlorobenzene	67 U
91-20-3	Naphthalene	67 U
106-47-8	4-Chloroaniline	200 U
87-68-3	Hexachlorobutadiene	130 U
59-50-7	4-Chloro-3-Methylphenol	130 U
91-57-6	2-Methylnaphthalene	67 U
77-47-4	Hexachlorocyclopentadiene	330 U
88-06-2	2,4,6-Trichlorophenol	330 U
95-95-4	2,4,5-Trichlorophenol	330 U
91-58-7	2-Chloronaphthalene	67 U
88-74-4	2-Nitroaniline	330 U
131-11-3	Dimethyl Phthalate	67 U
208-96-8	Acenaphthylene	67 U
99-09-2	3-Nitroaniline	330 U

CAS Number		µg/Kg
83-32-9	Acenaphthene	67 U
51-28-5	2,4-Dinitrophenol	670 U
100-02-7	4-Nitrophenol	330 U
132-64-9	Dibenzofuran	67 U
121-14-2	2,4-Dinitrotoluene	330 U
606-20-2	2,6-Dinitrotoluene	330 U
84-66-2	Diethylphthalate	67 U
7005-72-3	4-Chlorophenyl-phenylether	67 U
86-73-7	Fluorene	67 U
100-01-6	4-Nitroaniline	330 U
534-52-1	4,6-Dinitro-2-Methylphenol	670 U
86-30-6	N-Nitrosodiphenylamine(1)	67 U
101-55-3	4-Bromophenyl-phenylether	67 U
118-74-1	Hexachlorobenzene	67 U
87-86-5	Pentachlorophenol	330 U
85-01-8	Phenanthrene	67 U
120-12-7	Anthracene	67 U
84-74-2	Di-n-Butylphthalate	67 U
206-44-0	Fluoranthene	67 U
86-74-8	Carbazole	67 U
129-00-0	Pyrene	67 U
85-68-7	Butylbenzylphthalate	67 U
91-94-1	3,3'-Dichlorobenzidine	330 U
56-55-3	Benzo(a)Anthracene	67 U
117-81-7	bis(2-Ethylhexyl)Phthalate	67 U
218-01-9	Chrysene	67 U
117-84-0	Di-n-Octyl Phthalate	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(ghi)Perylene	67 U

(1) Cannot be separated from diphenylamine

***Base/neutral surrogate recoveries**

d5-Nitrobenzene	74.7%
2-Fluorobiphenyl	81.0%
d14-p-Terphenyl	79.9%
1,2-Dichlorobenzene	81.0%

***Acid surrogate recoveries**

d5-Phenol	70.9%
2-Fluorophenol	80.6%
2,4,6-Tribromophenol	65.1%
2-Chlorophenol	76.9%

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ORGANICS ANALYSIS DATA SHEET - METHOD 8270

Sample No: TMB4 - 4 - 18

Sample ID: 9626 E
Matrix: Soils/Sediments

QC Report No: 9626 Dames & Moore
Project No: 21199 - 032
Laurel Pump Sta.
Date Received: 12/12/91

Data Release Authorized: _____
Report prepared: 12/20/91 MAC: RPR

Sample Weight: 33.5 gm (Dry Weight)
%Moisture: 17.1
pH: NA
Conc/Dilution: 1 to 1

Date extracted: 12/17/91
Date Analyzed (FINN 6): 12/19/91
GPC Cleanup: Yes (1 of 2)

CAS Number		µg/Kg
108-95-2	Phenol	120 U
111-44-4	bis(2-Chloroethyl)Ether	60 U
95-57-8	2-Chlorophenol	60 U
541-73-1	1,3-Dichlorobenzene	60 U
106-46-7	1,4-Dichlorobenzene	60 U
100-51-6	Benzyl Alcohol	300 U
95-50-1	1,2-Dichlorobenzene	60 U
95-48-7	2-Methylphenol	60 U
108-60-1	2,2'-Oxybis(1-Chloroporpane)	60 U
106-44-5	4-Methylphenol	60 U
621-64-7	N-Nitroso-Di-n-Propylamine	60 U
67-72-1	Hexachloroethane	120 U
98-95-3	Nitrobenzene	60 U
78-59-1	Isophorone	60 U
88-75-5	2-Nitrophenol	300 U
105-67-9	2,4-Dimethylphenol	120 U
65-85-0	Benzoic Acid	600 U
111-91-1	bis(2-Chloroethoxy)Methane	60 U
120-83-2	2,4-Dichlorophenol	179 U
120-82-1	1,2,4-Trichlorobenzene	60 U
91-20-3	**Naphthalene**	**210**
106-47-8	4-Chloroaniline	179 U
87-68-3	Hexachlorobutadiene	120 U
59-50-7	4-Chloro-3-Methylphenol	120 U
91-57-6	**2-Methylnaphthalene**	**1300**
77-47-4	Hexachlorocyclopentadiene	300 U
88-06-2	2,4,6-Trichlorophenol	300 U
95-95-4	2,4,5-Trichlorophenol	300 U
91-58-7	2-Chloronaphthalene	60 U
88-74-4	2-Nitroaniline	300 U
131-11-3	Dimethyl Phthalate	60 U
208-96-8	Acenaphthylene	60 U
99-09-2	3-Nitroaniline	300 U

CAS Number		µg/Kg
83-32-9	Acenaphthene	60 U
51-28-5	2,4-Dinitrophenol	600 U
100-02-7	4-Nitrophenol	300 U
132-64-9	**Dibenzofuran**	**49 M**
121-14-2	2,4-Dinitrotoluene	300 U
606-20-2	2,6-Dinitrotoluene	300 U
84-66-2	Diethylphthalate	60 U
7005-72-3	4-Chlorophenyl-phenylether	60 U
86-73-7	**Fluorene**	**190**
100-01-6	4-Nitroaniline	300 U
534-52-1	4,6-Dinitro-2-Methylphenol	600 U
86-30-6	N-Nitrosodiphenylamine(1)	60 U
101-55-3	4-Bromophenyl-phenylether	60 U
118-74-1	Hexachlorobenzene	60 U
87-86-5	Pentachlorophenol	300 U
85-01-8	**Phenanthrene**	**400**
120-12-7	Anthracene	60 U
84-74-2	Di-n-Butylphthalate	60 U
206-44-0	Fluoranthene	60 U
86-74-8	Carbazole	60 U
129-00-0	**Pyrene**	**20 J**
85-68-7	Butylbenzylphthalate	60 U
91-94-1	3,3'-Dichlorobenzidine	300 U
56-55-3	Benzo(a)Anthracene	60 U
117-81-7	bis(2-Ethylhexyl)Phthalate	60 U
218-01-9	**Chrysene**	**98**
117-84-0	Di-n-Octyl Phthalate	60 U
205-99-2	Benzo(b)Fluoranthene	60 U
207-08-9	Benzo(k)Fluoranthene	60 U
50-32-8	Benzo(a)Pyrene	60 U
193-39-5	Indeno(1,2,3-cd)Pyrene	60 U
53-70-3	Dibenz(a,h)Anthracene	60 U
191-24-2	Benzo(ghi)Perylene	60 U

(1) Cannot be separated from diphenylamine

***Base/neutral surrogate recoveries**

d5-Nitrobenzene	76.8%
2-Fluorobiphenyl	81.6%
d14-p-Terphenyl	72.9%
1,2-Dichlorobenzene	82.0%

***Acid surrogate recoveries**

d5-Phenol	73.5%
2-Fluorophenol	85.1%
2,4,6-Tribromophenol	81.4%
2-Chlorophenol	80.2%

EXPLANATION OF INORGANIC DATA REPORT CODES

The columns labeled 'PREP', 'C', and 'M' contain important information about your analyses. The codes are explained below.

PREPARATION CODES

These 3-letter codes describe methods used to prepare samples for analysis:

AEN USEPA, Metals in air filters
AHM ARI, Mercury in air filters
AHN ARI, Metals in air filters
ANN NIOSH 7300, Metals in air filters
CAN AOAC (1984) 25.024, Metals in earthenware
DE6 EPA 600/4-79-020 218.5, Cr(VI) in water
DMM DMN followed by TMM, Dissolved mercury
DMN Filtered through .45u filter, Dissolved metals
EW6 EWN followed by DE6
EWM EWN followed by TMM
EWN USEPA SW-846 1310, EP Toxicity
FHP ARI, Metals in tissue ($HNO_3/HClO_4$)
FPP PSEP, Metals in tissue ($HNO_3/HClO_4$)
FRM Journal, Mercury in tissue
FRN Journal, Metals in tissue (HNO_3/H_2O_2)
KRN ARI, Concentration by coprecipitation
LEM USEPA, TCLP followed by TMM
LEN USEPA, TCLP Extraction
MHM ARI, Mercury in miscellaneous materials
MHN ARI, Metals in miscellaneous materials
OAM ARI, Mercury in oil, grease or tar
OAN ARI, Metals in oil, grease or tar
PHM ARI, Mercury in wipes
PHN ARI, Metals in wipes
RCC USEPA CLP, Water digestion, HCl matrix
RCN USEPA CLP, Water digestion, HNO_3 matrix
REC EPA 600/4-79-020 4.1.4, HCl matrix
REI EPA 600/4-79-020 200.7 and 9.4
REN EPA 600/4-79-020 4.1.4, HNO_3 matrix
RMA EPA 600/4-79-020 206.2
RWC USEPA SW-846 3005
SCC USEPA CLP, Soil digestion, HCl matrix
SCM USEPA CLP, Mercury in soil
SCN USEPA CLP, Soil digestion, HNO_3 matrix
SEM EPA 600/4-79-020 245.5, Mercury in soil
SHF ARI, Metals in soil, HF digestion
SRL Journal, Lithium meta-borate fusion
SPF PSEP, Metals in sediment, HF digestion
SSC Standard Methods 302C, Sb/Sn in soil
SSN Standard Methods 302C, Soil digestion
SSS Standard Methods 302C, Ti in soil
SW6 USEPA SW-846 3060, Cr(VI) in soil
SWC USEPA SW-846 3050, HCl matrix
SWN USEPA SW-846 3050, HNO_3 matrix
SWR USEPA SW-846 Modified 3005, Sb by GFAAS
TEC EPA 600/4-79-020 4.1.3, HCl matrix
TEG EPA 600/4-79-020 272.1, Silver in water
TEI EPA 600/4-79-020 200.7 and 9.3
TEN EPA 600/4-79-020 4.1.3, HNO_3 matrix
THG ARI, Silver in photographic solutions
TMM EPA 600/4-79-020 245.1, Mercury in water
TSC Standard Methods 302C, Sb/Sn in water
TSN Standard Methods 302D
TSS Standard Methods 302E, Ti in water
TWC USEPA SW-846 3010, HCl matrix
TWG USEPA SW-846 7760, Silver in water
TWN USEPA SW-846 3020, HNO_3 matrix
WMN EPA 600/4-79-020, Preserved, undigested water
XSC Standard Methods 302B

CONCENTRATION CODES

These codes are used to qualify reported concentrations:

U No analyte was detected. The reported value is the lower limit of detection.

METHOD CODES

These codes signify the instrumental technique used for analysis:

CVA Cold Vapor Atomic Absorption Spectrophotometry
FLA Flame Atomic Absorption Spectrophotometry
GFA Graphite Furnace Atomic Absorption Spectrophotometry
ICP Inductively Coupled Plasma Atomic Emission Spectrometry

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
12/26/91
08:38:29

Client: Dames & Moore
Contact: David Malthy
Project: Laurel Pump Sta.
ID number: TMB4-4-18
Description:
Sampled: / /
Received: 12/12/91
Matrix: Soil

ARI job number: 9626
ARI sample number: E

Released by:

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-36-0	Antimony	0.1 mg/kg-dry	U	SWC	GFA
7440-38-2	Arsenic	1.99 mg/kg-dry		SWN	GFA
7440-41-7	Beryllium	0.2 mg/kg-dry		SWC	ICP
7440-43-9	Cadmium	0.2 mg/kg-dry	U	SWC	ICP
7440-47-3	Chromium	17.6 mg/kg-dry		SWC	ICP
7440-50-8	Copper	15.3 mg/kg-dry		SWC	ICP
7439-92-1	Lead	2.9 mg/kg-dry		SWN	GFA
7439-97-6	Mercury	0.04 mg/kg-dry	U	SCM	CVA
7440-02-0	Nickel	16 mg/kg-dry		SWC	ICP
7782-49-2	Selenium	0.1 mg/kg-dry	U	SWN	GFA
7440-22-4	Silver	0.3 mg/kg-dry	U	SWC	ICP
7440-28-0	Thallium	0.1 mg/kg-dry	U	SWN	GFA
7440-66-6	Zinc	29.2 mg/kg-dry		SWC	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
12/26/91
08:38:33

Client: Dames & Moore
Contact: David Malthy
Project: Laurel Pump Sta.
ID number:
Description: Method Blank
Sampled: / /
Received: / /
Matrix: Soil

ARI job number: 9626
ARI sample number: MB

Released by:

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-36-0	Antimony	0.1 mg/kg-dry	U	SWC	GFA
7440-38-2	Arsenic	0.1 mg/kg-dry	U	SWN	GFA
7440-41-7	Beryllium	0.1 mg/kg-dry	U	SWC	ICP
7440-43-9	Cadmium	0.2 mg/kg-dry	U	SWC	ICP
7440-47-3	Chromium	0.5 mg/kg-dry	U	SWC	ICP
7440-50-8	Copper	0.2 mg/kg-dry	U	SWC	ICP
7439-92-1	Lead	0.1 mg/kg-dry	U	SWN	GFA
7439-97-6	Mercury	0.1 mg/kg-dry	U	SCM	CVA
7440-02-0	Nickel	1 mg/kg-dry	U	SWC	ICP
7782-49-2	Selenium	0.1 mg/kg-dry	U	SWN	GFA
7440-22-4	Silver	0.3 mg/kg-dry	U	SWC	ICP
7440-28-0	Thallium	0.1 mg/kg-dry	U	SWN	GFA
7440-66-6	Zinc	0.9 mg/kg-dry		SWC	ICP

ANALYTICAL
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333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

ORGANICS ANALYSIS DATA SHEET - Method 602/8020
BETX by GC-PID

Matrix: Soils
Level: Low

QC Report No: 9626-Dames & Moore
Project No: Laurel Pump Stn.

Date Received: 12/12/91

Data Release Authorized: _____
Report prepared: 12/19/91 - MAC:D

	Sample No.	Method Blank	TMB4-4-18	TMB4-4-18 Dup
	ARI ID	9626MB	9626E	9626E Dup
	Date Analyzed	12/16/91	12/17/91	12/17/91
	Amt Analyzed	0.1 gm	0.095 gm	0.095 gm
CAS Number	Units	µg/kg	µg/kg	µg/kg
71-43-2	Benzene	50 U	53 U	53 U
108-88-3	Toluene	50 U	53 U	53 U
100-41-4	Ethylbenzene	50 U	190 U	190 U
1330-20-7	Total Xylenes	100 U	**980**	**960**

Surrogate Recoveries			
Trifluorotoluene	101%	103%	102%
Bromobenzene	87.9%	NR	NR

Data Reporting Qualifiers

Value	If the result is a value greater than or equal to the detection limit, report the value.	B	This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.
U	Indicates compound was analyzed for but not detected at the given detection limit.	J	Indicates an estimated value when result is less than specified detection limit.
NR	Indicates not reported due to matrix interference.		

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ORGANICS ANALYSIS DATA SHEET - Method 602/8020
BETX by GC-PID

Matrix: Waters
Level: Low

QC Report No: 9626-Dames & Moore
Project No: Laurel Pump Stn.

Data Release Authorized: _____
Report prepared: 12/19/91 - MAC:D

Date Received: 12/12/91

	Sample No.	Meth Blank	T170OUT	T180OUT	PRTOUT	OWS-12-04-91
	ARI ID	1216MB	9626A	9626B	9626C	9626D
	Date Analyzed	12/16/91	12/16/91	12/16/91	12/16/91	12/16/91
	Amt Analyzed	5.0 mls	5.0 mls	5.0 mls	5.0 mls	5.0 mls
CAS Number	Units	µg/L	µg/L	µg/L	µg/L	µg/L
71-43-2	Benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
108-88-3	Toluene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
100-41-4	Ethylbenzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1330-20-7	Total Xylenes	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
	Surrogate Recoveries					
	Trifluorotoluene	101%	109%	111%	111%	37.6%
	Bromobenzene	87.9%	94.8%	97.8%	94.5%	36.3%

Data Reporting Qualifiers

Value	If the result is a value greater than or equal to the detection limit, report the value.	B	This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.
U	Indicates compound was analyzed for but not detected at the given detection limit.	J	Indicates an estimated value when result is less than specified detection limit.

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TOTAL GASOLINE RANGE HYDROCARBONS
WA TPHG Method by GC/FID

QC Report No: 9626-Dames & Moore
Project: 21199-032
Laurel Pump Stn.
VTSR: 12/12/91

Matrix: Water

Data Release Authorized _____
Data Prepared: 12/18/91 - MAC:D

Date Extracted: 12/16/91
Date Analyzed: 12/16-17/91

Lab ID	Client Sample ID	Dilution Factor	Gasoline Range Hydrocarbons †	Gas ID *	Surrogate A	Surrogate B
9626 MB(12/16)	*Method Blank*	*NA*	0.5 U	No	75.8%	65.4%
9626 MB(12/17)	*Method Blank*	*NA*	0.5 U	No	84.6%	78.2%
9626 A	T170 OUT	NA	0.5 U	No	80.5%	71.0%
9626 B	T180	NA	0.5 U	No	82.9%	72.8%
9626 C	PRT	NA	0.5 U	No	83.3%	72.0%
9626 D	OW5-1204-91	NA	**0.95**	No	30.5%	34.0%
9626 D RE	OW5-1204-91 RE	NA	**0.87**	No	32.3%	39.9%

Surrogate A = Trifluorotoluene
Surrogate B = Bromobenzene

Values reported in ppm (mg/kg).

U Indicates compound was analyzed for but not detected at the given detection limit.

X Indicates a value above the linear range of the detector. Dilution required.

† Value based on total peaks in the range from Toluene to Dodecane.

* In the opinion of the analyst, was there a pattern match for gasoline.

TOTAL PETROLEUM HYDROCARBONS by IR Scan
Modified EPA Method 418.1

Matrix: Soil

Project: 21199-032
QC Report No: 9626 - Dames & Moore
VTSR: 12/12/91

Data Release Authorized _____
Data Prepared: 12/18/91 -MAC:PJW

Date Prepared: 12/16/91
Date of Analysis: 12/17/91

Lab ID	Client Sample ID	Dilution Factor	TPH (ppm)
9626 MB	*METHOD BLANK*	*1*	*10 U*
9626 E	**TMB4-4-18'**	**10**	**1200**
9626 F	TMB5-2-13'	1	10 U
9626 G	TMB6-2-13'	1	10 U
9626 H	TMB7-2-8'	1	10 U
9626 H Dup	TMB7-2-8'	1	10 U
9626 H Trip	TMB7-2-8'	1	10 U

Values reported in ppm (mg/Kg) based on wet weight of sample

U Indicates compound was analyzed for but not detected at the given detection limit.

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TOTAL PETROLEUM HYDROCARBONS by IR Scan
Modified EPA Method 418.1

Matrix: Water

Project: 21199-032
Laurel Pump Sta.
QC Report No: 9626 - Dames & Moore
VTSR: 12/12/91

Data Release Authorized _____
Data Prepared: 12/18/91 -MAC:PJW

Date Prepared: 12/16/91
Date of Analysis: 12/16/91

Lab ID	Client Sample ID	Dilution Factor	TPH (ppm)
9626 MB	*METHOD BLANK*	*1*	*1 U*
9626 D	OWS 1204-91	1	1 U

Values reported in ppm (mg/L).

U Indicates compound was analyzed for but not detected at the given detection limit.

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TOTAL PETROLEUM HYDROCARBONS
WA HCID Method by GC/FID

Matrix: Soils

QC Report No: 9626-Dames & Moore
Project: 21199-032
Laurel Pump Stn.
VTSR: 12/12/91

Data Release Authorized _____
Data Prepared: 12/18/91 - MAC:D

Date extracted: 12/16/91
Date Analyzed: 12/17/91

Lab ID	Client Sample ID	Total Hydrocarbons †	ID *	Surrogate Recovery
9626 MB	*Method Blank*	10 U	No	132%
9626 E	TMB4-4-18	320	Diesel	103%

Surrogate is Me-Arachidate.
Values reported in ppm (mg/kg).

U Indicates compound was analyzed for but not detected at the given detection limit.
X Indicates a value above the linear range of the detector. Dilution required.
* In the opinion of the analyst, was there a pattern match for gasoline or diesel (yes or no).
† Value based on total peaks in Toluene-C24 range.
NR Indicates not reported due to matrix interference and/or dilution.

26 December 1991

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

David Maltby
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032 Trans Mtn.
ARI Job #9641 II

Dear David:

Please find enclosed the results and original chain-of-custody records for the above referenced project. The 418.1 tph results were faxed to you 12/18/91, and the BETX on 12/23/91. The three samples for tph-gas analysis were added as per your request of 12/16/91.

If you have any questions or need further information, please feel free to call any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Coordinator

KAS/ks

Enclosures

cc: file#9641 II

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Boring or Well Number	Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES: VOA 601/8010	VOA 602/8020	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (M)	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
SWRO	C5	Surface	20:25	H_2O	GLASS 1	X			X												Surf. Water Runoff	2	
SWRO	C6		22:20			X			X													2	
SWRO	C7		00:20			X			X													2	
SWRO	C8		02:22			X			X													2	
SWRO	D3-2		04:02			X			X													2	
SWRO	C9		04:20			X			X													2	
SWRO	C10		06:25			X			X													2	
SWRO	D2-2		06:45			X			X													2	
SWRO	C11		08:25			X			X													3	
SWRO	C12		10:25			X			X													3	
SWRO	C13		12:25			X			X													3	
SWRO-P1			12:35			X			X												RUSH (24hr)	3	
SWRO	C14		14:20			X			X													3	
SWRO	D2-3		15:45			X			X													3	
SWRO	D3-3		16:05			X			X													3	
SWRO	C15		16:20			X			X													3	
SWRO	C16		1825			X			X													3	
SWRO	C17		2100			X			X													3	

11/11

12/12

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

[signature] 12/13/91 12:44 Tom Fellows

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

ANALYTICAL LABORATORY:

LABORATORY CONTACT:

D&M CONTACT: David Maltby PHONE: 398-7000

LABORATORY NOTES: Please RUSH (24 hr) analysis of SWRO-P1; All other samples are STANDARD turnaround. Rush E.F. E.F. #9641

JOB NO.: 21199-032 SHEET 1 OF 2

PROJECT Transmountain

LOCATION Laurel Station

COLLECTORS DPM, RB, BAU DATE OF COLLECTION 12/11, 12/12/91

DAMES & MOORE
500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

12/12

12/13

Boring or Well Number	Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES	VOA 601/8010	VOA 602/8020	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (M)	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	.	.	.	.	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
SWRO	C18 ~~2225~~	SURFACE	2225	H2O	GLASS			✓			✓															SURFACE H2O RUNOFF	3	
SWRO	C19		2425					✓			✓																3	
SWRO	C20		450					✓			✓																3	
SWRO	D2-4		510					✓			✓																3	
SWRO	D3-4		530					✓			✓																3	
SWRO	C21		625					✓			✓																3	
SWRO	C22		820					✓			✓																3	
SWRO	C23		10:15					✓			✓																3	

RELINQUISHED BY: (Signature) [signature] DATE/TIME 12/13/91 12:44 RECEIVED BY: (Signature) [signature]

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

ANALYTICAL LABORATORY:

LABORATORY CONTACT:

D&M CONTACT: David Maltby PHONE: 398-7000

DAMES & MOORE
500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

LABORATORY NOTES: Standard Turnaround for all samples except SWRO-P1 (on sheet 1 of 2) which is 24hr Rush.

JOB NO.: 21199-032 SHEET 2 OF 2

PROJECT TRANS MOUNTAIN

LOCATION LAUREL STATION

COLLECTOR PDR DATE OF COLLECTION 12/12 - 12/13/1991

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL PETROLEUM HYDROCARBONS by IR Scan
Modified EPA Method 418.1

Matrix: Water

Project: 21199-032
Trans Mtn.
QC Report No: 9641 - Dames & Moore
VTSR: 12/13/91

Data Release Authorized _____
Data Prepared: 12/19/91 -MAC:PJW

Date Prepared: 12/18/91
Date of Analysis: 12/18/91

Values reported in ppm (mg/L).

Lab ID	Client Sample ID	Dilution Factor	TPH (ppm)
9641 MB	*METHOD BLANK*	*1*	*1 U*
9641 B	SWR0 C5	1	1 U
9641 C	SWR0 C6	1	1 U
9641 D	SWR0 C7	1	1 U
9641 E	SWR0 C8	1	1 U
9641 F	SWR0 D3-2	1	1 U
9641 G	SWR0 C9	1	1 U
9641 I	SWR0 D2-2	1	1 U
9641 J	SWR0 C11	1	1 U
9641 L	SWR0 C13	1	1 U
9641 N	SWR0 D2-3	1	1 U
9641 O	SWR0 D3-3	1	1 U
9641 P	SWR0 C15	1	1 U
9641 R	SWR0 C17	1	1 U
9641 T	SWR0 C19	1	1 U
9641 U	SWR0 C20	1	1 U
9641 V	SWR0 D2-4	1	1 U
9641 W	SWR0 D3-4	1	1 U
9641 Y	SWR0 C22	1	1 U

U Indicates compound was analyzed for but not detected at the given detection limit.

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ORGANICS ANALYSIS DATA SHEET
BTEX by Method 602/8020
Matrix: Water
Level: Low

Project No: 21199-032
Trans Mtn.
QC Report No: 9641 II-Dames&Moore
VTSR: 12/13/91

Data Release Authorized: _____
Report prepared: 12/20/91 - MAC:C PAT

Instrument ID: GC/PID

CAS Number		Sample No.	Method Blk	SWRO-C5	SWRO-C6	SWRO-C7
		ARI ID	1216MB	9641B	9641C	9641D
		Date Analyzed	12/16/91	12/17/91	12/17/91	12/17/91
		Amt Analyzed	5.0 ml	5.0 ml	5.0 ml	5.0 ml
		Units	µg/L	µg/L	µg/L	µg/L
71-43-2	Benzene		1.0 U	1.0 U	1.0 U	1.0 U
108-88-3	Toluene		1.0 U	1.0 U	1.0 U	1.0 U
100-41-4	Ethylbenzene		1.0 U	1.0 U	1.0 U	1.0 U
1330-20-7	Total Xylenes		2.0 U	2.0 U	2.0 U	2.0 U
		Trifluorotoluene	*101%*	*96.0%*	*94.6%*	*94.6%*
		Bromobenzene	*87.9%*	*93.3%*	*89.7%*	*89.8%*

Instrument ID: GC/PID

CAS Number		Sample No.	SWRO-C8	SWRO-D3-2	SWRO-C9	SWRO-D2-2
		ARI ID	9641E	9641F	9641G	9641I
		Date Analyzed	12/17/91	12/17/91	12/17/91	12/17/91
		Amt Analyzed	5.0 ml	5.0 ml	5.0 ml	5.0 ml
		Units	µg/L	µg/L	µg/L	µg/L
71-43-2	Benzene		1.0 U	1.0 U	1.0 U	1.0 U
108-88-3	Toluene		1.0 U	1.0 U	1.0 U	1.0 U
100-41-4	Ethylbenzene		1.0 U	1.0 U	1.0 U	1.0 U
1330-20-7	Total Xylenes		2.0 U	2.0 U	2.0 U	2.0 U
		Trifluorotoluene	*95.9%*	*91.2%*	*97.3%*	*93.6%*
		Bromobenzene	*89.7%*	*88.5%*	*89.4%*	*87.1%*

Value	If the result is a value greater than or equal to the detection limit, report the value.
U	Indicates compound was analyzed for but not detected at the given detection limit.
NR	Analysis not required.
B	This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.
K	This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

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ORGANICS ANALYSIS DATA SHEET
BTEX by Method 602/8020
Matrix: Water
Level: Low

Project No: 21199-032
Trans Mtn.
QC Report No: 9641 II-Dames&Moore
VTSR: 12/13/91

Data Release Authorized: _____
Report prepared: 12/20/91 - MAC:C PAT

Instrument ID: GC/PID	Sample No.	SWRO-C11	SWRO-C11(2)	SWRO-C13	SWRO-D2-3
	ARI ID	9641J	9641JDUP	9641L	9641N
	Date Analyzed	12/17/91	12/17/91	12/17/91	12/17/91
	Amt Analyzed	5.0 ml	5.0 ml	5.0 ml	5.0 ml
CAS Number	Units	µg/L	µg/L	µg/L	µg/L
71-43-2	Benzene	1.0 U	1.0 U	1.0 U	1.0 U
108-88-3	Toluene	1.0 U	1.0 U	1.0 U	1.0 U
100-41-4	Ethylbenzene	1.0 U	1.0 U	1.0 U	1.0 U
1330-20-7	Total Xylenes	2.0 U	2.0 U	2.0 U	2.0 U
	Trifluorotoluene	*95.9%*	*94.5%*	*93.7%*	*95.6%*
	Bromobenzene	*89.1%*	*86.4%*	*86.8%*	*85.8%*

Instrument ID: GC/PID	Sample No.	SWRO-D3-3	SWRO-C15	SWRO-C17	SWRO-C19
	ARI ID	9641O	9641P	9641R	9641T
	Date Analyzed	12/17/91	12/17/91	12/17/91	12/17/91
	Amt Analyzed	5.0 ml	5.0 ml	5.0 ml	5.0 ml
CAS Number	Units	µg/L	µg/L	µg/L	µg/L
71-43-2	Benzene	1.0 U	1.0 U	1.0 U	1.0 U
108-88-3	Toluene	1.0 U	1.0 U	1.0 U	1.0 U
100-41-4	Ethylbenzene	1.0 U	1.0 U	1.0 U	1.0 U
1330-20-7	Total Xylenes	2.0 U	2.0 U	2.0 U	2.0 U
	Trifluorotoluene	*90.3%*	*89.9%*	*90.7%*	*92.7%*
	Bromobenzene	*84.2%*	*82.9%*	*83.8%*	*85.9%*

Value	If the result is a value greater than or equa to the detection limit, report the value.
U	Indicates compound was analyzed for but not detected at the given detection limit.
NR	Analysis not required.
B	This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.
K	This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

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ORGANICS ANALYSIS DATA SHEET
BTEX by Method 602/8020
Matrix: Water
Level: Low

Project No: 21199-032
Trans Mtn.
QC Report No: 9641 II-Dames&Moore
VTSR: 12/13/91

Data Release Authorized: _____
Report prepared: 12/20/91 - MAC:C PAT

Instrument ID: GC/PID

CAS Number		Sample No.	SWRO-20	SWRO-C20(2)	SWRO-D2-4
		ARI ID	9641U	9641UDUP	9641V
		Date Analyzed	12/17/91	12/17/91	12/17/91
		Amt Analyzed	5.0 ml	5.0 ml	5.0 ml
		Units	µg/L	µg/L	µg/L
71-43-2	Benzene		1.0 U	1.0 U	1.0 U
108-88-3	Toluene		1.0 U	1.0 U	1.0 U
100-41-4	Ethylbenzene		1.0 U	1.0 U	1.0 U
1330-20-7	Total Xylenes		2.0 U	2.0 U	2.0 U
		Trifluorotoluene	*91.8%*	*88.9%*	*91.7%*
		Bromobenzene	*84.1%*	*83.4%*	*83.9%*

Value	If the result is a value greater than or equal to the detection limit, report the value.	B	This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.
U	Indicates compound was analyzed for but not detected at the given detection limit.	K	This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.
NR	Analysis not required.		

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ORGANICS ANALYSIS DATA SHEET
BTEX by Method 602/8020
Matrix: Water
Level: Low

Project No: 21199-032
Trans Mtn.
QC Report No: 9641 II-Dames&Moore
VTSR: 12/13/91

Data Release Authorized: _____
Report prepared: 12/20/91 - MAC:CPAT

Instrument ID: GC/PID

CAS Number		Sample No.	Method Blk	SWRO-D3-4	SWRO-D3-4(2)	SWRO-C22
		ARI ID	1217MB	9641W	9641WDUP	9641V
		Date Analyzed	12/17/91	12/17/91	12/17/91	12/17/91
		Amt Analyzed	5.0 ml	5.0 ml	5.0 ml	5.0 ml
		Units	µg/L	µg/L	µg/L	µg/L
71-43-2	Benzene		1.0 U	1.0 U	1.0 U	1.0 U
108-88-3	Toluene		1.0 U	1.0 U	1.0 U	1.0 U
100-41-4	Ethylbenzene		1.0 U	1.0 U	1.0 U	1.0 U
1330-20-7	Total Xylenes		2.0 U	2.0 U	2.0 U	2.0 U
		Trifluorotoluene	*95.2%*	*103%*	*99.1%*	*94.1%*
		Bromobenzene	*86.4%*	*88.5%*	*86.3%*	*81.0%*

Value	If the result is a value greater than or equal to the detection limit, report the value.	B	This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.
U	Indicates compound was analyzed for but not detected at the given detection limit.	K	This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.
NR	Analysis not required.		

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TOTAL GASOLINE RANGE HYDROCARBONS
WA TPHG Method by GC/FID

QC Report No: 9641 - II Dames & Moore
Project: **21199 - 032**
Trans Mtn.
VTSR: 12/13/91

Matrix: **Water**

Data Release Authorized _____
Data Prepared: 12/23/91 - MAC: RPR

Date Extracted: 12/16/91
Date Analyzed: 12/16 - 17/91

Lab ID		Client Sample ID	Dilution Factor	Gasoline Range Hydrocarbons †	Gas ID *	Surrogate A	Surrogate B
MB	1216	Mehtod Blank	NA	0.5 U	No	75.8%	65.4%
MB	1217	Mehtod Blank	NA	0.5 U	No	84.6%	78.2%
9641	U	SWRO - C20	NA	0.5 U	No	74.3%	71.0%
9641	U Dup.	SWRO - C20	NA	0.5 U	No	74.7%	70.2%
9641	V	SWRO - D2-4	NA	0.5 U	No	76.2%	69.5%
9641	W	SWRO - D3-4	NA	0.5 U	No	90.7%	75.9%
9641	W Dup.	SWRO - D3-4	NA	0.5 U	No	87.9%	77.6%

Surrogate A = Trifluorotoluene
Surrogate B = Bromobenzene

Values reported in ppm (mg/L).

U Indicates compound was analyzed for but not detected at the given detection limit.

X Indicates a value above the linear range of the detector. Dilution required.

* In the opinion of the analyst, was there a pattern match for gasoline.

† Value based on total peaks in the range from Toluene to Dodecane.

02 January 1992

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333 Ninth Ave. North
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(206) 621-7523 (FAX)

David Maltby
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #Laurel Upgrade;
ARI Job #9671

Dear David:

Please find enclosed the results for the above referenced project.

If you have any questions or need further information, please feel free to call any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Suzanne Kitch for

Kate Stegemoeller
Project Coordinator

KAS/ks

Enclosures

cc: file#9671

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TOTAL PETROLEUM HYDROCARBONS by IR Scan
Modified EPA Method 418.1

Matrix: Water

Project: Laurel Upgrade
QC Report No: 9671 - Dames & Moore
VTSR: 12/17/91

Data Release Authorized _____
Data Prepared: 12/20/91 -MAC:PJW

Date Prepared: 12/18/91
Date of Analysis: 12/18/91

Lab ID	Client Sample ID	Dilution Factor	TPH (ppm)
9671 MB	*METHOD BLANK*	*1*	*1 U*
9671 A	SWRO-C25	1	1 U
9671 B	SWRO-D2-6	1	1 U
9671 C	SWRO-DAM3-6	1	1 U
9671 D	SWRO-C-26	1	1 U
9671 E	SWRO-D2-7	1	1 U
9671 F	SWRO-D3-7	1	1 U

Values reported in ppm (mg/L).

U Indicates compound was analyzed for but not detected at the given detection limit.

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ORGANICS ANALYSIS DATA SHEET - Method 602/8020
BETX by GC-PID

Matrix: Water
Level: Low

QC Report No: 9671-Dames & Moore
Project No: Laurel Upgrade

Data Release Authorized: _____
Report prepared: 12/31/91 - MAC:D

Date Received: 12/17/91

	Sample No.	Meth Blank	SWRO-C2-5	SWRO-D2-6	SWRO-D3-6	SWRO-D3-6 Duplicate
	ARI ID	1219MB	9671A	9671B	9671C	9671C
	Date Analyzed	12/19/91	12/19/91	12/19/91	12/19/91	12/19/91
	Amt Analyzed	5.0 mls	5.0 mls	5.0 mls	5.0 mls	5.0 mls
CAS Number	Units	µg/L	µg/L	µg/L	µg/L	µg/L
71-43-2	Benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
108-88-3	Toluene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
100-41-4	Ethylbenzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1330-20-7	Total Xylenes	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
	Surrogate Recoveries					
	Trifluorotoluene	102%	93.1%	89.1%	91.6%	85.3%
	Bromobenzene	90.9%	83.8%	81.0%	83.3%	77.4%

	Sample No.	SWRO-C-26	SWRO-D2-7	SWRO-D3-7	Trip Blank
	ARI ID	9671D	9671E	9671F	9671G
	Date Analyzed	12/19/91	12/20/91	12/20/91	12/20/91
	Amt Analyzed	5.0 mls	5.0 mls	5.0 mls	5.0 mls
CAS Number	Units	µg/L	µg/L	µg/L	µg/L
71-43-2	Benzene	1.0 U	1.0 U	1.0 U	1.0 U
108-88-3	Toluene	1.0 U	1.0 U	1.0 U	1.0 U
100-41-4	Ethylbenzene	1.0 U	1.0 U	1.0 U	1.0 U
1330-20-7	Total Xylenes	2.0 U	2.0 U	2.0 U	2.0 U
	Surrogate Recoveries				
	Trifluorotoluene	91.4%	90.9%	92.5%	93.1%
	Bromobenzene	83.3%	83.4%	87.4%	85.6%

Data Reporting Qualifiers

Value	If the result is a value greater than or equal to the detection limit, report the value.	B	This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.
U	Indicates compound was analyzed for but not detected at the given detection limit.	J	Indicates an estimated value when result is less than specified detection limit.

07 January 1992

ANALYTICAL RESOURCES INCORPORATED

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333 Ninth Ave. North
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(206) 621-6490
(206) 621-7523 (FAX)

David Maltby
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032 Trans Mountain;
ARI Job #9698

Dear David:

Please find enclosed the results and original chain-of-custody for the above referenced project. The TPH-418.1 results were faxed to you 12/27/91.

If you have any questions or need further information, please feel free to call any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Coordinator

KAS/ks

Enclosures

cc: file#9698

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Boring or Well Number	Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	VOA 602/8020	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (M)	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	GRPH 8015 mod				FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
SWRO-C27			11:35	WATER			X			X											X					3	
SWRO-D2-8			11:50	"			X			X											X					3	
SWRO-D3-8			12:05	"			X			X											X					3	
~~TRIP BLANK~~							~~X~~			DM YES IN COOLER DM																1	

FIELD NOTES: M. 12/23/91 Per David this means Gas recoverable, Petroleum 9:55 T. Hedges

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
D. Maltby	12/20/91 16:00	[signature] 16:00

LABORATORY NOTES: STANDARD TURNAROUND

ANALYTICAL LABORATORY: ARI

LABORATORY CONTACT: KATE

D&M CONTACT: D. MALTBY PHONE: ✓

DAMES & MOORE
500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

JOB NO.: 21199-032 SHEET 1 OF 1

PROJECT TRANS MOUNTAIN

LOCATION LAUREL

COLLECTOR ______ DATE OF COLLECTION 12/17/91

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TOTAL PETROLEUM HYDROCARBONS by IR Scan
Modified EPA Method 418.1

Matrix: Water

Project: 21199-032
Trans Mountain
QC Report No: 9698 - Dames & Moore
VTSR: 12/20/91

Data Release Authorized _____
Data Prepared: 12/27/91 -MAC:PJW

Date Prepared: 12/23/91
Date of Analysis: 12/23/91

Lab ID	Client Sample ID	Dilution Factor	TPH (ppm)
9698 MB	*METHOD BLANK*	*1*	*1 U*
9698 A	SWRO-C27	1	1 U
9698 B	SWRO-D2-8	1	1 U
9698 C	SWRO-D3-8	1	1 U

Values reported in ppm (mg/L).

U Indicates compound was analyzed for but not detected at the given detection limit.

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TOTAL GASOLINE RANGE HYDROCARBONS
WA TPHG Method by GC/FID

QC Report No: 9698-Dames & Moore
Project: 21199-032
Trans. Mtn.
VTSR: 12/20/91

Matrix: Waters

Data Release Authorized _____
Data Prepared: 1/6/92 - MAC:K kas

Date Analyzed: 12/30/91

Lab ID	Client Sample ID	Dilution Factor	Gasoline Range Hydrocarbons †	Gas ID *	Surrogate A	Surrogate B
9698 MB	*Method Blank*	-	0.5 U	No	85.3%	80.4%
9698 A	SWRO-C27	-	0.5 U	No	85.2%	79.5%
9698 B	SWRO-D2-8	-	0.5 U	No	84.7%	77.4%
9698 C	SWRO-D3-8	-	0.5 U	No	84.2%	77.5%
9698 Cdup	SWRO-D3-8 dup.	-	0.5 U	No	81.4%	74.6%
9698 D	Trip Blank	-	0.5 U	No	80.5%	72.8%

Surrogate A = Trifluorotoluene
Surrogate B = Bromobenzene

Values reported in ppm (mg/L).

U Indicates compound was analyzed for but not detected at the given detection limit.

X Indicates a value above the linear range of the detector. Dilution required.

* In the opinion of the analyst, there was a pattern match for gasoline (yes or no).

† Value based on total peaks in the range from Toluene to Dodecane.

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ORGANICS ANALYSIS DATA SHEET - Method 602/8020
BETX by GC-PID

Matrix: Water
Level: Low

QC Report No: 9698-Dames & Moore
Project No: 21199-032
Trans Mtn.
Date Received: 12/20/91

Data Release Authorized: _____
Report prepared: 1/6/92 - MAC:K kas

	Sample No.	Method Blank	SWRO-C27	SWRO-D2-8	SWRO-D3-8	SWRO-D3-8 dup.
	ARI ID	1230MB	9698A	9698B	9698C	9698Cdup
	Date Analyzed	12/30/91	12/30/91	12/30/91	12/30/91	12/30/91
	Amt Analyzed	5.0 mls	5.0 mls	5.0 mls	5.0 mls	5.0 mls
CAS Number	Units	µg/L	µg/L	µg/L	µg/L	µg/L
71-43-2	Benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
108-88-3	Toluene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
100-41-4	Ethylbenzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1330-20-7	Total Xylenes	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U

Surrogate Recoveries

Trifluorotoluene	102%	99.9%	101%	100%	97.6%
Bromobenzene	95.4%	94.7%	93.1%	92.3%	87.0%

	Sample No.	Trip Blank
	ARI ID	9698D
	Date Analyzed	12/30/91
	Amt Analyzed	5.0 mls
CAS Number	Units	µg/L
71-43-2	Benzene	1.0 U
108-88-3	Toluene	1.0 U
100-41-4	Ethylbenzene	1.0 U
1330-20-7	Total Xylenes	2.0 U

Surrogate Recoveries

Trifluorotoluene	94.8%
Bromobenzene	86.0%

Data Reporting Qualifiers

Value	If the result is a value greater than or equal to the detection limit, report the value.	B	This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.
U	Indicates compound was analyzed for but not detected at the given detection limit.	J	Indicates an estimated value when result is less than specified detection limit.

06 January 1992

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

David Maltby
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032 Trans Mountain;
ARI Job #9714

Dear David:

Please find enclosed the results and original chain-of-custody for the above referenced project. The TPH-418.1 results were faxed to you 12/31/91.

If you have any questions or need further information, please feel free to call any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Coordinator

KAS/ks

Enclosures

cc: file#9714

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Boring or Well Number	Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	VOA 602/8020	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (M)	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	GASOLINE RANGE PH 8015 mod	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
SWRO-C28			9:30	WATER		X			X												X		3	
SWRO-02-9			9:40	↓		X			X												X		3	
SWRO-03-9			9:55	WATER		X			X												X		3	
FIELD BLANK						X																		

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

D. Maltby 12/24 12:35

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

ANALYTICAL LABORATORY: AR1

LABORATORY CONTACT: KATE

D&M CONTACT: D. MALTBY PHONE:

LABORATORY NOTES: STANDARD TURNAROUND

JOB NO.: 21199-032 SHEET 1 OF 1

PROJECT TRANSMOUNTAIN

LOCATION LAUREL

COLLECTOR D. MALTBY DATE OF COLLECTION 12/24/91

DAMES & MOORE
500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

ANALYTICAL
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INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL GASOLINE RANGE HYDROCARBONS BY GC/FID
WA TPH-G Method (Purge & Trap)

QC Report No: 9714-Dames & Moore
Project: 21199-032
Transmountain
VTSR: 12/24/91

Matrix: Waters

Data Release Authorized _____
Data Prepared: 01/02/91 - MAC:D

Date extracted: 12/30/91
Date Analyzed: 12/30/91

Lab ID		Client Sample ID	Dilution Factor	Gasoline Range Hydrocarbons †	Gas ID *	Surrogate A	Surrogate B
9714	*MB*	*Method Blank*	NA	0.5 U	No	85.3%	80.4%
9714	A	SWRO-C28	NA	0.5 U	No	81.8%	75.4%
9714	B	SWRO-D2-9	NA	0.5 U	No	78.6%	73.7%
9714	B Dup	SWRO-D2-9 Dup	NA	0.5 U	No	83.1%	78.2%
9714	C	SWRO-D3-9	NA	0.5 U	No	83.8%	79.8%
9714	D	Field Blank	NA	0.5 U	No	86.6%	80.9%

Surrogate A = Trifluorotoluene
Surrogate B = Bromobenzene

Values reported in ppm (mg/L).

U Indicates compound was analyzed for but not detected at the given detection limit.

X Indicates a value above the linear range of the detector. Dilution required.

* In the opinion of the analyst, was there a pattern match for gasoline (yes or no).

† Value based on total peaks in Toluene-C12 range.

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333 Ninth Ave. North
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(206) 621-6490
(206) 621-7523 (FAX)

ORGANICS ANALYSIS DATA SHEET - Method 602/8020
BETX by GC-PID

Matrix: Water
Level: Low

QC Report No: 9714-Dames & Moore
Project No: 21199-032
Transmountain
Date Received: 12/24/91

Data Release Authorized: _____
Report prepared: 01/02/92 - MAC:D

	Sample No.	Meth Blank	SWRO-C28	SWRO-D2-9	SWRO-D2-9 Duplicate
	ARI ID	1230MB	9714A	9714B	9714B Dup
	Date Analyzed	12/30/91	12/30/91	12/30/91	12/30/91
	Amt Analyzed	5.0 mls	5.0 mls	5.0 mls	5.0 mls
CAS Number	Units	µg/L	µg/L	µg/L	µg/L
71-43-2	Benzene	1.0 U	1.0 U	1.0 U	1.0 U
108-88-3	Toluene	1.0 U	1.0 U	1.0 U	1.0 U
100-41-4	Ethylbenzene	1.0 U	1.0 U	1.0 U	1.0 U
1330-20-7	Total Xylenes	2.0 U	2.0 U	2.0 U	2.0 U

Surrogate Recoveries

Trifluorotoluene	102%	95.9%	92.3%	96.1%
Bromobenzene	95.4%	89.1%	85.3%	91.5%

	Sample No.	SWRO-D3-9	Field Blank
	ARI ID	9714C	9714D
	Date Analyzed	12/30/91	12/30/91
	Amt Analyzed	5.0 mls	5.0 mls
CAS Number	Units	µg/L	µg/L
71-43-2	Benzene	1.0 U	1.0 U
108-88-3	Toluene	1.0 U	1.0 U
100-41-4	Ethylbenzene	1.0 U	1.0 U
1330-20-7	Total Xylenes	2.0 U	2.0 U

Surrogate Recoveries

Trifluorotoluene	95.9%	102%
Bromobenzene	92.9%	95.9%

Data Reporting Qualifiers

Value	If the result is a value greater than or equal to the detection limit, report the value.	B	This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.
U	Indicates compound was analyzed for but not detected at the given detection limit.	J	Indicates an estimated value when result is less than specified detection limit.

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL PETROLEUM HYDROCARBONS by IR Scan
Modified EPA Method 418.1

Matrix: Water

Project: 21199-032
Trans Mountain
QC Report No: 9714 - Dames & Moore
VTSR: 12/24/91

Data Release Authorized _____
Data Prepared: 12/27/91 -MAC:PJW

Date Prepared: 12/26/91
Date of Analysis: 12/26/91

Lab ID	Client Sample ID	Dilution Factor	TPH (ppm)
9714 MB	*METHOD BLANK*	*1*	*1 U*
9714 A	SWRO-C28	1	1 U
9714 B	SWRO-D2-9	1	1 U
9714 C	SWRO-D3-9	1	1 U

Values reported in ppm (mg/L).

U Indicates compound was analyzed for but not detected at the given detection limit.

10 January 1992

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

David Maltby
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032 Trans Mountain;
ARI Job #9727

Dear David:

Please find enclosed the results and original chain-of-custody for the above referenced project. The TPH-418.1 results were faxed to you 1/3/92.

If you have any questions or need further information, please feel free to call any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Coordinator

KAS/ks

Enclosures

cc: file#9727

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Boring or Well Number	Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	VOA 602/8020	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (M)	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	GASOLINE	KARL FISCHER			FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
SWRD-C29			8:00	WATER	1	X			X												X					3	
SWRD-02-10			8:10	"		X			X												X					3	
SWRD-03-10			8:25	"		X			X												X					3	
~~TRIP BLANK~~				"		~~X~~																				~~2~~	

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

D. Maltby 1/2/92 1/2/92 11:40 Jan Tolkins

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

LABORATORY NOTES: STANDARD TURN AROUND

ANALYTICAL LABORATORY: ARI

LABORATORY CONTACT: KATE

D&M CONTACT: DAVID MALTBY PHONE:

DAMES & MOORE
500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

JOB NO.: 21099-032-5502-005 SHEET 1 OF 1

PROJECT TRANS MOUNTAIN

LOCATION LAUREL STATION

COLLECTOR D. Maltby DATE OF COLLECTION 1/2/92

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL PETROLEUM HYDROCARBONS by IR Scan
Modified EPA Method 418.1

Matrix: Water

Project: 2199-032-5502-005
Trans Mountain
QC Report No: 9727 - Dames & Moore
VTSR: 01/02/92

Data Release Authorized _____
Data Prepared: 01/03/92 -MAC:PJW

Date Prepared: 01/02/92
Date of Analysis: 01/02/92

Lab ID	Client Sample ID	Dilution Factor	TPH (ppm)
9727 MB	*METHOD BLANK*	*1*	*1 U*
9727 A	SWRO-C29	1	1 U
9727 B	SWRO-02-10	1	1 U
9727 C	SWRO-03-10	1	1 U

Values reported in ppm (mg/L).

U Indicates compound was analyzed for but not detected at the given detection limit.

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL GASOLINE RANGE HYDROCARBONS
WA TPHG Method by GC/FID

QC Report No: 9727-Dames & Moore
Project: 21199-032-5502-005
Trans. Mtn.
VTSR: 01/02/92

Matrix: Waters

Data Release Authorized _____
Data Prepared: 1/10/92 - MAC:K kas

Date Analyzed: 01/09/92

Lab ID	Client Sample ID	Dilution Factor	Gasoline Range Hydrocarbons †	Gas ID *	Surrogate A	Surrogate B
9727 MB	*Method Blank*	-	0.5 U	No	83.3%	72.0%
9727 A	SWRO-C29	-	0.5 U	No	87.3%	77.7%
9727 Adup	SWRO-C29 dup.	-	0.5 U	No	97.5%	88.6%
9727 B	SWRO-02-10	-	0.5 U	No	86.4%	79.4%
9727 C	SWRO-03-10	-	0.5 U	No	87.9%	78.4%

Surrogate A = Trifluorotoluene
Surrogate B = Bromobenzene

Values reported in ppm (mg/L).

U Indicates compound was analyzed for but not detected at the given detection limit.

X Indicates a value above the linear range of the detector. Dilution required.

* In the opinion of the analyst, there was a pattern match for gasoline (yes or no).

† Value based on total peaks in the range from Toluene to Dodecane.

ANALYTICAL RESOURCES INCORPORATED

Analytical Chemists & Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

ORGANICS ANALYSIS DATA SHEET - Method 602/8020
BETX by GC-PID

Matrix: Water
Level: Low

QC Report No: 9727-Dames & Moore
Project No: 21199-032-5502-005
Trans. Mountain
Date Received: 1/2/92

Data Release Authorized: _____
Report prepared: 1/10/92 - MAC:K kas

	Sample No.	Method Blank	SWRO-C29	SWRO-C29 dup.	SWRO-02-10	SWRO-03-10
	ARI ID	MB1/7	9727A	9727Adup	9727B	9727C
	Date Analyzed	01/09/92	01/09/92	01/09/92	01/09/92	01/09/92
	Amt Analyzed	5.0 mls	5.0 mls	5.0 mls	5.0 mls	5.0 mls
CAS Number	Units	µg/L	µg/L	µg/L	µg/L	µg/L
71-43-2	Benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
108-88-3	Toluene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
100-41-4	Ethylbenzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1330-20-7	Total Xylenes	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
	Surrogate Recoveries					
	Trifluorotoluene	97.7%	103%	113%	101%	102%
	Bromobenzene	88.5%	94.2%	107%	93.3%	94.3%

Data Reporting Qualifiers

Value	If the result is a value greater than or equal to the detection limit, report the value.	B	This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.
U	Indicates compound was analyzed for but not detected at the given detection limit.	J	Indicates an estimated value when result is less than specified detection limit.

13 January 1992

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

David Maltby
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032-3502-005 Laurel Sta.;
ARI Job #9766

Dear David:

Please find enclosed the results and original chain-of-custody report for the above referenced project. The TPH-418.1 results were faxed to you 1/9/92, the BETX results earlier today.

Both soils and waters were run for TPH by Method 8015-HCID; water samples were in 1 liter amber bottles rather than the 4 oz. vials required for 8015-gas analysis.

If you have any questions or need further information, please feel free to call any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Coordinator

KAS/ks

Enclosures

cc: file#9766

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Boring or Well Number	Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	VOA 602/8020	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (M) HOLD	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
HA	-5X	4"	13:50	SOIL	4oz.					✓											TAKEN 1/6/92	1	
HA	-9X	4"	14:15	"	"					✓											"	1	
SWRO	-C30	SURF.	0955	H_2O	LITER					✓											TAKEN 1/8/92	1	
SWRO	-D2-11	"	1005	"	"					✓											"	1	
SWRO	-D3-11	"	1015	"	"					✓											"	1	
TW170	-3-1	"	1200	"	LITER + VOA	✓			✓												"	3	
TW170	-2-1	"	1415	"	"	✓			✓												"	3	
TW180	-2-1	"	1425	"	"	✓			✓												"	3	
HA	-3-3X	4ft.		SOIL	4oz.					✓											"	1	
HAX	-6-11	4"	1505	"	4oz.					✓											"	1	
HAX	-6-20	4"	1522	"	"					✓											"	1	

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

JM Williams 1/8/92 1600 Erin Cranwell

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

LABORATORY NOTES:

Per Pauline Roberts 1/9/92 please rush 72 hr sample #TW170-2-1 for BETX & TPH 1/9/92 9:30.

A. R. I. # 9766

ANALYTICAL LABORATORY: ARI

LABORATORY CONTACT: KATE

D&M CONTACT: DAVID MACTAV PHONE: 728-0744

DAMES & MOORE

500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

JOB NO.: 21199-032-5502-005 SHEET 1 OF 1

PROJECT TRANS MT.

LOCATION LAUREL STATION

COLLECTOR J. WILLIAMS, B. UNGER, P. ROBERTS DATE OF COLLECTION 1/6/92 - 1/8/92

ANALYTICAL
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Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL PETROLEUM HYDROCARBONS
WA HCID Method by GC/FID

QC Report No: 9766-Dames & Moore
Project: 21199-032-3502-005
Laurel Sta.
VTSR: 01/08/92

Matrix: Soil

Data Release Authorized _____
Data Prepared: 1/13/92 - MAC: RPR

Date extracted: 01/09/92
Dates Analyzed: 1/09-10/92

Lab ID		Client Sample ID	Dilution Factor	Petroleum Hydrocarbons †	TPH ID *	Surrogate Recovery
9768	MB 1-9	METHOD BLANK	-	10 U	-	120%
9766	A	HA - 5X	-	10 U	No	76.6%
9766	B	HA - 9X	-	10 U	No	76.3%
9766	C	HA - 3- 3X	-	10 U	No	80.1%
9766	D	HAX - 6 - 11	-	10 U	No	79.1%
9766	E	HAX - 6 - 20	-	10 U	No	79.6%

Surrogate is Me-Arachidate.

Values reported in ppm (mg/Kg).

U Indicates compound was analyzed for but not detected at the given detection limit.

X Indicates a value above the linear range of the detector. Dilution required.

* In the opinion of the analyst, was there a pattern match for diesel or gasoline (yes or no).

† Value based on total peaks in the range from Toluene to C24.

7-C-3-1

22 January 1992

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

David Maltby
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032 Transmountain
ARI Job #9809

Dear Sue:

Please find enclosed the results and original chain-of-custody report for the above referenced project. Samples arrived in good condition on 1/15/92. Ingrid Williams spoke with Shelby Miller on 1/16/92, requesting that sample PLBX-1-10-4' be deleted from the chain-of-custody and that sample PLBX-1-5-13' be added for holding. Shelby made these changes, as are indicated on the chain.

Due to machine drift on the IR instrument, the TPH-418.1 analysis was re-run. The original results were faxed to you yesterday; only the re-analysis results are included here, as the drift appears to have been corrected. (The "9809 G Dup 2" result was actually 9.9 ppm, but is reported as undetected since our normal detection limit is 10 ppm.)

If you have any questions or need further information, please feel free to call any time. I can be reached at the number above, or direct at 340-2867, ext. 117, where you can also leave a message if I'm not available.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Coordinator

KAS/ks

Enclosures

cc: file#9809

DAMES & MOORE
SEATTLE

JAN 23 1992

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Boring or Well Number	Sample Number	Date / ~~Depth~~	Time	Sample Type	Container Type	ANALYSES: VOA 601/8010	VOA 602/8020	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (M)	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	8015 (gas fuels)	8015 - HC/D	418.1 - TPHT	Hold	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
SWRO-C-31		1/15/92	11:10	H_2O	1-l glass amber															X						1	
SWRO-D3-12		1/15/92	11:30	H_2O	1-l glass amber															X						1	
SWRO-D2-12		1/15/92	11:17	H_2O	1-l glass amber															X						1	
SP1X-1-5		1/15/92	1005	soil	202 glass																X					1	
SP1X-1-10		1/15/92	1015	soil	2 oz glass																X					1	
SP2X-1-5		1/15/92	1040	soil	202 glass																X					1	
PLBX-1-5-12'		1/14/92	1240	soil	202 glass																X	X				1	
~~PLBX-1-10-4'~~		~~1/14/92~~	1550	soil	202 glass																X	X			1-16-92 mm. Per Ingrid W.	1	
PLBX-1-5-13'		1/15/92	1240	soil	202 glass																1/14/92 X	✓				1	

RELINQUISHED BY: (Signature) T M Williams DATE/TIME 1/15/92/13:00 RECEIVED BY: (Signature) Jan Fellows

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

ANALYTICAL LABORATORY: Kate @ ARI, Seattle

LABORATORY CONTACT: Kate

D&M CONTACT: D. Maltby PHONE: 398-7000

LABORATORY NOTES: 17:40

ARI # 9809

JOB NO.: _____ SHEET _____ OF _____

PROJECT _____

LOCATION _____

COLLECTOR _____ DATE OF COLLECTION _____

DAMES & MOORE
500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL PETROLEUM HYDROCARBONS
WA HCID Method by GC/FID

QC Report No: 9809-Dames&Moore
Project: Transmountain

Matrix: Soils

VTSR: 01/15/92

Data Release Authorized _____
Data Prepared: 01/22/92 - MAC:C SCM

Date Extracted: 01/16/92
Date Analyzed: 01/17/92

Lab ID	Client Sample ID	Dilution Factor	Petroleum Hydrocarbons †	TPH ID *	Surrogate Recovery
9809 MB	*Method Blank*	1	10 U	No	83.1%
9809 D	SP1X-1-5	1	10 U	No	124%
9809 E	SP1X-1-5	1	10 U	No	127%
9809 F	**SP2X-1-5**	**1**	**39**	**Diesel**	**128%**
9809 G	PLBX-1-5-12	1	10 U	No	135%

Surrogate is Me-Arachidate.

Values reported in ppm (mg/kg) on a dry weight basis.

U Indicates compound was analyzed for but not detected at the given detection limit.

X Indicates a value above the linear range of the detector. Dilution required.

* In the opinion of the analyst, was there a pattern match for diesel or gasoline.

† Value based on total peaks in the range from Toluene to C24.

ANALYTICAL
RESOURCES
INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL PETROLEUM HYDROCARBONS by IR Scan
Modified EPA Method 418.1

Matrix: Soil

Project: Transmountain
QC Report No: 9809 - Dames & Moore
VTSR: 01/15/92

Data Release Authorized _____
Data Prepared: 01/22/92 -MAC:PJW

Date Prepared: 01/21/92
Date of Analysis: 01/22/92

Lab ID	Client Sample ID	Dilution Factor	TPH (ppm)
9809 MB	*METHOD BLANK*	*1*	*10 U*
9809 G 2	**PLBX-1-5-12'**	**1**	**13**
9809 G Dup 2	PLBX-1-5-12'	1	10 U
9809 G Trip 2	**PLBX-1-5-12'**	**1**	**11**

Values reported in ppm (mg/Kg) based on wet weight of sample

U Indicates compound was analyzed for but not detected at the given detection limit.

29 January 1992

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

David Maltby
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032 Trans. Mountain/Laurel Stn.;
ARI Job #9849

Dear David

Please find enclosed the results and original chain-of-custody report for the above referenced project. Nine samples arrived in good condition on 1/21/92, and analyses proceeded without incident. The 418.1 results were faxed to you 1/23/92, the HCID's earlier today.

If you have any questions or need further information, please feel free to call any time. I can be reached at the number above, or direct at 340-2867, ext. 117, where you can also leave a message if I'm not available.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Coordinator

KAS/ks

Enclosures

cc: file#9849

DAMES & MOORE
SEATTLE
JAN 30 1992

DAMES & MOORE

500 Market Place Tower • 2025 First Avenue • Seattle, Washington 98121 • (206) 728-0744

Chain of Custody

Date 1/20/92 Page 1 of 1

Project Number: 21199.032
Project Manager: David Mathay
Laboratory: ARI
Turn around time: regular

Sampler's Initials: BAM
Sampler's Signature: TWilliams for BAM

Analysis Request

Sample ID	Date	Time	Matrix	Volatile Organics 624/8240 (GC/MS)	Halogenated Volatiles 601/8010	Aromatic Volatiles 602/8020	Base/Neutral/Acids 625/8270 (GC/MS)	BTX 602/8015	Polycyclic Aromatic Hydrocarbons 610/8310	Pesticides/PCBs 608/8080	BOIS HCID	418.1 Freon			Priority Pollutant Metals (13)	EP TOX Metals (8)			Comments/ Instructions	Number of Containers
TP 22-2X-5'	1/16/92	0905	soil								X								no 418.1 analysis	1
TP 24-1X-1'	1/16/92	0950	soil								X								no 418.1 analysis	1
PLB-1-1-7'	1/15/92	none	soil								X	X								1
SS-3-1 (previously labeled)	1/16/92	1530	soil								X									1
SS-3-5X	1/16/92	1600	soil								X	X								1
SS-3-6	1/16/92	1610	soil								X									1
TP-21-1-1'	1/15/92	1510	soil								X									1
TP-20-3X-10'	1/15/92	1445	soil								X	X								1
TMB9-1 (60')	none →		soil - core								X								Added to COC per David M. 1/22/92 14:09 T. Hedges		

Special Instructions/Comments:

Relinquished by:
(Sig) TWilliams
(Printed) TWilliams
(Company) Dames & Moore
(Time) 1500 (Date) 1/20/92

Received by (lab):
(Sig) Shelby Miller
(Printed) Shelby Miller
(Company) ARI
(Time) 5:45 (Date) 1/21/92

Sample Receipt

Total no. of containers:
Chain of custody seals:
Rec'd good condition/cold:
Conforms to record:

Lab number:

ANALYTICAL
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Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL PETROLEUM HYDROCARBONS by IR Scan
Modified EPA Method 418.1

Matrix: Soil

Project: 21199032

QC Report No: 9849 - Dames & Moore
VTSR: 01/21/92

Data Release Authorized _____
Data Prepared: 01/23/92 -MAC:PJW

Date Prepared: 01/22/92
Date of Analysis: 01/23/92

Lab ID	Client Sample ID	Dilution Factor	TPH (ppm)
9849 MB	*METHOD BLANK*	*1*	*10 U*
9849 C	**PLB-1-1-7'**	**1**	**15**
9849 E	**SS-3-5X**	**1**	**710**
9849 H	TP-20-3X-10'	1	10 U
9849 H Dup	TP-20-3X-10'	1	10 U
9849 H Trp	TP-20-3X-10'	1	10 U

Values reported in ppm (mg/Kg) based on wet weight of sample

U Indicates compound was analyzed for but not detected at the given detection limit.

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333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL PETROLEUM HYDROCARBONS
WA HCID Method by GC/FID

QC Report No: 9849-Dames & Moore
Project: 21199-032

Matrix: Soil Core

VTSR: 01/21/92

Data Release Authorized _____
Data Prepared: 1/29/92 - MAC:K kas

Date extracted: 1/22, 1/27/1992
Dates Analyzed: 1/23-1/24, 1/27/92

Lab ID	Client Sample ID	Dilution Factor	Petroleum Hydrocarbons †	TPH ID *	Surrogate Recovery
9849 MB	*Method Blank*	-	10 U	-	83.7%
9849 A	TP 22-2X-5'	-	10 U	No	90.0%
9849 B	**TP 24-1X-1'**	-	**7.6 J**	No	77.3%
9849 C	**PLB-1-1-7'**	-	**110**	No	124%
9849 D	**SS-3-1**	-	**340**	**Diesel**	81.5%
9849 E	**SS-3-5X**	-	**1600**	**Both**	85.7%
9849 F	**SS-3-6**	-	**1500**	**Both**	96.8%
9849 G	**TP-21-1-1'**	-	**16**	No	118%
9849 H	TP-20-3X-10'	-	10 U	No	73.7%
9849 MB2	*Method Blank*	-	10 U	-	87.8%
9849 I	TMB9-1 (60')	-	10 U	No	91.7%

Surrogate is Me-Arachidate.

Values reported in ppm (mg/Kg).

U Indicates compound was analyzed for but not detected at the given detection limit.
X Indicates a value above the linear range of the detector. Dilution required.
* In the opinion of the analyst, was there a pattern match for diesel or gasoline.
† Value based on total peaks in the range from Toluene to C24.
NR Indicates the surrogate was not recovered due to dilution or matrix effect.

ANALYTICAL RESOURCES INCORPORATED

Analytical Chemists & Consultants

333 Ninth Ave. North
Seattle, Wa 98109-5187
(206) 621-6490

Facsimile

Date of transmittal: 1/29/92 Time: 3:30

Addressee: David Maltby FAX No: ( ) #29

Company: Dames + Moore Phone No:( )

From: Kate Stegemoeller FAX No: (206) 621-7523

Number of Pages: 2 Phone No: (206) 621-6490
(including this cover page)

If you do not receive the number of pages indicated, please contact sender at ARI immediately - (206) 621-6490

Additional message Here are the TPH-HCID results for the Trans. Mtn. Samples received 1/21/92.

ANALYTICAL RESOURCES INCORPORATED

Analytical Chemists & Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL PETROLEUM HYDROCARBONS
WA HCID Method by GC/FID

QC Report No: 9849-Dames & Moore
Project: 21199-032

Matrix: Soil Core

VTSR: 01/21/92

Data Release Authorized

Data Prepared: 1/29/92 - MAC:K kas

Date extracted: 1/22, 1/27/1992
Dates Analyzed: 1/23-1/24, 1/27/92

Lab ID	Client Sample ID	Dilution Factor	Petroleum Hydrocarbons †	TPH ID *	Surrogate Recovery
9849 MB	*Method Blank*	-	10 U	-	83.7%
9849 A	TP 22-2X-5'	-	10 U	No	90.0%
9849 B	TP 24-1X-1'	-	7.6 J	No	77.3%
9849 C	PLB-1-1-7'	-	110	No	124%
9849 D	SS-3-1	-	340	Diesel	81.5%
9849 E	SS-3-5X	-	1600	Both	85.7%
9849 F	SS-3-6	-	1500	Both	96.8%
9849 G	TP-21-1-1'	-	16	No	118%
9849 H	TP-20-3X-10'	-	10 U	No	73.7%
9849 MB2	*Method Blank*	-	10 U	-	87.8%
9849 I	TMB9-1 (60')	-	10 U	No	91.7%

Surrogate is Me-Arachidate.

Values reported in ppm (mg/Kg).

U Indicates compound was analyzed for but not detected at the given detection limit.
X Indicates a value above the linear range of the detector. Dilution required.
* In the opinion of the analyst, was there a pattern match for diesel or gasoline.
† Value based on total peaks in the range from Toluene to C24.
NR Indicates the surrogate was not recovered due to dilution or matrix effect.

5 February 1992

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

David Maltby
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032 Trans. Mountain/Laurel Stn.;
ARI Job #9864

Dear David:

Please find enclosed the results and original chain-of-custody report for the above referenced project. Eight samples and a trip blank arrived in good condition on 1/23/92, and the analyses proceeded without incident. Results of the 8015-gas range analysis were faxed to you on 1/31/92.

If you have any questions or need further information, please feel free to call any time. I can be reached at the number above, or direct at 340-2867, ext. 117, where you can also leave a message if I'm not available.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Coordinator

KAS/ks

Enclosures

cc: file#9864

DAMES & MOORE
SEATTLE
FEB 06 1992

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Boring or Well Number	Sample Number	Depth	Time	Sample Type	Container Type	TPH 418.1	TPH 8015 (M) HC ID	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
PLS-1	-14X		am	soil	2-oz glass	X		1/17/92	1	
PLSX-1	-20		am	soil		X		1/21/92	1	
PLB-1	-15X		am	soil		X		1/17/92	1	
PLBX-1	-22		am	soil		X		1/21/92	1	
TP4X	-5-1	1140	am	soil		X		1/22/92	1	

ANALYSES: VOA 601/8010; VOA 602/8020; VOA 624/8240; Semi Vol 625/8270; TPH 418.1; TPH 8015 (M) HC ID; TITLE 22 METALS; WET Test; PNA 610/8100; PEST/PCBs 8080; HEX CHROME; ORGANIC LEAD; TCLP; pH; ASBESTOS; . . . . .

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

J M Williams 1/23/92 1100 Erin Cranwell 1/23/92 14:50

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

LABORATORY NOTES:

A.R.I. # 9864

ANALYTICAL LABORATORY: ART - Seattle

LABORATORY CONTACT: Kate

D&M CONTACT: David Matthay PHONE: 728 0744

DAMES & MOORE

500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

JOB NO.: 21199-032 SHEET 1 OF 1

PROJECT Transmountain - Laurel Station

LOCATION Bellingham +1/17

COLLECTOR J M Williams DATE OF COLLECTION 1/21 + 1/22/92

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Boring or Well Number	Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	VOA 602/8020	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (M) (gas only)	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
SWRO-C-32			0815	H_2O	2-40ml vials					X												2	
SWRO-D2-13			0825	H_2O	glass					X												2	
SWRO-D3-13			0835	H_2O	↓					X												2	
Trip Blank			am	H_2O	↓																	2	

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

JMWilliams 1/22/92 @ 1415 Erin Cranell 1/23/92

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

LABORATORY NOTES:

Samples stored in refridgerator @ Bellingham Laurel Station until delivery to lab.

ANALYTICAL LABORATORY: ARI

LABORATORY CONTACT: Kate

D&M CONTACT: David Maltby PHONE: 7250744 Seattle

DAMES & MOORE
500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

JOB NO.: 21199-032 SHEET 1 OF 1

PROJECT Transmountain

LOCATION Laurel Station, Bellingham WA

COLLECTOR JMWilliams DATE OF COLLECTION 1/22/92

ANALYTICAL
RESOURCES
INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL PETROLEUM HYDROCARBONS
WA HCID Method by GC/FID

QC Report No: 9864- Dames&Moore
Project: 21199-032
Trans Mtn.
VTSR: 01/23/92

Matrix: Soil

Data Release Authorized
Data Prepared: 01/28/92 - MAC:K SCM

Date extracted: 01/24/92
Date Analyzed: 01/27/92

Lab ID	Client Sample ID	Dilution Factor	Petroleum Hydrocarbons †	TPH ID *	Surrogate Recovery
9864 MB	*Method Blank*	-	10 U	No	89.0%
9864 A	PLS-1-14X	-	10 U	No	81.8%
9864 B	PLSX-1-20	-	10 U	No	87.0%
9864 C	PLB-1-15X	-	10 U	No	83.1%
9864 D	PLBX-1-22	-	10 U	No	78.8%
9864 E	TP4X-5-1	-	10 U	No	78.3%

Surrogate is Me-Arachidate.

Values reported in ppm (mg/Kg) on a dry weight basis.

U Indicates compound was analyzed for but not detected at the given detection limit.
X Indicates a value above the linear range of the detector. Dilution required.
* In the opinion of the analyst, was there a pattern match for diesel or gasoline.
† Value based on total peaks in the range from Toluene to C24.
NR Indicates the surrogate was not recovered due to dilution or matrix effect.

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333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL GASOLINE RANGE HYDROCARBONS
WA TPHG Method by GC/FID

QC Report No: 9864 - Dames & Moore
Project: 21199-032
Trans Mtn.
VTSR: 01/23/92

Matrix: Waters

Data Release Authorized
Data Prepared: 1/29/92 - MAC: RPR

Date Extracted: 01/27/92
Date Analyzed: 01/27/92

Lab ID		Client Sample ID	Dilution Factor	Gasoline Range Hydrocarbons †	Gas ID *	Surrogate A	Surrogate B
9864	MB-0127	Mehtod Blank	NA	0.25 U	No	88.8%	86.3%
9864	F	SWRO-C-32	NA	0.25 U	No	93.1%	89.6%
9864	F Dup	SWRO-C-32 dup.	NA	0.25 U	No	92.9%	88.5%
9864	G	SWRO-D2-13	NA	0.25 U	No	93.8%	89.0%
9864	H	SWRO-D3-13	NA	0.25 U	No	95.8%	91.7%
9864	I	TRIP BLANK	NA	0.25 U	No	92.4%	88.8%

Surrogate A = Trifluorotoluene
Surrogate B = Bromobenzene

Values reported in ppm (mg/L).

U Indicates compound was analyzed for but not detected at the given detection limit.

X Indicates a value above the linear range of the detector. Dilution required.

* In the opinion of the analyst, was there a pattern match for gasoline.

† Value based on total peaks in the range from Toluene to Dodecane.

Client:	Project #: 21199-032	Sample Acknowledgement	ARI Job Number: 9864	
Dames & Moore	Project: TRANS MTN.	Page 1 of 1	VTSR: 1/23/92	Turn-Around: 2/6/92
Client Contact: David Malthy	PO#:	Logged in by: Q.F.		Requested TA: 2 wk.

Billing Address:

Date of Transmittal: 1/24/92 Time: 14:45

Addressee: David Malthy Fax No:

Company: Dames & Moore Phone No:

Analytical Resources, Inc.
(206) 621-6490
(206) 621-7523 - fax

Following is a list of samples received and logged in at ARI.
Please verify information listed.
If there are discrepancies, contact ARI Lab Contact.

ARI Lab Contact: Kate Stegemoeller
(Please call this person with questions.)

	SMO/CLIENT SAMPLE ID:	ARI ID NO	Sample Matrix	#Bottles per sample
1	PLS-1-14X	9864 A	Soil	1 2oz gl.
2	PLSX-1-20	B		
3	PLB-1-15X	C		
4	PLBX-1-22	D		
5	TPHX-5-1	E		
6	SURR-C-32	F	H2O	2 40 ml.
7	SURR-D2-13	G		
8	SURR-D3-13	H		
9	TRIP BLANK	I		
10				

NO Samples	Matrix	Parameter	Meth No	Estimated Cost Per Sample	Estimated Extended Costs
5	Soil	TPH	HCID	75.00	375.00
3	H2O	TPH	8015	75.00	225.00
				TOTAL	600.00

THIS IS NOT AN INVOICE

ARI 06/1/90

NOTE Unless arrangements for storage/archiving are made for this project, water samples will be disposed of 60 days (VOA waters 30 day's) after sample receipt. (Opened volatile waters will be disposed of after analysis). Soil samples will be disposed of 90 days after sample receipt (VOA solls will be 60 days).

3 February 1992

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

David Maltby
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032 Trans. Mountain/Laurel Stn.;
ARI Job #9880

Dear David:

Please find enclosed the results and original chain-of-custody report for the above referenced project. Two samples arrived in good condition on 1/27/92, and the analysis proceeded without incident.

If you have any questions or need further information, please feel free to call any time. I can be reached at the number above, or direct at 340-2867, ext. 117, where you can also leave a message if I'm not available.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Coordinator

KAS/ks

Enclosures

cc: file#9880

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Boring or Well Number	Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES: VOA 601/8010	VOA 602/8020	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (M)	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	8015 HCID	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
SSX-6-15			1130	soil	2-oz glass															X			1	
SSX-6-7			1435	soil	2-oz glass															X			1	

RELINQUISHED BY: (Signature) JMWilliams DATE/TIME 1/27/92 RECEIVED BY: (Signature) Jan Fellows

RELINQUISHED BY: (Signature) DATE/TIME 14:04 RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

LABORATORY NOTES:

A.R.I. # 9880

ANALYTICAL LABORATORY:

LABORATORY CONTACT:

D&M CONTACT: David Mathay PHONE: 728-0744 | MWilliams 390 7000

DAMES & MOORE
500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

JOB NO.: 21195 032 SHEET 1 OF 1

PROJECT Trans Mountain

LOCATION Laurel Station, Bellingham

COLLECTOR JMW, Wams DATE OF COLLECTION 1/24/92

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INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL PETROLEUM HYDROCARBONS
WA HCID Method by GC/FID

QC Report No: 9880-Dames & Moore
Project: 21199-032
Trans. Mtn.
VTSR: 01/27/92

Matrix: Soils

Data Release Authorized _____
Data Prepared: 2/3/92 - MAC:K kas

Date extracted: 01/28/92
Dates Analyzed: 01/28/92

Lab ID	Client Sample ID	Dilution Factor	Petroleum Hydrocarbons †	TPH ID *	Surrogate Recovery
9880 MB	*Method Blank*	-	10 U	-	57.7%
9880 A	SSX-6-7	-	10 U	No	58.8%
9880 B	SSX-6-15	-	10 U	No	60.6%

Surrogate is Me-Arachidate.

Values reported in ppm (mg/Kg).

U Indicates compound was analyzed for but not detected at the given detection limit.
X Indicates a value above the linear range of the detector. Dilution required.
* In the opinion of the analyst, was there a pattern match for diesel or gasoline.
† Value based on total peaks in the range from Toluene to C24.
NR Indicates the surrogate was not recovered due to dilution or matrix effect.

31 January 1992

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

David Maltby
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032 Trans. Mountain/Laurel Stn.;
ARI Job #9884

Dear David

Please find enclosed the results and original chain-of-custody report for the above referenced project. One sample arrived in good condition on 1/28/92, and analyses proceeded without incident. The 418.1 results were faxed to you 1/29/92, the BETX earlier today.

If you have any questions or need further information, please feel free to call any time. I can be reached at the number above, or direct at 340-2867, ext. 117, where you can also leave a message if I'm not available.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Coordinator

KAS/ks

Enclosures

cc: file#9884

CHAIN-OF-CUSTODY RECORD

* Per Ingrid S/B BETX 602 not VOA T. Hedges 1/29/92 8:27

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Boring or Well Number	Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	~~VOA~~ 602/8020 BE	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (M)	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	.	.	.	.	.	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
TW170	NA	1200	water	1-l amber					X																		1	
TW170	NA	1200	water	2-40ml vial		X																					2	

* Per Ingrid W. 1/29/92 8:27 please have verbals By Friday 1/31/92. T. Hedges

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)
IMWilliams 1/27/92 1745 Jan Folkers

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

ANALYTICAL LABORATORY:

LABORATORY CONTACT:

D&M CONTACT: PHONE:

LABORATORY NOTES: A.R.I. 1/28/92 11:45

A.R.I. # 9884

JOB NO.: 21 99 032 SHEET 1 OF 1

PROJECT Trans Mountain

LOCATION Laurel - Bellingham

COLLECTOR IMWilliams DATE OF COLLECTION 1/27/92

DAMES & MOORE
500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL PETROLEUM HYDROCARBONS by IR Scan
Modified EPA Method 418.1

Matrix: Water

Project: 21199032
Trans Mountain
Dames & Moore

QC Report No: 9884 -
VTSR: 01/28/92

Data Release Authorized _____
Data Prepared: 01/29/92 -MAC:PJW

Date Prepared: 01/29/92
Date of Analysis: 01/29/92

Lab ID	Client Sample ID	Dilution Factor	TPH (ppm)
9884 MB	*METHOD BLANK*	*1*	*1 U*
9884 A	TW170	1	1 U

Values reported in ppm (mg/L).

U Indicates compound was analyzed for but not detected at the given detection limit.

ANALYTICAL RESOURCES INCORPORATED

Analytical Chemists & Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

ORGANICS ANALYSIS DATA SHEET
BTEX by Method 602/8020
Matrix: Water
Level: Low

Project No: 211 99 032
Trans Mtn.
QC Report No: 9884-Dames & Moore
VTSR: 01/28/92

Data Release Authorized: *Dana B. Cotter*
Report prepared: 01/30/92 - MAC:C PAT

Instrument ID: GC/PID

CAS Number		Sample No.	Method Blk	TW 170	TW 170 DUPL.
		ARI ID	0129MB	9884A	9884ADUP
		Date Analyzed	01/29/92	01/29/92	01/29/92
		Amt Analyzed	5.0 ml	5.0 ml	5.0 ml
		Units	µg/L	µg/L	µg/L
71-43-2	Benzene		1.0 U	**14**	**15**
108-88-3	Toluene		1.0 U	**16**	**16**
100-41-4	Ethylbenzene		1.0 U	1.0 U	1.0 U
1330-20-7	Total Xylenes		2.0 U	**7.3**	**7.6**
		Trifluorotoluene	*93.0%*	*97.5%*	*103%*
		Bromobenzene	*89.7%*	*98.0%*	*106%*

Value If the result is a value greater than or equal to the detection limit, report the value.

U Indicates compound was analyzed for but not detected at the given detection limit.

NR Analysis not required.

B This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.

K This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

4 February 1992

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

David Maltby
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032 Trans. Mountain/Laurel Stn.;
ARI Job #9903

Dear David:

Please find enclosed the results and original chain-of-custody report for the above referenced project. Five samples arrived in good condition on 1/30/92, and the analysis proceeded without incident.

If you have any questions or need further information, please feel free to call any time. I can be reached at the number above, or direct at 340-2867, ext. 117, where you can also leave a message if I'm not available.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Coordinator

KAS/ks

Enclosures

cc: file#9903

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Boring or Well Number	Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	VOA 602/8020	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (M) (CLASS V)	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	.	.	.	.	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
SWRO	-C-33		0900	water	2-40 ml. vials					X																2	
SWROX	-C-33		0900	"	"					X																2	
SWRO	-D2-14		0910							X																2	
SWRO	-D3-14		0930							X																2	
Trip Blank			1600	"	"					X																2	
																										2	

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)
M W Williams 1/30/92 9:05 Lenore Hedger

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

ANALYTICAL LABORATORY: ARI - Terry Hedger

LABORATORY CONTACT:

D&M CONTACT: PHONE:

LABORATORY NOTES:
Standard turn around time

JOB NO.: 21199.032 SHEET 1 OF 1

PROJECT Trans Mountain

LOCATION Laurel Station, Bellingham WA

COLLECTOR M Williams DATE OF COLLECTION 1/29/92

DAMES & MOORE
500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

ANALYTICAL
RESOURCES
INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL GASOLINE RANGE HYDROCARBONS
WA TPHG Method by GC/FID

QC Report No: 9903-Dames & Moore
Project: 21199-032
Trans Mountain
VTSR: 01/30/92

Matrix: Waters

Data Release Authorized _____
Data Prepared: 02/03/92 - MAC:C PAT

Date Extracted: 01/30/92
Date Analyzed: 01/30/92

Lab ID	Client Sample ID	Dilution Factor	Gasoline Range Hydrocarbons †	Gas ID *	Surrogate A	Surrogate B
9903 MB	*Method Blank*	1	0.25 U	No	85.8%	80.4%
9903 A	SWRO-C-33	1	0.25 U	No	91.7%	89.6%
9903 A DUP	SWRO-C-33 DUPL.	1	0.25 U	No	92.4%	89.7%
9903 B	SWRO-X-C-33	1	0.25 U	No	92.0%	89.6%
9903 C	SWRO-D2-14	1	0.25 U	No	95.6%	94.8%
9903 D	SWRO-D3-14	1	0.25 U	No	87.3%	84.9%
9903 E	Trip Blank	1	0.25 U	No	87.1%	82.5%

Surrogate A = Trifluorotoluene
Surrogate B = Bromobenzene

Values reported in ppm (mg/L).

U Indicates compound was analyzed for but not detected at the given detection limit.

X Indicates a value above the linear range of the detector. Dilution required.

* In the opinion of the analyst, was there a pattern match for gasoline.

† Value based on total peaks in the range from Toluene to Dodecane.

12 February 1992

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

David Maltby
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032 Trans. Mountain/Laurel Stn.;
ARI Job #9954

Dear David:

Please find enclosed the results and original chain-of-custody report for the above referenced project. Four samples and a trip blank arrived in good condition on 2/6/92, and the analyses proceeded without incident. Results of the tph-418.1 analysis were faxed to you on 2/10/92.

If you have any questions or need further information, please feel free to call any time. I can be reached at the number above, or direct at 340-2867, ext. 117, where you can also leave a message if I'm not available.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Coordinator

KAS/ks

Enclosures

cc: file#9954

CHAIN-OF-CUSTODY RECORD

Gasoline Range Hydrocarbons

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Boring or Well Number	Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	VOA 602/8020	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (M)	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	.	.	.	.	.	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
SWRO-C34			9:30	H2O	2x40ml VOA					X																	2	
SWRO-D2-15			9:40		"					X																	2	
SW50-03-15			9:50		"					X																	2	
TRIP BLANK					"																						2	
PRT-2692			10:10		2x40ml + 1 Hcl Amb	X			X																		3	

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

D. Maltby 2/6/92 16:00 Shelby Miller

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

ANALYTICAL LABORATORY: ARI

LABORATORY CONTACT: KATE

D&M CONTACT: DAVID MALTBY PHONE: 7280744

DAMES & MOORE
500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

LABORATORY NOTES: STD TURNAROUND

A.R.I. 9954

JOB NO.: ~~PRM~~ 21199-032 SHEET 1 OF 1

PROJECT TRANS MOUNTAIN

LOCATION LAUREL

COLLECTOR D. MALTBY DATE OF COLLECTION 2/6/92

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL GASOLINE RANGE HYDROCARBONS
WA TPHG Method by GC/FID

Matrix: **Waters**

QC Report No: 9954-Dames & Moore
Project: **21199-032**
Trans Mtn.
VTSR: 02/06/92

Data Release Authorized _____
Data Prepared: 02/11/92 - MAC: RPR

Date Extracted: 02/09/92
Date Analyzed: 02/09/92

Lab ID		Client Sample ID	Dilution Factor	Gasoline Range Hydrocarbons †	Gas ID *	Surrogate A	Surrogate B
9954	MB-0209	Method Blank	NA	0.25 U	No	91.7%	88.9%
9954	A	SWRO - C 34	NA	0.25 U	No	93.0%	91.7%
9954	A Dup	SWRO - C 34	NA	0.25 U	No	93.5%	91.4%
9954	B	SWRO - D2 - 15	NA	0.25 U	No	81.5%	63.4%
9954	C	SW50 - D3 - 15	NA	0.25 U	No	93.7%	89.5%
9954	D	Trip Blank	NA	0.25 U	No	89.2%	87.8%

Surrogate A = Trifluorotoluene
Surrogate B = Bromobenzene

Values reported in ppm (mg/kg).

U Indicates compound was analyzed for but not detected at the given detection limit.

X Indicates a value above the linear range of the detector. Dilution required.

* In the opinion of the analyst, was there a pattern match for gasoline.

† Value based on total peaks in the range from Toluene to Dodecane.

ANALYTICAL RESOURCES INCORPORATED

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Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

ORGANICS ANALYSIS DATA SHEET
BETX by Method 602/8020
Matrix: Water
Level: Low

Project No: 21199-032
Trans Mtn.
QC Report No: 9954-Dames & Moore
VTSR: 2/6/92

Data Release Authorized: _____
Report prepared: 02/11/92 - MAC: RR

Instrument ID: GC/PID

CAS Number		Sample No.	Method Blk	Trip Blank	PRT-2692
		ARI ID	MB-0209	9954 - D	9954 - E
		Date Analyzed	2/9/92	2/10/92	2/9/92
		Amt Analyzed	5.0 ml	5.0 ml	5.0 ml
		Units	µg/L	µg/L	µg/L
71-43-2	Benzene		1.0 U	1.0 U	1.0 U
108-88-3	Toluene		1.0 U	1.0 U	1.0 U
100-41-4	Ethylbenzene		1.0 U	1.0 U	1.0 U
1330-20-7	Total Xylenes		2.0 U	2.0 U	2.0 U
		Trifluorotoluene	*95.4%*	*96.8%*	*91.8%*
		Bromobenzene	*87.2%*	*69.0%*	*87.6%*

Value	If the result is a value greater than or equal to the detection limit, report the value.
U	Indicates compound was analyzed for but not detected at the given detection limit.
NR	Analysis not required.
B	This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.
K	This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

ANALYTICAL RESOURCES INCORPORATED

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(206) 621-6490
(206) 621-7523 (FAX)

TOTAL PETROLEUM HYDROCARBONS by IR Scan
Modified EPA Method 418.1

Matrix: Water

Project: 21199-032
Trans Mountain
QC Report No: 9954 - Dames & Moore
VTSR: 02/06/92

Data Release Authorized _____
Data Prepared: 02/10/92 -MAC:PJW

Date Prepared: 02/07/92
Date of Analysis: 02/07/92

Lab ID	Client Sample ID	Dilution Factor	TPH (ppm)
9954 MB	*METHOD BLANK*	*1*	*1 U*
9954 E	PRT-2692	1	1 U

Values reported in ppm (mg/L).

U Indicates compound was analyzed for but not detected at the given detection limit.

25 February 1992

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

David Maltby
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032 Trans Mtn.:
ARI Job #9991

Dear David:

Please find enclosed the results and original chain-of-custody report for the above referenced project. Four samples and a trip blank arrived in good condition on 2/14/92, and the analyses proceeded without incident.

If you have any questions or need further information, please feel free to call any time. I can be reached at the number above, or direct at 340-2867, ext. 117, where you can also leave a message if I'm not available.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Coordinator

KAS/ks

Enclosures

cc: file#9991

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Boring or Well Number	Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	VOA 602/8020	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (Mod.)	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	Turbidity	BETX			FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
SWRO-	C35-		1000	H_2O	40 ml vial					X																2	
SWRO-	D2-16		10:10	"	"					X																2	
SWRO-	D3-16		10:30	"	"					X																2	
T180			1045	"	500 ml plastic															X						1	
T180			10:45	"	1-l glass amber			X																		1	
T180			10:45	"	40 ml vial																X					2	
Trip	Blank		1000		40 ml vial																					2	

RELINQUISHED BY: (Signature) I M Williams DATE/TIME 2/12/92 @ 1445 RECEIVED BY: (Signature) Jan Fellows

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

ANALYTICAL LABORATORY: ARI

LABORATORY CONTACT: Jan

D&M CONTACT: David Maltby PHONE: 1280744

LABORATORY NOTES:

A.R.I. # 9991

JOB NO.: 21199 032 SHEET 1 OF 1

PROJECT Trans Mountain

LOCATION Laurel Pump Station ; Bellingham

COLLECTOR I M Williams DATE OF COLLECTION 2/12/92

DAMES & MOORE
500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

Final Report
Laboratory Analysis of Selected Parameters

Matrix: WATER

Data Release Authorized: MRubin

Report Prepared : February 25, 1992

Project No: 21199-032
QC Report No: DAMES & MOORE-9991
Date Received: 2/14/92

Sample Data:

		DATE OF ANALYSIS
		2/14/92
Lab ID	**Sample Number**	**Turbidity (NTU)**
9991 D	T-180	> 200

Method Blank Analysis:

Sample Number	**Turbidity (NTU)**
Method Blank 1	0.10
Detection Limit	0.10

Duplicate Analysis:

	(NTU)
Original	> 200
Duplicate	> 200
RSD	-

Comments: *Turbidity determined with a HACH Ratio Nephelometer calibrated against Formazin standards.*

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL GASOLINE RANGE HYDROCARBONS
WA TPHG Method by GC/FID

QC Report No: 9991-Dames & Moore
Project: 21199-032
Trans Mtn.
VTSR: 02/14/92

Matrix: Waters

Data Release Authorized _____
Data Prepared: 2/21/92 - MAC:K kas

Date Analyzed: 02/18/92

Lab ID	Client Sample ID	Dilution Factor	Gasoline Range Hydrocarbons †	Gas ID *	Surrogate A	Surrogate B
9991 MB	*Method Blank*	-	0.25 U	No	89.4%	86.6%
9991 A	SWRO-C35	-	0.25 U	No	86.5%	83.6%
9991 Adup	SWRO-C35 duplicate	-	0.25 U	No	85.7%	82.9%
9991 B	SWRO-D2-16	-	0.25 U	No	85.8%	81.8%
9991 C	SWRO-D3-16	-	0.25 U	No	86.6%	82.5%
9991 E	Trip Blank	-	0.25 U	No	86.0%	83.7%

Surrogate A = Trifluorotoluene
Surrogate B = Bromobenzene

Values reported in ppm (mg/L).

U Indicates compound was analyzed for but not detected at the given detection limit.

X Indicates a value above the linear range of the detector. Dilution required.

* In the opinion of the analyst, there was a pattern match for gasoline (yes or no).

† Value based on total peaks in the range from Toluene to Dodecane.

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

ORGANICS ANALYSIS DATA SHEET - Method 602/8020
BETX by GC-PID

Matrix: Water
Level: Low

Data Release Authorized: _____
Report prepared: 2/21/92 - MAC:K kas

QC Report No: 9991-Dames & Moore
Project No: 21199-032
Trans Mtn.
Date Received: 2/14/92

CAS Number		Sample No.	Method Blank	T180	Trip Blank
		ARI ID	MB0218	9991D	9991E
		Date Analyzed	02/19/92	02/19/92	02/19/92
		Amt Analyzed	5.0 mls	5.0 mls	5.0 mls
		Units	µg/L	µg/L	µg/L
71-43-2	Benzene		1.0 U	1.0 U	1.0 U
108-88-3	Toluene		1.0 U	1.0 U	1.0 U
100-41-4	Ethylbenzene		1.0 U	1.0 U	1.0 U
1330-20-7	Total Xylenes		2.0 U	2.0 U	2.0 U

Surrogate Recoveries

Trifluorotoluene	108%	97.6%	99.5%
Bromobenzene	100%	82.4%	95.3%

Data Reporting Qualifiers

Value	If the result is a value greater than or equal to the detection limit, report the value.	B	This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.
U	Indicates compound was analyzed for but not detected at the given detection limit.	J	Indicates an estimated value when result is less than specified detection limit.

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL PETROLEUM HYDROCARBONS by IR Scan
Modified EPA Method 418.1

Matrix: Water

Project: 21199-032
Trans Mountain
QC Report No: 9991 - Dames & Moore
VTSR: 02/14/92

Data Release Authorized _____
Data Prepared: 02/18/92 -MAC:PJW

Date Prepared: 02/18/92
Date of Analysis: 02/18/92

Lab ID	Client Sample ID	Dilution Factor	TPH (ppm)
9991 MB	*METHOD BLANK*	*1*	*1 U*
9991 D	**T180**	**1**	**1.2**

Values reported in ppm (mg/L).

U Indicates compound was analyzed for but not detected at the given detection limit.

ANALYTICAL RESOURCES INCORPORATED

Analytical Chemists & Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

28 July 1993

DAMES & MOORE
SEATTLE
JUL 29 1993

David Raubvogel
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032-005 Trans. Mtn. Characterization;
ARI Job #E367, E367 II, E367 III, E367 IV

Dear David:

Please find enclosed the results and original chain-of-custody (COC) record for samples from the above referenced project. Thirteen soil samples were received on 7/12/93, in good condition and with no discrepancies between the COC and sample container labels. The HCID and BETX analyses proceeded without incident of note, and these results were reported to you verbally and/or faxed to you as they became available.

At your request on 7/19, three samples were relogged into the laboratory for PAH analysis and one for TCLP Metals. Five addtional samples were relogged into the laboratory on 7/20 for TCLP Metals. All analyses were without incident, and these results were also reported to you verbally as soon as they became available.

A matrix spike and matrix spike duplicate were analyzed for the HCID and BETX parameters; recovery reports are included as documentation. A metals duplicate and matrix spike were analyzed, and recovery/RPD reports are included as well. Blank spikes were extracted and/or analyzed with these samples for the BETX and PAH parameters, and recovery reports are included as additional QC documentation for the project.

A copy of these results and all raw data will be kept on file by ARI should you require any additional information or copies of the paperwork. Also, if you have questions, please feel free to call me any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Coordinator
206-340-2866 ext. 117

Enclosures
cc: file#E367

DAMES & MOORE

500 Market Place Tower • 2025 First Avenue • Seattle, Washington 98121 • (206) 728-0744

ARI # E377 E3:7 EC 7/12/93

Chain of Custody

Date 7/12/93 Page 1 of 1

Project Number: 21199-632-005
Project Manager: DAVID RACEVSKIS
Laboratory: ARI
Turn around time: STANDARD

Sampler's Initials: DMW / GST
Sampler's Signature:

Analysis Request

Sample ID	Date	Time	Matrix	Volatile Organics 624/8240 (GC/MS)	Halogenated Volatiles 601/8010	Aromatic Volatiles 602/8020 BTEX only	Base/Neutral/Acids 625/8270 (GC/MS)	BTX 602/8015	Polycyclic Aromatic Hydrocarbons 610/8310	Pesticides/PCBs 608/8080	WTPH-HCID				Priority Pollutant Metals (13)	EP TOX Metals (8)			Comments/ Instructions	Number of Containers
PCSC-4-1-B	7/9/93	15:40	Soil			✓					✓								SEE BELOW	4
PCSC-4-2-D		16:30				✓					✓									4
PCSC-4-3-C		18:00				✓					✓									4
PCSC-4-4-A		15:35				✓					✓									4
PCSC-4-5-C		19:35				✓					✓									4
PCSC-4-6-B		20:10				✓					✓									3
PCSC-5-1-A		9:05				✓					✓									4
PCSC-5-2-C		10:10				✓					✓									4
PCSC-5-3-B		10:45				✓					✓									4
PCSC-5-4-D		11:45				✓					✓									4
PCSC-5-5-B		12:20				✓					✓									4
PCSC-4-2-DUP		16:30				✓					✓									4
PCSC-4-6-DUP		20:10				✓					✓									3

4 Jars provided EC 7/12/93

Special Instructions/Comments: ANALYZE FOR WPPH-G, WTPH-D, WTPH-418.1 BASED ON WTPH-HCID RESULTS. IF TPH RESULTS > 5000 PPM, CONTACT PM IMMEDIATELY.

Relinquished by:
(Sig)
(Printed) DAVID M. WECHSLER
(Company) DAMES & MOORE
(Time) 9:23 (Date) 7/12/93

Received by (lab):
(Sig) Terrie Hedger
(Printed) Terrie Hedger
(Company) ARI
(Time) 9:23 (Date) 7/12/93

Sample Receipt

Total no. of containers:
Chain of custody seals:
Rec'd good condition/cold:
Conforms to record:
Lab number:

ANALYTICAL
RESOURCES
INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
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TOTAL PETROLEUM HYDROCARBONS
WA HCID Method by GC/FID

Matrix: Soil

QC Report No: E367-Dames & Moore
Project: 21199-032-005
Trans Mtn Characterization

Data Release Authorized
Data Prepared: 07/20/93 MAC:kas

VTSR: 07/12/93

Date extracted: 07/14/93

Lab ID	Client Sample ID	Date Analyzed	Dilution Factor	Gas Range†	Diesel Range*	Oil Range°	Surrogate Recovery
E367 MB	*Method Blank*	*07/15/93*	-	*20 U*	*25 U*	*50 U*	*111%*
E367 A	**PCSC-4-1-B**	07/16/93	-	**58**	**210**	**78**	118%
E367 B	**PCSC-4-2-D**	07/16/93	-	20 U	**37**	50 U	117%
E367 C	**PCSC-4-3-C**	07/16/93	10	**7200**	**22000**	**7800**	105%
E367 D	**PCSC-4-4-A**	07/16/93	-	**75**	**400**	**290**	108%
E367 E	PCSC-4-5-C	07/16/93	-	20 U	25 U	50 U	111%
E367 F	PCSC-4-6-B	07/16/93	-	20 U	25 U	50 U	118%
E367 G	**PCSC-5-1-A**	07/16/93	-	**2300**	**7100 X**	**2200**	96.3%
E367 GdI	**PCSC-5-1-A**	07/16/93	10	**2400**	**7500**	**2800**	107%
E367 H	**PCSC-5-2-C**	07/16/93	-	**440**	**1500**	**660**	122%
E367 I	**PCSC-5-3-B**	07/16/93	-	**570**	**1700**	**68**	139%
E367 J	**PCSC-5-4-D**	07/16/93	-	**1700**	**5100 X**	**1800**	120%
E367 JdI	**PCSC-5-4-D**	07/16/93	10	**1500**	**4400**	**2100**	133%
E367 K	**PCSC-5-5-B**	07/16/93	-	**450**	**1200**	**360**	118%
E367 L	**PCSC-4-2-DUP**	07/16/93	-	**53**	**130**	**110**	115%
E367 M	**PCSC-4-6-DUP**	07/16/93	-	20 U	**430**	**320**	93.5%

Surrogate is Me-Arachidate.
Values reported in ppm (mg/Kg).

GC Data Reporting Qualifiers

U	Indicates compound was analyzed for but not detected at the given detection limit.
X	Indicates a value above the linear range of the detector. Dilution required.
J	Indicates an estimated value when the value is less than the calculated detection limit.
S	Indicates no value reported due to saturation of the detector. Dilution required.
D	Indicates that surrogate was not detected because of dilution of the extract.
C	Indicates a probable value which is unable to be confirmed due to matrix interference.
NR	Indicates no recovery due to matrix interference and/or dilution.
†	Value based on total peaks in the range from Toluene to C12.
*	Value based on total peaks in the range from C12 to C24.
°	Value based on total peaks in the range from C24 to C32.

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TPH MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

ARI Job I.D.: E367K
Matrix: Soil

Sample No: PCSC-5-5-B
QC Report No: E367-Dames & Moore
Project: 21199-032-005
Trans Mtn Characterizaiton

Data Release Authorized: P Klyle
Report: 07/20/93 MAC:kas

COMPOUND	SPIKE ADDED (mg/Kg)	SAMPLE CONC (mg/Kg)	MS CONC (mg/Kg)	MS REC	QC Limits
Diesel	597	1240	1750	85.4%	50-150

COMPOUND	SPIKE ADDED (mg/Kg)	MSD CONC (mg/Kg)	MSD REC	RPD	Q C Limits	
					RPD	REC
Diesel	592	1520	47.3% *	57% *	50	50-150

Spike Recovery: 1 out of 2 outside limits

Asterisked values outside advisory QC Limits

Comments: MSD Recovery and RPD outside limits
due to hydrocarbon concentration in the unspiked sample.

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ORGANICS ANALYSIS DATA SHEET
BETX Method by GC/PID

Matrix: Soil

QC Report No: E367 - D & M
Project: 21199-032-005
Trans. Mtn. Char.

Data Release Authorized:
Report: 07/23/93 MAC:ctr

VTSR: 07/12/93

	Sample No.	Method Blank	Method Blank 2	Method Blank	PCSC-4-1-B	PCSC-4-2-D	PCSC-4-3-C
	ARI ID	MB0716	MB20716	MB0719	E367A	E367B	E367C
	Date Analyzed	07/16/93	07/17/93	07/19/93	07/17/93	07/17/93	07/17/93
	Amt Analyzed	0.1 g	0.1 g	0.1 g	0.083 g	0.088 g	0.080 g
	Dilution	-	-	-	-	-	-
CAS Number	Units	µg/Kg	µg/Kg	µg/Kg	µg/Kg	µg/Kg	µg/Kg
71-43-2	Benzene	50 U	50 U	50 U	60 U	57 U	**1200**
108-88-3	Toluene	50 U	50 U	50 U	60 U	57 U	**18000 X**
100-41-4	Ethylbenzene	50 U	50 U	50 U	60 U	**160**	**12000 X**
1330-20-7	Total Xylenes	100 U	100 U	100 U	**110 J**	**190**	**47000 X**
	Trifluorotoluene	*94.4%*	*91.0%*	*99.1%*	*92.5%*	*99.2%*	*95.5%*
	Bromobenzene	*89.7%*	*91.0%*	*96.7%*	*102%*	*113%*	*NR*

	Sample No.	PCSC-4-3-C Dil.	PCSC-4-4-A	PCSC-4-5-C	PCSC-4-6-B	PCSC-5-1-A	PCSC-5-1-A Dil.
	ARI ID	E367CDIL	E367D	E367E	E367F	E367G	E367GDIL
	Date Analyzed	07/19/93	07/17/93	07/17/93	07/17/93	07/17/93	07/19/93
	Amt Analyzed	0.080 g	0.084 g	0.084 g	0.082 g	0.082 g	0.082 g
	Dilution	1:10	-	-	-	-	1:10
CAS Number	Units	µg/Kg	µg/Kg	µg/Kg	µg/Kg	µg/Kg	µg/Kg
71-43-2	Benzene	**1200**	60 U	60 U	61 U	**1200**	**1500**
108-88-3	Toluene	**21000**	60 U	60 U	61 U	**4400**	**5500**
100-41-4	Ethylbenzene	**12000**	60 U	60 U	61 U	**1800**	**2100**
1330-20-7	Total Xylenes	**52000**	120 U	120 U	120 U	**17000 X**	**19000**
	Trifluorotoluene	*98.0%*	*92.0%*	*91.8%*	*85.3%*	*96.8%*	*96.2%*
	Bromobenzene	*104%*	*94.6%*	*92.5%*	*86.7%*	*125%*	*98.5%*

GC Data Reporting Qualifiers

U	Indicates the compound was undetected at the reported detection limit.
J	Indicates an estimated value when the value is less than the calculated detection limit.
X	Indicates a value above the linear range of the detector. Dilution required.
S	Indicates no value reported due to saturation of the detector. Dilution required.
D	Indicates that surrogate was not detected because of dilution of the extract.
C	Indicates a probable value which is unable to be confirmed due to matrix interference.
NR	Indicates no recovery due to matrix interference and/or dilution.

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ORGANICS ANALYSIS DATA SHEET
BETX Method by GC/PID

Matrix: Soil

QC Report No: E367 - D & M
Project: 21199-032-005
Trans. Mtn. Char.

Data Release Authorized: _____
Report: 07/23/93 MAC:ctr

VTSR: 07/12/93

	Sample No.	PCSC-5-2-C	PCSC-5-3-B	PCSC-5-4-D	PCSC-5-4-D Dil.	PCSC-5-5-B	PCSC-5-5-C Dup.
	ARI ID	E367H	E367I	E367J	E367JDIL	E367K	E367KDUP
	Date Analyzed	07/17/93	07/17/93	07/17/93	07/19/93	07/17/93	07/19/93
	Amt Analyzed	0.079 g	0.076 g	0.076 g	0.076 g	0.078 g	0.078 g
	Dilution	-	-	-	1:10	-	-
CAS Number	Units	µg/Kg	µg/Kg	µg/Kg	µg/Kg	µg/Kg	µg/Kg
71-43-2	Benzene	**910**	**1700**	**5400**	**6300**	**110**	**140**
108-88-3	Toluene	**1300**	**6800**	**16000 X**	**17000**	150 U	**150**
100-41-4	Ethylbenzene	**1600**	**2500**	**5100**	**4700**	**2000**	**2100**
1330-20-7	Total Xylenes	**13000**	**22000**	**39000 X**	**39000**	**6600**	**6500**
	Trifluorotoluene	*94.4%*	*98.8%*	*94.1%*	*95.5%*	*92.6%*	*95.8%*
	Bromobenzene	*NR*	*NR*	*114%*	*96.5%*	*124%*	*NR*

GC Data Reporting Qualifiers

U	Indicates the compound was undetected at the reported detection limit.
J	Indicates an estimated value when the value is less than the calculated detection limit.
X	Indicates a value above the linear range of the detector. Dilution required.
S	Indicates no value reported due to saturation of the detector. Dilution required.
D	Indicates that surrogate was not detected because of dilution of the extract.
C	Indicates a probable value which is unable to be confirmed due to matrix interference.
NR	Indicates no recovery due to matrix interference and/or dilution.

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ORGANICS ANALYSIS DATA SHEET - Method 602/8020 GC/PID FOR BETX

Matrix: Soil

Client Project No: Trans Mtn.

Data Release Authorized: _____

Report prepared: 07/20/93 MAC:X jjr

QC Report No: E367II - Dames & Moore
VTSR: 07/12/93

CAS Number		Sample No.	Method Blank	Method Blank	PCSL-4-2-Dup	PCSL-4-6-Dup
		ARI ID	MB 7/13	MB #2 7/13	E367L	E367M
		Date Analyzed	07/13/93	07/14/93	07/14/93	07/14/93
		Amt Analyzed	0.1 g	0.1 g	0.087 g	0.081 g
		Units	µg/Kg	µg/Kg	µg/Kg	µg/Kg
71-43-2	Benzene		50 U	50 U	57 U	62 U
108-88-3	Toluene		50 U	50 U	57 U	62 U
100-41-4	Ethylbenzene		50 U	50 U	**99**	62 U
1330-20-7	Total Xylenes		100 U	100 U	**180**	120 U
		Trifluorotoluene	*96.6%*	*104%*	*91.0%*	*87.8%*
		Bromobenzene	*96.8%*	*111%*	*109%*	*96.1%*

GC Data Reporting Qualifiers

U	Indicates the compound was undetected at the reported detection limit.
J	Indicates an estimated value when the value is less than the calculated detection limit.
X	Indicates a value above the linear range of the detector. Dilution required.
S	Indicates no value reported due to saturation of the detector. Dilution required.
D	Indicates that surrogate was not detected because of dilution of the extract.
C	Indicates a probable value which is unable to be confirmed due to matrix interference.
NR	Indicates no recovery due to matrix interference and/or dilution.

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BETX MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Sample No: PCSC-4-6-B
Lab ID: E367F
QC Report No: E357 - D & M
Matrix: Soil
Project: 21199-032-005
Trans. Mtn. Char.
VTSR: 07/12/93

Data Release Authorized: _____
Report: 07/23/93 *MAC:ctr*

COMPOUND	SPIKE ADDED (µg/Kg)	SAMPLE CONC (µg/Kg)	MS CONC (µg/Kg)	MS REC
Benzene	1250	0	1280	102%
Toluene	1250	0	1290	103%
Ethylbenzene	1250	0	1280	102%
Total Xylenes	3750	0	3870	103%

COMPOUND	SPIKE ADDED (µg/Kg)	MSD CONC (µg/Kg)	MSD REC	RPD
Benzene	1250	1360	109%	6.6%
Toluene	1250	1360	109%	5.7%
Ethylbenzene	1250	1360	109%	6.6%
Total Xylenes	3750	4090	109%	5.7%

Surrogate rec.	TFT	BB
MS	**90.2%**	**93.1%**
MSD	**88.9%**	**92.7%**

Comments:

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BETX BLANK SPIKE RECOVERY

Matrix: Soil

QC Report No: E367 - D & M
Project: 21199-032-005
Trans. Mtn. Char.

Data Release Authorized: _____
Report: 07/23/93 MAC:ctr

Date Extracted: 07/16/93
Date Analyzed: 07/16/93

COMPOUND	SPIKE ADDED (µg/Kg)	SPIKE CONC (µg/Kg)	SPIKE REC	QC LIMITS
Benzene	1250	1250	100%	66-142
Toluene	1250	1240	99.2%	59-139
Ethylbenzene	1250	1230	98.4%	NA
Total Xylenes	3750	3680	98.1%	NA

	Surrogate rec.	QC Limits
Trifluorotoluene	96.9%	75-118
Bromobenzene	97.8%	66-124

Spike Recovery: 0 out of 2 outside limits
Surrogate Recovery: 0 out of 2 outside limits

Asterisked values outside QC Limits

Comments: NA - indicates no QC Limits established for these compounds

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BETX BLANK SPIKE DUPLICATE RECOVERY

Matrix: Soil

QC Report No: E367 - D & M
Project: 21199-032-005
Trans. Mtn. Char.
Date Extracted: 07/16/93
Date Analyzed: 07/16/93

Data Release Authorized: _____
Report: 07/23/93 MAC:ctr

COMPOUND	SPIKE ADDED (µg/Kg)	SPIKE CONC (µg/Kg)	SPIKE REC	QC LIMITS
Benzene	1250	1230	98.4%	66-142
Toluene	1250	1230	98.4%	59-139
Ethylbenzene	1250	1240	99.2%	NA
Total Xylenes	3750	3710	98.9%	NA

	Surrogate rec.	QC Limits
Trifluorotoluene	92.8%	75-118
Bromobenzene	95.0%	66-124

Spike Recovery: 0 out of 2 outside limits
Surrogate Recovery: 0 out of 2 outside limits

Asterisked values outside QC Limits

Comments: NA - indicates no QC Limits established for these compounds

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BETX BLANK SPIKE RECOVERY
#2

Matrix: Soil

QC Report No: E367 - D & M
Project: 21199-032-005
Trans. Mtn. Char.

Data Release Authorized: PKph
Report: 07/23/93 MAC:ctr

Date Extracted: 07/16/93
Date Analyzed: 07/17/93

COMPOUND	SPIKE ADDED (µg/Kg)	SPIKE CONC (µg/Kg)	SPIKE REC	QC LIMITS
Benzene	1250	1230	98.4%	66-142
Toluene	1250	1230	98.4%	59-139
Ethylbenzene	1250	1220	97.6%	NA
Total Xylenes	3750	3700	98.7%	NA

	Surrogate rec.	QC Limits
Trifluorotoluene	90.2%	75-118
Bromobenzene	93.5%	66-124

Spike Recovery: 0 out of 2 outside limits
Surrogate Recovery: 0 out of 2 outside limits

Asterisked values outside QC Limits

Comments: NA - indicates no QC Limits established for these compounds

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BETX BLANK SPIKE DUPLICATE RECOVERY
#2

Matrix: Soil

QC Report No: E367 - D & M
Project: 21199-032-005
Trans. Mtn. Char.
Date Extracted: 07/16/93
Date Analyzed: 07/17/93

Data Release Authorized: PKyle
Report: 07/23/93 MAC:ctr

COMPOUND	SPIKE ADDED (µg/Kg)	SPIKE CONC (µg/Kg)	SPIKE REC	QC LIMITS
Benzene	1250	1230	98.4%	66-142
Toluene	1250	1240	99.2%	59-139
Ethylbenzene	1250	1240	99.2%	NA
Total Xylenes	3750	3740	99.7%	NA

	Surrogate rec.	QC Limits
Trifluorotoluene	92.7%	75-118
Bromobenzene	96.0%	66-124

Spike Recovery: 0 out of 2 outside limits
Surrogate Recovery: 0 out of 2 outside limits

Asterisked values outside QC Limits

Comments: NA - indicates no QC Limits established for these compounds

EXPLANATION OF INORGANIC DATA REPORT CODES

The columns labeled 'PREP', 'C', and 'M' contain important information about your analyses. The codes are defined below.

PREPARATION CODES

These 3-letter codes describe methods used to prepare samples for analysis:

AEN USEPA, Metals in air filters
AHM ARI, Mercury in air filters
AHN ARI, Metals in air filters
ANN NIOSH 7300, Metals in air filters
CAN AOAC (1984) 25.024, Metals in earthenware
DE6 EPA 600/4-79-020 218.5, Cr(VI) in water
DMM DMN followed by TMM, Dissolved mercury
DMN Filtered through .45u filter, Dissolved metals
EW6 EWN followed by DE6
EWM EWN followed by TMM
EWN USEPA SW-846 1310, EP Toxicity
FHP ARI, Metals in tissue ($HNO_3/HClO_4$)
FPP PSEP, Metals in tissue ($HNO_3/HClO_4$)
FRM Journal, Mercury in tissue
FRN Journal, Metals in tissue (HNO_3/H_2O_2)
KRN ARI, Concentration by coprecipitation
LEM USEPA, TCLP followed by TMM
LEN USEPA, TCLP Extraction
MHM ARI, Mercury in miscellaneous materials
MHN ARI, Metals in miscellaneous materials
OAM ARI, Mercury in oil, grease or tar
OAN ARI, Metals in oil, grease or tar
PHM ARI, Mercury in wipes
PHN ARI, Metals in wipes
RCC USEPA CLP, Water digestion, HCl matrix
RCN USEPA CLP, Water digestion, HNO_3 matrix
REC EPA 600/4-79-020 4.1.4, HCl matrix
REI EPA 600/4-79-020 200.7 and 9.4
REN EPA 600/4-79-020 4.1.4, HNO_3 matrix
RMA EPA 600/4-79-020 206.2
RWC USEPA SW-846 3005
SCC USEPA CLP, Soil digestion, HCl matrix
SCM USEPA CLP, Mercury in soil
SCN USEPA CLP, Soil digestion, HNO_3 matrix
SEM EPA 600/4-79-020 245.5, Mercury in soil
SHF ARI, Metals in soil, HF digestion
SMN Agronomy,Metals in soil, Water extract
SMM SMN followed by DMM, Dissolved mercury
SSC Standard Methods 302C, Sb/Sn in soil
SSN Standard Methods 302C, Soil digestion
SSS Standard Methods 302C, Ti in soil
SW6 USEPA SW-846 3060, Cr(VI) in soil
SWC USEPA SW-846 3050, HCl matrix
SWN USEPA SW-846 3050, HNO_3 matrix
SZF PSEP/PSDDA, Microwave, Total acid digestion
TEC EPA 600/4-79-020 4.1.3, HCl matrix
TEG EPA 600/4-79-020 272.1, Silver in water
TEI EPA 600/4-79-020 200.7 and 9.3
TEN EPA 600/4-79-020 4.1.3, HNO_3 matrix
THG ARI, Silver in photographic solutions
TMM EPA 600/4-79-020 245.1, Mercury in water
TSC Standard Methods 302C, Sb/Sn in water
TSN Standard Methods 302D
TSS Standard Methods 302E, Ti in water
TWC USEPA SW-846 3010, HCl matrix
TWG USEPA SW-846 7760, Silver in water
TWN USEPA SW-846 3020, HNO_3 matrix
WMN EPA 600/4-79-020, Preserved, undigested water
XSC Standard Methods 302B

CONCENTRATION CODES

These codes are used to qualify reported concentrations:

U No analyte was detected. The reported value is the lower limit of detection.

METHOD CODES

These codes signify the instrumental technique used for analysis:

CVA Cold Vapor Atomic Absorption Spectrophotometry
FLA Flame Atomic Absorption Spectrophotometry
GFA Graphite Furnace Atomic Absorption Spectrophotometry
ICP Inductively Coupled Plasma Atomic Emission Spectrometry

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ARI job number: E367
ARI Sample number: C
Client: Dames & Moore
Contact: Dave Raubvogel
Matrix: Soil

% Solids: 0.00

ID number: PCSC-4-3-C
Project: 21199-032-005
Description:
Sampled: / /
Received: 07/19/93

Released by: _____

ANALYTICAL RESULTS

CAS Number	Analyte	Concentration	C	LOD	Prep	M	Analyzed
7440-38-2	Arsenic	0.05 mg/L	U	0.05	LEN	ICP	07/21/93
7440-39-3	Barium	0.801 mg/L		0.001	LEN	ICP	07/21/93
7440-43-9	Cadmium	0.002 mg/L	U	0.002	LEN	ICP	07/21/93
7440-47-3	Chromium	0.005 mg/L	U	0.005	LEN	ICP	07/21/93
7439-92-1	Lead	0.02 mg/L	U	0.02	LEN	ICP	07/21/93
7439-97-6	Mercury	0.0001 mg/L	U	0.0001	LEM	CVA	07/22/93
7782-49-2	Selenium	0.05 mg/L	U	0.05	LEN	ICP	07/21/93
7440-22-4	Silver	0.003 mg/L	U	0.003	LEN	ICP	07/21/93

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ARI job number: E367
ARI Sample number: CDUP
Client: Dames & Moore
Contact: Dave Raubvogel
Matrix: Soil

% Solids: 0.00

ID number: PCSC-4-3-C
Project: 21199-032-005
Description: Laboratory Duplicate
Sampled: / /
Received: 07/19/93

Released by: _____

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	LOD	Prep	M	Analyzed
7440-38-2	Arsenic	0.05 mg/L	U	0.05	LEN	ICP	07/21/93
7440-39-3	Barium	0.791 mg/L		0.001	LEN	ICP	07/21/93
7440-43-9	Cadmium	0.002 mg/L	U	0.002	LEN	ICP	07/21/93
7440-47-3	Chromium	0.005 mg/L	U	0.005	LEN	ICP	07/21/93
7439-92-1	Lead	0.02 mg/L	U	0.02	LEN	ICP	07/21/93
7439-97-6	Mercury	0.0001 mg/L	U	0.0001	LEM	CVA	07/22/93
7782-49-2	Selenium	0.05 mg/L	U	0.05	LEN	ICP	07/21/93
7440-22-4	Silver	0.003 mg/L	U	0.003	LEN	ICP	07/21/93

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Matrix Duplicate Quality Control Report

Client: Dames & Moore
Client's sample ID: PCSC-4-3-C
ARI sample ID: E367 CDUP
Units: mg/L

Analyte	Meth	Original Sample	Matrix Duplicate	RPD	Control Limit	Q
Arsenic	ICP	U 0.05	U 0.05	0.0	± 0.05	L
Barium	ICP	0.801	0.791	1.3	± 20 %	
Cadmium	ICP	U 0.002	U 0.002	0.0	± 0.002	L
Chromium	ICP	U 0.005	U 0.005	0.0	± 0.005	L
Lead	ICP	U 0.02	U 0.02	0.0	± 0.02	L
Mercury	CVA	U 0.0001	U 0.0001	0.0	±0.0001	L
Selenium	ICP	U 0.05	U 0.05	0.0	± 0.05	L
Silver	ICP	U 0.003	U 0.003	0.0	± 0.003	L

RPD = Relative Percent Difference

'Q' codes: '*' = control limit not met
'L' = RPD not valid, alternate limit = ± detection limit

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ARI job number: E367
ARI Sample number: CSPK
Client: Dames & Moore
Contact: Dave Raubvogel
Matrix: Soil

% Solids: 0.00

ID number: PCSC-4-3-C
Project: 21199-032-005
Description: Matrix Spike
Sampled: / /
Received: 07/19/93

Released by: _____

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	LOD	Prep	M	Analyzed
7440-38-2	Arsenic	5.27 mg/L		0.05	LEN	ICP	07/21/93
7440-39-3	Barium	5.81 mg/L		0.001	LEN	ICP	07/21/93
7440-43-9	Cadmium	1.01 mg/L		0.002	LEN	ICP	07/21/93
7440-47-3	Chromium	4.92 mg/L		0.005	LEN	ICP	07/21/93
7439-92-1	Lead	4.93 mg/L		0.02	LEN	ICP	07/21/93
7439-97-6	Mercury	0.0008 mg/L		0.0001	LEM	CVA	07/22/93
7782-49-2	Selenium	1.13 mg/L		0.05	LEN	ICP	07/21/93
7440-22-4	Silver	0.907 mg/L		0.003	LEN	ICP	07/21/93

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Matrix Spike Quality Control Report

Client: Dames & Moore
Client's sample ID: PCSC-4-3-C
ARI sample ID: E367 CSPK
Units: mg/L

Analyte	Meth	Sample	Matrix Spike	Spike Added	%R	Control Limit	Q
Arsenic	ICP	0	5.27	5.00	105.4	75-125%	
Barium	ICP	0.801	5.81	5.00	100.2	75-125%	
Cadmium	ICP	0	1.01	1.00	101.0	75-125%	
Chromium	ICP	0	4.92	5.00	98.4	75-125%	
Lead	ICP	0	4.93	5.00	98.6	75-125%	
Mercury	CVA	0	0.0008	0.0010	80.0	75-125%	
Selenium	ICP	0	1.13	1.00	113.0	75-125%	
Silver	ICP	0	0.907	1.000	90.7	75-125%	

%R = Percent Recovery

'Q' codes: 'N' = control limit not met
'H' = %R not applicable, sample concentration too high

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ARI job number: E367
ARI Sample number: G
Client: Dames & Moore
Contact: Dave Raubvogel
Matrix: Soil

% Solids: 0.00

ID number: PCSC-5-1-A
Project: 21199-032-005
Description:
Sampled: / /
Received: 07/20/93

Released by: _____

ANALYTICAL RESULTS

CAS Number	Analyte	Concentration	C	LOD	Prep	M	Analyzed
7440-38-2	Arsenic	0.05 mg/L	U	0.05	LEN	ICP	07/24/93
7440-39-3	Barium	1.03 mg/L		0.001	LEN	ICP	07/24/93
7440-43-9	Cadmium	0.002 mg/L	U	0.002	LEN	ICP	07/24/93
7440-47-3	Chromium	0.005 mg/L	U	0.005	LEN	ICP	07/24/93
7439-92-1	Lead	0.02 mg/L	U	0.02	LEN	ICP	07/24/93
7439-97-6	Mercury	0.0001 mg/L	U	0.0001	LEM	CVA	07/26/93
7782-49-2	Selenium	0.05 mg/L	U	0.05	LEN	ICP	07/24/93
7440-22-4	Silver	0.003 mg/L	U	0.003	LEN	ICP	07/24/93

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ARI job number: E367
ARI Sample number: GDUP
Client: Dames & Moore
Contact: Dave Raubvogel
Matrix: Soil

% Solids: 0.00

ID number: PCSC-5-1-A
Project: 21199-032-005
Description: Laboratory Duplicate
Sampled: / /
Received: 07/20/93

Released by: _____

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	LOD	Prep	M	Analyzed
7440-38-2	Arsenic	0.05 mg/L	U	0.05	LEN	ICP	07/27/93
7440-39-3	Barium	1.09 mg/L		0.001	LEN	ICP	07/27/93
7440-43-9	Cadmium	0.002 mg/L	U	0.002	LEN	ICP	07/27/93
7440-47-3	Chromium	0.005 mg/L	U	0.005	LEN	ICP	07/27/93
7439-92-1	Lead	0.02 mg/L	U	0.02	LEN	ICP	07/27/93
7439-97-6	Mercury	0.0001 mg/L	U	0.0001	LEM	CVA	07/26/93
7782-49-2	Selenium	0.05 mg/L	U	0.05	LEN	ICP	07/27/93
7440-22-4	Silver	0.003 mg/L	U	0.003	LEN	ICP	07/27/93

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Matrix Duplicate Quality Control Report

Client: Dames & Moore
Client's sample ID: PCSC-5-1-A
ARI sample ID: E367 GDUP
Units: mg/L

Analyte	Meth	Original Sample	Matrix Duplicate	RPD	Control Limit	Q
Arsenic	ICP	U 0.05	U 0.05	0.0	± 0.05	L
Barium	ICP	1.03	1.09	5.7	± 20 %	
Cadmium	ICP	U 0.002	U 0.002	0.0	± 0.002	L
Chromium	ICP	U 0.005	U 0.005	0.0	± 0.005	L
Lead	ICP	U 0.02	U 0.02	0.0	± 0.02	L
Mercury	CVA	U 0.0001	U 0.0001	0.0	±0.0001	L
Selenium	ICP	U 0.05	U 0.05	0.0	± 0.05	L
Silver	ICP	U 0.003	U 0.003	0.0	± 0.003	L

RPD = Relative Percent Difference

'Q' codes: '*' = control limit not met
'L' = RPD not valid, alternate limit = ± detection limit

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ARI job number: E367
ARI Sample number: GSPK
Client: Dames & Moore
Contact: Dave Raubvogel
Matrix: Soil

% Solids: 0.00

ID number: PCSC-5-1-A
Project: 21199-032-005
Description: Matrix Spike
Sampled: / /
Received: 07/20/93

Released by: _____

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	LOD	Prep	M	Analyzed
7440-38-2	Arsenic	5.22 mg/L		0.05	LEN	ICP	07/24/93
7440-39-3	Barium	5.95 mg/L		0.001	LEN	ICP	07/24/93
7440-43-9	Cadmium	1.00 mg/L		0.002	LEN	ICP	07/24/93
7440-47-3	Chromium	4.92 mg/L		0.005	LEN	ICP	07/24/93
7439-92-1	Lead	4.74 mg/L		0.02	LEN	ICP	07/24/93
7439-97-6	Mercury	0.0010 mg/L		0.0001	LEM	CVA	07/26/93
7782-49-2	Selenium	1.07 mg/L		0.05	LEN	ICP	07/24/93
7440-22-4	Silver	0.907 mg/L		0.003	LEN	ICP	07/24/93

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Matrix Spike Quality Control Report

Client: Dames & Moore
Client's sample ID: PCSC-5-1-A
ARI sample ID: E367 GSPK
Units: mg/L

Analyte	Meth	Sample	Matrix Spike	Spike Added	%R	Control Limit	Q
Arsenic	ICP	0	5.22	5.00	104.4	75-125%	
Barium	ICP	1.03	5.95	5.00	98.4	75-125%	
Cadmium	ICP	0	1.00	1.00	100.0	75-125%	
Chromium	ICP	0	4.92	5.00	98.4	75-125%	
Lead	ICP	0	4.74	5.00	94.8	75-125%	
Mercury	CVA	0	0.0010	0.0010	100.0	75-125%	
Selenium	ICP	0	1.07	1.00	107.0	75-125%	
Silver	ICP	0	0.907	1.000	90.7	75-125%	

%R = Percent Recovery

'Q' codes: 'N' = control limit not met
'H' = %R not applicable, sample concentration too high

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ARI job number: E367
ARI Sample number: H
Client: Dames & Moore
Contact: Dave Raubvogel
Matrix: Soil

% Solids: 0.00

ID number: PCSC-5-2-C
Project: 21199-032-005
Description:
Sampled: / /
Received: 07/20/93

Released by: _____

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	LOD	Prep	M	Analyzed
7440-38-2	Arsenic	0.05 mg/L	U	0.05	LEN	ICP	07/24/93
7440-39-3	Barium	0.931 mg/L		0.001	LEN	ICP	07/24/93
7440-43-9	Cadmium	0.002 mg/L	U	0.002	LEN	ICP	07/24/93
7440-47-3	Chromium	0.005 mg/L	U	0.005	LEN	ICP	07/24/93
7439-92-1	Lead	0.02 mg/L	U	0.02	LEN	ICP	07/24/93
7439-97-6	Mercury	0.0001 mg/L	U	0.0001	LEM	CVA	07/26/93
7782-49-2	Selenium	0.05 mg/L	U	0.05	LEN	ICP	07/24/93
7440-22-4	Silver	0.003 mg/L	U	0.003	LEN	ICP	07/24/93

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ARI job number: E367
ARI Sample number: I
Client: Dames & Moore
Contact: Dave Raubvogel
Matrix: Soil

% Solids: 0.00

ID number: PCSC-5-3-B
Project: 21199-032-005
Description:
Sampled: / /
Received: 07/20/93

Released by:

ANALYTICAL RESULTS

CAS Number	Analyte	Concentration	C	LOD	Prep	M	Analyzed
7440-38-2	Arsenic	0.05 mg/L	U	0.05	LEN	ICP	07/24/93
7440-39-3	Barium	0.842 mg/L		0.001	LEN	ICP	07/24/93
7440-43-9	Cadmium	0.002 mg/L	U	0.002	LEN	ICP	07/24/93
7440-47-3	Chromium	0.005 mg/L	U	0.005	LEN	ICP	07/24/93
7439-92-1	Lead	0.02 mg/L	U	0.02	LEN	ICP	07/24/93
7439-97-6	Mercury	0.0001 mg/L	U	0.0001	LEM	CVA	07/26/93
7782-49-2	Selenium	0.05 mg/L	U	0.05	LEN	ICP	07/24/93
7440-22-4	Silver	0.003 mg/L	U	0.003	LEN	ICP	07/24/93

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ARI job number: E367
ARI Sample number: J
Client: Dames & Moore
Contact: Dave Raubvogel
Matrix: Soil

% Solids: 0.00

ID number: PCSC-5-4-D
Project: 21199-032-005
Description:
Sampled: / /
Received: 07/20/93

Released by: _____

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	LOD	Prep	M	Analyzed
7440-38-2	Arsenic	0.05 mg/L	U	0.05	LEN	ICP	07/24/93
7440-39-3	Barium	1.18 mg/L		0.001	LEN	ICP	07/24/93
7440-43-9	Cadmium	0.002 mg/L	U	0.002	LEN	ICP	07/24/93
7440-47-3	Chromium	0.005 mg/L	U	0.005	LEN	ICP	07/24/93
7439-92-1	Lead	0.02 mg/L	U	0.02	LEN	ICP	07/24/93
7439-97-6	Mercury	0.0001 mg/L	U	0.0001	LEM	CVA	07/26/93
7782-49-2	Selenium	0.05 mg/L	U	0.05	LEN	ICP	07/24/93
7440-22-4	Silver	0.003 mg/L	U	0.003	LEN	ICP	07/24/93

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ARI job number: E367
ARI Sample number: K
Client: Dames & Moore
Contact: Dave Raubvogel
Matrix: Soil

% Solids: 0.00

ID number: PCSC-5-5-B
Project: 21199-032-005
Description:
Sampled: / /
Received: 07/20/93

Released by: _____

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	LOD	Prep	M	Analyzed
7440-38-2	Arsenic	0.05 mg/L	U	0.05	LEN	ICP	07/24/93
7440-39-3	Barium	0.714 mg/L		0.001	LEN	ICP	07/24/93
7440-43-9	Cadmium	0.002 mg/L	U	0.002	LEN	ICP	07/24/93
7440-47-3	Chromium	0.005 mg/L	U	0.005	LEN	ICP	07/24/93
7439-92-1	Lead	0.02 mg/L	U	0.02	LEN	ICP	07/24/93
7439-97-6	Mercury	0.0001 mg/L	U	0.0001	LEM	CVA	07/26/93
7782-49-2	Selenium	0.05 mg/L	U	0.05	LEN	ICP	07/24/93
7440-22-4	Silver	0.003 mg/L	U	0.003	LEN	ICP	07/24/93

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ARI job number: E367
ARI Sample number: MB
Client: Dames & Moore
Contact: Dave Raubvogel
Matrix: Soil

% Solids: 0.00

ID number:
Project: 21199-032-005
Description: Method Blank
Sampled: / /
Received: / /

Released by: _____

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	LOD	Prep	M	Analyzed
7440-38-2	Arsenic	0.05 mg/L	U	0.05	LEN	ICP	07/21/93
7440-39-3	Barium	0.241 mg/L		0.001	LEN	ICP	07/21/93
7440-43-9	Cadmium	0.002 mg/L	U	0.002	LEN	ICP	07/21/93
7440-47-3	Chromium	0.005 mg/L	U	0.005	LEN	ICP	07/21/93
7439-92-1	Lead	0.02 mg/L	U	0.02	LEN	ICP	07/21/93
7439-97-6	Mercury	0.0001 mg/L	U	0.0001	LEM	CVA	07/22/93
7782-49-2	Selenium	0.05 mg/L	U	0.05	LEN	ICP	07/21/93
7440-22-4	Silver	0.003 mg/L	U	0.003	LEN	ICP	07/21/93

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ARI job number: E367
ARI Sample number: MB2
Client: Dames & Moore
Contact: Dave Raubvogel
Matrix: Soil

% Solids: 0.00

ID number:
Project: 21199-032-005
Description: Method Blank
Sampled: / /
Received: / /

Released by: _____

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	LOD	Prep	M	Analyzed
7440-38-2	Arsenic	0.05 mg/L	U	0.05	LEN	ICP	07/24/93
7440-39-3	Barium	0.033 mg/L		0.001	LEN	ICP	07/24/93
7440-43-9	Cadmium	0.002 mg/L	U	0.002	LEN	ICP	07/24/93
7440-47-3	Chromium	0.005 mg/L	U	0.005	LEN	ICP	07/24/93
7439-92-1	Lead	0.02 mg/L	U	0.02	LEN	ICP	07/24/93
7439-97-6	Mercury	0.0001 mg/L	U	0.0001	LEM	CVA	07/26/93
7782-49-2	Selenium	0.05 mg/L	U	0.05	LEN	ICP	07/24/93
7440-22-4	Silver	0.003 mg/L	U	0.003	LEN	ICP	07/24/93

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ORGANICS ANALYSIS DATA SHEET
PNAs by GC/MS
Sample ID: E367mbs
Matrix: Soils/Sediments

Sample No: Method Blank

QC Report No: E367 - Dames & Moore
Project No: 21199-032-005
Trans Mtn. Characterization
VTSR: NA

Date Release Authorized: _____
Report: 07/27/93 MAC: sk

Date extracted: 07/21/93
Analyzed (FINN 4): 07/26/93
GPC Clean-up: Yes
Final Volume: 2.0 mL

Sample Wt: 15.0 g (Dry Weight Equiv.)
Percent Moisture: NA
pH: NA
Conc/Dilution: 1 to 1

CAS Number		µg/Kg
91-20-3	*Naphthalene*	*130 U*
91-57-6	*2-Methylnaphthalene*	*130 U*
208-96-8	*Acenaphthylene*	*130 U*
83-32-9	*Acenaphthene*	*130 U*
132-64-9	*Dibenzofuran*	*130 U*
86-73-7	*Fluorene*	*130 U*
85-01-8	*Phenanthrene*	*130 U*
120-12-7	*Anthracene*	*130 U*
206-44-0	*Fluoranthene*	*130 U*
129-00-0	*Pyrene*	*130 U*
56-55-3	*Benzo(a)Anthracene*	*130 U*
218-01-9	*Chrysene*	*130 U*
205-99-2	*Benzo(b)Fluoranthene*	*130 U*
207-08-9	*Benzo(k)Fluoranthene*	*130 U*
50-32-8	*Benzo(a)Pyrene*	*130 U*
193-39-5	*Indeno(1,2,3-cd)Pyrene*	*130 U*
53-70-3	*Dibenz(a,h)Anthracene*	*130 U*
191-24-2	*Benzo(ghi)Perylene*	*130 U*

Base/neutral surrogate recoveries

d14-p-Terphenyl	108%
d10-Diphenyl	76.4%

Data Reporting Qualifiers

Value — If the result is a value greater than or equal to the detection limit, report the value.

U — Indicates compound was analyzed for but not detected at the given detection limit.

J — Indicates an estimated value when result is less than specified detection limit.

NR — Analysis not required.

B — This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.

K — This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

M — Indicates an estimated value of analyte found and confirmed by analyst but with low spectral match parameters.

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ORGANICS ANALYSIS DATA SHEET
PNAs by GC/MS
Sample ID: E367G
Matrix: Soils/Sediments

Sample No: PCSC-5-1-A

QC Report No: E367 - Dames & Moore
Project No: 21199-032-005
Trans Mtn. Characterization
VTSR: 07/19/93

Date Release Authorized:
Report: 07/27/93 MAC: sk

Date extracted: 07/21/93
Analyzed (FINN 4): 07/26/93
GPC Clean-up: Yes
Final Volume: 2.0 mL

Sample Wt: 12.2 g (Dry Weight)
Percent Moisture: 20.3%
pH: 7.1
Conc/Dilution: 1 to 1

CAS Number		µg/Kg
91-20-3	**Naphthalene**	**1400**
91-57-6	**2-Methylnaphthalene**	**7500**
208-96-8	*Acenaphthylene*	*160 U*
83-32-9	*Acenaphthene*	*160 U*
132-64-9	**Dibenzofuran**	**320 M**
86-73-7	**Fluorene**	**1100**
85-01-8	**Phenanthrene**	**1800**
120-12-7	*Anthracene*	*160 U*
206-44-0	*Fluoranthene*	*160 U*
129-00-0	**Pyrene**	**360**
56-55-3	*Benzo(a)Anthracene*	*160 U*
218-01-9	**Chrysene**	**720**
205-99-2	*Benzo(b)Fluoranthene*	*160 U*
207-08-9	*Benzo(k)Fluoranthene*	*160 U*
50-32-8	*Benzo(a)Pyrene*	*160 U*
193-39-5	*Indeno(1,2,3-cd)Pyrene*	*160 U*
53-70-3	*Dibenz(a,h)Anthracene*	*160 U*
191-24-2	*Benzo(ghi)Perylene*	*160 U*

Base/neutral surrogate recoveries

d14-p-Terphenyl	118%
d10-Diphenyl	80.5%

Data Reporting Qualifiers

Value — If the result is a value greater than or equal to the detection limit, report the value.

U — Indicates compound was analyzed for but not detected at the given detection limit.

J — Indicates an estimated value when result is less than specified detection limit.

NR — Analysis not required.

B — This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.

K — This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

M — Indicates an estimated value of analyte found and confirmed by analyst but with low spectral match parameters.

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ORGANICS ANALYSIS DATA SHEET
PNAs by GC/MS
Sample ID: E367J
Matrix: Soils/Sediments

Sample No: PCSC-5-4-D

QC Report No: E367 - Dames & Moore
Project No: 21199-032-005
Trans Mtn. Characterization
VTSR: 07/19/93

Date Release Authorized:
Report: 07/27/93 MAC: sk

Date extracted: 07/21/93
Analyzed (FINN 4): 07/26/93
GPC Clean-up: Yes
Final Volume: 2.0 mL

Sample Wt: 11.8 g (Dry Weight)
Percent Moisture: 22.3%
pH: 7.1
Conc/Dilution: 1 to 1

CAS Number		µg/Kg
91-20-3	**Naphthalene**	**2500**
91-57-6	**2-Methylnaphthalene**	**11000**
208-96-8	*Acenaphthylene*	*170 U*
83-32-9	*Acenaphthene*	*170 U*
132-64-9	**Dibenzofuran**	**320 M**
86-73-7	**Fluorene**	**1000**
85-01-8	**Phenanthrene**	**1900**
120-12-7	*Anthracene*	*170 U*
206-44-0	**Fluoranthene**	**360 M**
129-00-0	**Pyrene**	**520**
56-55-3	**Benzo(a)Anthracene**	**150 M**
218-01-9	**Chrysene**	**720**
205-99-2	**Benzo(b)Fluoranthene**	
207-08-9	**Benzo(k)Fluoranthene**	**230**
50-32-8	**Benzo(a)Pyrene**	**85 J**
193-39-5	*Indeno(1,2,3-cd)Pyrene*	*170 U*
53-70-3	*Dibenz(a,h)Anthracene*	*170 U*
191-24-2	*Benzo(ghi)Perylene*	*170 U*

Base/neutral surrogate recoveries

d14-p-Terphenyl	102%
d10-Diphenyl	75.2%

Data Reporting Qualifiers

Value	If the result is a value greater than or equal to the detection limit, report the value.
U	Indicates compound was analyzed for but not detected at the given detection limit.
J	Indicates an estimated value when result is less than specified detection limit.
NR	Analysis not required.
B	This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.
K	This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.
M	Indicates an estimated value of analyte found and confirmed by analyst but with low spectral match parameters.

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(206) 621-7523 (FAX)

ORGANICS ANALYSIS DATA SHEET
PNAs by GC/MS
Sample ID: E367JdI
Matrix: Soils/Sediments

Sample No: PCSC-5-4-D

QC Report No: E367 - Dames & Moore
Project No: 21199-032-005
Trans Mtn. Characterization
VTSR: 07/19/93

Date Release Authorized: _____
Report: 07/27/93 MAC: sk

Date extracted: 07/21/93
Analyzed (FINN 4): 07/27/93
GPC Clean-up: Yes
Final Volume: 2.0 mL

Sample Wt: 11.8 g (Dry Weight)
Percent Moisture: 22.3%
pH: 7.1
Conc/Dilution: 1 to 2

CAS Number		µg/Kg
91-20-3	**Naphthalene**	**2500**
91-57-6	**2-Methylnaphthalene**	**11000**
208-96-8	*Acenaphthylene*	*340 U*
83-32-9	*Acenaphthene*	*340 U*
132-64-9	**Dibenzofuran**	**290 M**
86-73-7	**Fluorene**	**1000**
85-01-8	**Phenanthrene**	**2000**
120-12-7	*Anthracene*	*340 U*
206-44-0	**Fluoranthene**	**390**
129-00-0	**Pyrene**	**560**
56-55-3	*Benzo(a)Anthracene*	*340 U*
218-01-9	**Chrysene**	**750**
205-99-2	*Benzo(b)Fluoranthene*	*340 U*
207-08-9	*Benzo(k)Fluoranthene*	*340 U*
50-32-8	*Benzo(a)Pyrene*	*340 U*
193-39-5	*Indeno(1,2,3-cd)Pyrene*	*340 U*
53-70-3	*Dibenz(a,h)Anthracene*	*340 U*
191-24-2	*Benzo(ghi)Perylene*	*340 U*

Base/neutral surrogate recoveries

d14-p-Terphenyl	104%
d10-Diphenyl	78.0%

Data Reporting Qualifiers

Value	If the result is a value greater than or equal to the detection limit, report the value.
U	Indicates compound was analyzed for but not detected at the given detection limit.
J	Indicates an estimated value when result is less than specified detection limit.
NR	Analysis not required.
B	This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.
K	This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.
M	Indicates an estimated value of analyte found and confirmed by analyst but with low spectral match parameters.

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ORGANICS ANALYSIS DATA SHEET
PNAs by GC/MS
Sample ID: E367mbmr
Matrix: Soils/Sediments

Sample No: Method Blank

QC Report No: E367 - Dames & Moore
Project No: 21199-032-005
Trans Mtn. Characterization
VTSR: NA

Date Release Authorized: _____
Report: 07/27/93 MAC: sk

Date extracted: 07/21/93
Analyzed (FINN 4): 07/23/93
GPC Clean-up: No
Final Volume: 2.0 mL

Sample Wt: 2.00 g (Dry Weight Equiv.)
Percent Moisture: NA
pH: NA
Conc/Dilution: 1 to 1

CAS Number		µg/Kg
91-20-3	Naphthalene	1000 U
91-57-6	2-Methylnaphthalene	1000 U
208-96-8	Acenaphthylene	1000 U
83-32-9	Acenaphthene	1000 U
132-64-9	Dibenzofuran	1000 U
86-73-7	Fluorene	1000 U
85-01-8	Phenanthrene	1000 U
120-12-7	Anthracene	1000 U
206-44-0	Fluoranthene	1000 U
129-00-0	Pyrene	1000 U
56-55-3	Benzo(a)Anthracene	1000 U
218-01-9	Chrysene	1000 U
205-99-2	Benzo(b)Fluoranthene	1000 U
207-08-9	Benzo(k)Fluoranthene	1000 U
50-32-8	Benzo(a)Pyrene	1000 U
193-39-5	Indeno(1,2,3-cd)Pyrene	1000 U
53-70-3	Dibenz(a,h)Anthracene	1000 U
191-24-2	Benzo(ghi)Perylene	1000 U

Base/neutral surrogate recoveries

d14-p-Terphenyl	114%
d10-Diphenyl	92.9%

Data Reporting Qualifiers

Value — If the result is a value greater than or equal to the detection limit, report the value.

U — Indicates compound was analyzed for but not detected at the given detection limit.

J — Indicates an estimated value when result is less than specified detection limit.

NR — Analysis not required.

B — This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.

K — This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

M — Indicates an estimated value of analyte found and confirmed by analyst but with low spectral match parameters.

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ORGANICS ANALYSIS DATA SHEET
PNAs by GC/MS
Sample ID: E367C
Matrix: Soils/Sediments

Sample No: PCSC-4-3-C

QC Report No: E367 - Dames & Moore
Project No: 21199-032-005
Trans Mtn. Characterization
VTSR: 07/19/93

Date Release Authorized: _____
Report: 07/27/93 MAC: sk

Date extracted: 07/21/93
Analyzed (FINN 4): 07/23/93
GPC Clean-up: No
Final Volume: 2.0 mL

Sample Wt: 1.54 g (Dry Weight)
Percent Moisture: 22.9%
pH: 6.7
Conc/Dilution: 1 to 1

CAS Number		µg/Kg
91-20-3	**Naphthalene**	**8600**
91-57-6	**2-Methylnaphthalene**	**25000**
208-96-8	*Acenaphthylene*	*1300 U*
83-32-9	**Acenaphthene**	**840 M**
132-64-9	**Dibenzofuran**	**3000**
86-73-7	**Fluorene**	**3300 M**
85-01-8	**Phenanthrene**	**5700**
120-12-7	**Anthracene**	**1200 M**
206-44-0	**Fluoranthene**	**3400**
129-00-0	**Pyrene**	**3300**
56-55-3	**Benzo(a)Anthracene**	**940 J**
218-01-9	**Chrysene**	**1900**
205-99-2	*Benzo(b)Fluoranthene*	*1300 U*
207-08-9	*Benzo(k)Fluoranthene*	*1300 U*
50-32-8	*Benzo(a)Pyrene*	*1300 U*
193-39-5	*Indeno(1,2,3-cd)Pyrene*	*1300 U*
53-70-3	*Dibenz(a,h)Anthracene*	*1300 U*
191-24-2	*Benzo(ghi)Perylene*	*1300 U*

Base/neutral surrogate recoveries

d14-p-Terphenyl	129%
d10-Diphenyl	98.8%

Data Reporting Qualifiers

Value — If the result is a value greater than or equal to the detection limit, report the value.

U — Indicates compound was analyzed for but not detected at the given detection limit.

J — Indicates an estimated value when result is less than specified detection limit.

NR — Analysis not required.

B — This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.

K — This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

M — Indicates an estimated value of analyte found and confirmed by analyst but with low spectral match parameters.

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SOIL SEMIVOLATILE BLANK SPIKE RECOVERY

ARI Sample ID: E367sb

Instrument ID: FINN 4

Client: Dames & Moore
Project: 21199-032-005
Trans Mtn. Characterization

Report: MAC:sk 07/27/93
mH

Date extracted: 07/21/93
Date analyzed: 07/23/93

COMPOUND	SPIKE ADDED (µg/Kg)	SAMPLE CONC (µg/Kg)	SB CONC (µg/Kg)	SB REC	QC LIMITS REC
Acenaphthene	3330	0	3720	112	31-137
Fluoranthene	3330	0	4550	137	NA
Benzo(a)anthracene	3330	0	4040	121	NA

Base/neutral surrogate recoveries

d14-p-Terphenyl	127%
d10-Diphenyl	98.2%

Asterisked values outside QC Limits

Comments:

9 March 1992

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David Maltby
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032 Trans Mtn.:
ARI Job #A027

Dear David:

Please find enclosed the results and original chain-of-custody report for the above referenced project. Ten samples and a trip blank arrived in good condition on 2/21/92, and the analyses proceeded without incident.

The analyst notes that samples Burn Pit #1 and Burn Pit #2 were re-extracted and re-analyzed for HCID because the original results were so disparate. The second run confirmed the results of the first, so the original values are reported here.

Samples for volatile organics analysis were first extracted at medium level, which was found to give unnecessarily high detection limits. Both samples were re-run at higher concentration, and all results are reported here.

If you have any questions or need further information, please feel free to call any time. I can be reached at the number above, or direct at 340-2867, ext. 117, where you can also leave a message if I'm not available.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoel

Kate Stegemoeller
Project Coordinator

KAS/ks

Enclosures

cc: file#A027

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

BTEX = gasoline Range priority pollutant

~~Boring or Well~~ Number	Sample Number	~~Depth~~ Date	Time	Sample Type	Container Type	VOA 601/8010	VOA 602/8020 X	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (M) X	~~HILL-22~~ METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	TPH-HCID	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
TMB12X-10'		2/19	9:00	S	3" Rings															✓			1	
TMB10X-15'		2/17	9:15	S																✓			1	
TMB11X-5'		2/18	8:45	S																✓			1	
TMB13X-24'		2/20	9:58	S																✓			1	
TMB14X-34'		2/21	9:45	S																✓			1	
BumPit #1		2/19	3:00	S	803 glass 403 glass 203 VOA, 403 plastic		✓	✓			✓									✓			4	
BumPit #1 DUP		2/19	3:00	S	"		✓	✓			✓									✓			4	
SWRO-C36		2/20	1:20	W	1L amber 2 VOA					✓													3	
SWRO D2-17		2/20	1:30	W	"					✓													3	
SWRO D3-17		2/20	2:40	W	"					✓													3	
T180-022092		2/20	15:30	W	"		✓		✓													Rush-72 Hr. Turn*	3	
Trip Blank		2/2	—	W	one VOA																		1	
																						Total	26	

RELINQUISHED BY: (Signature) Daniel Watters DATE/TIME 4:00 2/21/92 RECEIVED BY: (Signature) Jen Tellen

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

LABORATORY NOTES:

*Need verbal Results on T180-022092 as soon as available-
Will Check Monday afternoon 2/24 for availability
Rest of analysis - Standard turnaround time

A.R.I. # A027

ANALYTICAL LABORATORY: ARI

LABORATORY CONTACT: Terri Hedger

D&M CONTACT: Dave Maltby PHONE: 728-0744

JOB NO.: 21199-032 SHEET 1 OF 1

PROJECT Transmountain

LOCATION Laurel Station

COLLECTOR DSW/JKM DATE OF COLLECTION Varied

DAMES & MOORE
500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

Q.C. logged seperately. as now

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TOTAL PETROLEUM HYDROCARBONS
WA HCID Method by GC/FID

QC Report No: A027-Dames & Moore
Project: 21199-032
Trans Mtn.
VTSR: 02/21/92

Matrix: Soils/Sediments

Data Release Authorized _____
Data Prepared: 2/26/92 - MAC:K kas

Date extracted: 02/24/92
Dates Analyzed: 02/25/92

Lab ID	Client Sample ID	Dilution Factor	Petroleum Hydrocarbons †	TPH ID *	Surrogate Recovery
A027 MB	*Method Blank*	-	10 U	-	90.1%
A027 A	TMB12X-10'	-	10 U	No	97.8%
A027 B	TMB10X-15'	-	10 U	No	103%
A027 C	**TMB11X-5'**	-	**2000**	**Diesel**	127%
A027 D	TMB13X-24'	-	10 U	No	90.6%
A027 E	**TMB14X-34'**	-	**20**	**Diesel**	93.6%
A027 F	**Burn Pit #1**	-	**170**	**Diesel**	91.8%
A027 G	Burn Pit #1 dup.	-	10 U	No	100%

Surrogate is Me-Arachidate.

Values reported in ppm (mg/Kg).

U Indicates compound was analyzed for but not detected at the given detection limit.
X Indicates a value above the linear range of the detector. Dilution required.
* In the opinion of the analyst, was there a pattern match for diesel or gasoline.
† Value based on total peaks in the range from Toluene to C24.
NR Indicates the surrogate was not recovered due to dilution or matrix effect.

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ORGANICS ANALYSIS DATA SHEET - METHOD 8270

Sample No: Method Blank

Sample ID: MB-0226 re
Matrix: Soils/Sediments

Data Release Authorized: _____
Report prepared: 03/05/92 - MAC: RPR

QC Report No: A027-Dames & Moore
Project No: 21199-032-Trans Mtn.
VTSR: NA
Sample Weight: 30 gm (Equiv. Dry Wt.)
%Moisture: NA
pH: NA
Final Ext. Vol.: 1.0 mls.
Conc/Dilution: 1 to 1

Date Extracted: 02/26/92
Date Analyzed (FINN 6): 03/04/92
GPC Cleanup: No(1 of 2)

CAS Number		µg/Kg
108-95-2	Phenol	130 U
111-44-4	bis(2-Chloroethyl)Ether	67 U
95-57-8	2-Chlorophenol	67 U
541-73-1	1,3-Dichlorobenzene	67 U
106-46-7	1,4-Dichlorobenzene	67 U
100-51-6	Benzyl Alcohol	330 U
95-50-1	1,2-Dichlorobenzene	67 U
95-48-7	2-Methylphenol	67 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	67 U
106-44-5	4-Methylphenol	67 U
621-64-7	N-Nitroso-Di-n-Propylamine	67 U
67-72-1	Hexachloroethane	130 U
98-95-3	Nitrobenzene	67 U
78-59-1	Isophorone	67 U
88-75-5	2-Nitrophenol	330 U
105-67-9	2,4-Dimethylphenol	130 U
65-85-0	Benzoic Acid	670 U
111-91-1	bis(2-Chloroethoxy)Methane	67 U
120-83-2	2,4-Dichlorophenol	200 U
120-82-1	1,2,4-Trichlorobenzene	67 U
91-20-3	Naphthalene	67 U
106-47-8	4-Chloroaniline	200 U
87-68-3	Hexachlorobutadiene	130 U
59-50-7	4-Chloro-3-Methylphenol	130 U
91-57-6	2-Methylnaphthalene	67 U
77-47-4	Hexachlorocyclopentadiene	330 U
88-06-2	2,4,6-Trichlorophenol	330 U
95-95-4	2,4,5-Trichlorophenol	330 U
91-58-7	2-Chloronaphthalene	67 U
88-74-4	2-Nitroaniline	330 U
131-11-3	Dimethyl Phthalate	67 U
208-96-8	Acenaphthylene	67 U
99-09-2	3-Nitroaniline	330 U

CAS Number		µg/Kg
83-32-9	Acenaphthene	67 U
51-28-5	2,4-Dinitrophenol	670 U
100-02-7	4-Nitrophenol	330 U
132-64-9	Dibenzofuran	67 U
121-14-2	2,4-Dinitrotoluene	330 U
606-20-2	2,6-Dinitrotoluene	330 U
84-66-2	Diethylphthalate	67 U
7005-72-3	4-Chlorophenyl-phenylether	67 U
86-73-7	Fluorene	67 U
100-01-6	4-Nitroaniline	330 U
534-52-1	4,6-Dinitro-2-Methylphenol	670 U
86-30-6	N-Nitrosodiphenylamine(1)	67 U
101-55-3	4-Bromophenyl-phenylether	67 U
118-74-1	Hexachlorobenzene	67 U
87-86-5	Pentachlorophenol	330 U
85-01-8	Phenanthrene	67 U
86-74-8	Carbazole	67 U
120-12-7	Anthracene	67 U
84-74-2	Di-n-Butylphthalate	67 U
206-44-0	Fluoranthene	67 U
129-00-0	Pyrene	67 U
85-68-7	Butylbenzylphthalate	67 U
91-94-1	3,3'-Dichlorobenzidine	330 U
56-55-3	Benzo(a)Anthracene	67 U
117-81-7	bis(2-Ethylhexyl)Phthalate	67 U
218-01-9	Chrysene	67 U
117-84-0	Di-n-Octyl Phthalate	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(ghi)Perylene	67 U

(1) Cannot be separated from diphenylamine

***Base/neutral surrogate recoveries**

d5-Nitrobenzene	67.0%
2-Fluorobiphenyl	55.2%
d14-p-Terphenyl	80.3%
d4 1,2-Dichlorobenzene	62.8%

***Acid surrogate recoveries**

d5-Phenol	51.2%
2-Fluorophenol	53.1%
2,4,6-Tribromophenol	42.4%
d4 2-Chlorophenol	59.6%

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ORGANICS ANALYSIS DATA SHEET - METHOD 8270

Sample No: Burn Pit #1

Sample ID: A027 - F re
Matrix: Soils/Sediments

Data Release Authorized: MW
Report prepared: 03/05/92 - MAC: RPR

QC Report No: A027-Dames & Moore
Project No: 21199-032-Trans Mtn.
VTSR: 02/21/92
Sample Weight: 29.1 gm (Dry Wt.)
%Moisture: 18.0
pH: 6.38
Final Ext. Vol.: 2.0 mls.
Conc/Dilution: 1 to 1

Date Extracted: 02/26/92
Date Analyzed (FINN 6): 03/04/92
GPC Cleanup: No (1 of 2)

CAS Number		µg/Kg
108-95-2	Phenol	140 U
111-44-4	bis(2-Chloroethyl)Ether	69 U
95-57-8	2-Chlorophenol	69 U
541-73-1	1,3-Dichlorobenzene	69 U
106-46-7	1,4-Dichlorobenzene	69 U
100-51-6	Benzyl Alcohol	340 U
95-50-1	1,2-Dichlorobenzene	69 U
95-48-7	2-Methylphenol	69 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	69 U
106-44-5	4-Methylphenol	69 U
621-64-7	N-Nitroso-Di-n-Propylamine	69 U
67-72-1	Hexachloroethane	140 U
98-95-3	Nitrobenzene	69 U
78-59-1	Isophorone	69 U
88-75-5	2-Nitrophenol	340 U
105-67-9	2,4-Dimethylphenol	140 U
65-85-0	Benzoic Acid	690 U
111-91-1	bis(2-Chloroethoxy)Methane	69 U
120-83-2	2,4-Dichlorophenol	210 U
120-82-1	1,2,4-Trichlorobenzene	69 U
91-20-3	**Naphthalene**	**150**
106-47-8	4-Chloroaniline	210 U
87-68-3	Hexachlorobutadiene	140 U
59-50-7	4-Chloro-3-Methylphenol	140 U
91-57-6	**2-Methylnaphthalene**	**750**
77-47-4	Hexachlorocyclopentadiene	340 U
88-06-2	2,4,6-Trichlorophenol	340 U
95-95-4	2,4,5-Trichlorophenol	340 U
91-58-7	2-Chloronaphthalene	69 U
88-74-4	2-Nitroaniline	340 U
131-11-3	Dimethyl Phthalate	69 U
208-96-8	Acenaphthylene	69 U
99-09-2	3-Nitroaniline	340 U

CAS Number		µg/Kg
83-32-9	Acenaphthene	69 U
51-28-5	2,4-Dinitrophenol	690 U
100-02-7	4-Nitrophenol	340 U
132-64-9	Dibenzofuran	69 U
121-14-2	2,4-Dinitrotoluene	340 U
606-20-2	2,6-Dinitrotoluene	340 U
84-66-2	Diethylphthalate	69 U
7005-72-3	4-Chlorophenyl-phenylether	69 U
86-73-7	**Fluorene**	**82 M**
100-01-6	4-Nitroaniline	340 U
534-52-1	4,6-Dinitro-2-Methylphenol	690 U
86-30-6	**N-Nitrosodiphenylamine(1)**	**200 M**
101-55-3	4-Bromophenyl-phenylether	69 U
118-74-1	Hexachlorobenzene	69 U
87-86-5	Pentachlorophenol	340 U
85-01-8	**Phenanthrene**	**180**
86-74-8	Carbazole	69 U
120-12-7	Anthracene	69 U
84-74-2	Di-n-Butylphthalate	69 U
206-44-0	**Fluoranthene**	**67 J**
129-00-0	**Pyrene**	**77**
85-68-7	Butylbenzylphthalate	69 U
91-94-1	3,3'-Dichlorobenzidine	340 U
56-55-3	Benzo(a)Anthracene	69 U
117-81-7	bis(2-Ethylhexyl)Phthalate	69 U
218-01-9	**Chrysene**	**55 J**
117-84-0	Di-n-Octyl Phthalate	69 U
205-99-2	Benzo(b)Fluoranthene	69 U
207-08-9	Benzo(k)Fluoranthene	69 U
50-32-8	Benzo(a)Pyrene	69 U
193-39-5	Indeno(1,2,3-cd)Pyrene	69 U
53-70-3	Dibenz(a,h)Anthracene	69 U
191-24-2	Benzo(ghi)Perylene	69 U

(1) Cannot be separated from diphenylamine

***Base/neutral surrogate recoveries**

d5-Nitrobenzene	61.2%
2-Fluorobiphenyl	69.0%
d14-p-Terphenyl	74.0%
d4 1,2-Dichlorobenzene	60.6%

***Acid surrogate recoveries**

d5-Phenol	56.2%
2-Fluorophenol	49.6%
2,4,6-Tribromophenol	68.3%
d4 2-Chlorophenol	62.1%

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ORGANICS ANALYSIS DATA SHEET - METHOD 8270

Sample No: Burn Pit #1 Dup

Sample ID: A027 - G re
Matrix: Soils/Sediments

Data Release Authorized: MW
Report prepared: 03/05/92 - MAC: RPR

QC Report No: A027-Dames & Moore
Project No: 21199-032-Trans Mtn.
VTSR: 02/21/92
Sample Weight: 26.9 gm (Dry Wt.)
%Moisture: 17.9
pH: 6.70
Final Ext. Vol.: 2.0 mls.
Conc/Dilution: 1 to 1

Date Extracted: 02/26/92
Date Analyzed (FINN 6): 03/04/92
GPC Cleanup: No (1 of 2)

CAS Number		µg/Kg
108-95-2	Phenol	150 U
111-44-4	bis(2-Chloroethyl)Ether	74 U
95-57-8	2-Chlorophenol	74 U
541-73-1	1,3-Dichlorobenzene	74 U
106-46-7	1,4-Dichlorobenzene	74 U
100-51-6	Benzyl Alcohol	370 U
95-50-1	1,2-Dichlorobenzene	74 U
95-48-7	2-Methylphenol	74 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	74 U
106-44-5	4-Methylphenol	74 U
621-64-7	N-Nitroso-Di-n-Propylamine	74 U
67-72-1	Hexachloroethane	150 U
98-95-3	Nitrobenzene	74 U
78-59-1	Isophorone	74 U
88-75-5	2-Nitrophenol	370 U
105-67-9	2,4-Dimethylphenol	150 U
65-85-0	Benzoic Acid	740 U
111-91-1	bis(2-Chloroethoxy)Methane	74 U
120-83-2	2,4-Dichlorophenol	220 U
120-82-1	1,2,4-Trichlorobenzene	74 U
91-20-3	**Naphthalene**	**58 J**
106-47-8	4-Chloroaniline	220 U
87-68-3	Hexachlorobutadiene	150 U
59-50-7	4-Chloro-3-Methylphenol	150 U
91-57-6	**2-Methylnaphthalene**	**260**
77-47-4	Hexachlorocyclopentadiene	370 U
88-06-2	2,4,6-Trichlorophenol	370 U
95-95-4	2,4,5-Trichlorophenol	370 U
91-58-7	2-Chloronaphthalene	74 U
88-74-4	2-Nitroaniline	370 U
131-11-3	Dimethyl Phthalate	74 U
208-96-8	Acenaphthylene	74 U
99-09-2	3-Nitroaniline	370 U

CAS Number		µg/Kg
83-32-9	Acenaphthene	74 U
51-28-5	2,4-Dinitrophenol	740 U
100-02-7	4-Nitrophenol	370 U
132-64-9	Dibenzofuran	74 U
121-14-2	2,4-Dinitrotoluene	370 U
606-20-2	2,6-Dinitrotoluene	370 U
84-66-2	Diethylphthalate	74 U
7005-72-3	4-Chlorophenyl-phenylether	74 U
86-73-7	**Fluorene**	**46 M J**
100-01-6	4-Nitroaniline	370 U
534-52-1	4,6-Dinitro-2-Methylphenol	740 U
86-30-6	**N-Nitrosodiphenylamine(1)**	**44 M J**
101-55-3	4-Bromophenyl-phenylether	74 U
118-74-1	Hexachlorobenzene	74 U
87-86-5	Pentachlorophenol	370 U
85-01-8	**Phenanthrene**	**84**
86-74-8	Carbazole	74 U
120-12-7	Anthracene	74 U
84-74-2	Di-n-Butylphthalate	74 U
206-44-0	**Fluoranthene**	**75 M**
129-00-0	**Pyrene**	**64 J**
85-68-7	Butylbenzylphthalate	74 U
91-94-1	3,3'-Dichlorobenzidine	370 U
56-55-3	Benzo(a)Anthracene	74 U
117-81-7	bis(2-Ethylhexyl)Phthalate	74 U
218-01-9	**Chrysene**	**42 M J**
117-84-0	Di-n-Octyl Phthalate	74 U
205-99-2	Benzo(b)Fluoranthene	74 U
207-08-9	Benzo(k)Fluoranthene	74 U
50-32-8	Benzo(a)Pyrene	74 U
193-39-5	**Indeno(1,2,3-cd)Pyrene**	**70 M J**
53-70-3	**Dibenz(a,h)Anthracene**	**46 M J**
191-24-2	**Benzo(ghi)Perylene**	**74 M J**

(1) Cannot be separated from diphenylamine

***Base/neutral surrogate recoveries**

d5-Nitrobenzene	57.8%
2-Fluorobiphenyl	62.7%
d14-p-Terphenyl	75.3%
d4 1,2-Dichlorobenzene	58.2%

***Acid surrogate recoveries**

d5-Phenol	51.3%
2-Fluorophenol	49.4%
2,4,6-Tribromophenol	66.5%
d4 2-Chlorophenol	57.5%

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ORGANICS ANALYSIS DATA SHEET
Volatiles by Method 624/8240

Lab ID: 0226MB
Matrix: Soils/Sediments

Data Release Authorized: _____
Report prepared 03/05/92 - MAC:D

Sample: Method Blank

QC Report No: A027-Dames & Moore
Project No: 21199-032
Trans. Mtn.
VTSR: NA

Instrument: FINN III
Date Analyzed: 02/26/92

Amount Analyzed: 5.0 gms (Equiv. Dry Weight)
Percent Moisture: NA
Conc/Dil: 1:1

CAS Number		µg/Kg
74-87-3	Chloromethane	2.0 U
74-83-9	Bromomethane	2.0 U
75-01-4	Vinyl Chloride	2.0 U
75-00-3	Chloroethane	2.0 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
75-27-4	Bromodichloromethane	1.0 U
75-69-4	Trichlorofluoromethane	2.0 U

CAS Number		µg/Kg
78-87-5	1,2-Dichloropropane	1.0 U
10061-02-6	Trans-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
10061-01-5	cis-1,3-Dichloropropene	1.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone	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
1330-20-7	Total Xylenes	2.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane		2.0 U

Surrogate Recoveries

d8-Toluene	106%
Bromofluorobenzene	98.3%
d4-1,2-Dichloroethane	94.3%

Data Reporting Qualifiers

Value If the result is a value greater than or equal to the detection limit, report the value.

U Indicates compound was analyzed for but not detected at the given detection limit.

J Indicates an estimated value when result is less than specified detection limit.

B This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.

K This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

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

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ORGANICS ANALYSIS DATA SHEET
Volatiles by Method 624/8240

Lab ID: A027F
Matrix: Soils/Sediments

Data Release Authorized: _____
Report prepared 03/05/92 - MAC:D

Sample: Burn Pit #1

QC Report No: A027-Dames & Moore
Project No: 21199-032
Trans. Mtn.
VTSR: 02/21/92

Amount Analyzed: .008 gms (Dry Weight)
Percent Moisture: 20.4%
Conc/Dil: 1:625

Instrument: FINN III
Date Analyzed: 02/26/92

CAS Number		µg/Kg
74-87-3	Chloromethane	1300 U
74-83-9	Bromomethane	1300 U
75-01-4	Vinyl Chloride	1300 U
75-00-3	Chloroethane	1300 U
75-09-2	Methylene Chloride	1300 U
67-64-1	Acetone	3100 U
75-15-0	Carbon Disulfide	630 U
75-35-4	1,1-Dichloroethene	630 U
75-34-3	1,1-Dichloroethane	630 U
156-60-5	Trans-1,2-Dichloroethene	630 U
156-59-2	Cis-1,2-Dichloroethene	630 U
67-66-3	Chloroform	630 U
107-06-2	1,2-Dichloroethane	630 U
78-93-3	2-Butanone	3100 U
71-55-6	1,1,1-Trichloroethane	630 U
56-23-5	Carbon Tetrachloride	630 U
75-27-4	Bromodichloromethane	630 U
75-69-4	Trichlorofluoromethane	1300 U

CAS Number		µg/Kg
78-87-5	1,2-Dichloropropane	630 U
10061-02-6	Trans-1,3-Dichloropropene	630 U
79-01-6	Trichloroethene	630 U
124-48-1	Dibromochloromethane	630 U
79-00-5	1,1,2-Trichloroethane	630 U
71-43-2	Benzene	630 U
10061-01-5	cis-1,3-Dichloropropene	630 U
75-25-2	Bromoform	630 U
108-10-1	4-Methyl-2-Pentanone	3100 U
591-78-6	2-Hexanone	3100 U
127-18-4	Tetrachloroethene	630 U
79-34-5	1,1,2,2-Tetrachloroethane	630 U
108-88-3	Toluene	630 U
108-90-7	Chlorobenzene	630 U
100-41-4	Ethylbenzene	630 U
100-42-5	Styrene	630 U
1330-20-7	Total Xylenes	1300 U
1,1,2-Trichloro-1,2,2-trifluoroethane		1300 U

Surrogate Recoveries

d8-Toluene	128%
Bromofluorobenzene	146%
d4-1,2-Dichloroethane	124%

Data Reporting Qualifiers

Value If the result is a value greater than or equal to the detection limit, report the value.

U Indicates compound was analyzed for but not detected at the given detection limit.

J Indicates an estimated value when result is less than specified detection limit.

B This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.

K This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

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

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ORGANICS ANALYSIS DATA SHEET
Volatiles by Method 624/8240

Lab ID: A027F RE
Matrix: Soils/Sediments

Data Release Authorized: _____
Report prepared 03/05/92 - MAC:D

Sample: Burn Pit #1
Rerun
QC Report No: A027-Dames & Moore
Project No: 21199-032
Trans. Mtn.
VTSR: 02/21/92

Amount Analyzed: .032 gms (Dry Weight)
Percent Moisture: 20.4%
Conc/Dil: 1:156

Instrument: FINN III
Date Analyzed: 02/26/92

CAS Number		µg/Kg
74-87-3	Chloromethane	310 U
74-83-9	Bromomethane	310 U
75-01-4	Vinyl Chloride	310 U
75-00-3	Chloroethane	310 U
75-09-2	Methylene Chloride	310 U
67-64-1	Acetone	780 U
75-15-0	Carbon Disulfide	160 U
75-35-4	1,1-Dichloroethene	160 U
75-34-3	1,1-Dichloroethane	160 U
156-60-5	Trans-1,2-Dichloroethene	160 U
156-59-2	Cis-1,2-Dichloroethene	160 U
67-66-3	Chloroform	160 U
107-06-2	1,2-Dichloroethane	160 U
78-93-3	2-Butanone	780 U
71-55-6	1,1,1-Trichloroethane	160 U
56-23-5	Carbon Tetrachloride	160 U
75-27-4	Bromodichloromethane	160 U
75-69-4	Trichlorofluoromethane	310 U

CAS Number		µg/Kg
78-87-5	1,2-Dichloropropane	160 U
10061-02-6	Trans-1,3-Dichloropropene	160 U
79-01-6	Trichloroethene	160 U
124-48-1	Dibromochloromethane	160 U
79-00-5	1,1,2-Trichloroethane	160 U
71-43-2	Benzene	160 U
10061-01-5	cis-1,3-Dichloropropene	160 U
75-25-2	Bromoform	160 U
108-10-1	4-Methyl-2-Pentanone	780 U
591-78-6	2-Hexanone	780 U
127-18-4	Tetrachloroethene	160 U
79-34-5	1,1,2,2-Tetrachloroethane	160 U
108-88-3	Toluene	160 U
108-90-7	Chlorobenzene	160 U
100-41-4	Ethylbenzene	160 U
100-42-5	Styrene	160 U
1330-20-7	Total Xylenes	310 U
1,1,2-Trichloro-1,2,2-trifluoroethane		310 U

Surrogate Recoveries

d8-Toluene	115%
Bromofluorobenzene	117%
d4-1,2-Dichloroethane	102%

Data Reporting Qualifiers

Value If the result is a value greater than or equal to the detection limit, report the value.

U Indicates compound was analyzed for but not detected at the given detection limit.

J Indicates an estimated value when result is less than specified detection limit.

B This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.

K This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

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

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ORGANICS ANALYSIS DATA SHEET
Volatiles by Method 624/8240

Lab ID: A027G
Matrix: Soils/Sediments

Data Release Authorized: _____
Report prepared 03/05/92 - MAC:D

Sample: Burn Pit #1 Dup

QC Report No: A027-Dames & Moore
Project No: 21199-032
Trans. Mtn.
VTSR: 02/21/92

Amount Analyzed: .008 gms (Dry Weight)
Percent Moisture: 20.5%
Conc/Dil: 1:625

Instrument: FINN III
Date Analyzed: 02/26/92

CAS Number		µg/Kg
74-87-3	Chloromethane	1300 U
74-83-9	Bromomethane	1300 U
75-01-4	Vinyl Chloride	1300 U
75-00-3	Chloroethane	1300 U
75-09-2	Methylene Chloride	1300 U
67-64-1	Acetone	3100 U
75-15-0	Carbon Disulfide	630 U
75-35-4	1,1-Dichloroethene	630 U
75-34-3	1,1-Dichloroethane	630 U
156-60-5	Trans-1,2-Dichloroethene	630 U
156-59-2	Cis-1,2-Dichloroethene	630 U
67-66-3	Chloroform	630 U
107-06-2	1,2-Dichloroethane	630 U
78-93-3	2-Butanone	3100 U
71-55-6	1,1,1-Trichloroethane	630 U
56-23-5	Carbon Tetrachloride	630 U
75-27-4	Bromodichloromethane	630 U
75-69-4	Trichlorofluoromethane	1300 U

CAS Number		µg/Kg
78-87-5	1,2-Dichloropropane	630 U
10061-02-6	Trans-1,3-Dichloropropene	630 U
79-01-6	Trichloroethene	630 U
124-48-1	Dibromochloromethane	630 U
79-00-5	1,1,2-Trichloroethane	630 U
71-43-2	Benzene	630 U
10061-01-5	cis-1,3-Dichloropropene	630 U
75-25-2	Bromoform	630 U
108-10-1	4-Methyl-2-Pentanone	3100 U
591-78-6	2-Hexanone	3100 U
127-18-4	Tetrachloroethene	630 U
79-34-5	1,1,2,2-Tetrachloroethane	630 U
108-88-3	Toluene	630 U
108-90-7	Chlorobenzene	630 U
100-41-4	**Ethylbenzene**	**830 M**
100-42-5	Styrene	630 U
1330-20-7	**Total Xylenes**	**2100**
1,1,2-Trichloro-1,2,2-trifluoroethane		1300 U

Surrogate Recoveries

d8-Toluene	97.2%
Bromofluorobenzene	98.7%
d4-1,2-Dichloroethane	84.0%

Data Reporting Qualifiers

Value If the result is a value greater than or equal to the detection limit, report the value.

U Indicates compound was analyzed for but not detected at the given detection limit.

J Indicates an estimated value when result is less than specified detection limit.

B This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.

K This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

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

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ORGANICS ANALYSIS DATA SHEET
Volatiles by Method 624/8240

Lab ID: A027G RE
Matrix: Soils/Sediments

Data Release Authorized: _____
Report prepared 03/05/92 - MAC:D

Sample: **Burn Pit #1 Dup Rerun**
QC Report No: A027-Dames & Moore
Project No: 21199-032
Trans. Mtn.
VTSR: 02/21/92

Instrument: FINN III
Date Analyzed: 02/26/92

Amount Analyzed: .032 gms (Dry Weight)
Percent Moisture: 20.5%
Conc/Dil: 1:156

CAS Number		µg/Kg
74-87-3	Chloromethane	310 U
74-83-9	Bromomethane	310 U
75-01-4	Vinyl Chloride	310 U
75-00-3	Chloroethane	310 U
75-09-2	Methylene Chloride	310 U
67-64-1	Acetone	790 U
75-15-0	Carbon Disulfide	160 U
75-35-4	1,1-Dichloroethene	160 U
75-34-3	1,1-Dichloroethane	160 U
156-60-5	Trans-1,2-Dichloroethene	160 U
156-59-2	Cis-1,2-Dichloroethene	160 U
67-66-3	Chloroform	160 U
107-06-2	1,2-Dichloroethane	160 U
78-93-3	2-Butanone	790 U
71-55-6	1,1,1-Trichloroethane	160 U
56-23-5	Carbon Tetrachloride	160 U
75-27-4	Bromodichloromethane	160 U
75-69-4	Trichlorofluoromethane	310 U

CAS Number		µg/Kg
78-87-5	1,2-Dichloropropane	160 U
10061-02-6	Trans-1,3-Dichloropropene	160 U
79-01-6	Trichloroethene	160 U
124-48-1	Dibromochloromethane	160 U
79-00-5	1,1,2-Trichloroethane	160 U
71-43-2	Benzene	160 U
10061-01-5	cis-1,3-Dichloropropene	160 U
75-25-2	Bromoform	160 U
108-10-1	4-Methyl-2-Pentanone	790 U
591-78-6	2-Hexanone	790 U
127-18-4	Tetrachloroethene	160 U
79-34-5	1,1,2,2-Tetrachloroethane	160 U
108-88-3	Toluene	160 U
108-90-7	Chlorobenzene	160 U
100-41-4	**Ethylbenzene**	**720**
100-42-5	Styrene	160 U
1330-20-7	**Total Xylenes**	**2400**
1,1,2-Trichloro-1,2,2-trifluoroethane		310 U

Surrogate Recoveries

d8-Toluene	92.7%
Bromofluorobenzene	117%
d4-1,2-Dichloroethane	93.7%

Data Reporting Qualifiers

Value If the result is a value greater than or equal to the detection limit, report the value.

U Indicates compound was analyzed for but not detected at the given detection limit.

J Indicates an estimated value when result is less than specified detection limit.

B This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.

K This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

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

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ORGANICS ANALYSIS DATA SHEET
Volatiles by Method 624/8240

Lab ID: 0226MB
Matrix: Waters

Sample: Method Blank

QC Report No: A027-Dames & Moore
Project No: 21199-032
Trans. Mtn.
VTSR: NA

Data Release Authorized: _____
Report prepared 03/05/92 - MAC:D

Instrument: FINN III
Date Analyzed: 02/26/92

Amount Purged: 5 mls
Conc/Dil: 1 to 1

CAS Number		µg/L
74-87-3	Chloromethane	2.0 U
74-83-9	Bromomethane	2.0 U
75-01-4	Vinyl Chloride	2.0 U
75-00-3	Chloroethane	2.0 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
75-27-4	Bromodichloromethane	1.0 U
75-69-4	Trichlorofluoromethane	2.0 U

CAS Number		µg/L
78-87-5	1,2-Dichloropropane	1.0 U
10061-02-6	Trans-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
10061-01-5	cis-1,3-Dichloropropene	1.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone	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
1330-20-7	Total Xylenes	2.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane		2.0 U

Surrogate Recoveries

d8-Toluene	106%
Bromofluorobenzene	98.3%
d4-1,2-Dichloroethane	94.3%

Data Reporting Qualifiers

Value If the result is a value greater than or equal to the detection limit, report the value.

U Indicates compound was analyzed for but not detected at the given detection limit.

J Indicates an estimated value when result is less than specified detection limit.

B This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.

K This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

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

ANALYTICAL
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Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
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(206) 621-7523 (FAX)

ORGANICS ANALYSIS DATA SHEET
Volatiles by Method 624/8240

Lab ID: A027K
Matrix: Waters

Data Release Authorized: _____
Report prepared 03/05/92 - MAC:D

Sample: Trip Blank

QC Report No: A027-Dames & Moore
Project No: 21199-032
Trans. Mtn.
VTSR: NA

Instrument: FINN III
Date Analyzed: 02/26/92

Amount Purged: 5 mls
Conc/Dil: 1 to 1

CAS Number		µg/L
74-87-3	Chloromethane	2.0 U
74-83-9	Bromomethane	2.0 U
75-01-4	Vinyl Chloride	2.0 U
75-00-3	Chloroethane	2.0 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
75-27-4	Bromodichloromethane	1.0 U
75-69-4	Trichlorofluoromethane	2.0 U

CAS Number		µg/L
78-87-5	1,2-Dichloropropane	1.0 U
10061-02-6	Trans-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
10061-01-5	cis-1,3-Dichloropropene	1.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone	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
1330-20-7	Total Xylenes	2.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane		2.0 U

Surrogate Recoveries

d8-Toluene	106%
Bromofluorobenzene	101%
d4-1,2-Dichloroethane	98.0%

Data Reporting Qualifiers

Value If the result is a value greater than or equal to the detection limit, report the value.

U Indicates compound was analyzed for but not detected at the given detection limit.

J Indicates an estimated value when result is less than specified detection limit.

B This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.

K This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

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

EXPLANATION OF INORGANIC DATA REPORT CODES

The columns labeled 'PREP', 'C', and 'M' contain important information about your analyses. The codes are described below.

PREPARATION CODES

These 3-letter codes describe methods used to prepare samples for analysis:

AEN USEPA, Metals in air filters
AHM ARI, Mercury in air filters
AHN ARI, Metals in air filters
ANN NIOSH 7300, Metals in air filters
CAN AOAC (1984) 25.024, Metals in earthenware
DE6 EPA 600/4-79-020 218.5, Cr(VI) in water
DMM DMN followed by TMM, Dissolved mercury
DMN Filtered through .45u filter, Dissolved metals
EW6 EWN followed by DE6
EWM EWN followed by TMM
EWN USEPA SW-846 1310, EP Toxicity
FHP ARI, Metals in tissue ($HNO_3/HClO_4$)
FPP PSEP, Metals in tissue ($HNO_3/HClO_4$)
FRM Journal, Mercury in tissue
FRN Journal, Metals in tissue (HNO_3/H_2O_2)
KRN ARI, Concentration by coprecipitation
LEM USEPA, TCLP followed by TMM
LEN USEPA, TCLP Extraction
MHM ARI, Mercury in miscellaneous materials
MHN ARI, Metals in miscellaneous materials
OAM ARI, Mercury in oil, grease or tar
OAN ARI, Metals in oil, grease or tar
PHM ARI, Mercury in wipes
PHN ARI, Metals in wipes
RCC USEPA CLP, Water digestion, HCl matrix
RCN USEPA CLP, Water digestion, HNO_3 matrix
REC EPA 600/4-79-020 4.1.4, HCl matrix
REI EPA 600/4-79-020 200.7 and 9.4
REN EPA 600/4-79-020 4.1.4, HNO_3 matrix
RMA EPA 600/4-79-020 206.2
RWC USEPA SW-846 3005
SCC USEPA CLP, Soil digestion, HCl matrix
SCM USEPA CLP, Mercury in soil
SCN USEPA CLP, Soil digestion, HNO_3 matrix
SEM EPA 600/4-79-020 245.5, Mercury in soil
SHF ARI, Metals in soil, HF digestion
SRL Journal, Lithium meta-borate fusion
SPF PSEP, Metals in sediment, HF digestion
SSC Standard Methods 302C, Sb/Sn in soil
SSN Standard Methods 302C, Soil digestion
SSS Standard Methods 302C, Ti in soil
SW6 USEPA SW-846 3060, Cr(VI) in soil
SWC USEPA SW-846 3050, HCl matrix
SWN USEPA SW-846 3050, HNO_3 matrix
SWR USEPA SW-846 Modified 3005, Sb by GFAAS
TEC EPA 600/4-79-020 4.1.3, HCl matrix
TEG EPA 600/4-79-020 272.1, Silver in water
TEI EPA 600/4-79-020 200.7 and 9.3
TEN EPA 600/4-79-020 4.1.3, HNO_3 matrix
THG ARI, Silver in photographic solutions
TMM EPA 600/4-79-020 245.1, Mercury in water
TSC Standard Methods 302C, Sb/Sn in water
TSN Standard Methods 302D
TSS Standard Methods 302E, Ti in water
TWC USEPA SW-846 3010, HCl matrix
TWG USEPA SW-846 7760, Silver in water
TWN USEPA SW-846 3020, HNO_3 matrix
WMN EPA 600/4-79-020, Preserved, undigested water
XSC Standard Methods 302B

CONCENTRATION CODES

These codes are used to qualify reported concentrations:

U No analyte was detected. The reported value is the lower limit of detection.

METHOD CODES

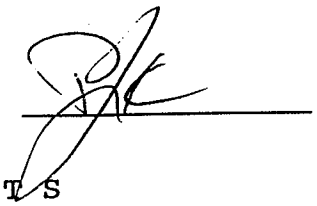
These codes signify the instrumental technique used for analysis:

CVA Cold Vapor Atomic Absorption Spectrophotometry
FLA Flame Atomic Absorption Spectrophotometry
GFA Graphite Furnace Atomic Absorption Spectrophotometry
ICP Inductively Coupled Plasma Atomic Emission Spectrometry

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
03/05/92
08:28:03

Client: Dames & Moore
Contact: David Maltby
Project: Trans. Mtn.
ID number: Burn Pit #1
Description:
Sampled: / /
Received: 02/21/92
Matrix: Soil

ARI job number: A027
ARI sample number: F

Released by: 

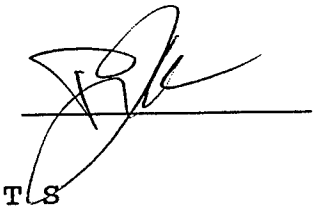
A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-36-0	Antimony	5 mg/kg-dry	U	SWC	ICP
7440-38-2	Arsenic	4.47 mg/kg-dry		SWN	GFA
7440-41-7	Beryllium	0.3 mg/kg-dry		SWC	ICP
7440-43-9	Cadmium	0.2 mg/kg-dry	U	SWC	ICP
7440-47-3	Chromium	52.2 mg/kg-dry		SWC	ICP
7440-50-8	Copper	31.0 mg/kg-dry		SWC	ICP
7439-92-1	Lead	4.2 mg/kg-dry		SWN	GFA
7439-97-6	Mercury	0.06 mg/kg-dry	U	SCM	CVA
7440-02-0	Nickel	45 mg/kg-dry		SWC	ICP
7782-49-2	Selenium	0.1 mg/kg-dry	U	SWN	GFA
7440-22-4	Silver	0.3 mg/kg-dry	U	SWC	ICP
7440-28-0	Thallium	0.1 mg/kg-dry	U	SWN	GFA
7440-66-6	Zinc	53.6 mg/kg-dry		SWC	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
03/05/92
08:28:07

Client: Dames & Moore
Contact: David Maltby
Project: Trans. Mtn.
ID number: Burn Pit #1 Dup
Description:
Sampled: / /
Received: 02/21/92
Matrix: Soil

ARI job number: A027
ARI sample number: G

Released by: 

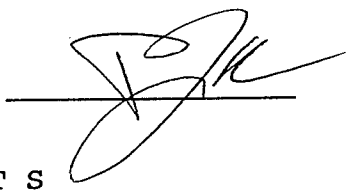
A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-36-0	Antimony	6 mg/kg-dry	U	SWC	ICP
7440-38-2	Arsenic	6.40 mg/kg-dry		SWN	GFA
7440-41-7	Beryllium	0.3 mg/kg-dry		SWC	ICP
7440-43-9	Cadmium	0.2 mg/kg-dry	U	SWC	ICP
7440-47-3	Chromium	46.1 mg/kg-dry		SWC	ICP
7440-50-8	Copper	26.2 mg/kg-dry		SWC	ICP
7439-92-1	Lead	4.7 mg/kg-dry		SWN	GFA
7439-97-6	Mercury	0.07 mg/kg-dry		SCM	CVA
7440-02-0	Nickel	39 mg/kg-dry		SWC	ICP
7782-49-2	Selenium	0.1 mg/kg-dry	U	SWN	GFA
7440-22-4	Silver	0.3 mg/kg-dry	U	SWC	ICP
7440-28-0	Thallium	0.1 mg/kg-dry	U	SWN	GFA
7440-66-6	Zinc	50.5 mg/kg-dry		SWC	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
03/05/92
08:28:11

Client: Dames & Moore
Contact: David Maltby
Project: Trans. Mtn.
ID number:
Description: Method Blank
Sampled: / /
Received: / /
Matrix: Soil

ARI job number: A027
ARI sample number: MB

Released by: 

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-36-0	Antimony	5 mg/kg-dry	U	SWC	ICP
7440-38-2	Arsenic	0.1 mg/kg-dry	U	SWN	GFA
7440-41-7	Beryllium	0.1 mg/kg-dry	U	SWC	ICP
7440-43-9	Cadmium	0.2 mg/kg-dry	U	SWC	ICP
7440-47-3	Chromium	0.5 mg/kg-dry	U	SWC	ICP
7440-50-8	Copper	0.4 mg/kg-dry		SWC	ICP
7439-92-1	Lead	0.1 mg/kg-dry	U	SWN	GFA
7439-97-6	Mercury	0.1 mg/kg-dry	U	SCM	CVA
7440-02-0	Nickel	1 mg/kg-dry	U	SWC	ICP
7782-49-2	Selenium	0.1 mg/kg-dry	U	SWN	GFA
7440-22-4	Silver	0.3 mg/kg-dry	U	SWC	ICP
7440-28-0	Thallium	0.1 mg/kg-dry	U	SWN	GFA
7440-66-6	Zinc	0.6 mg/kg-dry		SWC	ICP

5 March 1992

DAMES & MOORE
SEATTLE
MAR 06 1992

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

David Maltby
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032 Trans Mtn.:
ARI Job #A068

Dear David:

Please find enclosed the results and original chain-of-custody report for the above referenced project. Eleven samples and a trip blank arrived in good condition on 2/27/92, and the analyses proceeded without incident.

The analyst notes that sample DTSP-1 might have some gas, however there is diesel and perhaps some other "garbage" preventing gas range quantitation. Also note that samples TMB 16-13 and TMB 16-19 have hydrocarbons in both the gas and diesel ranges, but no gas pattern is evident; it looks like the early part of diesel, maybe Diesel #1. I've included copies of the chromatograms for these samples.

If you have any questions or need further information, please feel free to call any time. I can be reached at the number above, or direct at 340-2867, ext. 117, where you can also leave a message if I'm not available.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Coordinator

KAS/ks

Enclosures

cc: file#A068

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

~~Boring~~ or ~~Well~~ Number	Sample Number	~~Depth~~ Date	Time	Sample Type	Container Type	ANALYSES: VOA 601/8010	VOA 602/8020	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (M) Gasoline Range	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	TPH - HCID	.	.	.	.	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
TMB15	X-30'	2/24	10:00	S	3" Ring															✓							1	1
TMB16	-29	2/25	13:30	S																✓							1	1
TMB16	-13	2/25	11:00	S																✓							1	
TMB16	-19	2/25	11:15	S																✓							1	
TMB16	-39	2/25	14:15	S																✓							1	
TMB17	X-24	2/24	14:05	S																✓							1	
TMB18	-24	2/26	11:30	S																✓							1	
DTSP-1		2/25	12:15	S	2 03VOA, 40z jar					X										✓							2	
SWRO-C37		2/26	9:20	W	2x40mlVOA					✓																	2	
SWRO-D2-18		2/26	9:25	W	2x40mlVOA					✓																	2	
SWRO-D3-18		2/26	9:40	W	2x40mlVOA					✓																	2	
Trip Blank		2/21																									2	
																										Total Samples	17	

RELINQUISHED BY: (Signature) Julie Macdonald DATE/TIME 2/25 2/27/92 RECEIVED BY: (Signature) Terri Hedger

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

ANALYTICAL LABORATORY: ART

LABORATORY CONTACT: Terri Hedger

D&M CONTACT: Dave Maltby PHONE: 728-0744

DAMES & MOORE
500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

LABORATORY NOTES:

~~If HCID indicates additional TPH 2/27/92 was needed, please do.~~

A.R.I. # A068

JOB NO.: 21199-037 SHEET 1 OF 1

PROJECT Transmountain

LOCATION Laurel Station

COLLECTOR DSW DATE OF COLLECTION Varies-

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Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL PETROLEUM HYDROCARBONS
WA HCID Method by GC/FID

QC Report No: A068-Dames&Moore
Project: 21199-032
Trans Mtn.
VTSR: 02/27/92

Matrix: Soils

Data Release Authorized _____
Data Prepared: 03/04/92 - MAC:C PAT

Date Extracted: 02/28/92
Date Analyzed: 03/03/92

Lab ID	Client Sample ID	Dilution Factor	Petroleum Hydrocarbons †	TPH ID *	Surrogate Recovery
A068 MB	*Method Blank*	1	10 U	No	112%
A068 A	**TMB 15X-30**	**1**	**50**	**Diesel**	**107%**
A068 B	**TMB 16-29**	**1**	**30**	**No**	**109%**
A068 C	**TMB 16-13**	**1**	**3100**	**Diesel**	**106%**
A068 D	**TMB 16-19**	**1**	**510**	**Diesel**	**122%**
A068 E	TMB 16-39	1	10 U	No	110%
A068 F	TMB 17X-24	1	10 U	No	110%
A068 G	TMB 18-24	1	10 U	No	114%
A068 H	**DTSP-1**	**1**	**3500**	**Diesel**	**108%**

Surrogate is Me-Arachidate.

Values reported in ppm (mg/kg) on a dry weight basis.

U Indicates compound was analyzed for but not detected at the given detection limit.

X Indicates a value above the linear range of the detector. Dilution required.

* In the opinion of the analyst, was there a pattern match for diesel or gasoline.

† Value based on total peaks in the range from Toluene to C24.

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Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL GASOLINE RANGE HYDROCARBONS
WA TPHG Method by GC/FID

QC Report No: A068-Dames & Moore
Project: 21199-032
Trans Mountain
VTSR: 02/27/92

Matrix: Soils

Data Release Authorized _____
Data Prepared: 03/03/92 - MAC:C PAT

Date Extracted: 03/02/92
Date Analyzed: 03/02/92

Lab ID	Client Sample ID	Dilution Factor	Gasoline Range Hydrocarbons †	Gas ID *	Surrogate A	Surrogate B
A068 MB	*Method Blank*	1	5.0 U	No	99.9%	102%
A068 H	**DTSP-1**	**1**	**270**	**No**	**109%**	**NR**
A068 HDUP	**DTSP-1 DUPL.**	**1**	**260**	**No**	**108%**	**NR**

Surrogate A = Trifluorotoluene
Surrogate B = Bromobenzene

Values reported in ppm (mg/kg) on a dry weight basis.

U Indicates compound was analyzed for but not detected at the given detection limit.

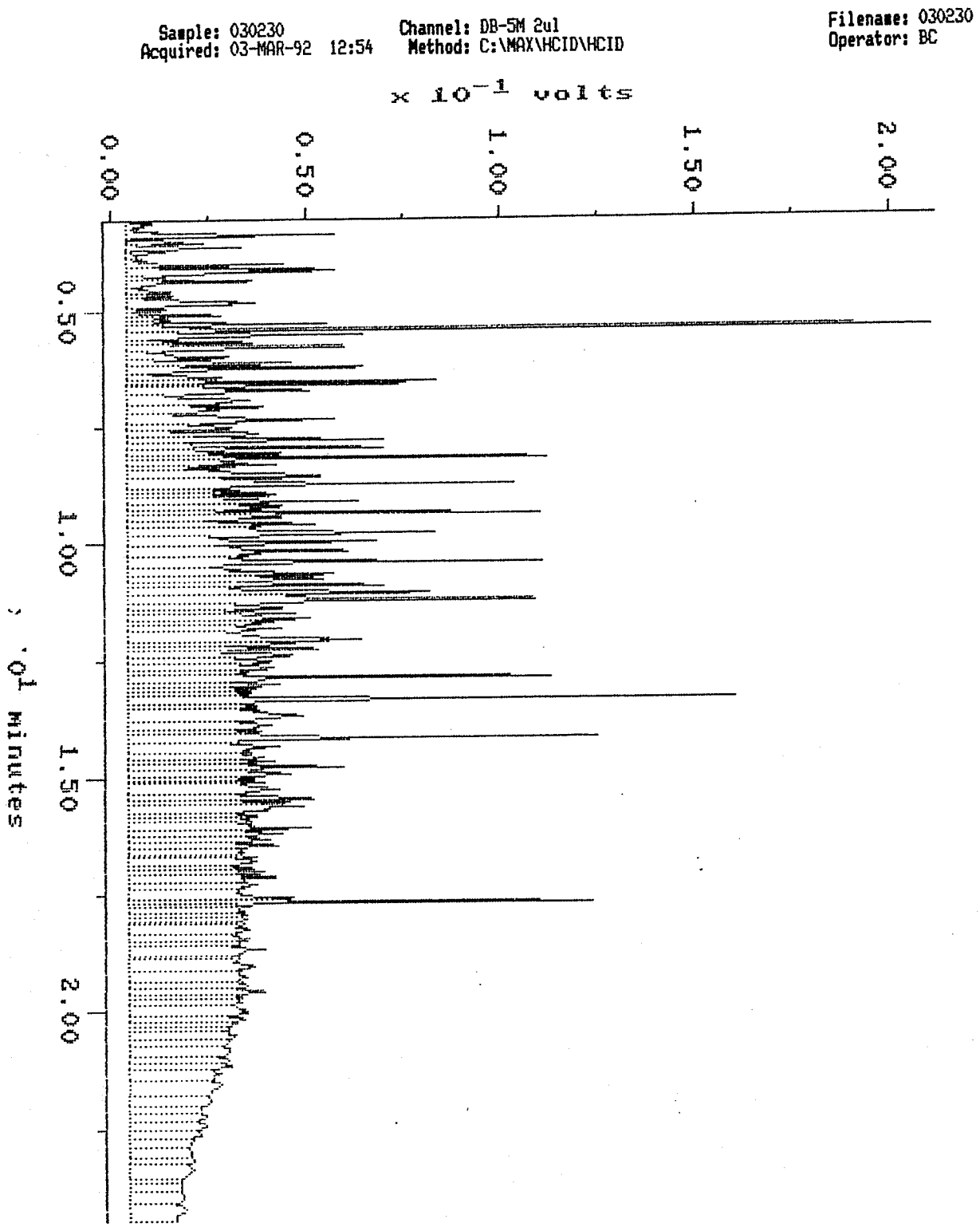
X Indicates a value above the linear range of the detector. Dilution required.

* In the opinion of the analyst, was there a pattern match for gasoline.

† Value based on total peaks in the range from Toluene to Dodecane.

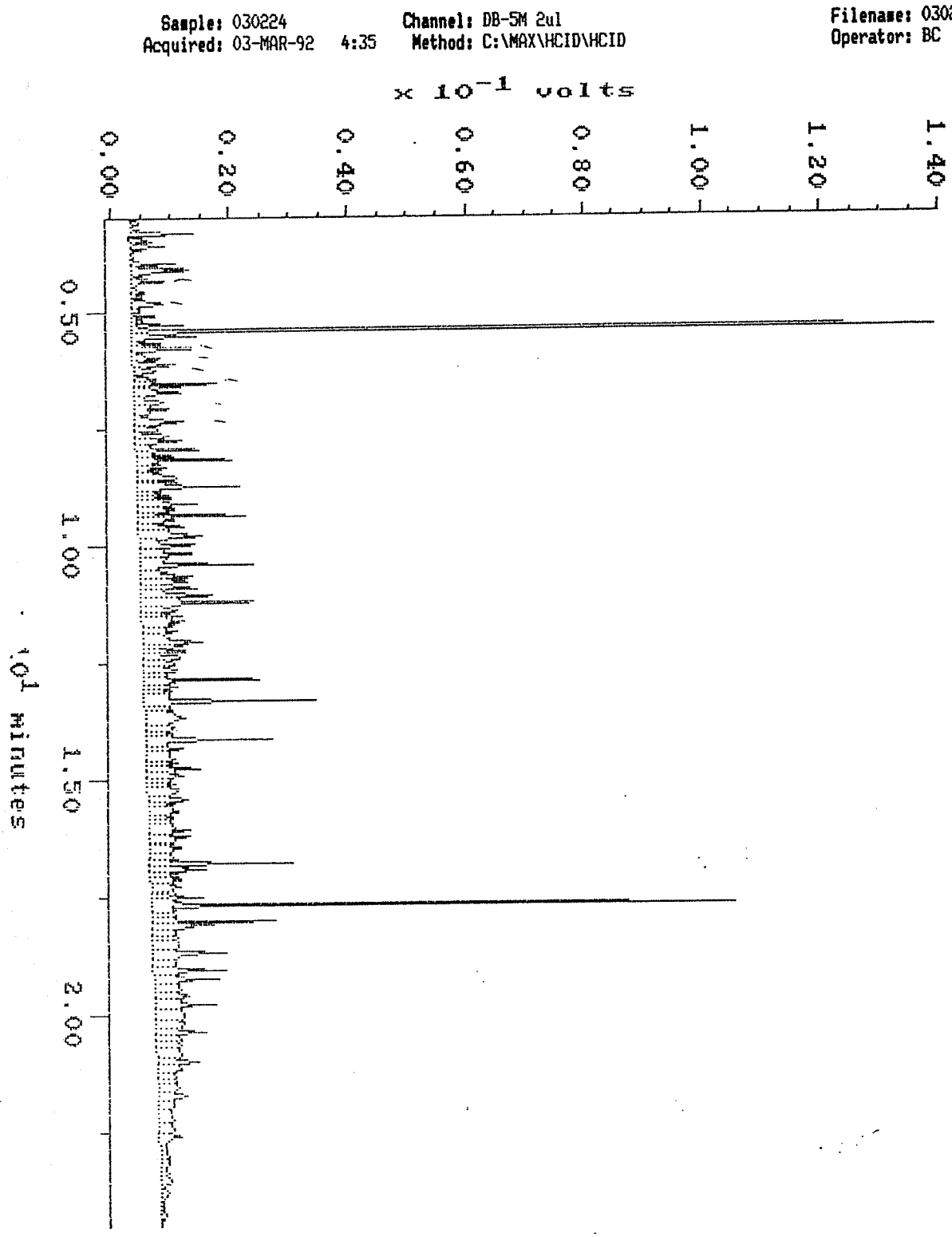
NR Indicates no recovery due to matrix interference and/or dilution.

TMB-16-13



A068C

TMB-16-19



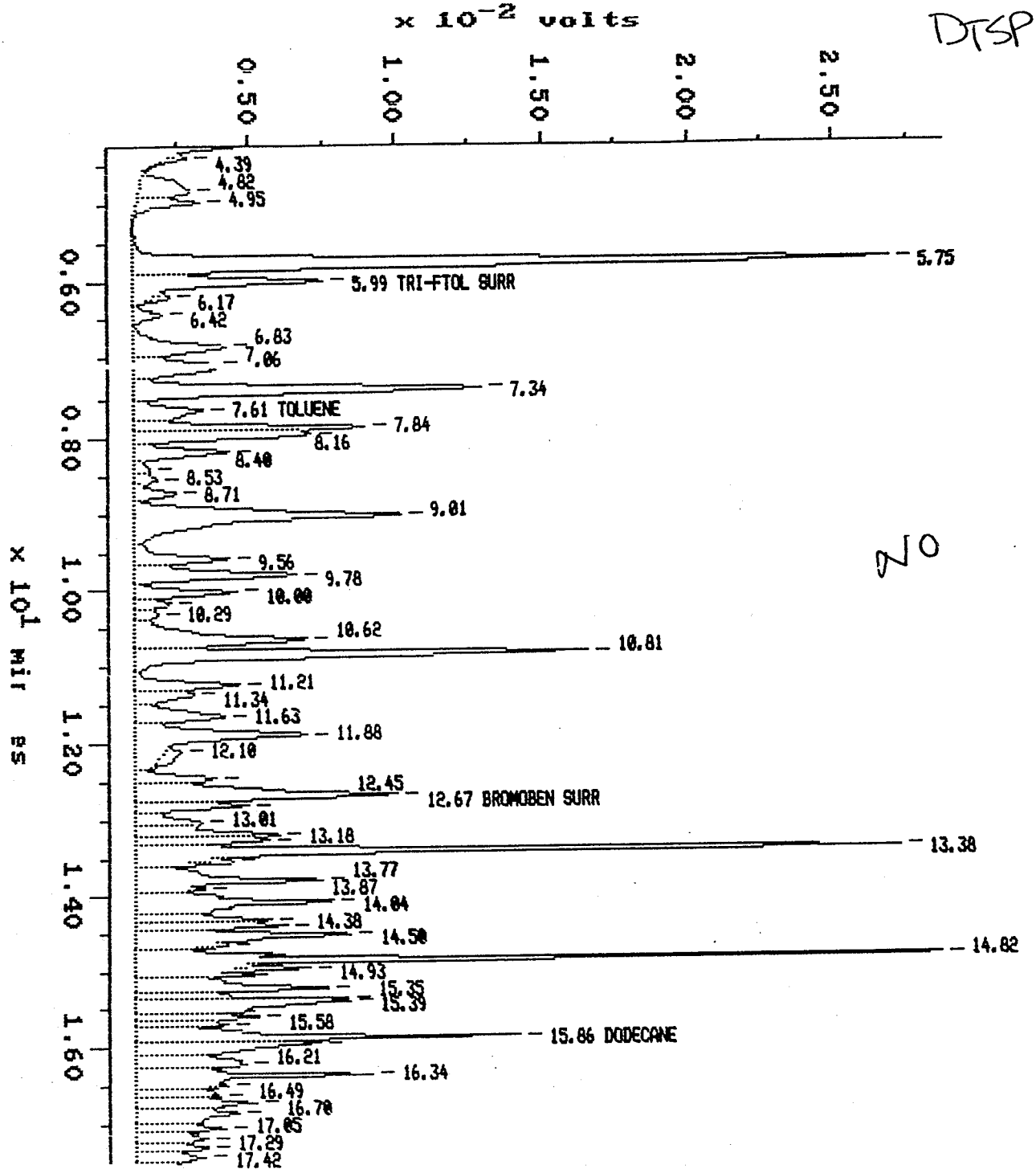
A068 D

Sample: A068 H
Acquired: 02-MAR-92 17:36

Channel: FID
Method: C:\MAX\BETXGAS\GAS4

Filename: R03026
Operator: MW

DTSP-1



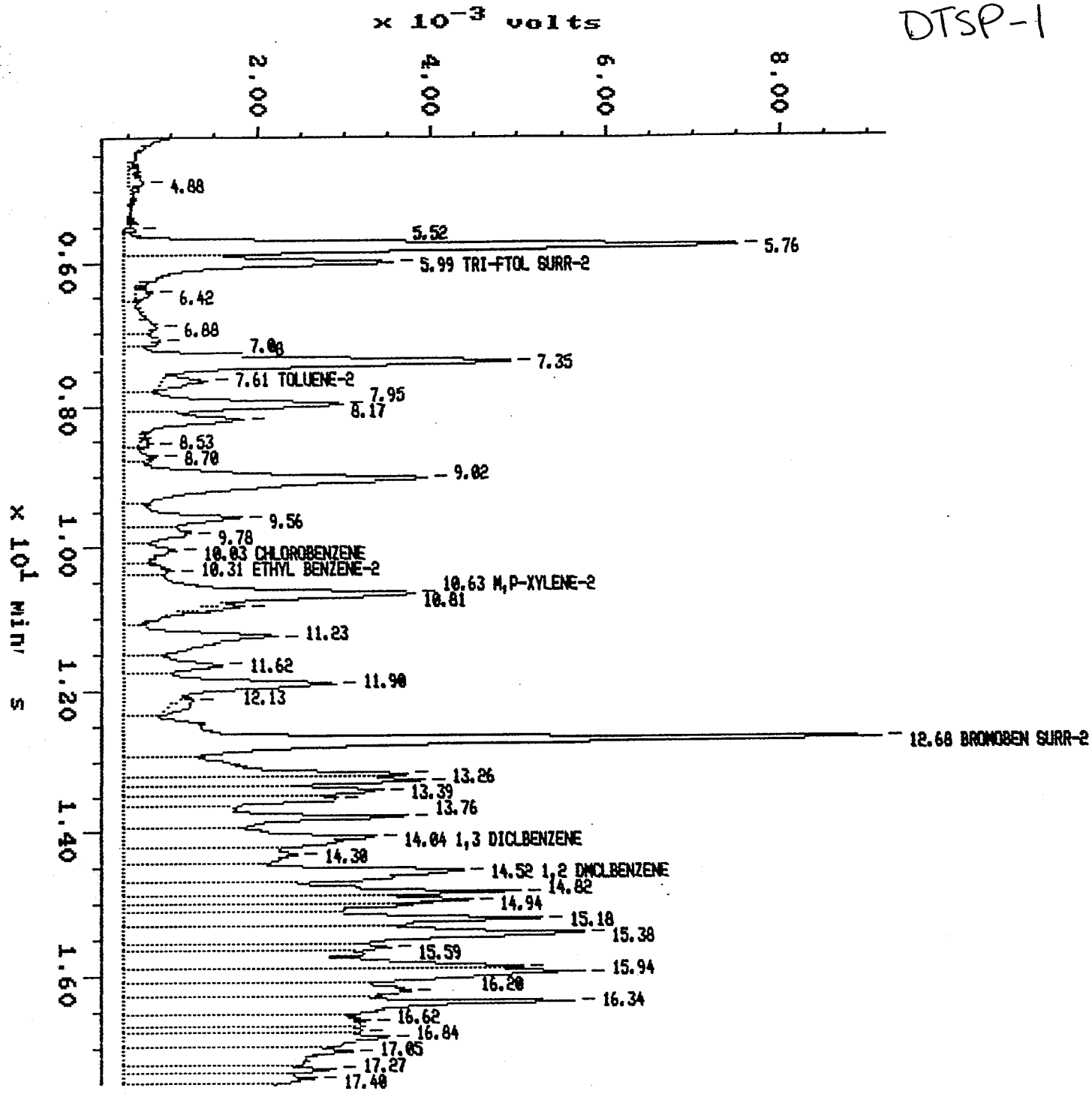
NO

Sample: A068 H
Acquired: 02-MAR-92 17:36

Channel: PID
Method: C:\MAX\BETXGAS\GAS4

Filename: R03026
Operator: MW

DTSP-1

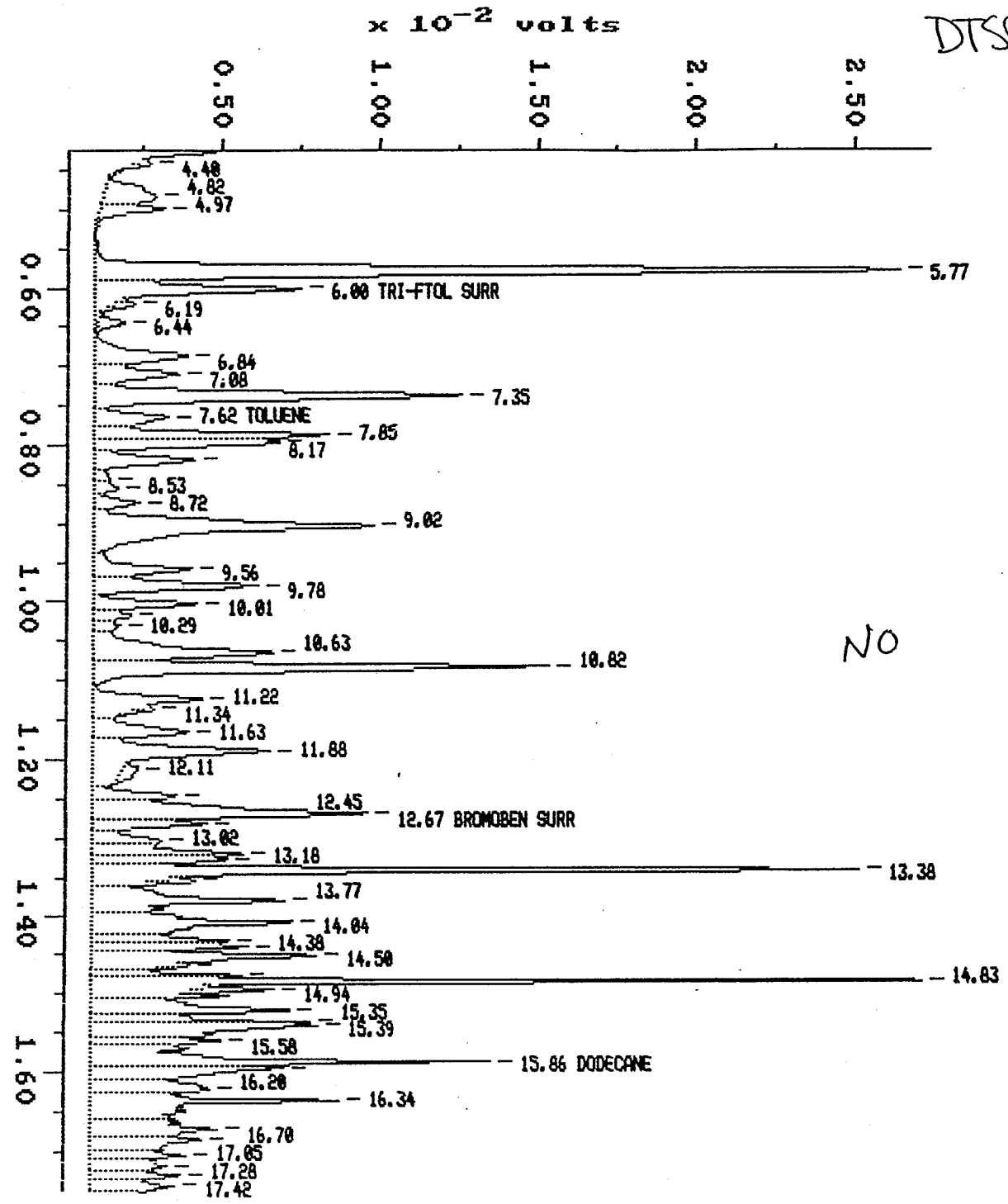


Sample: A068 H DUP
Acquired: 02-MAR-92 18:08

Channel: FID
Method: C:\MAX\BETXGAS\GAS4

Filename: R03027
Operator: MW

DTSP-1 dup.



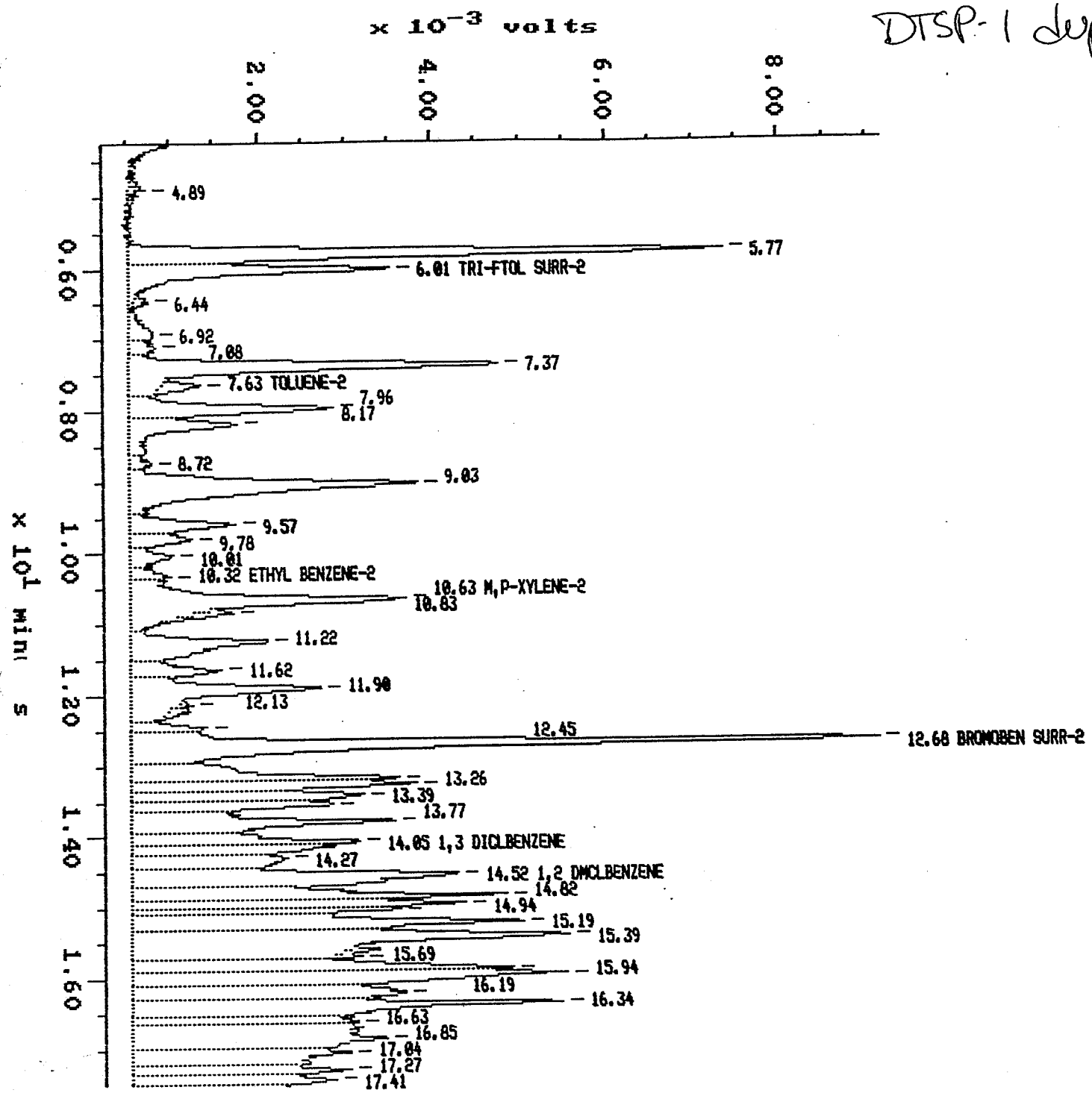
NO

Sample: A068 H DUP
Acquired: 02-MAR-92 18:08

Channel: PID
Method: C:\MAX\BETXGAS\GAS4

Filename: R03027
Operator: MW

DTSP-1 dup.



17 March 1992

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

David Maltby
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032 Trans Mtn.:
ARI Job #A089

Dear David:

Please find enclosed the results and original chain-of-custody report for the above referenced project. One sample was received in good condition on 3/2/92, and the analyses proceeded without incident. I apologize for the slight delay in shipping this package, but the metals results were held up until this morning. Hopefully this hasn't caused too much inconvenience.

If you have any questions or need further information, please feel free to call any time. I can be reached at the number above, or direct at 340-2867, ext. 117, where you can also leave a message if I'm not available.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Coordinator

KAS/ks

Enclosures

cc: file#A089

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Boring or Well Number	Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES: VOA 601/8010	VOA 602/8020	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (M)	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	Asbestos Quantity Determination	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
pit 1		15'	1500	Soil	3" alum cyl.			X	X											X		Sample suspected Contaminated	1	

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)
TMW, Wm 2/27/92 1755 [signature]

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)
[signature] 3/2/92 9:50 Jan Tolkins

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

LABORATORY NOTES:
Placed in Dames & Moore refrigerator for shipment to lab.
A.R.I. - A089

ANALYTICAL LABORATORY: ARI
LABORATORY CONTACT: Terry Hedges
D&M CONTACT: David Matthay PHONE: 728 0744

DAMES & MOORE
500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

JOB NO.: 21199 032 SHEET 1 OF 1
PROJECT Trans Mountain
LOCATION Lowell Pump Station
COLLECTOR TMWilliams DATE OF COLLECTION 2/27/92

ANALYTICAL RESOURCES INCORPORATED

Analytical Chemists & Consultants

333 Ninth Ave. North
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ORGANICS ANALYSIS DATA SHEET
Semivolatiles by Methods 625/8270

Lab ID: 0304MB
Matrix: Soils/Sediments

Sample No: Method Blank

QC Report No: A089-Dames & Moore
Project No: 21199-032
Trans Mtn.
VTSR: NA

Data Release Authorized: _____
Report prepared 03/09/92 - MAC:D

Sample Wt: 30.0 gm (Equivalent Dry Weight)
Percent Moisture: NA
pH: NA
Conc/Dilution: 1 to 1

Date extracted: 03/03/92
Analyzed (FINN 6): 03/04/92
GPC Clean-up: No (1 of 2)

CAS Number		µg/Kg
108-95-2	Phenol	130 U
111-44-4	bis(2-Chloroethyl)Ether	67 U
95-57-8	2-Chlorophenol	67 U
541-73-1	1,3-Dichlorobenzene	67 U
106-46-7	1,4-Dichlorobenzene	67 U
100-51-6	Benzyl Alcohol	330 U
95-50-1	1,2-Dichlorobenzene	67 U
95-48-7	2-Methylphenol	67 U
108-60-1	2,2'(Oxybis(1-Chloropropane)	67 U
106-44-5	4-Methylphenol	67 U
621-64-7	N-Nitroso-Di-n-Propylamine	67 U
67-72-1	Hexachloroethane	130 U
98-95-3	Nitrobenzene	67 U
78-59-1	Isophorone	67 U
88-75-5	2-Nitrophenol	330 U
105-67-9	2,4-Dimethylphenol	130 U
65-85-0	Benzoic Acid	670 U
111-91-1	bis(2-Chloroethoxy)Methane	67 U
120-83-2	2,4-Dichlorophenol	200 U
120-82-1	1,2,4-Trichlorobenzene	67 U
91-20-3	Naphthalene	67 U
106-47-8	4-Chloroaniline	200 U
87-68-3	Hexachlorobutadiene	130 U
59-50-7	4-Chloro-3-Methylphenol	130 U
91-57-6	2-Methylnaphthalene	67 U
77-47-4	Hexachlorocyclopentadiene	330 U
88-06-2	2,4,6-Trichlorophenol	330 U
95-95-4	2,4,5-Trichlorophenol	330 U
91-58-7	2-Chloronaphthalene	67 U
88-74-4	2-Nitroaniline	330 U
131-11-3	Dimethyl Phthalate	67 U
208-96-8	Acenaphthylene	67 U
99-09-2	3-Nitroaniline	330 U

CAS Number		µg/Kg
83-32-9	Acenaphthene	67 U
51-28-5	2,4-Dinitrophenol	670 U
100-02-7	4-Nitrophenol	330 U
132-64-9	Dibenzofuran	67 U
121-14-2	2,4-Dinitrotoluene	330 U
606-20-2	2,6-Dinitrotoluene	330 U
84-66-2	Diethylphthalate	67 U
7005-72-3	4-Chlorophenyl-phenylether	67 U
86-73-7	Fluorene	67 U
100-01-6	4-Nitroaniline	330 U
534-52-1	4,6-Dinitro-2-Methylphenol	670 U
86-30-6	N-Nitrosodiphenylamine(1)	67 U
101-55-3	4-Bromophenyl-phenylether	67 U
118-74-1	Hexachlorobenzene	67 U
87-86-5	Pentachlorophenol	330 U
85-01-8	Phenanthrene	67 U
86-74-8	Carbazole	67 U
120-12-7	Anthracene	67 U
84-74-2	Di-n-Butylphthalate	67 U
206-44-0	Fluoranthene	67 U
129-00-0	Pyrene	67 U
85-68-7	Butylbenzylphthalate	67 U
91-94-1	3,3'-Dichlorobenzidine	330 U
56-55-3	Benzo(a)Anthracene	67 U
117-81-7	bis(2-Ethylhexyl)Phthalate	67 U
218-01-9	Chrysene	67 U
117-84-0	Di-n-Octyl Phthalate	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(ghi)Perylene	67 U

(1) Cannot be separated from diphenylamine

***Base/neutral surrogate recoveries**

d5-Nitrobenzene	61.1%
2-Fluorobiphenyl	48.7%
d14-p-Terphenyl	80.9%
d4-1,2-Dichlorobenzene	56.9%

***Acid surrogate recoveries**

d5-Phenol	46.0%
2-Fluorophenol	46.5%
2,4,6-Tribromophenol	38.6%
d4-2-Chlorophenol	53.6%

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(206) 621-7523 (FAX)

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by Methods 625/8270

Lab ID: A089ARE
Matrix: Soils/Sediments

Data Release Authorized: _____
Report prepared 03/09/92 - MAC:D

Sample No: Pit 1

QC Report No: A089-Dames & Moore
Project No: 21199-032
Trans Mtn.
VTSR: 03/02/92

Sample Wt: 23.2 gm (Dry Weight)
Percent Moisture: 33.6%
pH: 6.5
Conc/Dilution: 1 to 1

Date extracted: 03/03/92
Analyzed (FINN 6): 03/04/92
GPC Clean-up: No (1 of 2)

CAS Number		µg/Kg
108-95-2	Phenol	170 U
111-44-4	bis(2-Chloroethyl)Ether	86 U
95-57-8	2-Chlorophenol	86 U
541-73-1	1,3-Dichlorobenzene	86 U
106-46-7	1,4-Dichlorobenzene	86 U
100-51-6	Benzyl Alcohol	430 U
95-50-1	1,2-Dichlorobenzene	86 U
95-48-7	2-Methylphenol	86 U
108-60-1	2,2'(Oxybis(1-Chloropropane)	86 U
106-44-5	4-Methylphenol	86 U
621-64-7	N-Nitroso-Di-n-Propylamine	86 U
67-72-1	Hexachloroethane	170 U
98-95-3	Nitrobenzene	86 U
78-59-1	Isophorone	86 U
88-75-5	2-Nitrophenol	430 U
105-67-9	2,4-Dimethylphenol	170 U
65-85-0	Benzoic Acid	860 U
111-91-1	bis(2-Chloroethoxy)Methane	86 U
120-83-2	2,4-Dichlorophenol	260 U
120-82-1	1,2,4-Trichlorobenzene	86 U
91-20-3	**Naphthalene**	**79 J**
106-47-8	4-Chloroaniline	260 U
87-68-3	Hexachlorobutadiene	170 U
59-50-7	4-Chloro-3-Methylphenol	170 U
91-57-6	**2-Methylnaphthalene**	**200**
77-47-4	Hexachlorocyclopentadiene	430 U
88-06-2	2,4,6-Trichlorophenol	430 U
95-95-4	2,4,5-Trichlorophenol	430 U
91-58-7	2-Chloronaphthalene	86 U
88-74-4	2-Nitroaniline	430 U
131-11-3	Dimethyl Phthalate	86 U
208-96-8	Acenaphthylene	86 U
99-09-2	3-Nitroaniline	430 U

CAS Number		µg/Kg
83-32-9	Acenaphthene	86 U
51-28-5	2,4-Dinitrophenol	860 U
100-02-7	4-Nitrophenol	430 U
132-64-9	Dibenzofuran	86 U
121-14-2	2,4-Dinitrotoluene	430 U
606-20-2	2,6-Dinitrotoluene	430 U
84-66-2	Diethylphthalate	86 U
7005-72-3	4-Chlorophenyl-phenylether	86 U
86-73-7	Fluorene	86 U
100-01-6	4-Nitroaniline	430 U
534-52-1	4,6-Dinitro-2-Methylphenol	860 U
86-30-6	N-Nitrosodiphenylamine(1)	86 U
101-55-3	4-Bromophenyl-phenylether	86 U
118-74-1	Hexachlorobenzene	86 U
87-86-5	Pentachlorophenol	430 U
85-01-8	**Phenanthrene**	**47 J**
86-74-8	Carbazole	86 U
120-12-7	Anthracene	86 U
84-74-2	Di-n-Butylphthalate	86 U
206-44-0	Fluoranthene	86 U
129-00-0	Pyrene	86 U
85-68-7	**Butylbenzylphthalate**	**370 M**
91-94-1	3,3'-Dichlorobenzidine	430 U
56-55-3	Benzo(a)Anthracene	86 U
117-81-7	bis(2-Ethylhexyl)Phthalate	86 U
218-01-9	Chrysene	86 U
117-84-0	Di-n-Octyl Phthalate	86 U
205-99-2	Benzo(b)Fluoranthene	86 U
207-08-9	Benzo(k)Fluoranthene	86 U
50-32-8	Benzo(a)Pyrene	86 U
193-39-5	Indeno(1,2,3-cd)Pyrene	86 U
53-70-3	Dibenz(a,h)Anthracene	86 U
191-24-2	Benzo(ghi)Perylene	86 U

(1) Cannot be separated from diphenylamine

***Base/neutral surrogate recoveries**

d5-Nitrobenzene	56.5%
2-Fluorobiphenyl	63.1%
d14-p-Terphenyl	59.5%
d4-1,2-Dichlorobenzene	54.5%

***Acid surrogate recoveries**

d5-Phenol	62.6%
2-Fluorophenol	61.9%
2,4,6-Tribromophenol	63.0%
d4-2-Chlorophenol	61.6%

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(206) 621-7523 (FAX)

ORGANICS ANALYSIS DATA SHEET
Volatiles by Method 624/8240

Sample No: Method Blank

Lab ID: MB - 0303
Matrix: Soils/Sediments

QC Report No: A089-Dames&Moore
Project No: 21199-032
Trans Mtn.
VTSR: NA

Data Release Authorized: _____
Report prepared: 03/04/92 - MAC: RPR

Amount Analyzed: 0.027 gm (Eqiuv.Dry Wt.)
Percent Moisture: NA
pH: NA

Instrument: FINN 7
Date Analyzed: 03/03/92

CAS Number		µg/Kg
74-87-3	Chloromethane	370 U
74-83-9	Bromomethane	370 U
75-01-4	Vinyl Chloride	370 U
75-00-3	Chloroethane	370 U
75-09-2	**Methylene Chloride**	**840**
67-64-1	**Acetone**	**500 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	930 U
71-55-6	1,1,1-Trichloroethane	190 U
56-23-5	Carbon Tetrachloride	190 U
75-27-4	Bromodichloromethane	190 U
75-69-4	Trichlorofluoromethane	190 U

CAS Number		µg/Kg
78-87-5	1,2-Dichloropropane	190 U
10061-02-6	Trans-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
10061-01-5	cis-1,3-Dichloropropene	190 U
110-75-8	2-Chloroethylvinylether	190 U
75-25-2	Bromoform	190 U
108-10-1	4-Methyl-2-Pentanone	370 U
591-78-6	2-Hexanone	740 U
127-18-4	Tetrachloroethene	190 U
79-34-5	1,1,2,2-Tetrachloroethane	190 U
108-88-3	Toluene	190 U
108-90-7	Chlorobenzene	190 U
100-41-4	Ethylbenzene	190 U
100-42-5	Styrene	190 U
1330-20-7	**Total Xylenes**	**340 M**
1,1,2-Trichloro-1,2,2-trifluoroethane		930 U

Surrogate Recoveries

d8-Toluene	104%
Bromofluorobenzene	101%
d4-1,2-Dichloroethane	95.0%

Data Reporting Qualifiers

Value If the result is a value greater than or equal to the detection limit, report the value.

U Indicates compound was analyzed for but not detected at the given detection limit.

J Indicates an estimated value when result is less than specified detection limit.

NR Analysis not required.

B This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.

K This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

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

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ORGANICS ANALYSIS DATA SHEET
Volatiles by Method 624/8240

Sample No: Pit - 1

Lab ID: A089 - A
Matrix: Soils/Sediments

QC Report No: A089-Dames&Moore
Project No: 21199-032
Trans Mtn.
VTSR: 03/02/92

Data Release Authorized: _____
Report prepared: 03/04/92 - MAC: RPR

Amount Analyzed: 0.027 gm (Dry Wt.)
Percent Moisture: 34.5%
pH: NA

Instrument: FINN 7
Date Analyzed: 03/03/92

CAS Number		µg/Kg
74-87-3	Chloromethane	370 U
74-83-9	Bromomethane	370 U
75-01-4	Vinyl Chloride	370 U
75-00-3	Chloroethane	370 U
75-09-2	**Methylene Chloride**	**900 B**
67-64-1	**Acetone**	**4400 B**
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	930 U
71-55-6	1,1,1-Trichloroethane	190 U
56-23-5	Carbon Tetrachloride	190 U
75-27-4	Bromodichloromethane	190 U
75-69-4	Trichlorofluoromethane	190 U

CAS Number		µg/Kg
78-87-5	1,2-Dichloropropane	190 U
10061-02-6	Trans-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
10061-01-5	cis-1,3-Dichloropropene	190 U
110-75-8	2-Chloroethylvinylether	190 U
75-25-2	Bromoform	190 U
108-10-1	4-Methyl-2-Pentanone	370 U
591-78-6	2-Hexanone	740 U
127-18-4	Tetrachloroethene	190 U
79-34-5	1,1,2,2-Tetrachloroethane	190 U
108-88-3	**Toluene**	**450**
108-90-7	Chlorobenzene	190 U
100-41-4	Ethylbenzene	190 U
100-42-5	Styrene	190 U
1330-20-7	**Total Xylenes**	**330 JB**
1,1,2-Trichloro-1,2,2-trifluoroethane		**590**

Surrogate Recoveries

d8-Toluene	98.9%
Bromofluorobenzene	94.1%
d4-1,2-Dichloroethane	88.8%

Data Reporting Qualifiers

Value If the result is a value greater than or equal to the detection limit, report the value.

U Indicates compound was analyzed for but not detected at the given detection limit.

J Indicates an estimated value when result is less than specified detection limit.

NR Analysis not required.

B This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.

K This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

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

EXPLANATION OF INORGANIC DATA REPORT CODES

The columns labeled 'PREP', 'C', and 'M' contain important information about your analyses. The codes are explained below.

PREPARATION CODES

These 3-letter codes describe methods used to prepare samples for analysis:

AEN USEPA, Metals in air filters
AHM ARI, Mercury in air filters
AHN ARI, Metals in air filters
ANN NIOSH 7300, Metals in air filters
CAN AOAC (1984) 25.024, Metals in earthenware
DE6 EPA 600/4-79-020 218.5, Cr(VI) in water
DMM DMN followed by TMM, Dissolved mercury
DMN Filtered through .45u filter, Dissolved metals
EW6 EWN followed by DE6
EWM EWN followed by TMM
EWN USEPA SW-846 1310, EP Toxicity
FHP ARI, Metals in tissue ($HNO_3/HClO_4$)
FPP PSEP, Metals in tissue ($HNO_3/HClO_4$)
FRM Journal, Mercury in tissue
FRN Journal, Metals in tissue (HNO_3/H_2O_2)
KRN ARI, Concentration by coprecipitation
LEM USEPA, TCLP followed by TMM
LEN USEPA, TCLP Extraction
MHM ARI, Mercury in miscellaneous materials
MHN ARI, Metals in miscellaneous materials
OAM ARI, Mercury in oil, grease or tar
OAN ARI, Metals in oil, grease or tar
PHM ARI, Mercury in wipes
PHN ARI, Metals in wipes
RCC USEPA CLP, Water digestion, HCl matrix
RCN USEPA CLP, Water digestion, HNO_3 matrix
REC EPA 600/4-79-020 4.1.4, HCl matrix
REI EPA 600/4-79-020 200.7 and 9.4
REN EPA 600/4-79-020 4.1.4, HNO_3 matrix
RMA EPA 600/4-79-020 206.2
RWC USEPA SW-846 3005
SCC USEPA CLP, Soil digestion, HCl matrix
SCM USEPA CLP, Mercury in soil
SCN USEPA CLP, Soil digestion, HNO_3 matrix
SEM EPA 600/4-79-020 245.5, Mercury in soil
SHF ARI, Metals in soil, HF digestion
SRL Journal, Lithium meta-borate fusion
SPF PSEP, Metals in sediment, HF digestion
SSC Standard Methods 302C, Sb/Sn in soil
SSN Standard Methods 302C, Soil digestion
SSS Standard Methods 302C, Ti in soil
SW6 USEPA SW-846 3060, Cr(VI) in soil
SWC USEPA SW-846 3050, HCl matrix
SWN USEPA SW-846 3050, HNO_3 matrix
SWR USEPA SW-846 Modified 3005, Sb by GFAAS
TEC EPA 600/4-79-020 4.1.3, HCl matrix
TEG EPA 600/4-79-020 272.1, Silver in water
TEI EPA 600/4-79-020 200.7 and 9.3
TEN EPA 600/4-79-020 4.1.3, HNO_3 matrix
THG ARI, Silver in photographic solutions
TMM EPA 600/4-79-020 245.1, Mercury in water
TSC Standard Methods 302C, Sb/Sn in water
TSN Standard Methods 302D
TSS Standard Methods 302E, Ti in water
TWC USEPA SW-846 3010, HCl matrix
TWG USEPA SW-846 7760, Silver in water
TWN USEPA SW-846 3020, HNO_3 matrix
WMN EPA 600/4-79-020, Preserved, undigested water
XSC Standard Methods 302B

CONCENTRATION CODES

These codes are used to qualify reported concentrations:

U No analyte was detected. The reported value is the lower limit of detection.

METHOD CODES

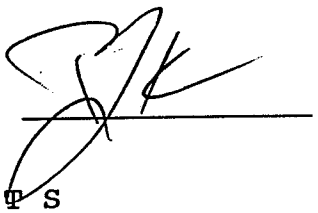
These codes signify the instrumental technique used for analysis:

CVA Cold Vapor Atomic Absorption Spectrophotometry
FLA Flame Atomic Absorption Spectrophotometry
GFA Graphite Furnace Atomic Absorption Spectrophotometry
ICP Inductively Coupled Plasma Atomic Emission Spectrometry

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
03/17/92
10:39:11

Client: Dames & Moore
Contact: David Maltby
Project: Trans. Mtn.
ID number: Pit 1
Description:
Sampled: / /
Received: 03/02/92
Matrix: Soil

ARI job number: A089
ARI sample number: A

Released by: 

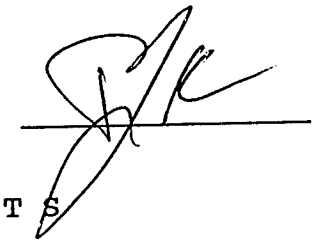
A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-36-0	Antimony	7 mg/kg-dry	U	SWC	ICP
7440-38-2	Arsenic	3.4 mg/kg-dry		SWN	GFA
7440-41-7	Beryllium	0.5 mg/kg-dry		SWC	ICP
7440-43-9	Cadmium	0.3 mg/kg-dry	U	SWC	ICP
7440-47-3	Chromium	44.6 mg/kg-dry		SWC	ICP
7440-50-8	Copper	21.4 mg/kg-dry		SWC	ICP
7439-92-1	Lead	6.4 mg/kg-dry		SWN	GFA
7439-97-6	Mercury	0.07 mg/kg-dry	U	SCM	CVA
7440-02-0	Nickel	45 mg/kg-dry		SWC	ICP
7782-49-2	Selenium	0.3 mg/kg-dry		SWN	GFA
7440-22-4	Silver	0.5 mg/kg-dry		SWC	ICP
7440-28-0	Thallium	0.1 mg/kg-dry	U	SWN	GFA
7440-66-6	Zinc	119 mg/kg-dry		SWC	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
03/17/92
10:39:15

Client: Dames & Moore
Contact: David Maltby
Project: Trans. Mtn.
ID number:
Description: Method Blank
Sampled: / /
Received: / /
Matrix: Soil

ARI job number: A089
ARI sample number: MB

Released by: 

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-36-0	Antimony	5 mg/kg-dry	U	SWC	ICP
7440-38-2	Arsenic	0.1 mg/kg-dry	U	SWN	GFA
7440-41-7	Beryllium	0.1 mg/kg-dry	U	SWC	ICP
7440-43-9	Cadmium	0.2 mg/kg-dry	U	SWC	ICP
7440-47-3	Chromium	0.5 mg/kg-dry	U	SWC	ICP
7440-50-8	Copper	0.2 mg/kg-dry	U	SWC	ICP
7439-92-1	Lead	0.1 mg/kg-dry	U	SWN	GFA
7439-97-6	Mercury	0.1 mg/kg-dry	U	SCM	CVA
7440-02-0	Nickel	1 mg/kg-dry	U	SWC	ICP
7782-49-2	Selenium	0.1 mg/kg-dry	U	SWN	GFA
7440-22-4	Silver	0.3 mg/kg-dry	U	SWC	ICP
7440-28-0	Thallium	0.1 mg/kg-dry	U	SWN	GFA
7440-66-6	Zinc	0.4 mg/kg-dry	U	SWC	ICP

12 March 1992

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

David Maltby
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032 Trans Mtn.:
ARI Job #A126

Dear David:

Please find enclosed the results and original chain-of-custody report for the above referenced project. Three samples and a trip blank arrived in good condition on 3/5/92, and the analysis proceeded without incident.

If you have any questions or need further information, please feel free to call any time. I can be reached at the number above, or direct at 340-2867, ext. 117, where you can also leave a message if I'm not available.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Coordinator

KAS/ks

Enclosures

cc: file#A126

CHAIN-OF-CUSTODY RECORD

gasoline range hydrocarbons

WHITE COPY / Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Boring or Well Number	Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	VOA 602/8020	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (M)	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	.	.	.	.	.	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
SWRO-C38			1535	water	2-40mlvials					X																	2	
SWRO-D2-19			1545	"	"					X																	2	
SWRO-D3-19			~~1535~~	"	"					X																	2	
Trip Blank				"	"																							

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

JMWilliams 3/3/92 1200

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

ANALYTICAL LABORATORY: ARI

LABORATORY CONTACT: Kate

D&M CONTACT: David Maltby PHONE: 7280744

DAMES & MOORE
500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

LABORATORY NOTES:

- placed in Trans Mountain refrigerator until ready to go to ARI on 3/4/92

JOB NO.: 21199 032 SHEET 1 OF 1

PROJECT Trans Mountain

LOCATION Bellingham - Laurel Station

COLLECTOR JMWilliams DATE OF COLLECTION 3/3/92

A.R.I. # A126

ANALYTICAL RESOURCES INCORPORATED

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Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL GASOLINE RANGE HYDROCARBONS BY GC/FID
WA TPH-G Method (Purge & Trap)

QC Report No: A126-Dames & Moore
Project: 21199032
Trans Mtn.
VTSR: 03/05/92

Matrix: Waters

Data Release Authorized _____
Data Prepared: 03/10/92 MAC:D sk

Date extracted: 03/06/92
Date Analyzed: 03/06-07/92

Lab ID		Client Sample ID	Dilution Factor	Gasoline Range Hydrocarbons †	Gas ID *	Surrogate A	Surrogate B
A126	*MB*	*Method Blank*	NA	0.25 U	No	86.8%	89.7%
A126	A	SWRO-C38	NA	0.25 U	No	85.8%	90.8%
A126	A DUP.	SWRO-C38 Dup	NA	0.25 U	No	87.7%	92.6%
A126	B	SWRO-D2-19	NA	0.25 U	No	86.0%	90.4%
A126	C	SWRO-D3-19	NA	0.25 U	No	85.5%	89.1%
A126	D	Trip Blank	NA	0.25 U	No	86.2%	93.8%

Surrogate A = Trifluorotoluene
Surrogate B = Bromobenzene

Values reported in ppm (mg/L).

U Indicates compound was analyzed for but not detected at the given detection limit.

X Indicates a value above the linear range of the detector. Dilution required.

* In the opinion of the analyst, was there a pattern match for gasoline (yes or no).

† Value based on total peaks in Toluene-C12 range.

13 March 1992

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333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

David Maltby
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032 Trans Mtn.:
ARI Job #A134

Dear David:

Please find enclosed the results and original chain-of-custody report for the above referenced project. Three samples were received in good condition on 3/5/92, and the analysis proceeded without incident.

If you have any questions or need further information, please feel free to call any time. I can be reached at the number above, or direct at 340-2867, ext. 117, where you can also leave a message if I'm not available.

Sincerely,

ANALYTICAL RESOURCES, INC.
Kate Stegemoeller
Kate Stegemoeller
Project Coordinator

KAS/ks

Enclosures

cc: file#A134

CHAIN-OF-CUSTODY RECORD

WHITE Y - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Boring or Well Number	Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	VOA 602/8020	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (M)	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	WTPH-HCID			FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
	DTE-1X	1X	1130	Soil	4 oz. Glass					*											✓				Field Screened - Hit	1	
	DTE-2X	2X	1135	Soil	↓					*											✓				" - Clean	1	
	DTE-3X	3X	1140	Soil	↓					*											✓				" - Hit	1	

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

3/5/92 17:17 Erin Cramer

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

LABORATORY NOTES:

* Run 8015 to quantify if any hits on HCID

ANALYTICAL LABORATORY: ARI

LABORATORY CONTACT: Kate Stegemoeller

D&M CONTACT: David Maltby PHONE: 728-0744

DAMES & MOORE
500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

JOB NO.: 21199-032-005 SHEET 1 OF 1

PROJECT Transmountain Oil Pipeline

LOCATION Bellingham WA

COLLECTOR David Maltby DATE OF COLLECTION 2/25/92

ANALYTICAL
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Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL PETROLEUM HYDROCARBONS
WA HCID Method by GC/FID

QC Report No: A134-Dames&Moore
Project: Trans Mountain

Matrix: Soils

VTSR: 03/05/92

Data Release Authorized _____
Data Prepared: 03/12/92 - MAC:C PAT

Date Extracted: 03/06/92
Date Analyzed: 03/12/92

Lab ID	Client Sample ID	Dilution Factor	Petroleum Hydrocarbons †	TPH ID *	Surrogate Recovery
A134 MB	*Method Blank*	1	15 U	No	99.9%
A134 A	**DTE-1X**	**1**	**460**	**Diesel**	**112%**
A134 B	DTE-2X	1	15 U	No	109%
A134 C	DTE-3X	1	15 U	No	102%

Surrogate is Me-Arachidate.

Values reported in ppm (mg/kg) on a dry weight basis.

U Indicates compound was analyzed for but not detected at the given detection limit.

X Indicates a value above the linear range of the detector. Dilution required.

* In the opinion of the analyst, was there a pattern match for diesel or gasoline.

† Value based on total peaks in the range from Toluene to C24.

12 March 1992

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

David Maltby
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032 Trans Mtn.:
ARI Job #A165

Dear David:

Please find enclosed the results and original chain-of-custody report for the above referenced project. Three samples were received in good condition on 3/11/92, and the analyses proceeded without incident. The 418.1 results were faxed to you yesterday, the BETX earlier today.

If you have any questions or need further information, please feel free to call any time. I can be reached at the number above, or direct at 340-2867, ext. 117, where you can also leave a message if I'm not available.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Coordinator

KAS/ks

Enclosures

cc: file#A165

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Boring or Well Number	Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES: VOA 601/8010	VOA 602/8020 (BTEX)	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (M)	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
T-170			1210	water	1-l glass amber				X												rush analysis	1	
T-170			1210		2-40ml vial		X														Tank 170.	2	
SW-1			1110		1-l plus 2-40ml		X		X													3	
SW-2			1145		1-l plus 2-40ml		X		X													3	

A.R.I. # A1605

RELINQUISHED BY: (Signature) JMWilliam DATE/TIME 3/10/92 1230 RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

ANALYTICAL LABORATORY: ARI

LABORATORY CONTACT: Kate

D&M CONTACT: David Maltby PHONE: 728 0744

LABORATORY NOTES:

T-170 rush analysis

SW-1, SW-2 } 2 wk turn around. JMW

~~Unpreserved aliquots will be collected by David Maltby or Ingrid Kelly~~

~~Samples sent by courier~~

DAMES & MOORE
500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

JOB NO.: 21199 032 SHEET 1 OF 1

PROJECT Trans Mountain

LOCATION Laurel Station / Emergency Response Samples

COLLECTOR J M William. DATE OF COLLECTION 3/10/92

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL PETROLEUM HYDROCARBONS by IR Scan
Modified EPA Method 418.1

Matrix: Water

Project: 21199-032

QC Report No: A165 Dames & Moore
VTSR: 03/11/92

Data Release Authorized _____
Data Prepared: 03/11/92 -MAC:PJW

Date Prepared: 03/11/92
Date of Analysis: 03/11/92

Lab ID	Client Sample ID	Dilution Factor	TPH (ppm)
A165 MB	*METHOD BLANK*	*1*	*1 U*
A165 A	T-170	1	1 U
A165 B	SW-1	1	1 U
A165 C	SW-2	1	1 U

Values reported in ppm (mg/L).

U Indicates compound was analyzed for but not detected at the given detection limit.

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333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

ORGANICS ANALYSIS DATA SHEET - Method 602/8020
BETX by GC-PID

Matrix: Water
Level: Low

Data Release Authorized: _____

QC Report No: A165-Dames & Moore
Project No: 21199-032

Report prepared: 3/12/92 - MAC:K kas

Date Received: 3/11/92

	Sample No.	Method Blank	T-170	SW-1	SW-2
	ARI ID	0309MB	A165A	A165B	A165C
	Date Analyzed	03/10/92	03/11/92	03/11/92	03/11/92
	Amt Analyzed	5.0 mls	5.0 mls	5.0 mls	5.0 mls
CAS Number	**Units**	µg/L	µg/L	µg/L	µg/L
71-43-2	Benzene	1.0 U	1.0 U	1.0 U	**5.4**
108-88-3	Toluene	1.0 U	**5.6**	1.0 U	**14**
100-41-4	Ethylbenzene	1.0 U	1.0 U	1.0 U	**2.1**
1330-20-7	Total Xylenes	2.0 U	2.0 U	2.0 U	**22**
	Surrogate Recoveries				
	Trifluorotoluene	83.5%	87.4%	85.0%	90.2%
	Bromobenzene	84.9%	83.6%	83.6%	95.1%

Data Reporting Qualifiers

Value	If the result is a value greater than or equal to the detection limit, report the value.	B	This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.
U	Indicates compound was analyzed for but not detected at the given detection limit.	J	Indicates an estimated value when result is less than specified detection limit.

18 March 1992

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

David Maltby
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032 Trans Mtn.:
ARI Job #A182

Dear David:

Please find enclosed the results and original chain-of-custody report for the above referenced project. Nine samples were received in good condition on 3/12/92, and the analyses proceeded without incident.

If you have any questions or need further information, please feel free to call any time. I can be reached at the number above, or direct at 340-2867, ext. 117, where you can also leave a message if I'm not available.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Coordinator

KAS/ks

Enclosures

cc: file#A182

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Boring or Well Number	Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	VOA 602/8020 BTEX	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (Mod. for gas)	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS					FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
SW-1	-2		0940	water	1-l plus 2-40ml	X			X																	3	
SW-2	-2		1010	"	1-l plus 2-40ml	X			X																	3	
SWRO	-C39		1410	"	2-40 ml					X																2	
SWRO	-D2-20		1430	"	↓					X																2	
SWRO	-D3-20		1450	"	↓					X																2	
Trip Blank																										2	
SW-1			1615	"	1-l amber				X																collected at 5381 Hannegan		

RELINQUISHED BY: (Signature) rmwilliams DATE/TIME 3/11/92 1545 RECEIVED BY: (Signature) Shelby Miller 3/12/92

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature) 15:17

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

ANALYTICAL LABORATORY: ARI, Seattle WA

LABORATORY CONTACT: Kate Stegenwaller

D&M CONTACT: David Matthay PHONE: 726-0744

DAMES & MOORE
500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

LABORATORY NOTES:

Samples stored in refridgerator on-site (Trans Mountain) until they are sent to ARI

Mod 8015 - gas range hydrocarbons

A.R.I. # A182

JOB NO.: 21199 032 SHEET 1 OF 1

PROJECT Trans Mountain Oil Pipe Line

LOCATION Laurel Station, Bellingham WA

COLLECTOR RM Williams DATE OF COLLECTION 3/11/92

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Boring or Well Number	Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	VOA 602/8020 BTE	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (M)	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	.	.	.	.	.	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
SW-1-3	—		0915	water	2-ml plus 1-L		X			V																	3	
SW-3-1	—		0945	"	2-ml plus 1-L		X			X																	3	

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

J M W. Ulian 3/12/92 Shelby Milly 3/12/92

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

15:17

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

ANALYTICAL LABORATORY: Analytical Resources Inc.

LABORATORY CONTACT: Kate Stegemoeller

D&M CONTACT: David Matthay PHONE: 728 0744

DAMES & MOORE
500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

LABORATORY NOTES:

Samples stored in refridgerator on Trans Mountain site until shipped to analytical laboratory.

JOB NO.: 21199 032 SHEET 1 OF 1

PROJECT Trans Mountain

LOCATION Laurel Station

COLLECTOR J M W. Ulian DATE OF COLLECTION 3/12/92

ANALYTICAL RESOURCES INCORPORATED

Analytical
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Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL PETROLEUM HYDROCARBONS by IR Scan
Modified EPA Method 418.1

Matrix: Water

Project: 21199 032
Trans Mtn.
QC Report No: A182 Dames & Moore
VTSR: 03/12/92

Data Release Authorized _____
Data Prepared: 03/17/92 -MAC:PJW

Date Prepared: 03/16/92
Date of Analysis: 03/16/92

Lab ID	Client Sample ID	Dilution Factor	TPH (ppm)
A182 MB	*METHOD BLANK*	*1*	*1 U*
A182 A	SW-1-2	1	1 U
A182 B	SW-2-2	1	1 U
A182 G	SW-1	1	1 U
A182 H	SW-1-3	1	1 U
A182 I	SW-3-1	1	1 U

Values reported in ppm (mg/L).

U Indicates compound was analyzed for but not detected at the given detection limit.

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL GASOLINE RANGE HYDROCARBONS BY GC/FID
WA TPH-G Method (Purge & Trap)

QC Report No: A182-Dames & Moore
Project: 21199032
Trans Mtn.
VTSR: 03/12/92

Matrix: Waters

Data Release Authorized _____
Data Prepared: 03/17/92 MAC:D sk

Date extracted: 03/16/92
Date Analyzed: 03/16/92

Lab ID	Client Sample ID	Dilution Factor	Gasoline Range Hydrocarbons †	Gas ID *	Surrogate A	Surrogate B
A182 MB	*Method Blank*	NA	0.25 U	No	92.1%	97.8%
A182 C	SWRO-C39	NA	0.25 U	No	92.6%	98.3%
A182 D	SWRO-D2-20	NA	0.25 U	No	96.8%	99.6%
A182 E	SWRO-D3-20	NA	0.25 U	No	91.9%	95.6%
A182 F	Trip Blank	NA	0.25 U	No	93.6%	99.6%

Surrogate A = Trifluorotoluene
Surrogate B = Bromobenzene

Values reported in ppm (mg/L).

U Indicates compound was analyzed for but not detected at the given detection limit.

X Indicates a value above the linear range of the detector. Dilution required.

* In the opinion of the analyst, was there a pattern match for gasoline (yes or no).

† Value based on total peaks in Toluene-C12 range.

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

ORGANICS ANALYSIS DATA SHEET - Method 602/8020
BETX by GC-PID

Matrix: Water
Level: Low

Data Release Authorized: _____
Report prepared: 03/17/92 *MAC:D sk*

QC Report No: A182-Dames & Moore
Project No: 21199032
Trans Mtn.
Date Received: 03/12/92

	Sample No.	Meth Blank	SW-1-2	SW-2-2	SWRO-C39	SWRO-D2-20
	ARI ID	0316MB	A182A	A182B	A182C	A182D
	Date Analyzed	03/16/92	03/16/92	03/16/92	03/16/92	03/16/92
	Amt Analyzed	5.0 mls	5.0 mls	5.0 mls	5.0 mls	5.0 mls
CAS Number	Units	µg/L	µg/L	µg/L	µg/L	µg/L
71-43-2	Benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
108-88-3	Toluene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
100-41-4	Ethylbenzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1330-20-7	Total Xylenes	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U

Surrogate Recoveries

Trifluorotoluene	92.1%	98.6%	93.0%	89.8%	90.2%
Bromobenzene	88.3%	96.1%	89.5%	87.8%	89.5%

	Sample No.	SWRO-D3-20	Trip Blank	SW-1-3	SW-1-3 dup	SW-3-1
	ARI ID	A182E	A182F	A182H	A182H dup	A182I
	Date Analyzed	03/16/92	03/16/92	03/16/92	03/16/92	03/16/92
	Amt Analyzed	5.0 mls	5.0 mls	5.0 mls	5.0 mls	5.0 mls
CAS Number	Units	µg/L	µg/L	µg/L	µg/L	µg/L
71-43-2	Benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
108-88-3	Toluene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
100-41-4	Ethylbenzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1330-20-7	Total Xylenes	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U

Surrogate Recoveries

Trifluorotoluene	91.4%	92.1%	92.1%	93.6%	95.1%
Bromobenzene	84.2%	90.0%	89.4%	87.4%	90.8%

Data Reporting Qualifiers

Value	If the result is a value greater than or equal to the detection limit, report the value.	B	This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.
U	Indicates compound was analyzed for but not detected at the given detection limit.	J	Indicates an estimated value when result is less than specified detection limit.

24 March 1992

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

David Maltby
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032 Trans Mtn.:
ARI Job #A210

Dear David:

Please find enclosed the results and original chain-of-custody report for the above referenced project. Two samples and a trip blank were received in good condition on 3/13/92, and the analyses proceeded without incident.

If you have any questions or need further information, please feel free to call any time. I can be reached at the number above, or direct at 340-2867, ext. 119, where you can also leave a message if I'm not available.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Coordinator

KAS/ks

Enclosures

cc: file#A210

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Boring or Well Number	Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES: VOA 601/8010	VOA 602/8020 BTEX	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (M)	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	.	.	.	.	.	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
SW-1	4		11:10	water	2-40 ml vial plus 1-L		X			X																	3	
SW-3	2		11:15	water	1-L		X			X																	3	
Trip Blank																												

RELINQUISHED BY: (Signature) J M Williams DATE/TIME 3/13/92 1150 RECEIVED BY: (Signature) Jon Folkins 3/13/92

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

LABORATORY NOTES: Stored samples in on-site refridgerator until delivery 17:50 to lab.

ANALYTICAL LABORATORY: Analytical Resources Inc.

LABORATORY CONTACT: Kate Steinmoeller

D&M CONTACT: David Matthys PHONE: 7280744

DAMES & MOORE
500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

JOB NO.: 21199 032 SHEET 1 OF 1

PROJECT Trans Mountain

LOCATION Laurel Station

COLLECTOR J M Williams DATE OF COLLECTION 3/13/92

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL PETROLEUM HYDROCARBONS by IR Scan
Modified EPA Method 418.1

Matrix: Water

Project: 21199 032
Trans Mtn.
QC Report No: A210 Dames & Moore
VTSR: 03/13/92

Data Release Authorized _____
Data Prepared: 03/17/92 -MAC:PJW

Date Prepared: 03/16/92
Date of Analysis: 03/16/92

Lab ID	Client Sample ID	Dilution Factor	TPH (ppm)
A210 MB	*METHOD BLANK*	*1*	*1 U*
A210 A	**SW-1-4**	**1**	**1.1**
A210 B	SW-3-2	1	1 U

Values reported in ppm (mg/L).

U Indicates compound was analyzed for but not detected at the given detection limit.

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

ORGANICS ANALYSIS DATA SHEET - Method 602/8020
BETX by GC-PID

Matrix: Water
Level: Low

QC Report No: A210-Dames & Moore
Project No: Trans Mtn.

Data Release Authorized: _____
Report prepared: 03/21/92 *MAC:D sk*

Date Received: 03/13/92

CAS Number		Sample No.	Meth Blank	SW-1-4	SW-1-4 dup	SW-3-2	Trip Blank
		ARI ID	0317MB	A210A	A210A dup	A210B	A210C
		Date Analyzed	03/17/92	03/17/92	03/17/92	03/17/92	03/17/92
		Amt Analyzed	5.0 mls	5.0 mls	5.0 mls	5.0 mls	5.0 mls
		Units	µg/L	µg/L	µg/L	µg/L	µg/L
71-43-2	Benzene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
108-88-3	Toluene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
100-41-4	Ethylbenzene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1330-20-7	Total Xylenes		2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
	Surrogate Recoveries						
	Trifluorotoluene		86.3%	92.7%	94.0%	92.1%	90.5%
	Bromobenzene		87.2%	93.8%	94.1%	92.4%	92.3%

Data Reporting Qualifiers

Value	If the result is a value greater than or equal to the detection limit, report the value.	B	This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.
U	Indicates compound was analyzed for but not detected at the given detection limit.	J	Indicates an estimated value when result is less than specified detection limit.

23 March 1992

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

David Maltby
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032 Trans Mtn.:
ARI Job #A222

Dear David:

Please find enclosed the results and original chain-of-custody report for the above referenced project. Six samples and a trip blank were received in good condition on 3/16/92, and the analyses proceeded without incident.

If you have any questions or need further information, please feel free to call any time. I can be reached at the number above, or direct at 340-2867, ext. 119, where you can also leave a message if I'm not available.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Coordinator

KAS/ks

Enclosures

cc: file#A222

A222

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Boring or Well Number	Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	VOA 602/8020 (BTEX)	VOA 624/8240	Semi-Vol 625/8270	TRH 418.1	TPH 8015 (M)	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	.	.	.	.	.	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
SW-3	-3			water	2-40ml, 1-L	X			X																	3/14/92	3	
SW-3	-4		15:05	↓	↓	X			X																	3/15/92		
SW-1	-5					X			X																	3/14/92	4	
SW-1	-6		1514			X			X																	3/15/92		

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)
Ingrid Wilian 3/16/92 1800

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)
Erin Cranwell 3/16/92 17:00

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

LABORATORY NOTES:

ANALYTICAL LABORATORY: Analytical Resources Inc.
LABORATORY CONTACT: Kate Stegmoeller
D&M CONTACT: David Maltby PHONE: 228 0744

DAMES & MOORE
500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

JOB NO.: 21199 032 SHEET ____ OF ____
PROJECT Trans Mountain
LOCATION Laurel Pump Station
COLLECTOR David Maltby DATE OF COLLECTION 3/14 ; 3/15/92

A222

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Boring or Well Number	Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	VOA 602/8020 ~~BTX~~	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (M)	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	.	.	.	.	.	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
SW-1-7		3/16/92	1130	water	2-40ml; 1-L		X		X																		3	
SW-3-5		3/16/92	1140	water	2-40ml; 1-L		X		X																		3	
Trip Blank		3/16/92		"	"																						2	

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

M.W. Mahr 3/16/92 1800 Erin Cramer 3/16/92

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

LABORATORY NOTES:

ANALYTICAL LABORATORY: Analytical Resources Inc.

LABORATORY CONTACT: Kate Hagemeier

D&M CONTACT: David Mathby PHONE: 728 0744

DAMES & MOORE
500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

JOB NO.: 21199 032 SHEET 1 OF 2

PROJECT Trans Mountain

LOCATION Laurel Pump Station

COLLECTOR M.W. Mahr DATE OF COLLECTION 3/16/92

ANALYTICAL
RESOURCES
INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

ORGANICS ANALYSIS DATA SHEET
BETX by Method 602/8020

Matrix: Waters
Level: Low

Data Release Authorized:
Report prepared: 03/23/92 - MAC: RPR

Project No: 21199-032
Trans Mtn.
QC Report No:A222-Dames & Moore
VTSR: 3/16/92

	Sample No.	Method Blank	S W - 3 - 3	S W - 3 - 3	S W - 3 - 4
	ARI ID	MB0317	A222 - A	A222 - A Dup	A222 - B
	Date Analyzed	3/17/92	3/18/92	3/18/92	3/18/92
	Amt Analyzed	5.0 ml	5.0 ml	5.0 ml	5.0 ml
CAS Number	Units	µg/L	µg/L	µg/L	µg/L
71-43-2	Benzene	1.0 U	1.0 U	1.0 U	1.0 U
108-88-3	Toluene	1.0 U	1.0 U	1.0 U	1.0 U
100-41-4	Ethylbenzene	1.0 U	1.0 U	1.0 U	1.0 U
1330-20-7	Total Xylenes	2.0 U	2.0 U	2.0 U	2.0 U
	Trifluorotoluene	86.2%	83.9%	87.0%	83.4%
	Bromobenzene	87.1%	89.8%	89.9%	85.2%

	Sample No.	S W - 1 - 5	S W - 1 - 6	S W - 1 - 7	S W - 3 - 5	Trip Blank
	ARI ID	A222 - C	A222 - D	A222 - E	A222 - F	A222 - G
	Date Analyzed	3/18/92	3/18/92	3/18/92	3/18/92	3/18/92
	Amt Analyzed	5.0 ml	5.0 ml	5.0 ml	5.0 ml	5.0 ml
CAS Number	Units	µg/L	µg/L	µg/L	µg/L	µg/L
71-43-2	Benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
108-88-3	Toluene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
100-41-4	Ethylbenzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1330-20-7	Total Xylenes	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
	Trifluorotoluene	85.3%	85.0%	85.0%	82.5%	86.7%
	Bromobenzene	86.7%	86.8%	84.0%	85.4%	86.0%

DATA QUALIFIERS

U	Indicates the compound was undetected at the listed concentration.
J	Indicates an estimated value when the value is less than the calculated detection limit.
D	Indicates the surrogate(s) was not detected, due to dilution of extract.
NR	Indicates the surrogate recovery cannot be reported due to matrix interference.
X	Indicates a value above the linear range of the detector. Dilution required.
S	Indicates no value reported due to saturation of the detector. Dilution required.
C	Indicates a probable value which is unable to be confirmed due to matrix interference.

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL PETROLEUM HYDROCARBONS by IR Scan
Modified EPA Method 418.1

Matrix: Water

Project: 21199-032
Trans. Mountain
QC Report No: A222 Dames & Moore
VTSR: 03/16/92

Data Release Authorized _____
Data Prepared: 03/18/92 -MAC:PJW

Date Prepared: 03/18/92
Date of Analysis: 03/18/92

Lab ID	Client Sample ID	Dilution Factor	TPH (ppm)
A222 MB	*METHOD BLANK*	*1*	*1 U*
A222 A	SW-3-3	1	1 U
A222 B	SW-3-4	1	1 U
A222 C	SW-1-5	1	1 U
A222 D	SW-1-6	1	1 U
A222 E	SW-1-7	1	1 U
A222 E MS	SW-1-7	1	-
A222 E MSD	SW-1-7	1	-
A222 F	SW-3-5	1	1 U

Values reported in ppm (mg/L).

U Indicates compound was analyzed for but not detected at the given detection limit.

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TPH WATER MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

ARI Sample No: A222 E
Client Sample No: SW-1-7

Client: Dames & Moore
Project: Trans. Mountain

COMPOUND	SPIKE ADDED (mg/L)	SAMPLE CONC. (mg/L)	MS CONC. (mg/L)	MS % REC	MSD CONC. (mg/L)	MSD % REC	RPD
TPH	10.0	0.6	9.9	93.0%	10.0	94.0%	1.1%

1 April 1992

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

David Maltby
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032 Trans Mtn.;
ARI Job #A247

Dear David:

Please find enclosed the results and original chain-of-custody record for the above referenced project. Seven samples and a trip blank were received in good condition on 3/18/92, and the analyses proceeded without incident. The 418.1 report was faxed to you 3/23/92, the BETX and tph-gas earlier today.

If you have any questions or need further information, please feel free to call any time. I can be reached at the number above, or direct at 340-2867, ext. 117, where you can also leave a message if I'm not available.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Coordinator

KAS/ks

Enclosures

cc: file#A247

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Boring or Well Number	Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	VOA 602/8020/EDB	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (Mod. or Gas)	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	.	.	.	.	.	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
SW 3-6			11:00	water	2-40ml; 1 L	X			X																	3/17/92	3	
SW 1-8			1115	"	2-40 ml, 1-L	X			X																	3/17/92	3	
SW-3-7			1000	"	"	X			X																	3/18/92	3	
SW-1-9			0950	"	"	X			X																	3/18/92	3	
Trip Blank			-		2-40 ml					1																3/18/92	2	
SW20-C40			1035		2-40ml					X																3/18/92	2	
SW20-D2-21			1050		2-40ml					X																3/18/92	2	
SW20-D3-21			11:10	"	2-40 ml					X																3/18/92	2	

RELINQUISHED BY: (Signature) DATE/TIME 3/18/92 RECEIVED BY: (Signature)
JMWilliam 3/18/92 15:05 Shelby Miller

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

ANALYTICAL LABORATORY: ARI

LABORATORY CONTACT: Kate

D&M CONTACT: D. Maltby PHONE: 7280744

DAMES & MOORE
500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

LABORATORY NOTES:

taken directly to lab.

A.R.I. # A247

JOB NO.: 21199 032 SHEET 1 OF 1

PROJECT Trans Mountain

LOCATION Laurel Station

COLLECTOR DMaltby/JMWilliam DATE OF COLLECTION 3/17/92 // 3/18/92

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL PETROLEUM HYDROCARBONS by IR Scan
Modified EPA Method 418.1

Matrix: Water

Project: 21199032
Trans. Mountain
QC Report No: A247 Dames & Moore
VTSR: 03/18/92

Data Release Authorized _____
Data Prepared: 03/20/92 -MAC:PJW

Date Prepared: 03/20/92
Date of Analysis: 03/20/92

Lab ID	Client Sample ID	Dilution Factor	TPH (ppm)
A247 MB	*METHOD BLANK*	*1*	*1 U*
A247 A	SW-3-6	1	1 U
A247 B	SW-1-8	1	1 U
A247 C	SW-3-7	1	1 U
A247 D	SW-1-9	1	1 U

Values reported in ppm (mg/L).

U Indicates compound was analyzed for but not detected at the given detection limit.

ANALYTICAL
RESOURCES
INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

ORGANICS ANALYSIS DATA SHEET
BETX by Method 602/8020

Matrix: Waters
Level: Low

Project No: 21199032
Trans Mtn.

Data Release Authorized: _____ QC Report No: A247-Dames&Moore
VTSR: 03/18/92
Report prepared: 03/31/92 - MAC:C HAT

	Sample No.	Method Blk.	SW-3-6	SW-3-6 DUPL.	SW-1-8
	ARI ID	MB0320	A247A	A247ADUP	A247B
	Date Analyzed	3/23/92	3/24/92	3/24/92	3/24/92
	Amt Analyzed	5.0 ml	5.0 ml	5.0 ml	0.2 ml
CAS Number	Units	µg/L	µg/L	µg/L	µg/L
71-43-2	Benzene	1.0 U	1.0 U	1.0 U	29.4 U
108-88-3	Toluene	1.0 U	1.0 U	1.0 U	29.4 U
100-41-4	Ethylbenzene	1.0 U	1.0 U	1.0 U	29.4 U
1330-20-7	Total Xylenes	2.0 U	2.0 U	2.0 U	58.8 U
	Trifluorotoluene	*106%*	*104%*	*95.5%*	*91.3%*
	Bromobenzene	*97.8%*	*99.2%*	*92.5%*	*89.5%*

	Sample No.	SW-3-7	SW-1-9
	ARI ID	A247C	A247D
	Date Analyzed	3/24/92	3/24/92
	Amt Analyzed	5.0 ml	0.2 ml
CAS Number	Units	µg/L	µg/L
71-43-2	Benzene	1.0 U	1.0 U
108-88-3	Toluene	1.0 U	1.0 U
100-41-4	Ethylbenzene	1.0 U	1.0 U
1330-20-7	Total Xylenes	2.0 U	2.0 U
	Trifluorotoluene	*96.2%*	*94.8%*
	Bromobenzene	*89.9%*	*88.0%*

Value If the result is a value greater than or equal to the detection limit, report value.

U Indicates compound was analyzed for but not detected at the given detection limit.

NR Analysis not required.

B This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.

K This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL GASOLINE RANGE HYDROCARBONS
WA TPHG Method by GC/FID

QC Report No: A247-Dames&Moore
Project: 21199032
Trans Mtn.
VTSR: 03/18/92

Matrix: Waters

Data Release Authorized _____
Data Prepared: 03/31/92 - MAC:C PAT

Date Extracted: 03/23/92
Date Analyzed: 03/23/92

Lab ID	Client Sample ID	Dilution Factor	Gasoline Range Hydrocarbons †	Gas ID *	Surrogate A	Surrogate B
A247 MB	*Method Blank*	1	0.25 U	No	102%	98.7%
A247 E	SWRO-C40	1	0.25 U	No	92.6%	91.1%
A247 F	SWRO-D2-21	1	0.25 U	No	91.1%	89.5%
A247 G	SWRO-D3-21	1	0.25 U	No	93.5%	94.0%
A247 H	Trip Blank	1	0.25 U	No	89.1%	91.6%

Surrogate A = Trifluorotoluene
Surrogate B = Bromobenzene

Values reported in ppm (mg/L).

U Indicates compound was analyzed for but not detected at the given detection limit.

X Indicates a value above the linear range of the detector. Dilution required.

* In the opinion of the analyst, was there a pattern match for gasoline.

† Value based on total peaks in the range from Toluene to Dodecane.

1 April 1992

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

David Maltby
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032 Trans Mtn.;
ARI Job #A285

Dear David:

Please find enclosed the results and original chain-of-custody record for the above referenced project. Seven samples and a trip blank were received in good condition on 3/23/92, and the analyses proceeded without incident. The 418.1 report was faxed to you 3/25/92.

The analyst notes that the hydrocarbon pattern looks like a crude oil, extending from the gasoline range to beyond the diesel range.

If you have any questions or need further information, please feel free to call any time. I can be reached at the number above, or direct at 340-2867, ext. 117, where you can also leave a message if I'm not available.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller

Kate Stegemoeller
Project Coordinator

KAS/ks

Enclosures

cc: file#A285

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Boring or Well Number	Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	VOA 602/8020 BETX	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (M) HID	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	.	.	.	.	.	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
SW-3-8			1640	water	2-40ml; 1-L	X			X																	collected on 3/19/92	3	
SW-3-9			1500	water	4	X			X																	collected on 3/20/92	3	
PRT-1			1625	soil						X																collected 3/20/92	1	
PRT-2			1635							X																3/20/92	1	
PRT-3			1645							X																3/20/92	1	
PRT-4			1700							X																3/20/92	1	
PRT-5			1705							X																3/20/92	1	
Trip Blank																												

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

M. William 3/20/92 1800 [signature]

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

[signature] 3/23/92 1720 [signature]

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

LABORATORY NOTES:

Stored in lab refrigerator @ Dames & Moore over weekend pending delivery on Monday 3/23/92 to ARI MW

ANALYTICAL LABORATORY: ARI

LABORATORY CONTACT: Kate Heyenoeller

D&M CONTACT: David Matthey PHONE: 730744

DAMES & MOORE

500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

A.R.I. A285

JOB NO.: 21199 032 SHEET 1 OF

PROJECT Trans Mountain

LOCATION Bellingham - Laurel Station

COLLECTOR MWilliam DATE OF COLLECTION 3/19/92 & 3/20/92

ANALYTICAL
RESOURCES
INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL PETROLEUM HYDROCARBONS
WA HCID Method by GC/FID

Matrix: Waters

QC Report No: A285-Dames & Moore
Project: 21199032
Trans Mtn.
VTSR: 03/27/92

Data Release Authorized _____
Data Prepared: 03/27/92 MAC:D sk

Date extracted: 03/24/92
Date Analyzed: 03/25/92

Lab ID	Client Sample ID	Petroleum Hydrocarbons †	Dilution Factor	TPH ID *	Surrogate Recovery
A285 MB	*Method Blank*	10 U	-	-	125%
A285 C	PRT-1	**22000X**	-	No	114%
A285 C dil	PRT-1 dil	**16000**	X50	No	D
A285 D	PRT-2	**10000X**	-	No	97.7%
A285 D dil	PRT-2 dil	**10000**	X20	No	D
A285 E	PRT-3	10 U	-	No	111%
A285 F	PRT-4	10 U	-	No	113%
A285 G	PRT-5	10 U	-	No	118%

Surrogate is Me-Arachidate.
Values reported in ppm (mg/L).

U	Indicates compound was analyzed for but not detected at the given detection limit.
X	Indicates a value above the linear range of the detector. Dilution required.
*	In the opinion of the analyst, was there a pattern match for gasoline or diesel (yes or no).
†	Value based on total peaks in Toluene-C24 range.
D	Indicates surrogate value diluted below detection limit.
NR	Indicates not reported due to matrix interference and/or dilution.

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TOTAL PETROLEUM HYDROCARBONS by IR Scan
Modified EPA Method 418.1

Matrix: Water

Project: 21199032
Trans Mountain
QC Report No: A285 Dames & Moore
VTSR: 03/23/92

Data Release Authorized _____
Data Prepared: 03/25/92 -MAC:PJW

Date Prepared: 03/24/92
Date of Analysis: 03/24/92

Lab ID	Client Sample ID	Dilution Factor	TPH (ppm)
A285 MB	*METHOD BLANK*	*1*	*1 U*
A285 A	SW-3-8	1	1 U
A285 B	SW-3-9	1	1 U

Values reported in ppm (mg/L).

U Indicates compound was analyzed for but not detected at the given detection limit.

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ORGANICS ANALYSIS DATA SHEET - Method 602/8020
BETX by GC-PID

Matrix: Water
Level: Low

QC Report No: A285-Dames & Moore
Project No: 21199-032

Data Release Authorized: _____
Report prepared: 4/1/92 - MAC:K kas

Date Received: 3/23/92

	Sample No.	Method Blank	SW-3-8	SW-3-8 duplicate	SW-3-9	Trip Blank
	ARI ID	0325MB	A285A	A285Adup	A285B	A285H
	Date Analyzed	03/26/92	02/27/92	03/27/92	03/27/92	03/27/92
	Amt Analyzed	5.0 mls	5.0 mls	5.0 mls	5.0 mls	5.0 mls
CAS Number	**Units**	µg/L	µg/L	µg/L	µg/L	µg/L
71-43-2	Benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
108-88-3	Toluene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
100-41-4	Ethylbenzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1330-20-7	Total Xylenes	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
	Surrogate Recoveries					
	Trifluorotoluene	97.3%	94.9%	101%	98.2%	89.5%
	Bromobenzene	96.1%	91.8%	95.3%	96.9%	90.1%

Data Reporting Qualifiers

Value	If the result is a value greater than or equal to the detection limit, report the value.	B	This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.
U	Indicates compound was analyzed for but not detected at the given detection limit.	J	Indicates an estimated value when result is less than specified detection limit.

8 April 1992

ANALYTICAL RESOURCES INCORPORATED

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333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

David Maltby
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032 Trans Mtn.;
ARI Job #A326

Dear David:

Please find enclosed the results and original chain-of-custody record for the above referenced project. Sixteen samples and a trip blank were received in good condition on 3/26/92. The sample listed as ES-3-8" on the COC was labeled as ES-3-6" on the sample bottle. As per your message yesterday the COC ID was used for reporting results.

All analyses proceeded without incident. The 418.1 report was faxed to you 4/1/92.

If you have any questions or need further information, please feel free to call any time. I can be reached at the number above, or direct at 340-2867, ext. 117, where you can also leave a message if I'm not available.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller

Kate Stegemoeller
Project Coordinator

KAS/ks

Enclosures

cc: file#A326

DAMES & MOORE
SEATTLE
APR 09 1992

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Boring or Well Number	Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	VOA 602/8020 BTEX	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (M) Diesel	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	PCB	FIELD NOTES: collected on	Total Number Of Containers	Laboratory Note Number
PRTO	-1		1450	soil	4oz glass					X	}	HELD										D&M 3/23/92	1	
PRTO	-2		1455	soil	4oz glass					X	}											D&M 3/23/92	1	
SW	-3-10		1610	water	2-40z; 1-L	X		X														D&M 3/24/92	3	
ES	-1-4"		1040	soil	4oz glass															X		3/25/92	1	
ES	-1-10"		1045																	X			1	
ES	-2-6"		1100																	X			1	
ES	-2-12"		1105																	X			1	
ES	-3-4"		1110																	X			1	
ES	-3-8"		1115																	X			1	
ES	-4-6"		1120																	X			1	
ES	-4-12"		1125																	X			1	
ES	-5-6"		1135																	X			1	
ES	-5-10"		1150																	X			1	
Trip Blank				water	2-40ml																	3/25/92	2	
SWRO	-C-41		0840	water						X	}	gas range hydrocarbons										3/25/92	2	
SWRO	-D2-41		0850	water						X	}												2	
SWRO	-D3-41		0910	water						X	}												2	

RELINQUISHED BY: (Signature) I M Williams DATE/TIME 3/25/92 1300 RECEIVED BY: (Signature) Scott Fair

RELINQUISHED BY: (Signature) Scott Fair DATE/TIME 3/26/92 1730 RECEIVED BY: (Signature) Jan Hollen

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

LABORATORY NOTES:
Stored in Laird Pump Station refrigerator until shipment to laboratory
Gave to Leslie Bisland to deliver to ARI 3/25/92 or next morning 3/26/92

ANALYTICAL LABORATORY: ARI
LABORATORY CONTACT: Kate Stegmueller
D&M CONTACT: David Matthy PHONE: 728 0744

DAMES & MOORE
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Seattle, Washington 98121
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JOB NO.: 21199 032 SHEET 1 OF 2
PROJECT Trans Mountain
LOCATION Laird Pump Station
COLLECTOR I M Williams DATE OF COLLECTION 3/23/92

A.R.I. # A326

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333 Ninth Ave. North
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(206) 621-7523 (FAX)

TOTAL GASOLINE RANGE HYDROCARBONS
WA TPHG Method by GC/FID

QC Report No: A326-Dames & Moore
Project: 21199032
Trans Mtn.
VTSR: 03/26/92

Matrix: Waters

Data Release Authorized _____
Data Prepared: 04/07/92 - MAC:C PAT

Date Extracted: 04/01/92
Date Analyzed: 04/01/92

Lab ID	Client Sample ID	Dilution Factor	Gasoline Range Hydrocarbons †	Gas ID *	Surrogate A	Surrogate B
A326 MB	*Method Blank*	1	0.25 U	No	85.8%	78.7%
A326 N	SWRO-C-41	1	0.25 U	No	90.9%	85.7%
A326 NDUP	SWRO-C-41 DUPL.	1	0.25 U	No	89.7%	82.5%
A326 O	SWRO-D2-21	1	0.25 U	No	88.6%	85.5%
A326 P	SWRO-D3-21	1	0.25 U	No	92.7%	89.0%
A326 Q	Trip Blank	1	0.25 U	No	91.4%	86.2%

Surrogate A = Trifluorotoluene
Surrogate B = Bromobenzene

Values reported in ppm (mg/L).

U Indicates compound was analyzed for but not detected at the given detection limit.

X Indicates a value above the linear range of the detector. Dilution required.

* In the opinion of the analyst, was there a pattern match for gasoline.

† Value based on total peaks in the range from Toluene to Dodecane.

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ORGANICS ANALYSIS DATA SHEET
PCB Analysis by GC/ECD

QC Report: A326-Dames & Moore
Date Received: 03/26/92

Matrix: Soils

GPC Cleanup: No
Alumina Cleanup: Yes
Acid Cleanup: No

Data Release Authorized _____
Report prepared: 04/07/92 - MAC:C PAT

Reported in ppb (µg/kg)

Sample #:	Method Blank	ES-1-4"	ES-1-10"	ES-2-6"	ES-2-12"	ES-3-4"
ARI Lab ID:	MB0321	A326D	A326E	A326F	A326G	A326H
Date Extracted:	03/31/92	03/31/92	03/31/92	03/31/92	03/31/92	03/31/92
Date Analyzed:	04/02/92	04/02/92	04/02/92	04/02/92	04/02/92	04/02/92
Dry Weight:	30.0 g	33.0 g	32.2 g	32.0 g	29.5 g	34.5 g
Final Volume:	20 mls	20 mls	20 mls	20 mls	20 mls	20 mls
Dilution:	1:1	1:1	1:1	1:1	1:1	1:1
1016/1242	50 U	50 U	50 U	50 U	50 U	50 U
1248	50 U	50 U	50 U	50 U	50 U	50 U
1254	50 U	50 U	50 U	50 U	50 U	50 U
1260	50 U	50 U	50 U	50 U	50 U	50 U
TCMX Surrogate %	81.5%	71.1%	94.4%	60.1%	82.7%	68.4%
DCBP Surrogate %	103%	87.7%	106%	73.4%	103%	91.9%

Sample #:	ES-3-8"	ES-4-12"	ES-4-6"	ES-5-6"	ES-5-10"
ARI Lab ID:	A326I	A326J	A326K	A326L	A326M
Date Extracted:	03/31/92	03/31/92	03/31/92	03/31/92	03/31/92
Date Analyzed:	04/02/92	04/02/92	04/02/92	04/02/92	04/02/92
Dry Weight:	33.0 g	24.4 g	27.7 g	29.8 g	30.9 g
Final Volume:	20 mls	20 mls	20 mls	20 mls	20 mls
Dilution:	1:1	1:1	1:1	1:1	1:1
1016/1242	50 U	50 U	50 U	50 U	50 U
1248	50 U	50 U	50 U	50 U	50 U
1254	50 U	50 U	50 U	50 U	50 U
1260	50 U	50 U	50 U	50 U	50 U
TCMX Surrogate %	78.8%	86.0%	88.8%	77.8%	78.6%
DCBP Surrogate %	86.1%	99.2%	104%	95.2%	92.8%

Data Qualifiers

Value	If the result is a value greater than or equal to the detection limit, report the value.
J	Indicates an estimated value when that value is less than the calculated detection limit.
U	Indicates compound was analyzed for, but not detected at the given detection limit.
X	Indicates value above the linear range of the detector. Dilution required.
D	Indicates surrogate was diluted out.

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Boring or Well Number	Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	VOA (602)/8020 w/ series	VOA (624)/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (M)	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH, TDS total dissolved	ASBESTOS	.WTPH-G	w TPH-D	.metals priority pollutants	anions		FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
SWRO-C-45		—	0920	water	1-l, 3-40 ml		X														+	+					4	
SWRO-D2-26		—	0930				X														+	+					4	
SWRO-D3-26			0945				X														+	+					4	
SW-3-15			1025				X			X	■																3	
dam			1040				X			X																	3	
T-180			1100				X			X																	3	
T-170			1110				X			X																	3	
DW-1			1130		2-l, 3-40 ml, ~~2-500 ml~~			X		X									X			~~X~~ NO	+	X		3 per Ingrid W. 4/23/92 9:36 Add the Anions for Cl, SO4, F, NO3 T Hedge	~~6~~ 7	
Trip Blank							✓																				2	

Per Ingrid No WTPH-D 4/23/92 T Hedge (no Bottle)

RELINQUISHED BY: (Signature) I M Williams DATE/TIME 4/22/92 1150 RECEIVED BY: (Signature) T Hedge 4/22/92 15:00

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

LABORATORY NOTES: TPH-G + BETX to be analyzed in series

ANALYTICAL LABORATORY: ARI

LABORATORY CONTACT: KATE

D&M CONTACT: D. MALTBY PHONE: 7280744

DAMES & MOORE
500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

JOB NO.: 21199 032 SHEET 1 OF 1

PROJECT Trans Mountain

LOCATION Laurel Pump Station, Bellingham WA

COLLECTOR I M Williams DATE OF COLLECTION 4/22/92

ARI# A523

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
05/12/92
15:22:33

Client: Dames & Moore
Contact: David Maltby
Project: Trans Mountain
ID number: DW-1
Description:
Sampled: / /
Received: 04/22/92
Matrix: Water

ARI job number: A523
ARI sample number: H

Released by:

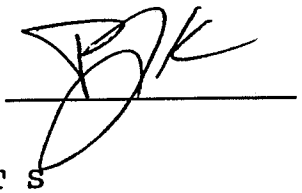
A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-36-0	Antimony	0.003 mg/L		RWC	GFA
7440-38-2	Arsenic	0.083 mg/L		RMA	GFA
7440-41-7	Beryllium	0.001 mg/L	U	TWN	ICP
7440-43-9	Cadmium	0.002 mg/L	U	TWN	ICP
7440-47-3	Chromium	0.038 mg/L		TWN	ICP
7440-50-8	Copper	0.010 mg/L		TWN	ICP
7439-92-1	Lead	0.009 mg/L		TWN	GFA
7439-97-6	Mercury	0.0001 mg/L	U	TMM	CVA
7440-02-0	Nickel	0.03 mg/L		TWN	ICP
7782-49-2	Selenium	0.001 mg/L	U	RMA	GFA
7440-22-4	Silver	0.003 mg/L	U	TWN	ICP
7440-28-0	Thallium	0.001 mg/L	U	TWN	GFA
7440-66-6	Zinc	0.028 mg/L		TWN	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
05/12/92
15:22:37

Client: Dames & Moore
Contact: David Maltby
Project: Trans Mountain
ID number:
Description: Method Blank
Sampled: / /
Received: / /
Matrix: Water

ARI job number: A523
ARI sample number: MB

Released by: 

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-36-0	Antimony	0.001 mg/L	U	RWC	GFA
7440-38-2	Arsenic	0.001 mg/L	U	RMA	GFA
7440-41-7	Beryllium	0.001 mg/L	U	TWN	ICP
7440-43-9	Cadmium	0.002 mg/L	U	TWN	ICP
7440-47-3	Chromium	0.005 mg/L	U	TWN	ICP
7440-50-8	Copper	0.002 mg/L	U	TWN	ICP
7439-92-1	Lead	0.002 mg/L		TWN	GFA
7439-97-6	Mercury	0.0001 mg/L	U	TMM	CVA
7440-02-0	Nickel	0.01 mg/L	U	TWN	ICP
7782-49-2	Selenium	0.001 mg/L	U	RMA	GFA
7440-22-4	Silver	0.003 mg/L	U	TWN	ICP
7440-28-0	Thallium	0.001 mg/L	U	TWN	GFA
7440-66-6	Zinc	0.005 mg/L		TWN	ICP

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333 Ninth Ave. North
Seattle, WA 98109-5187
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Final Report
Laboratory Analysis of Selected Parameters

Matrix: WATER

Data Release Authorized:

Report Prepared : May 19, 1992

Project No: 21199032
QC Report No: D&M-A523
Date Received: 4/22/92

Sample Data:		*DATE OF ANALYSIS*						
		4/27/92	*5/14/92*	*4/23/92*	*4/23/92*	*5/6/92*	*5/15/92*	*5/7/92*
Lab ID	**Sample Number**	**pH**	**TDS (mg/L)**	**NO2 (mg/L)**	**NO3 (mg/L)**	**Cl (mg/L)**	**F (mg/L)**	**SO4 (mg/L)**
A523 H	DW-1	8.23	8,523	< 0.010	0.023	4.3	0.24	6.1

Method Blank Analysis:

Sample Number	**pH**	**TDS (mg/L)**	**NO2 (mg/L)**	**NO3 (mg/L)**	**Cl (mg/L)**	**F (mg/L)**	**SO4 (mg/L)**
Method Blank 1	-	14	< 0.010	< 0.010	< 1.0	< 0.05	< 1.0
Detection Limit :	-	10	0.010	0.010	1.0	0.05	1.0

Check Standard:

	pH	**TDS (mg/L)**	**NO2 (mg/L)**	**NO3 (mg/L)**	**Cl (mg/L)**	**F (mg/L)**	**SO4 (mg/L)**
Measured Value	-	-	0.257	0.260	13.4	1.90	25.1
"True" Value	-	-	0.250	0.250	10.0	1.96	25.0
% Recovery	-	-	102.80%	104.00%	133.80%	96.94%	100.48%

Duplicate Analysis:

	pH	**TDS (mg/L)**	**NO2 (mg/L)**	**NO3 (mg/L)**	**Cl (mg/L)**	**F (mg/L)**	**SO4 (mg/L)**
Original	8.23	-	< 0.010	0.023	4.3	0.24	6.1
Duplicate	8.55	-	< 0.010	< 0.010	4.2	0.23	5.2
RSD	2.70%	-	-	-	1.50%	3.01%	11.09%

Comments: *Very turbid sample and some fine particulates may have passed the filter and hence account the high TDS. Conductivity of the sample was 262 µmho/cm.*
See job A501 for additional QC data.

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TOTAL PETROLEUM HYDROCARBONS by IR Scan
Modified EPA Method 418.1

Matrix: Water

Project: 21199032
Trans Mountain
QC Report No: A523 Dames & Moore
VTSR: 04/22/92

Data Release Authorized _____
Data Prepared: 04/24/92 -MAC:PJW

Date Prepared: 04/24/92
Date of Analysis: 04/24/92

Lab ID	Client Sample ID	Dilution Factor	TPH (ppm)
A523 MB	*METHOD BLANK*	*1*	*1 U*
A523 D	SW-3-15	1	1 U
A523 E	**DAM**	**1**	**4.9**
A523 F	T-180	1	1 U
A523 G	T-170	1	1 U
A523 H	DW-1	1	1 U

Values reported in ppm (mg/L).

U Indicates compound was analyzed for but not detected at the given detection limit.

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ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Lab ID: MB0423
Matrix: Waters

Data Release Authorized: _____
Report: 04/24/92 MAC:C pat

Sample: Method Blank

QC Report No: A523-Dames&Moore
Project: 21199032
Trans Mtn.
VTSR: NA

Instrument: FINN 3
Date Analyzed: 04/23/92

Amount Purged: 5.0 ml
Conc/Dilution: 1 to 1

CAS Number		µg/L
74-87-3	Chloromethane	2.0 U
74-83-9	Bromomethane	2.0 U
75-01-4	Vinyl Chloride	2.0 U
75-00-3	Chloroethane	2.0 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	1.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U

CAS Number		µg/L
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	1.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone	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
1330-20-7	Total Xylenes	2.0 U
75-69-4	Trichlorofluoromethane	2.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	2.0 U

Surrogate Recoveries

d8-Toluene	104%
Bromofluorobenzene	98.1%
d4-1,2-Dichloroethane	102%

Data Reporting Qualifiers

Value — If the result is a value greater than or equal to the detection limit, report the value.

U — Indicates compound was analyzed for but not detected at the given detection limit.

J — Indicates an estimated value when result is less than specified detection limit.

B — This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.

K — This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

M — Indicates an estimated value of analyte found and confirmed by analyst but with low spectral match parameters.

ANALYTICAL
RESOURCES
INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Lab ID: A523H
Matrix: Waters

Data Release Authorized: _____
Report: 04/24/92 MAC:C pat

Sample: DW-1

QC Report No: A523-Dames&Moore
Project: 21199032
Trans Mtn.
VTSR: 04/22/92

Instrument: FINN 3
Date Analyzed: 04/23/92

Amount Purged: 5.0 ml
Conc/Dilution: 1 to 1

CAS Number		µg/L
74-87-3	Chloromethane	2.0 U
74-83-9	Bromomethane	2.0 U
75-01-4	Vinyl Chloride	2.0 U
75-00-3	Chloroethane	2.0 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	1.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U

CAS Number		µg/L
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	1.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone	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
1330-20-7	Total Xylenes	2.0 U
75-69-4	Trichlorofluoromethane	2.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	2.0 U

Surrogate Recoveries

d8-Toluene	106%
Bromofluorobenzene	98.9%
d4-1,2-Dichloroethane	100%

Data Reporting Qualifiers

Value — If the result is a value greater than or equal to the detection limit, report the value.

U — Indicates compound was analyzed for but not detected at the given detection limit.

J — Indicates an estimated value when result is less than specified detection limit.

B — This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.

K — This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

M — Indicates an estimated value of analyte found and confirmed by analyst but with low spectral match parameters.

EXPLANATION OF INORGANIC DATA REPORT CODES

The columns labeled 'PREP', 'C', and 'M' contain important information about your analyses. The codes are described below.

PREPARATION CODES

These 3-letter codes describe methods used to prepare samples for analysis:

AEN USEPA, Metals in air filters
AHM ARI, Mercury in air filters
AHN ARI, Metals in air filters
ANN NIOSH 7300, Metals in air filters
CAN AOAC (1984) 25.024, Metals in earthenware
DE6 EPA 600/4-79-020 218.5, Cr(VI) in water
DMM DMN followed by TMM, Dissolved mercury
DMN Filtered through .45u filter, Dissolved metals
EW6 EWN followed by DE6
EWM EWN followed by TMM
EWN USEPA SW-846 1310, EP Toxicity
FHP ARI, Metals in tissue ($HNO_3/HClO_4$)
FPP PSEP, Metals in tissue ($HNO_3/HClO_4$)
FRM Journal, Mercury in tissue
FRN Journal, Metals in tissue (HNO_3/H_2O_2)
KRN ARI, Concentration by coprecipitation
LEM USEPA, TCLP followed by TMM
LEN USEPA, TCLP Extraction
MHM ARI, Mercury in miscellaneous materials
MHN ARI, Metals in miscellaneous materials
OAM ARI, Mercury in oil, grease or tar
OAN ARI, Metals in oil, grease or tar
PHM ARI, Mercury in wipes
PHN ARI, Metals in wipes
RCC USEPA CLP, Water digestion, HCl matrix
RCN USEPA CLP, Water digestion, HNO_3 matrix
REC EPA 600/4-79-020 4.1.4, HCl matrix
REI EPA 600/4-79-020 200.7 and 9.4
REN EPA 600/4-79-020 4.1.4, HNO_3 matrix
RMA EPA 600/4-79-020 206.2
RWC USEPA SW-846 3005
SCC USEPA CLP, Soil digestion, HCl matrix
SCM USEPA CLP, Mercury in soil
SCN USEPA CLP, Soil digestion, HNO_3 matrix
SEM EPA 600/4-79-020 245.5, Mercury in soil
SHF ARI, Metals in soil, HF digestion
SRL Journal, Lithium meta-borate fusion
SPF PSEP, Metals in sediment, HF digestion
SSC Standard Methods 302C, Sb/Sn in soil
SSN Standard Methods 302C, Soil digestion
SSS Standard Methods 302C, Ti in soil
SW6 USEPA SW-846 3060, Cr(VI) in soil
SWC USEPA SW-846 3050, HCl matrix
SWN USEPA SW-846 3050, HNO_3 matrix
SWR USEPA SW-846 Modified 3005, Sb by GFAAS
TEC EPA 600/4-79-020 4.1.3, HCl matrix
TEG EPA 600/4-79-020 272.1, Silver in water
TEI EPA 600/4-79-020 200.7 and 9.3
TEN EPA 600/4-79-020 4.1.3, HNO_3 matrix
THG ARI, Silver in photographic solutions
TMM EPA 600/4-79-020 245.1, Mercury in water
TSC Standard Methods 302C, Sb/Sn in water
TSN Standard Methods 302D
TSS Standard Methods 302E, Ti in water
TWC USEPA SW-846 3010, HCl matrix
TWG USEPA SW-846 7760, Silver in water
TWN USEPA SW-846 3020, HNO_3 matrix
WMN EPA 600/4-79-020, Preserved, undigested water
XSC Standard Methods 302B

CONCENTRATION CODES

These codes are used to qualify reported concentrations:

U No analyte was detected. The reported value is the lower limit of detection.

METHOD CODES

These codes signify the instrumental technique used for analysis:

CVA Cold Vapor Atomic Absorption Spectrophotometry
FLA Flame Atomic Absorption Spectrophotometry
GFA Graphite Furnace Atomic Absorption Spectrophotometry
ICP Inductively Coupled Plasma Atomic Emission Spectrometry

16 April 1992

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

David Maltby
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032 Trans Mtn.;
ARI Job #A383

Dear David:

Please find enclosed the results and original chain-of-custody record for the above referenced project. Four samples and a trip blank were received in good condition on 4/3/92, and analyses proceeded without incident. The 418.1 results were faxed to you on 4/7/92.

If you have any questions or need further information, please feel free to call any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Coordinator
206-340-2867 ext. 117

KAS/ks

Enclosures

cc: file#A383

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Boring or Well Number	Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	VOA 602/8020 BETX	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (Mod. range Hydrocarbons)	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	.	.	.	.	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
SWRO-C-42			1300	water	2-oz vial					X															X	2	
SWRO-D2-23			1310	↓	↓					X															X	2	
SWRO-D3-23			1320							X															X	2	
SW-3-12			1635	↓	2-oz plastic		X		X																X	3	
Trip Blank																											

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

JMWilliams 4/3/92 1700 Jan Tolkien 7:00

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

ANALYTICAL LABORATORY:

LABORATORY CONTACT:

D&M CONTACT: PHONE:

DAMES & MOORE
500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

LABORATORY NOTES:

* Samples stored in refridgerator on site at Laurel Pump Station pending delivery to ARI Lab.

A.R.I. # A383

JOB NO.: 21199 032 SHEET 1 OF 1

PROJECT Trans Mountain

LOCATION Laurel Pump Station - Bellingham

COLLECTOR JMWilliams DATE OF COLLECTION 4/1/92

JMW

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL PETROLEUM HYDROCARBONS by IR Scan
Modified EPA Method 418.1

Matrix: Water

Project: 21199 032
Trans Mountain
QC Report No: A383 Dames & Moore
VTSR: 04/03/92

Data Release Authorized _____
Data Prepared: 04/06/92 -MAC:PJW

Date Prepared: 04/06/92
Date of Analysis: 04/06/92

Lab ID	Client Sample ID	Dilution Factor	TPH (ppm)
A383 MB	*METHOD BLANK*	*1*	*1 U*
A383 D	SW-3-12	1	1 U

Values reported in ppm (mg/L).

U Indicates compound was analyzed for but not detected at the given detection limit.

ANALYTICAL RESOURCES INCORPORATED

Analytical Chemists & Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

ORGANICS ANALYSIS DATA SHEET
BETX by Method 602/8020
Matrix: Water
Level: Low

Project No: Trans Mtn.
21199032
QC Report No: A383-Dames & Moore
VTSR: 4/3/92

Data Release Authorized: _____
Report prepared: 04/14/92 - MAC: RPR

Instrument ID: GC/PID

CAS Number		Sample No.	Method Blank	SWRO-C-42	SWRO-D2-23	SWRO-D3-23
		ARI ID	MB-0409	A383 - A	A383 - B	A383 - C
		Date Analyzed	4/9/92	4/10/92	4/10/92	4/10/92
		Amt Analyzed	5.0 ml	5.0 ml	5.0 ml	5.0 ml
		Units	µg/L	µg/L	µg/L	µg/L
71-43-2	Benzene		1.0 U	1.0 U	1.0 U	1.0 U
108-88-3	Toluene		1.0 U	1.0 U	1.0 U	1.0 U
100-41-4	Ethylbenzene		1.0 U	1.0 U	1.0 U	1.0 U
1330-20-7	Total Xylenes		2.0 U	2.0 U	2.0 U	2.0 U
		Trifluorotoluene	100%	91.1%	90.9%	91.5%
		Bromobenzene	96.0%	90.5%	91.8%	94.8%

Instrument ID: GC/PID

CAS Number		Sample No.	SW - 3 - 12	Trip Blank
		ARI ID	A383 - D	A383 - E
		Date Analyzed	4/10/92	4/10/92
		Amt Analyzed	5.0 ml	5.0 ml
		Units	µg/L	µg/L
71-43-2	Benzene		1.0 U	1.0 U
108-88-3	Toluene		1.0 U	1.0 U
100-41-4	Ethylbenzene		1.0 U	1.0 U
1330-20-7	Total Xylenes		2.0 U	2.0 U
		Trifluorotoluene	87.1%	87.8%
		Bromobenzene	87.4%	90.2%

GC DATA QUALIFIERS

U Indicates the compound was undetected at the listed concentration.

J Indicates an estimated value when the value is less than the calculated detection limit.

D Indicates the surrogate(s) was not detected, due to dilution of extract.

NR Indicates the surrogate recovery cannot be reported due to matrix interference.

X Indicates a value above the linear range of the detector. Dilution required.

S Indicates no value reported due to saturation of the detector. Dilution required.

C Indicates a probable value which is unable to be confirmed due to matrix interference

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL GASOLINE RANGE HYDROCARBONS
WA TPHG Method by GC/FID

QC Report No: A383-Dames & Moore
Project: **Trans Mtn.**
21199032
VTSR: 04/03/92

Matrix: Waters

Data Release Authorized _____
Data Prepared: 04/14/92 - MAC: RPR

Date Extracted: 04/09/92
Date Analyzed: 04/09/92

Lab ID		Client Sample ID	Dilution Factor	Gasoline Range Hydrocarbons †	Gas ID *	Surrogate A	Surrogate B
A383	MB-0409	Method Blank	-	0.25 U	-	90.2%	107%
A383	A	S W R O - C - 42	-	0.25 U	No	89.4%	113%
A383	B	S W R O - D2 - 23	-	0.25 U	No	91.2%	115%
A383	C	S W R O - D3 - 23	-	0.25 U	No	93.4%	120%
A383	E	Trip Blank	-	0.25 U	No	88.8%	115%

Surrogate A = Trifluorotoluene
Surrogate B = Bromobenzene

Values reported in ppm (mg/L).

U Indicates compound was analyzed for but not detected at the given detection limit.

X Indicates a value above the linear range of the detector. Dilution required.

* In the opinion of the analyst, was there a pattern match for gasoline.

† Value based on total peaks in the range from Toluene to Dodecane.

21 April 1992

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

David Maltby
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032 Trans. Mtn.
ARI Job #A422

Dear David:

Please find enclosed the results and original chain-of-custody record for the above referenced project. Four samples and a trip blank were received in good condition on 4/9/92, and the analyses proceeded without incident.

Although BETX analysis was only requested for sample SW-3-13, the 8015-gas and BETX analyses are performed simultaneously, and the BETX results were therefore reported. A new report can be produced without the extra samples if necessary. You will not be invoiced for the unrequested results.

If you have any questions or need further information, please feel free to call any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Coordinator
206-340-2867 ext. 117

KAS/ks

Enclosures

cc: file#A422

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Boring or Well Number	Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	VOA 602/8020 BTEX	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (M) gasoline TPH	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	.	.	.	.	.	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
SWRO	-C-	43	0940	water	2-40 ml vials					X																	2	
SWRO	-D2-	24	0950							X																	2	
SWRO	-D3-	24	0915							X																	2	
SW	-3-	13	1200		2-40ml, 1-L	X			X																		3	
trip blank					2-40ml.																						2	

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

JM Williams 4/8/92

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

4/9/92 1635

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

4/9/92 16:35

ANALYTICAL LABORATORY:

LABORATORY CONTACT:

D&M CONTACT: PHONE:

DAMES & MOORE
500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

LABORATORY NOTES:

Stored in refrigerator on site until delivery to ARI

JOB NO.: 21199 032 SHEET 1 OF 1

PROJECT Trans Mountain - Laurel Pump Station

LOCATION Bellingham WA

COLLECTOR JM Williams DATE OF COLLECTION 4/8/92

ARI# A422

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL PETROLEUM HYDROCARBONS by IR Scan
Modified EPA Method 418.1

Matrix: Water

Project: 21199032
Trans Mountain
QC Report No: A422 Dames & Moore
VTSR: 04/09/92

Data Release Authorized _____
Data Prepared: 04/14/92 -MAC:PJW

Date Prepared: 04/13/92
Date of Analysis: 04/13/92

Lab ID	Client Sample ID	Dilution Factor	TPH (ppm)
A422 MB	*METHOD BLANK*	*1*	*1 U*
A422 D	SW-3-13	1	1 U

Values reported in ppm (mg/L).

U Indicates compound was analyzed for but not detected at the given detection limit.

ANALYTICAL RESOURCES INCORPORATED

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Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

ORGANICS ANALYSIS DATA SHEET - Method 602/8020
BETX by GC-PID

Matrix: Water
Level: Low

Data Release Authorized: _____
Report prepared: 04/20/92 *MAC:D sk*

QC Report No: A422-Dames & Moore
Project No: 21199032
Trans Mtn.
Date Received: 04/09/92

	Sample No.	Meth Blank	SWRO-C-43	SWRO-D2-24	SWRO-D3-24
	ARI ID	0415mb	A422A	A422B	A422C
	Date Analyzed	04/15/92	04/15/92	04/15/92	04/15/92
	Amt Analyzed	5.0 mls	5.0 mls	5.0 mls	5.0 mls
CAS Number	**Units**	µg/L	µg/L	µg/L	µg/L
71-43-2	Benzene	1.0 U	1.0 U	1.0 U	1.0 U
108-88-3	Toluene	1.0 U	1.0 U	1.0 U	1.0 U
100-41-4	Ethylbenzene	1.0 U	1.0 U	1.0 U	1.0 U
1330-20-7	Total Xylenes	2.0 U	2.0 U	2.0 U	2.0 U

Surrogate Recoveries

Trifluorotoluene	105%	99.3%	99.0%	99.4%
Bromobenzene	102%	101%	100%	95.4%

	Sample No.	SW-3-13	Trip Blank
	ARI ID	A422D	A422E
	Date Analyzed	04/15/92	04/15/92
	Amt Analyzed	5.0 mls	5.0 mls
CAS Number	**Units**	µg/L	µg/L
71-43-2	Benzene	1.0 U	1.0 U
108-88-3	Toluene	1.0 U	1.0 U
100-41-4	Ethylbenzene	1.0 U	1.0 U
1330-20-7	Total Xylenes	2.0 U	2.0 U

Surrogate Recoveries

Trifluorotoluene	103%	99.1%
Bromobenzene	101%	101%

Data Reporting Qualifiers

U	Indicates compound was analyzed for, but not detected at the given detection limit.
J	Indicates an estimated value when that value is less than the calculated detection limit.
X	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.
NR	Indicates no recovery due to matrix interference and/or dilution.

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL GASOLINE RANGE HYDROCARBONS BY GC/FID
WA TPH-G Method (Purge & Trap)

QC Report No: A422-Dames & Moore
Project: 21199032
Trans Mtn.
VTSR: 04/09/92

Matrix: Waters

Data Release Authorized _____
Data Prepared: 04/20/92 MAC:D sk

Date extracted: 04/15/92
Date Analyzed: 04/15-16/92

Lab ID	Client Sample ID	Dilution Factor	Gasoline Range Hydrocarbons †	Gas ID *	Surrogate A	Surrogate B
A422 MB	*Method Blank*	NA	0.25 U	No	94.3%	90.2%
A422 A	SWRO-C-43	NA	0.25 U	No	91.1%	91.1%
A422 B	SWRO-D2-24	NA	0.25 U	No	92.7%	90.3%
A422 C	SWRO-D3-24	NA	0.25 U	No	93.5%	86.2%
A422 E	Trip Blank	NA	0.25 U	No	94.5%	94.0%

Surrogate A = Trifluorotoluene
Surrogate B = Bromobenzene

Values reported in ppm (mg/L).

U Indicates compound was analyzed for but not detected at the given detection limit.

X Indicates a value above the linear range of the detector. Dilution required.

* In the opinion of the analyst, was there a pattern match for gasoline (yes or no).

† Value based on total peaks in Toluene-C12 range.

27 May 1992

ANALYTICAL
RESOURCES
INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
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DAMES & MOORE
SEATTLE
MAY 28 1992

David Maltby
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032 Trans. Mtn.
ARI Job #A501

Dear David:

Please find enclosed the original results for the volatile organics analyses for the above referenced project. I apologize for not including them in the data package mailed May 19th; hopefully the delay hasn't caused you too much inconvenience.

If you have any questions or need further information, please feel free to call any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller

Kate Stegemoeller
Project Coordinator
206-340-2867 ext. 117

KAS/ks

Enclosures

cc: file#A501

ANALYTICAL RESOURCES INCORPORATED

Analytical Chemists & Consultants

333 Ninth Ave. North
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ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Lab ID: 0422mb
Matrix: Waters

Data Release Authorized: _____
Report: 04/24/92 MAC:D sk

Sample: Method Blank

QC Report No: A501 - Dames & Moore
Project: 21199032
Trans Mtn.
VTSR: NA

Instrument: FINN 7
Date Analyzed: 04/22/92

Amount Purged: 5.0 ml
Conc/Dilution: 1 to 1

CAS Number		µg/L
74-87-3	Chloromethane	2.0 U
74-83-9	Bromomethane	2.0 U
75-01-4	Vinyl Chloride	2.0 U
75-00-3	Chloroethane	2.0 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	1.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U

CAS Number		µg/L
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	1.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone	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
1330-20-7	Total Xylenes	2.0 U
75-69-4	Trichlorofluoromethane	2.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	2.0 U

Surrogate Recoveries

d8-Toluene	101%
Bromofluorobenzene	100%
d4-1,2-Dichloroethane	92.3%

Data Reporting Qualifiers

Value — If the result is a value greater than or equal to the detection limit, report the value.

U — Indicates compound was analyzed for but not detected at the given detection limit.

J — Indicates an estimated value when result is less than specified detection limit.

B — This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.

K — This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

M — Indicates an estimated value of analyte found and confirmed by analyst but with low spectral match parameters.

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ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Lab ID: MB0505A
Matrix: Waters

Data Release Authorized: _____
Report: 05/05/92 MAC:K kas

Sample: Method Blank

QC Report No: A501 - Dames & Moore
Project: 21199-032
Trans Mtn.
VTSR: NA

Instrument: Finn 3
Date Analyzed: 05/05/92

Amount Purged: 5.0 ml
Conc/Dilution: 1 to 2 (equivalent)

CAS Number		µg/L
74-87-3	Chloromethane	4.0 U
74-83-9	Bromomethane	4.0 U
75-01-4	Vinyl Chloride	4.0 U
75-00-3	Chloroethane	4.0 U
75-09-2	Methylene Chloride	4.0 U
67-64-1	Acetone	10 U
75-15-0	Carbon Disulfide	2.0 U
75-35-4	1,1-Dichloroethene	2.0 U
75-34-3	1,1-Dichloroethane	2.0 U
156-60-5	Trans-1,2-Dichloroethene	2.0 U
156-59-2	Cis-1,2-Dichloroethene	2.0 U
67-66-3	Chloroform	2.0 U
107-06-2	1,2-Dichloroethane	2.0 U
78-93-3	2-Butanone	10 U
71-55-6	1,1,1-Trichloroethane	2.0 U
108-05-4	Vinyl Acetate	2.0 U
56-23-5	Carbon Tetrachloride	2.0 U
75-27-4	Bromodichloromethane	2.0 U
78-87-5	1,2-Dichloropropane	2.0 U

CAS Number		µg/L
10061-01-5	cis-1,3-Dichloropropene	2.0 U
79-01-6	Trichloroethene	2.0 U
124-48-1	Dibromochloromethane	2.0 U
79-00-5	1,1,2-Trichloroethane	2.0 U
71-43-2	Benzene	2.0 U
10061-02-6	trans-1,3-Dichloropropene	2.0 U
110-75-8	2-Chloroethylvinylether	2.0 U
75-25-2	Bromoform	2.0 U
108-10-1	4-Methyl-2-Pentanone	10 U
591-78-6	2-Hexanone	10 U
127-18-4	Tetrachloroethene	2.0 U
79-34-5	1,1,2,2-Tetrachloroethane	2.0 U
108-88-3	Toluene	2.0 U
108-90-7	Chlorobenzene	2.0 U
100-41-4	Ethylbenzene	2.0 U
100-42-5	Styrene	2.0 U
1330-20-7	Total Xylenes	4.0 U
75-69-4	Trichlorofluoromethane	4.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	4.0 U

Surrogate Recoveries

d8-Toluene	104%
Bromofluorobenzene	102%
d4-1,2-Dichloroethane	97.3%

Data Reporting Qualifiers

Value — If the result is a value greater than or equal to the detection limit, report the value.

U — Indicates compound was analyzed for but not detected at the given detection limit.

J — Indicates an estimated value when result is less than specified detection limit.

B — This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.

K — This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

M — Indicates an estimated value of analyte found and confirmed by analyst but with low spectral match parameters.

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ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Lab ID: A501E
Matrix: Waters

Sample: SW-1-11:30

QC Report No: A501 - Dames & Moore
Project: 21199032
Trans Mtn.
VTSR: 04/17/92

Data Release Authorized: _____
Report: 04/24/92 MAC:D sk

Instrument: FINN 7
Date Analyzed: 04/22/92

Amount Purged: 5.0 ml
Conc/Dilution: 1 to 1

CAS Number		µg/L
74-87-3	Chloromethane	2.0 U
74-83-9	Bromomethane	2.0 U
75-01-4	Vinyl Chloride	2.0 U
75-00-3	Chloroethane	2.0 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**	**14**
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	1.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U

CAS Number		µg/L
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	1.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone	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
1330-20-7	Total Xylenes	2.0 U
75-69-4	Trichlorofluoromethane	2.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	2.0 U

Surrogate Recoveries

d8-Toluene	106%
Bromofluorobenzene	95.2%
d4-1,2-Dichloroethane	88.2%

Data Reporting Qualifiers

Value — If the result is a value greater than or equal to the detection limit, report the value.

U — Indicates compound was analyzed for but not detected at the given detection limit.

J — Indicates an estimated value when result is less than specified detection limit.

B — This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.

K — This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

M — Indicates an estimated value of analyte found and confirmed by analyst but with low spectral match parameters.

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ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Lab ID: A501F
Matrix: Waters

Data Release Authorized: _____
Report: 04/24/92 MAC:D sk

Sample: SW-2-12:00

QC Report No: A501 - Dames & Moore
Project: 21199032
Trans Mtn.
VTSR: 04/17/92

Instrument: FINN 7
Date Analyzed: 04/22/92

Amount Purged: 5.0 ml
Conc/Dilution: 1 to 1

CAS Number		µg/L
74-87-3	Chloromethane	2.0 U
74-83-9	Bromomethane	2.0 U
75-01-4	Vinyl Chloride	2.0 U
75-00-3	Chloroethane	2.0 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	1.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U

CAS Number		µg/L
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	1.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone	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
1330-20-7	Total Xylenes	2.0 U
75-69-4	Trichlorofluoromethane	2.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	2.0 U

Surrogate Recoveries

d8-Toluene	105%
Bromofluorobenzene	95.0%
d4-1,2-Dichloroethane	85.9%

Data Reporting Qualifiers

Value — If the result is a value greater than or equal to the detection limit, report the value.

U — Indicates compound was analyzed for but not detected at the given detection limit.

J — Indicates an estimated value when result is less than specified detection limit.

B — This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.

K — This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

M — Indicates an estimated value of analyte found and confirmed by analyst but with low spectral match parameters.

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ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Lab ID: A501I
Matrix: Waters

Data Release Authorized: _____
Report: 04/24/92 MAC:D sk

Sample: SW-3

QC Report No: A501 - Dames & Moore
Project: 21199032
Trans Mtn.
VTSR: 04/17/92

Instrument: FINN 7
Date Analyzed: 04/22/92

Amount Purged: 5.0 ml
Conc/Dilution: 1 to 1

CAS Number		µg/L
74-87-3	Chloromethane	2.0 U
74-83-9	Bromomethane	2.0 U
75-01-4	Vinyl Chloride	2.0 U
75-00-3	Chloroethane	2.0 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	1.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U

CAS Number		µg/L
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	1.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone	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
1330-20-7	Total Xylenes	2.0 U
75-69-4	Trichlorofluoromethane	2.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	2.0 U

Surrogate Recoveries

d8-Toluene	105%
Bromofluorobenzene	96.3%
d4-1,2-Dichloroethane	87.6%

Data Reporting Qualifiers

Value — If the result is a value greater than or equal to the detection limit, report the value.

U — Indicates compound was analyzed for but not detected at the given detection limit.

J — Indicates an estimated value when result is less than specified detection limit.

B — This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.

K — This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

M — Indicates an estimated value of analyte found and confirmed by analyst but with low spectral match parameters.

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ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Lab ID: A501J
Matrix: Waters

Data Release Authorized: _____
Report: 04/24/92 MAC:D sk

Sample: SW-5

QC Report No: A501 - Dames & Moore
Project: 21199032
Trans Mtn.
VTSR: 04/17/92

Instrument: FINN 7
Date Analyzed: 04/22/92

Amount Purged: 5.0 ml
Conc/Dilution: 1 to 10

CAS Number		µg/L
74-87-3	Chloromethane	20 U
74-83-9	Bromomethane	20 U
75-01-4	Vinyl Chloride	20 U
75-00-3	Chloroethane	20 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	10 U
75-27-4	Bromodichloromethane	10 U
78-87-5	1,2-Dichloropropane	10 U

CAS Number		µg/L
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	10 U
75-25-2	Bromoform	10 U
108-10-1	4-Methyl-2-Pentanone	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	10 U
100-42-5	Styrene	10 U
1330-20-7	Total Xylenes	20 U
75-69-4	Trichlorofluoromethane	20 U
76-13-1	1,1,2-Trichlorotrifluoroethane	20 U

Surrogate Recoveries

d8-Toluene	109%
Bromofluorobenzene	95.9%
d4-1,2-Dichloroethane	86.9%

Data Reporting Qualifiers

Value — If the result is a value greater than or equal to the detection limit, report the value.

U — Indicates compound was analyzed for but not detected at the given detection limit.

J — Indicates an estimated value when result is less than specified detection limit.

B — This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.

K — This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

M — Indicates an estimated value of analyte found and confirmed by analyst but with low spectral match parameters.

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ORGANIC ANALYSIS DATA SHEET - Tentatively Identified Compounds

Sample No: **SW-5**

Lab ID: A501J
Matrix: Water

QC Report No: A501-Dames & Moore
Project No: 21199-032
Trans Mtn.
VTSR: 4/17/92

Data Release Authorized: _____

	CAS Number	Compound Name	Fraction	Scan Number	Estimated Concentration (µg/L)
1	-	UNKNOWN Hydrocarbon (bp m/e 43)	VOA	646	170 J
2	-	Trimethylcyclohexane Isomer (bp m/e 69)	VOA	691	250 J
3	-	UNKNOWN Hydrocarbon (bp m/e 57)	VOA	776	160 J
4	-	C10.H22 Isomer (bp m/e 57)	VOA	791	240 J
5	-	UNKNOWN Hydrocarbon (bp m/e 57)	VOA	808	200 J
6	-	UNKNOWN Hydrocarbon (bp m/e 43)	VOA	872	280 J
7	-	UNKNOWN Hydrocarbon coelute (bp m/e 57)	VOA	913	170 J
8	-	UNKNOWN Hydrocarbon (bp m/e 57)	VOA	969	240 J
9	-	UNKNOWN Hydrocarbon (bp m/e 43)	VOA	983	180 J
10	-	UNKNOWN Hydrocarbon (bp m/e 57)	VOA	1061	270 J
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					

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ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Lab ID: A501J (re)
Matrix: Waters

Data Release Authorized: _____
Report: 05/05/92 MAC:K kas

Sample: SW-5
re-analysis
QC Report No: A501 - Dames & Moore
Project: 21199-032
Trans Mtn.
VTSR: 04/17/92

Instrument: Finn 3
Date Analyzed: 05/05/92

Amount Purged: 5.0 ml
Conc/Dilution: 1 to 2

CAS Number		µg/L
74-87-3	Chloromethane	4.0 U
74-83-9	Bromomethane	4.0 U
75-01-4	Vinyl Chloride	4.0 U
75-00-3	Chloroethane	4.0 U
75-09-2	Methylene Chloride	4.0 U
67-64-1	Acetone	10 U
75-15-0	Carbon Disulfide	2.0 U
75-35-4	1,1-Dichloroethene	2.0 U
75-34-3	**1,1-Dichloroethane**	**1.2 J**
156-60-5	Trans-1,2-Dichloroethene	2.0 U
156-59-2	Cis-1,2-Dichloroethene	2.0 U
67-66-3	Chloroform	2.0 U
107-06-2	1,2-Dichloroethane	2.0 U
78-93-3	2-Butanone	10 U
71-55-6	**1,1,1-Trichloroethane**	**5.7**
108-05-4	Vinyl Acetate	2.0 U
56-23-5	Carbon Tetrachloride	2.0 U
75-27-4	Bromodichloromethane	2.0 U
78-87-5	1,2-Dichloropropane	2.0 U

CAS Number		µg/L
10061-01-5	cis-1,3-Dichloropropene	2.0 U
79-01-6	Trichloroethene	2.0 U
124-48-1	Dibromochloromethane	2.0 U
79-00-5	1,1,2-Trichloroethane	2.0 U
71-43-2	**Benzene**	**1.3 J**
10061-02-6	trans-1,3-Dichloropropene	2.0 U
110-75-8	2-Chloroethylvinylether	2.0 U
75-25-2	Bromoform	2.0 U
108-10-1	4-Methyl-2-Pentanone	10 U
591-78-6	2-Hexanone	10 U
127-18-4	Tetrachloroethene	2.0 U
79-34-5	1,1,2,2-Tetrachloroethane	2.0 U
108-88-3	Toluene	2.0 U
108-90-7	Chlorobenzene	2.0 U
100-41-4	Ethylbenzene	2.0 U
100-42-5	Styrene	2.0 U
1330-20-7	Total Xylenes	4.0 U
75-69-4	Trichlorofluoromethane	4.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	4.0 U

Surrogate Recoveries

d8-Toluene	103%
Bromofluorobenzene	106%
d4-1,2-Dichloroethane	101%

Data Reporting Qualifiers

Value — If the result is a value greater than or equal to the detection limit, report the value.

U — Indicates compound was analyzed for but not detected at the given detection limit.

J — Indicates an estimated value when result is less than specified detection limit.

B — This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.

K — This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

M — Indicates an estimated value of analyte found and confirmed by analyst but with low spectral match parameters.

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ORGANIC ANALYSIS DATA SHEET - Tentatively Identified Compounds

Sample No: **SW-5 re-analysis**

Lab ID: A501J (re)
Matrix: Water

QC Report No: A501-Dames & Moore
Project No: 21199-032
Trans Mtn.
VTSR: 4/17/92

Data Release Authorized: _____

	CAS Number	Compound Name	Fraction	Scan Number	Estimated Concentration (µg/L)
1	-	Alkylcyclopentane Isomer (bp m/e 41)	VOA	918	16 J
2	-	Trimethylcyclopentane Isomer (bp m/e 70)	VOA	954	15 J
3	-	Trimethylcyclopentane Isomer (bp m/e 55)	VOA	976	23 J
4	-	Alkylcyclohexane Isomer (bp m/e 41)	VOA	1119	22 J
5	-	Trimethylcyclohexane Isomer (bp m/e 111)	VOA	1197	35 J
6	-	UNKNOWN Hydrocarbon (bp m/e 57)	VOA	1372	13 J
7	-	UNKNOWN Hydrocarbon (bp m/e 43)	VOA	1506	21 J
8	-	C9.H12 Isomer (bp m/e 105)	VOA	1570	13 J
9	-	UNKNOWN (bp m/e 41)	VOA	1671	16 J
10	-	UNKNOWN Hydrocarbon (bp m/e 57)	VOA	1769	37 J
11	-	Tetramethylbenzene Isomer (bp m/e 119)	VOA	1819	39 J
12	-	UNKNOWN Hydrocarbon coelute (bp m/e 57)	VOA	1835	20 J
13					
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ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Lab ID: A501K
Matrix: Waters

Data Release Authorized: _____
Report: 04/24/92 MAC:D sk

Sample: DW-2

QC Report No: A501 - Dames & Moore
Project: 21199032
Trans Mtn.
VTSR: 04/17/92

Instrument: FINN 7
Date Analyzed: 04/22/92

Amount Purged: 5.0 ml
Conc/Dilution: 1 to 1

CAS Number		µg/L
74-87-3	**Chloromethane**	**1.6 J**
74-83-9	Bromomethane	2.0 U
75-01-4	Vinyl Chloride	2.0 U
75-00-3	Chloroethane	2.0 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	1.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U

CAS Number		µg/L
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	1.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone	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
1330-20-7	Total Xylenes	2.0 U
75-69-4	Trichlorofluoromethane	2.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	2.0 U

Surrogate Recoveries

d8-Toluene	111%
Bromofluorobenzene	96.3%
d4-1,2-Dichloroethane	86.7%

Data Reporting Qualifiers

Value — If the result is a value greater than or equal to the detection limit, report the value.

U — Indicates compound was analyzed for but not detected at the given detection limit.

J — Indicates an estimated value when result is less than specified detection limit.

B — This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.

K — This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

M — Indicates an estimated value of analyte found and confirmed by analyst but with low spectral match parameters.

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ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Lab ID: A501L
Matrix: Waters

Data Release Authorized: _____
Report: 04/24/92 MAC:D sk

Sample: DW-3

QC Report No: A501 - Dames & Moore
Project: 21199032
Trans Mtn.
VTSR: 04/17/92

Instrument: FINN 7
Date Analyzed: 04/22/92

Amount Purged: 5.0 ml
Conc/Dilution: 1 to 1

CAS Number		µg/L
74-87-3	Chloromethane	2.0 U
74-83-9	Bromomethane	2.0 U
75-01-4	Vinyl Chloride	2.0 U
75-00-3	Chloroethane	2.0 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	1.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U

CAS Number		µg/L
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	1.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone	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
1330-20-7	Total Xylenes	2.0 U
75-69-4	Trichlorofluoromethane	2.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	2.0 U

Surrogate Recoveries

d8-Toluene	109%
Bromofluorobenzene	96.3%
d4-1,2-Dichloroethane	88.1%

Data Reporting Qualifiers

Value — If the result is a value greater than or equal to the detection limit, report the value.

U — Indicates compound was analyzed for but not detected at the given detection limit.

J — Indicates an estimated value when result is less than specified detection limit.

B — This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.

K — This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

M — Indicates an estimated value of analyte found and confirmed by analyst but with low spectral match parameters.

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ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Lab ID: A501M
Matrix: Waters

Data Release Authorized: _____
Report: 04/24/92 MAC:D sk

Sample: DW-4

QC Report No: A501 - Dames & Moore
Project: 21199032
Trans Mtn.
VTSR: 04/17/92

Instrument: FINN 7
Date Analyzed: 04/22/92

Amount Purged: 5.0 ml
Conc/Dilution: 1 to 1

CAS Number		µg/L
74-87-3	Chloromethane	2.0 U
74-83-9	Bromomethane	2.0 U
75-01-4	Vinyl Chloride	2.0 U
75-00-3	Chloroethane	2.0 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	1.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U

CAS Number		µg/L
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	1.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone	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
1330-20-7	Total Xylenes	2.0 U
75-69-4	Trichlorofluoromethane	2.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	2.0 U

Surrogate Recoveries

d8-Toluene	109%
Bromofluorobenzene	95.1%
d4-1,2-Dichloroethane	87.3%

Data Reporting Qualifiers

Value — If the result is a value greater than or equal to the detection limit, report the value.

U — Indicates compound was analyzed for but not detected at the given detection limit.

J — Indicates an estimated value when result is less than specified detection limit.

B — This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.

K — This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

M — Indicates an estimated value of analyte found and confirmed by analyst but with low spectral match parameters.

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ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Lab ID: A501N
Matrix: Waters

Data Release Authorized: _____
Report: 04/24/92 MAC:D sk

Sample: DW-5

QC Report No: A501 - Dames & Moore
Project: 21199032
Trans Mtn.
VTSR: 04/17/92

Instrument: FINN 7
Date Analyzed: 04/22/92

Amount Purged: 5.0 ml
Conc/Dilution: 1 to 1

CAS Number		µg/L
74-87-3	Chloromethane	2.0 U
74-83-9	Bromomethane	2.0 U
75-01-4	Vinyl Chloride	2.0 U
75-00-3	Chloroethane	2.0 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	1.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U

CAS Number		µg/L
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	1.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone	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
1330-20-7	Total Xylenes	2.0 U
75-69-4	Trichlorofluoromethane	2.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	2.0 U

Surrogate Recoveries

d8-Toluene	108%
Bromofluorobenzene	94.1%
d4-1,2-Dichloroethane	87.4%

Data Reporting Qualifiers

Value — If the result is a value greater than or equal to the detection limit, report the value.

U — Indicates compound was analyzed for but not detected at the given detection limit.

J — Indicates an estimated value when result is less than specified detection limit.

B — This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.

K — This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

M — Indicates an estimated value of analyte found and confirmed by analyst but with low spectral match parameters.

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ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS

Lab ID: A501O
Matrix: Waters

Data Release Authorized: _____
Report: 04/24/92 MAC:D sk

Sample: Trip Blank

QC Report No: A501 - Dames & Moore
Project: 21199032
Trans Mtn.
VTSR: 04/17/92

Instrument: FINN 7
Date Analyzed: 04/22/92

Amount Purged: 5.0 ml
Conc/Dilution: 1 to 1

CAS Number		µg/L
74-87-3	Chloromethane	2.0 U
74-83-9	Bromomethane	2.0 U
75-01-4	Vinyl Chloride	2.0 U
75-00-3	Chloroethane	2.0 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	1.0 U
75-27-4	Bromodichloromethane	1.0 U
78-87-5	1,2-Dichloropropane	1.0 U

CAS Number		µg/L
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	1.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone	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
1330-20-7	Total Xylenes	2.0 U
75-69-4	Trichlorofluoromethane	2.0 U
76-13-1	1,1,2-Trichlorotrifluoroethane	2.0 U

Surrogate Recoveries

d8-Toluene	104%
Bromofluorobenzene	96.6%
d4-1,2-Dichloroethane	86.9%

Data Reporting Qualifiers

Value — If the result is a value greater than or equal to the detection limit, report the value.

U — Indicates compound was analyzed for but not detected at the given detection limit.

J — Indicates an estimated value when result is less than specified detection limit.

B — This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.

K — This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

M — Indicates an estimated value of analyte found and confirmed by analyst but with low spectral match parameters.

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19 May 1992

DAMES & MOORE
SEATTLE
MAY 20 1992

David Maltby
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032 Trans. Mtn.
ARI Job #A501, A523

Dear David:

Please find enclosed the results and original chain-of-custody records for the above referenced project. Fourteen samples and a trip blank were received on 4/17/92, eight samples and a trip blank on 4/22/92. All samples were in good condition. These have all been faxed to you as they became available.

Conventionals sample SW-5 was not analyzed for Cl due to analyst oversight. Only half a bottle of this sample was received, however if there is enough sample remaining she will perform the analysis.

If you have any questions or need further information, please feel free to call any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Coordinator
206-340-2867 ext. 117

KAS/ks

Enclosures

cc: file#A501, A523

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Boring or Well Number	Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	VOA 602/8020	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (M)	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	Total dissolved solids	Cations	Microtox, pulp, effluent water	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
DW-2			1230		3-40ml, 1-L glass		X		X										X	X	X	X			7	
DW-3			1500		2 O.J., 1-L plastic		X		X										X	X	X	X			7	
DW-4			1730		"		X		X										X	X	X	X			7	

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

J M Williams 4/16/92 1610 [signature]

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

LABORATORY NOTES:

ANALYTICAL LABORATORY: ARI

LABORATORY CONTACT: Kate

D&M CONTACT: David Mathby PHONE: 7280744

DAMES & MOORE
500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

JOB NO.: 21199 032 SHEET 1 OF 1

PROJECT Trans Mountain

LOCATION Laurel Pump Station - Bellingham WA

COLLECTOR J M Williams DATE OF COLLECTION 4/16/92

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Boring or Well Number	Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	VOA 602/8020 BTEX	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (M) Gas range	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	total dissolved solids	pp metals			FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
SW-3-4	-		1505	Water	1-1;40ml		X			X																3	
SWRO-C-4	-		1430		2-40ml						X															2	
SWRO-D2-25	-		1440								X															2	
SWRO-D3-25	-		1455								X															2	
Trip Blank	-				2-40ml																					2	
SW-1		-	1130		3-40ml, 2QT, 1L		X		[redacted]									X		X	X	X	X			6	
SW-2		-	1200		3-40ml, 2QT, 1-L		X											X		X	X	X	X			6	
SW-1		-	1600		1-L				X																	1	
SW-2			1600		1-L				X																	1	
SW-3			1530		3-40ml		X																			3	
SW-5			1700		3-40ml, 1-L, 1QT		X		X									X		X	X	X				5	

RELINQUISHED BY: (Signature) William DATE/TIME 4/17/92 1610 RECEIVED BY: (Signature) M Robson

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

ANALYTICAL LABORATORY: ARI

LABORATORY CONTACT: Kato

D&M CONTACT: David Matthay PHONE: 7280744

DAMES & MOORE
500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

LABORATORY NOTES:
Spoke to David Matthay ① anions include Cl, SO4, F, NO3
② do not do pp metals on SW-5 (no metals bottle supplied)
③ SW-1 & SW-2 used as sample ID twice. These samples were logged as they are on the C.O.C. with the times following the ID to differentiate the samples. Erin Cramwell 4/21/92 1:23 pm

JOB NO.: 21199032 SHEET 1 OF 1

PROJECT Trans Mountain Oil Pipe Line (TMOPL)

LOCATION Laurel Pump Station Bellingham WA

COLLECTOR HWJ Mains DATE OF COLLECTION 4/15/92

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Boring or Well Number	Sample Number	Depth	Time	Sample Type	Container Type	VOA 601/8010	VOA 602/8020	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (M)	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	total dissolved solids	Alkalinity	TPO reactive	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
DW-5			1200	H_2O	3-40ml, 1-l glass, 1-l plastic 2-O.J.			X		X								X		X	X	X			7	

RELINQUISHED BY: (Signature) IMW, Wians DATE/TIME 4/17/92 1810 RECEIVED BY: (Signature) [illegible]

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

LABORATORY NOTES:

ANALYTICAL LABORATORY: ARI

LABORATORY CONTACT: Kati

D&M CONTACT: David Maltby PHONE: 728 0744

DAMES & MOORE
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Seattle, Washington 98121
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JOB NO.: 21199 032 SHEET 1 OF 1

PROJECT Trans Mountain Oil Pipeline (TMOPL)

LOCATION Laurel Pump Station

COLLECTOR IMW, Wians DATE OF COLLECTION 4/17/92

ANALYTICAL
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Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

Final Report
Laboratory Analysis of Selected Parameters

Matrix: WATER

Data Release Authorized:

Report Prepared : May 19, 1992

Project No: 21199032
QC Report No: D&M-A501
Date Received: 4/17/92

Sample Data:

		DATE OF ANALYSIS						
		4/18/92	5/14/92	4/18/92	4/18/92	5/2/92	5/7/92	5/7/92
Lab ID	Sample Number	pH	TDS (mg/L)	NO2 (mg/L)	NO3 (mg/L)	Cl (mg/L)	F (mg/L)	SO4 (mg/L)
A501 E	SW-1-11:30	6.16	419	< 0.010	< 0.010	2.7	0.43	329.3
A501 F	SW-2-12:00	8.03	253	0.011	0.323	16.5	0.20	18.3
A501 J	SW-5	6.70	561	< 0.010	< 0.010	-	0.05	58.7
A501 K	DW-2	7.67	335	< 0.010	0.257	41.7	0.23	39.8
A501 L	DW-3	7.81	290	< 0.010	0.287	7.6	0.23	24.2
A501 M	DW-4	7.70	214	< 0.010	0.615	8.1	0.19	24.9
A501 N	DW-5	7.93	135	< 0.010	< 0.010	6.3	0.15	7.7

Method Blank Analysis:

Sample Number	pH	TDS (mg/L)	NO2 (mg/L)	NO3 (mg/L)	Cl (mg/L)	F (mg/L)	SO4 (mg/L)
Method Blank 1	-	< 10	< 0.010	< 0.010	< 1.0	< 0.05	< 1.0
Detection Limit :	-	10	0.010	0.010	1.0	0.05	1.0

Check Standard:

	pH	TDS (mg/L)	NO2 (mg/L)	NO3 (mg/L)	Cl (mg/L)	F (mg/L)	SO4 (mg/L)
Measured Value	-	-	0.257	0.260	10.3	1.99	24.9
"True" Value	-	-	0.250	0.250	10.0	1.96	25.0
% Recovery	-	-	102.80%	104.00%	102.80%	101.53%	99.56%

Duplicate Analysis:

	pH	TDS (mg/L)	NO2 (mg/L)	NO3 (mg/L)	Cl (mg/L)	F (mg/L)	SO4 (mg/L)
Original	7.93	214	< 0.010	< 0.010	6.3	0.20	18.3
Duplicate	7.95	225	< 0.010	< 0.010	6.6	0.21	19.2
RSD	0.18%	3.54%	-	-	3.07%	3.45%	3.55%

Spike Analysis:

	pH	TDS (mg/L)	NO2 (mg/L)	NO3 (mg/L)	Cl (mg/L)	F (mg/L)	SO4 (mg/L)
Original	-	-	< 0.010	< 0.010	6.3	0.19	24.15
Spike	-	-	0.387	0.417	16.4	2.15	56.3
Spike level	-	-	0.400	0.400	10.0	1.96	33
% Recovery	-	-	96.75%	104.25%	100.70%	100.00%	97.42%

Comments: *Sample SW-5 was missed during the analysis of chloride*

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TOTAL GASOLINE RANGE HYDROCARBONS
WA TPHG Method by GC/FID

QC Report No: **A501-Dames & Moore**
Project: 21199032
Trans Mountain
VTSR: 04/17/92

Matrix: Waters

Data Release Authorized _____
Data Prepared: 04/27/92 - MAC: rpr

Date Extracted: 04/20/92
Date Analyzed: 04/20/92

Lab ID		Client Sample ID	Dilution Factor	Gasoline Range Hydrocarbons †	Gas ID *	Surrogate A	Surrogate B
A501	MB0420	Method Blank	-	0.25 U	-	77.6%	79.3%
A501	B	SWRO - C - 44	-	0.25 U	No	81.0%	84.4%
A501	C	SWRO-D 2 - 25	-	0.25 U	No	96.2%	95.5%
A501	D	SWRO-D 3 - 25	-	0.25 U	No	94.4%	95.5%

Surrogate A = Trifluorotoluene
Surrogate B = Bromobenzene

Values reported in ppm (mg/L).

U Indicates compound was analyzed for but not detected at the given detection limit.

X Indicates a value above the linear range of the detector. Dilution required.

* In the opinion of the analyst, was there a pattern match for gasoline.

† Value based on total peaks in the range from Toluene to Dodecane.

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ORGANICS ANALYSIS DATA SHEET
BETX by Method 602/8020
Matrix: Water
Level: Low

Project No: 21199032

QC Report No: A501-Dames & Moore
VTSR: 4/17/92

Data Release Authorized: _____
Report prepared: 04/27/92 - MAC: RPR

Instrument ID: GC/PID

		Sample No.	Method Blk	SW - 3 - 14
		ARI ID	MB-0420	A501 - A
		Date Analyzed	4/20/92	4/21/92
		Amt Analyzed	5.0 ml	5.0 ml
CAS Number		Units	µg/L	µg/L
71-43-2	Benzene		1.0 U	1.0 U
108-88-3	Toluene		1.0 U	1.0 U
100-41-4	Ethylbenzene		1.0 U	1.0 U
1330-20-7	Total Xylenes		2.0 U	2.0 U
		Trifluorotoluene	78.3%	88.7%
		Bromobenzene	80.0%	89.1%

GC DATA QUALIFIERS

U Indicates the compound was undetected at the listed concentration.

J Indicates an estimated value when the value is less than the calculated detection limit.

D Indicates the surrogate(s) was not detected, due to dilution of extract.

NR Indicates the surrogate recovery cannot be reported due to matrix interference.

X Indicates a value above the linear range of the detector. Dilution required.

S Indicates no value reported due to saturation of the detector. Dilution required.

C Indicates a probable value which is unable to be confirmed due to matrix interference

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TOTAL PETROLEUM HYDROCARBONS by IR Scan
Modified EPA Method 418.1

Matrix: Water

Project: 21199032
Trans Mountain
QC Report No: A501 Dames & Moore
VTSR: 04/17/92

Data Release Authorized _____
Data Prepared: 04/23/92 -MAC:PJW

Date Prepared: 04/21/92
Date of Analysis: 04/21/92

Lab ID	Client Sample ID	Dilution Factor	TPH (ppm)
A501 MB	*METHOD BLANK*	*1*	*1 U*
A501 A	SW-3-14	1	1 U
A501 G	SW-1	1	1 U
A501 H	SW-2	1	1 U
A501 J	**SW-5**	**1**	**18**
A501 K	DW-2	1	1 U
A501 L	DW-3	1	1 U
A501 M	DW-4	1	1 U
A501 N	DW-5	1	1 U

Values reported in ppm (mg/L).

U Indicates compound was analyzed for but not detected at the given detection limit.

EXPLANATION OF INORGANIC DATA REPORT CODES

The columns labeled 'PREP', 'C', and 'M' contain important information about your analyses. The codes are described below.

PREPARATION CODES

These 3-letter codes describe methods used to prepare samples for analysis:

AEN USEPA, Metals in air filters
AHM ARI, Mercury in air filters
AHN ARI, Metals in air filters
ANN NIOSH 7300, Metals in air filters
CAN AOAC (1984) 25.024, Metals in earthenware
DE6 EPA 600/4-79-020 218.5, Cr(VI) in water
DMM DMN followed by TMM, Dissolved mercury
DMN Filtered through .45u filter, Dissolved metals
EW6 EWN followed by DE6
EWM EWN followed by TMM
EWN USEPA SW-846 1310, EP Toxicity
FHP ARI, Metals in tissue ($HNO_3/HClO_4$)
FPP PSEP, Metals in tissue ($HNO_3/HClO_4$)
FRM Journal, Mercury in tissue
FRN Journal, Metals in tissue (HNO_3/H_2O_2)
KRN ARI, Concentration by coprecipitation
LEM USEPA, TCLP followed by TMM
LEN USEPA, TCLP Extraction
MMM ARI, Mercury in miscellaneous materials
MMN ARI, Metals in miscellaneous materials
OAM ARI, Mercury in oil, grease or tar
OAN ARI, Metals in oil, grease or tar
PHM ARI, Mercury in wipes
PHN ARI, Metals in wipes
RCC USEPA CLP, Water digestion, HCl matrix
RCN USEPA CLP, Water digestion, HNO_3 matrix
REC EPA 600/4-79-020 4.1.4, HCl matrix
REI EPA 600/4-79-020 200.7 and 9.4
REN EPA 600/4-79-020 4.1.4, HNO_3 matrix
RMA EPA 600/4-79-020 206.2
RWC USEPA SW-846 3005
SCC USEPA CLP, Soil digestion, HCl matrix
SCM USEPA CLP, Mercury in soil
SCN USEPA CLP, Soil digestion, HNO_3 matrix
SEM EPA 600/4-79-020 245.5, Mercury in soil
SHF ARI, Metals in soil, HF digestion
SRL Journal, Lithium meta-borate fusion
SPF PSEP, Metals in sediment, HF digestion
SSC Standard Methods 302C, Sb/Sn in soil
SSN Standard Methods 302C, Soil digestion
SSS Standard Methods 302C, Ti in soil
SW6 USEPA SW-846 3060, Cr(VI) in soil
SWC USEPA SW-846 3050, HCl matrix
SWN USEPA SW-846 3050, HNO_3 matrix
SWR USEPA SW-846 Modified 3005, Sb by GFAAS
TEC EPA 600/4-79-020 4.1.3, HCl matrix
TEG EPA 600/4-79-020 272.1, Silver in water
TEI EPA 600/4-79-020 200.7 and 9.3
TEN EPA 600/4-79-020 4.1.3, HNO_3 matrix
THG ARI, Silver in photographic solutions
TMM EPA 600/4-79-020 245.1, Mercury in water
TSC Standard Methods 302C, Sb/Sn in water
TSN Standard Methods 302D
TSS Standard Methods 302E, Ti in water
TWC USEPA SW-846 3010, HCl matrix
TWG USEPA SW-846 7760, Silver in water
TWN USEPA SW-846 3020, HNO_3 matrix
WMN EPA 600/4-79-020, Preserved, undigested water
XSC Standard Methods 302B

CONCENTRATION CODES

These codes are used to qualify reported concentrations:

U No analyte was detected. The reported value is the lower limit of detection.

METHOD CODES

These codes signify the instrumental technique used for analysis:

CVA Cold Vapor Atomic Absorption Spectrophotometry
FLA Flame Atomic Absorption Spectrophotometry
GFA Graphite Furnace Atomic Absorption Spectrophotometry
ICP Inductively Coupled Plasma Atomic Emission Spectrometry

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
05/05/92
10:42:05

Client: Dames & Moore
Contact: David Malthy
Project: Trans Mountain
ID number: SW-1 11:30
Description:
Sampled: / /
Received: 04/17/92
Matrix: Water

ARI job number: A501
ARI sample number: E

Released by: _____

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-36-0	Antimony	0.001 mg/L		RWC	GFA
7440-38-2	Arsenic	0.007 mg/L		RMA	GFA
7440-41-7	Beryllium	0.002 mg/L		TWN	ICP
7440-43-9	Cadmium	0.002 mg/L	U	TWN	ICP
7440-47-3	Chromium	0.179 mg/L		TWN	ICP
7440-50-8	Copper	0.207 mg/L		TWN	ICP
7439-92-1	Lead	0.031 mg/L		TWN	GFA
7439-97-6	Mercury	0.001 mg/L	U	TMM	CVA
7440-02-0	Nickel	0.23 mg/L		TWN	ICP
7782-49-2	Selenium	0.005 mg/L	U	RMA	GFA
7440-22-4	Silver	0.003 mg/L	U	TWN	ICP
7440-28-0	Thallium	0.005 mg/L	U	TWN	GFA
7440-66-6	Zinc	0.279 mg/L		TWN	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
05/05/92
10:42:09

Client: Dames & Moore
Contact: David Malthy
Project: Trans Mountain
ID number: SW-1 11:30
Description: Matrix Spike
Sampled: / /
Received: 04/17/92
Matrix: Water

ARI job number: A501
ARI sample number: ESPK

Released by:

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-36-0	Antimony	0.075 mg/L		RWC	GFA
7440-38-2	Arsenic	0.071 mg/L		RMA	GFA
7440-41-7	Beryllium	0.048 mg/L		TWN	ICP
7440-43-9	Cadmium	0.099 mg/L		TWN	ICP
7440-47-3	Chromium	0.450 mg/L		TWN	ICP
7440-50-8	Copper	0.307 mg/L		TWN	ICP
7439-92-1	Lead	0.129 mg/L		TWN	GFA
7439-97-6	Mercury	0.006 mg/L		TMM	CVA
7440-02-0	Nickel	0.73 mg/L		TWN	ICP
7782-49-2	Selenium	0.088 mg/L		RMA	GFA
7440-22-4	Silver	0.239 mg/L		TWN	ICP
7440-28-0	Thallium	0.113 mg/L		TWN	GFA
7440-66-6	Zinc	0.773 mg/L		TWN	ICP

ANALYTICAL RESOURCES, INC.
Matrix Spike Quality Control Report

Client: Dames & Moore

Client's sample ID: SW-1 11:30

ARI sample ID: A501 ESPK

Units: mg/L

Analyte	Meth	Sample	Matrix Spike	Spike Added	%R	Control Limit	Q
Antimony	GFA	0.001	0.075	0.100	74.0	75-125%	N
Arsenic	GFA	0.007	0.071	0.100	64.0	75-125%	N
Beryllium	ICP	0.002	0.048	0.050	92.0	75-125%	
Cadmium	ICP	0	0.099	0.100	99.0	75-125%	
Chromium	ICP	0.179	0.450	0.250	108.4	75-125%	
Copper	ICP	0.207	0.307	0.100	100.0	75-125%	
Lead	GFA	0.031	0.129	0.100	98.0	75-125%	
Mercury	CVA	0	0.006	0.005	120.0	75-125%	
Nickel	ICP	0.23	0.73	0.500	100.0	75-125%	
Selenium	GFA	0	0.088	0.100	88.0	75-125%	
Silver	ICP	0	0.239	0.250	95.6	75-125%	
Thallium	GFA	0	0.113	0.100	113.0	75-125%	
Zinc	ICP	0.279	0.773	0.500	98.8	75-125%	

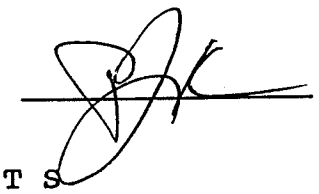
%R = Percent recovery

'Q' codes: 'N' = control limit not met
'H' = %R not valid, sample concentration too high

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
05/05/92
10:42:13

Client: Dames & Moore
Contact: David Malthy
Project: Trans Mountain
ID number: SW-2 12:00
Description:
Sampled: / /
Received: 04/17/92
Matrix: Water

ARI job number: A501
ARI sample number: F

Released by: 

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-36-0	Antimony	0.003 mg/L		RWC	GFA
7440-38-2	Arsenic	0.005 mg/L		RMA	GFA
7440-41-7	Beryllium	0.004 mg/L		TWN	ICP
7440-43-9	Cadmium	0.002 mg/L	U	TWN	ICP
7440-47-3	Chromium	0.767 mg/L		TWN	ICP
7440-50-8	Copper	0.523 mg/L		TWN	ICP
7439-92-1	Lead	0.090 mg/L		TWN	GFA
7439-97-6	Mercury	0.0002 mg/L		TMM	CVA
7440-02-0	Nickel	0.60 mg/L		TWN	ICP
7782-49-2	Selenium	0.010 mg/L	U	RMA	GFA
7440-22-4	Silver	0.003 mg/L	U	TWN	ICP
7440-28-0	Thallium	0.008 mg/L		TWN	GFA
7440-66-6	Zinc	1.03 mg/L		TWN	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
05/05/92
10:42:17

Client: Dames & Moore
Contact: David Malthy
Project: Trans Mountain
ID number: SW-2 12:00
Description: Laboratory Duplicate
Sampled: / /
Received: 04/17/92
Matrix: Water

ARI job number: A501
ARI sample number: FDUP

Released by: 

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-36-0	Antimony	0.003 mg/L		RWC	GFA
7440-38-2	Arsenic	0.009 mg/L		RMA	GFA
7440-41-7	Beryllium	0.004 mg/L		TWN	ICP
7440-43-9	Cadmium	0.003 mg/L		TWN	ICP
7440-47-3	Chromium	0.792 mg/L		TWN	ICP
7440-50-8	Copper	0.523 mg/L		TWN	ICP
7439-92-1	Lead	0.088 mg/L		TWN	GFA
7439-97-6	Mercury	0.0001 mg/L		TMM	CVA
7440-02-0	Nickel	0.59 mg/L		TWN	ICP
7782-49-2	Selenium	0.010 mg/L	U	RMA	GFA
7440-22-4	Silver	0.003 mg/L	U	TWN	ICP
7440-28-0	Thallium	0.011 mg/L		TWN	GFA
7440-66-6	Zinc	1.01 mg/L		TWN	ICP

ANALYTICAL RESOURCES, INC.
Matrix Duplicate Quality Control Report

Client: Dames & Moore

Client's sample ID: SW-2 12:00

ARI sample ID: A501 FDUP

Units: mg/L

Analyte	Meth	Original Sample	Matrix Duplicate	RPD	Control Limit	Q
Antimony	GFA	0.003	0.003	0.0	± 20 %	
Arsenic	GFA	0.005	0.009	57.1	± 0.005	L
Beryllium	ICP	0.004	0.004	0.0	± 20 %	
Cadmium	ICP	U 0.002	0.003	40.0	± 0.002	L
Chromium	ICP	0.767	0.792	3.2	± 20 %	
Copper	ICP	0.523	0.523	0.0	± 20 %	
Lead	GFA	0.090	0.088	2.2	± 20 %	
Mercury	CVA	0.0002	0.0001	66.7	±0.0001	L
Nickel	ICP	0.60	0.59	1.7	± 20 %	
Selenium	GFA	U 0.010	U 0.010	0.0	± 0.010	L
Silver	ICP	U 0.003	U 0.003	0.0	± 0.003	L
Thallium	GFA	0.008	0.011	31.6	± 0.005	L
Zinc	ICP	1.03	1.01	2.0	± 20 %	

RPD = Relative percent difference

'Q' codes: '*' = control limit not met
'L' = RPD not valid, alternate limit = ± detection limit

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
05/05/92
10:42:21

Client: Dames & Moore
Contact: David Malthy
Project: Trans Mountain
ID number: DW-2
Description:
Sampled: / /
Received: 04/17/92
Matrix: Water

ARI job number: A501
ARI sample number: K

Released by:

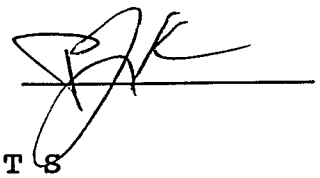
A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-36-0	Antimony	0.001 mg/L	U	RWC	GFA
7440-38-2	Arsenic	0.002 mg/L	U	RMA	GFA
7440-41-7	Beryllium	0.006 mg/L		TWN	ICP
7440-43-9	Cadmium	0.002 mg/L	U	TWN	ICP
7440-47-3	Chromium	0.154 mg/L		TWN	ICP
7440-50-8	Copper	0.209 mg/L		TWN	ICP
7439-92-1	Lead	0.167 mg/L		TWN	GFA
7439-97-6	Mercury	0.0001 mg/L	U	TMM	CVA
7440-02-0	Nickel	0.08 mg/L		TWN	ICP
7782-49-2	Selenium	0.005 mg/L	U	RMA	GFA
7440-22-4	Silver	0.003 mg/L	U	TWN	ICP
7440-28-0	Thallium	0.009 mg/L		TWN	GFA
7440-66-6	Zinc	0.243 mg/L		TWN	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
05/05/92
10:42:25

Client: Dames & Moore
Contact: David Malthy
Project: Trans Mountain
ID number: DW-3
Description:
Sampled: / /
Received: 04/17/92
Matrix: Water

ARI job number: A501
ARI sample number: L

Released by: 

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-36-0	Antimony	0.002 mg/L		RWC	GFA
7440-38-2	Arsenic	0.018 mg/L		RMA	GFA
7440-41-7	Beryllium	0.001 mg/L		TWN	ICP
7440-43-9	Cadmium	0.002 mg/L	U	TWN	ICP
7440-47-3	Chromium	0.036 mg/L		TWN	ICP
7440-50-8	Copper	0.080 mg/L		TWN	ICP
7439-92-1	Lead	0.028 mg/L		TWN	GFA
7439-97-6	Mercury	0.0001 mg/L	U	TMM	CVA
7440-02-0	Nickel	0.03 mg/L		TWN	ICP
7782-49-2	Selenium	0.005 mg/L	U	RMA	GFA
7440-22-4	Silver	0.003 mg/L	U	TWN	ICP
7440-28-0	Thallium	0.002 mg/L		TWN	GFA
7440-66-6	Zinc	0.218 mg/L		TWN	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
05/05/92
10:42:29

Client: Dames & Moore
Contact: David Malthy
Project: Trans Mountain
ID number: DW-4
Description:
Sampled: / /
Received: 04/17/92
Matrix: Water

ARI job number: A501
ARI sample number: M

Released by: 

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-36-0	Antimony	0.001 mg/L	U	RWC	GFA
7440-38-2	Arsenic	0.014 mg/L		RMA	GFA
7440-41-7	Beryllium	0.001 mg/L	U	TWN	ICP
7440-43-9	Cadmium	0.002 mg/L		TWN	ICP
7440-47-3	Chromium	0.014 mg/L		TWN	ICP
7440-50-8	Copper	0.017 mg/L		TWN	ICP
7439-92-1	Lead	0.021 mg/L		TWN	GFA
7439-97-6	Mercury	0.0001 mg/L	U	TMM	CVA
7440-02-0	Nickel	0.02 mg/L		TWN	ICP
7782-49-2	Selenium	0.001 mg/L	U	RMA	GFA
7440-22-4	Silver	0.003 mg/L	U	TWN	ICP
7440-28-0	Thallium	0.001 mg/L	U	TWN	GFA
7440-66-6	Zinc	0.045 mg/L		TWN	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
05/05/92
10:42:36

Client: Dames & Moore
Contact: David Malthy
Project: Trans Mountain
ID number: DW-5
Description:
Sampled: / /
Received: 04/17/92
Matrix: Water

ARI job number: A501
ARI sample number: N

Released by:

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-36-0	Antimony	0.002 mg/L		RWC	GFA
7440-38-2	Arsenic	0.019 mg/L		RMA	GFA
7440-41-7	Beryllium	0.001 mg/L	U	TWN	ICP
7440-43-9	Cadmium	0.002 mg/L	U	TWN	ICP
7440-47-3	Chromium	0.042 mg/L		TWN	ICP
7440-50-8	Copper	0.041 mg/L		TWN	ICP
7439-92-1	Lead	0.013 mg/L		TWN	GFA
7439-97-6	Mercury	0.0001 mg/L	U	TMM	CVA
7440-02-0	Nickel	0.05 mg/L		TWN	ICP
7782-49-2	Selenium	0.024 mg/L		RMA	GFA
7440-22-4	Silver	0.003 mg/L	U	TWN	ICP
7440-28-0	Thallium	0.001 mg/L	U	TWN	GFA
7440-66-6	Zinc	0.079 mg/L		TWN	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
05/05/92
10:42:32

Client: Dames & Moore
Contact: David Malthy
Project: Trans Mountain
ID number:
Description: Method Blank
Sampled: / /
Received: / /
Matrix: Water

ARI job number: A501
ARI sample number: MB

Released by:

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-36-0	Antimony	0.001 mg/L	U	RWC	GFA
7440-38-2	Arsenic	0.001 mg/L	U	RMA	GFA
7440-41-7	Beryllium	0.001 mg/L	U	TWN	ICP
7440-43-9	Cadmium	0.002 mg/L	U	TWN	ICP
7440-47-3	Chromium	0.005 mg/L	U	TWN	ICP
7440-50-8	Copper	0.002 mg/L	U	TWN	ICP
7439-92-1	Lead	0.001 mg/L	U	TWN	GFA
7439-97-6	Mercury	0.0001 mg/L	U	TMM	CVA
7440-02-0	Nickel	0.01 mg/L	U	TWN	ICP
7782-49-2	Selenium	0.001 mg/L	U	RMA	GFA
7440-22-4	Silver	0.003 mg/L	U	TWN	ICP
7440-28-0	Thallium	0.001 mg/L	U	TWN	GFA
7440-66-6	Zinc	0.004 mg/L	U	TWN	ICP

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

26 October 1992

David Raubvogel
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032 Trans. Mtn.
ARI Job #C003

Dear David:

Please find enclosed the results and original chain-of-custody record for the above referenced project. Seventeen soil samples were received on 10/19/92, in good condition.

The HCID analysis proceeded without incident, however the method blank and several samples had surrogate recoveries slightly lower than QC limits. These results were given to you verbally, as preliminaries, on 10/21. All samples were re-extracted and re-analyzed, and only these results are reported here.

A copy of these results and all raw data will be kept on file with ARI should you require any additional information or copies of the paperwork.

If you have any questions , please feel free to call me any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Coordinator
206-340-2866 ext. 117

KAS/ks

Enclosures

cc: file#C003

ANALYTICAL RESOURCES INCORPORATED

Analytical
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Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL PETROLEUM HYDROCARBONS
WA HCID Method by GC/FID

QC Report No: C003 - D & M
Project: 21199-036-7172-005
Trans Mtn.
VTSR: 10/19/92

Matrix: Soils

Data Release Authorized _____
Data Prepared: 10/23/92 *MAC:D sk*

Date extracted: 10/21/92
Dates Analyzed: 10/22-23/92

Lab ID	Client Sample ID	Dilution Factor	Gas Range Petroleum Hydrocarbons †	Diesel Range Petroleum Hydrocarbons *	Oil Range Petroleum Hydrocarbons °	Surrogate Recovery
C003 MB	Method Blank	-	10 U	10 U	10 U	65.9%
C003 A2	PCS-BT-1	-	10 U	10 U	10 U	64.1%
C003 B2	PCS-BT-2	-	10 U	10 U	10 U	54.8%
C003 C2	PCS-BT-3	-	10 U	10 U	10 U	63.3%
C003 D2	PCS-BT-4	-	10 U	10 U	10 U	68.8%
C003 E2	PCS-SC-1A	-	10 U	10 U	10 U	57.4%
C003 F2	PCS-SC-1B	-	10 U	10 U	10 U	68.8%
C003 G2	PCS-SC-1C	-	10 U	10 U	10 U	63.3%
C003 H2	PCS-SC-1D	-	10 U	10 U	10 U	60.6%
C003 I2	PCS-SC-1E	-	10 U	10 U	10 U	65.9%
C003 J2	PCS-SC-1F	-	10 U	10 U	10 U	65.3%
C003 K2	PCS-SC-1G	-	10 U	10 U	10 U	59.0%

Surrogate is Me-Arachidate.
Values reported in ppm (mg/kg).

U Indicates compound was analyzed, but not detected at the given detection limit.
X Indicates a value above the linear range of the detector. Dilution required.
* Value based on total peaks in C12-C24 range.
† Value based on total peaks in Toluene-C24 range.
NR Indicates not reported due to matrix interference.
S Indicates no value reported due to saturation of the detector. Dilution required.
J Indicates an estimated value when the value is less than the calculated detection limit.
D Indicates the surrogate was diluted out.

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(206) 621-7523 (FAX)

TOTAL PETROLEUM HYDROCARBONS
WA HCID Method by GC/FID

QC Report No: C003 - D & M
Project: 21199-036-7172-005
Trans Mtn.
VTSR: 10/19/92

Matrix: Soils

Data Release Authorized _____
Data Prepared: 10/23/92 *MAC:D sk*

Date extracted: 10/21/92
Dates Analyzed: 10/22-23/92

Lab ID	Client Sample ID	Dilution Factor	Gas Range Petroleum Hydrocarbons †	Diesel Range Petroleum Hydrocarbons *	Oil Range Petroleum Hydrocarbons °	Surrogate Recovery
C003 L2	PCS-SC-1H	-	10 U	10 U	10 U	60.1%
C003 M2	PCS-4S-1	-	10 U	10 U	10 U	64.7%
C003 N2	PCS-4S-2	-	10 U	10 U	10 U	59.6%
C003 O2	PCS-4S-3	-	10 U	10 U	10 U	60.7%
C003 P2	PCS-4S-4	-	10 U	10 U	10 U	62.6%
C003 Q2	PCS-4S-5	-	10 U	10 U	10 U	63.0%

Surrogate is Me-Arachidate.
Values reported in ppm (mg/kg).

U Indicates compound was analyzed, but not detected at the given detection limit.
X Indicates a value above the linear range of the detector. Dilution required.
* Value based on total peaks in C12-C24 range.
† Value based on total peaks in Toluene-C12 range.
° Value based on total peaks in C24-C32 range.
NR Indicates not reported due to matrix interference.
S Indicates no value reported due to saturation of the detector. Dilution required.
J Indicates an estimated value when the value is less than the calculated detection limit.
D Indicates the surrogate was diluted out.

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DIESEL MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

ARI Job No: C003

Client: D & M
Project: 21199-036-7172-005
Trans Mtn.

Sample No: PCS-SC-1H

COMPOUND	SPIKE ADDED (mg/Kg)	SAMPLE CONC (mg/Kg)	MS CONC (mg/Kg)	MS % REC	QC LIMITS REC
Diesel	596	0	672	113%	50-150

COMPOUND	SPIKE ADDED (mg/Kg)	MSD CONC (mg/Kg)	MSD % REC	% RPD	Q C LIMITS RPD	REC
Diesel	598	670	112%	0.89	50	50-150

SURROGATE % RECOVERY		
	MS	96.6%
	MSD	96.7%

Surrogate is Me-Arachidate

Comments: Advisory QC Limits

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Boring or Well Number	Sample Number	BGS Depth	Time	Sample Type	Container Type	ANALYSES: VOA 601/8010	VOA 602/8020	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (M)	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	WTPH-HCID	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
PCS	BT-1	1 3'	1330	Soil	8 oz Glass															X		TPH <100 check for	1	
PCS	BT-2	6'	1330	"	"															X		dominant hydro-	1	
PCS	BT-3	6'	1330	"	"															X		carbon identified	1	
PCS	BT-4	3 3'	1330	"	"															X		on All samples	1	
PCS	SC-1A	4'	1515	"	8 oz Glass															X			1	
PCS	SC-1B	4'																		X			1	
PCS	SC-1C	3 5'																		X			1	
PCS	SC-1D	3 5'																		X			1	
PCS	SC-1E	3'																		X			1	
PCS	SC-1F	3'																		X			1	
PCS	SC-1G	2 5'																		X			1	
PCS	SC-1H	2 5'																		X			1	
PCS	4S-1	2 5'	1615	Soil	8 oz Glass															X			1	
PCS	4S-2	2 5'	1615	Soil	8 oz Glass															X			1	
PCS	4S-3	3'																		X			1	
PCS	4S-4	3'																		X			1	
PCS	4S-5	3'																		X			1	

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

Todd W. Ver 3:10 10/19/92 Erin Cranwell

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

ANALYTICAL LABORATORY:

LABORATORY CONTACT:

D&M CONTACT: David Raubvogel PHONE: 728-0744

LABORATORY NOTES: LLP ~~TPH <100ppm~~ TAT: 10/22/92 afternoon

A.R.I. # C003

JOB NO.: 21199-036-7172-005 SHEET 1 OF

PROJECT Trans Mountain Pipeline PCS Cell Consolidation

LOCATION Laurel

COLLECTOR L. Pfeifer DATE OF COLLECTION 16 oct 92

DAMES & MOORE
500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

ANALYTICAL
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333 Ninth Ave. North
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(206) 621-6490
(206) 621-7523 (FAX)

03 December 1992

David Raubvogel
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032 Trans. Mtn.
ARI Job #C332

Dear David:

Please find enclosed the results and original chain-of-custody (COC) record for the above referenced project. Five soil samples were received on 11/25/92, in good condition, and the analysis proceeded without incident

Note that a blank spike recovery report is included; this blank was extracted and analyzed with your samples for QC documentation.

A copy of these results and all raw data will be kept on file with ARI should you require any additional information or copies of the paperwork.

If you have any questions , please feel free to call me any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Coordinator
206-340-2866 ext. 117

KAS/ks

Enclosures

cc: file#C332

Sample

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

ID ~~Boring or Well Number~~	Sample Number	Time ~~Depth~~	Date ~~Time~~	Sample Type	Container Type	ANALYSES: VOA 601/8010	VOA 602/8020	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (M)	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	WTPH-Acid					FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
PS-2		930	11/25/92	soil	4 oz glass															X							1	
PS-3		945			w/ teflon lid															X							1	
PS-4		1000																		X							1	
PS-5		1015																		X							1	
PS-6	—	1030																		X							1	

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

JM Williams 11/25/92 1230 Shelby Mills

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

ANALYTICAL LABORATORY: ARI

LABORATORY CONTACT: Kate Stegemoeller

D&M CONTACT: Mark Molinari / Ingrid Williams PHONE: 728 0744

LABORATORY NOTES:

2-week turnaround

A.R.I. # C332

JOB NO.: 21199.032 SHEET 1 OF 1

PROJECT Transmountain

LOCATION Laurel Pump Station

COLLECTOR JMWilliams DATE OF COLLECTION 11/25/92

DAMES & MOORE

500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

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Chemists &
Consultants

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Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL PETROLEUM HYDROCARBONS
WA HCID Method by GC/FID

Matrix: Soil

QC Report No: C332-Dames & Moore
Project: 21199.032
Trans. Mtn.

Data Release Authorized _____
Data Prepared: 12/03/92 - MAC:K kas

VTSR: 11/25/92

Date extracted: 11/30/92

Lab ID	Client Sample ID	Date Analyzed	Dilution Factor	Gas Range†	Diesel Range*	Oil Range°	Surrogate Recovery
C332 MB	*Method Blank*	12/01/92	-	10 U	10 U	10 U	106%
C332 A	P5-2	12/02/92	-	10 U	10 U	10 U	132%
C332 B	P5-3	12/02/92	-	10 U	10 U	10 U	127%
C332 C	P5-4	12/02/92	-	10 U	10 U	10 U	121%
C332 D	P5-5	12/02/92	-	10 U	10 U	10 U	123%
C332 E	P5-6	12/02/92	-	10 U	10 U	10 U	127%

Surrogate is Me-Arachidate.
Values reported in ppm (mg/Kg).

GC Data Reporting Qualifiers

U	Indicates compound was analyzed for but not detected at the given detection limit.
X	Indicates a value above the linear range of the detector. Dilution required.
J	Indicates an estimated value when the value is less than the calculated detection limit.
S	Indicates no value reported due to saturation of the detector. Dilution required.
D	Indicates that surrogate was not detected because of dilution of the extract.
C	Indicates a probable value which is unable to be confirmed due to matrix interference.
NR	Indicates no recovery due to matrix interference and/or dilution.
†	Value based on total peaks in the range from Toluene to C12.
*	Value based on total peaks in the range from C12 to C24.
°	Value based on total peaks in the range from C24 to C32.

ANALYTICAL
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333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL DIESEL RANGE HYDROCARBON SPIKE BLANK RECOVERY

ARI Job No: C332

Matrix: Soil

Client: Dames & Moore
Project: 21199.03
Trans. Mtn.

COMPOUND	SPIKE ADDED (mg/kg)	SB CONC. (mg/kg)	SB % REC	QC Limits REC
Diesel	625	787	126	48-155

	Surrogate % rec.	QC Limits
Methyl Arachidate	124%	59-153

Spike Recovery: 0 out of 1 outside limits
Surrogate Recovery: 0 out of 1 outside limits

Asterisked values outside QC Limits

Comments:

Report prepared: 12/03/92 MAC:K kas

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

10 December 1992

David Raubvogel
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032 Trans. Mtn.
ARI Job #C360

Dear David:

Please find enclosed the results and original chain-of-custody (COC) records for the above referenced project. Twenty-four soil samples were received on 12/1/92, in good condition. Sample **TP2-5** was not on the COC, but was added per Ingrid Williams' instructions to Terrie Hedger at 10:30 am on 12/2. These reports were faxed to you earlier today.

The analyses were without incident of note. A blank spike recovery report is included; this blank was extracted and analyzed with your samples for QC documentation.

A copy of these results and all raw data will be kept on file with ARI should you require any additional information or copies of the paperwork.

If you have any questions , please feel free to call me any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Coordinator
206-340-2866 ext. 117

KAS/ks

Enclosures

cc: file#C360

12/1/92

Sample

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manag

~~Boring or Well Number~~	Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES: VOA 601/8010	VOA 602/8020	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (M)	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	MTPH-HCID	FIELD NOTES:	Total Number Of Containers	Laboratory Number
P5-7			0900	Soil	4oz jar															X			1	
1-8																				X				
9																				X				
10																				X				
11																				X				
12			↓																	X				
13			0930																	X				
14																				X				
15																				X				
16																				X				
17																				X				
18																				X				
19			↓																	X				
TP1-2			1300																	X				
TP1-4			↓																	X				
TP1-5																				X				
TP2-3			1315																	X				
TP2-1			11																	X			↓	

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

M Williams 12/1/92 1750 Jane Fellows

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

LABORATORY NOTES:

ARI # C360

ANALYTICAL LABORATORY: ARI

LABORATORY CONTACT: Kate Stegemoeller

D&M CONTACT: JM Williams PHONE: 7280744

DAMES & MOORE
500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

JOB NO.: 21199 032 SHEET 1 OF 1

PROJECT Trans Mountain

LOCATION Laurel Station / Anacortes 11/30/92 5

COLLECTOR JM Williams DATE OF COLLECTION 12/1/92

ANALYTICAL
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TOTAL PETROLEUM HYDROCARBONS
WA HCID Method by GC/FID

Matrix: Soil

QC Report No: C360-Dames & Moore
Project: 21199.032
Trans. Mtn.

Data Release Authorized: _____

Data Prepared: 12/09/92 - MAC:K kas

VTSR: 12/01/92

Date extracted: 12/02/92

Lab ID	Client Sample ID	Date Analyzed	Dilution Factor	Gas Range†	Diesel Range*	Oil Range°	Surrogate Recovery
C360 MB1	*Method Blank*	12/03/92	-	10 U	10 U	10 U	134%
C360 MB2	*Method Blank*	12/03/92	-	10 U	10 U	10 U	99.7%
C360 A	P5-7	12/08/92	-	10 U	10 U	10 U	106%
C360 B	P5-8	12/05/92	-	10 U	10 U	10 U	131%
C360 C	P5-9	12/08/92	-	10 U	10 U	10 U	97.6%
C360 D	P5-10	12/08/92	-	10 U	10 U	10 U	96.2%
C360 E	P5-11	12/08/92	-	10 U	10 U	10 U	86.1%
C360 F	P5-12	12/09/92	-	10 U	10 U	10 U	87.1%
C360 G	P5-13	12/09/92	-	10 U	10 U	12	111%
C360 H	P5-14	12/05/92	-	10 U	10 U	10 U	133%
C360 I	P5-15	12/09/92	-	10 U	10 U	10 U	104%
C360 J	P5-16	12/09/92	-	10 U	10 U	10 U	98.3%
C360 K	P5-17	12/09/92	-	10 U	10 U	10 U	89.3%
C360 L	P5-18	12/09/92	-	10 U	10 U	10 U	90.8%
C360 M	P5-19	12/09/92	-	10 U	10 U	10 U	96.9%

Surrogate is Me-Arachidate.
Values reported in ppm (mg/Kg).

GC Data Reporting Qualifiers

U	Indicates compound was analyzed for but not detected at the given detection limit.
X	Indicates a value above the linear range of the detector. Dilution required.
J	Indicates an estimated value when the value is less than the calculated detection limit.
S	Indicates no value reported due to saturation of the detector. Dilution required.
D	Indicates that surrogate was not detected because of dilution of the extract.
C	Indicates a probable value which is unable to be confirmed due to matrix interference.
NR	Indicates no recovery due to matrix interference and/or dilution.
†	Value based on total peaks in the range from Toluene to C12.
*	Value based on total peaks in the range from C12 to C24.
°	Value based on total peaks in the range from C24 to C32.

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TOTAL DIESEL RANGE HYDROCARBON SPIKE BLANK RECOVERY

ARI Job No: C360

Client: Dames & Moore
Project: 21199.03
Trans. Mtn.

Matrix: Soil

COMPOUND	SPIKE ADDED (mg/kg)	SB CONC. (mg/kg)	SB % REC	QC Limits REC
Diesel	625	788	126	48-155

	Surrogate % rec.	QC Limits
Methyl Arachidate	107%	59-153

Spike Recovery: 0 out of 1 outside limits
Surrogate Recovery: 0 out of 1 outside limits

Asterisked values outside QC Limits

Comments:

Report prepared: 12/09/92 MAC:K kas

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TOTAL PETROLEUM HYDROCARBONS
WA HCID Method by GC/FID

QC Report No: C003 - D & M
Project: 21199-036-7172-005
Trans Mtn.
VTSR: 10/19/92

Matrix: Soils

Data Release Authorized _____
Data Prepared: 10/23/92 *MAC:D sk*

Date extracted: 10/21/92
Dates Analyzed: 10/22-23/92

Lab ID	Client Sample ID	Dilution Factor	Gas Range Petroleum Hydrocarbons †	Diesel Range Petroleum Hydrocarbons *	Oil Range Petroleum Hydrocarbons °	Surrogate Recovery
C003 L2	PCS-SC-1H	-	10 U	10 U	10 U	60.1%
C003 M2	PCS-4S-1	-	10 U	10 U	10 U	64.7%
C003 N2	PCS-4S-2	-	10 U	10 U	10 U	59.6%
C003 O2	PCS-4S-3	-	10 U	10 U	10 U	60.7%
C003 P2	PCS-4S-4	-	10 U	10 U	10 U	62.6%
C003 Q2	PCS-4S-5	-	10 U	10 U	10 U	63.0%

Surrogate is Me-Arachidate.
Values reported in ppm (mg/kg).

U Indicates compound was analyzed, but not detected at the given detection limit.
X Indicates a value above the linear range of the detector. Dilution required.
* Value based on total peaks in C12-C24 range.
† Value based on total peaks in Toluene-C12 range.
° Value based on total peaks in C24-C32 range.
NR Indicates not reported due to matrix interference.
S Indicates no value reported due to saturation of the detector. Dilution required.
J Indicates an estimated value when the value is less than the calculated detection limit.
D Indicates the surrogate was diluted out.

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DIESEL MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

ARI Job No: C003

Sample No: PCS-SC-1H

Client: D & M
Project: 21199-036-7172-005
Trans Mtn.

COMPOUND	SPIKE ADDED (mg/Kg)	SAMPLE CONC (mg/Kg)	MS CONC (mg/Kg)	MS % REC	QC LIMITS REC
Diesel	596	0	672	113%	50-150

COMPOUND	SPIKE ADDED (mg/Kg)	MSD CONC (mg/Kg)	MSD % REC	% RPD	Q C LIMITS RPD	Q C LIMITS REC
Diesel	598	670	112%	0.89	50	50-150

SURROGATE % RECOVERY		
	MS	96.6%
	MSD	96.7%

Surrogate is Me-Arachidate

Comments: Advisory QC Limits

CHAIN-OF-CUSTODY RECORD

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

Boring or Well Number	Sample Number	BGS Depth	Time	Sample Type	Container Type	ANALYSES: VOA 601/8010	VOA 602/8020	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (M)	TITLE 22 METALS	WET Test	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TCLP	pH	ASBESTOS	WTPH-HCID	FIELD NOTES:	Total Number Of Containers	Laboratory Note Number
PCS	BT-1	1 3'	1330	Soil	8 oz Glass															X		TPH <100 check for	1	
PCS	BT-2	6'	1330	"	"															X		dominant hydro -	1	
PCS	BT-3	6'	1330	"	"															X		Carbon identified	1	
PCS	BT-4	3 3'	1330	"	"															X		on All samples	1	
PCS	SC-1A	4'	1515	"	8 oz Glass															X			1	
PCS	SC-1B	4'																		X			1	
PCS	SC-1C	3 5'																		X			1	
PCS	SC-1D	3 5'																		X			1	
PCS	SC-1E	3'																		X			1	
PCS	SC-1F	3'																		X			1	
PCS	SC-1G	2 5'																		X			1	
PCS	SC-1H	2 5'																		X			1	
PCS	4S-1	2 5'	1615	Soil	8 oz Glass															X			1	
PCS	4S-2	2 5'	1615	Soil	8 oz Glass															X			1	
PCS	4S-3	3'																		X			1	
PCS	4S-4	3'																		X			1	
PCS	4S-5	3'																		X			1	

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

Todd Miller 3:10 10/19/92 Erin Cramer

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

ANALYTICAL LABORATORY:

LABORATORY CONTACT:

D&M CONTACT: David Raubvogel PHONE: 728-0744

DAMES & MOORE
500 Market Place Tower
2025 First Avenue
Seattle, Washington 98121
(206) 728-0744 Fax No. (206) 448-7994

LABORATORY NOTES: LLP

~~TPH <100ppm~~

TAT: 10/22/92 afternoon

A.R.I. # C003

JOB NO.: 21199-036-7172-005 SHEET 1 OF

PROJECT Trans Mountain Pipeline PCS Cell Consolidation

LOCATION Laurel

COLLECTOR L. Pfeifer DATE OF COLLECTION 16 Oct 92

DAMES & MOORE
SEATTLE
JUL 27 1993

26 July 1993

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David Raubvogel
Dames & Moore
500 Market Place Tower
2025 First Avenue
Seattle, WA 98121

RE: Client Project: #21199-032-005 Trans. Mtn. Characterization;
ARI Job #E354

Dear David:

Please find enclosed the results and original chain-of-custody (COC) record for samples from the above referenced project. Eleven soil samples, one water sample, and a trip blank were received on 7/9/93, in good condition and with no discrepancies between the COC and sample container labels. Copies of these reports were faxed to you as they became available.

The analyses were without incident of note. A matrix spike and matrix spike duplicate were analyzed by the HCID method on sample **PCSC-2-1-A**; a recovery report is included as documentation. Please note that the high recoveries are influenced by the level of matrix contamination. Blank spikes were extracted and/or analyzed with these samples for the BETX and 418.1 parameters, and recovery reports are included as additional QC documentation for the project.

A copy of these results and all raw data will be kept on file by ARI should you require any additional information or copies of the paperwork. Also, if you have questions, please feel free to call me any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Coordinator
206-340-2866 ext. 117

Enclosures

cc: file#E354

Coolers 9°C ARI # 1535

DAMES & MOORE

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Chain of Custody

Date 7/8/93 Page 1 of ___

Project Number: 21199-032-005
Project Manager: DAVID RAUBVOGEL
Laboratory: ARI
Turn around time: STANDARD

Sampler's Initials: DMW/GST
Sampler's Signature: David M. Wechsler

Analysis Request

Sample ID	Date	Time	Matrix	Volatile Organics 624/8240 (GC/MS)	Halogenated Volatiles 601/8010	Aromatic Volatiles 602/8020 BTEX ONLY	Base/Neutral/Acids 625/8270 (GC/MS)	BTX 602/8020	Polycyclic Aromatic Hydrocarbons 610/8310	Pesticides/PCBs 608/8080	TPH - 418.1	TPH - HCID			Priority Pollutant Metals (13)	EP TOX Metals (8)			Comments/ Instructions	Number of Containers
PCSC-2-1-A	7/7/93	11:00	SOIL			✓						✓							SEE SPECIAL	3
PCSC-2-2-D	7/7/93	12:40	SOIL			✓						✓							INSTRUCTIONS	3
PCSC-2-3-B	7/7/93	14:10	SOIL			✓						✓								3
PCSC-2-4-C	7/7/93	15:28	SOIL			✓						✓								3
PCSC-2-6-A	7/8/93	9:05	SOIL			✓						✓								3
PCSC-2-6-C	7/8/93	9:45	SOIL			✓						✓								3
PCSC-2-7-B	7/8/93	10:35	SOIL			✓						✓								3
PCSC-3-1-C	7/8/93	12:00	SOIL			✓						✓								3
PCSC-3-2-D	7/8/93	14:35	SOIL			✓						✓								3
PCSC-3-3-A	7/8/93	15:05	SOIL			✓						✓								3
PCSC-3-4-B	7/8/93	15:50	SOIL			✓						✓								3
PCWC-3-1	7/8/93	15:30	WATER					✓			✓									4
TRIP BLANK			WATER					✓												2

Special Instructions/Comments:
TPH-D, TPH-G, & WTPH-418.1 WILL BE NECESSARY PENDING HCID RESULTS. IF TPH RESULTS >5000 PPM, THEN CONTACT PROJECT MANAGER IMMEDIATELY

Relinquished by:
(Sig) David M. Wechsler
(Printed) DAVID M. WECHSLER
(Company) DAMES & MOORE
(Time) 19:36 (Date) 7/8/93

Received by (lab):
(Sig) Erin Cranwell
(Printed) Erin Cranwell
(Company) ARI
(Time) 9:40 AM (Date) 7/9/93

DELIVERED TO ARI 7/9/93

Sample Receipt

Total no. of containers:
Chain of custody seals:
Rec'd good condition/cold:
Conforms to record:
Lab number:

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Analytical Chemists & Consultants

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TOTAL PETROLEUM HYDROCARBONS
WA HCID Method by GC/FID

Matrix: Soil

QC Report No: E354-Dames & Moore
Project: 21199-032-005
Trans Mtn Characterization

Data Release Authorized
Data Prepared: 07/22/93 MAC:kas

VTSR: 07/09/93

Date extracted: 07/13/93

Lab ID	Client Sample ID	Date Analyzed	Dilution Factor	Gas Range†	Diesel Range*	Oil Range°	Surrogate Recovery
E354 MB	*Method Blank*	*07/17/93*	-	*20 U*	*25 U*	*50 U*	*114%*
E354 A	**PCSC-2-1-A**	07/17/93	-	**49**	**150**	**55**	119%
E354 B	**PCSC-2-2-D**	07/17/93	-	**91**	**400**	**140**	123%
E354 C	**PCSC-2-3-B**	07/17/93	-	**120**	**400**	**130**	124%
E354 D	**PCSC-2-4-C**	07/17/93	-	**23**	**38**	50 U	115%
E354 E	**PCSC-2-6-A**	07/17/93	-	**120**	**420**	**160**	126%
E354 F	**PCSC-2-6-C**	07/17/93	-	**78**	**350**	50 U	132%
E354 G	**PCSC-2-7-B**	07/17/93	-	**22**	**67**	50 U	120%
E354 H	**PCSC-3-1-C**	07/17/93	-	20 U	**25**	50 U	117%
E354 I	**PCSC-3-2-D**	07/17/93	-	**55**	**280**	**120**	174%
E354 J	**PCSC-3-3-A**	07/17/93	-	**71**	**400**	**160**	131%
E354 K	**PCSC-3-4-B**	07/17/93	-	**66**	**240**	**100**	138%

Surrogate is Me-Arachidate.
Values reported in ppm (mg/Kg).

GC Data Reporting Qualifiers

U	Indicates compound was analyzed for but not detected at the given detection limit.
X	Indicates a value above the linear range of the detector. Dilution required.
J	Indicates an estimated value when the value is less than the calculated detection limit.
S	Indicates no value reported due to saturation of the detector. Dilution required.
D	Indicates that surrogate was not detected because of dilution of the extract.
C	Indicates a probable value which is unable to be confirmed due to matrix interference.
NR	Indicates no recovery due to matrix interference and/or dilution.
†	Value based on total peaks in the range from Toluene to C12.
*	Value based on total peaks in the range from C12 to C24.
°	Value based on total peaks in the range from C24 to C32.

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TPH MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

ARI Job I.D.: E354A
Matrix: Soil

Sample No: PCSC-2-1-A
QC Report No: E354-Dames & Moore
Project: 21199-032-005
Trans Mtn Characterizaiton

Data Release Authorized: PKgh
Report: 07/22/93 MAC:kas

COMPOUND	SPIKE ADDED (mg/Kg)	SAMPLE CONC (mg/Kg)	MS CONC (mg/Kg)	MS REC	QC Limits
Diesel	627	151	1330	188% *	50-150

COMPOUND	SPIKE ADDED (mg/Kg)	MSD CONC (mg/Kg)	MSD REC	RPD	Q C Limits	
					RPD	REC
Diesel	627	966	130%	36%	50	50-150

Surrogate % Recovery	MS	MSD
Me-Arachidate	147%	123%

Spike Recovery: 1 out of 2 outside limits

Comments: Asterisked values outside advisory QC Limits.

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ORGANICS ANALYSIS DATA SHEET - Method 602/8020
GC/PID FOR BETX

Matrix: Soil

Data Release Authorized: _____
Report prepared: *07/19/93* *MAC:X jjr*

Client Project No: **21199-032-005**
Trans Mtn. .
Characterization
QC Report No: E354 - Dames & Moore
VTSR: 07/09/93

CAS Number		Sample No.	Method Blank	Method Blank	Method Blank	PCSC-2-1-A	PCSC-2-2-D
		ARI ID	MB 07/14	MB 07/14 #2	MB 07/14 #3	E354A	E354B
		Date Analyzed	07/14/93	07/15/93	07/15/93	07/15/93	07/15/93
		Amt Analyzed	0.1 g	0.1 g	0.1 g	0.080 g	0.086 g
		Units	µg/Kg	µg/Kg	µg/Kg	µg/Kg	µg/Kg
71-43-2	Benzene		50 U	50 U	50 U	62 U	58 U
108-88-3	Toluene		50 U	50 U	50 U	62 U	58 U
100-41-4	Ethylbenzene		50 U	50 U	50 U	62 U	**88**
1330-20-7	Total Xylenes		100 U	100 U	100 U	120 U	**120**
		Trifluorotoluene	*97.7%*	*94.8%*	*98.1%*	*94.1%*	*94.0%*
		Bromobenzene	*99.6%*	*102%*	*102%*	*102%*	*119%*

CAS Number		Sample No.	PCSC-2-3-B	PCSC-2-4-C	duplicate PCSC-2-4-C	PCSC-2-6-A	PCSC-2-6-C
		ARI ID	E354C	E354D	E354Ddup	E354E	E354F
		Date Analyzed	07/15/93	07/15/93	07/15/93	07/15/93	07/15/93
		Amt Analyzed	0.086 g	0.087 g	0.087 g	0.082 g	0.087 g
		Units	µg/Kg	µg/Kg	µg/Kg	µg/Kg	µg/Kg
71-43-2	Benzene		**180**	57 U	57 U	61 U	58 U
108-88-3	Toluene		58 U	57 U	57 U	61 U	58 U
100-41-4	Ethylbenzene		**520**	**89**	**92**	**130**	**72**
1330-20-7	Total Xylenes		**2200**	**220**	**220**	**340**	**110 J**
		Trifluorotoluene	*95.0%*	*90.4%*	*89.8%*	*92.9%*	*91.7%*
		Bromobenzene	*109%*	*118%*	*119%*	*115%*	*114%*

GC Data Reporting Qualifiers

U	Indicates the compound was undetected at the reported detection limit.
J	Indicates an estimated value when the value is less than the calculated detection limit.
X	Indicates a value above the linear range of the detector. Dilution required.
S	Indicates no value reported due to saturation of the detector. Dilution required.
D	Indicates that surrogate was not detected because of dilution of the extract.
C	Indicates a probable value which is unable to be confirmed due to matrix interference.
NR	Indicates no recovery due to matrix interference and/or dilution.

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ORGANICS ANALYSIS DATA SHEET - Method 602/8020
GC/PID FOR BETX

Matrix: Soil

Client Project No: 21199-032-005
Trans Mtn. Characterization
QC Report No: E354 - Dames & Moore
VTSR: 07/09/93

Data Release Authorized:
Report prepared: 07/19/93 MAC:X jjr

	Sample No.	PCSC-2-7-B	PCSC-3-1-C	PCSC-3-2-D	PCSC-3-3-A	Method Blank
	ARI ID	E354G	E354H	E354I	E354J	MB 7/16
	Date Analyzed	07/15/93	07/15/93	07/15/93	07/15/93	07/16/93
	Amt Analyzed	0.085 g	0.086 g	0.086 g	0.087 g	0.1 g
CAS Number	Units	µg/Kg	µg/Kg	µg/Kg	µg/Kg	µg/Kg
71-43-2	Benzene	59 U	58 U	58 U	57 U	50 U
108-88-3	Toluene	59 U	58 U	58 U	57 U	50 U
100-41-4	Ethylbenzene	**71**	**77**	58 U	**100**	50 U
1330-20-7	Total Xylenes	**89 J**	**120**	**72 J**	**220**	100 U
	Trifluorotoluene	*95.2%*	*92.0%*	*91.4%*	*90.9%*	*94.4%*
	Bromobenzene	*116%*	*116%*	*110%*	*125%*	*89.7%*

	Sample No.	PCSC-3-4-B
	ARI ID	E354K
	Date Analyzed	07/16/93
	Amt Analyzed	0.085 g
CAS Number	Units	µg/Kg
71-43-2	Benzene	**720**
108-88-3	Toluene	59 U
100-41-4	Ethylbenzene	**1400**
1330-20-7	Total Xylenes	**1100**
	Trifluorotoluene	*105%*
	Bromobenzene	*NR*

GC Data Reporting Qualifiers

U	Indicates the compound was undetected at the reported detection limit.
J	Indicates an estimated value when the value is less than the calculated detection limit.
X	Indicates a value above the linear range of the detector. Dilution required.
S	Indicates no value reported due to saturation of the detector. Dilution required.
D	Indicates that surrogate was not detected because of dilution of the extract.
C	Indicates a probable value which is unable to be confirmed due to matrix interference.
NR	Indicates no recovery due to matrix interference and/or dilution.

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ORGANICS ANALYSIS DATA SHEET - Method 602/8020 GC/PID FOR BETX

Matrix: Water

Data Release Authorized: _____
Report prepared: *07/19/93* *MAC:X jjr*

Client Project No: 21199-032-005
Trans Mtn. . Characterization
QC Report No: E354 - Dames & Moore
VTSR: 07/09/93

	Sample No.	Method Blank	Method Blank	Method Blank	PCWC-3-1	Trip Blank
	ARI ID	MB 07/14	MB 07/14 #2	MB 07/14 #3	E354L	E354M
	Date Analyzed	07/14/93	07/15/93	07/15/93	07/15/93	07/15/93
	Amt Analyzed	5.0 ml	5.0 ml	5.0 ml	5.0 ml	5.0 ml
	Dilution	-	-	-	-	-
CAS Number	Units	µg/L	µg/L	µg/L	µg/L	µg/L
71-43-2	Benzene	1.0 U	1.0 U	1.0 U	**10**	1.0 U
108-88-3	Toluene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
100-41-4	Ethylbenzene	1.0 U	1.0 U	1.0 U	**2.5**	1.0 U
1330-20-7	Total Xylenes	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
	Trifluorotoluene	*97.5%*	*95.2%*	*96.2%*	*93.2%*	*94.4%*
	Bromobenzene	*98.5%*	*103%*	*102%*	*102%*	*101%*

GC Data Reporting Qualifiers

U	Indicates the compound was undetected at the reported detection limit.
J	Indicates an estimated value when the value is less than the calculated detection limit.
X	Indicates a value above the linear range of the detector. Dilution required.
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(206) 621-7523 (FAX)

BETX SPIKE BLANK RECOVERY

ARI Job No: E354

Matrix Soil

Client: Dames & Moore
Project: 21199-032-005
Trans Mtn.
Characterization

Date Extracted: 07/14/93
Date Analyzed: 07/14/93

COMPOUND	SPIKE ADDED (µg/Kg)	SB CONC (µg/Kg)	SB % REC	QC LIMITS REC
Benzene	1250	1190	95.2	NA
Toluene	1250	1150	92.0	NA
Ethylbenzene	1250	1200	96.0	NA
Total Xylenes	3750	3550	94.7	NA

	Surrogate % rec.	QC Limits
Trifluorotoluene	93.4%	75-118
Bromobenzene	101%	66-124

Surrogate Recovery: 0 out of 2 outside limits

Asterisked values outside QC Limits

Comments: NA - indicates no QC Limits established for these compounds

Report prepared: 07/19/93 MAC:X jjr

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

BETX SPIKE BLANK RECOVERY

ARI Job No: E354

Client: Dames & Moore
Project: 21199-032-005
Trans Mtn.
Characterization

Matrix Soil

Date Extracted: 07/14/93 (#2)
Date Analyzed: 07/15/93

COMPOUND	SPIKE ADDED (µg/Kg)	SB CONC (µg/Kg)	SB % REC	QC LIMITS REC
Benzene	1250	1180	94.4	NA
Toluene	1250	1130	90.4	NA
Ethylbenzene	1250	1170	93.6	NA
Total Xylenes	3750	3470	92.5	NA

	Surrogate % rec.	QC Limits
Trifluorotoluene	92.6%	75-118
Bromobenzene	102%	66-124

Surrogate Recovery: 0 out of 2 outside limits

Asterisked values outside QC Limits

Comments: NA - indicates no QC Limits established for these compounds

Report prepared: 07/19/93 MAC:X jjr

ANALYTICAL RESOURCES INCORPORATED

Analytical Chemists & Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

BETX SPIKE BLANK RECOVERY

ARI Job No: E354

Matrix Soil

Client: Dames & Moore
Project: 21199-032-005
Trans Mtn.
Characterization

Date Extracted: 07/14/93 (#3)
Date Analyzed: 07/15/93

COMPOUND	SPIKE ADDED (µg/Kg)	SB CONC (µg/Kg)	SB % REC	QC LIMITS REC
Benzene	1250	1170	93.6	NA
Toluene	1250	1130	90.4	NA
Ethylbenzene	1250	1160	92.8	NA
Total Xylenes	3750	3440	91.7	NA

	Surrogate % rec.	QC Limits
Trifluorotoluene	87.0%	75-118
Bromobenzene	97.6%	66-124

Surrogate Recovery: 0 out of 2 outside limits

Asterisked values outside QC Limits

Comments: NA - indicates no QC Limits established for these compounds

Report prepared: 07/19/93 MAC:X jjr

ANALYTICAL
RESOURCES
INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

BETX SPIKE BLANK RECOVERY

ARI Job No: E354

Matrix Soil

Client: Dames & Moore
Project: 21199-032-005
Trans Mtn.
Characterization

Date Extracted: 07/16/93
Date Analyzed: 07/16/93

COMPOUND	SPIKE ADDED (µg/Kg)	SB CONC (µg/Kg)	SB % REC	QC LIMITS REC
Benzene	1250	1250	100	NA
Toluene	1250	1240	99.2	NA
Ethylbenzene	1250	1230	98.4	NA
Total Xylenes	3750	3680	98.1	NA

	Surrogate % rec.	QC Limits
Trifluorotoluene	96.9%	75-118
Bromobenzene	97.8%	66-124

Surrogate Recovery: 0 out of 2 outside limits

Asterisked values outside QC Limits

Comments: NA - indicates no QC Limits established for these compounds

Report prepared: 07/19/93 MAC:X jjr

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL PETROLEUM HYDROCARBONS by IR Scan
Modified EPA Method 418.1

Matrix: Water

Client: Dames & Moore
Project: Trans. Mtn. Characterization
21199-032-005

ARI LAB ID: E354

VTSR: 07/09/93

Data Release Authorized _____
Data Prepared: 07/22/93 MAC:pjw

Date Prepared: 07/21/93
Date of Analysis: 07/22/93

Lab ID	Client Sample ID	Dilution Factor	TPH (ppm)
E354 MB	*METHOD BLANK*	*1*	*1 U*
E354 L	**PCWC-3-1**	**1**	**3.3**

Quality Control Data Results

Lab ID	Client Sample ID	Sample Conc.	TPH (ppm)	Amount Spiked	QC % Rec.	RPD
E354 SB	SPIKE BLANK	0	5.1	5.0 ppm	102%	-
E354 SBdup	SPIKE BLANK DUP	0	4.2	5.0 ppm	84.0%	19.4

Values reported in ppm (mg/L)

U Indicates compound was analyzed for but not detected at the given detection limit.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

March 10, 2008

Karen Mixon
URS Corporation
Century Square
1501 Fourth Avenue Suite 1400
Seattle, WA 98101

RE: Client Project: Laurel Station
ARI Job No: ML21

Dear Karen:

Please find enclosed the original chain of custody documentation and the final results for the sample from the project referenced above. Analytical Resources, Inc. (ARI) received twenty soil samples and one trip blank in good condition on March 4, 2008.

The samples were analyzed for NWTPH-Dx and NWTPH-Gx plus BTEX, as requested on the COC.

There were no anomalies associated with the samples.

A copy of these reports and all associated raw data will remain on file electronically with ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kelly Bottem
Client Services Manager
206/695-6211
kellyb@arilabs.com

Enclosures

cc: file ML21

KFB/kfb

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: ML21	Turn-around Requested: STD TAT	Page: 1 of 3	
ARI Client Company: URS Corporation	Phone: 206-438-2234	Date: 3/3/08	Ice Present? Y
Client Contact: Kurn Mixon		No. of Coolers: 1	Cooler Temps: 2.8°
Client Project Name: Laurel Station - Kinder Morgan			
Client Project #: —	Samplers:		

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: NWTPH-Gx/BTEX (8021B)	Analysis Requested: NWTPH-Dx (Acid/Silica Gel)	Notes/Comments
08-B2-3'	3/3/08	1418	soil	4	X	X	
08-B3-3'		1500	Soil	4	X	X	
08-B2-4.5		1500	Soil	4	X	X	
08-B3-4.5		1530	soil	4	X	X	
08-B5-1		1610	soil	4	X	X	
08-B6-1		1430	soil	4	X	X	
08-B5-3		1700	soil	4	X	X	
08-B5-4.5		1710	soil	4	X	X	
08-B6-3		1745	soil	4	X	X	
Trip Blank	3/3/08	-	H_2O	2	X		

Comments/Special Instructions
note pgs 1→3
some 2oz containers do not have labels sample IDs written on l.ds w jars.

	Relinquished by:	Received by:	Relinquished by:	Received by:
(Signature)				
Printed Name:	Kurn L Mixon	Bob Congleton		
Company:	URS	ARI		
Date & Time:	3/4/08 0715	3/4/08 1010		

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release 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 Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

report goes to URS, direct bill Kinder Morgan

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: ML21	Turn-around Requested: Std TAT	Page: 2 of 3	
ARI Client Company: URS Corporation	Phone: 206-438-2234	Date: 3/3/08	Ice Present? Y
Client Contact: Kiren Mixon		No. of Coolers: 1	Cooler Temps: 2.8°
Client Project Name: Laurel Station - Kinder Morgan			
Client Project #:	Samplers:		

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: NWTPH-Gx/BTEX (8021B)	Analysis Requested: NWTPH-Dx (Diesel + heavy)	Notes/Comments
Tank 170-1-surface	3/3/08	1145	soil	4	X	X	
Tank 170-1-2'		1155	soil	4	X	X	
#08-B3-1'		1210	soil	4	X	X	
Tank 170-2-surface		1240		4	X	X	
Tank 170-2-2'		1250		4	X	X	
Tank 170-2-3½'		1300		4	X	X	
08-B2-1'		1305		4	X	X	
Tank 180-1-surface		1330		4	X	X	
Tank 180-1-2'		1335		4	X	X	
Tank 180-1-3'	3/3/08	1340	soil	4	X	X	

Comments/Special Instructions	Relinquished by:	Received by:	Relinquished by:	Received by:
	(Signature) Kiren Mixon	(Signature) Bob Completon	(Signature)	(Signature)
	Printed Name: Kiren L Mixon	Printed Name: Bob Completon	Printed Name:	Printed Name:
	Company: URS	Company: ARI	Company:	Company:
	Date & Time: 3/4/08 0715	Date & Time: 3/4/08 1010	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release 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 Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Report goes to URS, direct bill Kinder Morgan

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: ML21	Turn-around Requested: STD TAT	Page: 3 of 3	
ARI Client Company: URS Corporation	Phone: 206-438-2234	Date: 3/3/08	Ice Present?
Client Contact: Karen Mixon		No. of Coolers:	Cooler Temps:
Client Project Name: Laurel Stetson - Kinder Morgan			
Client Project #:	Samplers:		

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: NWTPH-Gx/BTEX (8021B)	Analysis Requested: NWTPH-Dx (Diesel + Heavier)	Notes/Comments
08-B4-1	3/3/08	1645	Soil	4	X	X	

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Karen L Mixon	Printed Name: Bob Congleton	Printed Name:	Printed Name:
	Company: URS	Company: ARI	Company:	Company:
	Date & Time: 3/4/08 0715	Date & Time: 3/4/08 1010	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release 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 Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

report go to URS, direct bill Kinder Morgan

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: URS Corp. Project Name: Laurel STN.

COC No: _____ Delivered by: ARI

Assigned ARI Job No: ML21 Tracking No: _____

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	(YES)	NO
Were custody papers included with the cooler?	(YES)	NO
Were custody papers properly filled out (ink, signed, etc.)	(YES)	NO
Record cooler temperature (recommended 2.0-6.0 °C for chemistry	2.8 °C	

Cooler Accepted by: Bob Compton Date: 3/4/08 Time: 1010

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?	YES	(NO)
What kind of packing material was used?	ICE/EB	
Was sufficient ice used (if appropriate)?	(YES)	NO
Were all bottles sealed in individual plastic bags?	YES	(NO)
Did all bottle arrive in good condition (unbroken)?	(YES)	NO
Were all bottle labels complete and legible?	(YES)	NO
Did all bottle labels and tags agree with custody papers?	(YES)	NO
Were all bottles used correct for the requested analyses?	(YES)	NO
Do any of the analyses (bottles) require preservation? (attach preservation checklist)	YES	(NO)
Were all VOC vials free of air bubbles? (NA)	YES	NO
Was sufficient amount of sample sent in each bottle?	(YES)	NO

Samples Logged by: BL Date: 3/4/08 Time: 1215

***** Notify Project Manager of discrepancies or concerns *****

Explain discrepancies or negative responses:

By: Date:

ANALYTICAL RESOURCES INCORPORATED

BETX SOIL SURROGATE RECOVERY SUMMARY

ARI Job: ML21
Matrix: Soil

QC Report No: ML21-URS Corporation
Project: Laurel Station - Kinder Morgan
Event: NA

Client ID	TFT	BBZ	TOT OUT
MB-030608	105%	106%	0
LCS-030608	105%	104%	0
LCSD-030608	91.4%	93.9%	0
08-B2-3'	92.7%	93.8%	0
08-B3-3'	99.5%	101%	0
08-B2-4.5'	105%	105%	0
08-B3-4.5'	93.5%	95.8%	0
08-B5-1'	99.9%	102%	0
08-B6-1'	98.2%	100%	0
08-B5-3'	100%	101%	0
08-B5-4.5'	90.3%	93.2%	0
08-B6-3'	95.4%	99.2%	0
TANK170-1-SURFACE	95.0%	98.1%	0
TANK170-1-2'	92.4%	96.2%	0
08-B3-1'	92.1%	95.4%	0
TANK170-2-SURFACE	91.2%	95.3%	0
MB-030608	99.1%	101%	0
LCS-030608	99.9%	101%	0
LCSD-030608	93.4%	96.2%	0
TANK170-2-2	89.3%	92.7%	0
TANK170-2-31/2'	92.4%	96.1%	0
08-B2-1'	97.4%	100%	0
TANK180-1-SURFACE	91.5%	97.3%	0
TANK180-1-2'	96.2%	104%	0
TANK180-1-3'	90.9%	98.7%	0
08-B4-1	87.5%	92.3%	0

	LCS/MB LIMITS	QC LIMITS
(TFT) = Trifluorotoluene	(80-120)	(61-137)
(BBZ) = Bromobenzene	(80-120)	(58-139)

Log Number Range: 08-4218 to 08-4237

ANALYTICAL RESOURCES INCORPORATED

TPHG SOIL SURROGATE RECOVERY SUMMARY

ARI Job: ML21
Matrix: Soil

QC Report No: ML21-URS Corporation
Project: Laurel Station - Kinder Morgan
Event: NA

Client ID	BFB	TFT	BBZ	TOT OUT
MB-030608	NA	104%	105%	0
LCS-030608	NA	103%	105%	0
LCSD-030608	NA	89.7%	93.8%	0
08-B2-3'	NA	91.0%	93.2%	0
08-B3-3'	NA	98.8%	100%	0
08-B2-4.5'	NA	103%	104%	0
08-B3-4.5'	NA	91.5%	95.3%	0
08-B5-1'	NA	97.8%	101%	0
08-B6-1'	NA	96.4%	99.8%	0
08-B5-3'	NA	98.7%	101%	0
08-B5-4.5'	NA	91.4%	95.3%	0
08-B6-3'	NA	95.6%	100%	0
TANK170-1-SURFACE	NA	95.3%	99.0%	0
TANK170-1-2'	NA	92.4%	96.7%	0
08-B3-1'	NA	92.9%	96.2%	0
TANK170-2-SURFACE	NA	91.5%	96.5%	0
MB-030608	NA	99.7%	102%	0
LCS-030608	NA	99.0%	102%	0
LCSD-030608	NA	93.5%	97.3%	0
TANK170-2-2	NA	90.0%	93.7%	0
TANK170-2-31/2'	NA	92.6%	96.6%	0
08-B2-1'	NA	97.9%	101%	0
TANK180-1-SURFACE	NA	92.0%	103%	0
TANK180-1-2'	NA	96.6%	88.9%	0
TANK180-1-3'	NA	91.3%	109%	0
08-B4-1	NA	87.1%	92.3%	0

	LCS/MB LIMITS	QC LIMITS
(BFB) = Bromofluorobenzene	(70-130)	(70-130)
(TFT) = Trifluorotoluene	(80-120)	(65-137)
(BBZ) = Bromobenzene	(80-120)	(54-144)

Log Number Range: 08-4218 to 08-4237

ANALYTICAL RESOURCES INCORPORATED

BETX WATER SURROGATE RECOVERY SUMMARY

ARI Job: ML21
Matrix: Water

QC Report No: ML21-URS Corporation
Project: Laurel Station - Kinder Morgan
Event: NA

Client ID	TFT	BBZ	TOT OUT
TRIP BLANK	110%	105%	0

	LCS/MB LIMITS	QC LIMITS
(TFT) = Trifluorotoluene	(80-120)	(80-120)
(BBZ) = Bromobenzene	(80-120)	(80-120)

Log Number Range: 08-4238 to 08-4238

ANALYTICAL RESOURCES INCORPORATED

TPHG WATER SURROGATE RECOVERY SUMMARY

ARI Job: ML21
Matrix: Water

QC Report No: ML21-URS Corporation
Project: Laurel Station - Kinder Morgan
Event: NA

Client ID	TFT	BBZ	TOT OUT
TRIP BLANK	107%	105%	0

	LCS/MB LIMITS	QC LIMITS
(TFT) = Trifluorotoluene	(80-120)	(80-120)
(BBZ) = Bromobenzene	(80-120)	(80-120)

Log Number Range: 08-4238 to 08-4238

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod
TPHG by Method NWTPHG
Page 1 of 1

Sample ID: MB-030608
METHOD BLANK

Lab Sample ID: MB-030608
LIMS ID: 08-4218
Matrix: Soil
Data Release Authorized:
Reported: 03/07/08

QC Report No: ML21-URS Corporation
Project: Laurel Station - Kinder Morgan
Event: NA
Date Sampled: NA
Date Received: NA

Date Analyzed: 03/06/08 09:18
Instrument/Analyst: PID3/PKC

Purge Volume: 5.0 mL
Sample Amount: 100 mg-dry-wt

CAS Number	Analyte	RL	Result	
71-43-2	Benzene	12	< 12 U	
108-88-3	Toluene	12	< 12 U	
100-41-4	Ethylbenzene	12	< 12 U	
	m,p-Xylene	25	< 25 U	
95-47-6	o-Xylene	12	< 12 U	
				GAS ID
	Gasoline Range Hydrocarbons	5.0	< 5.0 U	---

BETX Surrogate Recovery

Trifluorotoluene	105%
Bromobenzene	106%

Gasoline Surrogate Recovery

Trifluorotoluene	104%
Bromobenzene	105%

BETX values reported in µg/kg (ppb)
Gasoline values reported in mg/kg (ppm)

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod
TPHG by Method NWTPHG
Page 1 of 1

Sample ID: MB-030608
METHOD BLANK

Lab Sample ID: MB-030608
LIMS ID: 08-4231
Matrix: Soil
Data Release Authorized:
Reported: 03/07/08

QC Report No: ML21-URS Corporation
Project: Laurel Station - Kinder Morgan
Event: NA
Date Sampled: NA
Date Received: NA

Date Analyzed: 03/06/08 19:54
Instrument/Analyst: PID3/PKC

Purge Volume: 5.0 mL
Sample Amount: 100 mg-dry-wt

CAS Number	Analyte	RL	Result
71-43-2	Benzene	12	< 12 U
108-88-3	Toluene	12	< 12 U
100-41-4	Ethylbenzene	12	< 12 U
	m,p-Xylene	25	< 25 U
95-47-6	o-Xylene	12	< 12 U

			GAS ID
	Gasoline Range Hydrocarbons	5.0	< 5.0 U ---

BETX Surrogate Recovery

Trifluorotoluene	99.1%
Bromobenzene	101%

Gasoline Surrogate Recovery

Trifluorotoluene	99.7%
Bromobenzene	102%

BETX values reported in µg/kg (ppb)
Gasoline values reported in mg/kg (ppm)

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod **Sample ID: 08-B2-3'**
TPHG by Method NWTPHG **SAMPLE**
Page 1 of 1

Lab Sample ID: ML21A
LIMS ID: 08-4218
Matrix: Soil
Data Release Authorized:
Reported: 03/07/08

QC Report No: ML21-URS Corporation
Project: Laurel Station - Kinder Morgan
Event: NA
Date Sampled: 03/03/08
Date Received: 03/04/08

Date Analyzed: 03/06/08 14:33
Instrument/Analyst: PID3/PKC

Purge Volume: 5.0 mL
Sample Amount: 110 mg-dry-wt
Percent Moisture: 7.4%

CAS Number	Analyte	RL	Result
71-43-2	Benzene	11	< 11 U
108-88-3	Toluene	11	< 11 U
100-41-4	Ethylbenzene	11	< 11 U
	m,p-Xylene	22	< 22 U
95-47-6	o-Xylene	11	< 11 U

			GAS ID
Gasoline Range Hydrocarbons	4.5	< 4.5 U	---

BETX Surrogate Recovery

Trifluorotoluene	92.7%
Bromobenzene	93.8%

Gasoline Surrogate Recovery

Trifluorotoluene	91.0%
Bromobenzene	93.2%

BETX values reported in µg/kg (ppb)
Gasoline values reported in mg/kg (ppm)

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod **Sample ID: 08-B3-3'**
TPHG by Method NWTPHG **SAMPLE**
Page 1 of 1

Lab Sample ID: ML21B
LIMS ID: 08-4219
Matrix: Soil
Data Release Authorized:
Reported: 03/07/08

QC Report No: ML21-URS Corporation
Project: Laurel Station - Kinder Morgan
Event: NA
Date Sampled: 03/03/08
Date Received: 03/04/08

Date Analyzed: 03/06/08 14:58
Instrument/Analyst: PID3/PKC

Purge Volume: 5.0 mL
Sample Amount: 39 mg-dry-wt
Percent Moisture: 38.6%

CAS Number	Analyte	RL	Result	
71-43-2	Benzene	32	< 32 U	
108-88-3	Toluene	32	< 32 U	
100-41-4	Ethylbenzene	32	< 32 U	
	m,p-Xylene	64	< 64 U	
95-47-6	o-Xylene	32	< 32 U	
	Gasoline Range Hydrocarbons	13	< 13 U	GAS ID ---

BETX Surrogate Recovery

Trifluorotoluene	99.5%
Bromobenzene	101%

Gasoline Surrogate Recovery

Trifluorotoluene	98.8%
Bromobenzene	100%

BETX values reported in µg/kg (ppb)
Gasoline values reported in mg/kg (ppm)

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod **Sample ID: 08-B2-4.5'**
TPHG by Method NWTPHG **SAMPLE**
Page 1 of 1

Lab Sample ID: ML21C
LIMS ID: 08-4220
Matrix: Soil
Data Release Authorized:
Reported: 03/07/08

QC Report No: ML21-URS Corporation
Project: Laurel Station - Kinder Morgan
Event: NA
Date Sampled: 03/03/08
Date Received: 03/04/08

Date Analyzed: 03/06/08 15:22
Instrument/Analyst: PID3/PKC

Purge Volume: 5.0 mL
Sample Amount: 69 mg-dry-wt
Percent Moisture: 26.7%

CAS Number	Analyte	RL	Result	
71-43-2	Benzene	18	< 18 U	
108-88-3	Toluene	18	< 18 U	
100-41-4	Ethylbenzene	18	< 18 U	
	m,p-Xylene	36	< 36 U	
95-47-6	o-Xylene	18	< 18 U	
	Gasoline Range Hydrocarbons	7.3	< 7.3 U	GAS ID ---

BETX Surrogate Recovery

Trifluorotoluene	105%
Bromobenzene	105%

Gasoline Surrogate Recovery

Trifluorotoluene	103%
Bromobenzene	104%

BETX values reported in µg/kg (ppb)
Gasoline values reported in mg/kg (ppm)

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod
TPHG by Method NWTPHG
Page 1 of 1

Sample ID: 08-B3-4.5'
SAMPLE

Lab Sample ID: ML21D
LIMS ID: 08-4221
Matrix: Soil
Data Release Authorized:
Reported: 03/07/08

QC Report No: ML21-URS Corporation
Project: Laurel Station - Kinder Morgan
Event: NA
Date Sampled: 03/03/08
Date Received: 03/04/08

Date Analyzed: 03/06/08 15:47
Instrument/Analyst: PID3/PKC

Purge Volume: 5.0 mL
Sample Amount: 45 mg-dry-wt
Percent Moisture: 22.2%

CAS Number	Analyte	RL	Result
71-43-2	**Benzene**	**28**	**33**
108-88-3	Toluene	28	< 28 U
100-41-4	Ethylbenzene	28	< 28 U
	m,p-Xylene	**56**	**58**
95-47-6	o-Xylene	28	< 28 U

			GAS ID
Gasoline Range Hydrocarbons	11	< 11 U	---

BETX Surrogate Recovery

Trifluorotoluene	93.5%
Bromobenzene	95.8%

Gasoline Surrogate Recovery

Trifluorotoluene	91.5%
Bromobenzene	95.3%

BETX values reported in µg/kg (ppb)
Gasoline values reported in mg/kg (ppm)

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod **Sample ID: 08-B5-1'**
TPHG by Method NWTPHG **SAMPLE**
Page 1 of 1

Lab Sample ID: ML21E
LIMS ID: 08-4222
Matrix: Soil
Data Release Authorized:
Reported: 03/07/08

QC Report No: ML21-URS Corporation
Project: Laurel Station - Kinder Morgan
Event: NA
Date Sampled: 03/03/08
Date Received: 03/04/08

Date Analyzed: 03/06/08 16:12
Instrument/Analyst: PID3/PKC

Purge Volume: 5.0 mL
Sample Amount: 72 mg-dry-wt
Percent Moisture: 19.3%

CAS Number	Analyte	RL	Result	
71-43-2	Benzene	17	< 17 U	
108-88-3	Toluene	17	< 17 U	
100-41-4	Ethylbenzene	17	< 17 U	
	m,p-Xylene	35	< 35 U	
95-47-6	o-Xylene	17	< 17 U	
	Gasoline Range Hydrocarbons	6.9	< 6.9 U	GAS ID ---

BETX Surrogate Recovery

Trifluorotoluene	99.9%
Bromobenzene	102%

Gasoline Surrogate Recovery

Trifluorotoluene	97.8%
Bromobenzene	101%

BETX values reported in µg/kg (ppb)
Gasoline values reported in mg/kg (ppm)

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod **Sample ID: 08-B6-1'**
TPHG by Method NWTPHG **SAMPLE**
Page 1 of 1

Lab Sample ID: ML21F
LIMS ID: 08-4223
Matrix: Soil
Data Release Authorized:
Reported: 03/07/08

QC Report No: ML21-URS Corporation
Project: Laurel Station - Kinder Morgan
Event: NA
Date Sampled: 03/03/08
Date Received: 03/04/08

Date Analyzed: 03/06/08 16:36
Instrument/Analyst: PID3/PKC

Purge Volume: 5.0 mL
Sample Amount: 72 mg-dry-wt
Percent Moisture: 16.4%

CAS Number	Analyte	RL	Result
71-43-2	Benzene	18	< 18 U
108-88-3	Toluene	18	< 18 U
100-41-4	Ethylbenzene	18	< 18 U
	m,p-Xylene	35	< 35 U
95-47-6	o-Xylene	18	< 18 U

			GAS ID
Gasoline Range Hydrocarbons	7.0	< 7.0 U	---

BETX Surrogate Recovery

Trifluorotoluene	98.2%
Bromobenzene	100%

Gasoline Surrogate Recovery

Trifluorotoluene	96.4%
Bromobenzene	99.8%

BETX values reported in µg/kg (ppb)
Gasoline values reported in mg/kg (ppm)

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod **Sample ID: 08-B5-3'**
TPHG by Method NWTPHG **SAMPLE**
Page 1 of 1

Lab Sample ID: ML21G
LIMS ID: 08-4224
Matrix: Soil
Data Release Authorized:
Reported: 03/07/08

QC Report No: ML21-URS Corporation
Project: Laurel Station - Kinder Morgan
Event: NA
Date Sampled: 03/03/08
Date Received: 03/04/08

Date Analyzed: 03/06/08 17:01
Instrument/Analyst: PID3/PKC

Purge Volume: 5.0 mL
Sample Amount: 79 mg-dry-wt
Percent Moisture: 21.5%

CAS Number	Analyte	RL	Result
71-43-2	Benzene	16	< 16 U
108-88-3	Toluene	16	< 16 U
100-41-4	Ethylbenzene	16	< 16 U
	m,p-Xylene	32	< 32 U
95-47-6	o-Xylene	16	< 16 U

			GAS ID
Gasoline Range Hydrocarbons	6.3	< 6.3 U	---

BETX Surrogate Recovery

Trifluorotoluene	100%
Bromobenzene	101%

Gasoline Surrogate Recovery

Trifluorotoluene	98.7%
Bromobenzene	101%

BETX values reported in µg/kg (ppb)
Gasoline values reported in mg/kg (ppm)

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod **Sample ID: 08-B5-4.5'**
TPHG by Method NWTPHG **SAMPLE**
Page 1 of 1

Lab Sample ID: ML21H
LIMS ID: 08-4225
Matrix: Soil
Data Release Authorized:
Reported: 03/07/08

QC Report No: ML21-URS Corporation
Project: Laurel Station - Kinder Morgan
Event: NA
Date Sampled: 03/03/08
Date Received: 03/04/08

Date Analyzed: 03/06/08 17:26
Instrument/Analyst: PID3/PKC

Purge Volume: 5.0 mL
Sample Amount: 88 mg-dry-wt
Percent Moisture: 14.3%

CAS Number	Analyte	RL	Result
71-43-2	Benzene	14	< 14 U
108-88-3	Toluene	14	< 14 U
100-41-4	Ethylbenzene	14	< 14 U
	m,p-Xylene	28	< 28 U
95-47-6	o-Xylene	14	< 14 U

			GAS ID
Gasoline Range Hydrocarbons	5.7	< 5.7 U	---

BETX Surrogate Recovery

Trifluorotoluene	90.3%
Bromobenzene	93.2%

Gasoline Surrogate Recovery

Trifluorotoluene	91.4%
Bromobenzene	95.3%

BETX values reported in µg/kg (ppb)
Gasoline values reported in mg/kg (ppm)

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod
TPHG by Method NWTPHG
Page 1 of 1

Sample ID: 08-B6-3'
SAMPLE

Lab Sample ID: ML21I
LIMS ID: 08-4226
Matrix: Soil
Data Release Authorized:
Reported: 03/07/08

QC Report No: ML21-URS Corporation
Project: Laurel Station - Kinder Morgan
Event: NA
Date Sampled: 03/03/08
Date Received: 03/04/08

Date Analyzed: 03/06/08 20:19
Instrument/Analyst: PID3/PKC

Purge Volume: 5.0 mL
Sample Amount: 97 mg-dry-wt
Percent Moisture: 5.7%

CAS Number	Analyte	RL	Result	
71-43-2	Benzene	13	< 13 U	
108-88-3	Toluene	13	< 13 U	
100-41-4	Ethylbenzene	13	< 13 U	
	m,p-Xylene	26	< 26 U	
95-47-6	o-Xylene	13	< 13 U	
	Gasoline Range Hydrocarbons	5.1	< 5.1 U	GAS ID ---

BETX Surrogate Recovery

Trifluorotoluene	95.4%
Bromobenzene	99.2%

Gasoline Surrogate Recovery

Trifluorotoluene	95.6%
Bromobenzene	100%

BETX values reported in µg/kg (ppb)
Gasoline values reported in mg/kg (ppm)

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod
TPHG by Method NWTPHG
Page 1 of 1

Sample ID: TANK170-1-SURFACE SAMPLE

Lab Sample ID: ML21J
LIMS ID: 08-4227
Matrix: Soil
Data Release Authorized:
Reported: 03/07/08

QC Report No: ML21-URS Corporation
Project: Laurel Station - Kinder Morgan
Event: NA
Date Sampled: 03/03/08
Date Received: 03/04/08

Date Analyzed: 03/06/08 20:44
Instrument/Analyst: PID3/PKC

Purge Volume: 5.0 mL
Sample Amount: 110 mg-dry-wt
Percent Moisture: 0.8%

CAS Number	Analyte	RL	Result	
71-43-2	Benzene	11	< 11 U	
108-88-3	Toluene	11	< 11 U	
100-41-4	Ethylbenzene	11	< 11 U	
	m,p-Xylene	22	< 22 U	
95-47-6	o-Xylene	11	< 11 U	
	Gasoline Range Hydrocarbons	**4.4**	**6.2**	GAS ID **GRO**

BETX Surrogate Recovery

Trifluorotoluene	95.0%
Bromobenzene	98.1%

Gasoline Surrogate Recovery

Trifluorotoluene	95.3%
Bromobenzene	99.0%

BETX values reported in µg/kg (ppb)
Gasoline values reported in mg/kg (ppm)

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod
TPHG by Method NWTPHG
Page 1 of 1

Sample ID: TANK170-1-2'
SAMPLE

Lab Sample ID: ML21K
LIMS ID: 08-4228
Matrix: Soil
Data Release Authorized:
Reported: 03/07/08

QC Report No: ML21-URS Corporation
Project: Laurel Station - Kinder Morgan
Event: NA
Date Sampled: 03/03/08
Date Received: 03/04/08

Date Analyzed: 03/06/08 21:08
Instrument/Analyst: PID3/PKC

Purge Volume: 5.0 mL
Sample Amount: 89 mg-dry-wt
Percent Moisture: 3.3%

CAS Number	Analyte	RL	Result	
71-43-2	Benzene	14	< 14 U	
108-88-3	Toluene	14	< 14 U	
100-41-4	Ethylbenzene	14	< 14 U	
	m,p-Xylene	28	< 28 U	
95-47-6	o-Xylene	14	< 14 U	
	Gasoline Range Hydrocarbons	**5.6**	**7.8**	GAS ID **GRO**

BETX Surrogate Recovery

Trifluorotoluene	92.4%
Bromobenzene	96.2%

Gasoline Surrogate Recovery

Trifluorotoluene	92.4%
Bromobenzene	96.7%

BETX values reported in µg/kg (ppb)
Gasoline values reported in mg/kg (ppm)

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod **Sample ID: 08-B3-1'**
TPHG by Method NWTPHG **SAMPLE**
Page 1 of 1

Lab Sample ID: ML21L
LIMS ID: 08-4229
Matrix: Soil
Data Release Authorized:
Reported: 03/07/08

QC Report No: ML21-URS Corporation
Project: Laurel Station - Kinder Morgan
Event: NA
Date Sampled: 03/03/08
Date Received: 03/04/08

Date Analyzed: 03/06/08 21:33
Instrument/Analyst: PID3/PKC

Purge Volume: 5.0 mL
Sample Amount: 55 mg-dry-wt
Percent Moisture: 28.7%

CAS Number	Analyte	RL	Result
71-43-2	Benzene	23	< 23 U
108-88-3	Toluene	23	< 23 U
100-41-4	Ethylbenzene	23	< 23 U
	m,p-Xylene	46	< 46 U
95-47-6	o-Xylene	23	< 23 U

			GAS ID
Gasoline Range Hydrocarbons	9.1	< 9.1 U	---

BETX Surrogate Recovery

Trifluorotoluene	92.1%
Bromobenzene	95.4%

Gasoline Surrogate Recovery

Trifluorotoluene	92.9%
Bromobenzene	96.2%

BETX values reported in µg/kg (ppb)
Gasoline values reported in mg/kg (ppm)

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod
TPHG by Method NWTPHG
Page 1 of 1

Sample ID: TANK170-2-SURFACE SAMPLE

Lab Sample ID: ML21M
LIMS ID: 08-4230
Matrix: Soil
Data Release Authorized:
Reported: 03/07/08

QC Report No: ML21-URS Corporation
Project: Laurel Station - Kinder Morgan
Event: NA
Date Sampled: 03/03/08
Date Received: 03/04/08

Date Analyzed: 03/06/08 21:58
Instrument/Analyst: PID3/PKC

Purge Volume: 5.0 mL
Sample Amount: 86 mg-dry-wt
Percent Moisture: 7.5%

CAS Number	Analyte	RL	Result
71-43-2	Benzene	15	< 15 U
108-88-3	Toluene	15	< 15 U
100-41-4	Ethylbenzene	15	< 15 U
	m,p-Xylene	29	< 29 U
95-47-6	o-Xylene	15	< 15 U
	Gasoline Range Hydrocarbons	**5.8**	**8.4** GAS ID **GRO**

BETX Surrogate Recovery

Trifluorotoluene	91.2%
Bromobenzene	95.3%

Gasoline Surrogate Recovery

Trifluorotoluene	91.5%
Bromobenzene	96.5%

BETX values reported in µg/kg (ppb)
Gasoline values reported in mg/kg (ppm)

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod
TPHG by Method NWTPHG
Page 1 of 1

Sample ID: TANK170-2-2
SAMPLE

Lab Sample ID: ML21N
LIMS ID: 08-4231
Matrix: Soil
Data Release Authorized:
Reported: 03/07/08

QC Report No: ML21-URS Corporation
Project: Laurel Station - Kinder Morgan
Event: NA
Date Sampled: 03/03/08
Date Received: 03/04/08

Date Analyzed: 03/06/08 22:22
Instrument/Analyst: PID3/PKC

Purge Volume: 5.0 mL
Sample Amount: 63 mg-dry-wt
Percent Moisture: 15.1%

CAS Number	Analyte	RL	Result	
71-43-2	Benzene	20	< 20 U	
108-88-3	Toluene	20	< 20 U	
100-41-4	Ethylbenzene	20	< 20 U	
	m,p-Xylene	40	< 40 U	
95-47-6	o-Xylene	20	< 20 U	
	Gasoline Range Hydrocarbons	7.9	< 7.9 U	GAS ID ---

BETX Surrogate Recovery

Trifluorotoluene	89.3%
Bromobenzene	92.7%

Gasoline Surrogate Recovery

Trifluorotoluene	90.0%
Bromobenzene	93.7%

BETX values reported in µg/kg (ppb)
Gasoline values reported in mg/kg (ppm)

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod
TPHG by Method NWTPHG
Page 1 of 1

Sample ID: TANK170-2-31/2'
SAMPLE

Lab Sample ID: ML210
LIMS ID: 08-4232
Matrix: Soil
Data Release Authorized:
Reported: 03/07/08

QC Report No: ML21-URS Corporation
Project: Laurel Station - Kinder Morgan
Event: NA
Date Sampled: 03/03/08
Date Received: 03/04/08

Date Analyzed: 03/07/08 00:01
Instrument/Analyst: PID3/PKC

Purge Volume: 5.0 mL
Sample Amount: 36 mg-dry-wt
Percent Moisture: 8.9%

CAS Number	Analyte	RL	Result
71-43-2	Benzene	35	< 35 U
108-88-3	Toluene	35	< 35 U
100-41-4	Ethylbenzene	35	< 35 U
	m,p-Xylene	70	< 70 U
95-47-6	o-Xylene	35	< 35 U

			GAS ID
	Gasoline Range Hydrocarbons	14	< 14 U ---

BETX Surrogate Recovery

Trifluorotoluene	92.4%
Bromobenzene	96.1%

Gasoline Surrogate Recovery

Trifluorotoluene	92.6%
Bromobenzene	96.6%

BETX values reported in µg/kg (ppb)
Gasoline values reported in mg/kg (ppm)

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod
TPHG by Method NWTPHG
Page 1 of 1

Sample ID: 08-B2-1'
SAMPLE

Lab Sample ID: ML21P
LIMS ID: 08-4233
Matrix: Soil
Data Release Authorized:
Reported: 03/07/08

QC Report No: ML21-URS Corporation
Project: Laurel Station - Kinder Morgan
Event: NA
Date Sampled: 03/03/08
Date Received: 03/04/08

Date Analyzed: 03/07/08 00:26
Instrument/Analyst: PID3/PKC

Purge Volume: 5.0 mL
Sample Amount: 89 mg-dry-wt
Percent Moisture: 10.2%

CAS Number	Analyte	RL	Result	GAS ID
71-43-2	Benzene	14	< 14 U	
108-88-3	Toluene	14	< 14 U	
100-41-4	Ethylbenzene	14	< 14 U	
	m,p-Xylene	28	< 28 U	
95-47-6	o-Xylene	14	< 14 U	
	Gasoline Range Hydrocarbons	5.6	< 5.6 U	---

BETX Surrogate Recovery

Trifluorotoluene	97.4%
Bromobenzene	100%

Gasoline Surrogate Recovery

Trifluorotoluene	97.9%
Bromobenzene	101%

BETX values reported in µg/kg (ppb)
Gasoline values reported in mg/kg (ppm)

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod
TPHG by Method NWTPHG
Page 1 of 1

Sample ID: TANK180-1-SURFACE SAMPLE

Lab Sample ID: ML21Q
LIMS ID: 08-4234
Matrix: Soil
Data Release Authorized:
Reported: 03/07/08

QC Report No: ML21-URS Corporation
Project: Laurel Station - Kinder Morgan
Event: NA
Date Sampled: 03/03/08
Date Received: 03/04/08

Date Analyzed: 03/07/08 00:51
Instrument/Analyst: PID3/PKC

Purge Volume: 5.0 mL
Sample Amount: 62 mg-dry-wt
Percent Moisture: 5.0%

CAS Number	Analyte	RL	Result	
71-43-2	Benzene	20	< 20 U	
108-88-3	**Toluene**	**20**	**21**	
100-41-4	Ethylbenzene	20	< 20 U	
	m,p-Xylene	40	< 40 U	
95-47-6	**o-Xylene**	**20**	**30**	
	Gasoline Range Hydrocarbons	**8.0**	**150**	GAS ID **GRO**

BETX Surrogate Recovery

Trifluorotoluene	91.5%
Bromobenzene	97.3%

Gasoline Surrogate Recovery

Trifluorotoluene	92.0%
Bromobenzene	103%

BETX values reported in µg/kg (ppb)
Gasoline values reported in mg/kg (ppm)

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod
TPHG by Method NWTPHG
Page 1 of 1

Sample ID: TANK180-1-2'
SAMPLE

Lab Sample ID: ML21R
LIMS ID: 08-4235
Matrix: Soil
Data Release Authorized:
Reported: 03/07/08

QC Report No: ML21-URS Corporation
Project: Laurel Station - Kinder Morgan
Event: NA
Date Sampled: 03/03/08
Date Received: 03/04/08

Date Analyzed: 03/07/08 01:15
Instrument/Analyst: PID3/PKC

Purge Volume: 5.0 mL
Sample Amount: 93 mg-dry-wt
Percent Moisture: 4.1%

CAS Number	Analyte	RL	Result	
71-43-2	Benzene	14	< 14 U	
108-88-3	Toluene	14	< 14 U	
100-41-4	Ethylbenzene	14	< 14 U	
	m,p-Xylene	27	< 27 U	
95-47-6	o-Xylene	14	< 14 U	
	Gasoline Range Hydrocarbons	**5.4**	**300**	GAS ID **GRO**

BETX Surrogate Recovery

Trifluorotoluene	96.2%
Bromobenzene	104%

Gasoline Surrogate Recovery

Trifluorotoluene	96.6%
Bromobenzene	88.9%

BETX values reported in µg/kg (ppb)
Gasoline values reported in mg/kg (ppm)

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod **Sample ID: TANK180-1-3'**
TPHG by Method NWTPHG **SAMPLE**
Page 1 of 1

Lab Sample ID: ML21S
LIMS ID: 08-4236
Matrix: Soil
Data Release Authorized:
Reported: 03/07/08

QC Report No: ML21-URS Corporation
Project: Laurel Station - Kinder Morgan
Event: NA
Date Sampled: 03/03/08
Date Received: 03/04/08

Date Analyzed: 03/07/08 01:40
Instrument/Analyst: PID3/PKC

Purge Volume: 5.0 mL
Sample Amount: 76 mg-dry-wt
Percent Moisture: 9.8%

CAS Number	Analyte	RL	Result	
71-43-2	Benzene	16	< 16 U	
108-88-3	Toluene	16	< 16 U	
100-41-4	Ethylbenzene	16	< 16 U	
	m,p-Xylene	33	< 33 U	
95-47-6	o-Xylene	16	< 16 U	
	Gasoline Range Hydrocarbons	**6.6**	**350**	GAS ID **GRO**

BETX Surrogate Recovery

Trifluorotoluene	90.9%
Bromobenzene	98.7%

Gasoline Surrogate Recovery

Trifluorotoluene	91.3%
Bromobenzene	109%

BETX values reported in µg/kg (ppb)
Gasoline values reported in mg/kg (ppm)

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod **Sample ID: 08-B4-1**
TPHG by Method NWTPHG **SAMPLE**
Page 1 of 1

Lab Sample ID: ML21T
LIMS ID: 08-4237
Matrix: Soil
Data Release Authorized:
Reported: 03/07/08

QC Report No: ML21-URS Corporation
Project: Laurel Station - Kinder Morgan
Event: NA
Date Sampled: 03/03/08
Date Received: 03/04/08

Date Analyzed: 03/07/08 02:05
Instrument/Analyst: PID3/PKC

Purge Volume: 5.0 mL
Sample Amount: 64 mg-dry-wt
Percent Moisture: 20.9%

CAS Number	Analyte	RL	Result	
71-43-2	Benzene	20	< 20 U	
108-88-3	Toluene	20	< 20 U	
100-41-4	Ethylbenzene	20	< 20 U	
	m,p-Xylene	39	< 39 U	
95-47-6	o-Xylene	20	< 20 U	
	Gasoline Range Hydrocarbons	**7.8**	**38**	GAS ID **GRO**

BETX Surrogate Recovery

Trifluorotoluene	87.5%
Bromobenzene	92.3%

Gasoline Surrogate Recovery

Trifluorotoluene	87.1%
Bromobenzene	92.3%

BETX values reported in µg/kg (ppb)
Gasoline values reported in mg/kg (ppm)

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod **Sample ID: TRIP BLANK**
TPHG by Method NWTPHG **SAMPLE**

Lab Sample ID: ML21U
LIMS ID: 08-4238
Matrix: Water
Data Release Authorized:
Reported: 03/07/08

QC Report No: ML21-URS Corporation
Project: Laurel Station - Kinder Morgan
Event: NA
Date Sampled: 03/03/08
Date Received: 03/04/08

Date Analyzed: 03/06/08 10:27
Instrument/Analyst: PID3/PKC

Purge Volume: 5.0 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
71-43-2	Benzene	1.0	< 1.0 U
108-88-3	Toluene	1.0	< 1.0 U
100-41-4	Ethylbenzene	1.0	< 1.0 U
	m,p-Xylene	1.0	< 1.0 U
95-47-6	o-Xylene	1.0	< 1.0 U

			GAS ID
Gasoline Range Hydrocarbons	0.25	< 0.25 U	---

BETX Surrogate Recovery

Trifluorotoluene	110%
Bromobenzene	105%

Gasoline Surrogate Recovery

Trifluorotoluene	107%
Bromobenzene	105%

BETX values reported in µg/L (ppb)
Gasoline values reported in mg/L (ppm)

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod
Page 1 of 1

Sample ID: LCS-030608
LAB CONTROL SAMPLE

Lab Sample ID: LCS-030608
LIMS ID: 08-4218
Matrix: Soil
Data Release Authorized:
Reported: 03/07/08

QC Report No: ML21-URS Corporation
Project: Laurel Station - Kinder Morgan
Event: NA
Date Sampled: NA
Date Received: NA

Date Analyzed LCS: 03/06/08 08:29
LCSD: 03/06/08 08:54
Instrument/Analyst LCS: PID3/PKC
LCSD: PID3/PKC

Purge Volume: 5.0 mL

Sample Amount LCS: 100 mg-dry-wt
LCSD: 100 mg-dry-wt

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Benzene	352	350	101%	352	350	101%	0.0%
Toluene	3070	3100	99.0%	3120	3100	101%	1.6%
Ethylbenzene	574	595	96.5%	587	595	98.7%	2.2%
m,p-Xylene	2150	2230	96.4%	2190	2230	98.2%	1.8%
o-Xylene	778	790	98.5%	796	790	101%	2.3%

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

BETX Surrogate Recovery

	LCS	LCSD
Trifluorotoluene	105%	91.4%
Bromobenzene	104%	93.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TPHG by Method NWTPHG
Page 1 of 1

Sample ID: LCS-030608
LAB CONTROL SAMPLE

Lab Sample ID: LCS-030608
LIMS ID: 08-4218
Matrix: Soil
Data Release Authorized:
Reported: 03/07/08

QC Report No: ML21-URS Corporation
Project: Laurel Station - Kinder Morgan
Event: NA
Date Sampled: NA
Date Received: NA

Date Analyzed LCS: 03/06/08 08:29
LCSD: 03/06/08 08:54
Instrument/Analyst LCS: PID3/PKC
LCSD: PID3/PKC

Purge Volume: 5.0 mL

Sample Amount LCS: 100 mg-dry-wt
LCSD: 100 mg-dry-wt

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Gasoline Range Hydrocarbons	55.5	50.0	111%	53.1	50.0	106%	4.4%

Reported in mg/kg (ppm)

RPD calculated using sample concentrations per SW846.

TPHG Surrogate Recovery

	LCS	LCSD
Trifluorotoluene	103%	89.7%
Bromobenzene	105%	93.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod
Page 1 of 1

Sample ID: LCS-030608
LAB CONTROL SAMPLE

Lab Sample ID: LCS-030608
LIMS ID: 08-4231
Matrix: Soil
Data Release Authorized:
Reported: 03/07/08

QC Report No: ML21-URS Corporation
Project: Laurel Station - Kinder Morgan
Event: NA
Date Sampled: NA
Date Received: NA

Date Analyzed LCS: 03/06/08 19:05
LCSD: 03/06/08 19:30
Instrument/Analyst LCS: PID3/PKC
LCSD: PID3/PKC

Purge Volume: 5.0 mL

Sample Amount LCS: 100 mg-dry-wt
LCSD: 100 mg-dry-wt

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Benzene	334	350	95.4%	332	350	94.9%	0.6%
Toluene	2890	3100	93.2%	2910	3100	93.9%	0.7%
Ethylbenzene	548	595	92.1%	550	595	92.4%	0.4%
m,p-Xylene	2050	2230	91.9%	2070	2230	92.8%	1.0%
o-Xylene	744	790	94.2%	753	790	95.3%	1.2%

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

BETX Surrogate Recovery

	LCS	LCSD
Trifluorotoluene	99.9%	93.4%
Bromobenzene	101%	96.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TPHG by Method NWTPHG
Page 1 of 1

Sample ID: LCS-030608
LAB CONTROL SAMPLE

Lab Sample ID: LCS-030608
LIMS ID: 08-4231
Matrix: Soil
Data Release Authorized:
Reported: 03/07/08

QC Report No: ML21-URS Corporation
Project: Laurel Station - Kinder Morgan
Event: NA
Date Sampled: NA
Date Received: NA

Date Analyzed LCS: 03/06/08 19:05
LCSD: 03/06/08 19:30
Instrument/Analyst LCS: PID3/PKC
LCSD: PID3/PKC

Purge Volume: 5.0 mL

Sample Amount LCS: 100 mg-dry-wt
LCSD: 100 mg-dry-wt

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Gasoline Range Hydrocarbons	51.8	50.0	104%	50.6	50.0	101%	2.3%

Reported in mg/kg (ppm)

RPD calculated using sample concentrations per SW846.

TPHG Surrogate Recovery

	LCS	LCSD
Trifluorotoluene	99.0%	93.5%
Bromobenzene	102%	97.3%

ANALYTICAL RESOURCES INCORPORATED

TPHD SURROGATE RECOVERY SUMMARY

Matrix: Soil

QC Report No: ML21-URS Corporation
Project: Laurel Station - Kinder Morgan

Client ID	OTER	TOT OUT
08-B2-3'	91.6%	0
08-B3-3'	92.0%	0
08-B2-4.5'	90.2%	0
08-B3-4.5'	96.4%	0
08-B5-1'	91.1%	0
08-B6-1'	86.0%	0
08-B5-3'	92.7%	0
08-B5-4.5'	95.8%	0
08-B6-3'	87.6%	0
TANK170-1-SURFACE	89.3%	0
TANK170-1-2'	88.0%	0
08-B3-1'	88.7%	0
TANK170-2-SURFACE	83.1%	0
TANK170-2-2	95.3%	0
TANK170-2-31/2'	97.8%	0
08-B2-1'	97.1%	0
TANK180-1-SURFACE	88.4%	0
TANK180-1-2'	67.6%	0
030508MBS	86.2%	0
030508LCS	84.7%	0
030508LCSD	84.9%	0
TANK180-1-3'	D	0
TANK180-1-3' MS	97.6%	0
TANK180-1-3' MSD	80.4%	0
08-B4-1	92.4%	0

	LCS/MB LIMITS	QC LIMITS
(OTER) = o-Terphenyl	(46-116)	(42-112)

Prep Method: SW3550B
Log Number Range: 08-4218 to 08-4237

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD by GC/FID
Page 1 of 2
Matrix: Soil

QC Report No: ML21-URS Corporation
Project: Laurel Station - Kinder Morgan

Date Received: 03/04/08

Data Release Authorized:
Reported: 03/10/08

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range	RL	Result
ML21A	08-B2-3'	03/05/08	03/07/08	1.00	Diesel	5.4	< 5.4 U
08-4218	HC ID: ---		FID3A	1.0	Motor Oil	11	< 11 U
					o-Terphenyl		91.6%
ML21B	08-B3-3'	03/05/08	03/07/08	1.00	**Diesel**	**8.1**	**41**
08-4219	HC ID: **DRO/RRO**		FID3A	1.0	**Motor Oil**	**16**	**60**
					o-Terphenyl		92.0%
ML21C	08-B2-4.5'	03/05/08	03/07/08	1.00	Diesel	6.8	< 6.8 U
08-4220	HC ID: ---		FID3A	1.0	Motor Oil	14	< 14 U
					o-Terphenyl		90.2%
ML21D	08-B3-4.5'	03/05/08	03/07/08	1.00	**Diesel**	**6.4**	**8.7**
08-4221	HC ID: **DRO**		FID3A	1.0	Motor Oil	13	< 13 U
					o-Terphenyl		96.4%
ML21E	08-B5-1'	03/05/08	03/07/08	1.00	Diesel	6.2	< 6.2 U
08-4222	HC ID: ---		FID3A	1.0	Motor Oil	12	< 12 U
					o-Terphenyl		91.1%
ML21F	08-B6-1'	03/05/08	03/07/08	1.00	Diesel	6.0	< 6.0 U
08-4223	HC ID: ---		FID3A	1.0	Motor Oil	12	< 12 U
					o-Terphenyl		86.0%
ML21G	08-B5-3'	03/05/08	03/07/08	1.00	Diesel	6.3	< 6.3 U
08-4224	HC ID: ---		FID3A	1.0	Motor Oil	13	< 13 U
					o-Terphenyl		92.7%
ML21H	08-B5-4.5'	03/05/08	03/07/08	1.00	Diesel	5.8	< 5.8 U
08-4225	HC ID: ---		FID3A	1.0	Motor Oil	12	< 12 U
					o-Terphenyl		95.8%
ML21I	08-B6-3'	03/05/08	03/07/08	1.00	Diesel	5.3	< 5.3 U
08-4226	HC ID: ---		FID3A	1.0	Motor Oil	10	< 10 U
					o-Terphenyl		87.6%
ML21J	TANK170-1-SURFACE	03/05/08	03/07/08	1.00	**Diesel**	**5.0**	**130**
08-4227	HC ID: **DRO/RRO**		FID3A	1.0	**Motor Oil**	**10**	**190**
					o-Terphenyl		89.3%
ML21K	TANK170-1-2'	03/05/08	03/07/08	1.00	**Diesel**	**5.2**	**36**
08-4228	HC ID: **DIESEL/MOTOR OIL**		FID3A	1.0	**Motor Oil**	**10**	**34**
					o-Terphenyl		88.0%
ML21L	08-B3-1'	03/05/08	03/07/08	1.00	**Diesel**	**7.0**	**19**
08-4229	HC ID: **DRO/RRO**		FID3A	1.0	**Motor Oil**	**14**	**51**
					o-Terphenyl		88.7%
ML21M	TANK170-2-SURFACE	03/05/08	03/07/08	1.00	**Diesel**	**5.4**	**25**
08-4230	HC ID: **DRO/RRO**		FID3A	1.0	**Motor Oil**	**11**	**21**
					o-Terphenyl		83.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD by GC/FID
Page 2 of 2
Matrix: Soil

QC Report No: ML21-URS Corporation
Project: Laurel Station - Kinder Morgan

Date Received: 03/04/08

Data Release Authorized:
Reported: 03/10/08

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range	RL	Result
ML21N	TANK170-2-2	03/05/08	03/07/08	1.00	Diesel	5.8	< 5.8 U
08-4231	HC ID: ---		FID3A	1.0	Motor Oil	12	< 12 U
					o-Terphenyl		95.3%
ML21O	TANK170-2-31/2'	03/05/08	03/07/08	1.00	Diesel	5.5	< 5.5 U
08-4232	HC ID: ---		FID3A	1.0	Motor Oil	11	< 11 U
					o-Terphenyl		97.8%
ML21P	08-B2-1'	03/05/08	03/07/08	1.00	Diesel	5.6	< 5.6 U
08-4233	HC ID: **RRO**		FID3A	1.0	**Motor Oil**	**11**	**11**
					o-Terphenyl		97.1%
ML21Q	TANK180-1-SURFACE	03/05/08	03/07/08	1.00	**Diesel**	**52**	**1,900**
08-4234	HC ID: **DRO/MOTOR OIL**		FID3A	10	**Motor Oil**	**100**	**2,500**
					o-Terphenyl		88.4%
ML21R	TANK180-1-2'	03/05/08	03/07/08	1.00	**Diesel**	**52**	**2,200**
08-4235	HC ID: **DRO/MOTOR OIL**		FID3A	10	**Motor Oil**	**100**	**2,300**
					o-Terphenyl		67.6%
MB-030508	Method Blank	03/05/08	03/06/08	1.00	Diesel	5.0	< 5.0 U
08-4236	HC ID: ---		FID3A	1.0	Motor Oil	10	< 10 U
					o-Terphenyl		86.2%
ML21S	TANK180-1-3'	03/05/08	03/10/08	1.00	**Diesel**	**110**	**3,100**
08-4236	HC ID: **DRO/MOTOR OIL**		FID3A	20	**Motor Oil**	**220**	**3,500**
					o-Terphenyl		D
ML21T	08-B4-1	03/05/08	03/07/08	1.00	Diesel	6.3	< 6.3 U
08-4237	HC ID: **RRO**		FID3A	1.0	**Motor Oil**	**13**	**15**
					o-Terphenyl		92.4%

Reported in mg/kg (ppm)

EFV-Effective Final Volume in mL.
DL-Dilution of extract prior to analysis.
RL-Reporting limit.

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.
HC ID: DRO/RRO indicates results of organics or additional hydrocarbons in ranges are not identifiable.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPHD by GC/FID
Page 1 of 1

Sample ID: TANK180-1-3'
MS/MSD

Lab Sample ID: ML21S
LIMS ID: 08-4236
Matrix: Soil
Data Release Authorized:
Reported: 03/10/08

QC Report No: ML21-URS Corporation
Project: Laurel Station - Kinder Morgan

Date Sampled: 03/03/08
Date Received: 03/04/08

Date Extracted MS/MSD: 03/05/08

Date Analyzed MS: 03/07/08 06:59
MSD: 03/07/08 07:15

Instrument/Analyst MS: FID3A/JGR
MSD: FID3A/JGR

Sample Amount MS: 9.04 g-dry-wt
MSD: 9.04 g-dry-wt

Final Extract Volume MS: 1.0 mL
MSD: 1.0 mL

Dilution Factor MS: 10.0
MSD: 10.0

Percent Moisture: 9.8%

Range	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Diesel	3,120	3,840	166	NA	3,720	166	NA	3.2%

TPHD Surrogate Recovery

	MS	MSD
o-Terphenyl	97.6%	80.4%

Results reported in mg/kg
NA-No recovery due to high concentration of analyte in original sample and/or calculated negative recovery.
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPHD by GC/FID **Sample ID: LCS-030508**
Page 1 of 1 **LCS/LCSD**

Lab Sample ID: LCS-030508 QC Report No: ML21-URS Corporation
LIMS ID: 08-4236 Project: Laurel Station - Kinder Morgan
Matrix: Soil
Data Release Authorized: Date Sampled: NA
Reported: 03/10/08 Date Received: NA

Date Extracted LCS/LCSD: 03/05/08 Sample Amount LCS: 10.0 g
LCSD: 10.0 g
Date Analyzed LCS: 03/06/08 23:16 Final Extract Volume LCS: 1.0 mL
LCSD: 03/06/08 23:31 LCSD: 1.0 mL
Instrument/Analyst LCS: FID3A/JGR Dilution Factor LCS: 1.00
LCSD: FID3A/JGR LCSD: 1.00

Range	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Diesel	126	150	84.0%	128	150	85.3%	1.6%

TPHD Surrogate Recovery

	LCS	LCSD
o-Terphenyl	84.7%	84.9%

Results reported in mg/kg
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS-EXTRACTION REPORT

ARI Job: ML21
Matrix: Soil
Project: Laurel Station - Kinder Morgan
Date Received: 03/04/08

ARI ID	Client ID	Client Amt	Final Vol	Basis	Prep Date
08-4218-ML21A	08-B2-3'	9.33 g	1.00 mL	D	03/05/08
08-4219-ML21B	08-B3-3'	6.15 g	1.00 mL	D	03/05/08
08-4220-ML21C	08-B2-4.5'	7.33 g	1.00 mL	D	03/05/08
08-4221-ML21D	08-B3-4.5'	7.78 g	1.00 mL	D	03/05/08
08-4222-ML21E	08-B5-1'	8.10 g	1.00 mL	D	03/05/08
08-4223-ML21F	08-B6-1'	8.41 g	1.00 mL	D	03/05/08
08-4224-ML21G	08-B5-3'	7.90 g	1.00 mL	D	03/05/08
08-4225-ML21H	08-B5-4.5'	8.57 g	1.00 mL	D	03/05/08
08-4226-ML21I	08-B6-3'	9.49 g	1.00 mL	D	03/05/08
08-4227-ML21J	TANK170-1-SURFACE	9.92 g	1.00 mL	D	03/05/08
08-4228-ML21K	TANK170-1-2'	9.67 g	1.00 mL	D	03/05/08
08-4229-ML21L	08-B3-1'	7.17 g	1.00 mL	D	03/05/08
08-4230-ML21M	TANK170-2-SURFACE	9.29 g	1.00 mL	D	03/05/08
08-4231-ML21N	TANK170-2-2	8.56 g	1.00 mL	D	03/05/08
08-4232-ML21O	TANK170-2-31/2'	9.11 g	1.00 mL	D	03/05/08
08-4233-ML21P	08-B2-1'	8.98 g	1.00 mL	D	03/05/08
08-4234-ML21Q	TANK180-1-SURFACE	9.56 g	1.00 mL	D	03/05/08
08-4235-ML21R	TANK180-1-2'	9.67 g	1.00 mL	D	03/05/08
08-4236-030508MB1	Method Blank	10.0 g	1.00 mL	-	03/05/08
08-4236-030508LCS1	Lab Control	10.0 g	1.00 mL	-	03/05/08
08-4236-030508LCSD1	Lab Control Dup	10.0 g	1.00 mL	-	03/05/08
08-4236-ML21S	TANK180-1-3'	9.02 g	1.00 mL	D	03/05/08
08-4236-ML21SMS	TANK180-1-3'	9.04 g	1.00 mL	D	03/05/08
08-4236-ML21SMSD	TANK180-1-3'	9.04 g	1.00 mL	D	03/05/08
08-4237-ML21T	08-B4-1	7.94 g	1.00 mL	D	03/05/08

Basis: D=Dry Weight W=As Received

Analytical Resources, Incorporated
Analytical Chemists and Consultants

March 27, 2008

Karen Mixon
URS Corporation
Century Square
1501 Fourth Avenue Suite 1400
Seattle, WA 98101

RE: Client Project: 33760783.08001, Laurel Station
ARI Job No: MN46

Dear Karen:

Please find enclosed the original chain of custody documentation and the final results for the sample from the project referenced above. Analytical Resources, Inc. (ARI) received four water samples and two soil samples and a trip blank in good condition on March 14, 2008. The samples were logged under two different ARI SDGs.

The samples were analyzed for VOAs, NWTPH-Dx and SIM PAHs as requested.

There were no anomalies associated with the samples.

A copy of these reports and all associated raw data will remain on file electronically with ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kelly Bottem
Client Services Manager
206/695-6211
kellyb@arilabs.com

Enclosures

cc: file MN46

KFB/kfb

08-5480 to 08-5486

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: MN46	Turn-around Requested:	Page: 1 of 1	
ARI Client Company: URS	Phone: 206-438-2700	Date: 3/13/08	Ice Present?
Client Contact: KAREN MIXON		No. of Coolers:	Cooler Temps: 2.0
Client Project Name: KINDER MORGAN LAUREL STATION BELLINGHAM			
Client Project #: 33760783.08001	Samplers: D Lewis I Vermeeren		

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	VOCs	NWTPH-Dx	LL SIM PAH	TPH-G/BTEX 8021	TPH-Dx				Notes/Comments
SW-4	3/13/08	1116	H_2O	7	X	X	X						
SW-1		1230	H_2O	12	X	X	X						MS/MSD
SW-11		1300	H_2O	7	X	X	X						
SW-2		1537	H_2O	4	X	X	X						
08-B4-3		1600	SOIL	5				X	X				
08-B4-4.5		1620	SOIL	5				X	X				

Comments/Special Instructions	Relinquished by:	Received by:	Relinquished by:	Received by:
please put soil samples in separate workorder use URS job # 33760784. Billing goes to Bond Kathleen Mayo at Kinder Morgan	(Signature)	(Signature)	(Signature)	(Signature)
	Printed Name: Karen Lmixon	Printed Name: ASHLEY CAMPBELL	Printed Name:	Printed Name:
	Company: URS Corporation	Company: ARI	Company:	Company:
	Date & Time: 3-14-08 / 0705	Date & Time: 3/14/08 1505	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release 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 Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: VRS
Project Name: KINDER MORGAN
COC No: NA
Delivered by: Courier - ard
Assigned ARI Job No: MN46
Tracking No: NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	(YES)	NO
Were custody papers included with the cooler?	(YES)	NO
Were custody papers properly filled out (ink, signed, etc.)	(YES)	NO
Record cooler temperature (recommended 2.0-6.0 °C for chemistry	2.0 °C	

Cooler Accepted by: ard Date: 3/14/08 Time: _____

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?	YES	(NO)
What kind of packing material was used?	ICE	
Was sufficient ice used (if appropriate)?	(YES)	NO
Were all bottles sealed in individual plastic bags?	YES	(NO)
Did all bottle arrive in good condition (unbroken)?	(YES)	NO
Were all bottle labels complete and legible?	(YES)	NO
Did all bottle labels and tags agree with custody papers?	(YES)	NO
Were all bottles used correct for the requested analyses?	(YES)	NO
Do any of the analyses (bottles) require preservation? (attach preservation checklist)	YES	(NO)
Were all VOC vials free of air bubbles?	(NA) (YES) 3/17/08	NO
Was sufficient amount of sample sent in each bottle?	(YES)	NO

Samples Logged by: S Joshi Date: 3/17/08 Time: _____

*** Notify Project Manager of discrepancies or concerns ***

Explain discrepancies or negative responses:
14 bottles received for sample SW-1

By: Date:

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: SW-4**
 SAMPLE

Lab Sample ID: MN46A
LIMS ID: 08-5480
Matrix: Water
Data Release Authorized:
Reported: 03/19/08

QC Report No: MN46-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
33760783.08001
Date Sampled: 03/13/08
Date Received: 03/14/08

Instrument/Analyst: NT5/JZ
Date Analyzed: 03/18/08 14:47

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
74-87-3	Chloromethane	0.2	< 0.2	U
74-83-9	Bromomethane	0.2	< 0.2	U
75-01-4	Vinyl Chloride	0.2	< 0.2	U
75-00-3	Chloroethane	0.2	< 0.2	U
75-09-2	Methylene Chloride	0.5	< 0.5	U
67-64-1	**Acetone**	**1.0**	**14**	
75-15-0	Carbon Disulfide	0.2	< 0.2	U
75-35-4	1,1-Dichloroethene	0.2	< 0.2	U
75-34-3	1,1-Dichloroethane	0.2	< 0.2	U
156-60-5	trans-1,2-Dichloroethene	0.2	< 0.2	U
156-59-2	cis-1,2-Dichloroethene	0.2	< 0.2	U
67-66-3	Chloroform	0.2	< 0.2	U
107-06-2	1,2-Dichloroethane	0.2	< 0.2	U
78-93-3	2-Butanone	1.0	< 1.0	U
71-55-6	1,1,1-Trichloroethane	0.2	< 0.2	U
56-23-5	Carbon Tetrachloride	0.2	< 0.2	U
108-05-4	Vinyl Acetate	1.0	< 1.0	U
75-27-4	Bromodichloromethane	0.2	< 0.2	U
78-87-5	1,2-Dichloropropane	0.2	< 0.2	U
10061-01-5	cis-1,3-Dichloropropene	0.2	< 0.2	U
79-01-6	Trichloroethene	0.2	< 0.2	U
124-48-1	Dibromochloromethane	0.2	< 0.2	U
79-00-5	1,1,2-Trichloroethane	0.2	< 0.2	U
71-43-2	Benzene	0.2	< 0.2	U
10061-02-6	trans-1,3-Dichloropropene	0.2	< 0.2	U
110-75-8	2-Chloroethylvinylether	0.2	< 0.2	U
75-25-2	Bromoform	0.2	< 0.2	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	1.0	< 1.0	U
591-78-6	2-Hexanone	1.0	< 1.0	U
127-18-4	Tetrachloroethene	0.2	< 0.2	U
79-34-5	1,1,2,2-Tetrachloroethane	0.2	< 0.2	U
108-88-3	Toluene	0.2	< 0.2	U
108-90-7	Chlorobenzene	0.2	< 0.2	U
100-41-4	Ethylbenzene	0.2	< 0.2	U
100-42-5	Styrene	0.2	< 0.2	U
75-69-4	Trichlorofluoromethane	0.2	< 0.2	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.2	< 0.2	U
1330-20-7	m,p-Xylene	0.4	< 0.4	U
95-47-6	o-Xylene	0.2	< 0.2	U
95-50-1	1,2-Dichlorobenzene	0.2	< 0.2	U
541-73-1	1,3-Dichlorobenzene	0.2	< 0.2	U
106-46-7	1,4-Dichlorobenzene	0.2	< 0.2	U
107-02-8	Acrolein	1.0	< 1.0	U
74-88-4	Methyl Iodide	1.0	< 1.0	U
74-96-4	Bromoethane	0.2	< 0.2	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.2	< 0.2	U
74-95-3	Dibromomethane	0.2	< 0.2	U
630-20-6	1,1,1,2-Tetrachloroethane	0.2	< 0.2	U
96-12-8	1,2-Dibromo-3-chloropropane	1.0	< 1.0	U
96-18-4	1,2,3-Trichloropropane	0.2	< 0.2	U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: SW-4**
 SAMPLE

Lab Sample ID: MN46A
LIMS ID: 08-5480
Matrix: Water
Date Analyzed: 03/18/08 14:47

QC Report No: MN46-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
33760783.08001

CAS Number	Analyte	RL	Result	Q
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.2	< 0.2	U
95-63-6	1,2,4-Trimethylbenzene	0.2	< 0.2	U
87-68-3	Hexachlorobutadiene	1.0	< 1.0	U
106-93-4	Ethylene Dibromide	0.2	< 0.2	U
74-97-5	Bromochloromethane	0.2	< 0.2	U
594-20-7	2,2-Dichloropropane	0.2	< 0.2	U
142-28-9	1,3-Dichloropropane	0.2	< 0.2	U
98-82-8	Isopropylbenzene	0.2	< 0.2	U
103-65-1	n-Propylbenzene	0.2	< 0.2	U
108-86-1	Bromobenzene	0.2	< 0.2	U
95-49-8	2-Chlorotoluene	0.2	< 0.2	U
106-43-4	4-Chlorotoluene	0.2	< 0.2	U
98-06-6	tert-Butylbenzene	0.2	< 0.2	U
135-98-8	sec-Butylbenzene	0.2	< 0.2	U
99-87-6	4-Isopropyltoluene	0.2	< 0.2	U
104-51-8	n-Butylbenzene	0.2	< 0.2	U
120-82-1	1,2,4-Trichlorobenzene	1.0	< 1.0	U
91-20-3	Naphthalene	1.0	< 1.0	U
87-61-6	1,2,3-Trichlorobenzene	1.0	< 1.0	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	117%
d8-Toluene	104%
Bromofluorobenzene	95.4%
d4-1,2-Dichlorobenzene	104%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: SW-1**
 SAMPLE

Lab Sample ID: MN46B
LIMS ID: 08-5481
Matrix: Water
Data Release Authorized:
Reported: 03/19/08

QC Report No: MN46-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
33760783.08001
Date Sampled: 03/13/08
Date Received: 03/14/08

Instrument/Analyst: NT5/JZ
Date Analyzed: 03/18/08 15:13

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
74-87-3	Chloromethane	0.2	< 0.2	U
74-83-9	Bromomethane	0.2	< 0.2	U
75-01-4	Vinyl Chloride	0.2	< 0.2	U
75-00-3	Chloroethane	0.2	< 0.2	U
75-09-2	Methylene Chloride	0.5	< 0.5	U
67-64-1	**Acetone**	**1.0**	**7.5**	
75-15-0	Carbon Disulfide	0.2	< 0.2	U
75-35-4	1,1-Dichloroethene	0.2	< 0.2	U
75-34-3	1,1-Dichloroethane	0.2	< 0.2	U
156-60-5	trans-1,2-Dichloroethene	0.2	< 0.2	U
156-59-2	cis-1,2-Dichloroethene	0.2	< 0.2	U
67-66-3	**Chloroform**	**0.2**	**0.2**	
107-06-2	1,2-Dichloroethane	0.2	< 0.2	U
78-93-3	2-Butanone	1.0	< 1.0	U
71-55-6	1,1,1-Trichloroethane	0.2	< 0.2	U
56-23-5	Carbon Tetrachloride	0.2	< 0.2	U
108-05-4	Vinyl Acetate	1.0	< 1.0	U
75-27-4	Bromodichloromethane	0.2	< 0.2	U
78-87-5	1,2-Dichloropropane	0.2	< 0.2	U
10061-01-5	cis-1,3-Dichloropropene	0.2	< 0.2	U
79-01-6	Trichloroethene	0.2	< 0.2	U
124-48-1	Dibromochloromethane	0.2	< 0.2	U
79-00-5	1,1,2-Trichloroethane	0.2	< 0.2	U
71-43-2	Benzene	0.2	< 0.2	U
10061-02-6	trans-1,3-Dichloropropene	0.2	< 0.2	U
110-75-8	2-Chloroethylvinylether	0.2	< 0.2	U
75-25-2	Bromoform	0.2	< 0.2	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	1.0	< 1.0	U
591-78-6	2-Hexanone	1.0	< 1.0	U
127-18-4	Tetrachloroethene	0.2	< 0.2	U
79-34-5	1,1,2,2-Tetrachloroethane	0.2	< 0.2	U
108-88-3	Toluene	0.2	< 0.2	U
108-90-7	Chlorobenzene	0.2	< 0.2	U
100-41-4	Ethylbenzene	0.2	< 0.2	U
100-42-5	Styrene	0.2	< 0.2	U
75-69-4	Trichlorofluoromethane	0.2	< 0.2	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.2	< 0.2	U
1330-20-7	m,p-Xylene	0.4	< 0.4	U
95-47-6	o-Xylene	0.2	< 0.2	U
95-50-1	1,2-Dichlorobenzene	0.2	< 0.2	U
541-73-1	1,3-Dichlorobenzene	0.2	< 0.2	U
106-46-7	1,4-Dichlorobenzene	0.2	< 0.2	U
107-02-8	Acrolein	1.0	< 1.0	U
74-88-4	Methyl Iodide	1.0	< 1.0	U
74-96-4	Bromoethane	0.2	< 0.2	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.2	< 0.2	U
74-95-3	Dibromomethane	0.2	< 0.2	U
630-20-6	1,1,1,2-Tetrachloroethane	0.2	< 0.2	U
96-12-8	1,2-Dibromo-3-chloropropane	1.0	< 1.0	U
96-18-4	1,2,3-Trichloropropane	0.2	< 0.2	U

Lab Sample ID: MN46B
LIMS ID: 08-5481
Matrix: Water
Date Analyzed: 03/18/08 15:13

QC Report No: MN46-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
33760783.08001

CAS Number	Analyte	RL	Result	Q
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.2	< 0.2	U
95-63-6	1,2,4-Trimethylbenzene	0.2	< 0.2	U
87-68-3	Hexachlorobutadiene	1.0	< 1.0	U
106-93-4	Ethylene Dibromide	0.2	< 0.2	U
74-97-5	Bromochloromethane	0.2	< 0.2	U
594-20-7	2,2-Dichloropropane	0.2	< 0.2	U
142-28-9	1,3-Dichloropropane	0.2	< 0.2	U
98-82-8	Isopropylbenzene	0.2	< 0.2	U
103-65-1	n-Propylbenzene	0.2	< 0.2	U
108-86-1	Bromobenzene	0.2	< 0.2	U
95-49-8	2-Chlorotoluene	0.2	< 0.2	U
106-43-4	4-Chlorotoluene	0.2	< 0.2	U
98-06-6	tert-Butylbenzene	0.2	< 0.2	U
135-98-8	sec-Butylbenzene	0.2	< 0.2	U
99-87-6	4-Isopropyltoluene	0.2	< 0.2	U
104-51-8	n-Butylbenzene	0.2	< 0.2	U
120-82-1	1,2,4-Trichlorobenzene	1.0	< 1.0	U
91-20-3	Naphthalene	1.0	< 1.0	U
87-61-6	1,2,3-Trichlorobenzene	1.0	< 1.0	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	128%
d8-Toluene	101%
Bromofluorobenzene	94.1%
d4-1,2-Dichlorobenzene	106%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: SW-1**
 MATRIX SPIKE

Lab Sample ID: MN46B
LIMS ID: 08-5481
Matrix: Water
Data Release Authorized:
Reported: 03/19/08

QC Report No: MN46-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
33760783.08001
Date Sampled: 03/13/08
Date Received: 03/14/08

Instrument/Analyst: NT5/JZ
Date Analyzed: 03/18/08 17:23

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
74-87-3	Chloromethane	0.2	---	
74-83-9	Bromomethane	0.2	---	
75-01-4	Vinyl Chloride	0.2	---	
75-00-3	Chloroethane	0.2	---	
75-09-2	Methylene Chloride	0.5	---	
67-64-1	Acetone	1.0	---	
75-15-0	Carbon Disulfide	0.2	---	
75-35-4	1,1-Dichloroethene	0.2	---	
75-34-3	1,1-Dichloroethane	0.2	---	
156-60-5	trans-1,2-Dichloroethene	0.2	---	
156-59-2	cis-1,2-Dichloroethene	0.2	---	
67-66-3	Chloroform	0.2	---	
107-06-2	1,2-Dichloroethane	0.2	---	
78-93-3	2-Butanone	1.0	---	
71-55-6	1,1,1-Trichloroethane	0.2	---	
56-23-5	Carbon Tetrachloride	0.2	---	
108-05-4	Vinyl Acetate	1.0	---	
75-27-4	Bromodichloromethane	0.2	---	
78-87-5	1,2-Dichloropropane	0.2	---	
10061-01-5	cis-1,3-Dichloropropene	0.2	---	
79-01-6	Trichloroethene	0.2	---	
124-48-1	Dibromochloromethane	0.2	---	
79-00-5	1,1,2-Trichloroethane	0.2	---	
71-43-2	Benzene	0.2	---	
10061-02-6	trans-1,3-Dichloropropene	0.2	---	
110-75-8	2-Chloroethylvinylether	0.2	---	
75-25-2	Bromoform	0.2	---	
108-10-1	4-Methyl-2-Pentanone (MIBK)	1.0	---	
591-78-6	2-Hexanone	1.0	---	
127-18-4	Tetrachloroethene	0.2	---	
79-34-5	1,1,2,2-Tetrachloroethane	0.2	---	
108-88-3	Toluene	0.2	---	
108-90-7	Chlorobenzene	0.2	---	
100-41-4	Ethylbenzene	0.2	---	
100-42-5	Styrene	0.2	---	
75-69-4	Trichlorofluoromethane	0.2	---	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.2	---	
1330-20-7	m,p-Xylene	0.4	---	
95-47-6	o-Xylene	0.2	---	
95-50-1	1,2-Dichlorobenzene	0.2	---	
541-73-1	1,3-Dichlorobenzene	0.2	---	
106-46-7	1,4-Dichlorobenzene	0.2	---	
107-02-8	Acrolein	1.0	---	
74-88-4	Methyl Iodide	1.0	---	
74-96-4	Bromoethane	0.2	---	
107-13-1	Acrylonitrile	1.0	---	
563-58-6	1,1-Dichloropropene	0.2	---	
74-95-3	Dibromomethane	0.2	---	
630-20-6	1,1,1,2-Tetrachloroethane	0.2	---	
96-12-8	1,2-Dibromo-3-chloropropane	1.0	---	
96-18-4	1,2,3-Trichloropropane	0.2	---	

Lab Sample ID: MN46B
LIMS ID: 08-5481
Matrix: Water
Date Analyzed: 03/18/08 17:23

QC Report No: MN46-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
33760783.08001

CAS Number	Analyte	RL	Result	Q
110-57-6	trans-1,4-Dichloro-2-butene	1.0	---	
108-67-8	1,3,5-Trimethylbenzene	0.2	---	
95-63-6	1,2,4-Trimethylbenzene	0.2	---	
87-68-3	Hexachlorobutadiene	1.0	---	
106-93-4	Ethylene Dibromide	0.2	---	
74-97-5	Bromochloromethane	0.2	---	
594-20-7	2,2-Dichloropropane	0.2	---	
142-28-9	1,3-Dichloropropane	0.2	---	
98-82-8	Isopropylbenzene	0.2	---	
103-65-1	n-Propylbenzene	0.2	---	
108-86-1	Bromobenzene	0.2	---	
95-49-8	2-Chlorotoluene	0.2	---	
106-43-4	4-Chlorotoluene	0.2	---	
98-06-6	tert-Butylbenzene	0.2	---	
135-98-8	sec-Butylbenzene	0.2	---	
99-87-6	4-Isopropyltoluene	0.2	---	
104-51-8	n-Butylbenzene	0.2	---	
120-82-1	1,2,4-Trichlorobenzene	1.0	---	
91-20-3	Naphthalene	1.0	---	
87-61-6	1,2,3-Trichlorobenzene	1.0	---	

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	98.8%
d8-Toluene	98.5%
Bromofluorobenzene	99.2%
d4-1,2-Dichlorobenzene	98.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: SW-1**
 MATRIX SPIKE DUP

Lab Sample ID: MN46B
LIMS ID: 08-5481
Matrix: Water
Data Release Authorized:
Reported: 03/19/08

QC Report No: MN46-URS Corporation
Project: Kinder Morgan Laurel Station B'ham 33760783.08001
Date Sampled: 03/13/08
Date Received: 03/14/08

Instrument/Analyst: NT5/JZ
Date Analyzed: 03/18/08 17:49

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
74-87-3	Chloromethane	0.2	---	
74-83-9	Bromomethane	0.2	---	
75-01-4	Vinyl Chloride	0.2	---	
75-00-3	Chloroethane	0.2	---	
75-09-2	Methylene Chloride	0.5	---	
67-64-1	Acetone	1.0	---	
75-15-0	Carbon Disulfide	0.2	---	
75-35-4	1,1-Dichloroethene	0.2	---	
75-34-3	1,1-Dichloroethane	0.2	---	
156-60-5	trans-1,2-Dichloroethene	0.2	---	
156-59-2	cis-1,2-Dichloroethene	0.2	---	
67-66-3	Chloroform	0.2	---	
107-06-2	1,2-Dichloroethane	0.2	---	
78-93-3	2-Butanone	1.0	---	
71-55-6	1,1,1-Trichloroethane	0.2	---	
56-23-5	Carbon Tetrachloride	0.2	---	
108-05-4	Vinyl Acetate	1.0	---	
75-27-4	Bromodichloromethane	0.2	---	
78-87-5	1,2-Dichloropropane	0.2	---	
10061-01-5	cis-1,3-Dichloropropene	0.2	---	
79-01-6	Trichloroethene	0.2	---	
124-48-1	Dibromochloromethane	0.2	---	
79-00-5	1,1,2-Trichloroethane	0.2	---	
71-43-2	Benzene	0.2	---	
10061-02-6	trans-1,3-Dichloropropene	0.2	---	
110-75-8	2-Chloroethylvinylether	0.2	---	
75-25-2	Bromoform	0.2	---	
108-10-1	4-Methyl-2-Pentanone (MIBK)	1.0	---	
591-78-6	2-Hexanone	1.0	---	
127-18-4	Tetrachloroethene	0.2	---	
79-34-5	1,1,2,2-Tetrachloroethane	0.2	---	
108-88-3	Toluene	0.2	---	
108-90-7	Chlorobenzene	0.2	---	
100-41-4	Ethylbenzene	0.2	---	
100-42-5	Styrene	0.2	---	
75-69-4	Trichlorofluoromethane	0.2	---	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.2	---	
1330-20-7	m,p-Xylene	0.4	---	
95-47-6	o-Xylene	0.2	---	
95-50-1	1,2-Dichlorobenzene	0.2	---	
541-73-1	1,3-Dichlorobenzene	0.2	---	
106-46-7	1,4-Dichlorobenzene	0.2	---	
107-02-8	Acrolein	1.0	---	
74-88-4	Methyl Iodide	1.0	---	
74-96-4	Bromoethane	0.2	---	
107-13-1	Acrylonitrile	1.0	---	
563-58-6	1,1-Dichloropropene	0.2	---	
74-95-3	Dibromomethane	0.2	---	
630-20-6	1,1,1,2-Tetrachloroethane	0.2	---	
96-12-8	1,2-Dibromo-3-chloropropane	1.0	---	
96-18-4	1,2,3-Trichloropropane	0.2	---	

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: SW-1**
 MATRIX SPIKE DUP

Lab Sample ID: MN46B
LIMS ID: 08-5481
Matrix: Water
Date Analyzed: 03/18/08 17:49

QC Report No: MN46-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
33760783.08001

CAS Number	Analyte	RL	Result	Q
110-57-6	trans-1,4-Dichloro-2-butene	1.0	---	
108-67-8	1,3,5-Trimethylbenzene	0.2	---	
95-63-6	1,2,4-Trimethylbenzene	0.2	---	
87-68-3	Hexachlorobutadiene	1.0	---	
106-93-4	Ethylene Dibromide	0.2	---	
74-97-5	Bromochloromethane	0.2	---	
594-20-7	2,2-Dichloropropane	0.2	---	
142-28-9	1,3-Dichloropropane	0.2	---	
98-82-8	Isopropylbenzene	0.2	---	
103-65-1	n-Propylbenzene	0.2	---	
108-86-1	Bromobenzene	0.2	---	
95-49-8	2-Chlorotoluene	0.2	---	
106-43-4	4-Chlorotoluene	0.2	---	
98-06-6	tert-Butylbenzene	0.2	---	
135-98-8	sec-Butylbenzene	0.2	---	
99-87-6	4-Isopropyltoluene	0.2	---	
104-51-8	n-Butylbenzene	0.2	---	
120-82-1	1,2,4-Trichlorobenzene	1.0	---	
91-20-3	Naphthalene	1.0	---	
87-61-6	1,2,3-Trichlorobenzene	1.0	---	

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	102%
d8-Toluene	99.4%
Bromofluorobenzene	98.8%
d4-1,2-Dichlorobenzene	99.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: SW-11**
Page 1 of 2 **SAMPLE**

Lab Sample ID: MN46C
LIMS ID: 08-5482
Matrix: Water
Data Release Authorized:
Reported: 03/19/08

QC Report No: MN46-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
33760783.08001
Date Sampled: 03/13/08
Date Received: 03/14/08

Instrument/Analyst: NT5/JZ
Date Analyzed: 03/18/08 15:39

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
74-87-3	Chloromethane	0.2	< 0.2	U
74-83-9	Bromomethane	0.2	< 0.2	U
75-01-4	Vinyl Chloride	0.2	< 0.2	U
75-00-3	Chloroethane	0.2	< 0.2	U
75-09-2	Methylene Chloride	0.5	< 0.5	U
67-64-1	**Acetone**	**1.0**	**5.9**	
75-15-0	Carbon Disulfide	0.2	< 0.2	U
75-35-4	1,1-Dichloroethene	0.2	< 0.2	U
75-34-3	1,1-Dichloroethane	0.2	< 0.2	U
156-60-5	trans-1,2-Dichloroethene	0.2	< 0.2	U
156-59-2	cis-1,2-Dichloroethene	0.2	< 0.2	U
67-66-3	Chloroform	0.2	< 0.2	U
107-06-2	1,2-Dichloroethane	0.2	< 0.2	U
78-93-3	2-Butanone	1.0	< 1.0	U
71-55-6	1,1,1-Trichloroethane	0.2	< 0.2	U
56-23-5	Carbon Tetrachloride	0.2	< 0.2	U
108-05-4	Vinyl Acetate	1.0	< 1.0	U
75-27-4	Bromodichloromethane	0.2	< 0.2	U
78-87-5	1,2-Dichloropropane	0.2	< 0.2	U
10061-01-5	cis-1,3-Dichloropropene	0.2	< 0.2	U
79-01-6	Trichloroethene	0.2	< 0.2	U
124-48-1	Dibromochloromethane	0.2	< 0.2	U
79-00-5	1,1,2-Trichloroethane	0.2	< 0.2	U
71-43-2	Benzene	0.2	< 0.2	U
10061-02-6	trans-1,3-Dichloropropene	0.2	< 0.2	U
110-75-8	2-Chloroethylvinylether	0.2	< 0.2	U
75-25-2	Bromoform	0.2	< 0.2	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	1.0	< 1.0	U
591-78-6	2-Hexanone	1.0	< 1.0	U
127-18-4	Tetrachloroethene	0.2	< 0.2	U
79-34-5	1,1,2,2-Tetrachloroethane	0.2	< 0.2	U
108-88-3	Toluene	0.2	< 0.2	U
108-90-7	Chlorobenzene	0.2	< 0.2	U
100-41-4	Ethylbenzene	0.2	< 0.2	U
100-42-5	Styrene	0.2	< 0.2	U
75-69-4	Trichlorofluoromethane	0.2	< 0.2	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.2	< 0.2	U
1330-20-7	m,p-Xylene	0.4	< 0.4	U
95-47-6	o-Xylene	0.2	< 0.2	U
95-50-1	1,2-Dichlorobenzene	0.2	< 0.2	U
541-73-1	1,3-Dichlorobenzene	0.2	< 0.2	U
106-46-7	1,4-Dichlorobenzene	0.2	< 0.2	U
107-02-8	Acrolein	1.0	< 1.0	U
74-88-4	Methyl Iodide	1.0	< 1.0	U
74-96-4	Bromoethane	0.2	< 0.2	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.2	< 0.2	U
74-95-3	Dibromomethane	0.2	< 0.2	U
630-20-6	1,1,1,2-Tetrachloroethane	0.2	< 0.2	U
96-12-8	1,2-Dibromo-3-chloropropane	1.0	< 1.0	U
96-18-4	1,2,3-Trichloropropane	0.2	< 0.2	U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: SW-11**
 SAMPLE

Lab Sample ID: MN46C
LIMS ID: 08-5482
Matrix: Water
Date Analyzed: 03/18/08 15:39

QC Report No: MN46-URS Corporation
Project: Kinder Morgan Laurel Station B'ham 33760783.08001

CAS Number	Analyte	RL	Result	Q
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.2	< 0.2	U
95-63-6	1,2,4-Trimethylbenzene	0.2	< 0.2	U
87-68-3	Hexachlorobutadiene	1.0	< 1.0	U
106-93-4	Ethylene Dibromide	0.2	< 0.2	U
74-97-5	Bromochloromethane	0.2	< 0.2	U
594-20-7	2,2-Dichloropropane	0.2	< 0.2	U
142-28-9	1,3-Dichloropropane	0.2	< 0.2	U
98-82-8	Isopropylbenzene	0.2	< 0.2	U
103-65-1	n-Propylbenzene	0.2	< 0.2	U
108-86-1	Bromobenzene	0.2	< 0.2	U
95-49-8	2-Chlorotoluene	0.2	< 0.2	U
106-43-4	4-Chlorotoluene	0.2	< 0.2	U
98-06-6	tert-Butylbenzene	0.2	< 0.2	U
135-98-8	sec-Butylbenzene	0.2	< 0.2	U
99-87-6	4-Isopropyltoluene	0.2	< 0.2	U
104-51-8	n-Butylbenzene	0.2	< 0.2	U
120-82-1	1,2,4-Trichlorobenzene	1.0	< 1.0	U
91-20-3	Naphthalene	1.0	< 1.0	U
87-61-6	1,2,3-Trichlorobenzene	1.0	< 1.0	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	121%
d8-Toluene	99.4%
Bromofluorobenzene	95.4%
d4-1,2-Dichlorobenzene	105%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: SW-2**
Page 1 of 2 **SAMPLE**

Lab Sample ID: MN46D
LIMS ID: 08-5483
Matrix: Water
Data Release Authorized:
Reported: 03/19/08

QC Report No: MN46-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
33760783.08001
Date Sampled: 03/13/08
Date Received: 03/14/08

Instrument/Analyst: NT5/JZ
Date Analyzed: 03/18/08 16:05

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
74-87-3	Chloromethane	0.2	< 0.2	U
74-83-9	Bromomethane	0.2	< 0.2	U
75-01-4	Vinyl Chloride	0.2	< 0.2	U
75-00-3	Chloroethane	0.2	< 0.2	U
75-09-2	Methylene Chloride	0.5	< 0.5	U
67-64-1	**Acetone**	**1.0**	**1.7**	
75-15-0	Carbon Disulfide	0.2	< 0.2	U
75-35-4	1,1-Dichloroethene	0.2	< 0.2	U
75-34-3	1,1-Dichloroethane	0.2	< 0.2	U
156-60-5	trans-1,2-Dichloroethene	0.2	< 0.2	U
156-59-2	cis-1,2-Dichloroethene	0.2	< 0.2	U
67-66-3	Chloroform	0.2	< 0.2	U
107-06-2	1,2-Dichloroethane	0.2	< 0.2	U
78-93-3	2-Butanone	1.0	< 1.0	U
71-55-6	1,1,1-Trichloroethane	0.2	< 0.2	U
56-23-5	Carbon Tetrachloride	0.2	< 0.2	U
108-05-4	Vinyl Acetate	1.0	< 1.0	U
75-27-4	Bromodichloromethane	0.2	< 0.2	U
78-87-5	1,2-Dichloropropane	0.2	< 0.2	U
10061-01-5	cis-1,3-Dichloropropene	0.2	< 0.2	U
79-01-6	Trichloroethene	0.2	< 0.2	U
124-48-1	Dibromochloromethane	0.2	< 0.2	U
79-00-5	1,1,2-Trichloroethane	0.2	< 0.2	U
71-43-2	Benzene	0.2	< 0.2	U
10061-02-6	trans-1,3-Dichloropropene	0.2	< 0.2	U
110-75-8	2-Chloroethylvinylether	0.2	< 0.2	U
75-25-2	Bromoform	0.2	< 0.2	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	1.0	< 1.0	U
591-78-6	2-Hexanone	1.0	< 1.0	U
127-18-4	Tetrachloroethene	0.2	< 0.2	U
79-34-5	1,1,2,2-Tetrachloroethane	0.2	< 0.2	U
108-88-3	Toluene	0.2	< 0.2	U
108-90-7	Chlorobenzene	0.2	< 0.2	U
100-41-4	Ethylbenzene	0.2	< 0.2	U
100-42-5	Styrene	0.2	< 0.2	U
75-69-4	Trichlorofluoromethane	0.2	< 0.2	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.2	< 0.2	U
1330-20-7	m,p-Xylene	0.4	< 0.4	U
95-47-6	o-Xylene	0.2	< 0.2	U
95-50-1	1,2-Dichlorobenzene	0.2	< 0.2	U
541-73-1	1,3-Dichlorobenzene	0.2	< 0.2	U
106-46-7	1,4-Dichlorobenzene	0.2	< 0.2	U
107-02-8	Acrolein	1.0	< 1.0	U
74-88-4	Methyl Iodide	1.0	< 1.0	U
74-96-4	Bromoethane	0.2	< 0.2	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.2	< 0.2	U
74-95-3	Dibromomethane	0.2	< 0.2	U
630-20-6	1,1,1,2-Tetrachloroethane	0.2	< 0.2	U
96-12-8	1,2-Dibromo-3-chloropropane	1.0	< 1.0	U
96-18-4	1,2,3-Trichloropropane	0.2	< 0.2	U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: SW-2**
 SAMPLE

Lab Sample ID: MN46D
LIMS ID: 08-5483
Matrix: Water
Date Analyzed: 03/18/08 16:05

QC Report No: MN46-URS Corporation
Project: Kinder Morgan Laurel Station B'ham 33760783.08001

CAS Number	Analyte	RL	Result	Q
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.2	< 0.2	U
95-63-6	1,2,4-Trimethylbenzene	0.2	< 0.2	U
87-68-3	Hexachlorobutadiene	1.0	< 1.0	U
106-93-4	Ethylene Dibromide	0.2	< 0.2	U
74-97-5	Bromochloromethane	0.2	< 0.2	U
594-20-7	2,2-Dichloropropane	0.2	< 0.2	U
142-28-9	1,3-Dichloropropane	0.2	< 0.2	U
98-82-8	Isopropylbenzene	0.2	< 0.2	U
103-65-1	n-Propylbenzene	0.2	< 0.2	U
108-86-1	Bromobenzene	0.2	< 0.2	U
95-49-8	2-Chlorotoluene	0.2	< 0.2	U
106-43-4	4-Chlorotoluene	0.2	< 0.2	U
98-06-6	tert-Butylbenzene	0.2	< 0.2	U
135-98-8	sec-Butylbenzene	0.2	< 0.2	U
99-87-6	4-Isopropyltoluene	0.2	< 0.2	U
104-51-8	n-Butylbenzene	0.2	< 0.2	U
120-82-1	1,2,4-Trichlorobenzene	1.0	< 1.0	U
91-20-3	Naphthalene	1.0	< 1.0	U
87-61-6	1,2,3-Trichlorobenzene	1.0	< 1.0	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	124%
d8-Toluene	104%
Bromofluorobenzene	93.6%
d4-1,2-Dichlorobenzene	106%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: Trip Blank**
Page 1 of 2 **SAMPLE**

Lab Sample ID: MN46E
LIMS ID: 08-5486
Matrix: Water
Data Release Authorized:
Reported: 03/19/08

QC Report No: MN46-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
33760783.08001
Date Sampled: 03/13/08
Date Received: 03/14/08

Instrument/Analyst: NT5/JZ
Date Analyzed: 03/18/08 13:04

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
74-87-3	Chloromethane	0.2	< 0.2	U
74-83-9	Bromomethane	0.2	< 0.2	U
75-01-4	Vinyl Chloride	0.2	< 0.2	U
75-00-3	Chloroethane	0.2	< 0.2	U
75-09-2	Methylene Chloride	0.5	< 0.5	U
67-64-1	**Acetone**	**1.0**	**1.5**	
75-15-0	**Carbon Disulfide**	**0.2**	**0.8**	
75-35-4	1,1-Dichloroethene	0.2	< 0.2	U
75-34-3	1,1-Dichloroethane	0.2	< 0.2	U
156-60-5	trans-1,2-Dichloroethene	0.2	< 0.2	U
156-59-2	cis-1,2-Dichloroethene	0.2	< 0.2	U
67-66-3	Chloroform	0.2	< 0.2	U
107-06-2	1,2-Dichloroethane	0.2	< 0.2	U
78-93-3	2-Butanone	1.0	< 1.0	U
71-55-6	1,1,1-Trichloroethane	0.2	< 0.2	U
56-23-5	Carbon Tetrachloride	0.2	< 0.2	U
108-05-4	Vinyl Acetate	1.0	< 1.0	U
75-27-4	Bromodichloromethane	0.2	< 0.2	U
78-87-5	1,2-Dichloropropane	0.2	< 0.2	U
10061-01-5	cis-1,3-Dichloropropene	0.2	< 0.2	U
79-01-6	Trichloroethene	0.2	< 0.2	U
124-48-1	Dibromochloromethane	0.2	< 0.2	U
79-00-5	1,1,2-Trichloroethane	0.2	< 0.2	U
71-43-2	Benzene	0.2	< 0.2	U
10061-02-6	trans-1,3-Dichloropropene	0.2	< 0.2	U
110-75-8	2-Chloroethylvinylether	0.2	< 0.2	U
75-25-2	Bromoform	0.2	< 0.2	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	1.0	< 1.0	U
591-78-6	2-Hexanone	1.0	< 1.0	U
127-18-4	Tetrachloroethene	0.2	< 0.2	U
79-34-5	1,1,2,2-Tetrachloroethane	0.2	< 0.2	U
108-88-3	Toluene	0.2	< 0.2	U
108-90-7	Chlorobenzene	0.2	< 0.2	U
100-41-4	Ethylbenzene	0.2	< 0.2	U
100-42-5	Styrene	0.2	< 0.2	U
75-69-4	Trichlorofluoromethane	0.2	< 0.2	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.2	< 0.2	U
1330-20-7	m,p-Xylene	0.4	< 0.4	U
95-47-6	o-Xylene	0.2	< 0.2	U
95-50-1	1,2-Dichlorobenzene	0.2	< 0.2	U
541-73-1	1,3-Dichlorobenzene	0.2	< 0.2	U
106-46-7	1,4-Dichlorobenzene	0.2	< 0.2	U
107-02-8	Acrolein	1.0	< 1.0	U
74-88-4	Methyl Iodide	1.0	< 1.0	U
74-96-4	Bromoethane	0.2	< 0.2	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.2	< 0.2	U
74-95-3	Dibromomethane	0.2	< 0.2	U
630-20-6	1,1,1,2-Tetrachloroethane	0.2	< 0.2	U
96-12-8	1,2-Dibromo-3-chloropropane	1.0	< 1.0	U
96-18-4	1,2,3-Trichloropropane	0.2	< 0.2	U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: Trip Blank**
 SAMPLE

Lab Sample ID: MN46E
LIMS ID: 08-5486
Matrix: Water
Date Analyzed: 03/18/08 13:04

QC Report No: MN46-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
33760783.08001

CAS Number	Analyte	RL	Result	Q
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.2	< 0.2	U
95-63-6	1,2,4-Trimethylbenzene	0.2	< 0.2	U
87-68-3	Hexachlorobutadiene	1.0	< 1.0	U
106-93-4	Ethylene Dibromide	0.2	< 0.2	U
74-97-5	Bromochloromethane	0.2	< 0.2	U
594-20-7	2,2-Dichloropropane	0.2	< 0.2	U
142-28-9	1,3-Dichloropropane	0.2	< 0.2	U
98-82-8	Isopropylbenzene	0.2	< 0.2	U
103-65-1	n-Propylbenzene	0.2	< 0.2	U
108-86-1	Bromobenzene	0.2	< 0.2	U
95-49-8	2-Chlorotoluene	0.2	< 0.2	U
106-43-4	4-Chlorotoluene	0.2	< 0.2	U
98-06-6	tert-Butylbenzene	0.2	< 0.2	U
135-98-8	sec-Butylbenzene	0.2	< 0.2	U
99-87-6	4-Isopropyltoluene	0.2	< 0.2	U
104-51-8	n-Butylbenzene	0.2	< 0.2	U
120-82-1	1,2,4-Trichlorobenzene	1.0	< 1.0	U
91-20-3	Naphthalene	1.0	< 1.0	U
87-61-6	1,2,3-Trichlorobenzene	1.0	< 1.0	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	114%
d8-Toluene	103%
Bromofluorobenzene	93.8%
d4-1,2-Dichlorobenzene	103%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: MB-031808**
 METHOD BLANK

Lab Sample ID: MB-031808
LIMS ID: 08-5481
Matrix: Water
Data Release Authorized:
Reported: 03/19/08

QC Report No: MN46-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
33760783.08001
Date Sampled: NA
Date Received: NA

Instrument/Analyst: NT5/JZ
Date Analyzed: 03/18/08 12:38

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
74-87-3	Chloromethane	0.2	< 0.2	U
74-83-9	Bromomethane	0.2	< 0.2	U
75-01-4	Vinyl Chloride	0.2	< 0.2	U
75-00-3	Chloroethane	0.2	< 0.2	U
75-09-2	Methylene Chloride	0.5	< 0.5	U
67-64-1	Acetone	1.0	< 1.0	U
75-15-0	Carbon Disulfide	0.2	< 0.2	U
75-35-4	1,1-Dichloroethene	0.2	< 0.2	U
75-34-3	1,1-Dichloroethane	0.2	< 0.2	U
156-60-5	trans-1,2-Dichloroethene	0.2	< 0.2	U
156-59-2	cis-1,2-Dichloroethene	0.2	< 0.2	U
67-66-3	Chloroform	0.2	< 0.2	U
107-06-2	1,2-Dichloroethane	0.2	< 0.2	U
78-93-3	2-Butanone	1.0	< 1.0	U
71-55-6	1,1,1-Trichloroethane	0.2	< 0.2	U
56-23-5	Carbon Tetrachloride	0.2	< 0.2	U
108-05-4	Vinyl Acetate	1.0	< 1.0	U
75-27-4	Bromodichloromethane	0.2	< 0.2	U
78-87-5	1,2-Dichloropropane	0.2	< 0.2	U
10061-01-5	cis-1,3-Dichloropropene	0.2	< 0.2	U
79-01-6	Trichloroethene	0.2	< 0.2	U
124-48-1	Dibromochloromethane	0.2	< 0.2	U
79-00-5	1,1,2-Trichloroethane	0.2	< 0.2	U
71-43-2	Benzene	0.2	< 0.2	U
10061-02-6	trans-1,3-Dichloropropene	0.2	< 0.2	U
110-75-8	2-Chloroethylvinylether	0.2	< 0.2	U
75-25-2	Bromoform	0.2	< 0.2	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	1.0	< 1.0	U
591-78-6	2-Hexanone	1.0	< 1.0	U
127-18-4	Tetrachloroethene	0.2	< 0.2	U
79-34-5	1,1,2,2-Tetrachloroethane	0.2	< 0.2	U
108-88-3	Toluene	0.2	< 0.2	U
108-90-7	Chlorobenzene	0.2	< 0.2	U
100-41-4	Ethylbenzene	0.2	< 0.2	U
100-42-5	Styrene	0.2	< 0.2	U
75-69-4	Trichlorofluoromethane	0.2	< 0.2	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.2	< 0.2	U
1330-20-7	m,p-Xylene	0.4	< 0.4	U
95-47-6	o-Xylene	0.2	< 0.2	U
95-50-1	1,2-Dichlorobenzene	0.2	< 0.2	U
541-73-1	1,3-Dichlorobenzene	0.2	< 0.2	U
106-46-7	1,4-Dichlorobenzene	0.2	< 0.2	U
107-02-8	Acrolein	1.0	< 1.0	U
74-88-4	Methyl Iodide	1.0	< 1.0	U
74-96-4	Bromoethane	0.2	< 0.2	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.2	< 0.2	U
74-95-3	Dibromomethane	0.2	< 0.2	U
630-20-6	1,1,1,2-Tetrachloroethane	0.2	< 0.2	U
96-12-8	1,2-Dibromo-3-chloropropane	1.0	< 1.0	U
96-18-4	1,2,3-Trichloropropane	0.2	< 0.2	U

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: MB-031808**
METHOD BLANK

Lab Sample ID: MB-031808
LIMS ID: 08-5481
Matrix: Water
Date Analyzed: 03/18/08 12:38

QC Report No: MN46-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
33760783.08001

CAS Number	Analyte	RL	Result	Q
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.2	< 0.2	U
95-63-6	1,2,4-Trimethylbenzene	0.2	< 0.2	U
87-68-3	Hexachlorobutadiene	1.0	< 1.0	U
106-93-4	Ethylene Dibromide	0.2	< 0.2	U
74-97-5	Bromochloromethane	0.2	< 0.2	U
594-20-7	2,2-Dichloropropane	0.2	< 0.2	U
142-28-9	1,3-Dichloropropane	0.2	< 0.2	U
98-82-8	Isopropylbenzene	0.2	< 0.2	U
103-65-1	n-Propylbenzene	0.2	< 0.2	U
108-86-1	Bromobenzene	0.2	< 0.2	U
95-49-8	2-Chlorotoluene	0.2	< 0.2	U
106-43-4	4-Chlorotoluene	0.2	< 0.2	U
98-06-6	tert-Butylbenzene	0.2	< 0.2	U
135-98-8	sec-Butylbenzene	0.2	< 0.2	U
99-87-6	4-Isopropyltoluene	0.2	< 0.2	U
104-51-8	n-Butylbenzene	0.2	< 0.2	U
120-82-1	1,2,4-Trichlorobenzene	1.0	< 1.0	U
91-20-3	Naphthalene	1.0	< 1.0	U
87-61-6	1,2,3-Trichlorobenzene	1.0	< 1.0	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	114%
d8-Toluene	104%
Bromofluorobenzene	98.4%
d4-1,2-Dichlorobenzene	101%

ANALYTICAL RESOURCES INCORPORATED

VOA SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: MN46-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
33760783.08001

ARI ID	Client ID	PV	DCE	TOL	BFB	DCB	TOT OUT
MN46A	SW-4	10	117%	104%	95.4%	104%	0
MB-031808	Method Blank	10	114%	104%	98.4%	101%	0
LCS-031808	Lab Control	10	110%	101%	101%	100%	0
LCSD-031808	Lab Control Dup	10	109%	101%	101%	99.7%	0
MN46B	SW-1	10	128%	101%	94.1%	106%	0
MN46BMS	SW-1	10	98.8%	98.5%	99.2%	98.8%	0
MN46BMSD	SW-1	10	102%	99.4%	98.8%	99.8%	0
MN46C	SW-11	10	121%	99.4%	95.4%	105%	0
MN46D	SW-2	10	124%	104%	93.6%	106%	0
MN46E	Trip Blank	10	114%	103%	93.8%	103%	0

SW8260B	LCS/MB LIMITS	QC LIMITS
(DCE) = d4-1,2-Dichloroethane	70-130	70-130
(TOL) = d8-Toluene	70-130	70-130
(BFB) = Bromofluorobenzene	70-130	70-130
(DCB) = d4-1,2-Dichlorobenzene	70-130	70-130

Prep Method: SW5030B
Log Number Range: 08-5480 to 08-5486

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: LCS-031808**
 LAB CONTROL SAMPLE

Lab Sample ID: LCS-031808
LIMS ID: 08-5481
Matrix: Water
Data Release Authorized:
Reported: 03/19/08

QC Report No: MN46-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
33760783.08001
Date Sampled: NA
Date Received: NA

Instrument/Analyst LCS: NT5/JZ
LCSD: NT5/JZ
Date Analyzed LCS: 03/18/08 11:29
LCSD: 03/18/08 12:03

Sample Amount LCS: 10.0 mL
LCSD: 10.0 mL
Purge Volume LCS: 10.0 mL
LCSD: 10.0 mL

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Chloromethane	9.9	10.0	99.0%	9.2	10.0	92.0%	7.3%
Bromomethane	10.0	10.0	100%	9.4	10.0	94.0%	6.2%
Vinyl Chloride	10.2	10.0	102%	9.8	10.0	98.0%	4.0%
Chloroethane	13.7	10.0	137%	12.7	10.0	127%	7.6%
Methylene Chloride	9.8	10.0	98.0%	9.5	10.0	95.0%	3.1%
Acetone	53.2	50.0	106%	51.7	50.0	103%	2.9%
Carbon Disulfide	10.8	10.0	108%	10.2	10.0	102%	5.7%
1,1-Dichloroethene	10.6	10.0	106%	10.2	10.0	102%	3.8%
1,1-Dichloroethane	10.6	10.0	106%	10.0	10.0	100%	5.8%
trans-1,2-Dichloroethene	10.4	10.0	104%	10.0	10.0	100%	3.9%
cis-1,2-Dichloroethene	10.2	10.0	102%	9.8	10.0	98.0%	4.0%
Chloroform	10.5	10.0	105%	10.0	10.0	100%	4.9%
1,2-Dichloroethane	9.8	10.0	98.0%	9.4	10.0	94.0%	4.2%
2-Butanone	52.9	50.0	106%	51.3	50.0	103%	3.1%
1,1,1-Trichloroethane	10.8	10.0	108%	10.3	10.0	103%	4.7%
Carbon Tetrachloride	11.2	10.0	112%	10.5	10.0	105%	6.5%
Vinyl Acetate	10.7	10.0	107%	10.7	10.0	107%	0.0%
Bromodichloromethane	10.2	10.0	102%	9.8	10.0	98.0%	4.0%
1,2-Dichloropropane	9.9	10.0	99.0%	9.3	10.0	93.0%	6.2%
cis-1,3-Dichloropropene	10.2	10.0	102%	9.8	10.0	98.0%	4.0%
Trichloroethene	10.0	10.0	100%	9.4	10.0	94.0%	6.2%
Dibromochloromethane	10.7	10.0	107%	10.2	10.0	102%	4.8%
1,1,2-Trichloroethane	9.7	10.0	97.0%	9.4	10.0	94.0%	3.1%
Benzene	10.1	10.0	101%	9.6	10.0	96.0%	5.1%
trans-1,3-Dichloropropene	10.5	10.0	105%	10.0	10.0	100%	4.9%
2-Chloroethylvinylether	10.2	10.0	102%	9.6	10.0	96.0%	6.1%
Bromoform	9.0	10.0	90.0%	8.6	10.0	86.0%	4.5%
4-Methyl-2-Pentanone (MIBK)	49.9	50.0	99.8%	49.7	50.0	99.4%	0.4%
2-Hexanone	50.2	50.0	100%	48.8	50.0	97.6%	2.8%
Tetrachloroethene	9.2	10.0	92.0%	8.7	10.0	87.0%	5.6%
1,1,2,2-Tetrachloroethane	10.2	10.0	102%	9.7	10.0	97.0%	5.0%
Toluene	10.0	10.0	100%	9.5	10.0	95.0%	5.1%
Chlorobenzene	9.8	10.0	98.0%	9.3	10.0	93.0%	5.2%
Ethylbenzene	10.4	10.0	104%	9.9	10.0	99.0%	4.9%
Styrene	10.2	10.0	102%	9.7	10.0	97.0%	5.0%
Trichlorofluoromethane	11.8	10.0	118%	11.3	10.0	113%	4.3%
1,1,2-Trichloro-1,2,2-trifluoroetha	11.0	10.0	110%	10.3	10.0	103%	6.6%
m,p-Xylene	20.5	20.0	102%	19.3	20.0	96.5%	6.0%
o-Xylene	10.1	10.0	101%	9.6	10.0	96.0%	5.1%
1,2-Dichlorobenzene	9.4	10.0	94.0%	8.9	10.0	89.0%	5.5%
1,3-Dichlorobenzene	9.7	10.0	97.0%	9.2	10.0	92.0%	5.3%
1,4-Dichlorobenzene	9.5	10.0	95.0%	9.1	10.0	91.0%	4.3%
Acrolein	45.9	50.0	91.8%	46.1	50.0	92.2%	0.4%
Methyl Iodide	9.8	10.0	98.0%	9.6	10.0	96.0%	2.1%
Bromoethane	10.5	10.0	105%	10.1	10.0	101%	3.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: LCS-031808**
 LAB CONTROL SAMPLE

Lab Sample ID: LCS-031808 QC Report No: MN46-URS Corporation
LIMS ID: 08-5481 Project: Kinder Morgan Laurel Station B'ham
Matrix: Water 33760783.08001

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Acrylonitrile	10.1	10.0	101%	10.1	10.0	101%	0.0%
1,1-Dichloropropene	10.4	10.0	104%	9.8	10.0	98.0%	5.9%
Dibromomethane	9.8	10.0	98.0%	9.4	10.0	94.0%	4.2%
1,1,1,2-Tetrachloroethane	10.7	10.0	107%	10.1	10.0	101%	5.8%
1,2-Dibromo-3-chloropropane	10.4	10.0	104%	10.4	10.0	104%	0.0%
1,2,3-Trichloropropane	9.3	10.0	93.0%	9.3	10.0	93.0%	0.0%
trans-1,4-Dichloro-2-butene	10.6	10.0	106%	10.0	10.0	100%	5.8%
1,3,5-Trimethylbenzene	10.6	10.0	106%	10.0	10.0	100%	5.8%
1,2,4-Trimethylbenzene	10.7	10.0	107%	10.2	10.0	102%	4.8%
Hexachlorobutadiene	9.1	10.0	91.0%	8.4	10.0	84.0%	8.0%
Ethylene Dibromide	9.7	10.0	97.0%	9.6	10.0	96.0%	1.0%
Bromochloromethane	9.9	10.0	99.0%	9.6	10.0	96.0%	3.1%
2,2-Dichloropropane	11.3	10.0	113%	10.7	10.0	107%	5.5%
1,3-Dichloropropane	9.8	10.0	98.0%	9.4	10.0	94.0%	4.2%
Isopropylbenzene	10.5	10.0	105%	9.9	10.0	99.0%	5.9%
n-Propylbenzene	10.6	10.0	106%	10.0	10.0	100%	5.8%
Bromobenzene	9.2	10.0	92.0%	8.7	10.0	87.0%	5.6%
2-Chlorotoluene	10.0	10.0	100%	9.5	10.0	95.0%	5.1%
4-Chlorotoluene	10.2	10.0	102%	9.7	10.0	97.0%	5.0%
tert-Butylbenzene	10.4	10.0	104%	9.8	10.0	98.0%	5.9%
sec-Butylbenzene	10.7	10.0	107%	10.2	10.0	102%	4.8%
4-Isopropyltoluene	10.8	10.0	108%	10.2	10.0	102%	5.7%
n-Butylbenzene	11.0	10.0	110%	10.3	10.0	103%	6.6%
1,2,4-Trichlorobenzene	9.0	10.0	90.0%	8.5	10.0	85.0%	5.7%
Naphthalene	9.9	10.0	99.0%	9.5	10.0	95.0%	4.1%
1,2,3-Trichlorobenzene	8.9	10.0	89.0%	8.7	10.0	87.0%	2.3%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	110%	109%
d8-Toluene	101%	101%
Bromofluorobenzene	101%	101%
d4-1,2-Dichlorobenzene	100%	99.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: SW-1**
 MATRIX SPIKE

Lab Sample ID: MN46B
LIMS ID: 08-5481
Matrix: Water
Data Release Authorized:
Reported: 03/19/08

QC Report No: MN46-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
33760783.08001
Date Sampled: 03/13/08
Date Received: 03/14/08

Instrument/Analyst MS: NT5/JZ
MSD: NT5/JZ
Date Analyzed MS: 03/18/08 17:23
MSD: 03/18/08 17:49

Sample Amount MS: 10.0 mL
MSD: 10.0 mL
Purge Volume MS: 10.0 mL
MSD: 10.0 mL

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Chloromethane	< 0.2 U	8.3	10.0	83.0%	9.0	10.0	90.0%	8.1%
Bromomethane	< 0.2 U	9.3	10.0	93.0%	10.3	10.0	103%	10.2%
Vinyl Chloride	< 0.2 U	8.8	10.0	88.0%	9.5	10.0	95.0%	7.7%
Chloroethane	< 0.2 U	11.6	10.0	116%	12.5	10.0	125%	7.5%
Methylene Chloride	< 0.5 U	8.7	10.0	87.0%	9.5	10.0	95.0%	8.8%
Acetone	7.5	45.6	50.0	76.2%	49.1	50.0	83.2%	7.4%
Carbon Disulfide	< 0.2 U	9.3	10.0	93.0%	10.1	10.0	101%	8.2%
1,1-Dichloroethene	< 0.2 U	9.4	10.0	94.0%	10.2	10.0	102%	8.2%
1,1-Dichloroethane	< 0.2 U	9.2	10.0	92.0%	9.9	10.0	99.0%	7.3%
trans-1,2-Dichloroethene	< 0.2 U	9.3	10.0	93.0%	9.9	10.0	99.0%	6.2%
cis-1,2-Dichloroethene	< 0.2 U	9.2	10.0	92.0%	10.0	10.0	100%	8.3%
Chloroform	0.2	9.4	10.0	92.0%	10.1	10.0	99.0%	7.2%
1,2-Dichloroethane	< 0.2 U	8.7	10.0	87.0%	9.3	10.0	93.0%	6.7%
2-Butanone	< 1.0 U	46.5	50.0	93.0%	49.8	50.0	99.6%	6.9%
1,1,1-Trichloroethane	< 0.2 U	9.6	10.0	96.0%	10.4	10.0	104%	8.0%
Carbon Tetrachloride	< 0.2 U	10.3	10.0	103%	11.0	10.0	110%	6.6%
Vinyl Acetate	< 1.0 U	8.9	10.0	89.0%	9.5	10.0	95.0%	6.5%
Bromodichloromethane	< 0.2 U	9.2	10.0	92.0%	9.8	10.0	98.0%	6.3%
1,2-Dichloropropane	< 0.2 U	8.7	10.0	87.0%	9.3	10.0	93.0%	6.7%
cis-1,3-Dichloropropene	< 0.2 U	8.8	10.0	88.0%	9.4	10.0	94.0%	6.6%
Trichloroethene	< 0.2 U	9.3	10.0	93.0%	9.9	10.0	99.0%	6.2%
Dibromochloromethane	< 0.2 U	9.7	10.0	97.0%	10.2	10.0	102%	5.0%
1,1,2-Trichloroethane	< 0.2 U	9.0	10.0	90.0%	9.7	10.0	97.0%	7.5%
Benzene	< 0.2 U	9.2	10.0	92.0%	9.7	10.0	97.0%	5.3%
trans-1,3-Dichloropropene	< 0.2 U	9.2	10.0	92.0%	10.0	10.0	100%	8.3%
2-Chloroethylvinylether	< 0.2 U	7.7	10.0	77.0%	7.9	10.0	79.0%	2.6%
Bromoform	< 0.2 U	7.8	10.0	78.0%	8.2	10.0	82.0%	5.0%
4-Methyl-2-Pentanone (MIBK)	< 1.0 U	44.5	50.0	89.0%	47.3	50.0	94.6%	6.1%
2-Hexanone	< 1.0 U	43.7	50.0	87.4%	46.0	50.0	92.0%	5.1%
Tetrachloroethene	< 0.2 U	8.9	10.0	89.0%	9.4	10.0	94.0%	5.5%
1,1,2,2-Tetrachloroethane	< 0.2 U	9.2	10.0	92.0%	9.6	10.0	96.0%	4.3%
Toluene	< 0.2 U	9.1	10.0	91.0%	9.6	10.0	96.0%	5.3%
Chlorobenzene	< 0.2 U	9.2	10.0	92.0%	9.6	10.0	96.0%	4.3%
Ethylbenzene	< 0.2 U	9.4	10.0	94.0%	9.9	10.0	99.0%	5.2%
Styrene	< 0.2 U	8.2	10.0	82.0%	8.5	10.0	85.0%	3.6%
Trichlorofluoromethane	< 0.2 U	10.8	10.0	108%	11.4	10.0	114%	5.4%
1,1,2-Trichloro-1,2,2-trifl	< 0.2 U	9.8	10.0	98.0%	10.6	10.0	106%	7.8%
m,p-Xylene	< 0.4 U	18.3	20.0	91.5%	19.2	20.0	96.0%	4.8%
o-Xylene	< 0.2 U	9.1	10.0	91.0%	9.4	10.0	94.0%	3.2%
1,2-Dichlorobenzene	< 0.2 U	8.7	10.0	87.0%	9.3	10.0	93.0%	6.7%
1,3-Dichlorobenzene	< 0.2 U	9.0	10.0	90.0%	9.6	10.0	96.0%	6.5%
1,4-Dichlorobenzene	< 0.2 U	8.8	10.0	88.0%	9.4	10.0	94.0%	6.6%
Acrolein	< 1.0 U	40.2	50.0	80.4%	44.5	50.0	89.0%	10.2%
Methyl Iodide	< 1.0 U	9.9	10.0	99.0%	10.8	10.0	108%	8.7%
Bromoethane	< 0.2 U	9.4	10.0	94.0%	10.1	10.0	101%	7.2%
Acrylonitrile	< 1.0 U	8.4	10.0	84.0%	9.6	10.0	96.0%	13.3%
1,1-Dichloropropene	< 0.2 U	9.3	10.0	93.0%	9.8	10.0	98.0%	5.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: SW-1**
 MATRIX SPIKE

Lab Sample ID: MN46B
LIMS ID: 08-5481
Matrix: Water

QC Report No: MN46-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
33760783.08001

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Dibromomethane	< 0.2 U	9.2	10.0	92.0%	9.6	10.0	96.0%	4.3%
1,1,1,2-Tetrachloroethane	< 0.2 U	9.9	10.0	99.0%	10.7	10.0	107%	7.8%
1,2-Dibromo-3-chloropropane	< 1.0 U	9.3	10.0	93.0%	9.9	10.0	99.0%	6.2%
1,2,3-Trichloropropane	< 0.2 U	8.6	10.0	86.0%	9.5	10.0	95.0%	9.9%
trans-1,4-Dichloro-2-butene	< 1.0 U	8.8	10.0	88.0%	9.4	10.0	94.0%	6.6%
1,3,5-Trimethylbenzene	< 0.2 U	8.7	10.0	87.0%	8.8	10.0	88.0%	1.1%
1,2,4-Trimethylbenzene	< 0.2 U	9.1	10.0	91.0%	9.6	10.0	96.0%	5.3%
Hexachlorobutadiene	< 1.0 U	8.3	10.0	83.0%	8.8	10.0	88.0%	5.8%
Ethylene Dibromide	< 0.2 U	9.1	10.0	91.0%	9.6	10.0	96.0%	5.3%
Bromochloromethane	< 0.2 U	8.8	10.0	88.0%	9.6	10.0	96.0%	8.7%
2,2-Dichloropropane	< 0.2 U	9.8	10.0	98.0%	10.6	10.0	106%	7.8%
1,3-Dichloropropane	< 0.2 U	9.0	10.0	90.0%	9.4	10.0	94.0%	4.3%
Isopropylbenzene	< 0.2 U	9.4	10.0	94.0%	9.9	10.0	99.0%	5.2%
n-Propylbenzene	< 0.2 U	9.4	10.0	94.0%	9.8	10.0	98.0%	4.2%
Bromobenzene	< 0.2 U	8.6	10.0	86.0%	9.2	10.0	92.0%	6.7%
2-Chlorotoluene	< 0.2 U	9.0	10.0	90.0%	9.5	10.0	95.0%	5.4%
4-Chlorotoluene	< 0.2 U	9.2	10.0	92.0%	9.6	10.0	96.0%	4.3%
tert-Butylbenzene	< 0.2 U	9.5	10.0	95.0%	10.1	10.0	101%	6.1%
sec-Butylbenzene	< 0.2 U	9.6	10.0	96.0%	10.2	10.0	102%	6.1%
4-Isopropyltoluene	< 0.2 U	9.6	10.0	96.0%	10.2	10.0	102%	6.1%
n-Butylbenzene	< 0.2 U	9.6	10.0	96.0%	10.1	10.0	101%	5.1%
1,2,4-Trichlorobenzene	< 1.0 U	8.4	10.0	84.0%	9.0	10.0	90.0%	6.9%
Naphthalene	< 1.0 U	9.1	10.0	91.0%	9.7	10.0	97.0%	6.4%
1,2,3-Trichlorobenzene	< 1.0 U	8.5	10.0	85.0%	9.0	10.0	90.0%	5.7%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS **Sample ID: SW-4**
Page 1 of 1 **SAMPLE**

Lab Sample ID: MN46A
LIMS ID: 08-5480
Matrix: Water
Data Release Authorized:
Reported: 03/27/08

QC Report No: MN46-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
Event: 33760783.08001
Date Sampled: 03/13/08
Date Received: 03/14/08

Date Extracted: 03/20/08
Date Analyzed: 03/27/08 12:41
Instrument/Analyst: NT2/VTS

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	**Naphthalene**	**0.010**	**0.012**
91-57-6	2-Methylnaphthalene	0.010	< 0.010 U
90-12-0	1-Methylnaphthalene	0.010	< 0.010 U
208-96-8	Acenaphthylene	0.010	< 0.010 U
83-32-9	Acenaphthene	0.010	< 0.010 U
86-73-7	Fluorene	0.010	< 0.010 U
85-01-8	Phenanthrene	0.010	< 0.010 U
120-12-7	Anthracene	0.010	< 0.010 U
206-44-0	Fluoranthene	0.010	< 0.010 U
129-00-0	Pyrene	0.010	< 0.010 U
56-55-3	Benzo(a)anthracene	0.010	< 0.010 U
218-01-9	Chrysene	0.010	< 0.010 U
205-99-2	Benzo(b)fluoranthene	0.010	< 0.010 U
207-08-9	Benzo(k)fluoranthene	0.010	< 0.010 U
50-32-8	Benzo(a)pyrene	0.010	< 0.010 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.010	< 0.010 U
53-70-3	Dibenz(a,h)anthracene	0.010	< 0.010 U
191-24-2	Benzo(g,h,i)perylene	0.010	< 0.010 U
132-64-9	Dibenzofuran	0.010	< 0.010 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	52.7%
d14-Dibenzo(a,h)anthracene	43.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS **Sample ID: SW-1**
Page 1 of 1 **SAMPLE**

Lab Sample ID: MN46B
LIMS ID: 08-5481
Matrix: Water
Data Release Authorized:
Reported: 03/27/08

QC Report No: MN46-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
Event: 33760783.08001
Date Sampled: 03/13/08
Date Received: 03/14/08

Date Extracted: 03/20/08
Date Analyzed: 03/27/08 13:09
Instrument/Analyst: NT2/VTS

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	0.010	< 0.010 U
91-57-6	**2-Methylnaphthalene**	**0.010**	**0.027**
90-12-0	**1-Methylnaphthalene**	**0.010**	**0.023**
208-96-8	Acenaphthylene	0.010	< 0.010 U
83-32-9	Acenaphthene	0.010	< 0.010 U
86-73-7	Fluorene	0.010	< 0.010 U
85-01-8	Phenanthrene	0.010	< 0.010 U
120-12-7	Anthracene	0.010	< 0.010 U
206-44-0	Fluoranthene	0.010	< 0.010 U
129-00-0	Pyrene	0.010	< 0.010 U
56-55-3	Benzo(a)anthracene	0.010	< 0.010 U
218-01-9	Chrysene	0.010	< 0.010 U
205-99-2	Benzo(b)fluoranthene	0.010	< 0.010 U
207-08-9	Benzo(k)fluoranthene	0.010	< 0.010 U
50-32-8	Benzo(a)pyrene	0.010	< 0.010 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.010	< 0.010 U
53-70-3	Dibenz(a,h)anthracene	0.010	< 0.010 U
191-24-2	Benzo(g,h,i)perylene	0.010	< 0.010 U
132-64-9	Dibenzofuran	0.010	< 0.010 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	64.0%
d14-Dibenzo(a,h)anthracene	29.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS **Sample ID: SW-1**
Page 1 of 1 **MATRIX SPIKE**

Lab Sample ID: MN46B
LIMS ID: 08-5481
Matrix: Water
Data Release Authorized:
Reported: 03/27/08

QC Report No: MN46-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
Event: 33760783.08001
Date Sampled: 03/13/08
Date Received: 03/14/08

Date Extracted: 03/20/08
Date Analyzed: 03/27/08 13:38
Instrument/Analyst: NT2/VTS

Sample Amount: 460 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	0.011	---
91-57-6	2-Methylnaphthalene	0.011	---
90-12-0	1-Methylnaphthalene	0.011	---
208-96-8	Acenaphthylene	0.011	---
83-32-9	Acenaphthene	0.011	---
86-73-7	Fluorene	0.011	---
85-01-8	Phenanthrene	0.011	---
120-12-7	Anthracene	0.011	---
206-44-0	Fluoranthene	0.011	---
129-00-0	Pyrene	0.011	---
56-55-3	Benzo(a)anthracene	0.011	---
218-01-9	Chrysene	0.011	---
205-99-2	Benzo(b)fluoranthene	0.011	---
207-08-9	Benzo(k)fluoranthene	0.011	---
50-32-8	Benzo(a)pyrene	0.011	---
193-39-5	Indeno(1,2,3-cd)pyrene	0.011	---
53-70-3	Dibenz(a,h)anthracene	0.011	---
191-24-2	Benzo(g,h,i)perylene	0.011	---
132-64-9	Dibenzofuran	0.011	---

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	58.0%
d14-Dibenzo(a,h)anthracene	28.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS **Sample ID: SW-1**
Page 1 of 1 **MATRIX SPIKE DUPLICATE**

Lab Sample ID: MN46B
LIMS ID: 08-5481
Matrix: Water
Data Release Authorized:
Reported: 03/27/08

QC Report No: MN46-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
Event: 33760783.08001
Date Sampled: 03/13/08
Date Received: 03/14/08

Date Extracted: 03/20/08
Date Analyzed: 03/27/08 14:07
Instrument/Analyst: NT2/VTS

Sample Amount: 460 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	0.011	---
91-57-6	2-Methylnaphthalene	0.011	---
90-12-0	1-Methylnaphthalene	0.011	---
208-96-8	Acenaphthylene	0.011	---
83-32-9	Acenaphthene	0.011	---
86-73-7	Fluorene	0.011	---
85-01-8	Phenanthrene	0.011	---
120-12-7	Anthracene	0.011	---
206-44-0	Fluoranthene	0.011	---
129-00-0	Pyrene	0.011	---
56-55-3	Benzo(a)anthracene	0.011	---
218-01-9	Chrysene	0.011	---
205-99-2	Benzo(b)fluoranthene	0.011	---
207-08-9	Benzo(k)fluoranthene	0.011	---
50-32-8	Benzo(a)pyrene	0.011	---
193-39-5	Indeno(1,2,3-cd)pyrene	0.011	---
53-70-3	Dibenz(a,h)anthracene	0.011	---
191-24-2	Benzo(g,h,i)perylene	0.011	---
132-64-9	Dibenzofuran	0.011	---

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	60.7%
d14-Dibenzo(a,h)anthracene	31.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS **Sample ID: SW-11**
Page 1 of 1 **SAMPLE**

Lab Sample ID: MN46C
LIMS ID: 08-5482
Matrix: Water
Data Release Authorized:
Reported: 03/27/08

QC Report No: MN46-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
Event: 33760783.08001
Date Sampled: 03/13/08
Date Received: 03/14/08

Date Extracted: 03/20/08
Date Analyzed: 03/27/08 15:04
Instrument/Analyst: NT2/VTS

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	0.010	< 0.010 U
91-57-6	**2-Methylnaphthalene**	**0.010**	**0.013**
90-12-0	**1-Methylnaphthalene**	**0.010**	**0.011**
208-96-8	Acenaphthylene	0.010	< 0.010 U
83-32-9	Acenaphthene	0.010	< 0.010 U
86-73-7	Fluorene	0.010	< 0.010 U
85-01-8	Phenanthrene	0.010	< 0.010 U
120-12-7	Anthracene	0.010	< 0.010 U
206-44-0	Fluoranthene	0.010	< 0.010 U
129-00-0	Pyrene	0.010	< 0.010 U
56-55-3	Benzo(a)anthracene	0.010	< 0.010 U
218-01-9	Chrysene	0.010	< 0.010 U
205-99-2	Benzo(b)fluoranthene	0.010	< 0.010 U
207-08-9	Benzo(k)fluoranthene	0.010	< 0.010 U
50-32-8	Benzo(a)pyrene	0.010	< 0.010 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.010	< 0.010 U
53-70-3	Dibenz(a,h)anthracene	0.010	< 0.010 U
191-24-2	Benzo(g,h,i)perylene	0.010	< 0.010 U
132-64-9	Dibenzofuran	0.010	< 0.010 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	59.3%
d14-Dibenzo(a,h)anthracene	40.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS **Sample ID: SW-2**
Page 1 of 1 **SAMPLE**

Lab Sample ID: MN46D
LIMS ID: 08-5483
Matrix: Water
Data Release Authorized:
Reported: 03/27/08

QC Report No: MN46-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
Event: 33760783.08001
Date Sampled: 03/13/08
Date Received: 03/14/08

Date Extracted: 03/20/08
Date Analyzed: 03/27/08 15:33
Instrument/Analyst: NT2/VTS

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	0.010	< 0.010 U
91-57-6	2-Methylnaphthalene	0.010	< 0.010 U
90-12-0	1-Methylnaphthalene	0.010	< 0.010 U
208-96-8	Acenaphthylene	0.010	< 0.010 U
83-32-9	Acenaphthene	0.010	< 0.010 U
86-73-7	Fluorene	0.010	< 0.010 U
85-01-8	Phenanthrene	0.010	< 0.010 U
120-12-7	Anthracene	0.010	< 0.010 U
206-44-0	Fluoranthene	0.010	< 0.010 U
129-00-0	Pyrene	0.010	< 0.010 U
56-55-3	Benzo(a)anthracene	0.010	< 0.010 U
218-01-9	Chrysene	0.010	< 0.010 U
205-99-2	Benzo(b)fluoranthene	0.010	< 0.010 U
207-08-9	Benzo(k)fluoranthene	0.010	< 0.010 U
50-32-8	Benzo(a)pyrene	0.010	< 0.010 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.010	< 0.010 U
53-70-3	Dibenz(a,h)anthracene	0.010	< 0.010 U
191-24-2	Benzo(g,h,i)perylene	0.010	< 0.010 U
132-64-9	Dibenzofuran	0.010	< 0.010 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	62.3%
d14-Dibenzo(a,h)anthracene	27.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS

Sample ID: MB-032008
METHOD BLANK

Lab Sample ID: MB-032008
LIMS ID: 08-5481
Matrix: Water
Data Release Authorized:
Reported: 03/27/08

QC Report No: MN46-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
Event: 33760783.08001
Date Sampled: NA
Date Received: NA

Date Extracted: 03/20/08
Date Analyzed: 03/26/08 22:30
Instrument/Analyst: NT2/VTS

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	0.010	< 0.010 U
91-57-6	2-Methylnaphthalene	0.010	< 0.010 U
90-12-0	1-Methylnaphthalene	0.010	< 0.010 U
208-96-8	Acenaphthylene	0.010	< 0.010 U
83-32-9	Acenaphthene	0.010	< 0.010 U
86-73-7	Fluorene	0.010	< 0.010 U
85-01-8	Phenanthrene	0.010	< 0.010 U
120-12-7	Anthracene	0.010	< 0.010 U
206-44-0	Fluoranthene	0.010	< 0.010 U
129-00-0	Pyrene	0.010	< 0.010 U
56-55-3	Benzo(a)anthracene	0.010	< 0.010 U
218-01-9	Chrysene	0.010	< 0.010 U
205-99-2	Benzo(b)fluoranthene	0.010	< 0.010 U
207-08-9	Benzo(k)fluoranthene	0.010	< 0.010 U
50-32-8	Benzo(a)pyrene	0.010	< 0.010 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.010	< 0.010 U
53-70-3	Dibenz(a,h)anthracene	0.010	< 0.010 U
191-24-2	Benzo(g,h,i)perylene	0.010	< 0.010 U
132-64-9	Dibenzofuran	0.010	< 0.010 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	70.0%
d14-Dibenzo(a,h)anthracene	69.3%

ANALYTICAL RESOURCES INCORPORATED

SIM SW8270 SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: MN46-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
33760783.08001

Client ID	MNP	DBA	TOT OUT
SW-4	52.7%	43.0%	0
MB-032008	70.0%	69.3%	0
LCS-032008	73.7%	78.3%	0
LCSD-032008	66.3%	67.7%	0
SW-1	64.0%	29.3%	0
SW-1 MS	58.0%	28.4%	0
SW-1 MSD	60.7%	31.4%	0
SW-11	59.3%	40.7%	0
SW-2	62.3%	27.9%	0

	LCS/MB LIMITS	QC LIMITS
(MNP) = d10-2-Methylnaphthalene	(49-113)	(44-112)
(DBA) = d14-Dibenzo(a,h)anthracene	(49-132)	(10-138)

Prep Method: SW3520C
Log Number Range: 08-5480 to 08-5483

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS
Page 1 of 1

Sample ID: LCS-032008
LAB CONTROL SAMPLE

Lab Sample ID: LCS-032008
LIMS ID: 08-5481
Matrix: Water
Data Release Authorized:
Reported: 03/27/08

QC Report No: MN46-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
Event: 33760783.08001
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 03/20/08

Date Analyzed LCS: 03/26/08 22:58
LCSD: 03/27/08 12:12
Instrument/Analyst LCS: NT2/VTS
LCSD: NT2/VTS

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Naphthalene	0.212	0.300	70.7%	0.198	0.300	66.0%	6.8%
2-Methylnaphthalene	0.204	0.300	68.0%	0.188	0.300	62.7%	8.2%
1-Methylnaphthalene	0.214	0.300	71.3%	0.230	0.300	76.7%	7.2%
Acenaphthylene	0.187	0.300	62.3%	0.171	0.300	57.0%	8.9%
Acenaphthene	0.231	0.300	77.0%	0.206	0.300	68.7%	11.4%
Fluorene	0.243	0.300	81.0%	0.219	0.300	73.0%	10.4%
Phenanthrene	0.219	0.300	73.0%	0.205	0.300	68.3%	6.6%
Anthracene	0.181	0.300	60.3%	0.185	0.300	61.7%	2.2%
Fluoranthene	0.222	0.300	74.0%	0.208	0.300	69.3%	6.5%
Pyrene	0.220	0.300	73.3%	0.208	0.300	69.3%	5.6%
Benzo(a)anthracene	0.191	0.300	63.7%	0.174	0.300	58.0%	9.3%
Chrysene	0.267	0.300	89.0%	0.250	0.300	83.3%	6.6%
Benzo(b)fluoranthene	0.206	0.300	68.7%	0.189	0.300	63.0%	8.6%
Benzo(k)fluoranthene	0.343	0.300	114%	0.327	0.300	109%	4.8%
Benzo(a)pyrene	0.129	0.300	43.0%	0.130	0.300	43.3%	0.8%
Indeno(1,2,3-cd)pyrene	0.237	0.300	79.0%	0.216	0.300	72.0%	9.3%
Dibenz(a,h)anthracene	0.231	0.300	77.0%	0.213	0.300	71.0%	8.1%
Benzo(g,h,i)perylene	0.223	0.300	74.3%	0.204	0.300	68.0%	8.9%
Dibenzofuran	0.239	0.300	79.7%	0.218	0.300	72.7%	9.2%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

SIM Semivolatile Surrogate Recovery

	LCS	LCSD
d10-2-Methylnaphthalene	73.7%	66.3%
d14-Dibenzo(a,h)anthracene	78.3%	67.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS
Page 1 of 1

Sample ID: SW-1
MATRIX SPIKE

Lab Sample ID: MN46B
LIMS ID: 08-5481
Matrix: Water
Data Release Authorized:
Reported: 03/27/08

QC Report No: MN46-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
Event: 33760783.08001
Date Sampled: 03/13/08
Date Received: 03/14/08

Date Extracted MS/MSD: 03/20/08

Date Analyzed MS: 03/27/08 13:38
MSD: 03/27/08 14:07
Instrument/Analyst MS: NT2/VTS
MSD: NT2/VTS

Sample Amount MS: 460 mL
MSD: 460 mL
Final Extract Volume MS: 0.50 mL
MSD: 0.50 mL
Dilution Factor MS: 1.00
MSD: 1.00

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Naphthalene	< 0.0100 U	0.184	0.326	56.4%	0.197	0.326	60.4%	6.8%
2-Methylnaphthalene	0.0271	0.198	0.326	52.4%	0.210	0.326	56.1%	5.9%
1-Methylnaphthalene	0.0226	0.206	0.326	56.3%	0.228	0.326	63.0%	10.1%
Acenaphthylene	< 0.0100 U	0.171	0.326	52.5%	0.182	0.326	55.8%	6.2%
Acenaphthene	< 0.0100 U	0.204	0.326	62.6%	0.218	0.326	66.9%	6.6%
Fluorene	< 0.0100 U	0.225	0.326	69.0%	0.240	0.326	73.6%	6.5%
Phenanthrene	< 0.0100 U	0.218	0.326	66.9%	0.231	0.326	70.9%	5.8%
Anthracene	< 0.0100 U	0.195	0.326	59.8%	0.211	0.326	64.7%	7.9%
Fluoranthene	< 0.0100 U	0.212	0.326	65.0%	0.222	0.326	68.1%	4.6%
Pyrene	< 0.0100 U	0.205	0.326	62.9%	0.218	0.326	66.9%	6.1%
Benzo(a)anthracene	< 0.0100 U	0.146	0.326	44.8%	0.153	0.326	46.9%	4.7%
Chrysene	< 0.0100 U	0.209	0.326	64.1%	0.215	0.326	66.0%	2.8%
Benzo(b)fluoranthene	< 0.0100 U	0.118	0.326	36.2%	0.108	0.326	33.1%	8.8%
Benzo(k)fluoranthene	< 0.0100 U	0.175	0.326	53.7%	0.203	0.326	62.3%	14.8%
Benzo(a)pyrene	< 0.0100 U	0.0898	0.326	27.5%	0.101	0.326	31.0%	11.7%
Indeno(1,2,3-cd)pyrene	< 0.0100 U	0.0774	0.326	23.7%	0.0809	0.326	24.8%	4.4%
Dibenz(a,h)anthracene	< 0.0100 U	0.0800	0.326	24.5%	0.0838	0.326	25.7%	4.6%
Benzo(g,h,i)perylene	< 0.0100 U	0.0710	0.326	21.8%	0.0781	0.326	24.0%	9.5%
Dibenzofuran	< 0.0100 U	0.188	0.326	57.7%	0.193	0.326	59.2%	2.6%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD by GC/FID
Page 1 of 1
Matrix: Water

QC Report No: MN46-URS Corporation
Project: Kinder Morgan Laurel Station B'
33760783.08001
Date Received: 03/14/08

Data Release Authorized:
Reported: 03/25/08

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range	RL	Result
MN46A	SW-4	03/20/08	03/21/08	1.00	Diesel	0.25	< 0.25 U
08-5480	HC ID: ---		FID3A	1.0	Motor Oil	0.50	< 0.50 U
					o-Terphenyl		82.0%
MB-032008	Method Blank	03/20/08	03/21/08	1.00	Diesel	0.25	< 0.25 U
08-5481	HC ID: ---		FID3A	1.0	Motor Oil	0.50	< 0.50 U
					o-Terphenyl		87.6%
MN46B	SW-1	03/20/08	03/21/08	1.00	Diesel	0.25	< 0.25 U
08-5481	HC ID: ---		FID3A	1.0	Motor Oil	0.50	< 0.50 U
					o-Terphenyl		84.7%
MN46C	SW-11	03/20/08	03/21/08	1.00	Diesel	0.25	< 0.25 U
08-5482	HC ID: ---		FID3A	1.0	Motor Oil	0.50	< 0.50 U
					o-Terphenyl		87.6%
MN46D	SW-2	03/20/08	03/21/08	1.00	Diesel	0.25	< 0.25 U
08-5483	HC ID: ---		FID3A	1.0	Motor Oil	0.50	< 0.50 U
					o-Terphenyl		90.2%

Reported in mg/L (ppm)

EFV-Effective Final Volume in mL.
DL-Dilution of extract prior to analysis.
RL-Reporting limit.

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.
HC ID: DRO/RRO indicates results of organics or additional hydrocarbons in ranges are not identifiable.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPHD by GC/FID
Page 1 of 1

Sample ID: SW-1
MS/MSD

Lab Sample ID: MN46B
LIMS ID: 08-5481
Matrix: Water
Data Release Authorized:
Reported: 03/25/08

QC Report No: MN46-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
33760783.08001
Date Sampled: 03/13/08
Date Received: 03/14/08

Date Extracted MS/MSD: 03/20/08

Date Analyzed MS: 03/21/08 18:42
MSD: 03/21/08 18:57
Instrument/Analyst MS: FID3A/JGR
MSD: FID3A/JGR

Sample Amount MS: 470 mL
MSD: 470 mL
Final Extract Volume MS: 1.0 mL
MSD: 1.0 mL
Dilution Factor MS: 1.00
MSD: 1.00

Range	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Diesel	< 0.25 U	2.15	3.19	67.4%	2.39	3.19	74.9%	10.6%

TPHD Surrogate Recovery

	MS	MSD
o-Terphenyl	75.1%	83.1%

Results reported in mg/L
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

TPHD SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: MN46-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
33760783.08001

Client ID	OTER	TOT OUT
SW-4	82.0%	0
MB-032008	87.6%	0
LCS-032008	88.9%	0
LCSD-032008	81.3%	0
SW-1	84.7%	0
SW-1 MS	75.1%	0
SW-1 MSD	83.1%	0
SW-11	87.6%	0
SW-2	90.2%	0

	LCS/MB LIMITS	QC LIMITS
(OTER) = o-Terphenyl	(58-114)	(45-121)

Prep Method: SW3510C
Log Number Range: 08-5480 to 08-5483

FORM-II TPHD

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPHD by GC/FID
Page 1 of 1

Sample ID: LCS-032008
LCS/LCSD

Lab Sample ID: LCS-032008
LIMS ID: 08-5481
Matrix: Water
Data Release Authorized:
Reported: 03/25/08

QC Report No: MN46-URS Corporation
Project: Kinder Morgan Laurel Station B'ham 33760783.08001
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 03/20/08

Date Analyzed LCS: 03/21/08 16:55
LCSD: 03/21/08 17:10
Instrument/Analyst LCS: FID3A/JGR
LCSD: FID3A/JGR

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 1.0 mL
LCSD: 1.0 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Range	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Diesel	2.27	3.00	75.7%	2.07	3.00	69.0%	9.2%

TPHD Surrogate Recovery

	LCS	LCSD
o-Terphenyl	88.9%	81.3%

Results reported in mg/L
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS-EXTRACTION REPORT

Matrix: Water
Date Received: 03/14/08

ARI Job: MN46
Project: Kinder Morgan Laurel Station B'ham
33760783.08001

ARI ID	Client ID	Samp Amt	Final Vol	Prep Date
08-5480-MN46A	SW-4	500 mL	1.00 mL	03/20/08
08-5481-032008MB1	Method Blank	500 mL	1.00 mL	03/20/08
08-5481-032008LCS1	Lab Control	500 mL	1.00 mL	03/20/08
08-5481-032008LCSD1	Lab Control Dup	500 mL	1.00 mL	03/20/08
08-5481-MN46B	SW-1	500 mL	1.00 mL	03/20/08
08-5481-MN46BMS	SW-1	470 mL	1.00 mL	03/20/08
08-5481-MN46BMSD	SW-1	470 mL	1.00 mL	03/20/08
08-5482-MN46C	SW-11	500 mL	1.00 mL	03/20/08
08-5483-MN46D	SW-2	500 mL	1.00 mL	03/20/08

Analytical Resources, Incorporated
Analytical Chemists and Consultants

March 26, 2008

Karen Mixon
URS Corporation
Century Square
1501 Fourth Avenue Suite 1400
Seattle, WA 98101

RE: Client Project: Laurel Station
ARI Job No: MN48

Dear Karen:

Please find enclosed the original chain of custody documentation and the final results for the sample from the project referenced above. Analytical Resources, Inc. (ARI) received four water samples and two soil samples and a trip blank in good condition on March 14, 2008. The samples were logged under two different ARI SDGs.

The samples were analyzed for NWTPH-Dx and NWTPH-Gx plus BTEX, as requested on the COC.

There were no anomalies associated with the samples.

A copy of these reports and all associated raw data will remain on file electronically with ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kelly Bottem
Client Services Manager
206/695-6211
kellyb@arilabs.com

Enclosures

cc: file MN48

KFB/kfb

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 33MN46 MN48	Turn-around Requested:	Page: 1 of 1	
ARI Client Company: URS	Phone: 206-438-2700	Date: 3/13/08	Ice Present?
Client Contact: KAREN MIXON		No. of Coolers:	Cooler Temps: 2.0
Client Project Name: KINDER MORGAN LAUREL STATION BELLINGHAM			
Client Project #: 33760783.08001	Samplers: DLewis JVermeeren		

Sample ID	Date	Time	Matrix	No. Containers	VOCs	NWTPH-Dx	LL SIM PAH	TPH-G/BTEX 8021	TPH-Dx				Notes/Comments
SW-4	3/13/08	1116	H_2O	7	X	X	X						
SW-1		1230	H_2O	12	X	X	X						MS/MSD
SW-11		1300	H_2O	7	X	X	X						
SW-2		1537	H_2O	4	X	X	X						
08-B4-3		1600	SOIL	5				X	X				
08-B4-4.5		1620	SOIL	5				X	X				

Comments/Special Instructions	Relinquished by:	Received by:	Relinquished by:	Received by:
please put soil samples in separate workorder use URS job# 33760784. Billing goes to Bond Kahlenbeck at Kinder Morgan	(Signature)	(Signature)	(Signature)	(Signature)
	Printed Name: Karen Lmixon	Printed Name: ASHLEY LAMOUNTAIN	Printed Name:	Printed Name:
	Company: URS Corporation	Company: ARI	Company:	Company:
	Date & Time: 3-14-08 / 0705	Date & Time: 3/14/08 1505	Date & Time:	Date & Time:

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: URS
Project Name: KINDER MORGAN
COC No: NA
Delivered by: Courier - ard
Assigned ARI Job No: MN46 | MN48
Tracking No: NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	(YES)	NO
Were custody papers included with the cooler?	(YES)	NO
Were custody papers properly filled out (ink, signed, etc.)	(YES)	NO
Record cooler temperature (recommended 2.0-6.0 °C for chemistry	2.0 °C	

Cooler Accepted by: ard Date: 3/14/08 Time: _____

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?	YES	(NO)
What kind of packing material was used?	ICE	
Was sufficient ice used (if appropriate)?	(YES)	NO
Were all bottles sealed in individual plastic bags?	YES	(NO)
Did all bottle arrive in good condition (unbroken)?	(YES)	NO
Were all bottle labels complete and legible?	(YES)	NO
Did all bottle labels and tags agree with custody papers?	(YES)	NO
Were all bottles used correct for the requested analyses?	(YES)	NO
Do any of the analyses (bottles) require preservation? (attach preservation checklist)	YES	(NO)
Were all VOC vials free of air bubbles?	NA (YES) 3/17/08	NO
Was sufficient amount of sample sent in each bottle?	(YES)	NO

Samples Logged by: S Joshi Date: 3/17/08 Time: _____

***** Notify Project Manager of discrepancies or concerns *****

Explain discrepancies or negative responses:

14 bottles received for sample SW-1

By: Date:

ANALYTICAL RESOURCES INCORPORATED

BETX SOIL SURROGATE RECOVERY SUMMARY

ARI Job: MN48
Matrix: Soil

QC Report No: MN48-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
Event: 33760784

Client ID	TFT	BBZ	TOT OUT
MB-031808	100%	105%	0
LCS-031808	103%	107%	0
LCSD-031808	97.9%	104%	0
08-B4-3	89.7%	95.0%	0
08-B4-4.5	83.9%	90.7%	0

	LCS/MB LIMITS	QC LIMITS
(TFT) = Trifluorotoluene	(80-120)	(61-137)
(BBZ) = Bromobenzene	(80-120)	(58-139)

Log Number Range: 08-5484 to 08-5485

ANALYTICAL RESOURCES INCORPORATED

TPHG SOIL SURROGATE RECOVERY SUMMARY

ARI Job: MN48
Matrix: Soil

QC Report No: MN48-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
Event: 33760784

Client ID	BFB	TFT	BBZ	TOT OUT
MB-031808	NA	99.0%	105%	0
LCS-031808	NA	101%	108%	0
LCSD-031808	NA	96.6%	104%	0
08-B4-3	NA	87.9%	93.6%	0
08-B4-4.5	NA	82.4%	89.2%	0

	LCS/MB LIMITS	QC LIMITS
(BFB) = Bromofluorobenzene	(70-130)	(70-130)
(TFT) = Trifluorotoluene	(80-120)	(65-137)
(BBZ) = Bromobenzene	(80-120)	(54-144)

Log Number Range: 08-5484 to 08-5485

ANALYTICAL RESOURCES INCORPORATED

BETX WATER SURROGATE RECOVERY SUMMARY

ARI Job: MN48
Matrix: Water

QC Report No: MN48-URS Corporation
Project: 33760784
Event: NA

Client ID	TFT	BBZ	TOT OUT
Trip Blank	102%	102%	0

	LCS/MB LIMITS	QC LIMITS
(TFT) = Trifluorotoluene	(80-120)	(80-120)
(BBZ) = Bromobenzene	(80-120)	(80-120)

Log Number Range: 08-5490 to 08-5490

ANALYTICAL RESOURCES INCORPORATED

TPHG WATER SURROGATE RECOVERY SUMMARY

ARI Job: MN48
Matrix: Water

QC Report No: MN48-URS Corporation
Project: 33760784
Event: NA

Client ID	TFT	BBZ	TOT OUT
Trip Blank	101%	103%	0

	LCS/MB LIMITS	QC LIMITS
(TFT) = Trifluorotoluene	(80-120)	(80-120)
(BBZ) = Bromobenzene	(80-120)	(80-120)

Log Number Range: 08-5490 to 08-5490

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod
TPHG by Method NWTPHG
Page 1 of 1

Sample ID: MB-031808
METHOD BLANK

Lab Sample ID: MB-031808
LIMS ID: 08-5484
Matrix: Soil
Data Release Authorized:
Reported: 03/19/08

QC Report No: MN48-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
Event: 33760784
Date Sampled: NA
Date Received: NA

Date Analyzed: 03/18/08 09:19
Instrument/Analyst: PID3/PKC

Purge Volume: 5.0 mL
Sample Amount: 100 mg-dry-wt

CAS Number	Analyte	RL	Result
71-43-2	Benzene	12	< 12 U
108-88-3	Toluene	12	< 12 U
100-41-4	Ethylbenzene	12	< 12 U
	m,p-Xylene	25	< 25 U
95-47-6	o-Xylene	12	< 12 U

			GAS ID
Gasoline Range Hydrocarbons	5.0	< 5.0 U	---

BETX Surrogate Recovery

Trifluorotoluene	100%
Bromobenzene	105%

Gasoline Surrogate Recovery

Trifluorotoluene	99.0%
Bromobenzene	105%

BETX values reported in µg/kg (ppb)
Gasoline values reported in mg/kg (ppm)

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod
TPHG by Method NWTPHG
Page 1 of 1

Sample ID: 08-B4-3
SAMPLE

Lab Sample ID: MN48A
LIMS ID: 08-5484
Matrix: Soil
Data Release Authorized:
Reported: 03/19/08

QC Report No: MN48-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
Event: 33760784
Date Sampled: 03/13/08
Date Received: 03/14/08

Date Analyzed: 03/18/08 15:14
Instrument/Analyst: PID3/PKC

Purge Volume: 5.0 mL
Sample Amount: 70 mg-dry-wt
Percent Moisture: 22.2%

CAS Number	Analyte	RL	Result
71-43-2	Benzene	18	< 18 U
108-88-3	Toluene	18	< 18 U
100-41-4	Ethylbenzene	18	< 18 U
	m,p-Xylene	36	< 36 U
95-47-6	o-Xylene	18	< 18 U

			GAS ID
Gasoline Range Hydrocarbons	7.1	< 7.1 U	---

BETX Surrogate Recovery

Trifluorotoluene	89.7%
Bromobenzene	95.0%

Gasoline Surrogate Recovery

Trifluorotoluene	87.9%
Bromobenzene	93.6%

BETX values reported in µg/kg (ppb)
Gasoline values reported in mg/kg (ppm)

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod
TPHG by Method NWTPHG
Page 1 of 1

Sample ID: 08-B4-4.5
SAMPLE

Lab Sample ID: MN48B
LIMS ID: 08-5485
Matrix: Soil
Data Release Authorized:
Reported: 03/19/08

QC Report No: MN48-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
Event: 33760784
Date Sampled: 03/13/08
Date Received: 03/14/08

Date Analyzed: 03/18/08 15:39
Instrument/Analyst: PID3/PKC

Purge Volume: 5.0 mL
Sample Amount: 79 mg-dry-wt
Percent Moisture: 20.3%

CAS Number	Analyte	RL	Result
71-43-2	Benzene	16	< 16 U
108-88-3	Toluene	16	< 16 U
100-41-4	Ethylbenzene	16	< 16 U
	m,p-Xylene	32	< 32 U
95-47-6	o-Xylene	16	< 16 U

			GAS ID
Gasoline Range Hydrocarbons	6.4	< 6.4 U	---

BETX Surrogate Recovery

Trifluorotoluene	83.9%
Bromobenzene	90.7%

Gasoline Surrogate Recovery

Trifluorotoluene	82.4%
Bromobenzene	89.2%

BETX values reported in µg/kg (ppb)
Gasoline values reported in mg/kg (ppm)

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod
TPHG by Method NWTPHG

Sample ID: Trip Blank
SAMPLE

Lab Sample ID: MN48C
LIMS ID: 08-5490
Matrix: Water
Data Release Authorized:
Reported: 03/19/08

QC Report No: MN48-URS Corporation
Project: 33760784
Event: NA
Date Sampled: 03/13/08
Date Received: 03/14/08

Date Analyzed: 03/18/08 11:33
Instrument/Analyst: PID3/PKC

Purge Volume: 5.0 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result	GAS ID
71-43-2	Benzene	0.25	< 0.25 U	
108-88-3	Toluene	0.25	< 0.25 U	
100-41-4	Ethylbenzene	0.25	< 0.25 U	
	m,p-Xylene	0.50	< 0.50 U	
95-47-6	o-Xylene	0.25	< 0.25 U	
	Gasoline Range Hydrocarbons	0.10	< 0.10 U	---

BETX Surrogate Recovery

Trifluorotoluene	102%
Bromobenzene	102%

Gasoline Surrogate Recovery

Trifluorotoluene	101%
Bromobenzene	103%

BETX values reported in µg/L (ppb)
Gasoline values reported in mg/L (ppm)

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod
Page 1 of 1

Sample ID: LCS-031808
LAB CONTROL SAMPLE

Lab Sample ID: LCS-031808
LIMS ID: 08-5484
Matrix: Soil
Data Release Authorized:
Reported: 03/19/08

QC Report No: MN48-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
Event: 33760784
Date Sampled: NA
Date Received: NA

Date Analyzed LCS: 03/18/08 08:30
LCSD: 03/18/08 08:55
Instrument/Analyst LCS: PID3/PKC
LCSD: PID3/PKC

Purge Volume: 5.0 mL

Sample Amount LCS: 100 mg-dry-wt
LCSD: 100 mg-dry-wt

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Benzene	332	350	94.9%	364	350	104%	9.2%
Toluene	2910	3100	93.9%	3160	3100	102%	8.2%
Ethylbenzene	556	595	93.4%	604	595	102%	8.3%
m,p-Xylene	2100	2230	94.2%	2300	2230	103%	9.1%
o-Xylene	766	790	97.0%	843	790	107%	9.6%

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

BETX Surrogate Recovery

	LCS	LCSD
Trifluorotoluene	103%	97.9%
Bromobenzene	107%	104%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TPHG by Method NWTPHG
Page 1 of 1

Sample ID: LCS-031808
LAB CONTROL SAMPLE

Lab Sample ID: LCS-031808
LIMS ID: 08-5484
Matrix: Soil
Data Release Authorized:
Reported: 03/19/08

QC Report No: MN48-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
Event: 33760784
Date Sampled: NA
Date Received: NA

Date Analyzed LCS: 03/18/08 08:30
LCSD: 03/18/08 08:55
Instrument/Analyst LCS: PID3/PKC
LCSD: PID3/PKC

Purge Volume: 5.0 mL

Sample Amount LCS: 100 mg-dry-wt
LCSD: 100 mg-dry-wt

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Gasoline Range Hydrocarbons	53.2	50.0	106%	54.0	50.0	108%	1.5%

Reported in mg/kg (ppm)

RPD calculated using sample concentrations per SW846.

TPHG Surrogate Recovery

	LCS	LCSD
Trifluorotoluene	101%	96.6%
Bromobenzene	108%	104%

ANALYTICAL RESOURCES INCORPORATED

TPHD SURROGATE RECOVERY SUMMARY

Matrix: Soil

QC Report No: MN48-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
33760784

Client ID	OTER	TOT OUT
031908MBS	85.8%	0
031908LCS	96.9%	0
08-B4-3	90.2%	0
08-B4-4.5	94.4%	0

	LCS/MB LIMITS	QC LIMITS
(OTER) = o-Terphenyl	(46-116)	(42-112)

Prep Method: SW3550B
Log Number Range: 08-5484 to 08-5485

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD by GC/FID
Page 1 of 1
Matrix: Soil

QC Report No: MN48-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
33760784
Date Received: 03/14/08

Data Release Authorized:
Reported: 03/25/08

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range	RL	Result
MB-031908	Method Blank	03/19/08	03/20/08	1.00	Diesel	5.0	< 5.0 U
08-5484	HC ID: ---		FID3A	1.0	Motor Oil	10	< 10 U
					o-Terphenyl		85.8%
MN48A	08-B4-3	03/19/08	03/20/08	1.00	Diesel	6.0	< 6.0 U
08-5484	HC ID: ---		FID3A	1.0	Motor Oil	12	< 12 U
					o-Terphenyl		90.2%
MN48B	08-B4-4.5	03/19/08	03/20/08	1.00	Diesel	6.0	< 6.0 U
08-5485	HC ID: ---		FID3A	1.0	Motor Oil	12	< 12 U
					o-Terphenyl		94.4%

Reported in mg/kg (ppm)

EFV-Effective Final Volume in mL.
DL-Dilution of extract prior to analysis.
RL-Reporting limit.

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.
HC ID: DRO/RRO indicates results of organics or additional hydrocarbons in ranges are not identifiable.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPHD by GC/FID

Sample ID: LCS-031908
LAB CONTROL

Lab Sample ID: LCS-031908
LIMS ID: 08-5484
Matrix: Soil
Data Release Authorized:
Reported: 03/25/08

QC Report No: MN48-URS Corporation
Project: Kinder Morgan Laurel Station B'ham
33760784
Date Sampled: NA
Date Received: NA

Date Extracted: 03/19/08
Date Analyzed: 03/20/08 08:24
Instrument/Analyst: FID3A/JGR

Sample Amount: 10.0 g
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00

Range	Lab Control	Spike Added	Recovery
Diesel	111	150	74.0%

TPHD Surrogate Recovery

o-Terphenyl	96.9%

Results reported in mg/kg

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS-EXTRACTION REPORT

ARI Job: MN48
Project: Kinder Morgan Laurel Station B'ham 33760784

Matrix: Soil
Date Received: 03/14/08

ARI ID	Client ID	Client Amt	Final Vol	Basis	Prep Date
08-5484-031908MB1	Method Blank	10.0 g	1.00 mL	-	03/19/08
08-5484-031908LCS1	Lab Control	10.0 g	1.00 mL	-	03/19/08
08-5484-MN48A	08-B4-3	8.29 g	1.00 mL	D	03/19/08
08-5485-MN48B	08-B4-4.5	8.32 g	1.00 mL	D	03/19/08

Basis: D=Dry Weight W=As Received

Analytical Resources, Incorporated
Analytical Chemists and Consultants

March 28, 2008

Karen Mixon
URS Corporation
Century Square
1501 Fourth Avenue Suite 1400
Seattle, WA 98101

RE: Client Project: Kinder Morgan
ARI Job No: MO08

Dear Karen:

Please find enclosed the original chain of custody documentation and the final results for the sample from the project referenced above. Analytical Resources, Inc. (ARI) received six soil samples in good condition on March 20, 2008.

The samples were analyzed for NWTPH-Dx and NWTPH-Gx plus BTEX, as requested on the COC.

There were no anomalies associated with the samples.

A copy of these reports and all associated raw data will remain on file electronically with ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kelly Bottem
Client Services Manager
206/695-6211
kellyb@arilabs.com

Enclosures

cc: file MO08

KFB/kfb

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: M1008	Turn-around Requested:	Page: 1 of 1	
ARI Client Company: URS	Phone: 206 438 2700	Date: 03/19/08	Ice Present?
Client Contact: KAREN MIXON		No. of Coolers: 1	Cooler Temps:
Client Project Name: KINDER MORGAN			
Client Project #: 37607784.08001	Samplers: IAN VERMEEREN		

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: NWTPH Gx/BTEX	Analysis Requested: NWTPH Dx	Notes/Comments
180-3-0.5'	03/19/08	0805	Soil	4	X	X	
180-3-1.5'		0810			X	X	
180-3-3'		0830			X	X	
180-2-0.5		0840			X	X	
180-2-1.5'		0850			X	X	
180-2-4'		0910			X	X	

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: IAN VERMEEREN	Printed Name: Kirk L Mixon	Printed Name: Tressa Pearson-Franks	Printed Name: ASHLEY LAMOUNTAIN
	Company: URS	Company: URS	Company: URS	Company: ARI
	Date & Time: 03/19/08 4:18	Date & Time: 03/19/08 4:20	Date & Time: 3/20/08 8:30 am	Date & Time: 3/20/08 1050

1 OF 3/20/08

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release 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 Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: IRS Project Name: KINDER MORGAN

COC No: NA Delivered by: COURIER-anl

Assigned ARI Job No: MX008 Tracking No: NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	(YES)	NO
Were custody papers included with the cooler?	(YES)	NO
Were custody papers properly filled out (ink, signed, etc.)	(YES)	NO
Record cooler temperature (recommended 2.0-6.0 °C for chemistry	2.0 °C	

Cooler Accepted by: anl Date: 3/20/08 Time: 1050

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?	YES	(NO)
What kind of packing material was used?	ICE	
Was sufficient ice used (if appropriate)?	(YES)	NO
Were all bottles sealed in individual plastic bags?	YES	(NO)
Did all bottle arrive in good condition (unbroken)?	(YES)	NO
Were all bottle labels complete and legible?	(YES)	NO
Did all bottle labels and tags agree with custody papers?	(YES)	NO
Were all bottles used correct for the requested analyses?	(YES)	NO
Do any of the analyses (bottles) require preservation? (attach preservation checklist)	YES	(NO)
Were all VOC vials free of air bubbles? (NA)	YES	NO
Was sufficient amount of sample sent in each bottle?	(YES)	NO

Samples Logged by: anl Date: 3/20/08 Time: 1128

***** Notify Project Manager of discrepancies or concerns *****

Explain discrepancies or negative responses:

By: Date:

ANALYTICAL RESOURCES INCORPORATED

BETX SOIL SURROGATE RECOVERY SUMMARY

ARI Job: MO08
Matrix: Soil

QC Report No: MO08-URS Corporation
Project: Kinder Morgan
Event: 33760784.08001

Client ID	TFT	BBZ	TOT OUT
MB-032608	97.6%	100%	0
LCS-032608	104%	107%	0
LCSD-032608	95.3%	99.2%	0
180-3-0.5'	96.7%	98.5%	0
180-3-1.5'	97.7%	100%	0
180-3-3'	96.2%	99.5%	0
180-2-0.5'	95.1%	99.0%	0
180-2-1.5'	87.8%	90.6%	0
180-2-4'	96.6%	99.4%	0

	LCS/MB LIMITS	QC LIMITS
(TFT) = Trifluorotoluene	(80-120)	(61-137)
(BBZ) = Bromobenzene	(80-120)	(58-139)

Log Number Range: 08-5755 to 08-5760

ANALYTICAL RESOURCES INCORPORATED

TPHG SOIL SURROGATE RECOVERY SUMMARY

ARI Job: MO08
Matrix: Soil

QC Report No: MO08-URS Corporation
Project: Kinder Morgan
Event: 33760784.08001

Client ID	BFB	TFT	BBZ	TOT OUT
MB-032608	NA	98.0%	101%	0
LCS-032608	NA	104%	108%	0
LCSD-032608	NA	94.8%	100%	0
180-3-0.5'	NA	97.4%	101%	0
180-3-1.5'	NA	98.4%	102%	0
180-3-3'	NA	97.6%	102%	0
180-2-0.5'	NA	96.7%	102%	0
180-2-1.5'	NA	89.5%	93.1%	0
180-2-4'	NA	97.1%	102%	0

	LCS/MB LIMITS	QC LIMITS
(BFB) = Bromofluorobenzene	(70-130)	(70-130)
(TFT) = Trifluorotoluene	(80-120)	(65-137)
(BBZ) = Bromobenzene	(80-120)	(54-144)

Log Number Range: 08-5755 to 08-5760

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod
TPHG by Method NWTPHG
Page 1 of 1

Sample ID: MB-032608
METHOD BLANK

Lab Sample ID: MB-032608
LIMS ID: 08-5755
Matrix: Soil
Data Release Authorized:
Reported: 03/28/08

QC Report No: MO08-URS Corporation
Project: Kinder Morgan
Event: 33760784.08001
Date Sampled: NA
Date Received: NA

Date Analyzed: 03/26/08 10:57
Instrument/Analyst: PID3/PKC

Purge Volume: 5.0 mL
Sample Amount: 100 mg-dry-wt

CAS Number	Analyte	RL	Result
71-43-2	Benzene	12	< 12 U
108-88-3	Toluene	12	< 12 U
100-41-4	Ethylbenzene	12	< 12 U
	m,p-Xylene	25	< 25 U
95-47-6	o-Xylene	12	< 12 U

			GAS ID
Gasoline Range Hydrocarbons	5.0	< 5.0 U	---

BETX Surrogate Recovery

Trifluorotoluene	97.6%
Bromobenzene	100%

Gasoline Surrogate Recovery

Trifluorotoluene	98.0%
Bromobenzene	101%

BETX values reported in µg/kg (ppb)
Gasoline values reported in mg/kg (ppm)

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod
TPHG by Method NWTPHG
Page 1 of 1

Sample ID: 180-3-0.5'
SAMPLE

Lab Sample ID: MO08A
LIMS ID: 08-5755
Matrix: Soil
Data Release Authorized:
Reported: 03/28/08

QC Report No: MO08-URS Corporation
Project: Kinder Morgan
Event: 33760784.08001
Date Sampled: 03/19/08
Date Received: 03/20/08

Date Analyzed: 03/26/08 12:43
Instrument/Analyst: PID3/PKC

Purge Volume: 5.0 mL
Sample Amount: 87 mg-dry-wt
Percent Moisture: 3.9%

CAS Number	Analyte	RL	Result	GAS ID
71-43-2	Benzene	14	< 14 U	
108-88-3	Toluene	14	< 14 U	
100-41-4	Ethylbenzene	14	< 14 U	
	m,p-Xylene	29	< 29 U	
95-47-6	o-Xylene	14	< 14 U	
	Gasoline Range Hydrocarbons	5.8	< 5.8 U	---

BETX Surrogate Recovery

Trifluorotoluene	96.7%
Bromobenzene	98.5%

Gasoline Surrogate Recovery

Trifluorotoluene	97.4%
Bromobenzene	101%

BETX values reported in µg/kg (ppb)
Gasoline values reported in mg/kg (ppm)

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod **Sample ID: 180-3-1.5'**
TPHG by Method NWTPHG **SAMPLE**
Page 1 of 1

Lab Sample ID: MO08B
LIMS ID: 08-5756
Matrix: Soil
Data Release Authorized:
Reported: 03/28/08

QC Report No: MO08-URS Corporation
Project: Kinder Morgan
Event: 33760784.08001
Date Sampled: 03/19/08
Date Received: 03/20/08

Date Analyzed: 03/26/08 13:08
Instrument/Analyst: PID3/PKC

Purge Volume: 5.0 mL
Sample Amount: 79 mg-dry-wt
Percent Moisture: 4.7%

CAS Number	Analyte	RL	Result	
71-43-2	Benzene	16	< 16 U	
108-88-3	Toluene	16	< 16 U	
100-41-4	Ethylbenzene	16	< 16 U	
	m,p-Xylene	32	< 32 U	
95-47-6	o-Xylene	16	< 16 U	
	Gasoline Range Hydrocarbons	**6.3**	**9.1**	GAS ID **GRO**

BETX Surrogate Recovery

Trifluorotoluene	97.7%
Bromobenzene	100%

Gasoline Surrogate Recovery

Trifluorotoluene	98.4%
Bromobenzene	102%

BETX values reported in µg/kg (ppb)
Gasoline values reported in mg/kg (ppm)

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod **Sample ID: 180-3-3'**
TPHG by Method NWTPHG **SAMPLE**
Page 1 of 1

Lab Sample ID: MO08C
LIMS ID: 08-5757
Matrix: Soil
Data Release Authorized:
Reported: 03/28/08

QC Report No: MO08-URS Corporation
Project: Kinder Morgan
Event: 33760784.08001
Date Sampled: 03/19/08
Date Received: 03/20/08

Date Analyzed: 03/26/08 13:33
Instrument/Analyst: PID3/PKC

Purge Volume: 5.0 mL
Sample Amount: 110 mg-dry-wt
Percent Moisture: 7.0%

CAS Number	Analyte	RL	Result	GAS ID
71-43-2	Benzene	11	< 11 U	
108-88-3	Toluene	11	< 11 U	
100-41-4	Ethylbenzene	11	< 11 U	
	m,p-Xylene	23	< 23 U	
95-47-6	o-Xylene	11	< 11 U	
	Gasoline Range Hydrocarbons	4.5	< 4.5 U	---

BETX Surrogate Recovery

Trifluorotoluene	96.2%
Bromobenzene	99.5%

Gasoline Surrogate Recovery

Trifluorotoluene	97.6%
Bromobenzene	102%

BETX values reported in µg/kg (ppb)
Gasoline values reported in mg/kg (ppm)

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod
TPHG by Method NWTPHG
Page 1 of 1

Sample ID: 180-2-0.5'
SAMPLE

Lab Sample ID: MO08D
LIMS ID: 08-5758
Matrix: Soil
Data Release Authorized:
Reported: 03/28/08

QC Report No: MO08-URS Corporation
Project: Kinder Morgan
Event: 33760784.08001
Date Sampled: 03/19/08
Date Received: 03/20/08

Date Analyzed: 03/26/08 13:57
Instrument/Analyst: PID3/PKC

Purge Volume: 5.0 mL
Sample Amount: 90 mg-dry-wt
Percent Moisture: 6.4%

CAS Number	Analyte	RL	Result	
71-43-2	Benzene	14	< 14 U	
108-88-3	Toluene	14	< 14 U	
100-41-4	Ethylbenzene	14	< 14 U	
	m,p-Xylene	28	< 28 U	
95-47-6	o-Xylene	14	< 14 U	
	Gasoline Range Hydrocarbons	5.6	< 5.6 U	GAS ID ---

BETX Surrogate Recovery

Trifluorotoluene	95.1%
Bromobenzene	99.0%

Gasoline Surrogate Recovery

Trifluorotoluene	96.7%
Bromobenzene	102%

BETX values reported in µg/kg (ppb)
Gasoline values reported in mg/kg (ppm)

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod
TPHG by Method NWTPHG
Page 1 of 1

Sample ID: 180-2-1.5'
SAMPLE

Lab Sample ID: MO08E
LIMS ID: 08-5759
Matrix: Soil
Data Release Authorized:
Reported: 03/28/08

QC Report No: MO08-URS Corporation
Project: Kinder Morgan
Event: 33760784.08001
Date Sampled: 03/19/08
Date Received: 03/20/08

Date Analyzed: 03/26/08 14:22
Instrument/Analyst: PID3/PKC

Purge Volume: 5.0 mL
Sample Amount: 98 mg-dry-wt
Percent Moisture: 7.3%

CAS Number	Analyte	RL	Result	
71-43-2	Benzene	13	< 13 U	
108-88-3	Toluene	13	< 13 U	
100-41-4	Ethylbenzene	13	< 13 U	
	m,p-Xylene	25	< 25 U	
95-47-6	o-Xylene	13	< 13 U	
	Gasoline Range Hydrocarbons	5.1	< 5.1 U	GAS ID ---

BETX Surrogate Recovery

Trifluorotoluene	87.8%
Bromobenzene	90.6%

Gasoline Surrogate Recovery

Trifluorotoluene	89.5%
Bromobenzene	93.1%

BETX values reported in µg/kg (ppb)
Gasoline values reported in mg/kg (ppm)

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod **Sample ID: 180-2-4'**
TPHG by Method NWTPHG **SAMPLE**
Page 1 of 1

Lab Sample ID: MO08F
LIMS ID: 08-5760
Matrix: Soil
Data Release Authorized:
Reported: 03/28/08

QC Report No: MO08-URS Corporation
Project: Kinder Morgan
Event: 33760784.08001
Date Sampled: 03/19/08
Date Received: 03/20/08

Date Analyzed: 03/26/08 16:00
Instrument/Analyst: PID3/PKC

Purge Volume: 5.0 mL
Sample Amount: 86 mg-dry-wt
Percent Moisture: 14.7%

CAS Number	Analyte	RL	Result
71-43-2	Benzene	14	< 14 U
108-88-3	Toluene	14	< 14 U
100-41-4	Ethylbenzene	14	< 14 U
	m,p-Xylene	29	< 29 U
95-47-6	o-Xylene	14	< 14 U

			GAS ID
Gasoline Range Hydrocarbons	5.8	< 5.8 U	---

BETX Surrogate Recovery

Trifluorotoluene	96.6%
Bromobenzene	99.4%

Gasoline Surrogate Recovery

Trifluorotoluene	97.1%
Bromobenzene	102%

BETX values reported in µg/kg (ppb)
Gasoline values reported in mg/kg (ppm)

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
BETX by Method SW8021BMod
Page 1 of 1

Sample ID: LCS-032608
LAB CONTROL SAMPLE

Lab Sample ID: LCS-032608
LIMS ID: 08-5755
Matrix: Soil
Data Release Authorized:
Reported: 03/28/08

QC Report No: MO08-URS Corporation
Project: Kinder Morgan
Event: 33760784.08001
Date Sampled: NA
Date Received: NA

Date Analyzed LCS: 03/26/08 10:08
LCSD: 03/26/08 10:32
Instrument/Analyst LCS: PID3/PKC
LCSD: PID3/PKC

Purge Volume: 5.0 mL

Sample Amount LCS: 100 mg-dry-wt
LCSD: 100 mg-dry-wt

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Benzene	328	350	93.7%	302	350	86.3%	8.3%
Toluene	2840	3100	91.6%	2610	3100	84.2%	8.4%
Ethylbenzene	546	595	91.8%	502	595	84.4%	8.4%
m,p-Xylene	2050	2230	91.9%	1890	2230	84.8%	8.1%
o-Xylene	736	790	93.2%	694	790	87.8%	5.9%

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

BETX Surrogate Recovery

	LCS	LCSD
Trifluorotoluene	104%	95.3%
Bromobenzene	107%	99.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TPHG by Method NWTPHG
Page 1 of 1

Sample ID: LCS-032608
LAB CONTROL SAMPLE

Lab Sample ID: LCS-032608
LIMS ID: 08-5755
Matrix: Soil
Data Release Authorized:
Reported: 03/28/08

QC Report No: MO08-URS Corporation
Project: Kinder Morgan
Event: 33760784.08001
Date Sampled: NA
Date Received: NA

Date Analyzed LCS: 03/26/08 10:08
LCSD: 03/26/08 10:32
Instrument/Analyst LCS: PID3/PKC
LCSD: PID3/PKC

Purge Volume: 5.0 mL

Sample Amount LCS: 100 mg-dry-wt
LCSD: 100 mg-dry-wt

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Gasoline Range Hydrocarbons	52.6	50.0	105%	46.7	50.0	93.4%	11.9%

Reported in mg/kg (ppm)

RPD calculated using sample concentrations per SW846.

TPHG Surrogate Recovery

	LCS	LCSD
Trifluorotoluene	104%	94.8%
Bromobenzene	108%	100%

ANALYTICAL RESOURCES INCORPORATED

TPHD SURROGATE RECOVERY SUMMARY

Matrix: Soil

QC Report No: MO08-URS Corporation
Project: Kinder Morgan
33760784.08001

Client ID	OTER	TOT OUT
180-3-0.5'	86.2%	0
180-3-1.5'	75.8%	0
180-3-3'	86.7%	0
180-2-0.5'	79.8%	0
180-2-1.5'	77.6%	0
032408MBS	86.7%	0
032408LCS	80.9%	0
032408LCSD	84.4%	0
180-2-4'	90.4%	0
180-2-4' MS	89.6%	0
180-2-4' MSD	91.1%	0

	LCS/MB LIMITS	QC LIMITS
(OTER) = o-Terphenyl	(46-116)	(42-112)

Prep Method: SW3550B
Log Number Range: 08-5755 to 08-5760

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD by GC/FID
Page 1 of 1
Matrix: Soil

QC Report No: MO08-URS Corporation
Project: Kinder Morgan
33760784.08001
Date Received: 03/20/08

Data Release Authorized:
Reported: 03/28/08

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range	RL	Result
MO08A	180-3-0.5'	03/24/08	03/25/08	1.00	Diesel	6.0	< 6.0 U
08-5755	HC ID: ---		FID3A	1.0	Motor Oil	12	< 12 U
					o-Terphenyl		86.2%
MO08B	180-3-1.5'	03/24/08	03/25/08	1.00	Diesel	5.3	< 5.3 U
08-5756	HC ID: ---		FID3A	1.0	Motor Oil	11	< 11 U
					o-Terphenyl		75.8%
MO08C	180-3-3'	03/24/08	03/25/08	1.00	Diesel	5.4	< 5.4 U
08-5757	HC ID: ---		FID3A	1.0	Motor Oil	11	< 11 U
					o-Terphenyl		86.7%
MO08D	180-2-0.5'	03/24/08	03/25/08	1.00	Diesel	5.3	< 5.3 U
08-5758	HC ID: ---		FID3A	1.0	Motor Oil	11	< 11 U
					o-Terphenyl		79.8%
MO08E	180-2-1.5'	03/24/08	03/25/08	1.00	Diesel	6.0	< 6.0 U
08-5759	HC ID: ---		FID3A	1.0	Motor Oil	12	< 12 U
					o-Terphenyl		77.6%
MB-032408	Method Blank	03/24/08	03/25/08	1.00	Diesel	5.0	< 5.0 U
08-5760	HC ID: ---		FID3A	1.0	Motor Oil	10	< 10 U
					o-Terphenyl		86.7%
MO08F	180-2-4'	03/24/08	03/25/08	1.00	Diesel	6.1	< 6.1 U
08-5760	HC ID: ---		FID3A	1.0	Motor Oil	12	< 12 U
					o-Terphenyl		90.4%

Reported in mg/kg (ppm)

EFV-Effective Final Volume in mL.
DL-Dilution of extract prior to analysis.
RL-Reporting limit.

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.
HC ID: DRO/RRO indicates results of organics or additional hydrocarbons in ranges are not identifiable.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPHD by GC/FID
Page 1 of 1

Sample ID: 180-2-4'
MS/MSD

Lab Sample ID: MO08F
LIMS ID: 08-5760
Matrix: Soil
Data Release Authorized:
Reported: 03/28/08

QC Report No: MO08-URS Corporation
Project: Kinder Morgan
33760784.08001
Date Sampled: 03/19/08
Date Received: 03/20/08

Date Extracted MS/MSD: 03/24/08

Sample Amount MS: 8.20 g-dry-wt
MSD: 8.17 g-dry-wt

Date Analyzed MS: 03/25/08 19:15
MSD: 03/25/08 19:31

Final Extract Volume MS: 1.0 mL
MSD: 1.0 mL

Instrument/Analyst MS: FID3A/JGR
MSD: FID3A/JGR

Dilution Factor MS: 1.00
MSD: 1.00

Percent Moisture: 18.3%

Range	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Diesel	< 6.1 U	138	183	75.4%	142	184	77.2%	2.9%

TPHD Surrogate Recovery

	MS	MSD
o-Terphenyl	89.6%	91.1%

Results reported in mg/kg
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPHD by GC/FID
Page 1 of 1

Sample ID: LCS-032408
LCS/LCSD

Lab Sample ID: LCS-032408
LIMS ID: 08-5760
Matrix: Soil
Data Release Authorized:
Reported: 03/28/08

QC Report No: MO08-URS Corporation
Project: Kinder Morgan
33760784.08001
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 03/24/08

Date Analyzed LCS: 03/25/08 16:27
LCSD: 03/25/08 16:42
Instrument/Analyst LCS: FID3A/JGR
LCSD: FID3A/JGR

Sample Amount LCS: 10.0 g
LCSD: 10.0 g
Final Extract Volume LCS: 1.0 mL
LCSD: 1.0 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Range	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Diesel	102	150	68.0%	103	150	68.7%	1.0%

TPHD Surrogate Recovery

	LCS	LCSD
o-Terphenyl	80.9%	84.4%

Results reported in mg/kg
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS-EXTRACTION REPORT

ARI Job: MO08
Project: Kinder Morgan
33760784.08001

Matrix: Soil
Date Received: 03/20/08

ARI ID	Client ID	Client Amt	Final Vol	Basis	Prep Date
08-5755-MO08A	180-3-0.5'	8.26 g	1.00 mL	D	03/24/08
08-5756-MO08B	180-3-1.5'	9.40 g	1.00 mL	D	03/24/08
08-5757-MO08C	180-3-3'	9.28 g	1.00 mL	D	03/24/08
08-5758-MO08D	180-2-0.5'	9.46 g	1.00 mL	D	03/24/08
08-5759-MO08E	180-2-1.5'	8.29 g	1.00 mL	D	03/24/08
08-5760-032408MB1	Method Blank	10.0 g	1.00 mL	-	03/24/08
08-5760-032408LCS1	Lab Control	10.0 g	1.00 mL	-	03/24/08
08-5760-032408LCSD1	Lab Control Dup	10.0 g	1.00 mL	-	03/24/08
08-5760-MO08F	180-2-4'	8.19 g	1.00 mL	D	03/24/08
08-5760-MO08FMS	180-2-4'	8.20 g	1.00 mL	D	03/24/08
08-5760-MO08FMSD	180-2-4'	8.17 g	1.00 mL	D	03/24/08

Basis: D=Dry Weight W=As Received

URS

Memo

1501 4th Avenue, Suite 1400
Seattle, Washington 98101
206.438.2700 Telephone
206.438.2699 Fax

To:	Karen Mixon, Project Manager	**Info:**	**FINAL**
From:	Alison M Rohde, Chemist	**Date:**	January 19, 2007

SUBJECT: **Summary Data Quality Review**
Laurel Station Facility, Kinder Morgan
Bellingham, Washington
Groundwater Monitoring – November/December 2006

The summary data quality review of 7 groundwater samples, one field duplicate, and one trip blank collected between November 7 and December 8, 2006 has been completed. The samples were analyzed at the Analytical Resources, Incorporated (ARI) laboratory in Tukwila, Washington for volatile organic compounds (VOCs) by EPA Method 8260B, total petroleum hydrocarbons (TPH, gasoline-range, diesel-range and oil-range) by Washington State Department of Ecology (Ecology) methods NWTPH-Gx and NWTPH-Dx, and/or polynuclear aromatic hydrocarbons (PAHs) by EPA Method 8270D modified for select ion monitoring (SIM) as described below. The analyses were performed in general accordance with the methods specified in EPA's *Test Methods for Evaluating Solid Waste (SW-846), Update IIIB*, June 2005 and Ecology's *Analytical Methods for Petroleum Hydrocarbons,* June 1997. The laboratory provided a summary report containing sample results and associated QA/QC data for all samples. The following samples are associated with ARI sample delivery groups (SDGs) KF01, KG83, and KI11:

Sample ID	ARI ID	Requested Analysis
SW-4	KF01A	VOCs, NWTPH-Dx, PAHs
Trip Blank	KF01B	VOCs
SW-4	KG83A	PAHs
DW-1	KI11A	VOCs, NWTPH-Gx, NWTPH-Dx, PAHs
DW-2	KI11B	VOCs, NWTPH-Gx, NWTPH-Dx, PAHs
DW-3	KI11C	VOCs, NWTPH-Gx, NWTPH-Dx, PAHs
DW-4	KI11D	VOCs, NWTPH-Gx, NWTPH-Dx, PAHs
SW-2	KI11E	VOCs, NWTPH-Gx, NWTPH-Dx, PAHs
DW-5	KI11F	VOCs, NWTPH-Gx, NWTPH-Dx, PAHs
DUP (Duplicate of DW-4)	KI11G	VOCs, NWTPH-Gx, NWTPH-Dx, PAHs

Upon receipt by ARI, the sample jar information was compared to the chain-of-custody (COC). No discrepancies relating to sample identification were noted by ARI and the coolers were within the EPA-recommended range of 4°C±2° C.

Data validation is based on method performance criteria and, where appropriate, laboratory-specified control limits. Hold times, method / trip blanks, surrogate recoveries, matrix spike/matrix spike duplicate recoveries, laboratory duplicate results, blank spike recoveries (laboratory control samples) and reporting limits were reviewed

to assess compliance with applicable methods. If data qualification was required, data were qualified based on the definitions and use of qualifying flags outlined in the EPA document *USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Organic Data Review,* October 1999.

Organic Analysis

Samples were analyzed for VOCs, TPH, and/or PAHs by the methods identified in the introduction of this report.

1. Holding Times – Acceptable except as noted below:

   PAHs by Method 8270D-SIM – Sample SW-4 (KF01A) was extracted and analyzed by EPA method 8270D but not by the low-level technique required to achieve reporting limits below the Ecology Model Toxics Control Act (MTCA) Method B groundwater cleanup levels. URS Corporation requested ARI to use the remaining unused sample volume to extract and analyze the sample using the low-level method. ARI relogged the sample under work order KG83. The sample was extracted 16 days past the 7-day method holding time. PAHs were not detected in the sample in either analysis. The PAH results for the re-extracted sample (KG83) are qualified as estimated based on the holding time exceedance and flagged 'J' if reported as detected or 'UJ' if reported as not detected.

2. Blanks – Acceptable except as noted below:

   PAHs by Method 8270D-SIM – Naphthalene (0.0064 ug/L) was detected in the method blank extracted on November 30, 2006 with sample SW-4 (KG83A). Per CLP guidelines, analytes detected in samples that are also detected in blanks are qualified if the sample concentration is less than five times (5x) the blank concentration. Naphthalene was detected in sample SW-4 at a concentration less than 5x the method blank concentration; therefore, the result for naphthalene was qualified as not detected and flagged 'U' at the reported result.

3. Surrogates – Acceptable

4. Laboratory Control/Laboratory Control Duplicate Samples (LCS/LCSD) – Acceptable except as noted below:

   VOCs by Method 8260B – The percent recoveries for tetrachloroethene (115%) and acrolein (68.0%) in the LCS analyzed on December 12, 2006 (associated with samples in KI11) were outside the laboratory control limits of 77-114% and 69-118%, respectively. As the LCSD and relative percent difference (RPD) for the LCS/LCSD pairs were acceptable, data were not qualified based on the LCS results.

5. Matrix Spike / Matrix Spike Duplicates (MS/MSD) – Acceptable except as noted below:

   General - MS/MSDs were performed on sample SW-2 for TPH and PAHs. Results were acceptable.

   VOCs by Method 8260B - A MS/MSD was performed on sample SW-2. With the exception of 2-chloroethylvinylether (2-CVE), recoveries were acceptable. 2-CVE was not recovered. 2-CVE has been documented to be unstable in the presence of acids; even dilute acids will produce hydrolysis of 2-CVE to acetaldehyde and 2-chloroethanol. Any 2-CVE which may have been present in a water sample is therefore likely to react with the hydrochloric acid used for sample preservation. The results for 2-CVE for samples associated with these SDGs are qualified as rejected and flagged 'R.'

6. Field Duplicate – Acceptable

   A field duplicate was submitted for DW-4 and identified as DUP. Results were comparable for all analyses.

7. Reporting Limits – Acceptable except as noted below:

   PAHs by Method 8270D-SIM – The reporting limits for PAHs in the initial analysis of sample SW-4 (KF01) were elevated because the laboratory used the incorrect method. The laboratory re-extracted and reanalyzed sample SW-4 using the appropriate method at the request of URS Corporation. The reporting limits for SW-4 (KG83) were acceptable, but the results are qualified as estimated based on holding time exceedance. The qualified data from the lower level analysis will be used for groundwater assessment.

Overall Assessment of Data

The completeness for SDGs KF01, KG83, and KI11 is greater than 97%. The usefulness of this data is based on USEPA guidance documents listed in the introduction to this report. Upon consideration of the information presented above, the data are acceptable except where flagged with data qualifiers that modify the usefulness of the individual values.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

27 November 2006

Karen Mixon
URS Corporation
Century Square
1501 Fourth Avenue Suite 1400
Seattle, WA 98101

RE: Client Project: 3375, Kinder Morgan, Laurel Station
ARI Job No: KF01

Dear Karen:

Please find enclosed the original chain of custody documentation and the final results for the samples from the project referenced above. Analytical Resources, Inc. (ARI) received one water sample and one trip blank in good condition on November 10, 2006.

The samples were analyzed for VOAs, NWTPH-Dx and PAHs as requested.

These analyses proceeded without incident of note.

A copy of these reports and all associated raw data will remain on file electronically with ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Mark D. Harris
Project Manager
206/695-6210
markh@arilabs.com

Enclosures

cc: file KF01

MDH/mdh

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: KP01	Turn-around Requested: Standard	Page: 1 of 1	
ARI Client Company: URS Corp.	Phone: (206) 438-2234	Date: 11/10/06	Ice Present? Y
Client Contact: Karen Mixon		No. of Coolers: 1	Cooler Temps: 5.0°
Client Project Name: Kinder Morgan - Laurel Station			
Client Project #: 3375	Samplers: VTM, MHH		

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: NWTPH-Dx	* PAH by 8270-SIM	8260B VOCs						Notes/Comments
SW-4	11/07/06	1535	Water	7	X	X	X						* PAH RL 0.01 mg/L
TRIP BLANK	11/07/06	—	Water	4			X						

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Jesse McCullough	Printed Name: BOB CONGLETON	Printed Name:	Printed Name:
	Company: URS Corp.	Company: ART	Company:	Company:
	Date & Time: 11/10/06 1240	Date & Time: 11/10/06 1420	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release 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 Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

ARI Data Reporting Qualifiers

Effective 11/22/04

Inorganic Data

U	Indicates that the target analyte was not detected at the reported concentration
*	Duplicate RPD is not within established control limits
B	Reported value is less than the CRDL but ≥ the Reporting Limit
N	Matrix Spike recovery not within established control limits
NA	Not Applicable, analyte not spiked
H	The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
L	Analyte concentration is ≤5 times the Reporting Limit and the replicate control limit defaults to ±1 RL instead of the normal 20% RPD

Organic Data

U	Indicates that the target analyte was not detected at the reported concentration
*	Flagged value is not within established control limits
B	Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
J	Estimated concentration when the value is less than ARI's established reporting limits
D	The spiked compound was not detected due to sample extract dilution
NR	Spiked compound recovery is not reported due to chromatographic interference
E	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.
S	Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte
NA	The flagged analyte was not analyzed for
NS	The flagged analyte was not spiked into the sample
M	Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"
Y	The analyte reporting limit is raised due to a positive chromatographic interference. The compound is not detected above the raised limit but may be present at or below the limit
C	The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column
P	The analyte was detected on both chromatographic columns but the quantified values differ by ≥40% RPD with no obvious chromatographic interference

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: MB-111506**
Page 1 of 2 **METHOD BLANK**

Lab Sample ID: MB-111506
LIMS ID: 06-23070
Matrix: Water
Data Release Authorized:
Reported: 01/19/07

QC Report No: KF01-URS Corp
Project: KINDER MORGAN- LAUREL STATION 3375
Date Sampled: NA
Date Received: NA

Instrument/Analyst: FINN3/PAB
Date Analyzed: 11/15/06 16:53

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	RL	Result	Q
74-87-3	Chloromethane	0.2	< 0.2	U
74-83-9	Bromomethane	0.2	< 0.2	U
75-01-4	Vinyl Chloride	0.2	< 0.2	U
75-00-3	Chloroethane	0.2	< 0.2	U
75-09-2	Methylene Chloride	0.3	< 0.3	U
67-64-1	Acetone	3.0	< 3.0	U
75-15-0	Carbon Disulfide	0.2	< 0.2	U
75-35-4	1,1-Dichloroethene	0.2	< 0.2	U
75-34-3	1,1-Dichloroethane	0.2	< 0.2	U
156-60-5	trans-1,2-Dichloroethene	0.2	< 0.2	U
156-59-2	cis-1,2-Dichloroethene	0.2	< 0.2	U
67-66-3	Chloroform	0.2	< 0.2	U
107-06-2	1,2-Dichloroethane	0.2	< 0.2	U
78-93-3	2-Butanone	1.0	< 1.0	U
71-55-6	1,1,1-Trichloroethane	0.2	< 0.2	U
56-23-5	Carbon Tetrachloride	0.2	< 0.2	U
108-05-4	Vinyl Acetate	0.2	< 0.2	U
75-27-4	Bromodichloromethane	0.2	< 0.2	U
78-87-5	1,2-Dichloropropane	0.2	< 0.2	U
10061-01-5	cis-1,3-Dichloropropene	0.2	< 0.2	U
79-01-6	Trichloroethene	0.2	< 0.2	U
124-48-1	Dibromochloromethane	0.2	< 0.2	U
79-00-5	1,1,2-Trichloroethane	0.2	< 0.2	U
71-43-2	Benzene	0.2	< 0.2	U
10061-02-6	trans-1,3-Dichloropropene	0.2	< 0.2	U
110-75-8	2-Chloroethylvinylether	0.5	< 0.5	U
75-25-2	Bromoform	0.2	< 0.2	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	1.0	< 1.0	U
591-78-6	2-Hexanone	3.0	< 3.0	U
127-18-4	Tetrachloroethene	0.2	< 0.2	U
79-34-5	1,1,2,2-Tetrachloroethane	0.2	< 0.2	U
108-88-3	Toluene	0.2	< 0.2	U
108-90-7	Chlorobenzene	0.2	< 0.2	U
100-41-4	Ethylbenzene	0.2	< 0.2	U
100-42-5	Styrene	0.2	< 0.2	U
75-69-4	Trichlorofluoromethane	0.2	< 0.2	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.2	< 0.2	U
1330-20-7	m,p-Xylene	0.4	< 0.4	U
95-47-6	o-Xylene	0.2	< 0.2	U
95-50-1	1,2-Dichlorobenzene	0.2	< 0.2	U
541-73-1	1,3-Dichlorobenzene	0.2	< 0.2	U
106-46-7	1,4-Dichlorobenzene	0.2	< 0.2	U
107-02-8	Acrolein	5.0	< 5.0	U
74-88-4	Methyl Iodide	0.2	< 0.2	U
74-96-4	Bromoethane	0.2	< 0.2	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.2	< 0.2	U
74-95-3	Dibromomethane	0.2	< 0.2	U
630-20-6	1,1,1,2-Tetrachloroethane	0.2	< 0.2	U
96-12-8	1,2-Dibromo-3-chloropropane	0.5	< 0.5	U
96-18-4	1,2,3-Trichloropropane	0.5	< 0.5	U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: MB-111506**
 METHOD BLANK

Lab Sample ID: MB-111506 QC Report No: KF01-URS Corp
LIMS ID: 06-23070 Project: KINDER MORGAN- LAUREL STATION
Matrix: Water 3375
Date Analyzed: 11/15/06 16:53

CAS Number	Analyte	RL	Result	Q
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.2	< 0.2	U
95-63-6	1,2,4-Trimethylbenzene	0.2	< 0.2	U
87-68-3	Hexachlorobutadiene	0.5	< 0.5	U
106-93-4	Ethylene Dibromide	0.2	< 0.2	U
74-97-5	Bromochloromethane	0.2	< 0.2	U
594-20-7	2,2-Dichloropropane	0.2	< 0.2	U
142-28-9	1,3-Dichloropropane	0.2	< 0.2	U
98-82-8	Isopropylbenzene	0.2	< 0.2	U
103-65-1	n-Propylbenzene	0.2	< 0.2	U
108-86-1	Bromobenzene	0.2	< 0.2	U
95-49-8	2-Chlorotoluene	0.2	< 0.2	U
106-43-4	4-Chlorotoluene	0.2	< 0.2	U
98-06-6	tert-Butylbenzene	0.2	< 0.2	U
135-98-8	sec-Butylbenzene	0.2	< 0.2	U
99-87-6	4-Isopropyltoluene	0.2	< 0.2	U
104-51-8	n-Butylbenzene	0.2	< 0.2	U
120-82-1	1,2,4-Trichlorobenzene	0.5	< 0.5	U
91-20-3	Naphthalene	0.5	< 0.5	U
87-61-6	1,2,3-Trichlorobenzene	0.5	< 0.5	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	83.5%
d8-Toluene	93.5%
Bromofluorobenzene	77.0%
d4-1,2-Dichlorobenzene	97.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: SW-4**
Page 1 of 2 **SAMPLE**

Lab Sample ID: KF01A
LIMS ID: 06-23070
Matrix: Water
Data Release Authorized:
Reported: 01/19/07

QC Report No: KF01-URS Corp
Project: KINDER MORGAN- LAUREL STATION 3375
Date Sampled: 11/07/06
Date Received: 11/10/06

Instrument/Analyst: FINN3/PAB
Date Analyzed: 11/15/06 17:48

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	RL	Result	Q
74-87-3	Chloromethane	0.2	< 0.2	U
74-83-9	Bromomethane	0.2	< 0.2	U
75-01-4	Vinyl Chloride	0.2	< 0.2	U
75-00-3	Chloroethane	0.2	< 0.2	U
75-09-2	Methylene Chloride	0.3	< 0.3	U
67-64-1	Acetone	3.0	< 3.0	U
75-15-0	Carbon Disulfide	0.2	< 0.2	U
75-35-4	1,1-Dichloroethene	0.2	< 0.2	U
75-34-3	1,1-Dichloroethane	0.2	< 0.2	U
156-60-5	trans-1,2-Dichloroethene	0.2	< 0.2	U
156-59-2	cis-1,2-Dichloroethene	0.2	< 0.2	U
67-66-3	Chloroform	0.2	< 0.2	U
107-06-2	1,2-Dichloroethane	0.2	< 0.2	U
78-93-3	2-Butanone	1.0	< 1.0	U
71-55-6	1,1,1-Trichloroethane	0.2	< 0.2	U
56-23-5	Carbon Tetrachloride	0.2	< 0.2	U
108-05-4	Vinyl Acetate	0.2	< 0.2	U
75-27-4	Bromodichloromethane	0.2	< 0.2	U
78-87-5	1,2-Dichloropropane	0.2	< 0.2	U
10061-01-5	cis-1,3-Dichloropropene	0.2	< 0.2	U
79-01-6	Trichloroethene	0.2	< 0.2	U
124-48-1	Dibromochloromethane	0.2	< 0.2	U
79-00-5	1,1,2-Trichloroethane	0.2	< 0.2	U
71-43-2	Benzene	0.2	< 0.2	U
10061-02-6	trans-1,3-Dichloropropene	0.2	< 0.2	U
110-75-8	2-Chloroethylvinylether	0.5	< 0.5	U
75-25-2	Bromoform	0.2	< 0.2	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	1.0	< 1.0	U
591-78-6	2-Hexanone	3.0	< 3.0	U
127-18-4	Tetrachloroethene	0.2	< 0.2	U
79-34-5	1,1,2,2-Tetrachloroethane	0.2	< 0.2	U
108-88-3	Toluene	0.2	< 0.2	U
108-90-7	Chlorobenzene	0.2	< 0.2	U
100-41-4	Ethylbenzene	0.2	< 0.2	U
100-42-5	Styrene	0.2	< 0.2	U
75-69-4	Trichlorofluoromethane	0.2	< 0.2	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.2	< 0.2	U
1330-20-7	m,p-Xylene	0.4	< 0.4	U
95-47-6	o-Xylene	0.2	< 0.2	U
95-50-1	1,2-Dichlorobenzene	0.2	< 0.2	U
541-73-1	1,3-Dichlorobenzene	0.2	< 0.2	U
106-46-7	1,4-Dichlorobenzene	0.2	< 0.2	U
107-02-8	Acrolein	5.0	< 5.0	U
74-88-4	Methyl Iodide	0.2	< 0.2	U
74-96-4	Bromoethane	0.2	< 0.2	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.2	< 0.2	U
74-95-3	Dibromomethane	0.2	< 0.2	U
630-20-6	1,1,1,2-Tetrachloroethane	0.2	< 0.2	U
96-12-8	1,2-Dibromo-3-chloropropane	0.5	< 0.5	U
96-18-4	1,2,3-Trichloropropane	0.5	< 0.5	U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: SW-4**
Page 2 of 2 **SAMPLE**

Lab Sample ID: KF01A
LIMS ID: 06-23070
Matrix: Water
Date Analyzed: 11/15/06 17:48

QC Report No: KF01-URS Corp
Project: KINDER MORGAN- LAUREL STATION 3375

CAS Number	Analyte	RL	Result	Q
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.2	< 0.2	U
95-63-6	1,2,4-Trimethylbenzene	0.2	< 0.2	U
87-68-3	Hexachlorobutadiene	0.5	< 0.5	U
106-93-4	Ethylene Dibromide	0.2	< 0.2	U
74-97-5	Bromochloromethane	0.2	< 0.2	U
594-20-7	2,2-Dichloropropane	0.2	< 0.2	U
142-28-9	1,3-Dichloropropane	0.2	< 0.2	U
98-82-8	Isopropylbenzene	0.2	< 0.2	U
103-65-1	n-Propylbenzene	0.2	< 0.2	U
108-86-1	Bromobenzene	0.2	< 0.2	U
95-49-8	2-Chlorotoluene	0.2	< 0.2	U
106-43-4	4-Chlorotoluene	0.2	< 0.2	U
98-06-6	tert-Butylbenzene	0.2	< 0.2	U
135-98-8	sec-Butylbenzene	0.2	< 0.2	U
99-87-6	4-Isopropyltoluene	0.2	< 0.2	U
104-51-8	n-Butylbenzene	0.2	< 0.2	U
120-82-1	1,2,4-Trichlorobenzene	0.5	< 0.5	U
91-20-3	Naphthalene	0.5	< 0.5	U
87-61-6	1,2,3-Trichlorobenzene	0.5	< 0.5	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	87.5%
d8-Toluene	92.2%
Bromofluorobenzene	80.2%
d4-1,2-Dichlorobenzene	104%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: TRIP BLANK SAMPLE**

Lab Sample ID: KF01B
LIMS ID: 06-23071
Matrix: Water
Data Release Authorized:
Reported: 01/19/07

QC Report No: KF01-URS Corp
Project: KINDER MORGAN- LAUREL STATION 3375
Date Sampled: 11/07/06
Date Received: 11/10/06

Instrument/Analyst: FINN3/PAB
Date Analyzed: 11/15/06 17:21

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	RL	Result	Q
74-87-3	Chloromethane	0.2	< 0.2	U
74-83-9	Bromomethane	0.2	< 0.2	U
75-01-4	Vinyl Chloride	0.2	< 0.2	U
75-00-3	Chloroethane	0.2	< 0.2	U
75-09-2	Methylene Chloride	0.3	< 0.3	U
67-64-1	Acetone	3.0	< 3.0	U
75-15-0	Carbon Disulfide	0.2	< 0.2	U
75-35-4	1,1-Dichloroethene	0.2	< 0.2	U
75-34-3	1,1-Dichloroethane	0.2	< 0.2	U
156-60-5	trans-1,2-Dichloroethene	0.2	< 0.2	U
156-59-2	cis-1,2-Dichloroethene	0.2	< 0.2	U
67-66-3	Chloroform	0.2	< 0.2	U
107-06-2	1,2-Dichloroethane	0.2	< 0.2	U
78-93-3	2-Butanone	1.0	< 1.0	U
71-55-6	1,1,1-Trichloroethane	0.2	< 0.2	U
56-23-5	Carbon Tetrachloride	0.2	< 0.2	U
108-05-4	Vinyl Acetate	0.2	< 0.2	U
75-27-4	Bromodichloromethane	0.2	< 0.2	U
78-87-5	1,2-Dichloropropane	0.2	< 0.2	U
10061-01-5	cis-1,3-Dichloropropene	0.2	< 0.2	U
79-01-6	Trichloroethene	0.2	< 0.2	U
124-48-1	Dibromochloromethane	0.2	< 0.2	U
79-00-5	1,1,2-Trichloroethane	0.2	< 0.2	U
71-43-2	Benzene	0.2	< 0.2	U
10061-02-6	trans-1,3-Dichloropropene	0.2	< 0.2	U
110-75-8	2-Chloroethylvinylether	0.5	< 0.5	U
75-25-2	Bromoform	0.2	< 0.2	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	1.0	< 1.0	U
591-78-6	2-Hexanone	3.0	< 3.0	U
127-18-4	Tetrachloroethene	0.2	< 0.2	U
79-34-5	1,1,2,2-Tetrachloroethane	0.2	< 0.2	U
108-88-3	Toluene	0.2	< 0.2	U
108-90-7	Chlorobenzene	0.2	< 0.2	U
100-41-4	Ethylbenzene	0.2	< 0.2	U
100-42-5	Styrene	0.2	< 0.2	U
75-69-4	Trichlorofluoromethane	0.2	< 0.2	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.2	< 0.2	U
1330-20-7	m,p-Xylene	0.4	< 0.4	U
95-47-6	o-Xylene	0.2	< 0.2	U
95-50-1	1,2-Dichlorobenzene	0.2	< 0.2	U
541-73-1	1,3-Dichlorobenzene	0.2	< 0.2	U
106-46-7	1,4-Dichlorobenzene	0.2	< 0.2	U
107-02-8	Acrolein	5.0	< 5.0	U
74-88-4	Methyl Iodide	0.2	< 0.2	U
74-96-4	Bromoethane	0.2	< 0.2	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.2	< 0.2	U
74-95-3	Dibromomethane	0.2	< 0.2	U
630-20-6	1,1,1,2-Tetrachloroethane	0.2	< 0.2	U
96-12-8	1,2-Dibromo-3-chloropropane	0.5	< 0.5	U
96-18-4	1,2,3-Trichloropropane	0.5	< 0.5	U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: TRIP BLANK SAMPLE**

Lab Sample ID: KF01B
LIMS ID: 06-23071
Matrix: Water
Date Analyzed: 11/15/06 17:21

QC Report No: KF01-URS Corp
Project: KINDER MORGAN- LAUREL STATION 3375

CAS Number	Analyte	RL	Result	Q
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.2	< 0.2	U
95-63-6	1,2,4-Trimethylbenzene	0.2	< 0.2	U
87-68-3	Hexachlorobutadiene	0.5	< 0.5	U
106-93-4	Ethylene Dibromide	0.2	< 0.2	U
74-97-5	Bromochloromethane	0.2	< 0.2	U
594-20-7	2,2-Dichloropropane	0.2	< 0.2	U
142-28-9	1,3-Dichloropropane	0.2	< 0.2	U
98-82-8	Isopropylbenzene	0.2	< 0.2	U
103-65-1	n-Propylbenzene	0.2	< 0.2	U
108-86-1	Bromobenzene	0.2	< 0.2	U
95-49-8	2-Chlorotoluene	0.2	< 0.2	U
106-43-4	4-Chlorotoluene	0.2	< 0.2	U
98-06-6	tert-Butylbenzene	0.2	< 0.2	U
135-98-8	sec-Butylbenzene	0.2	< 0.2	U
99-87-6	4-Isopropyltoluene	0.2	< 0.2	U
104-51-8	n-Butylbenzene	0.2	< 0.2	U
120-82-1	1,2,4-Trichlorobenzene	0.5	< 0.5	U
91-20-3	Naphthalene	0.5	< 0.5	U
87-61-6	1,2,3-Trichlorobenzene	0.5	< 0.5	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	91.0%
d8-Toluene	95.2%
Bromofluorobenzene	83.5%
d4-1,2-Dichlorobenzene	97.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: LCS-111506**
 LAB CONTROL SAMPLE

Lab Sample ID: LCS-111506 QC Report No: KF01-URS Corp
LIMS ID: 06-23070 Project: KINDER MORGAN- LAUREL STATION
Matrix: Water 3375
Data Release Authorized: Date Sampled: NA
Reported: 01/19/07 Date Received: NA

Instrument/Analyst LCS: FINN3/PAB Sample Amount LCS: 20.0 mL
LCSD: FINN3/PAB LCSD: 20.0 mL
Date Analyzed LCS: 11/15/06 15:22 Purge Volume LCS: 20.0 mL
LCSD: 11/15/06 16:03 LCSD: 20.0 mL

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Chloromethane	2.6	4.0	65.0%	2.6	4.0	65.0%	0.0%
Bromomethane	4.0	4.0	100%	3.8	4.0	95.0%	5.1%
Vinyl Chloride	3.2	4.0	80.0%	2.9	4.0	72.5%	9.8%
Chloroethane	3.1	4.0	77.5%	3.2	4.0	80.0%	3.2%
Methylene Chloride	4.1	4.0	102%	3.3	4.0	82.5%	21.6%
Acetone	16.8	20.0	84.0%	16.6	20.0	83.0%	1.2%
Carbon Disulfide	3.6	4.0	90.0%	3.1	4.0	77.5%	14.9%
1,1-Dichloroethene	3.9	4.0	97.5%	3.7	4.0	92.5%	5.3%
1,1-Dichloroethane	4.0	4.0	100%	3.4	4.0	85.0%	16.2%
trans-1,2-Dichloroethene	4.2	4.0	105%	3.6	4.0	90.0%	15.4%
cis-1,2-Dichloroethene	3.5	4.0	87.5%	3.2	4.0	80.0%	9.0%
Chloroform	3.7	4.0	92.5%	3.3	4.0	82.5%	11.4%
1,2-Dichloroethane	3.9	4.0	97.5%	4.0	4.0	100%	2.5%
2-Butanone	17.3	20.0	86.5%	15.8	20.0	79.0%	9.1%
1,1,1-Trichloroethane	3.7	4.0	92.5%	3.3	4.0	82.5%	11.4%
Carbon Tetrachloride	3.6	4.0	90.0%	3.6	4.0	90.0%	0.0%
Vinyl Acetate	3.4	4.0	85.0%	3.2	4.0	80.0%	6.1%
Bromodichloromethane	3.8	4.0	95.0%	3.5	4.0	87.5%	8.2%
1,2-Dichloropropane	3.8	4.0	95.0%	3.6	4.0	90.0%	5.4%
cis-1,3-Dichloropropene	4.0	4.0	100%	3.7	4.0	92.5%	7.8%
Trichloroethene	3.9	4.0	97.5%	3.7	4.0	92.5%	5.3%
Dibromochloromethane	3.5	4.0	87.5%	3.2	4.0	80.0%	9.0%
1,1,2-Trichloroethane	4.0	4.0	100%	3.8	4.0	95.0%	5.1%
Benzene	4.1	4.0	102%	3.8	4.0	95.0%	7.6%
trans-1,3-Dichloropropene	3.7	4.0	92.5%	3.5	4.0	87.5%	5.6%
2-Chloroethylvinylether	3.5	4.0	87.5%	3.2	4.0	80.0%	9.0%
Bromoform	3.6	4.0	90.0%	3.3	4.0	82.5%	8.7%
4-Methyl-2-Pentanone (MIBK)	18.2	20.0	91.0%	17.3	20.0	86.5%	5.1%
2-Hexanone	19.0	20.0	95.0%	17.9	20.0	89.5%	6.0%
Tetrachloroethene	4.4	4.0	110%	4.2	4.0	105%	4.7%
1,1,2,2-Tetrachloroethane	3.5	4.0	87.5%	3.3	4.0	82.5%	5.9%
Toluene	4.1	4.0	102%	4.0	4.0	100%	2.5%
Chlorobenzene	4.1	4.0	102%	3.7	4.0	92.5%	10.3%
Ethylbenzene	4.2	4.0	105%	3.7	4.0	92.5%	12.7%
Styrene	4.6	4.0	115%	4.1	4.0	102%	11.5%
Trichlorofluoromethane	3.6	4.0	90.0%	3.5	4.0	87.5%	2.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: LCS-111506**
 LAB CONTROL SAMPLE

Lab Sample ID: LCS-111506 QC Report No: KF01-URS Corp
LIMS ID: 06-23070 Project: KINDER MORGAN- LAUREL STATION
Matrix: Water 3375

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
1,1,2-Trichloro-1,2,2-trifluoroetha	3.8	4.0	95.0%	3.6	4.0	90.0%	5.4%
m,p-Xylene	9.0	8.0	112%	7.9	8.0	98.8%	13.0%
o-Xylene	4.3	4.0	108%	3.8	4.0	95.0%	12.3%
1,2-Dichlorobenzene	4.2	4.0	105%	4.0	4.0	100%	4.9%
1,3-Dichlorobenzene	4.3	4.0	108%	3.9	4.0	97.5%	9.8%
1,4-Dichlorobenzene	4.2	4.0	105%	3.9	4.0	97.5%	7.4%
Acrolein	15.7	20.0	78.5%	16.7	20.0	83.5%	6.2%
Methyl Iodide	4.6	4.0	115%	4.4	4.0	110%	4.4%
Bromoethane	3.9	4.0	97.5%	3.8	4.0	95.0%	2.6%
Acrylonitrile	3.6	4.0	90.0%	3.3	4.0	82.5%	8.7%
1,1-Dichloropropene	3.8	4.0	95.0%	3.5	4.0	87.5%	8.2%
Dibromomethane	4.1	4.0	102%	3.6	4.0	90.0%	13.0%
1,1,1,2-Tetrachloroethane	3.9	4.0	97.5%	3.6	4.0	90.0%	8.0%
1,2-Dibromo-3-chloropropane	3.1	4.0	77.5%	3.0	4.0	75.0%	3.3%
1,2,3-Trichloropropane	3.8	4.0	95.0%	3.3	4.0	82.5%	14.1%
trans-1,4-Dichloro-2-butene	3.8	4.0	95.0%	3.6	4.0	90.0%	5.4%
1,3,5-Trimethylbenzene	4.2	4.0	105%	3.5	4.0	87.5%	18.2%
1,2,4-Trimethylbenzene	4.3	4.0	108%	3.6	4.0	90.0%	17.7%
Hexachlorobutadiene	4.1	4.0	102%	3.8	4.0	95.0%	7.6%
Ethylene Dibromide	3.7	4.0	92.5%	3.6	4.0	90.0%	2.7%
Bromochloromethane	3.9	4.0	97.5%	3.5	4.0	87.5%	10.8%
2,2-Dichloropropane	4.0	4.0	100%	3.4	4.0	85.0%	16.2%
1,3-Dichloropropane	4.0	4.0	100%	3.7	4.0	92.5%	7.8%
Isopropylbenzene	4.0	4.0	100%	3.6	4.0	90.0%	10.5%
n-Propylbenzene	4.5	4.0	112%	3.8	4.0	95.0%	16.9%
Bromobenzene	4.3	4.0	108%	3.9	4.0	97.5%	9.8%
2-Chlorotoluene	3.6	4.0	90.0%	3.7	4.0	92.5%	2.7%
4-Chlorotoluene	4.2	4.0	105%	3.7	4.0	92.5%	12.7%
tert-Butylbenzene	4.3	4.0	108%	3.6	4.0	90.0%	17.7%
sec-Butylbenzene	4.3	4.0	108%	3.8	4.0	95.0%	12.3%
4-Isopropyltoluene	4.2	4.0	105%	3.8	4.0	95.0%	10.0%
n-Butylbenzene	4.1	4.0	102%	4.0	4.0	100%	2.5%
1,2,4-Trichlorobenzene	4.1	4.0	102%	3.9	4.0	97.5%	5.0%
Naphthalene	3.7	4.0	92.5%	3.5	4.0	87.5%	5.6%
1,2,3-Trichlorobenzene	4.1	4.0	102%	3.9	4.0	97.5%	5.0%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	97.5%	87.5%
d8-Toluene	100%	92.8%
Bromofluorobenzene	90.5%	86.2%
d4-1,2-Dichlorobenzene	99.2%	91.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: MB-111406
METHOD BLANK

Lab Sample ID: MB-111406
LIMS ID: 06-23070
Matrix: Water
Data Release Authorized:
Reported: 01/19/07

QC Report No: KF01-URS Corp
Project: KINDER MORGAN- LAUREL STATION
Event: 3375
Date Sampled: NA
Date Received: NA

Date Extracted: 11/14/06
Date Analyzed: 11/22/06 12:39
Instrument/Analyst: NT1/VTS

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	0.10	< 0.10 U
91-57-6	2-Methylnaphthalene	0.10	< 0.10 U
208-96-8	Acenaphthylene	0.10	< 0.10 U
83-32-9	Acenaphthene	0.10	< 0.10 U
86-73-7	Fluorene	0.10	< 0.10 U
85-01-8	Phenanthrene	0.10	< 0.10 U
120-12-7	Anthracene	0.10	< 0.10 U
206-44-0	Fluoranthene	0.10	< 0.10 U
129-00-0	Pyrene	0.10	< 0.10 U
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
205-99-2	Benzo(b)fluoranthene	0.10	< 0.10 U
207-08-9	Benzo(k)fluoranthene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10	< 0.10 U
132-64-9	Dibenzofuran	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	84.0%
d14-Dibenzo(a,h)anthracen	100%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
Page 1 of 1

Sample ID: SW-4
SAMPLE

Lab Sample ID: KF01A
LIMS ID: 06-23070
Matrix: Water
Data Release Authorized:
Reported: 01/19/07

QC Report No: KF01-URS Corp
Project: KINDER MORGAN- LAUREL STATION
Event: 3375
Date Sampled: 11/07/06
Date Received: 11/10/06

Date Extracted: 11/14/06
Date Analyzed: 11/22/06 15:33
Instrument/Analyst: NT1/VTS

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	0.10	< 0.10 U
91-57-6	2-Methylnaphthalene	0.10	< 0.10 U
208-96-8	Acenaphthylene	0.10	< 0.10 U
83-32-9	Acenaphthene	0.10	< 0.10 U
86-73-7	Fluorene	0.10	< 0.10 U
85-01-8	Phenanthrene	0.10	< 0.10 U
120-12-7	Anthracene	0.10	< 0.10 U
206-44-0	Fluoranthene	0.10	< 0.10 U
129-00-0	Pyrene	0.10	< 0.10 U
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
205-99-2	Benzo(b)fluoranthene	0.10	< 0.10 U
207-08-9	Benzo(k)fluoranthene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10	< 0.10 U
132-64-9	Dibenzofuran	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	83.7%
d14-Dibenzo(a,h)anthracen	97.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
Page 1 of 1

Sample ID: LCS-111406
LAB CONTROL SAMPLE

Lab Sample ID: LCS-111406
LIMS ID: 06-23070
Matrix: Water
Data Release Authorized:
Reported: 01/19/07

QC Report No: KF01-URS Corp
Project: KINDER MORGAN- LAUREL STATION
Event: 3375
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 11/14/06

Date Analyzed LCS: 11/22/06 13:04
LCSD: 11/22/06 13:28
Instrument/Analyst LCS: NT1/VTS
LCSD: NT1/VTS

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Naphthalene	2.62	3.00	87.3%	2.58	3.00	86.0%	1.5%
Acenaphthylene	2.78	3.00	92.7%	2.84	3.00	94.7%	2.1%
Acenaphthene	2.84	3.00	94.7%	2.72	3.00	90.7%	4.3%
Fluorene	2.90	3.00	96.7%	2.88	3.00	96.0%	0.7%
Phenanthrene	3.04	3.00	101%	3.09	3.00	103%	1.6%
Anthracene	2.94	3.00	98.0%	2.85	3.00	95.0%	3.1%
Fluoranthene	3.03	3.00	101%	3.12	3.00	104%	2.9%
Pyrene	3.00	3.00	100%	3.34	3.00	111%	10.7%
Benzo(a)anthracene	2.67	3.00	89.0%	2.89	3.00	96.3%	7.9%
Chrysene	2.91	3.00	97.0%	3.30	3.00	110%	12.6%
Benzo(b)fluoranthene	2.84	3.00	94.7%	3.30	3.00	110%	15.0%
Benzo(k)fluoranthene	3.50	3.00	117%	3.03	3.00	101%	14.4%
Benzo(a)pyrene	2.78	3.00	92.7%	2.88	3.00	96.0%	3.5%
Indeno(1,2,3-cd)pyrene	2.90	3.00	96.7%	2.93	3.00	97.7%	1.0%
Dibenz(a,h)anthracene	2.88	3.00	96.0%	3.05	3.00	102%	5.7%
Benzo(g,h,i)perylene	2.88	3.00	96.0%	2.90	3.00	96.7%	0.7%
Dibenzofuran	2.51	3.00	83.7%	2.58	3.00	86.0%	2.8%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

SIM Semivolatile Surrogate Recovery

	LCS	LCSD
d10-2-Methylnaphthalene	87.7%	84.7%
d14-Dibenzo(a,h)anthracen	105%	96.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD by GC/FID
Page 1 of 1
Matrix: Water

QC Report No: KF01-URS Corp
Project: KINDER MORGAN- LAUREL STATION 3375
Date Received: 11/10/06

Data Release Authorized:
Reported: 01/19/07

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range	Result
MB-111406	Method Blank	11/14/06	11/15/06	1.00	Diesel	< 0.25 U
06-23070	HC ID: ---		FID3A	1.0	Motor Oil	< 0.50 U
					o-Terphenyl	94.7%
KF01A	SW-4	11/14/06	11/15/06	1.00	Diesel	< 0.25 U
06-23070	HC ID: ---		FID3A	1.0	Motor Oil	< 0.50 U
					o-Terphenyl	93.8%

Reported in mg/L (ppm)

EFV-Effective Final Volume in mL.
DL-Dilution of extract prior to analysis.

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.
HC ID: DRO/RRO indicates results of organics or additional hydrocarbons in ranges are not identifiable.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPHD by GC/FID
Page 1 of 1

Sample ID: LCS-111406
LAB CONTROL

Lab Sample ID: LCS-111406
LIMS ID: 06-23070
Matrix: Water
Data Release Authorized:
Reported: 01/19/07

QC Report No: KF01-URS Corp
Project: KINDER MORGAN- LAUREL STATION 3375
Date Sampled: NA
Date Received: NA

Date Extracted: 11/14/06
Date Analyzed: 11/15/06 20:57
Instrument/Analyst: FID3A/JGR

Sample Amount: 500 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00

Range	Lab Control	Spike Added	Recovery
Diesel	2.45	3.00	81.7%

TPHD Surrogate Recovery

o-Terphenyl	93.3%

Results reported in mg/L

Analytical Resources Inc.
TPH Quantitation Report

Data file: /chem3/fid3a.i/20061115.b/1115a058.d ARI ID: KF01MBW1
Method: /chem3/fid3a.i/20061115.b/ftphfid3a.m Client ID:
Instrument: fid3a.i Injection: 15-NOV-2006 19:55
Operator: JR
Report Date: 11/16/2006 Dilution Factor: 1
Macro: 21-JUN-2006
Calibration Dates: Gas:10-NOV-2006 Diesel:15-NOV-2006 M.Oil:10-OCT-2006
AK102:15-NOV-2006 AK103:18-OCT-2006 JP-4:12-APR-2004 JET-A:15-JUL-2006 CREOSOTE:
FID:3A RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	1.178	0.029	28128	111263	GAS (Tol-C12)	600900	25
C8	1.332	-0.019	13361	37339	DIESEL (C12-C24)	235590	16
C10	2.615	0.000	3633	3961	M.OIL (C24-C38)	32784	4
C12	3.113	-0.002	4276	2133	AK-102 (C10-C25)	369266	20
C14	3.447	0.006	3917	1478	AK-103 (C25-C36)	26719	4
C16	3.691	-0.003	3571	3931			
C18	3.938	0.002	3054	2348			
C20	4.166	0.017	2742	2446			
C22	4.381	-0.004	1809	1749			
C24	4.573	-0.006	1188	1059			
C25	4.691	-0.003	847	216			
C26	4.804	0.003	572	179			
C28	5.006	-0.007	245	71			
C32	5.468	0.006	1395	2026	JP-4 (Tol-C14)	678759	61
C34	5.680	0.003	381	327	CREOSOT (C12-C22)	224176	59
Filter Peak	6.234	0.000	584	183			
C36	5.887	0.002	444.0	360	o-Terph Surrogate Rec = 94.6%		(772788)
C38	6.104	-0.004	580.0	374	Triacon Surrogate Rec = 114.8%		(693853)
C40	6.379	0.001	535	158			
o-terph	4.011	-0.041	1504587	772788	JET-A (C10-C18)	305013	26
Triacon Surr	5.259	0.016	839683	693853			

JR 11/15/06

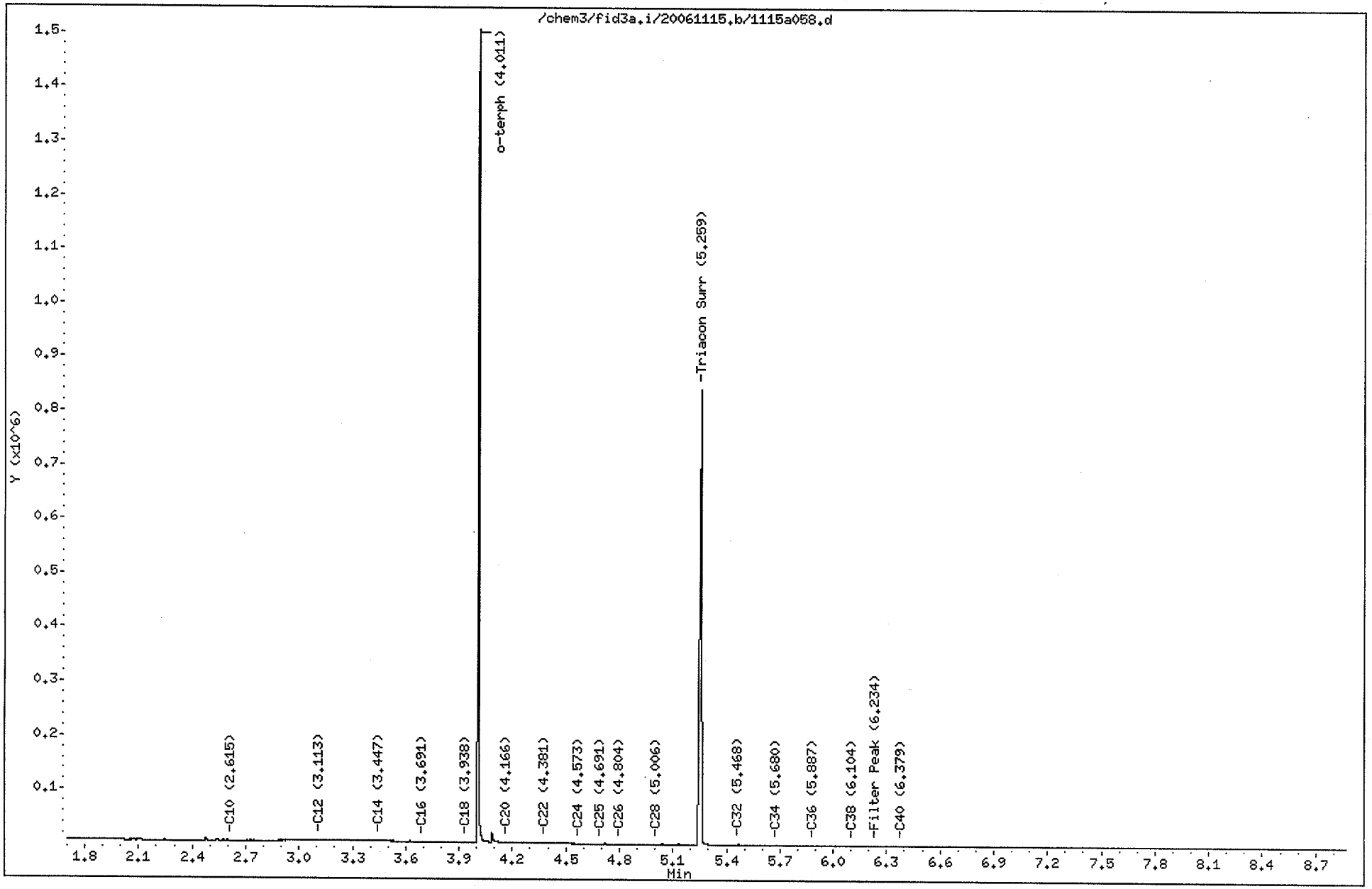
Range Times: NW Diesel(3.114 - 4.579) AK102(2.62 - 4.69) Jet A(2.62 - 3.94)
NW M.Oil(4.58 - 6.11) AK103(4.69 - 5.89) OR Diesel(2.62 - 5.01)

Data File: /chem3/fid3a.i/20061115.b/1115a058.d
Date : 15-NOV-2006 19:55
Client ID:
Sample Info: KF01MBW1

Instrument: fid3a.i

Operator: JR
Column diameter: 0.25

Column phase: RTX-1



Analytical Resources Inc.
TPH Quantitation Report

Data file: /chem3/fid3a.i/20061115.b/1115a062.d
Method: /chem3/fid3a.i/20061115.b/ftphfid3a.m
Instrument: fid3a.i
Operator: JR
Report Date: 11/16/2006
Macro: 21-JUN-2006
ARI ID: KF01LCSW1
Client ID:
Injection: 15-NOV-2006 20:57
Dilution Factor: 1

Calibration Dates: Gas:10-NOV-2006 Diesel:15-NOV-2006 M.Oil:10-OCT-2006
AK102:15-NOV-2006 AK103:18-OCT-2006 JP-4:12-APR-2004 JET-A:15-JUL-2006 CREOSOTE:

FID:3A RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	1.178	0.030	47938	58868	GAS (Tol-C12)	4166359	174
C8	1.353	0.003	25372	33626	DIESEL (C12-C24)	18192861	1224
C10	2.619	0.003	266829	149327	M.OIL (C24-C38)	324967	38
C12	3.120	0.006	779038	336947	AK-102 (C10-C25)	21299518	1178
C14	3.436	-0.004	934598	587766	AK-103 (C25-C36)	305421	45
C16	3.685	-0.008	270788	192138			
C18	3.942	0.006	650859	544219			
C20	4.148	-0.001	167512	64552			
C22	4.391	0.006	73245	55016			
C24	4.576	-0.003	31224	6141			
C25	4.693	-0.001	45410	30577			
C26	4.800	-0.001	23143	20388			
C28	5.009	-0.004	3741	1443			
C32	5.467	0.005	1875	2233	JP-4 (Tol-C14)	8795856	791
C34	5.681	0.004	326	220	CREOSOT (C12-C22)	17679806	4625
Filter Peak	6.240	0.006	229	122			
C36	5.885	0.000	304.0	117	o-Terph Surrogate Rec = 93.3%		(762621)
C38	6.110	0.003	297.0	104	Triacon Surrogate Rec = 115.3%		(697051)
C40	6.380	0.003	175	105			
o-terph	4.016	-0.036	1240874	762621	JET-A (C10-C18)	16370796	1414
Triacon Surr	5.258	0.015	872672	697051			

11/16/06

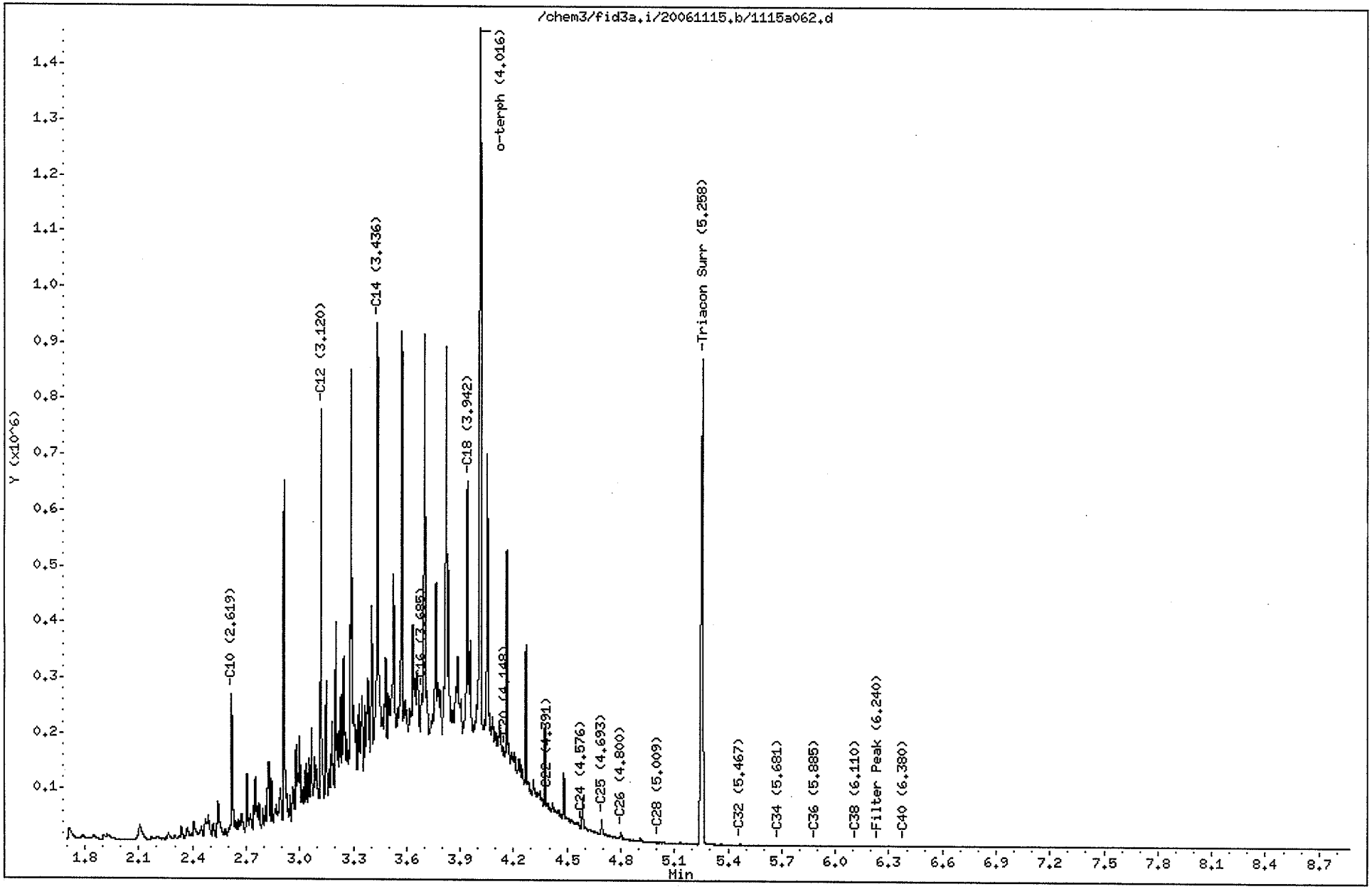
Range Times: NW Diesel(3.114 - 4.579) AK102(2.62 - 4.69) Jet A(2.62 - 3.94)
NW M.Oil(4.58 - 6.11) AK103(4.69 - 5.89) OR Diesel(2.62 - 5.01)

Data File: /chem3/fid3a.i/20061115.b/1115a062.d
Date : 15-NOV-2006 20:57
Client ID:
Sample Info: KF01LCSW1

Instrument: fid3a.i

Operator: JR
Column diameter: 0.25

Column phase: RTX-1



Analytical Resources Inc.
TPH Quantitation Report

Data file: /chem3/fid3a.i/20061115.b/1115a063.d ARI ID: KF01A
Method: /chem3/fid3a.i/20061115.b/ftphfid3a.m Client ID:
Instrument: fid3a.i Injection: 15-NOV-2006 21:12
Operator: JR
Report Date: 11/16/2006 Dilution Factor: 1
Macro: 21-JUN-2006
Calibration Dates: Gas:10-NOV-2006 Diesel:15-NOV-2006 M.Oil:10-OCT-2006
AK102:15-NOV-2006 AK103:18-OCT-2006 JP-4:12-APR-2004 JET-A:15-JUL-2006 CREOSOTE:

FID:3A RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	1.177	0.029	28215	82845	GAS (Tol-C12)	572113	24
C8	1.328	-0.023	14849	45109	DIESEL (C12-C24)	388907	26
C10	2.615	0.000	3400	3646	M.OIL (C24-C38)	150738	17
C12	3.121	0.007	5169	3869	AK-102 (C10-C25)	554014	31
C14	3.444	0.003	4335	1208	AK-103 (C25-C36)	139800	21
C16	3.688	-0.005	4877	5764			
C18	3.938	0.002	4850	4812			
C20	4.144	-0.005	5338	4323			
C22	4.385	0.000	5589	3156			
C24	4.579	0.000	4923	1555			
C25	4.693	0.000	4561	1626			
C26	4.800	-0.002	3906	2736			
C28	5.011	-0.002	2575	559			
C32	5.464	0.002	3017	3388	JP-4 (Tol-C14)	649853	58
C34	5.680	0.003	822	1073	CREOSOT (C12-C22)	330247	86
Filter Peak	6.234	0.000	401	379			
C36	5.883	-0.002	668.0	460	o-Terph Surrogate Rec = 93.8%		(766374)
C38	6.105	-0.002	477.0	132	Triacon Surrogate Rec = 114.5%		(692132)
C40	6.380	0.003	272	85			
o-terph	4.014	-0.038	1552755	766374	JET-A (C10-C18)	365249	32
Triacon Surr	5.256	0.013	867880	692132			

JK 11/16/06

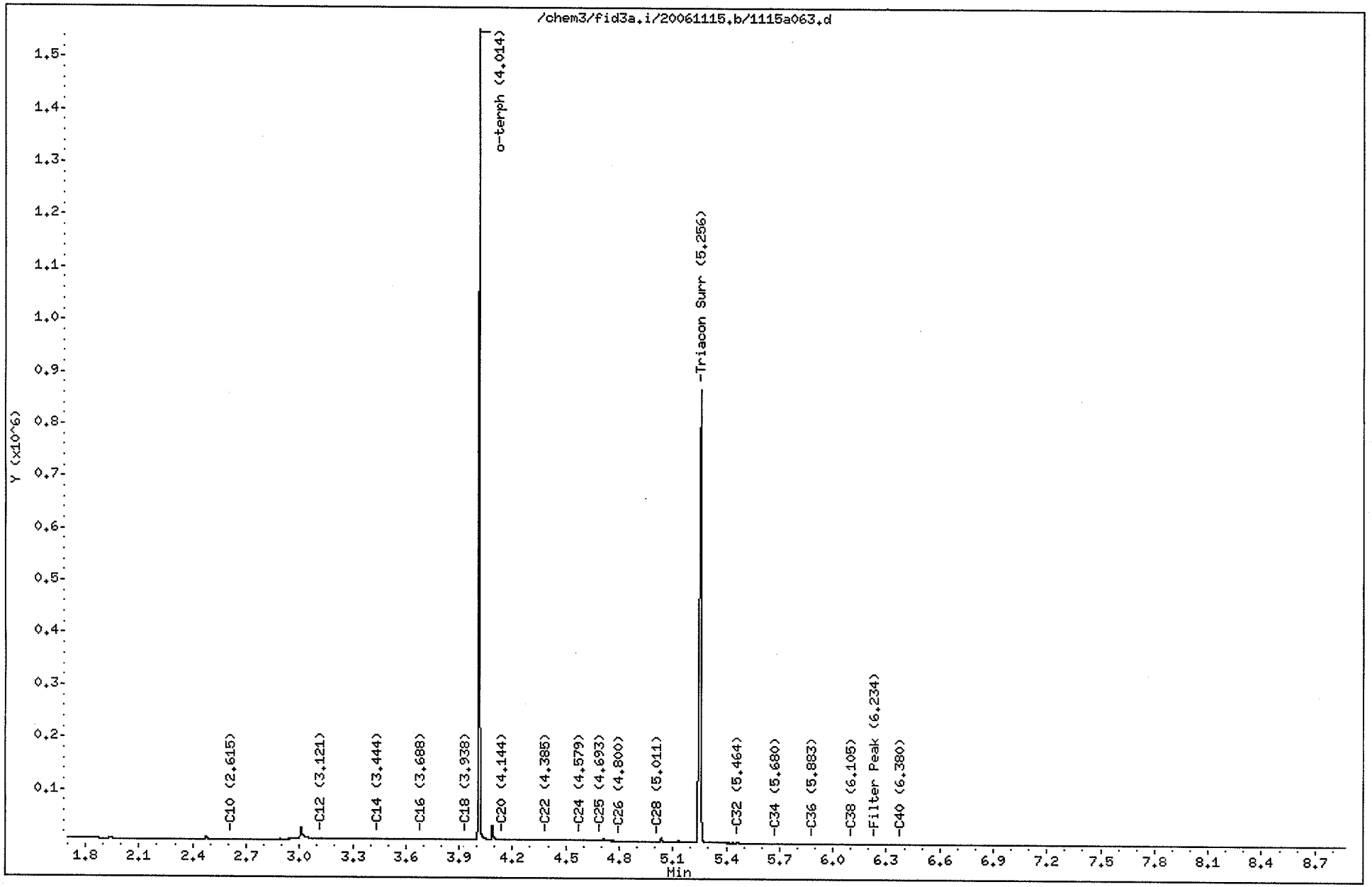
Range Times: NW Diesel(3.114 - 4.579) AK102(2.62 - 4.69) Jet A(2.62 - 3.94)
NW M.Oil(4.58 - 6.11) AK103(4.69 - 5.89) OR Diesel(2.62 - 5.01)

Data File: /chem3/fid3a.i/20061115.b/1115a063.d
Date : 15-NOV-2006 21:12
Client ID:
Sample Info: KF01A

Instrument: fid3a.i

Operator: JR
Column diameter: 0.25

Column phase: RTX-1



Analytical Resources, Incorporated
Analytical Chemists and Consultants

6 December 2006

Karen Mixon
URS Corporation
Century Square
1501 Fourth Avenue Suite 1400
Seattle, WA 98101

RE: Client Project: 3375, Kinder Morgan, Laurel Station
ARI Job No: KG83

Dear Karen:

Please find enclosed the final results for the sample from the project referenced above.

Sample SW-4 was re-extracted and re-analyzed outside of holding time for PAHs as requested.

This analysis proceeded without incident of note.

A copy of these reports and all associated raw data will remain on file electronically with ARI. If you have any further questions, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Mark D. Harris
Project Manager
206/695-6210
markh@arilabs.com

Enclosures

cc: file KG83

MDH/mdh

ARI Data Reporting Qualifiers

Effective 11/22/04

Inorganic Data

U	Indicates that the target analyte was not detected at the reported concentration
*	Duplicate RPD is not within established control limits
B	Reported value is less than the CRDL but ≥ the Reporting Limit
N	Matrix Spike recovery not within established control limits
NA	Not Applicable, analyte not spiked
H	The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
L	Analyte concentration is ≤5 times the Reporting Limit and the replicate control limit defaults to ±1 RL instead of the normal 20% RPD

Organic Data

U	Indicates that the target analyte was not detected at the reported concentration
*	Flagged value is not within established control limits
B	Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
J	Estimated concentration when the value is less than ARI's established reporting limits
D	The spiked compound was not detected due to sample extract dilution
NR	Spiked compound recovery is not reported due to chromatographic interference
E	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.
S	Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte
NA	The flagged analyte was not analyzed for
NS	The flagged analyte was not spiked into the sample
M	Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"
Y	The analyte reporting limit is raised due to a positive chromatographic interference. The compound is not detected above the raised limit but may be present at or below the limit
C	The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column
P	The analyte was detected on both chromatographic columns but the quantified values differ by ≥40% RPD with no obvious chromatographic interference

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS **Sample ID: MB-113006**
Page 1 of 1 **METHOD BLANK**

Lab Sample ID: MB-113006
LIMS ID: 06-23904
Matrix: Water
Data Release Authorized:
Reported: 01/19/07

QC Report No: KG83-URS Corp
Project: KINDER MORGAN-LAUREL STATION
Event: 3375
Date Sampled: NA
Date Received: NA

Date Extracted: 11/30/06
Date Analyzed: 12/02/06 09:46
Instrument/Analyst: NT1/VTS

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	**Naphthalene**	**0.010**	**0.0064 J**
91-57-6	2-Methylnaphthalene	0.010	< 0.010 U
208-96-8	Acenaphthylene	0.010	< 0.010 U
83-32-9	Acenaphthene	0.010	< 0.010 U
86-73-7	Fluorene	0.010	< 0.010 U
85-01-8	Phenanthrene	0.010	< 0.010 U
120-12-7	Anthracene	0.010	< 0.010 U
206-44-0	Fluoranthene	0.010	< 0.010 U
129-00-0	Pyrene	0.010	< 0.010 U
56-55-3	Benzo(a)anthracene	0.010	< 0.010 U
218-01-9	Chrysene	0.010	< 0.010 U
205-99-2	Benzo(b)fluoranthene	0.010	< 0.010 U
207-08-9	Benzo(k)fluoranthene	0.010	< 0.010 U
50-32-8	Benzo(a)pyrene	0.010	< 0.010 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.010	< 0.010 U
53-70-3	Dibenz(a,h)anthracene	0.010	< 0.010 U
191-24-2	Benzo(g,h,i)perylene	0.010	< 0.010 U
132-64-9	Dibenzofuran	0.010	< 0.010 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	63.7%
d14-Dibenzo(a,h)anthracen	73.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS **Sample ID: SW-4**
Page 1 of 1 **SAMPLE**

Lab Sample ID: KG83A
LIMS ID: 06-23904
Matrix: Water
Data Release Authorized:
Reported: 01/19/07

QC Report No: KG83-URS Corp
Project: KINDER MORGAN-LAUREL STATION
Event: 3375
Date Sampled: 11/07/06
Date Received: 11/10/06

Date Extracted: 11/30/06
Date Analyzed: 12/02/06 10:36
Instrument/Analyst: NT1/VTS

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	**Naphthalene**	**0.010**	**0.011 B**
91-57-6	2-Methylnaphthalene	0.010	< 0.010 U
208-96-8	Acenaphthylene	0.010	< 0.010 U
83-32-9	Acenaphthene	0.010	< 0.010 U
86-73-7	Fluorene	0.010	< 0.010 U
85-01-8	Phenanthrene	0.010	< 0.010 U
120-12-7	Anthracene	0.010	< 0.010 U
206-44-0	Fluoranthene	0.010	< 0.010 U
129-00-0	Pyrene	0.010	< 0.010 U
56-55-3	Benzo(a)anthracene	0.010	< 0.010 U
218-01-9	Chrysene	0.010	< 0.010 U
205-99-2	Benzo(b)fluoranthene	0.010	< 0.010 U
207-08-9	Benzo(k)fluoranthene	0.010	< 0.010 U
50-32-8	Benzo(a)pyrene	0.010	< 0.010 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.010	< 0.010 U
53-70-3	Dibenz(a,h)anthracene	0.010	< 0.010 U
191-24-2	Benzo(g,h,i)perylene	0.010	< 0.010 U
132-64-9	Dibenzofuran	0.010	< 0.010 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	65.3%
d14-Dibenzo(a,h)anthracen	70.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS **Sample ID: LCS-113006**
Page 1 of 1 **LAB CONTROL SAMPLE**

Lab Sample ID: LCS-113006
LIMS ID: 06-23904
Matrix: Water
Data Release Authorized:
Reported: 01/19/07

QC Report No: KG83-URS Corp
Project: KINDER MORGAN-LAUREL STATION
Event: 3375
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 11/30/06
Date Analyzed LCS: 12/02/06 10:11
Instrument/Analyst LCS: NT1/VTS

Sample Amount LCS: 500 mL
Final Extract Volume LCS: 0.50 mL
Dilution Factor LCS: 1.00

Analyte	LCS	Spike Added	Recovery
Naphthalene	0.228	0.300	76.0%
Acenaphthylene	0.229	0.300	76.3%
Acenaphthene	0.227	0.300	75.7%
Fluorene	0.279	0.300	93.0%
Phenanthrene	0.246	0.300	82.0%
Anthracene	0.193	0.300	64.3%
Fluoranthene	0.273	0.300	91.0%
Pyrene	0.269	0.300	89.7%
Benzo(a)anthracene	0.242	0.300	80.7%
Chrysene	0.266	0.300	88.7%
Benzo(b)fluoranthene	0.238	0.300	79.3%
Benzo(k)fluoranthene	0.240	0.300	80.0%
Benzo(a)pyrene	0.157	0.300	52.3%
Indeno(1,2,3-cd)pyrene	0.229	0.300	76.3%
Dibenz(a,h)anthracene	0.236	0.300	78.7%
Benzo(g,h,i)perylene	0.236	0.300	78.7%
Dibenzofuran	0.201	0.300	67.0%

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	74.7%
d14-Dibenzo(a,h)anthracen	84.0%

Analytical Resources, Incorporated
Analytical Chemists and Consultants

21 December 2006

Karen Mixon
URS Corporation
Century Square
1501 Fourth Avenue Suite 1400
Seattle, WA 98121

RE: Client Project: 33759339, Laurel Station
ARI Job No: KI11

Dear Karen:

Please find enclosed the original chain of custody documentation and the final results for the samples from the project referenced above. Analytical Resources, Inc. (ARI) received seven water samples in good condition on December 9, 2006.

The samples were analyzed for VOAs, NWTPH-G, NWTPH-Dx and PAHs as requested.

All samples were initially analyzed for PAHs on 12/16/06. The percent recoveries for the surrogates and internal standards were low following the analyses of samples DW-2 and DW-3. These samples were re-analyzed on 12/20/06. The percent recoveries were within acceptable QC limits for the re-analyses. The results for the re-analyses only have been submitted.

The remaining analyses proceeded without incident of note.

A copy of these reports and all associated raw data will remain on file electronically with ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Mark D. Harris
Project Manager
206/695-6210
markh@arilabs.com

Enclosures

cc: file KI11

MDH/mdh

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: KI11	Turn-around Requested: STANDARD	Page: 1 of 1	
ARI Client Company: NRS CORPORATION	Phone: 206-438-2700	Date: 12-8-06	Ice Present? Y
Client Contact: KAREN MIXON		No. of Coolers: 2	Cooler Temps: 4.6, 4.7
Client Project Name: LAUREL STATION			
Client Project #: 33759339	Samplers: JESSE MCCULLOUGH, MATT HOMMEYER		

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: NWTPH-Gx	NWTPH-Dx (extended)	VOCs (8260B)	PAHs (sim) (8270D)					Notes/Comments
DW-1	12/7/06	1345	AQ	7	x	x	x	x					
DW-2	12/8/06	0900	AQ	7	x	x	x	x					
DW-3	12/8/06	1030	AQ	7	x	x	x	x					
DW-4	12/8/06	1230	AQ	7	x	x	x	x					
SW-2	12/8/06	1335	AQ	14	x	x	x	x					EXTRA VOLUME FOR MS/MSD
DW-5	12/8/06	1510	AQ	7	x	x	x	x					
DUP	12/8/06	—	AQ	7	x	x	x	x					FIELD DUPLICATE

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
• PAHs (SIM) REQUIRE 0.01 µg/L REPORTING • INVOICE KINDER MORGAN FOR SERVICES; CONTACT K. MIXON FOR BILLING INFO IF NEEDED	Printed Name: MATT HOMMEYER	Printed Name: BRIAN KEGEL	Printed Name:	Printed Name:
	Company: NRS CORP.	Company: ARI	Company:	Company:
	Date & Time: 12/9/06, 1050	Date & Time: 12/9/06 1050	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release 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 Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

ARI Data Reporting Qualifiers

Effective 11/22/04

Inorganic Data

U	Indicates that the target analyte was not detected at the reported concentration
*	Duplicate RPD is not within established control limits
B	Reported value is less than the CRDL but ≥ the Reporting Limit
N	Matrix Spike recovery not within established control limits
NA	Not Applicable, analyte not spiked
H	The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
L	Analyte concentration is ≤5 times the Reporting Limit and the replicate control limit defaults to ±1 RL instead of the normal 20% RPD

Organic Data

U	Indicates that the target analyte was not detected at the reported concentration
*	Flagged value is not within established control limits
B	Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
J	Estimated concentration when the value is less than ARI's established reporting limits
D	The spiked compound was not detected due to sample extract dilution
NR	Spiked compound recovery is not reported due to chromatographic interference
E	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.
S	Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte
NA	The flagged analyte was not analyzed for
NS	The flagged analyte was not spiked into the sample
M	Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"
Y	The analyte reporting limit is raised due to a positive chromatographic interference. The compound is not detected above the raised limit but may be present at or below the limit
C	The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column
P	The analyte was detected on both chromatographic columns but the quantified values differ by ≥40% RPD with no obvious chromatographic interference

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: MB-121206**
 METHOD BLANK

Lab Sample ID: MB-121206
LIMS ID: 06-24545
Matrix: Water
Data Release Authorized:
Reported: 12/18/06

QC Report No: KI11-URS Corp
Project: LAUREL STATION
33759339
Date Sampled: NA
Date Received: NA

Instrument/Analyst: FINN3/PAB
Date Analyzed: 12/12/06 10:21

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	RL	Result	Q
74-87-3	Chloromethane	0.2	< 0.2	U
74-83-9	Bromomethane	0.2	< 0.2	U
75-01-4	Vinyl Chloride	0.2	< 0.2	U
75-00-3	Chloroethane	0.2	< 0.2	U
75-09-2	Methylene Chloride	0.3	< 0.3	U
67-64-1	Acetone	3.0	< 3.0	U
75-15-0	Carbon Disulfide	0.2	< 0.2	U
75-35-4	1,1-Dichloroethene	0.2	< 0.2	U
75-34-3	1,1-Dichloroethane	0.2	< 0.2	U
156-60-5	trans-1,2-Dichloroethene	0.2	< 0.2	U
156-59-2	cis-1,2-Dichloroethene	0.2	< 0.2	U
67-66-3	Chloroform	0.2	< 0.2	U
107-06-2	1,2-Dichloroethane	0.2	< 0.2	U
78-93-3	2-Butanone	1.0	< 1.0	U
71-55-6	1,1,1-Trichloroethane	0.2	< 0.2	U
56-23-5	Carbon Tetrachloride	0.2	< 0.2	U
108-05-4	Vinyl Acetate	0.2	< 0.2	U
75-27-4	Bromodichloromethane	0.2	< 0.2	U
78-87-5	1,2-Dichloropropane	0.2	< 0.2	U
10061-01-5	cis-1,3-Dichloropropene	0.2	< 0.2	U
79-01-6	Trichloroethene	0.2	< 0.2	U
124-48-1	Dibromochloromethane	0.2	< 0.2	U
79-00-5	1,1,2-Trichloroethane	0.2	< 0.2	U
71-43-2	Benzene	0.2	< 0.2	U
10061-02-6	trans-1,3-Dichloropropene	0.2	< 0.2	U
110-75-8	2-Chloroethylvinylether	0.5	< 0.5	U
75-25-2	Bromoform	0.2	< 0.2	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	1.0	< 1.0	U
591-78-6	2-Hexanone	3.0	< 3.0	U
127-18-4	Tetrachloroethene	0.2	< 0.2	U
79-34-5	1,1,2,2-Tetrachloroethane	0.2	< 0.2	U
108-88-3	Toluene	0.2	< 0.2	U
108-90-7	Chlorobenzene	0.2	< 0.2	U
100-41-4	Ethylbenzene	0.2	< 0.2	U
100-42-5	Styrene	0.2	< 0.2	U
75-69-4	Trichlorofluoromethane	0.2	< 0.2	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.2	< 0.2	U
1330-20-7	m,p-Xylene	0.4	< 0.4	U
95-47-6	o-Xylene	0.2	< 0.2	U
95-50-1	1,2-Dichlorobenzene	0.2	< 0.2	U
541-73-1	1,3-Dichlorobenzene	0.2	< 0.2	U
106-46-7	1,4-Dichlorobenzene	0.2	< 0.2	U
107-02-8	Acrolein	5.0	< 5.0	U
74-88-4	Methyl Iodide	0.2	< 0.2	U
74-96-4	Bromoethane	0.2	< 0.2	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.2	< 0.2	U
74-95-3	Dibromomethane	0.2	< 0.2	U
630-20-6	1,1,1,2-Tetrachloroethane	0.2	< 0.2	U
96-12-8	1,2-Dibromo-3-chloropropane	0.5	< 0.5	U
96-18-4	1,2,3-Trichloropropane	0.5	< 0.5	U

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: MB-121206**
 METHOD BLANK

Lab Sample ID: MB-121206 QC Report No: KI11-URS Corp
LIMS ID: 06-24545 Project: LAUREL STATION
Matrix: Water 33759339
Date Analyzed: 12/12/06 10:21

CAS Number	Analyte	RL	Result	Q
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.2	< 0.2	U
95-63-6	1,2,4-Trimethylbenzene	0.2	< 0.2	U
87-68-3	Hexachlorobutadiene	0.5	< 0.5	U
106-93-4	Ethylene Dibromide	0.2	< 0.2	U
74-97-5	Bromochloromethane	0.2	< 0.2	U
594-20-7	2,2-Dichloropropane	0.2	< 0.2	U
142-28-9	1,3-Dichloropropane	0.2	< 0.2	U
98-82-8	Isopropylbenzene	0.2	< 0.2	U
103-65-1	n-Propylbenzene	0.2	< 0.2	U
108-86-1	Bromobenzene	0.2	< 0.2	U
95-49-8	2-Chlorotoluene	0.2	< 0.2	U
106-43-4	4-Chlorotoluene	0.2	< 0.2	U
98-06-6	tert-Butylbenzene	0.2	< 0.2	U
135-98-8	sec-Butylbenzene	0.2	< 0.2	U
99-87-6	4-Isopropyltoluene	0.2	< 0.2	U
104-51-8	n-Butylbenzene	0.2	< 0.2	U
120-82-1	1,2,4-Trichlorobenzene	0.5	< 0.5	U
91-20-3	Naphthalene	0.5	< 0.5	U
87-61-6	1,2,3-Trichlorobenzene	0.5	< 0.5	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	96.5%
d8-Toluene	100%
Bromofluorobenzene	83.8%
d4-1,2-Dichlorobenzene	93.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: DW-1**
Page 1 of 2 **SAMPLE**

Lab Sample ID: KI11A
LIMS ID: 06-24541
Matrix: Water
Data Release Authorized:
Reported: 12/18/06

QC Report No: KI11-URS Corp
Project: LAUREL STATION
33759339
Date Sampled: 12/07/06
Date Received: 12/09/06

Instrument/Analyst: FINN3/PAB
Date Analyzed: 12/12/06 13:59

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	RL	Result	Q
74-87-3	Chloromethane	0.2	< 0.2	U
74-83-9	Bromomethane	0.2	< 0.2	U
75-01-4	Vinyl Chloride	0.2	< 0.2	U
75-00-3	Chloroethane	0.2	< 0.2	U
75-09-2	Methylene Chloride	0.3	< 0.3	U
67-64-1	Acetone	3.0	< 3.0	U
75-15-0	Carbon Disulfide	0.2	< 0.2	U
75-35-4	1,1-Dichloroethene	0.2	< 0.2	U
75-34-3	1,1-Dichloroethane	0.2	< 0.2	U
156-60-5	trans-1,2-Dichloroethene	0.2	< 0.2	U
156-59-2	cis-1,2-Dichloroethene	0.2	< 0.2	U
67-66-3	Chloroform	0.2	< 0.2	U
107-06-2	1,2-Dichloroethane	0.2	< 0.2	U
78-93-3	2-Butanone	1.0	< 1.0	U
71-55-6	1,1,1-Trichloroethane	0.2	< 0.2	U
56-23-5	Carbon Tetrachloride	0.2	< 0.2	U
108-05-4	Vinyl Acetate	0.2	< 0.2	U
75-27-4	Bromodichloromethane	0.2	< 0.2	U
78-87-5	1,2-Dichloropropane	0.2	< 0.2	U
10061-01-5	cis-1,3-Dichloropropene	0.2	< 0.2	U
79-01-6	Trichloroethene	0.2	< 0.2	U
124-48-1	Dibromochloromethane	0.2	< 0.2	U
79-00-5	1,1,2-Trichloroethane	0.2	< 0.2	U
71-43-2	Benzene	0.2	< 0.2	U
10061-02-6	trans-1,3-Dichloropropene	0.2	< 0.2	U
110-75-8	2-Chloroethylvinylether	0.5	< 0.5	U
75-25-2	Bromoform	0.2	< 0.2	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	1.0	< 1.0	U
591-78-6	2-Hexanone	3.0	< 3.0	U
127-18-4	Tetrachloroethene	0.2	< 0.2	U
79-34-5	1,1,2,2-Tetrachloroethane	0.2	< 0.2	U
108-88-3	Toluene	0.2	< 0.2	U
108-90-7	Chlorobenzene	0.2	< 0.2	U
100-41-4	Ethylbenzene	0.2	< 0.2	U
100-42-5	Styrene	0.2	< 0.2	U
75-69-4	Trichlorofluoromethane	0.2	< 0.2	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.2	< 0.2	U
1330-20-7	m,p-Xylene	0.4	< 0.4	U
95-47-6	o-Xylene	0.2	< 0.2	U
95-50-1	1,2-Dichlorobenzene	0.2	< 0.2	U
541-73-1	1,3-Dichlorobenzene	0.2	< 0.2	U
106-46-7	1,4-Dichlorobenzene	0.2	< 0.2	U
107-02-8	Acrolein	5.0	< 5.0	U
74-88-4	Methyl Iodide	0.2	< 0.2	U
74-96-4	Bromoethane	0.2	< 0.2	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.2	< 0.2	U
74-95-3	Dibromomethane	0.2	< 0.2	U
630-20-6	1,1,1,2-Tetrachloroethane	0.2	< 0.2	U
96-12-8	1,2-Dibromo-3-chloropropane	0.5	< 0.5	U
96-18-4	1,2,3-Trichloropropane	0.5	< 0.5	U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: DW-1**
 SAMPLE

Lab Sample ID: KI11A
LIMS ID: 06-24541
Matrix: Water
Date Analyzed: 12/12/06 13:59

QC Report No: KI11-URS Corp
Project: LAUREL STATION
33759339

CAS Number	Analyte	RL	Result	Q
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.2	< 0.2	U
95-63-6	1,2,4-Trimethylbenzene	0.2	< 0.2	U
87-68-3	Hexachlorobutadiene	0.5	< 0.5	U
106-93-4	Ethylene Dibromide	0.2	< 0.2	U
74-97-5	Bromochloromethane	0.2	< 0.2	U
594-20-7	2,2-Dichloropropane	0.2	< 0.2	U
142-28-9	1,3-Dichloropropane	0.2	< 0.2	U
98-82-8	Isopropylbenzene	0.2	< 0.2	U
103-65-1	n-Propylbenzene	0.2	< 0.2	U
108-86-1	Bromobenzene	0.2	< 0.2	U
95-49-8	2-Chlorotoluene	0.2	< 0.2	U
106-43-4	4-Chlorotoluene	0.2	< 0.2	U
98-06-6	tert-Butylbenzene	0.2	< 0.2	U
135-98-8	sec-Butylbenzene	0.2	< 0.2	U
99-87-6	4-Isopropyltoluene	0.2	< 0.2	U
104-51-8	n-Butylbenzene	0.2	< 0.2	U
120-82-1	1,2,4-Trichlorobenzene	0.5	< 0.5	U
91-20-3	Naphthalene	0.5	< 0.5	U
87-61-6	1,2,3-Trichlorobenzene	0.5	< 0.5	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	97.2%
d8-Toluene	96.8%
Bromofluorobenzene	78.5%
d4-1,2-Dichlorobenzene	105%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: DW-2**
Page 1 of 2 **SAMPLE**

Lab Sample ID: KI11B
LIMS ID: 06-24542
Matrix: Water
Data Release Authorized:
Reported: 12/18/06

QC Report No: KI11-URS Corp
Project: LAUREL STATION
33759339
Date Sampled: 12/08/06
Date Received: 12/09/06

Instrument/Analyst: FINN3/PAB
Date Analyzed: 12/12/06 14:26

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	RL	Result	Q
74-87-3	Chloromethane	0.2	< 0.2	U
74-83-9	Bromomethane	0.2	< 0.2	U
75-01-4	Vinyl Chloride	0.2	< 0.2	U
75-00-3	Chloroethane	0.2	< 0.2	U
75-09-2	Methylene Chloride	0.3	< 0.3	U
67-64-1	Acetone	3.0	< 3.0	U
75-15-0	Carbon Disulfide	0.2	< 0.2	U
75-35-4	1,1-Dichloroethene	0.2	< 0.2	U
75-34-3	1,1-Dichloroethane	0.2	< 0.2	U
156-60-5	trans-1,2-Dichloroethene	0.2	< 0.2	U
156-59-2	cis-1,2-Dichloroethene	0.2	< 0.2	U
67-66-3	Chloroform	0.2	< 0.2	U
107-06-2	1,2-Dichloroethane	0.2	< 0.2	U
78-93-3	2-Butanone	1.0	< 1.0	U
71-55-6	1,1,1-Trichloroethane	0.2	< 0.2	U
56-23-5	Carbon Tetrachloride	0.2	< 0.2	U
108-05-4	Vinyl Acetate	0.2	< 0.2	U
75-27-4	Bromodichloromethane	0.2	< 0.2	U
78-87-5	1,2-Dichloropropane	0.2	< 0.2	U
10061-01-5	cis-1,3-Dichloropropene	0.2	< 0.2	U
79-01-6	Trichloroethene	0.2	< 0.2	U
124-48-1	Dibromochloromethane	0.2	< 0.2	U
79-00-5	1,1,2-Trichloroethane	0.2	< 0.2	U
71-43-2	Benzene	0.2	< 0.2	U
10061-02-6	trans-1,3-Dichloropropene	0.2	< 0.2	U
110-75-8	2-Chloroethylvinylether	0.5	< 0.5	U
75-25-2	Bromoform	0.2	< 0.2	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	1.0	< 1.0	U
591-78-6	2-Hexanone	3.0	< 3.0	U
127-18-4	Tetrachloroethene	0.2	< 0.2	U
79-34-5	1,1,2,2-Tetrachloroethane	0.2	< 0.2	U
108-88-3	Toluene	0.2	< 0.2	U
108-90-7	Chlorobenzene	0.2	< 0.2	U
100-41-4	Ethylbenzene	0.2	< 0.2	U
100-42-5	Styrene	0.2	< 0.2	U
75-69-4	Trichlorofluoromethane	0.2	< 0.2	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.2	< 0.2	U
1330-20-7	m,p-Xylene	0.4	< 0.4	U
95-47-6	o-Xylene	0.2	< 0.2	U
95-50-1	1,2-Dichlorobenzene	0.2	< 0.2	U
541-73-1	1,3-Dichlorobenzene	0.2	< 0.2	U
106-46-7	1,4-Dichlorobenzene	0.2	< 0.2	U
107-02-8	Acrolein	5.0	< 5.0	U
74-88-4	Methyl Iodide	0.2	< 0.2	U
74-96-4	Bromoethane	0.2	< 0.2	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.2	< 0.2	U
74-95-3	Dibromomethane	0.2	< 0.2	U
630-20-6	1,1,1,2-Tetrachloroethane	0.2	< 0.2	U
96-12-8	1,2-Dibromo-3-chloropropane	0.5	< 0.5	U
96-18-4	1,2,3-Trichloropropane	0.5	< 0.5	U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: DW-2**
Page 2 of 2 **SAMPLE**

Lab Sample ID: KI11B
LIMS ID: 06-24542
Matrix: Water
Date Analyzed: 12/12/06 14:26

QC Report No: KI11-URS Corp
Project: LAUREL STATION
33759339

CAS Number	Analyte	RL	Result	Q
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.2	< 0.2	U
95-63-6	1,2,4-Trimethylbenzene	0.2	< 0.2	U
87-68-3	Hexachlorobutadiene	0.5	< 0.5	U
106-93-4	Ethylene Dibromide	0.2	< 0.2	U
74-97-5	Bromochloromethane	0.2	< 0.2	U
594-20-7	2,2-Dichloropropane	0.2	< 0.2	U
142-28-9	1,3-Dichloropropane	0.2	< 0.2	U
98-82-8	Isopropylbenzene	0.2	< 0.2	U
103-65-1	n-Propylbenzene	0.2	< 0.2	U
108-86-1	Bromobenzene	0.2	< 0.2	U
95-49-8	2-Chlorotoluene	0.2	< 0.2	U
106-43-4	4-Chlorotoluene	0.2	< 0.2	U
98-06-6	tert-Butylbenzene	0.2	< 0.2	U
135-98-8	sec-Butylbenzene	0.2	< 0.2	U
99-87-6	4-Isopropyltoluene	0.2	< 0.2	U
104-51-8	n-Butylbenzene	0.2	< 0.2	U
120-82-1	1,2,4-Trichlorobenzene	0.5	< 0.5	U
91-20-3	Naphthalene	0.5	< 0.5	U
87-61-6	1,2,3-Trichlorobenzene	0.5	< 0.5	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	90.0%
d8-Toluene	98.8%
Bromofluorobenzene	81.0%
d4-1,2-Dichlorobenzene	102%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: DW-3**
Page 1 of 2 **SAMPLE**

Lab Sample ID: KI11C
LIMS ID: 06-24543
Matrix: Water
Data Release Authorized:
Reported: 12/18/06

QC Report No: KI11-URS Corp
Project: LAUREL STATION
33759339
Date Sampled: 12/08/06
Date Received: 12/09/06

Instrument/Analyst: FINN3/PAB
Date Analyzed: 12/12/06 14:53

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	RL	Result	Q
74-87-3	Chloromethane	0.2	< 0.2	U
74-83-9	Bromomethane	0.2	< 0.2	U
75-01-4	Vinyl Chloride	0.2	< 0.2	U
75-00-3	Chloroethane	0.2	< 0.2	U
75-09-2	Methylene Chloride	0.3	< 0.3	U
67-64-1	Acetone	3.0	< 3.0	U
75-15-0	Carbon Disulfide	0.2	< 0.2	U
75-35-4	1,1-Dichloroethene	0.2	< 0.2	U
75-34-3	1,1-Dichloroethane	0.2	< 0.2	U
156-60-5	trans-1,2-Dichloroethene	0.2	< 0.2	U
156-59-2	cis-1,2-Dichloroethene	0.2	< 0.2	U
67-66-3	Chloroform	0.2	< 0.2	U
107-06-2	1,2-Dichloroethane	0.2	< 0.2	U
78-93-3	2-Butanone	1.0	< 1.0	U
71-55-6	1,1,1-Trichloroethane	0.2	< 0.2	U
56-23-5	Carbon Tetrachloride	0.2	< 0.2	U
108-05-4	Vinyl Acetate	0.2	< 0.2	U
75-27-4	Bromodichloromethane	0.2	< 0.2	U
78-87-5	1,2-Dichloropropane	0.2	< 0.2	U
10061-01-5	cis-1,3-Dichloropropene	0.2	< 0.2	U
79-01-6	Trichloroethene	0.2	< 0.2	U
124-48-1	Dibromochloromethane	0.2	< 0.2	U
79-00-5	1,1,2-Trichloroethane	0.2	< 0.2	U
71-43-2	Benzene	0.2	< 0.2	U
10061-02-6	trans-1,3-Dichloropropene	0.2	< 0.2	U
110-75-8	2-Chloroethylvinylether	0.5	< 0.5	U
75-25-2	Bromoform	0.2	< 0.2	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	1.0	< 1.0	U
591-78-6	2-Hexanone	3.0	< 3.0	U
127-18-4	Tetrachloroethene	0.2	< 0.2	U
79-34-5	1,1,2,2-Tetrachloroethane	0.2	< 0.2	U
108-88-3	Toluene	0.2	< 0.2	U
108-90-7	Chlorobenzene	0.2	< 0.2	U
100-41-4	Ethylbenzene	0.2	< 0.2	U
100-42-5	Styrene	0.2	< 0.2	U
75-69-4	Trichlorofluoromethane	0.2	< 0.2	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.2	< 0.2	U
1330-20-7	m,p-Xylene	0.4	< 0.4	U
95-47-6	o-Xylene	0.2	< 0.2	U
95-50-1	1,2-Dichlorobenzene	0.2	< 0.2	U
541-73-1	1,3-Dichlorobenzene	0.2	< 0.2	U
106-46-7	1,4-Dichlorobenzene	0.2	< 0.2	U
107-02-8	Acrolein	5.0	< 5.0	U
74-88-4	Methyl Iodide	0.2	< 0.2	U
74-96-4	Bromoethane	0.2	< 0.2	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.2	< 0.2	U
74-95-3	Dibromomethane	0.2	< 0.2	U
630-20-6	1,1,1,2-Tetrachloroethane	0.2	< 0.2	U
96-12-8	1,2-Dibromo-3-chloropropane	0.5	< 0.5	U
96-18-4	1,2,3-Trichloropropane	0.5	< 0.5	U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: DW-3**
 SAMPLE

Lab Sample ID: KI11C
LIMS ID: 06-24543
Matrix: Water
Date Analyzed: 12/12/06 14:53

QC Report No: KI11-URS Corp
Project: LAUREL STATION
33759339

CAS Number	Analyte	RL	Result	Q
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.2	< 0.2	U
95-63-6	1,2,4-Trimethylbenzene	0.2	< 0.2	U
87-68-3	Hexachlorobutadiene	0.5	< 0.5	U
106-93-4	Ethylene Dibromide	0.2	< 0.2	U
74-97-5	Bromochloromethane	0.2	< 0.2	U
594-20-7	2,2-Dichloropropane	0.2	< 0.2	U
142-28-9	1,3-Dichloropropane	0.2	< 0.2	U
98-82-8	Isopropylbenzene	0.2	< 0.2	U
103-65-1	n-Propylbenzene	0.2	< 0.2	U
108-86-1	Bromobenzene	0.2	< 0.2	U
95-49-8	2-Chlorotoluene	0.2	< 0.2	U
106-43-4	4-Chlorotoluene	0.2	< 0.2	U
98-06-6	tert-Butylbenzene	0.2	< 0.2	U
135-98-8	sec-Butylbenzene	0.2	< 0.2	U
99-87-6	4-Isopropyltoluene	0.2	< 0.2	U
104-51-8	n-Butylbenzene	0.2	< 0.2	U
120-82-1	1,2,4-Trichlorobenzene	0.5	< 0.5	U
91-20-3	Naphthalene	0.5	< 0.5	U
87-61-6	1,2,3-Trichlorobenzene	0.5	< 0.5	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	98.2%
d8-Toluene	94.5%
Bromofluorobenzene	81.2%
d4-1,2-Dichlorobenzene	106%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: DW-4**
Page 1 of 2 **SAMPLE**

Lab Sample ID: KI11D
LIMS ID: 06-24544
Matrix: Water
Data Release Authorized:
Reported: 12/18/06

QC Report No: KI11-URS Corp
Project: LAUREL STATION
33759339
Date Sampled: 12/08/06
Date Received: 12/09/06

Instrument/Analyst: FINN3/PAB
Date Analyzed: 12/12/06 15:20

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	RL	Result	Q
74-87-3	Chloromethane	0.2	< 0.2	U
74-83-9	Bromomethane	0.2	< 0.2	U
75-01-4	Vinyl Chloride	0.2	< 0.2	U
75-00-3	Chloroethane	0.2	< 0.2	U
75-09-2	Methylene Chloride	0.3	< 0.3	U
67-64-1	Acetone	3.0	< 3.0	U
75-15-0	Carbon Disulfide	0.2	< 0.2	U
75-35-4	1,1-Dichloroethene	0.2	< 0.2	U
75-34-3	1,1-Dichloroethane	0.2	< 0.2	U
156-60-5	trans-1,2-Dichloroethene	0.2	< 0.2	U
156-59-2	cis-1,2-Dichloroethene	0.2	< 0.2	U
67-66-3	Chloroform	0.2	< 0.2	U
107-06-2	1,2-Dichloroethane	0.2	< 0.2	U
78-93-3	2-Butanone	1.0	< 1.0	U
71-55-6	1,1,1-Trichloroethane	0.2	< 0.2	U
56-23-5	Carbon Tetrachloride	0.2	< 0.2	U
108-05-4	Vinyl Acetate	0.2	< 0.2	U
75-27-4	Bromodichloromethane	0.2	< 0.2	U
78-87-5	1,2-Dichloropropane	0.2	< 0.2	U
10061-01-5	cis-1,3-Dichloropropene	0.2	< 0.2	U
79-01-6	Trichloroethene	0.2	< 0.2	U
124-48-1	Dibromochloromethane	0.2	< 0.2	U
79-00-5	1,1,2-Trichloroethane	0.2	< 0.2	U
71-43-2	Benzene	0.2	< 0.2	U
10061-02-6	trans-1,3-Dichloropropene	0.2	< 0.2	U
110-75-8	2-Chloroethylvinylether	0.5	< 0.5	U
75-25-2	Bromoform	0.2	< 0.2	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	1.0	< 1.0	U
591-78-6	2-Hexanone	3.0	< 3.0	U
127-18-4	Tetrachloroethene	0.2	< 0.2	U
79-34-5	1,1,2,2-Tetrachloroethane	0.2	< 0.2	U
108-88-3	Toluene	0.2	< 0.2	U
108-90-7	Chlorobenzene	0.2	< 0.2	U
100-41-4	Ethylbenzene	0.2	< 0.2	U
100-42-5	Styrene	0.2	< 0.2	U
75-69-4	Trichlorofluoromethane	0.2	< 0.2	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.2	< 0.2	U
1330-20-7	m,p-Xylene	0.4	< 0.4	U
95-47-6	o-Xylene	0.2	< 0.2	U
95-50-1	1,2-Dichlorobenzene	0.2	< 0.2	U
541-73-1	1,3-Dichlorobenzene	0.2	< 0.2	U
106-46-7	1,4-Dichlorobenzene	0.2	< 0.2	U
107-02-8	Acrolein	5.0	< 5.0	U
74-88-4	Methyl Iodide	0.2	< 0.2	U
74-96-4	Bromoethane	0.2	< 0.2	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.2	< 0.2	U
74-95-3	Dibromomethane	0.2	< 0.2	U
630-20-6	1,1,1,2-Tetrachloroethane	0.2	< 0.2	U
96-12-8	1,2-Dibromo-3-chloropropane	0.5	< 0.5	U
96-18-4	1,2,3-Trichloropropane	0.5	< 0.5	U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: DW-4**
 SAMPLE

Lab Sample ID: KI11D
LIMS ID: 06-24544
Matrix: Water
Date Analyzed: 12/12/06 15:20

QC Report No: KI11-URS Corp
Project: LAUREL STATION
33759339

CAS Number	Analyte	RL	Result	Q
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.2	< 0.2	U
95-63-6	1,2,4-Trimethylbenzene	0.2	< 0.2	U
87-68-3	Hexachlorobutadiene	0.5	< 0.5	U
106-93-4	Ethylene Dibromide	0.2	< 0.2	U
74-97-5	Bromochloromethane	0.2	< 0.2	U
594-20-7	2,2-Dichloropropane	0.2	< 0.2	U
142-28-9	1,3-Dichloropropane	0.2	< 0.2	U
98-82-8	Isopropylbenzene	0.2	< 0.2	U
103-65-1	n-Propylbenzene	0.2	< 0.2	U
108-86-1	Bromobenzene	0.2	< 0.2	U
95-49-8	2-Chlorotoluene	0.2	< 0.2	U
106-43-4	4-Chlorotoluene	0.2	< 0.2	U
98-06-6	tert-Butylbenzene	0.2	< 0.2	U
135-98-8	sec-Butylbenzene	0.2	< 0.2	U
99-87-6	4-Isopropyltoluene	0.2	< 0.2	U
104-51-8	n-Butylbenzene	0.2	< 0.2	U
120-82-1	1,2,4-Trichlorobenzene	0.5	< 0.5	U
91-20-3	Naphthalene	0.5	< 0.5	U
87-61-6	1,2,3-Trichlorobenzene	0.5	< 0.5	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	98.2%
d8-Toluene	101%
Bromofluorobenzene	78.8%
d4-1,2-Dichlorobenzene	108%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: SW-2**
Page 1 of 2 **SAMPLE**

Lab Sample ID: KI11E
LIMS ID: 06-24545
Matrix: Water
Data Release Authorized:
Reported: 12/18/06

QC Report No: KI11-URS Corp
Project: LAUREL STATION
33759339
Date Sampled: 12/08/06
Date Received: 12/09/06

Instrument/Analyst: FINN3/PAB
Date Analyzed: 12/12/06 11:52

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	RL	Result	Q
74-87-3	Chloromethane	0.2	< 0.2	U
74-83-9	Bromomethane	0.2	< 0.2	U
75-01-4	Vinyl Chloride	0.2	< 0.2	U
75-00-3	Chloroethane	0.2	< 0.2	U
75-09-2	Methylene Chloride	0.3	< 0.3	U
67-64-1	Acetone	3.0	< 3.0	U
75-15-0	Carbon Disulfide	0.2	< 0.2	U
75-35-4	1,1-Dichloroethene	0.2	< 0.2	U
75-34-3	1,1-Dichloroethane	0.2	< 0.2	U
156-60-5	trans-1,2-Dichloroethene	0.2	< 0.2	U
156-59-2	cis-1,2-Dichloroethene	0.2	< 0.2	U
67-66-3	Chloroform	0.2	< 0.2	U
107-06-2	1,2-Dichloroethane	0.2	< 0.2	U
78-93-3	2-Butanone	1.0	< 1.0	U
71-55-6	1,1,1-Trichloroethane	0.2	< 0.2	U
56-23-5	Carbon Tetrachloride	0.2	< 0.2	U
108-05-4	Vinyl Acetate	0.2	< 0.2	U
75-27-4	Bromodichloromethane	0.2	< 0.2	U
78-87-5	1,2-Dichloropropane	0.2	< 0.2	U
10061-01-5	cis-1,3-Dichloropropene	0.2	< 0.2	U
79-01-6	Trichloroethene	0.2	< 0.2	U
124-48-1	Dibromochloromethane	0.2	< 0.2	U
79-00-5	1,1,2-Trichloroethane	0.2	< 0.2	U
71-43-2	Benzene	0.2	< 0.2	U
10061-02-6	trans-1,3-Dichloropropene	0.2	< 0.2	U
110-75-8	2-Chloroethylvinylether	0.5	< 0.5	U
75-25-2	Bromoform	0.2	< 0.2	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	1.0	< 1.0	U
591-78-6	2-Hexanone	3.0	< 3.0	U
127-18-4	Tetrachloroethene	0.2	< 0.2	U
79-34-5	1,1,2,2-Tetrachloroethane	0.2	< 0.2	U
108-88-3	Toluene	0.2	< 0.2	U
108-90-7	Chlorobenzene	0.2	< 0.2	U
100-41-4	Ethylbenzene	0.2	< 0.2	U
100-42-5	Styrene	0.2	< 0.2	U
75-69-4	Trichlorofluoromethane	0.2	< 0.2	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.2	< 0.2	U
1330-20-7	m,p-Xylene	0.4	< 0.4	U
95-47-6	o-Xylene	0.2	< 0.2	U
95-50-1	1,2-Dichlorobenzene	0.2	< 0.2	U
541-73-1	1,3-Dichlorobenzene	0.2	< 0.2	U
106-46-7	1,4-Dichlorobenzene	0.2	< 0.2	U
107-02-8	Acrolein	5.0	< 5.0	U
74-88-4	Methyl Iodide	0.2	< 0.2	U
74-96-4	Bromoethane	0.2	< 0.2	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.2	< 0.2	U
74-95-3	Dibromomethane	0.2	< 0.2	U
630-20-6	1,1,1,2-Tetrachloroethane	0.2	< 0.2	U
96-12-8	1,2-Dibromo-3-chloropropane	0.5	< 0.5	U
96-18-4	1,2,3-Trichloropropane	0.5	< 0.5	U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: SW-2**
 SAMPLE

Lab Sample ID: KI11E
LIMS ID: 06-24545
Matrix: Water
Date Analyzed: 12/12/06 11:52

QC Report No: KI11-URS Corp
Project: LAUREL STATION
33759339

CAS Number	Analyte	RL	Result	Q
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.2	< 0.2	U
95-63-6	1,2,4-Trimethylbenzene	0.2	< 0.2	U
87-68-3	Hexachlorobutadiene	0.5	< 0.5	U
106-93-4	Ethylene Dibromide	0.2	< 0.2	U
74-97-5	Bromochloromethane	0.2	< 0.2	U
594-20-7	2,2-Dichloropropane	0.2	< 0.2	U
142-28-9	1,3-Dichloropropane	0.2	< 0.2	U
98-82-8	Isopropylbenzene	0.2	< 0.2	U
103-65-1	n-Propylbenzene	0.2	< 0.2	U
108-86-1	Bromobenzene	0.2	< 0.2	U
95-49-8	2-Chlorotoluene	0.2	< 0.2	U
106-43-4	4-Chlorotoluene	0.2	< 0.2	U
98-06-6	tert-Butylbenzene	0.2	< 0.2	U
135-98-8	sec-Butylbenzene	0.2	< 0.2	U
99-87-6	4-Isopropyltoluene	0.2	< 0.2	U
104-51-8	n-Butylbenzene	0.2	< 0.2	U
120-82-1	1,2,4-Trichlorobenzene	0.5	< 0.5	U
91-20-3	Naphthalene	0.5	< 0.5	U
87-61-6	1,2,3-Trichlorobenzene	0.5	< 0.5	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	104%
d8-Toluene	109%
Bromofluorobenzene	90.2%
d4-1,2-Dichlorobenzene	113%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: SW-2**
Page 1 of 2 **MATRIX SPIKE**

Lab Sample ID: KI11E
LIMS ID: 06-24545
Matrix: Water
Data Release Authorized:
Reported: 12/18/06

QC Report No: KI11-URS Corp
Project: LAUREL STATION
33759339
Date Sampled: 12/08/06
Date Received: 12/09/06

Instrument/Analyst: FINN3/PAB
Date Analyzed: 12/12/06 13:04

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	RL	Result	Q
74-87-3	Chloromethane	0.2	---	
74-83-9	Bromomethane	0.2	---	
75-01-4	Vinyl Chloride	0.2	---	
75-00-3	Chloroethane	0.2	---	
75-09-2	Methylene Chloride	0.3	---	
67-64-1	Acetone	3.0	---	
75-15-0	Carbon Disulfide	0.2	---	
75-35-4	1,1-Dichloroethene	0.2	---	
75-34-3	1,1-Dichloroethane	0.2	---	
156-60-5	trans-1,2-Dichloroethene	0.2	---	
156-59-2	cis-1,2-Dichloroethene	0.2	---	
67-66-3	Chloroform	0.2	---	
107-06-2	1,2-Dichloroethane	0.2	---	
78-93-3	2-Butanone	1.0	---	
71-55-6	1,1,1-Trichloroethane	0.2	---	
56-23-5	Carbon Tetrachloride	0.2	---	
108-05-4	Vinyl Acetate	0.2	---	
75-27-4	Bromodichloromethane	0.2	---	
78-87-5	1,2-Dichloropropane	0.2	---	
10061-01-5	cis-1,3-Dichloropropene	0.2	---	
79-01-6	Trichloroethene	0.2	---	
124-48-1	Dibromochloromethane	0.2	---	
79-00-5	1,1,2-Trichloroethane	0.2	---	
71-43-2	Benzene	0.2	---	
10061-02-6	trans-1,3-Dichloropropene	0.2	---	
110-75-8	2-Chloroethylvinylether	0.5	---	
75-25-2	Bromoform	0.2	---	
108-10-1	4-Methyl-2-Pentanone (MIBK)	1.0	---	
591-78-6	2-Hexanone	3.0	---	
127-18-4	Tetrachloroethene	0.2	---	
79-34-5	1,1,2,2-Tetrachloroethane	0.2	---	
108-88-3	Toluene	0.2	---	
108-90-7	Chlorobenzene	0.2	---	
100-41-4	Ethylbenzene	0.2	---	
100-42-5	Styrene	0.2	---	
75-69-4	Trichlorofluoromethane	0.2	---	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.2	---	
1330-20-7	m,p-Xylene	0.4	---	
95-47-6	o-Xylene	0.2	---	
95-50-1	1,2-Dichlorobenzene	0.2	---	
541-73-1	1,3-Dichlorobenzene	0.2	---	
106-46-7	1,4-Dichlorobenzene	0.2	---	
107-02-8	Acrolein	5.0	---	
74-88-4	Methyl Iodide	0.2	---	
74-96-4	Bromoethane	0.2	---	
107-13-1	Acrylonitrile	1.0	---	
563-58-6	1,1-Dichloropropene	0.2	---	
74-95-3	Dibromomethane	0.2	---	
630-20-6	1,1,1,2-Tetrachloroethane	0.2	---	
96-12-8	1,2-Dibromo-3-chloropropane	0.5	---	
96-18-4	1,2,3-Trichloropropane	0.5	---	

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: SW-2**
 MATRIX SPIKE

Lab Sample ID: KI11E
LIMS ID: 06-24545
Matrix: Water
Date Analyzed: 12/12/06 13:04

QC Report No: KI11-URS Corp
Project: LAUREL STATION
33759339

CAS Number	Analyte	RL	Result	Q
110-57-6	trans-1,4-Dichloro-2-butene	1.0	---	
108-67-8	1,3,5-Trimethylbenzene	0.2	---	
95-63-6	1,2,4-Trimethylbenzene	0.2	---	
87-68-3	Hexachlorobutadiene	0.5	---	
106-93-4	Ethylene Dibromide	0.2	---	
74-97-5	Bromochloromethane	0.2	---	
594-20-7	2,2-Dichloropropane	0.2	---	
142-28-9	1,3-Dichloropropane	0.2	---	
98-82-8	Isopropylbenzene	0.2	---	
103-65-1	n-Propylbenzene	0.2	---	
108-86-1	Bromobenzene	0.2	---	
95-49-8	2-Chlorotoluene	0.2	---	
106-43-4	4-Chlorotoluene	0.2	---	
98-06-6	tert-Butylbenzene	0.2	---	
135-98-8	sec-Butylbenzene	0.2	---	
99-87-6	4-Isopropyltoluene	0.2	---	
104-51-8	n-Butylbenzene	0.2	---	
120-82-1	1,2,4-Trichlorobenzene	0.5	---	
91-20-3	Naphthalene	0.5	---	
87-61-6	1,2,3-Trichlorobenzene	0.5	---	

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	99.2%
d8-Toluene	103%
Bromofluorobenzene	85.8%
d4-1,2-Dichlorobenzene	102%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: SW-2**
Page 1 of 2 **MATRIX SPIKE DUP**

Lab Sample ID: KI11E
LIMS ID: 06-24545
Matrix: Water
Data Release Authorized:
Reported: 12/18/06

QC Report No: KI11-URS Corp
Project: LAUREL STATION
33759339
Date Sampled: 12/08/06
Date Received: 12/09/06

Instrument/Analyst: FINN3/PAB
Date Analyzed: 12/12/06 13:32

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	RL	Result	Q
74-87-3	Chloromethane	0.2	---	
74-83-9	Bromomethane	0.2	---	
75-01-4	Vinyl Chloride	0.2	---	
75-00-3	Chloroethane	0.2	---	
75-09-2	Methylene Chloride	0.3	---	
67-64-1	Acetone	3.0	---	
75-15-0	Carbon Disulfide	0.2	---	
75-35-4	1,1-Dichloroethene	0.2	---	
75-34-3	1,1-Dichloroethane	0.2	---	
156-60-5	trans-1,2-Dichloroethene	0.2	---	
156-59-2	cis-1,2-Dichloroethene	0.2	---	
67-66-3	Chloroform	0.2	---	
107-06-2	1,2-Dichloroethane	0.2	---	
78-93-3	2-Butanone	1.0	---	
71-55-6	1,1,1-Trichloroethane	0.2	---	
56-23-5	Carbon Tetrachloride	0.2	---	
108-05-4	Vinyl Acetate	0.2	---	
75-27-4	Bromodichloromethane	0.2	---	
78-87-5	1,2-Dichloropropane	0.2	---	
10061-01-5	cis-1,3-Dichloropropene	0.2	---	
79-01-6	Trichloroethene	0.2	---	
124-48-1	Dibromochloromethane	0.2	---	
79-00-5	1,1,2-Trichloroethane	0.2	---	
71-43-2	Benzene	0.2	---	
10061-02-6	trans-1,3-Dichloropropene	0.2	---	
110-75-8	2-Chloroethylvinylether	0.5	---	
75-25-2	Bromoform	0.2	---	
108-10-1	4-Methyl-2-Pentanone (MIBK)	1.0	---	
591-78-6	2-Hexanone	3.0	---	
127-18-4	Tetrachloroethene	0.2	---	
79-34-5	1,1,2,2-Tetrachloroethane	0.2	---	
108-88-3	Toluene	0.2	---	
108-90-7	Chlorobenzene	0.2	---	
100-41-4	Ethylbenzene	0.2	---	
100-42-5	Styrene	0.2	---	
75-69-4	Trichlorofluoromethane	0.2	---	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.2	---	
1330-20-7	m,p-Xylene	0.4	---	
95-47-6	o-Xylene	0.2	---	
95-50-1	1,2-Dichlorobenzene	0.2	---	
541-73-1	1,3-Dichlorobenzene	0.2	---	
106-46-7	1,4-Dichlorobenzene	0.2	---	
107-02-8	Acrolein	5.0	---	
74-88-4	Methyl Iodide	0.2	---	
74-96-4	Bromoethane	0.2	---	
107-13-1	Acrylonitrile	1.0	---	
563-58-6	1,1-Dichloropropene	0.2	---	
74-95-3	Dibromomethane	0.2	---	
630-20-6	1,1,1,2-Tetrachloroethane	0.2	---	
96-12-8	1,2-Dibromo-3-chloropropane	0.5	---	
96-18-4	1,2,3-Trichloropropane	0.5	---	

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: SW-2**
 MATRIX SPIKE DUP

Lab Sample ID: KI11E
LIMS ID: 06-24545
Matrix: Water
Date Analyzed: 12/12/06 13:32

QC Report No: KI11-URS Corp
Project: LAUREL STATION
33759339

CAS Number	Analyte	RL	Result	Q
110-57-6	trans-1,4-Dichloro-2-butene	1.0	---	
108-67-8	1,3,5-Trimethylbenzene	0.2	---	
95-63-6	1,2,4-Trimethylbenzene	0.2	---	
87-68-3	Hexachlorobutadiene	0.5	---	
106-93-4	Ethylene Dibromide	0.2	---	
74-97-5	Bromochloromethane	0.2	---	
594-20-7	2,2-Dichloropropane	0.2	---	
142-28-9	1,3-Dichloropropane	0.2	---	
98-82-8	Isopropylbenzene	0.2	---	
103-65-1	n-Propylbenzene	0.2	---	
108-86-1	Bromobenzene	0.2	---	
95-49-8	2-Chlorotoluene	0.2	---	
106-43-4	4-Chlorotoluene	0.2	---	
98-06-6	tert-Butylbenzene	0.2	---	
135-98-8	sec-Butylbenzene	0.2	---	
99-87-6	4-Isopropyltoluene	0.2	---	
104-51-8	n-Butylbenzene	0.2	---	
120-82-1	1,2,4-Trichlorobenzene	0.5	---	
91-20-3	Naphthalene	0.5	---	
87-61-6	1,2,3-Trichlorobenzene	0.5	---	

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	106%
d8-Toluene	100%
Bromofluorobenzene	93.5%
d4-1,2-Dichlorobenzene	98.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: DW-5**
Page 1 of 2 **SAMPLE**

Lab Sample ID: KI11F
LIMS ID: 06-24546
Matrix: Water
Data Release Authorized:
Reported: 12/18/06

QC Report No: KI11-URS Corp
Project: LAUREL STATION
33759339
Date Sampled: 12/08/06
Date Received: 12/09/06

Instrument/Analyst: FINN3/PAB
Date Analyzed: 12/12/06 15:48

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	RL	Result	Q
74-87-3	Chloromethane	0.2	< 0.2	U
74-83-9	Bromomethane	0.2	< 0.2	U
75-01-4	Vinyl Chloride	0.2	< 0.2	U
75-00-3	Chloroethane	0.2	< 0.2	U
75-09-2	Methylene Chloride	0.3	< 0.3	U
67-64-1	Acetone	3.0	< 3.0	U
75-15-0	Carbon Disulfide	0.2	< 0.2	U
75-35-4	1,1-Dichloroethene	0.2	< 0.2	U
75-34-3	1,1-Dichloroethane	0.2	< 0.2	U
156-60-5	trans-1,2-Dichloroethene	0.2	< 0.2	U
156-59-2	cis-1,2-Dichloroethene	0.2	< 0.2	U
67-66-3	Chloroform	0.2	< 0.2	U
107-06-2	1,2-Dichloroethane	0.2	< 0.2	U
78-93-3	2-Butanone	1.0	< 1.0	U
71-55-6	1,1,1-Trichloroethane	0.2	< 0.2	U
56-23-5	Carbon Tetrachloride	0.2	< 0.2	U
108-05-4	Vinyl Acetate	0.2	< 0.2	U
75-27-4	Bromodichloromethane	0.2	< 0.2	U
78-87-5	1,2-Dichloropropane	0.2	< 0.2	U
10061-01-5	cis-1,3-Dichloropropene	0.2	< 0.2	U
79-01-6	Trichloroethene	0.2	< 0.2	U
124-48-1	Dibromochloromethane	0.2	< 0.2	U
79-00-5	1,1,2-Trichloroethane	0.2	< 0.2	U
71-43-2	Benzene	0.2	< 0.2	U
10061-02-6	trans-1,3-Dichloropropene	0.2	< 0.2	U
110-75-8	2-Chloroethylvinylether	0.5	< 0.5	U
75-25-2	Bromoform	0.2	< 0.2	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	1.0	< 1.0	U
591-78-6	2-Hexanone	3.0	< 3.0	U
127-18-4	Tetrachloroethene	0.2	< 0.2	U
79-34-5	1,1,2,2-Tetrachloroethane	0.2	< 0.2	U
108-88-3	Toluene	0.2	< 0.2	U
108-90-7	Chlorobenzene	0.2	< 0.2	U
100-41-4	Ethylbenzene	0.2	< 0.2	U
100-42-5	Styrene	0.2	< 0.2	U
75-69-4	Trichlorofluoromethane	0.2	< 0.2	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.2	< 0.2	U
1330-20-7	m,p-Xylene	0.4	< 0.4	U
95-47-6	o-Xylene	0.2	< 0.2	U
95-50-1	1,2-Dichlorobenzene	0.2	< 0.2	U
541-73-1	1,3-Dichlorobenzene	0.2	< 0.2	U
106-46-7	1,4-Dichlorobenzene	0.2	< 0.2	U
107-02-8	Acrolein	5.0	< 5.0	U
74-88-4	Methyl Iodide	0.2	< 0.2	U
74-96-4	Bromoethane	0.2	< 0.2	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.2	< 0.2	U
74-95-3	Dibromomethane	0.2	< 0.2	U
630-20-6	1,1,1,2-Tetrachloroethane	0.2	< 0.2	U
96-12-8	1,2-Dibromo-3-chloropropane	0.5	< 0.5	U
96-18-4	1,2,3-Trichloropropane	0.5	< 0.5	U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: DW-5**
 SAMPLE

Lab Sample ID: KI11F
LIMS ID: 06-24546
Matrix: Water
Date Analyzed: 12/12/06 15:48

QC Report No: KI11-URS Corp
Project: LAUREL STATION
33759339

CAS Number	Analyte	RL	Result	Q
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.2	< 0.2	U
95-63-6	1,2,4-Trimethylbenzene	0.2	< 0.2	U
87-68-3	Hexachlorobutadiene	0.5	< 0.5	U
106-93-4	Ethylene Dibromide	0.2	< 0.2	U
74-97-5	Bromochloromethane	0.2	< 0.2	U
594-20-7	2,2-Dichloropropane	0.2	< 0.2	U
142-28-9	1,3-Dichloropropane	0.2	< 0.2	U
98-82-8	Isopropylbenzene	0.2	< 0.2	U
103-65-1	n-Propylbenzene	0.2	< 0.2	U
108-86-1	Bromobenzene	0.2	< 0.2	U
95-49-8	2-Chlorotoluene	0.2	< 0.2	U
106-43-4	4-Chlorotoluene	0.2	< 0.2	U
98-06-6	tert-Butylbenzene	0.2	< 0.2	U
135-98-8	sec-Butylbenzene	0.2	< 0.2	U
99-87-6	4-Isopropyltoluene	0.2	< 0.2	U
104-51-8	n-Butylbenzene	0.2	< 0.2	U
120-82-1	1,2,4-Trichlorobenzene	0.5	< 0.5	U
91-20-3	Naphthalene	0.5	< 0.5	U
87-61-6	1,2,3-Trichlorobenzene	0.5	< 0.5	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	97.0%
d8-Toluene	98.0%
Bromofluorobenzene	82.8%
d4-1,2-Dichlorobenzene	99.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: DUP SAMPLE**

Lab Sample ID: KI11G
LIMS ID: 06-24547
Matrix: Water
Data Release Authorized:
Reported: 12/18/06

QC Report No: KI11-URS Corp
Project: LAUREL STATION
33759339
Date Sampled: 12/08/06
Date Received: 12/09/06

Instrument/Analyst: FINN3/PAB
Date Analyzed: 12/12/06 16:22

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	RL	Result	Q
74-87-3	Chloromethane	0.2	< 0.2	U
74-83-9	Bromomethane	0.2	< 0.2	U
75-01-4	Vinyl Chloride	0.2	< 0.2	U
75-00-3	Chloroethane	0.2	< 0.2	U
75-09-2	Methylene Chloride	0.3	< 0.3	U
67-64-1	Acetone	3.0	< 3.0	U
75-15-0	Carbon Disulfide	0.2	< 0.2	U
75-35-4	1,1-Dichloroethene	0.2	< 0.2	U
75-34-3	1,1-Dichloroethane	0.2	< 0.2	U
156-60-5	trans-1,2-Dichloroethene	0.2	< 0.2	U
156-59-2	cis-1,2-Dichloroethene	0.2	< 0.2	U
67-66-3	Chloroform	0.2	< 0.2	U
107-06-2	1,2-Dichloroethane	0.2	< 0.2	U
78-93-3	2-Butanone	1.0	< 1.0	U
71-55-6	1,1,1-Trichloroethane	0.2	< 0.2	U
56-23-5	Carbon Tetrachloride	0.2	< 0.2	U
108-05-4	Vinyl Acetate	0.2	< 0.2	U
75-27-4	Bromodichloromethane	0.2	< 0.2	U
78-87-5	1,2-Dichloropropane	0.2	< 0.2	U
10061-01-5	cis-1,3-Dichloropropene	0.2	< 0.2	U
79-01-6	Trichloroethene	0.2	< 0.2	U
124-48-1	Dibromochloromethane	0.2	< 0.2	U
79-00-5	1,1,2-Trichloroethane	0.2	< 0.2	U
71-43-2	Benzene	0.2	< 0.2	U
10061-02-6	trans-1,3-Dichloropropene	0.2	< 0.2	U
110-75-8	2-Chloroethylvinylether	0.5	< 0.5	U
75-25-2	Bromoform	0.2	< 0.2	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	1.0	< 1.0	U
591-78-6	2-Hexanone	3.0	< 3.0	U
127-18-4	Tetrachloroethene	0.2	< 0.2	U
79-34-5	1,1,2,2-Tetrachloroethane	0.2	< 0.2	U
108-88-3	Toluene	0.2	< 0.2	U
108-90-7	Chlorobenzene	0.2	< 0.2	U
100-41-4	Ethylbenzene	0.2	< 0.2	U
100-42-5	Styrene	0.2	< 0.2	U
75-69-4	Trichlorofluoromethane	0.2	< 0.2	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.2	< 0.2	U
1330-20-7	m,p-Xylene	0.4	< 0.4	U
95-47-6	o-Xylene	0.2	< 0.2	U
95-50-1	1,2-Dichlorobenzene	0.2	< 0.2	U
541-73-1	1,3-Dichlorobenzene	0.2	< 0.2	U
106-46-7	1,4-Dichlorobenzene	0.2	< 0.2	U
107-02-8	Acrolein	5.0	< 5.0	U
74-88-4	Methyl Iodide	0.2	< 0.2	U
74-96-4	Bromoethane	0.2	< 0.2	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.2	< 0.2	U
74-95-3	Dibromomethane	0.2	< 0.2	U
630-20-6	1,1,1,2-Tetrachloroethane	0.2	< 0.2	U
96-12-8	1,2-Dibromo-3-chloropropane	0.5	< 0.5	U
96-18-4	1,2,3-Trichloropropane	0.5	< 0.5	U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: DUP SAMPLE**

Lab Sample ID: KI11G
LIMS ID: 06-24547
Matrix: Water
Date Analyzed: 12/12/06 16:22

QC Report No: KI11-URS Corp
Project: LAUREL STATION
33759339

CAS Number	Analyte	RL	Result	Q
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.2	< 0.2	U
95-63-6	1,2,4-Trimethylbenzene	0.2	< 0.2	U
87-68-3	Hexachlorobutadiene	0.5	< 0.5	U
106-93-4	Ethylene Dibromide	0.2	< 0.2	U
74-97-5	Bromochloromethane	0.2	< 0.2	U
594-20-7	2,2-Dichloropropane	0.2	< 0.2	U
142-28-9	1,3-Dichloropropane	0.2	< 0.2	U
98-82-8	Isopropylbenzene	0.2	< 0.2	U
103-65-1	n-Propylbenzene	0.2	< 0.2	U
108-86-1	Bromobenzene	0.2	< 0.2	U
95-49-8	2-Chlorotoluene	0.2	< 0.2	U
106-43-4	4-Chlorotoluene	0.2	< 0.2	U
98-06-6	tert-Butylbenzene	0.2	< 0.2	U
135-98-8	sec-Butylbenzene	0.2	< 0.2	U
99-87-6	4-Isopropyltoluene	0.2	< 0.2	U
104-51-8	n-Butylbenzene	0.2	< 0.2	U
120-82-1	1,2,4-Trichlorobenzene	0.5	< 0.5	U
91-20-3	Naphthalene	0.5	< 0.5	U
87-61-6	1,2,3-Trichlorobenzene	0.5	< 0.5	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	94.0%
d8-Toluene	97.2%
Bromofluorobenzene	79.0%
d4-1,2-Dichlorobenzene	107%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: SW-2**
 MATRIX SPIKE

Lab Sample ID: KI11E
LIMS ID: 06-24545
Matrix: Water
Data Release Authorized:
Reported: 12/18/06

QC Report No: KI11-URS Corp
Project: LAUREL STATION
33759339
Date Sampled: 12/08/06
Date Received: 12/09/06

Instrument/Analyst MS: FINN3/PAB
MSD: FINN3/PAB
Date Analyzed MS: 12/12/06 13:04
MSD: 12/12/06 13:32

Sample Amount MS: 20.0 mL
MSD: 20.0 mL
Purge Volume MS: 20.0 mL
MSD: 20.0 mL

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Chloromethane	< 0.2 U	2.9	4.0	72.5%	3.0	4.0	75.0%	3.4%
Bromomethane	< 0.2 U	3.7	4.0	92.5%	3.8	4.0	95.0%	2.7%
Vinyl Chloride	< 0.2 U	3.3	4.0	82.5%	3.3	4.0	82.5%	0.0%
Chloroethane	< 0.2 U	3.3	4.0	82.5%	3.5	4.0	87.5%	5.9%
Methylene Chloride	< 0.3 U	3.5	4.0	87.5%	3.7	4.0	92.5%	5.6%
Acetone	< 3.0 U	15.7	20.0	78.5%	21.0	20.0	105%	28.9%
Carbon Disulfide	< 0.2 U	4.0	4.0	100%	4.0	4.0	100%	0.0%
1,1-Dichloroethene	< 0.2 U	3.6	4.0	90.0%	3.6	4.0	90.0%	0.0%
1,1-Dichloroethane	< 0.2 U	3.8	4.0	95.0%	4.0	4.0	100%	5.1%
trans-1,2-Dichloroethene	< 0.2 U	3.9	4.0	97.5%	3.9	4.0	97.5%	0.0%
cis-1,2-Dichloroethene	< 0.2 U	3.5	4.0	87.5%	3.7	4.0	92.5%	5.6%
Chloroform	< 0.2 U	3.6	4.0	90.0%	3.8	4.0	95.0%	5.4%
1,2-Dichloroethane	< 0.2 U	4.3	4.0	108%	4.5	4.0	112%	4.5%
2-Butanone	< 1.0 U	15.1	20.0	75.5%	17.4	20.0	87.0%	14.2%
1,1,1-Trichloroethane	< 0.2 U	3.8	4.0	95.0%	4.1	4.0	102%	7.6%
Carbon Tetrachloride	< 0.2 U	4.4	4.0	110%	4.2	4.0	105%	4.7%
Vinyl Acetate	< 0.2 U	3.2	4.0	80.0%	3.7	4.0	92.5%	14.5%
Bromodichloromethane	< 0.2 U	4.0	4.0	100%	4.2	4.0	105%	4.9%
1,2-Dichloropropane	< 0.2 U	4.0	4.0	100%	4.0	4.0	100%	0.0%
cis-1,3-Dichloropropene	< 0.2 U	4.2	4.0	105%	4.0	4.0	100%	4.9%
Trichloroethene	< 0.2 U	4.2	4.0	105%	3.9	4.0	97.5%	7.4%
Dibromochloromethane	< 0.2 U	3.5	4.0	87.5%	3.8	4.0	95.0%	8.2%
1,1,2-Trichloroethane	< 0.2 U	4.0	4.0	100%	4.4	4.0	110%	9.5%
Benzene	< 0.2 U	4.3	4.0	108%	4.1	4.0	102%	4.8%
trans-1,3-Dichloropropene	< 0.2 U	4.0	4.0	100%	4.0	4.0	100%	0.0%
2-Chloroethylvinylether	< 0.5 U	< 0.5 U	4.0	NA	< 0.5 U	4.0	NA	NA
Bromoform	< 0.2 U	3.6	4.0	90.0%	3.6	4.0	90.0%	0.0%
4-Methyl-2-Pentanone (MIBK)	< 1.0 U	17.5	20.0	87.5%	17.8	20.0	89.0%	1.7%
2-Hexanone	< 3.0 U	17.2	20.0	86.0%	20.4	20.0	102%	17.0%
Tetrachloroethene	< 0.2 U	4.7	4.0	118%	4.8	4.0	120%	2.1%
1,1,2,2-Tetrachloroethane	< 0.2 U	3.3	4.0	82.5%	3.3	4.0	82.5%	0.0%
Toluene	< 0.2 U	4.5	4.0	112%	4.4	4.0	110%	2.2%
Chlorobenzene	< 0.2 U	4.1	4.0	102%	4.0	4.0	100%	2.5%
Ethylbenzene	< 0.2 U	4.4	4.0	110%	4.2	4.0	105%	4.7%
Styrene	< 0.2 U	3.4	4.0	85.0%	3.6	4.0	90.0%	5.7%
Trichlorofluoromethane	< 0.2 U	3.8	4.0	95.0%	4.0	4.0	100%	5.1%
1,1,2-Trichloro-1,2,2-trifl	< 0.2 U	4.0	4.0	100%	4.0	4.0	100%	0.0%
m,p-Xylene	< 0.4 U	9.2	8.0	115%	8.9	8.0	111%	3.3%
o-Xylene	< 0.2 U	4.0	4.0	100%	4.2	4.0	105%	4.9%
1,2-Dichlorobenzene	< 0.2 U	4.0	4.0	100%	3.9	4.0	97.5%	2.5%
1,3-Dichlorobenzene	< 0.2 U	4.1	4.0	102%	4.1	4.0	102%	0.0%
1,4-Dichlorobenzene	< 0.2 U	4.0	4.0	100%	4.1	4.0	102%	2.5%
Acrolein	< 5.0 U	13.4	20.0	67.0%	14.5	20.0	72.5%	7.9%
Methyl Iodide	< 0.2 U	4.7	4.0	118%	4.9	4.0	122%	4.2%
Bromoethane	< 0.2 U	3.8	4.0	95.0%	4.0	4.0	100%	5.1%
Acrylonitrile	< 1.0 U	3.2	4.0	80.0%	3.6	4.0	90.0%	11.8%
1,1-Dichloropropene	< 0.2 U	3.8	4.0	95.0%	3.7	4.0	92.5%	2.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: SW-2**
 MATRIX SPIKE

Lab Sample ID: KI11E
LIMS ID: 06-24545
Matrix: Water

QC Report No: KI11-URS Corp
Project: LAUREL STATION
33759339

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Dibromomethane	< 0.2 U	4.0	4.0	100%	4.1	4.0	102%	2.5%
1,1,1,2-Tetrachloroethane	< 0.2 U	4.0	4.0	100%	4.0	4.0	100%	0.0%
1,2-Dibromo-3-chloropropane	< 0.5 U	3.2	4.0	80.0%	3.0	4.0	75.0%	6.5%
1,2,3-Trichloropropane	< 0.5 U	3.3	4.0	82.5%	3.7	4.0	92.5%	11.4%
trans-1,4-Dichloro-2-butene	< 1.0 U	3.6	4.0	90.0%	4.0	4.0	100%	10.5%
1,3,5-Trimethylbenzene	< 0.2 U	3.6	4.0	90.0%	3.5	4.0	87.5%	2.8%
1,2,4-Trimethylbenzene	< 0.2 U	3.7	4.0	92.5%	3.4	4.0	85.0%	8.5%
Hexachlorobutadiene	< 0.5 U	4.5	4.0	112%	4.3	4.0	108%	4.5%
Ethylene Dibromide	< 0.2 U	4.0	4.0	100%	3.9	4.0	97.5%	2.5%
Bromochloromethane	< 0.2 U	3.4	4.0	85.0%	3.9	4.0	97.5%	13.7%
2,2-Dichloropropane	< 0.2 U	4.3	4.0	108%	4.3	4.0	108%	0.0%
1,3-Dichloropropane	< 0.2 U	3.6	4.0	90.0%	4.2	4.0	105%	15.4%
Isopropylbenzene	< 0.2 U	3.8	4.0	95.0%	3.8	4.0	95.0%	0.0%
n-Propylbenzene	< 0.2 U	4.1	4.0	102%	4.0	4.0	100%	2.5%
Bromobenzene	< 0.2 U	4.1	4.0	102%	4.3	4.0	108%	4.8%
2-Chlorotoluene	< 0.2 U	3.9	4.0	97.5%	3.8	4.0	95.0%	2.6%
4-Chlorotoluene	< 0.2 U	4.0	4.0	100%	4.0	4.0	100%	0.0%
tert-Butylbenzene	< 0.2 U	3.9	4.0	97.5%	3.8	4.0	95.0%	2.6%
sec-Butylbenzene	< 0.2 U	4.0	4.0	100%	3.9	4.0	97.5%	2.5%
4-Isopropyltoluene	< 0.2 U	4.0	4.0	100%	4.0	4.0	100%	0.0%
n-Butylbenzene	< 0.2 U	4.1	4.0	102%	3.9	4.0	97.5%	5.0%
1,2,4-Trichlorobenzene	< 0.5 U	3.8	4.0	95.0%	3.9	4.0	97.5%	2.6%
Naphthalene	< 0.5 U	2.8	4.0	70.0%	3.1	4.0	77.5%	10.2%
1,2,3-Trichlorobenzene	< 0.5 U	3.8	4.0	95.0%	3.8	4.0	95.0%	0.0%

Reported in µg/L (ppb)

NA-No recovery due to high concentration of analyte in original sample, calculated negative recovery, or undetected spike.
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: LCS-121206**
 LAB CONTROL SAMPLE

Lab Sample ID: LCS-121206
LIMS ID: 06-24545
Matrix: Water
Data Release Authorized:
Reported: 12/18/06

QC Report No: KI11-URS Corp
Project: LAUREL STATION
33759339
Date Sampled: NA
Date Received: NA

Instrument/Analyst LCS: FINN3/PAB
LCSD: FINN3/PAB
Date Analyzed LCS: 12/12/06 09:21
LCSD: 12/12/06 09:52

Sample Amount LCS: 20.0 mL
LCSD: 20.0 mL
Purge Volume LCS: 20.0 mL
LCSD: 20.0 mL

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Chloromethane	3.0	4.0	75.0%	2.9	4.0	72.5%	3.4%
Bromomethane	3.8	4.0	95.0%	3.8	4.0	95.0%	0.0%
Vinyl Chloride	3.3	4.0	82.5%	3.1	4.0	77.5%	6.2%
Chloroethane	3.2	4.0	80.0%	3.2	4.0	80.0%	0.0%
Methylene Chloride	3.6	4.0	90.0%	3.5	4.0	87.5%	2.8%
Acetone	17.2	20.0	86.0%	15.4	20.0	77.0%	11.0%
Carbon Disulfide	4.2	4.0	105%	4.2	4.0	105%	0.0%
1,1-Dichloroethene	3.7	4.0	92.5%	3.6	4.0	90.0%	2.7%
1,1-Dichloroethane	3.8	4.0	95.0%	3.8	4.0	95.0%	0.0%
trans-1,2-Dichloroethene	3.7	4.0	92.5%	3.8	4.0	95.0%	2.7%
cis-1,2-Dichloroethene	3.8	4.0	95.0%	3.4	4.0	85.0%	11.1%
Chloroform	3.7	4.0	92.5%	3.7	4.0	92.5%	0.0%
1,2-Dichloroethane	4.2	4.0	105%	4.4	4.0	110%	4.7%
2-Butanone	15.7	20.0	78.5%	15.1	20.0	75.5%	3.9%
1,1,1-Trichloroethane	3.8	4.0	95.0%	3.8	4.0	95.0%	0.0%
Carbon Tetrachloride	4.0	4.0	100%	4.1	4.0	102%	2.5%
Vinyl Acetate	3.6	4.0	90.0%	3.3	4.0	82.5%	8.7%
Bromodichloromethane	4.0	4.0	100%	3.9	4.0	97.5%	2.5%
1,2-Dichloropropane	3.9	4.0	97.5%	4.0	4.0	100%	2.5%
cis-1,3-Dichloropropene	4.0	4.0	100%	4.1	4.0	102%	2.5%
Trichloroethene	4.0	4.0	100%	4.0	4.0	100%	0.0%
Dibromochloromethane	3.6	4.0	90.0%	3.5	4.0	87.5%	2.8%
1,1,2-Trichloroethane	4.3	4.0	108%	4.0	4.0	100%	7.2%
Benzene	3.9	4.0	97.5%	4.1	4.0	102%	5.0%
trans-1,3-Dichloropropene	3.9	4.0	97.5%	3.9	4.0	97.5%	0.0%
2-Chloroethylvinylether	3.0	4.0	75.0%	3.0	4.0	75.0%	0.0%
Bromoform	3.6	4.0	90.0%	3.6	4.0	90.0%	0.0%
4-Methyl-2-Pentanone (MIBK)	17.7	20.0	88.5%	17.0	20.0	85.0%	4.0%
2-Hexanone	18.6	20.0	93.0%	17.3	20.0	86.5%	7.2%
Tetrachloroethene	4.6	4.0	115%	4.4	4.0	110%	4.4%
1,1,2,2-Tetrachloroethane	3.4	4.0	85.0%	3.2	4.0	80.0%	6.1%
Toluene	4.2	4.0	105%	4.3	4.0	108%	2.4%
Chlorobenzene	4.0	4.0	100%	3.9	4.0	97.5%	2.5%
Ethylbenzene	4.2	4.0	105%	4.0	4.0	100%	4.9%
Styrene	4.3	4.0	108%	4.2	4.0	105%	2.4%
Trichlorofluoromethane	3.8	4.0	95.0%	3.7	4.0	92.5%	2.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: LCS-121206**
 LAB CONTROL SAMPLE

Lab Sample ID: LCS-121206 QC Report No: KI11-URS Corp
LIMS ID: 06-24545 Project: LAUREL STATION
Matrix: Water 33759339

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
1,1,2-Trichloro-1,2,2-trifluoroetha	3.9	4.0	97.5%	4.0	4.0	100%	2.5%
m,p-Xylene	9.1	8.0	114%	8.9	8.0	111%	2.2%
o-Xylene	4.2	4.0	105%	4.2	4.0	105%	0.0%
1,2-Dichlorobenzene	4.1	4.0	102%	3.9	4.0	97.5%	5.0%
1,3-Dichlorobenzene	4.2	4.0	105%	4.0	4.0	100%	4.9%
1,4-Dichlorobenzene	4.1	4.0	102%	3.8	4.0	95.0%	7.6%
Acrolein	13.6	20.0	68.0%	13.8	20.0	69.0%	1.5%
Methyl Iodide	4.7	4.0	118%	4.5	4.0	112%	4.3%
Bromoethane	4.1	4.0	102%	4.0	4.0	100%	2.5%
Acrylonitrile	3.4	4.0	85.0%	3.2	4.0	80.0%	6.1%
1,1-Dichloropropene	3.8	4.0	95.0%	4.0	4.0	100%	5.1%
Dibromomethane	4.2	4.0	105%	4.5	4.0	112%	6.9%
1,1,1,2-Tetrachloroethane	4.0	4.0	100%	3.8	4.0	95.0%	5.1%
1,2-Dibromo-3-chloropropane	2.9	4.0	72.5%	2.8	4.0	70.0%	3.5%
1,2,3-Trichloropropane	3.0	4.0	75.0%	3.2	4.0	80.0%	6.5%
trans-1,4-Dichloro-2-butene	4.2	4.0	105%	3.6	4.0	90.0%	15.4%
1,3,5-Trimethylbenzene	4.0	4.0	100%	3.6	4.0	90.0%	10.5%
1,2,4-Trimethylbenzene	4.0	4.0	100%	3.8	4.0	95.0%	5.1%
Hexachlorobutadiene	4.5	4.0	112%	4.3	4.0	108%	4.5%
Ethylene Dibromide	3.7	4.0	92.5%	4.0	4.0	100%	7.8%
Bromochloromethane	3.7	4.0	92.5%	3.6	4.0	90.0%	2.7%
2,2-Dichloropropane	4.3	4.0	108%	4.2	4.0	105%	2.4%
1,3-Dichloropropane	3.8	4.0	95.0%	3.5	4.0	87.5%	8.2%
Isopropylbenzene	3.9	4.0	97.5%	3.8	4.0	95.0%	2.6%
n-Propylbenzene	4.2	4.0	105%	3.9	4.0	97.5%	7.4%
Bromobenzene	4.4	4.0	110%	4.0	4.0	100%	9.5%
2-Chlorotoluene	4.0	4.0	100%	3.9	4.0	97.5%	2.5%
4-Chlorotoluene	3.9	4.0	97.5%	3.6	4.0	90.0%	8.0%
tert-Butylbenzene	4.0	4.0	100%	3.7	4.0	92.5%	7.8%
sec-Butylbenzene	4.2	4.0	105%	3.9	4.0	97.5%	7.4%
4-Isopropyltoluene	4.2	4.0	105%	3.8	4.0	95.0%	10.0%
n-Butylbenzene	4.2	4.0	105%	3.9	4.0	97.5%	7.4%
1,2,4-Trichlorobenzene	4.1	4.0	102%	3.8	4.0	95.0%	7.6%
Naphthalene	3.3	4.0	82.5%	3.1	4.0	77.5%	6.2%
1,2,3-Trichlorobenzene	4.1	4.0	102%	3.9	4.0	97.5%	5.0%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	101%	95.0%
d8-Toluene	98.0%	101%
Bromofluorobenzene	94.5%	84.8%
d4-1,2-Dichlorobenzene	103%	98.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TPHG by Method NWTPHG
Matrix: Water

Data Release Authorized: VTS
Reported: 12/13/06

QC Report No: KI11-URS Corp
Project: LAUREL STATION
Event: 33759339
Date Sampled: 12/07/06
Date Received: 12/09/06

ARI ID	Client ID	Analysis Date	DL	Range	Result
MB-121106	Method Blank	12/11/06	1.0	Gasoline	< 0.25 U
06-24541		VOA_PID		HC ID	---
				Trifluorotoluene	93.9%
				Bromobenzene	91.8%
KI11A	DW-1	12/11/06	1.0	Gasoline	< 0.25 U
06-24541		VOA_PID		HC ID	---
				Trifluorotoluene	96.4%
				Bromobenzene	95.7%
KI11B	DW-2	12/11/06	1.0	Gasoline	< 0.25 U
06-24542		VOA_PID		HC ID	---
				Trifluorotoluene	96.3%
				Bromobenzene	94.5%
KI11C	DW-3	12/11/06	1.0	Gasoline	< 0.25 U
06-24543		VOA_PID		HC ID	---
				Trifluorotoluene	96.3%
				Bromobenzene	94.9%
KI11D	DW-4	12/11/06	1.0	Gasoline	< 0.25 U
06-24544		VOA_PID		HC ID	---
				Trifluorotoluene	96.6%
				Bromobenzene	95.9%
KI11E	SW-2	12/11/06	1.0	Gasoline	< 0.25 U
06-24545		VOA_PID		HC ID	---
				Trifluorotoluene	96.7%
				Bromobenzene	93.6%
KI11F	DW-5	12/11/06	1.0	Gasoline	< 0.25 U
06-24546		VOA_PID		HC ID	---
				Trifluorotoluene	94.1%
				Bromobenzene	92.8%
KI11G	DUP	12/11/06	1.0	Gasoline	< 0.25 U
06-24547		VOA_PID		HC ID	---
				Trifluorotoluene	92.8%
				Bromobenzene	91.1%

Gasoline values reported in mg/L (ppm)

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

FORM I

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TPHG by Method NWTPHG
Page 1 of 1

Sample ID: SW-2
MATRIX SPIKE

Lab Sample ID: KI11E
LIMS ID: 06-24545
Matrix: Water
Data Release Authorized: VTS
Reported: 12/13/06

QC Report No: KI11-URS Corp
Project: LAUREL STATION
Event: 33759339
Date Sampled: 12/08/06
Date Received: 12/09/06

Date Analyzed MS: 12/11/06 19:26
MSD: 12/11/06 19:50
Instrument/Analyst MS: VOA_PID/PKC
MSD: VOA_PID/PKC

Purge Volume: 5.0 mL
Dilution Factor MS: 1.0 mL
MSD: 1.0 mL

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Gasoline Range Hydrocarbons	< 0.25 U	0.84	1.00	84.0%	0.87	1.00	87.0%	3.5%

Reported in mg/L (ppm)

RPD calculated using sample concentrations per SW846.

TPHG Surrogate Recovery

	MS	MSD
Trifluorotoluene	96.7%	97.2%
Bromobenzene	94.6%	95.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TPHG by Method NWTPHG
Page 1 of 1

Sample ID: LCS-121106
LAB CONTROL SAMPLE

Lab Sample ID: LCS-121106
LIMS ID: 06-24541
Matrix: Water
Data Release Authorized: VTS
Reported: 12/13/06

QC Report No: KI11-URS Corp
Project: LAUREL STATION
Event: 33759339
Date Sampled: NA
Date Received: NA

Date Analyzed LCS: 12/11/06 13:23
LCSD: 12/11/06 13:48
Instrument/Analyst LCS: VOA_PID/PKC
LCSD: VOA_PID/PKC

Purge Volume: 5.0 mL
Dilution Factor LCS: 1.0 mL
LCSD: 1.0 mL

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Gasoline Range Hydrocarbons	0.94	1.00	94.0%	0.89	1.00	89.0%	5.5%

Reported in mg/L (ppm)

RPD calculated using sample concentrations per SW846.

TPHG Surrogate Recovery

	LCS	LCSD
Trifluorotoluene	98.1%	98.4%
Bromobenzene	95.3%	98.1%

PC
12/12/06

Analytical Resources Inc.
BETX/Gas Quantitation Report

Data file 1: /chem3/pid3.i/20061211-2.b/1211a004.d
Data file 2: /chem3/pid3.i/20061211-1.b/1211a004.d
Method: /chem3/pid3.i/20061211-1.b/PIDB.m
Instrument: pid3.i
Gas Ical Date: 06-DEC-2006
BETX Ical Date: 06-DEC-2006

ARI ID: lcs121106w1
Client ID:
Injection Date: 11-DEC-2006 13:23
Matrix: WATER
Dilution Factor: 1.000

==========

FID Surrogates

RT	Shift	Height	Area	%Rec	Compound
5.625	-0.002	10631	149913	98.1	TFT(Surr)
12.100	0.001	5113	62703	95.3	BB(Surr)

PETROLEUM HYDROCARBONS (FID)

Range	Total Area*	Amount
WAGas (Tol-C12)	1356683	0.927
8015B (2MP-TMB)	2870007	0.938
AKGas (nC6-nC10)	2034187	0.916
NWGas (Tol-Nap)	1459594	0.944

* Surrogate areas are subtracted from Total Area

==========

PID Surrogates

RT	Shift	Response	%Rec	Compound
5.625	-0.002	43748	92.3	TFT(Surr)
12.099	0.001	69696	91.5	BB(Surr)

AROMATICS (PID)

RT	Shift	Response	Amount	Compound
5.052	-0.001	19508	7.14	Benzene
7.222	0.000	159742	61.21	Toluene
9.624	0.000	25114	11.06	Ethylbenzene
9.763	0.003	101966	42.04	M/P-Xylene
10.558	0.000	30681	14.60	O-Xylene
3.348	-0.005	92531	113.60	MTBE

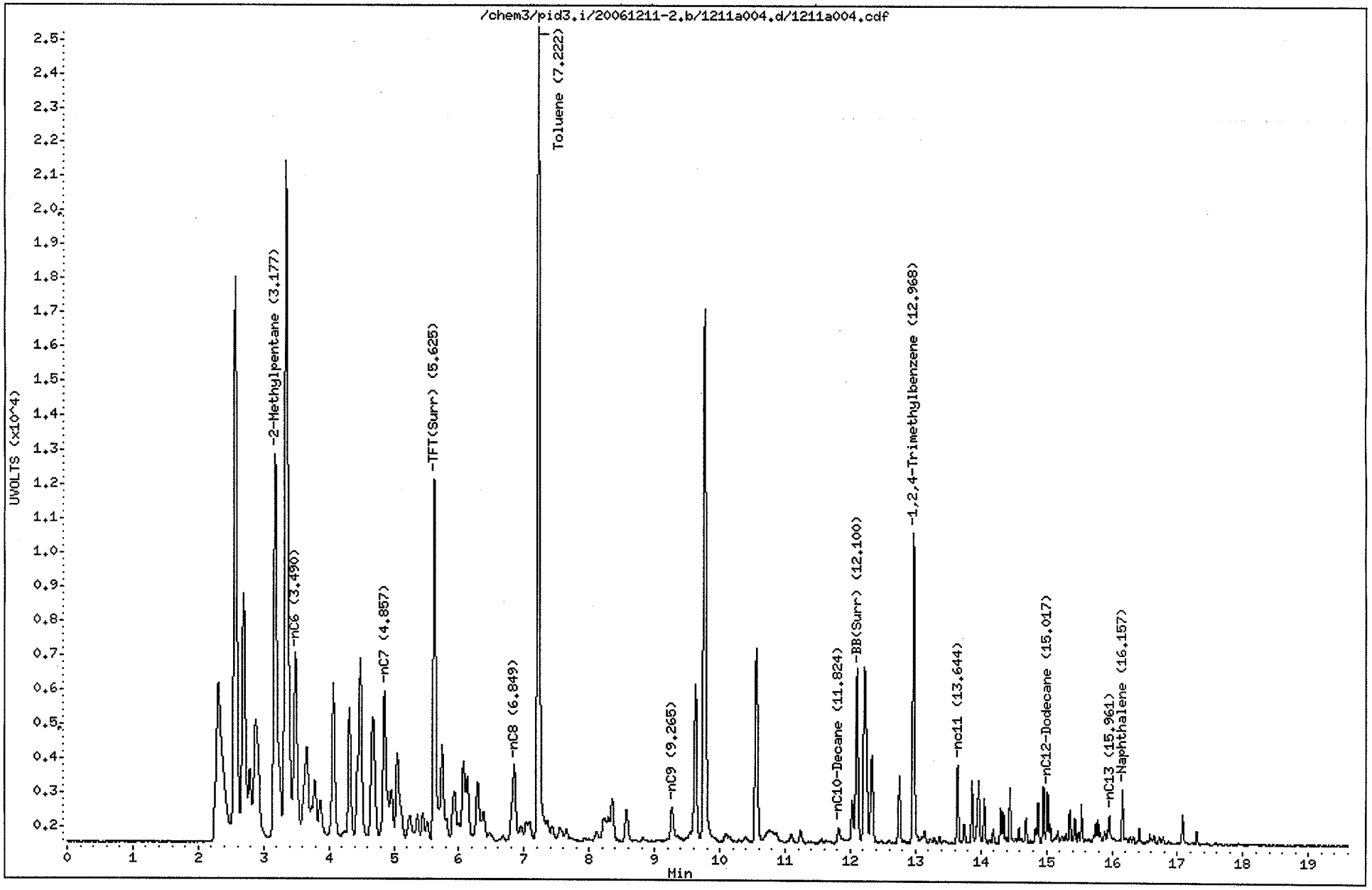
A Indicates Peak Area was used for quantitation instead of Height
N Indicates peak peak was manually integrated

Data File: /chem3/pid3.i/20061211-2.b/1211a004.d
Date : 11-DEC-2006 13:23
Client ID:
Sample Info: lcs121106w1

Instrument: pid3.i

Operator: PC
Column diameter: 0.18

Column phase: RTX 502-2 FID



PC
12/12/06

Analytical Resources Inc.
BETX/Gas,Quantitation Report

Data file 1: /chem3/pid3.i/20061211-2.b/1211a005.d
Data file 2: /chem3/pid3.i/20061211-1.b/1211a005.d
Method: /chem3/pid3.i/20061211-1.b/PIDB.m
Instrument: pid3.i
Gas Ical Date: 06-DEC-2006
BETX Ical Date: 06-DEC-2006

ARI ID: lcsd121106w1
Client ID:
Injection Date: 11-DEC-2006 13:48
Matrix: WATER
Dilution Factor: 1.000

FID Surrogates

RT	Shift	Height	Area	%Rec	Compound
5.625	-0.002	10663	150874	98.4	TFT(Surr)
12.100	0.001	5262	63368	98.1	BB(Surr)

PETROLEUM HYDROCARBONS (FID)

Range	Total Area*	Amount
WAGas (Tol-C12)	1301590	0.890
8015B (2MP-TMB)	2801311	0.916
AKGas (nC6-nC10)	1985162	0.894
NWGas (Tol-Nap)	1373812	0.888

* Surrogate areas are subtracted from Total Area

PID Surrogates

RT	Shift	Response	%Rec	Compound
5.625	-0.002	43457	91.7	TFT(Surr)
12.100	0.001	71583	94.0	BB(Surr)

AROMATICS (PID)

RT	Shift	Response	Amount	Compound
5.054	0.001	19072	6.98	Benzene
7.222	-0.001	159062	60.95	Toluene
9.624	0.000	25147	11.08	Ethylbenzene
9.762	0.002	102523	42.27	M/P-Xylene
10.557	0.000	30899	14.70	O-Xylene
3.350	-0.003	88300	108.41	MTBE

A Indicates Peak Area was used for quantitation instead of Height
N Indicates peak peak was manually integrated

Data File: /chem3/pid3.i/20061211-2.b/1211a005.d

Date : 11-DEC-2006 13:48

Client ID:

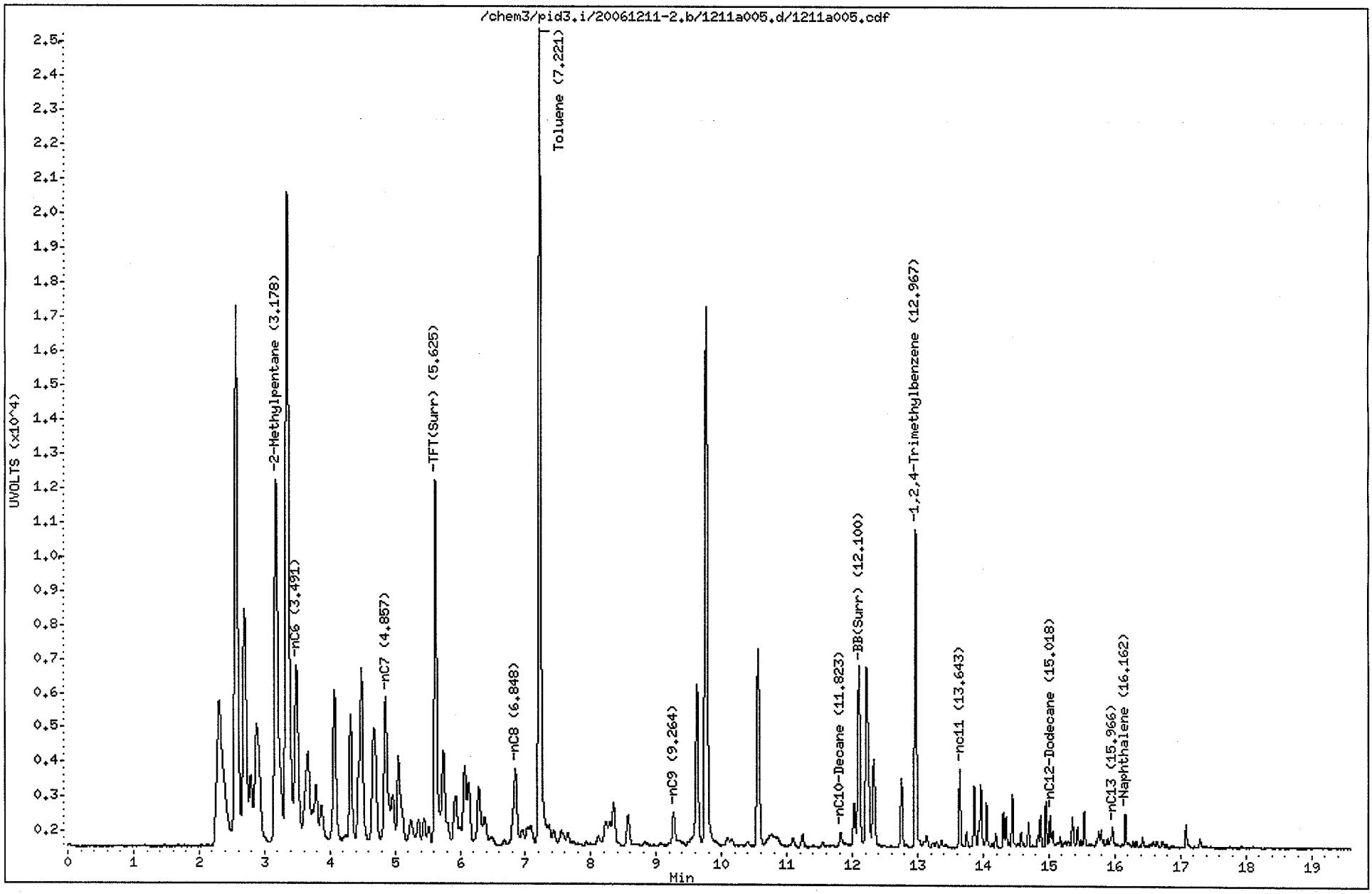
Sample Info: lcsd121106w1

Column phase: RTX 502-2 FID

Instrument: pid3.i

Operator: PC

Column diameter: 0.18



RC
12/12/06

Analytical Resources Inc.
BETX/Gas Quantitation Report

Data file 1: /chem3/pid3.i/20061211-2.b/1211a006.d
Data file 2: /chem3/pid3.i/20061211-1.b/1211a006.d
Method: /chem3/pid3.i/20061211-1.b/PIDB.m
Instrument: pid3.i
Gas Ical Date: 06-DEC-2006
BETX Ical Date: 06-DEC-2006

ARI ID: mb121106w1
Client ID:
Injection Date: 11-DEC-2006 14:13
Matrix: WATER
Dilution Factor: 1.000

==========

FID Surrogates

RT	Shift	Height	Area	%Rec	Compound
5.621	-0.005	10176	134735	93.9	TFT(Surr)
12.098	0.000	4922	57450	91.8	BB(Surr)

PETROLEUM HYDROCARBONS (FID)

Range	Total Area*	Amount
WAGas (Tol-C12)	10572	0.007
8015B (2MP-TMB)	6742	0.002
AKGas (nC6-nC10)	0	0.000
NWGas (Tol-Nap)	20933	0.014

* Surrogate areas are subtracted from Total Area

==========

PID Surrogates

RT	Shift	Response	%Rec	Compound
5.622	-0.005	41038	86.6	TFT(Surr)
12.098	0.000	66530	87.4	BB(Surr)

AROMATICS (PID)

RT	Shift	Response	Amount	Compound
ND	---	---	---	Benzene
ND	---	---	---	Toluene
ND	---	---	---	Ethylbenzene
ND	---	---	---	M/P-Xylene
ND	---	---	---	O-Xylene
ND	---	---	---	MTBE

A Indicates Peak Area was used for quantitation instead of Height
N Indicates peak peak was manually integrated

Data File: /chem3/pid3.i/20061211-2.b/1211a006.d

Date : 11-DEC-2006 14:13

Client ID:

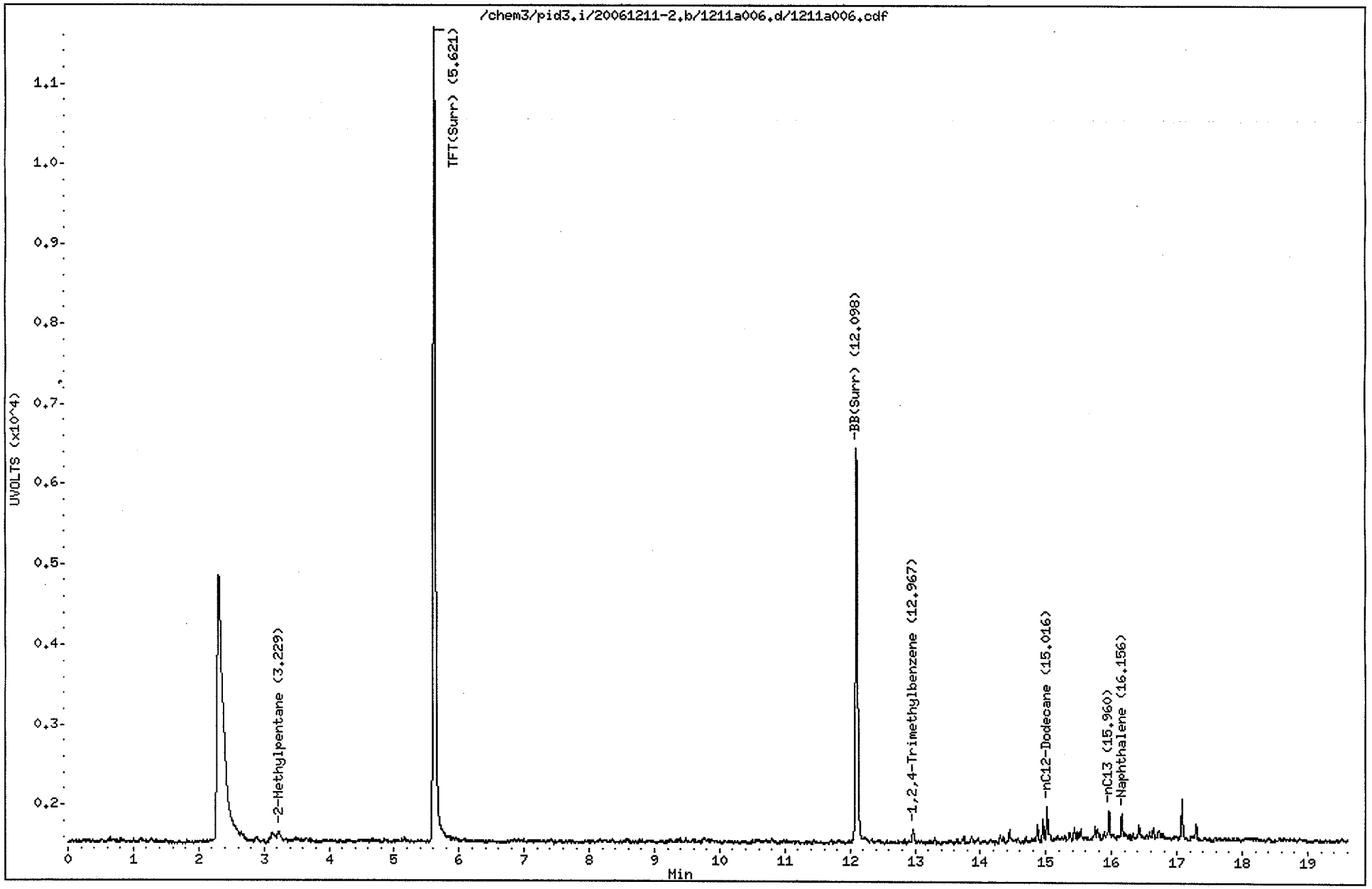
Sample Info: mb121106w1

Instrument: pid3.i

Operator: PC

Column phase: RTX 502-2 FID

Column diameter: 0.18



PC
12/11/06

Analytical Resources Inc.
BETX/Gas Quantitation Report

Data file 1: /chem3/pid3.i/20061211-2.b/1211a009.d
Data file 2: /chem3/pid3.i/20061211-1.b/1211a009.d
Method: /chem3/pid3.i/20061211-1.b/PIDB.m
Instrument: pid3.i
Gas Ical Date: 06-DEC-2006
BETX Ical Date: 06-DEC-2006

ARI ID: kl11a
Client ID: DW-1
Injection Date: 11-DEC-2006 16:07
Matrix: WATER
Dilution Factor: 1.000

FID Surrogates

RT	Shift	Height	Area	%Rec	Compound
5.623	-0.004	10456	139832	96.4	TFT(Surr)
12.099	0.000	5136	59647	95.7	BB(Surr)

PETROLEUM HYDROCARBONS (FID)

Range	Total Area*	Amount
WAGas (Tol-C12)	36975	0.025
8015B (2MP-TMB)	12486	0.004
AKGas (nC6-nC10)	6118	0.003
NWGas (Tol-Nap)	133019	0.086

* Surrogate areas are subtracted from Total Area

PID Surrogates

RT	Shift	Response	%Rec	Compound
5.623	-0.003	42294	89.3	TFT(Surr)
12.099	0.000	69441	91.2	BB(Surr)

AROMATICS (PID)

RT	Shift	Response	Amount	Compound
ND	---	---	---	Benzene
ND	---	---	---	Toluene
ND	---	---	---	Ethylbenzene
9.760	0.000	1478	0.61	M/P-Xylene
ND	---	---	---	O-Xylene
ND	---	---	---	MTBE

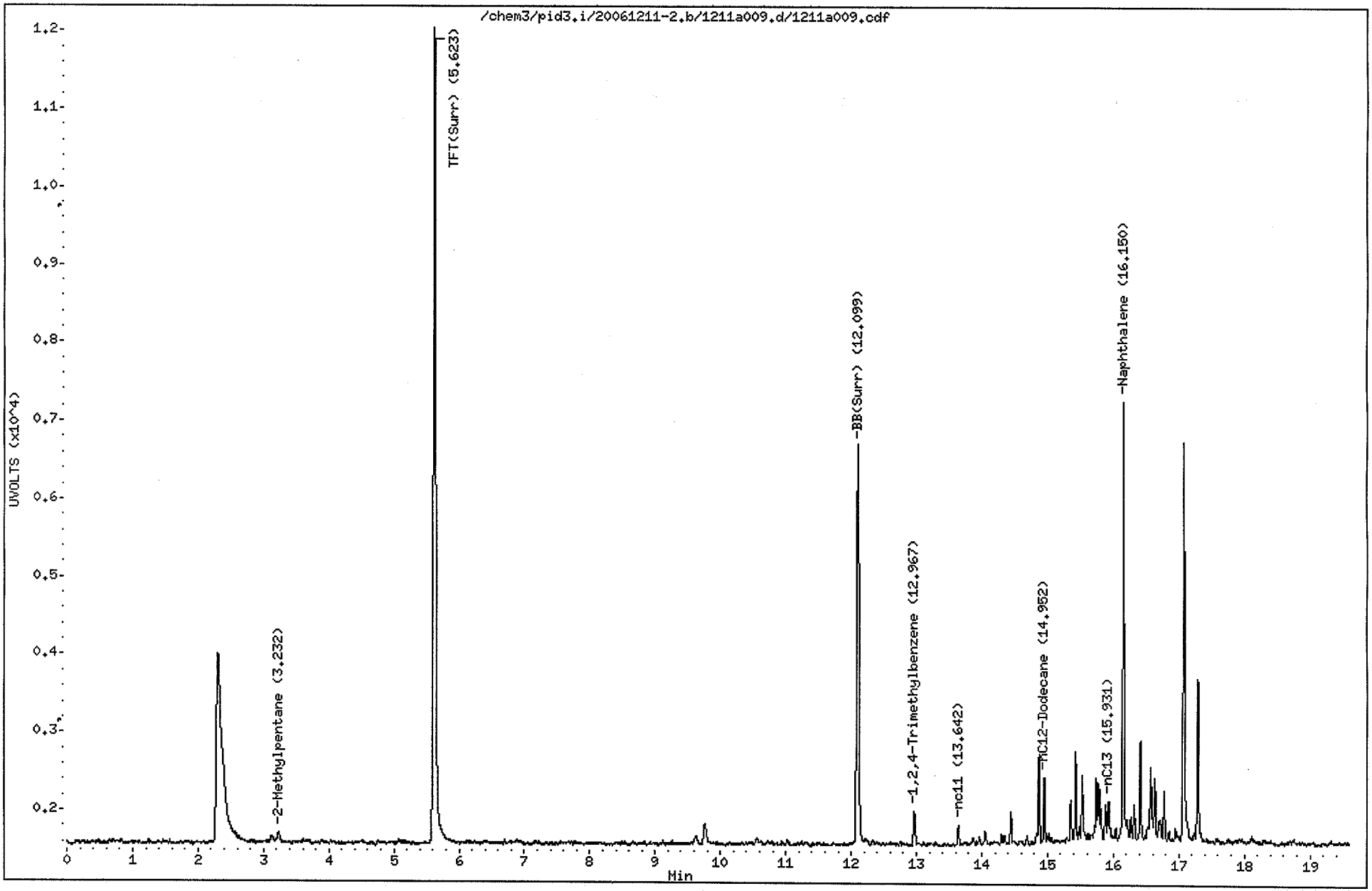
A Indicates Peak Area was used for quantitation instead of Height
N Indicates peak peak was manually integrated

Data File: /chem3/pid3.i/20061211-2.b/1211a009.d
Date : 11-DEC-2006 16:07
Client ID: DW-1
Sample Info: ki11a

Instrument: pid3.i

Operator: PC
Column diameter: 0.18

Column phase: RTX 502-2 FID



PC
12/12/06

Analytical Resources Inc.
BETX/Gas Quantitation Report

Data file 1: /chem3/pid3.i/20061211-2.b/1211a010.d
Data file 2: /chem3/pid3.i/20061211-1.b/1211a010.d
Method: /chem3/pid3.i/20061211-1.b/PIDB.m
Instrument: pid3.i
Gas Ical Date: 06-DEC-2006
BETX Ical Date: 06-DEC-2006

ARI ID: ki11b
Client ID: DW-2
Injection Date: 11-DEC-2006 16:32
Matrix: WATER
Dilution Factor: 1.000

==========

FID Surrogates

RT	Shift	Height	Area	%Rec	Compound
5.622	-0.004	10444	140182	96.3	TFT(Surr)
12.098	0.000	5072	59994	94.5	BB(Surr)

PETROLEUM HYDROCARBONS (FID)

Range	Total Area*	Amount
WAGas (Tol-C12)	2309	0.002
8015B (2MP-TMB)	2	0.000
AKGas (nC6-nC10)	1	0.000
NWGas (Tol-Nap)	14735	0.010

* Surrogate areas are subtracted from Total Area

==========

PID Surrogates

RT	Shift	Response	%Rec	Compound
5.623	-0.004	42337	89.4	TFT(Surr)
12.099	0.000	68940	90.5	BB(Surr)

AROMATICS (PID)

RT	Shift	Response	Amount	Compound
ND	---	---	---	Benzene
ND	---	---	---	Toluene
ND	---	---	---	Ethylbenzene
ND	---	---	---	M/P-Xylene
ND	---	---	---	O-Xylene
ND	---	---	---	MTBE

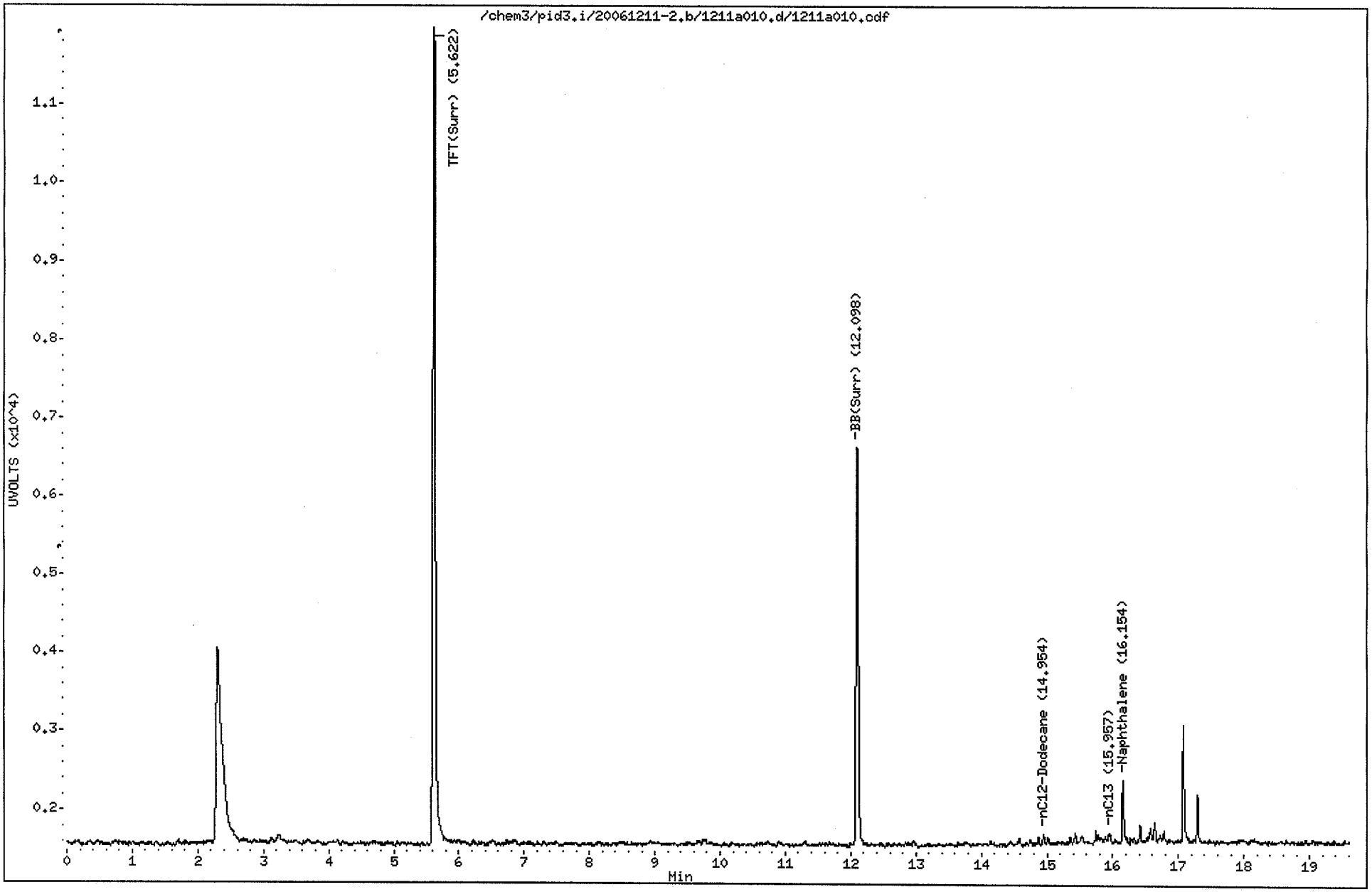
A Indicates Peak Area was used for quantitation instead of Height
N Indicates peak peak was manually integrated

Data File: /chem3/pid3.i/20061211-2.b/1211a010.d
Date : 11-DEC-2006 16:32
Client ID: DW-2
Sample Info: ki11b

Instrument: pid3.i

Operator: PC
Column diameter: 0.18

Column phase: RTX 502-2 FID



RC
12/12/06

Analytical Resources Inc.
BETX/Gas Quantitation Report

Data file 1: /chem3/pid3.i/20061211-2.b/1211a011.d
Data file 2: /chem3/pid3.i/20061211-1.b/1211a011.d
Method: /chem3/pid3.i/20061211-1.b/PIDB.m
Instrument: pid3.i
Gas Ical Date: 06-DEC-2006
BETX Ical Date: 06-DEC-2006

ARI ID: ki11c
Client ID: DW-3
Injection Date: 11-DEC-2006 16:58
Matrix: WATER
Dilution Factor: 1.000

==========

FID Surrogates

RT	Shift	Height	Area	%Rec	Compound
5.620	-0.007	10444	137744	96.3	TFT(Surr)
12.098	-0.001	5090	59552	94.9	BB(Surr)

PETROLEUM HYDROCARBONS (FID)

Range	Total Area*	Amount
WAGas (Tol-C12)	1	0.000
8015B (2MP-TMB)	2574	0.001
AKGas (nC6-nC10)	0	0.000
NWGas (Tol-Nap)	1593	0.001

* Surrogate areas are subtracted from Total Area

==========

PID Surrogates

RT	Shift	Response	%Rec	Compound
5.620	-0.006	42213	89.1	TFT(Surr)
12.098	-0.001	69086	90.7	BB(Surr)

AROMATICS (PID)

RT	Shift	Response	Amount	Compound
ND	---	---	---	Benzene
ND	---	---	---	Toluene
ND	---	---	---	Ethylbenzene
ND	---	---	---	M/P-Xylene
ND	---	---	---	O-Xylene
ND	---	---	---	MTBE

A Indicates Peak Area was used for quantitation instead of Height
N Indicates peak peak was manually integrated

Data File: /chem3/pid3.i/20061211-2.b/1211a011.d

Date : 11-DEC-2006 16:58

Client ID: DW-3

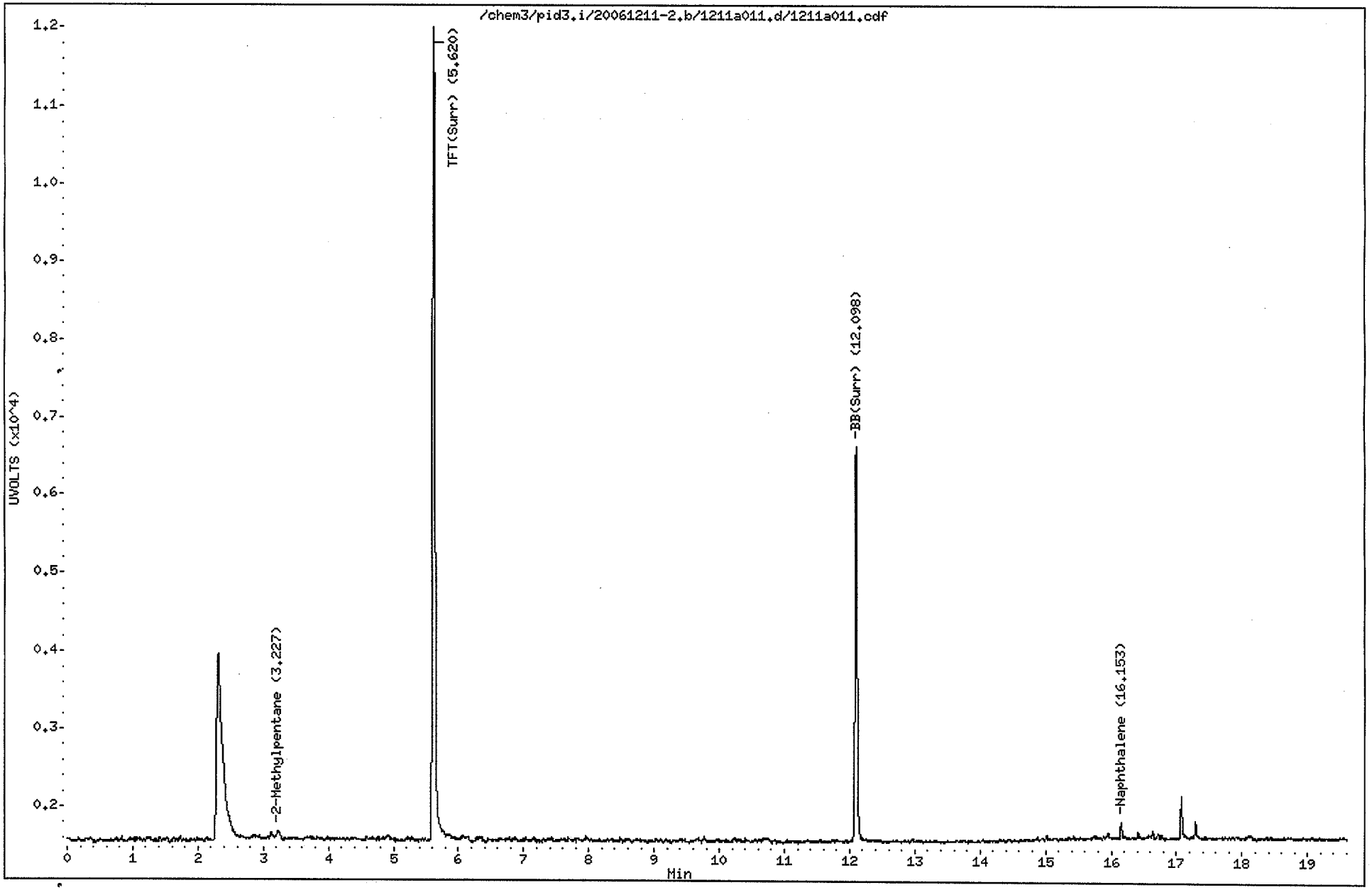
Sample Info: ki11c

Instrument: pid3.i

Operator: PC

Column phase: RTX 502-2 FID

Column diameter: 0.18



PC
12/11/06

Analytical Resources Inc.
BETX/Gas Quantitation Report

Data file 1: /chem3/pid3.i/20061211-2.b/1211a012.d
Data file 2: /chem3/pid3.i/20061211-1.b/1211a012.d
Method: /chem3/pid3.i/20061211-1.b/PIDB.m
Instrument: pid3.i
Gas Ical Date: 06-DEC-2006
BETX Ical Date: 06-DEC-2006

ARI ID: ki11d
Client ID: DW-4
Injection Date: 11-DEC-2006 17:23
Matrix: WATER
Dilution Factor: 1.000

==========

FID Surrogates

RT	Shift	Height	Area	%Rec	Compound
5.617	-0.010	10470	136338	96.6	TFT(Surr)
12.097	-0.001	5145	60328	95.9	BB(Surr)

PETROLEUM HYDROCARBONS (FID)

Range	Total Area*	Amount
WAGas (Tol-C12)	1	0.000
8015B (2MP-TMB)	1	0.000
AKGas (nC6-nC10)	0	0.000
NWGas (Tol-Nap)	1507	0.001

* Surrogate areas are subtracted from Total Area

==========

PID Surrogates

RT	Shift	Response	%Rec	Compound
5.617	-0.009	41551	87.7	TFT(Surr)
12.097	-0.001	68553	90.0	BB(Surr)

AROMATICS (PID)

RT	Shift	Response	Amount	Compound
ND	---	---	---	Benzene
ND	---	---	---	Toluene
ND	---	---	---	Ethylbenzene
ND	---	---	---	M/P-Xylene
ND	---	---	---	O-Xylene
ND	---	---	---	MTBE

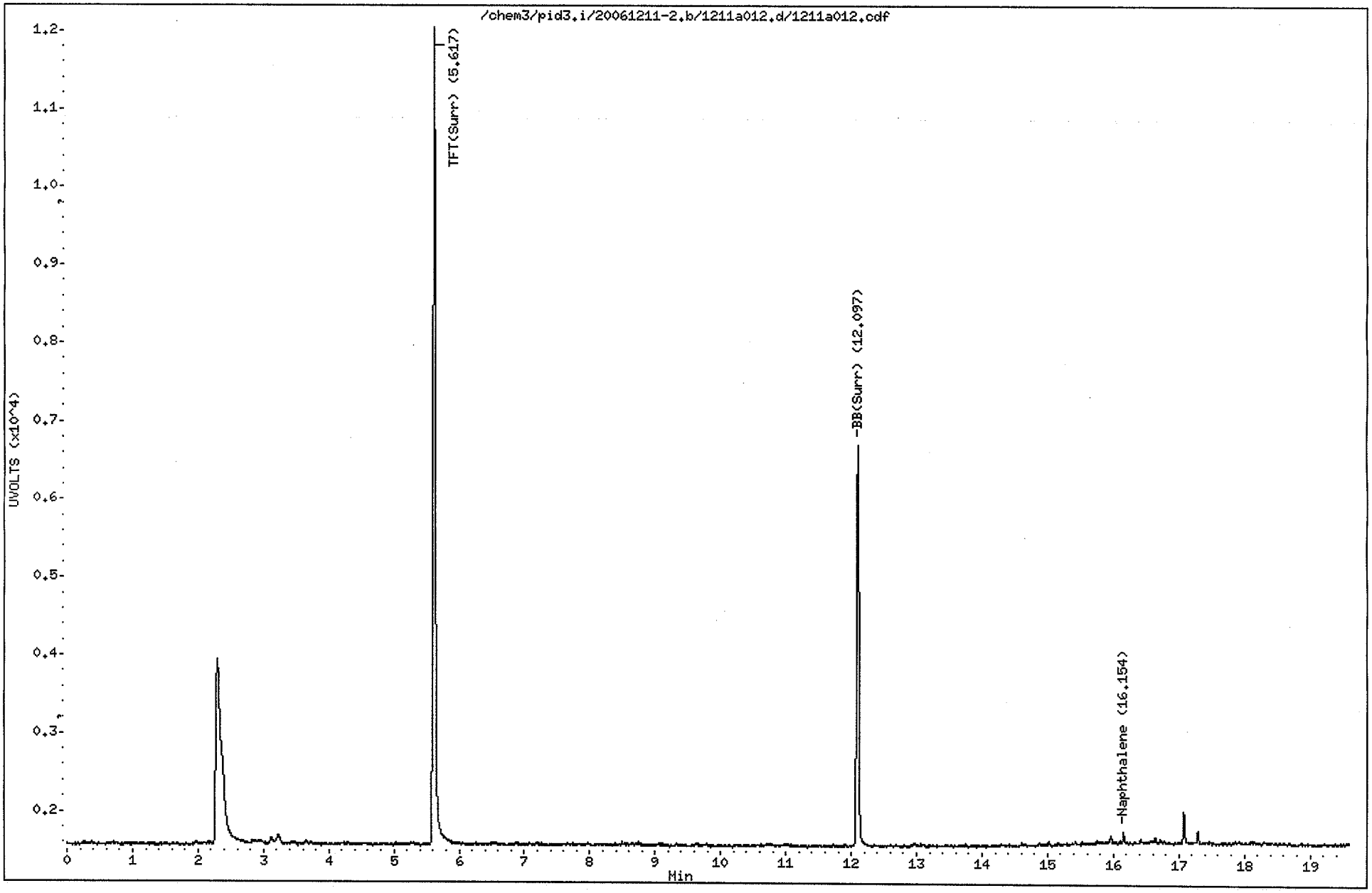
A Indicates Peak Area was used for quantitation instead of Height
N Indicates peak peak was manually integrated

Data File: /chem3/pid3.i/20061211-2.b/1211a012.d
Date : 11-DEC-2006 17:23
Client ID: DW-4
Sample Info: ki11d

Instrument: pid3.i

Operator: PC
Column diameter: 0.18

Column phase: RTX 502-2 FID



kc
12/12/06

Analytical Resources Inc.
BETX/Gas Quantitation Report

Data file 1: /chem3/pid3.i/20061211-2.b/1211a016.d
Data file 2: /chem3/pid3.i/20061211-1.b/1211a016.d
Method: /chem3/pid3.i/20061211-1.b/PIDB.m
Instrument: pid3.i
Gas Ical Date: 06-DEC-2006
BETX Ical Date: 06-DEC-2006

ARI ID: ki11e
Client ID: SW-2
Injection Date: 11-DEC-2006 19:01
Matrix: WATER
Dilution Factor: 1.000

FID Surrogates

RT	Shift	Height	Area	%Rec	Compound
5.616	-0.011	10488	137684	96.7	TFT(Surr)
12.098	-0.001	5023	57556	93.6	BB(Surr)

PETROLEUM HYDROCARBONS (FID)

Range	Total Area*	Amount
WAGas (Tol-C12)	26162	0.018
8015B (2MP-TMB)	3545	0.001
AKGas (nC6-nC10)	0	0.000
NWGas (Tol-Nap)	45270	0.029

* Surrogate areas are subtracted from Total Area

PID Surrogates

RT	Shift	Response	%Rec	Compound
5.616	-0.010	40372	85.2	TFT(Surr)
12.098	-0.001	66198	86.9	BB(Surr)

AROMATICS (PID)

RT	Shift	Response	Amount	Compound
ND	---	---	---	Benzene
ND	---	---	---	Toluene
ND	---	---	---	Ethylbenzene
9.760	0.000	482	0.20	M/P-Xylene
ND	---	---	---	O-Xylene
ND	---	---	---	MTBE

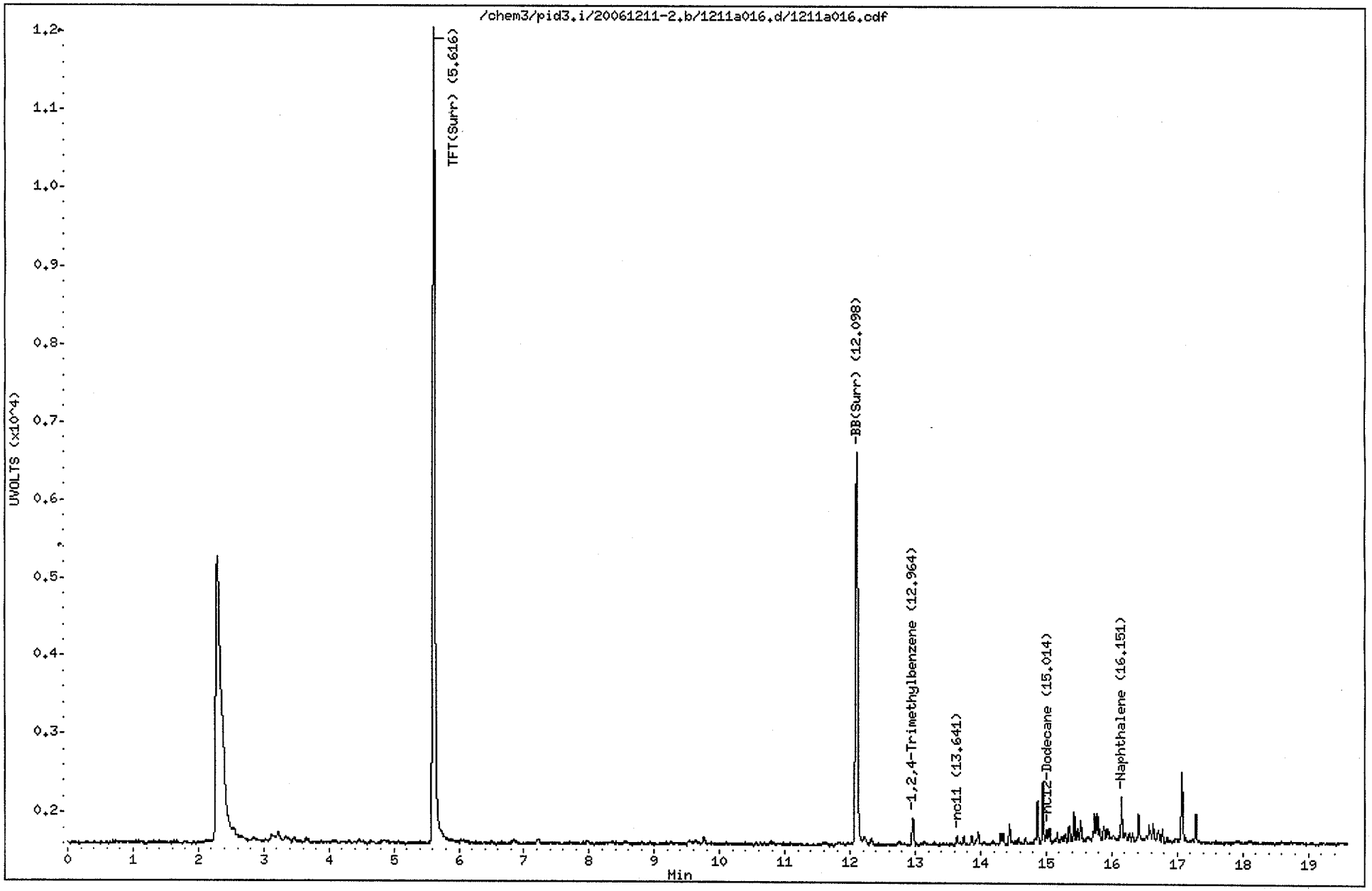
A Indicates Peak Area was used for quantitation instead of Height
N Indicates peak peak was manually integrated

Data File: /chem3/pid3.i/20061211-2.b/1211a016.d
Date : 11-DEC-2006 19:01
Client ID: SW-2
Sample Info: ki11e

Instrument: pid3.i

Operator: PC
Column diameter: 0.18

Column phase: RTX 502-2 FID



RC
12/12/06

Analytical Resources Inc.
BETX/Gas Quantitation Report

Data file 1: /chem3/pid3.i/20061211-2.b/1211a019.d
Data file 2: /chem3/pid3.i/20061211-1.b/1211a019.d
Method: /chem3/pid3.i/20061211-1.b/PIDB.m
Instrument: pid3.i
Gas Ical Date: 06-DEC-2006
BETX Ical Date: 06-DEC-2006

ARI ID: ki11f
Client ID: DW-5
Injection Date: 11-DEC-2006 20:14
Matrix: WATER
Dilution Factor: 1.000

==========

FID Surrogates

RT	Shift	Height	Area	%Rec	Compound
5.616	-0.010	10205	136897	94.1	TFT(Surr)
12.098	-0.001	4978	56932	92.8	BB(Surr)

PETROLEUM HYDROCARBONS (FID)

Range	Total Area*	Amount
WAGas (Tol-C12)	8392	0.006
8015B (2MP-TMB)	4026	0.001
AKGas (nC6-nC10)	1	0.000
NWGas (Tol-Nap)	15227	0.010

* Surrogate areas are subtracted from Total Area

==========

PID Surrogates

RT	Shift	Response	%Rec	Compound
5.617	-0.010	39847	84.1	TFT(Surr)
12.098	-0.001	65933	86.6	BB(Surr)

AROMATICS (PID)

RT	Shift	Response	Amount	Compound
ND	---	---	---	Benzene
ND	---	---	---	Toluene
ND	---	---	---	Ethylbenzene
ND	---	---	---	M/P-Xylene
ND	---	---	---	O-Xylene
ND	---	---	---	MTBE

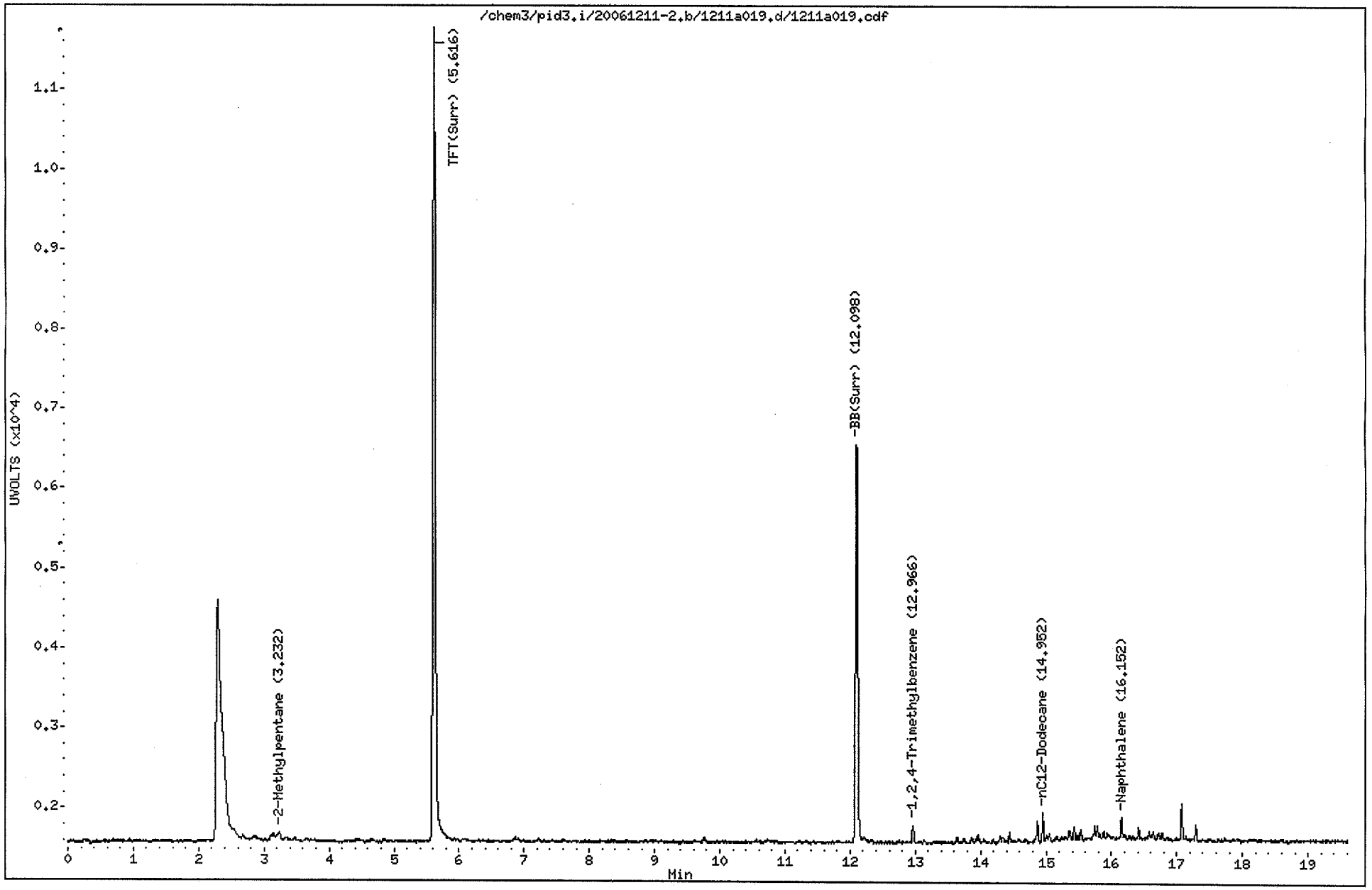
A Indicates Peak Area was used for quantitation instead of Height
N Indicates peak peak was manually integrated

Data File: /chem3/pid3.i/20061211-2.b/1211a019.d
Date : 11-DEC-2006 20:14
Client ID: DW-5
Sample Info: ki11f

Instrument: pid3.i

Operator: PC
Column diameter: 0.18

Column phase: RTX 502-2 FID



PC
12/12/06

Analytical Resources Inc.
BETX/Gas Quantitation Report

Data file 1: /chem3/pid3.i/20061211-2.b/1211a020.d
Data file 2: /chem3/pid3.i/20061211-1.b/1211a020.d
Method: /chem3/pid3.i/20061211-1.b/PIDB.m
Instrument: pid3.i
Gas Ical Date: 06-DEC-2006
BETX Ical Date: 06-DEC-2006

ARI ID: ki11g
Client ID: DUP
Injection Date: 11-DEC-2006 20:39
Matrix: WATER
Dilution Factor: 1.000

==========

FID Surrogates

RT	Shift	Height	Area	%Rec	Compound
5.616	-0.010	10055	133807	92.8	TFT(Surr)
12.098	-0.001	4886	56787	91.1	BB(Surr)

PETROLEUM HYDROCARBONS (FID)

Range	Total Area*	Amount
WAGas (Tol-C12)	0	0.000
8015B (2MP-TMB)	5289	0.002
AKGas (nC6-nC10)	3079	0.001
NWGas (Tol-Nap)	0	0.000

* Surrogate areas are subtracted from Total Area

==========

PID Surrogates

RT	Shift	Response	%Rec	Compound
5.617	-0.010	38993	82.3	TFT(Surr)
12.098	0.000	64662	84.9	BB(Surr)

AROMATICS (PID)

RT	Shift	Response	Amount	Compound
ND	---	---	---	Benzene
ND	---	---	---	Toluene
ND	---	---	---	Ethylbenzene
ND	---	---	---	M/P-Xylene
ND	---	---	---	O-Xylene
ND	---	---	---	MTBE

A Indicates Peak Area was used for quantitation instead of Height
N Indicates peak peak was manually integrated

Data File: /chem3/pid3.i/20061211-2.b/1211a020.d

Date : 11-DEC-2006 20:39

Client ID: DUP

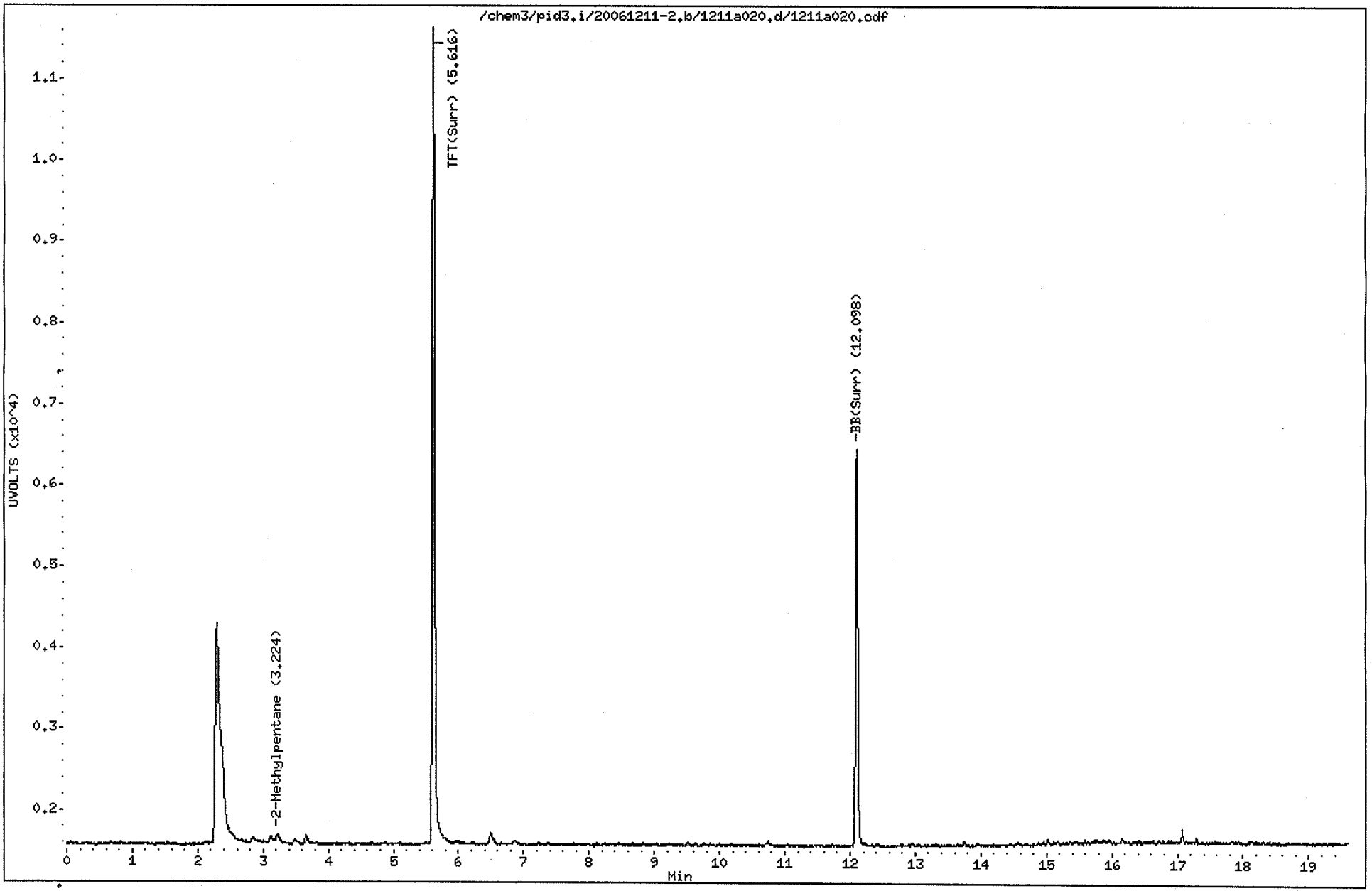
Sample Info: ki11g

Column phase: RTX 502-2 FID

Instrument: pid3.i

Operator: PC

Column diameter: 0.18



PC
12/12/06

Analytical Resources Inc.
BETX/Gas Quantitation Report

Data file 1: /chem3/pid3.i/20061211-2.b/1211a017.d
Data file 2: /chem3/pid3.i/20061211-1.b/1211a017.d
Method: /chem3/pid3.i/20061211-1.b/PIDB.m
Instrument: pid3.i
Gas Ical Date: 06-DEC-2006
BETX Ical Date: 06-DEC-2006

ARI ID: ki11ems
Client ID: SW-2 MS
Injection Date: 11-DEC-2006 19:26
Matrix: WATER
Dilution Factor: 1.000

==========

FID Surrogates

RT	Shift	Height	Area	%Rec	Compound
5.616	-0.011	10486	145021	96.7	TFT(Surr)
12.098	-0.001	5075	60304	94.6	BB(Surr)

PETROLEUM HYDROCARBONS (FID)

Range	Total Area*	Amount
WAGas (Tol-C12)	1248057	0.853
8015B (2MP-TMB)	2714254	0.887
AKGas (nC6-nC10)	1919820	0.864
NWGas (Tol-Nap)	1301501	0.841

* Surrogate areas are subtracted from Total Area

==========

PID Surrogates

RT	Shift	Response	%Rec	Compound
5.616	-0.011	41271	87.1	TFT(Surr)
12.097	-0.001	67309	88.4	BB(Surr)

AROMATICS (PID)

RT	Shift	Response	Amount	Compound
5.044	-0.008	19750	7.23	Benzene
7.215	-0.007	159549	61.14	Toluene
9.620	-0.003	24733	10.90	Ethylbenzene
9.759	-0.001	102860	42.41	M/P-Xylene
10.555	-0.003	30505	14.51	O-Xylene
3.336	-0.017	90529	111.14	MTBE

A Indicates Peak Area was used for quantitation instead of Height
N Indicates peak peak was manually integrated

Data File: /chem3/pid3.i/20061211-2.b/1211a017.d

Date : 11-DEC-2006 19:26

Client ID: SW-2 MS

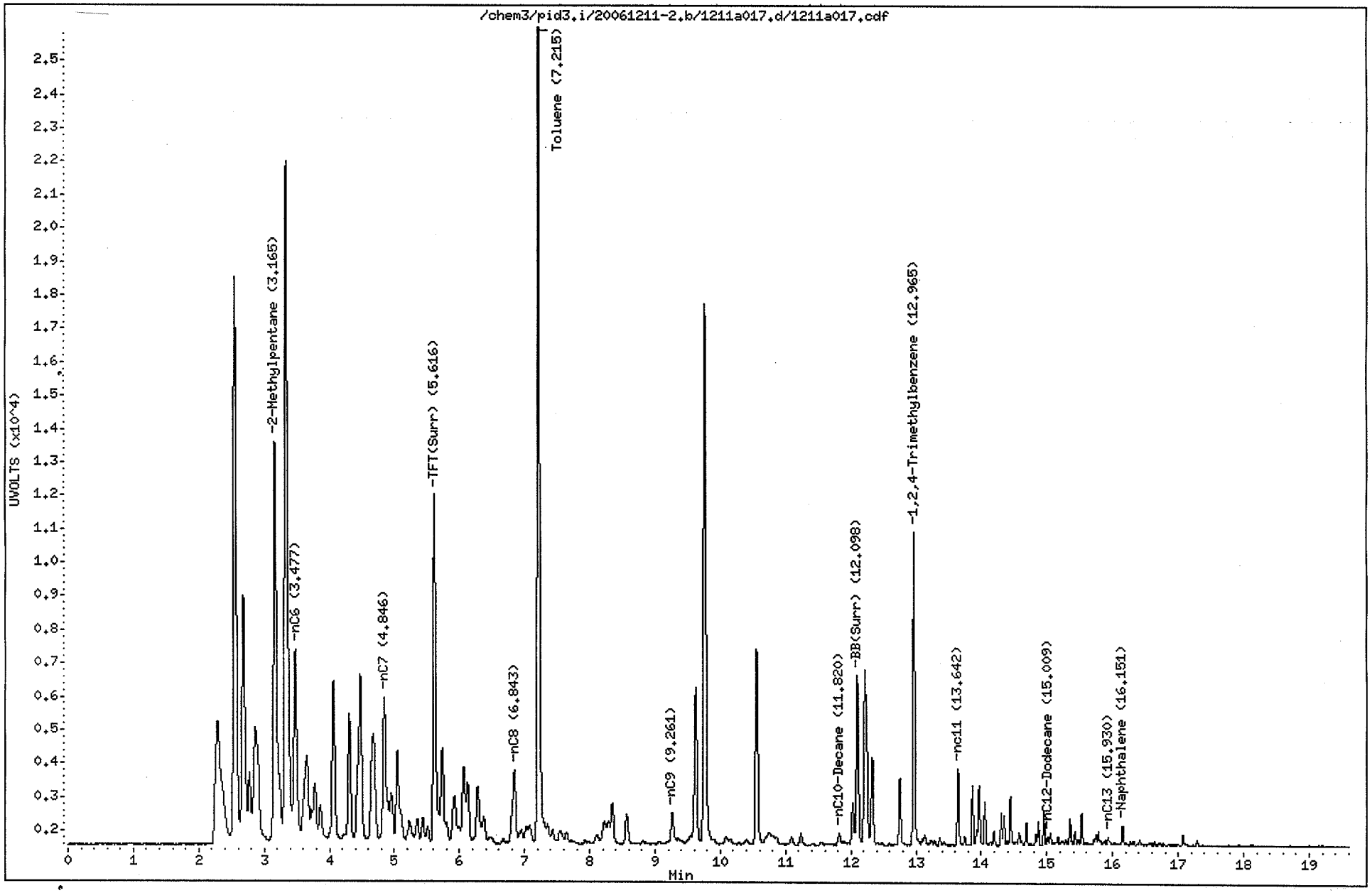
Sample Info: ki11ems

Column phase: RTX 502-2 FID

Instrument: pid3.i

Operator: PC

Column diameter: 0.18



RC
12/12/06

Analytical Resources Inc.
BETX/Gas Quantitation Report

Data file 1: /chem3/pid3.i/20061211-2.b/1211a018.d
Data file 2: /chem3/pid3.i/20061211-1.b/1211a018.d
Method: /chem3/pid3.i/20061211-1.b/PIDB.m
Instrument: pid3.i
Gas Ical Date: 06-DEC-2006
BETX Ical Date: 06-DEC-2006

ARI ID: ki11emsd
Client ID: SW-2 MSD
Injection Date: 11-DEC-2006 19:50
Matrix: WATER
Dilution Factor: 1.000

FID Surrogates

RT	Shift	Height	Area	%Rec	Compound
5.616	-0.010	10540	145448	97.2	TFT(Surr)
12.097	-0.001	5116	60832	95.4	BB(Surr)

PETROLEUM HYDROCARBONS (FID)

Range	Total Area*	Amount
WAGas (Tol-C12)	1280460	0.875
8015B (2MP-TMB)	2737554	0.895
AKGas (nC6-nC10)	1936364	0.872
NWGas (Tol-Nap)	1341253	0.867

* Surrogate areas are subtracted from Total Area

PID Surrogates

RT	Shift	Response	%Rec	Compound
5.616	-0.010	41326	87.2	TFT(Surr)
12.097	-0.001	67853	89.1	BB(Surr)

AROMATICS (PID)

RT	Shift	Response	Amount	Compound
5.045	-0.007	19843	7.26	Benzene
7.215	-0.007	160575	61.53	Toluene
9.620	-0.003	25279	11.14	Ethylbenzene
9.758	-0.001	104271	42.99	M/P-Xylene
10.554	-0.003	31093	14.79	O-Xylene
3.337	-0.016	91580	112.43	MTBE

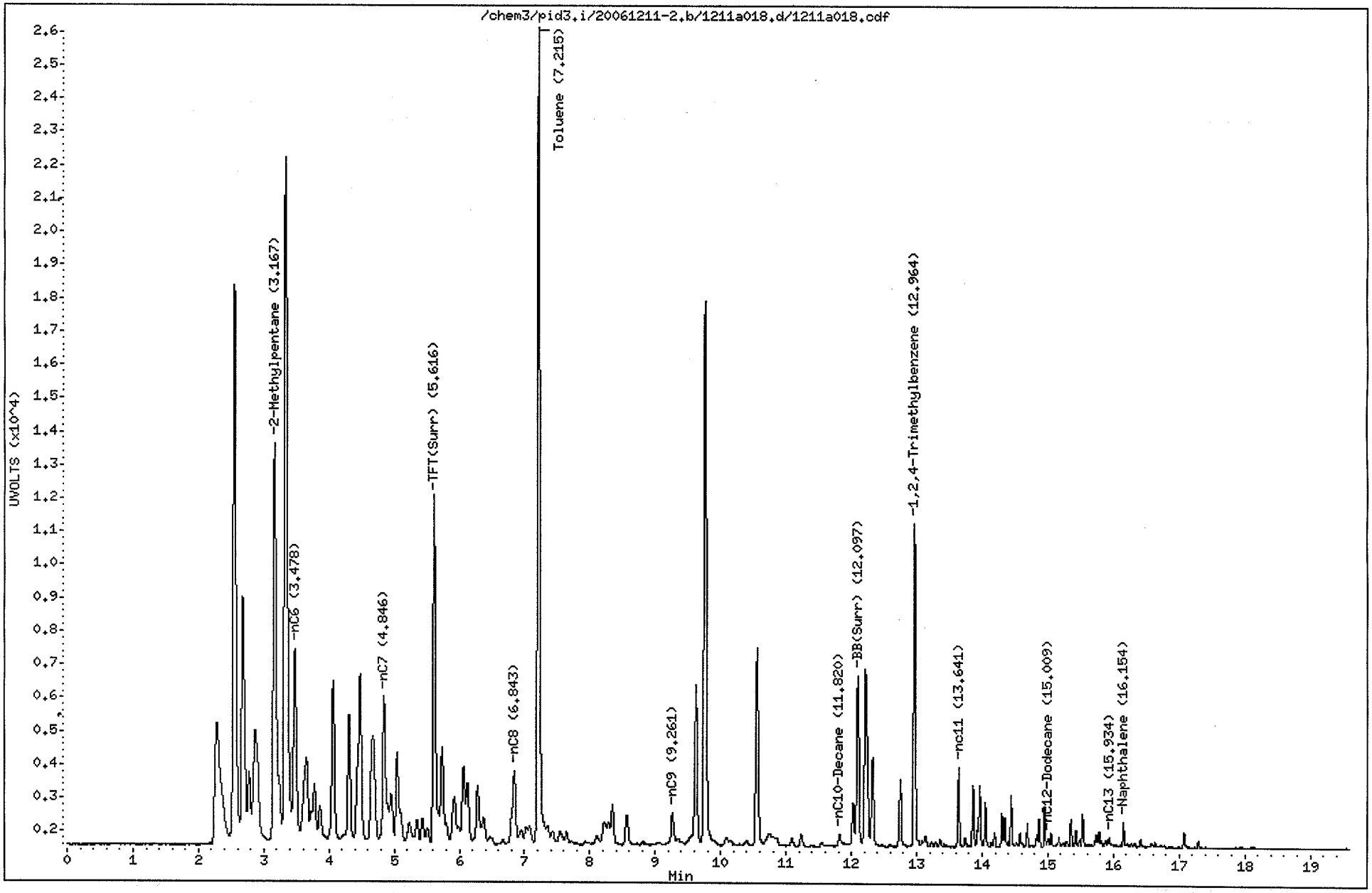
A Indicates Peak Area was used for quantitation instead of Height
N Indicates peak peak was manually integrated

Data File: /chem3/pid3.i/20061211-2.b/1211a018.d
Date : 11-DEC-2006 19:50
Client ID: SW-2 MSD
Sample Info: ki11emsd

Instrument: pid3.i

Operator: PC
Column diameter: 0.18

Column phase: RTX 502-2 FID



ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: MB-121306
METHOD BLANK

Lab Sample ID: MB-121306
LIMS ID: 06-24545
Matrix: Water
Data Release Authorized:
Reported: 12/20/06

QC Report No: KI11-URS Corp
Project: LAUREL STATION
Event: 33759339
Date Sampled: NA
Date Received: NA

Date Extracted: 12/13/06
Date Analyzed: 12/16/06 14:00
Instrument/Analyst: NT1/VTS

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	0.01	< 0.01 U
91-57-6	2-Methylnaphthalene	0.01	< 0.01 U
208-96-8	Acenaphthylene	0.01	< 0.01 U
83-32-9	Acenaphthene	0.01	< 0.01 U
86-73-7	Fluorene	0.01	< 0.01 U
85-01-8	Phenanthrene	0.01	< 0.01 U
120-12-7	Anthracene	0.01	< 0.01 U
206-44-0	Fluoranthene	0.01	< 0.01 U
129-00-0	Pyrene	0.01	< 0.01 U
56-55-3	Benzo(a)anthracene	0.01	< 0.01 U
218-01-9	Chrysene	0.01	< 0.01 U
205-99-2	Benzo(b)fluoranthene	0.01	< 0.01 U
207-08-9	Benzo(k)fluoranthene	0.01	< 0.01 U
50-32-8	Benzo(a)pyrene	0.01	< 0.01 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.01	< 0.01 U
53-70-3	Dibenz(a,h)anthracene	0.01	< 0.01 U
191-24-2	Benzo(g,h,i)perylene	0.01	< 0.01 U
132-64-9	Dibenzofuran	0.01	< 0.01 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	81.3%
d14-Dibenzo(a,h)anthracen	76.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
Page 1 of 1

Sample ID: DW-1
SAMPLE

Lab Sample ID: KI11A
LIMS ID: 06-24541
Matrix: Water
Data Release Authorized:
Reported: 12/20/06

QC Report No: KI11-URS Corp
Project: LAUREL STATION
Event: 33759339
Date Sampled: 12/07/06
Date Received: 12/09/06

Date Extracted: 12/13/06
Date Analyzed: 12/16/06 14:52
Instrument/Analyst: NT1/VTS

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	0.01	< 0.01 U
91-57-6	2-Methylnaphthalene	0.01	< 0.01 U
208-96-8	Acenaphthylene	0.01	< 0.01 U
83-32-9	Acenaphthene	0.01	< 0.01 U
86-73-7	Fluorene	0.01	< 0.01 U
85-01-8	Phenanthrene	0.01	< 0.01 U
120-12-7	Anthracene	0.01	< 0.01 U
206-44-0	Fluoranthene	0.01	< 0.01 U
129-00-0	Pyrene	0.01	< 0.01 U
56-55-3	Benzo(a)anthracene	0.01	< 0.01 U
218-01-9	Chrysene	0.01	< 0.01 U
205-99-2	Benzo(b)fluoranthene	0.01	< 0.01 U
207-08-9	Benzo(k)fluoranthene	0.01	< 0.01 U
50-32-8	Benzo(a)pyrene	0.01	< 0.01 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.01	< 0.01 U
53-70-3	Dibenz(a,h)anthracene	0.01	< 0.01 U
191-24-2	Benzo(g,h,i)perylene	0.01	< 0.01 U
132-64-9	Dibenzofuran	0.01	< 0.01 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	68.0%
d14-Dibenzo(a,h)anthracen	39.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: DW-2
SAMPLE

Lab Sample ID: KI11B
LIMS ID: 06-24542
Matrix: Water
Data Release Authorized:
Reported: 12/20/06

QC Report No: KI11-URS Corp
Project: LAUREL STATION
Event: 33759339
Date Sampled: 12/08/06
Date Received: 12/09/06

Date Extracted: 12/13/06
Date Analyzed: 12/20/06 11:03
Instrument/Analyst: NT1/VTS

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	0.01	< 0.01 U
91-57-6	2-Methylnaphthalene	0.01	< 0.01 U
208-96-8	Acenaphthylene	0.01	< 0.01 U
83-32-9	Acenaphthene	0.01	< 0.01 U
86-73-7	Fluorene	0.01	< 0.01 U
85-01-8	Phenanthrene	0.01	< 0.01 U
120-12-7	Anthracene	0.01	< 0.01 U
206-44-0	Fluoranthene	0.01	< 0.01 U
129-00-0	Pyrene	0.01	< 0.01 U
56-55-3	Benzo(a)anthracene	0.01	< 0.01 U
218-01-9	Chrysene	0.01	< 0.01 U
205-99-2	Benzo(b)fluoranthene	0.01	< 0.01 U
207-08-9	Benzo(k)fluoranthene	0.01	< 0.01 U
50-32-8	Benzo(a)pyrene	0.01	< 0.01 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.01	< 0.01 U
53-70-3	Dibenz(a,h)anthracene	0.01	< 0.01 U
191-24-2	Benzo(g,h,i)perylene	0.01	< 0.01 U
132-64-9	Dibenzofuran	0.01	< 0.01 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	55.3%
d14-Dibenzo(a,h)anthracen	22.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
Page 1 of 1

Sample ID: DW-3
SAMPLE

Lab Sample ID: KI11C
LIMS ID: 06-24543
Matrix: Water
Data Release Authorized:
Reported: 12/20/06

QC Report No: KI11-URS Corp
Project: LAUREL STATION
Event: 33759339
Date Sampled: 12/08/06
Date Received: 12/09/06

Date Extracted: 12/13/06
Date Analyzed: 12/20/06 11:28
Instrument/Analyst: NT1/VTS

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	0.01	< 0.01 U
91-57-6	2-Methylnaphthalene	0.01	< 0.01 U
208-96-8	Acenaphthylene	0.01	< 0.01 U
83-32-9	Acenaphthene	0.01	< 0.01 U
86-73-7	Fluorene	0.01	< 0.01 U
85-01-8	Phenanthrene	0.01	< 0.01 U
120-12-7	Anthracene	0.01	< 0.01 U
206-44-0	Fluoranthene	0.01	< 0.01 U
129-00-0	Pyrene	0.01	< 0.01 U
56-55-3	Benzo(a)anthracene	0.01	< 0.01 U
218-01-9	Chrysene	0.01	< 0.01 U
205-99-2	Benzo(b)fluoranthene	0.01	< 0.01 U
207-08-9	Benzo(k)fluoranthene	0.01	< 0.01 U
50-32-8	Benzo(a)pyrene	0.01	< 0.01 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.01	< 0.01 U
53-70-3	Dibenz(a,h)anthracene	0.01	< 0.01 U
191-24-2	Benzo(g,h,i)perylene	0.01	< 0.01 U
132-64-9	Dibenzofuran	0.01	< 0.01 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	69.0%
d14-Dibenzo(a,h)anthracen	50.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
Page 1 of 1

Sample ID: DW-4
SAMPLE

Lab Sample ID: KI11D
LIMS ID: 06-24544
Matrix: Water
Data Release Authorized:
Reported: 12/20/06

QC Report No: KI11-URS Corp
Project: LAUREL STATION
Event: 33759339
Date Sampled: 12/08/06
Date Received: 12/09/06

Date Extracted: 12/13/06
Date Analyzed: 12/16/06 16:10
Instrument/Analyst: NT1/VTS

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	**Naphthalene**	**0.01**	**0.02**
91-57-6	2-Methylnaphthalene	0.01	< 0.01 U
208-96-8	Acenaphthylene	0.01	< 0.01 U
83-32-9	Acenaphthene	0.01	< 0.01 U
86-73-7	Fluorene	0.01	< 0.01 U
85-01-8	Phenanthrene	0.01	< 0.01 U
120-12-7	Anthracene	0.01	< 0.01 U
206-44-0	Fluoranthene	0.01	< 0.01 U
129-00-0	Pyrene	0.01	< 0.01 U
56-55-3	Benzo(a)anthracene	0.01	< 0.01 U
218-01-9	Chrysene	0.01	< 0.01 U
205-99-2	Benzo(b)fluoranthene	0.01	< 0.01 U
207-08-9	Benzo(k)fluoranthene	0.01	< 0.01 U
50-32-8	Benzo(a)pyrene	0.01	< 0.01 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.01	< 0.01 U
53-70-3	Dibenz(a,h)anthracene	0.01	< 0.01 U
191-24-2	Benzo(g,h,i)perylene	0.01	< 0.01 U
132-64-9	Dibenzofuran	0.01	< 0.01 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	79.3%
d14-Dibenzo(a,h)anthracen	45.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS **Sample ID: SW-2**
Page 1 of 1 **SAMPLE**

Lab Sample ID: KI11E
LIMS ID: 06-24545
Matrix: Water
Data Release Authorized:
Reported: 12/20/06

QC Report No: KI11-URS Corp
Project: LAUREL STATION
Event: 33759339
Date Sampled: 12/08/06
Date Received: 12/09/06

Date Extracted: 12/13/06
Date Analyzed: 12/16/06 16:36
Instrument/Analyst: NT1/VTS

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	**Naphthalene**	**0.01**	**0.01**
91-57-6	2-Methylnaphthalene	0.01	< 0.01 U
208-96-8	Acenaphthylene	0.01	< 0.01 U
83-32-9	Acenaphthene	0.01	< 0.01 U
86-73-7	Fluorene	0.01	< 0.01 U
85-01-8	Phenanthrene	0.01	< 0.01 U
120-12-7	Anthracene	0.01	< 0.01 U
206-44-0	Fluoranthene	0.01	< 0.01 U
129-00-0	Pyrene	0.01	< 0.01 U
56-55-3	Benzo(a)anthracene	0.01	< 0.01 U
218-01-9	Chrysene	0.01	< 0.01 U
205-99-2	Benzo(b)fluoranthene	0.01	< 0.01 U
207-08-9	Benzo(k)fluoranthene	0.01	< 0.01 U
50-32-8	Benzo(a)pyrene	0.01	< 0.01 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.01	< 0.01 U
53-70-3	Dibenz(a,h)anthracene	0.01	< 0.01 U
191-24-2	Benzo(g,h,i)perylene	0.01	< 0.01 U
132-64-9	Dibenzofuran	0.01	< 0.01 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	76.7%
d14-Dibenzo(a,h)anthracen	26.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
Page 1 of 1

Sample ID: SW-2
MATRIX SPIKE

Lab Sample ID: KI11E
LIMS ID: 06-24545
Matrix: Water
Data Release Authorized:
Reported: 12/20/06

QC Report No: KI11-URS Corp
Project: LAUREL STATION
Event: 33759339
Date Sampled: 12/08/06
Date Received: 12/09/06

Date Extracted: 12/13/06
Date Analyzed: 12/16/06 17:02
Instrument/Analyst: NT1/VTS

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	**Naphthalene**	**0.01**	**0.01**
91-57-6	2-Methylnaphthalene	0.01	< 0.01 U
208-96-8	Acenaphthylene	0.01	< 0.01 U
83-32-9	Acenaphthene	0.01	< 0.01 U
86-73-7	Fluorene	0.01	< 0.01 U
85-01-8	Phenanthrene	0.01	---
120-12-7	Anthracene	0.01	< 0.01 U
206-44-0	Fluoranthene	0.01	< 0.01 U
129-00-0	Pyrene	0.01	< 0.01 U
56-55-3	Benzo(a)anthracene	0.01	< 0.01 U
218-01-9	Chrysene	0.01	---
205-99-2	Benzo(b)fluoranthene	0.01	< 0.01 U
207-08-9	Benzo(k)fluoranthene	0.01	---
50-32-8	Benzo(a)pyrene	0.01	< 0.01 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.01	< 0.01 U
53-70-3	Dibenz(a,h)anthracene	0.01	< 0.01 U
191-24-2	Benzo(g,h,i)perylene	0.01	< 0.01 U
132-64-9	Dibenzofuran	0.01	< 0.01 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	81.0%
d14-Dibenzo(a,h)anthracen	32.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
Page 1 of 1

Sample ID: SW-2
MATRIX SPIKE DUPLICATE

Lab Sample ID: KI11E
LIMS ID: 06-24545
Matrix: Water
Data Release Authorized:
Reported: 12/20/06

QC Report No: KI11-URS Corp
Project: LAUREL STATION
Event: 33759339
Date Sampled: 12/08/06
Date Received: 12/09/06

Date Extracted: 12/13/06
Date Analyzed: 12/16/06 17:28
Instrument/Analyst: NT1/VTS

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	0.01	< 0.01 U
91-57-6	2-Methylnaphthalene	0.01	< 0.01 U
208-96-8	Acenaphthylene	0.01	< 0.01 U
83-32-9	Acenaphthene	0.01	< 0.01 U
86-73-7	Fluorene	0.01	< 0.01 U
85-01-8	Phenanthrene	0.01	---
120-12-7	Anthracene	0.01	< 0.01 U
206-44-0	Fluoranthene	0.01	< 0.01 U
129-00-0	Pyrene	0.01	< 0.01 U
56-55-3	Benzo(a)anthracene	0.01	< 0.01 U
218-01-9	Chrysene	0.01	---
205-99-2	Benzo(b)fluoranthene	0.01	< 0.01 U
207-08-9	Benzo(k)fluoranthene	0.01	---
50-32-8	Benzo(a)pyrene	0.01	< 0.01 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.01	< 0.01 U
53-70-3	Dibenz(a,h)anthracene	0.01	< 0.01 U
191-24-2	Benzo(g,h,i)perylene	0.01	< 0.01 U
132-64-9	Dibenzofuran	0.01	< 0.01 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	70.0%
d14-Dibenzo(a,h)anthracen	29.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS **Sample ID: DW-5**
Page 1 of 1 **SAMPLE**

Lab Sample ID: KI11F
LIMS ID: 06-24546
Matrix: Water
Data Release Authorized:
Reported: 12/20/06

QC Report No: KI11-URS Corp
Project: LAUREL STATION
Event: 33759339
Date Sampled: 12/08/06
Date Received: 12/09/06

Date Extracted: 12/13/06
Date Analyzed: 12/16/06 17:54
Instrument/Analyst: NT1/VTS

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	0.01	< 0.01 U
91-57-6	2-Methylnaphthalene	0.01	< 0.01 U
208-96-8	Acenaphthylene	0.01	< 0.01 U
83-32-9	Acenaphthene	0.01	< 0.01 U
86-73-7	Fluorene	0.01	< 0.01 U
85-01-8	Phenanthrene	0.01	< 0.01 U
120-12-7	Anthracene	0.01	< 0.01 U
206-44-0	Fluoranthene	0.01	< 0.01 U
129-00-0	Pyrene	0.01	< 0.01 U
56-55-3	Benzo(a)anthracene	0.01	< 0.01 U
218-01-9	Chrysene	0.01	< 0.01 U
205-99-2	Benzo(b)fluoranthene	0.01	< 0.01 U
207-08-9	Benzo(k)fluoranthene	0.01	< 0.01 U
50-32-8	Benzo(a)pyrene	0.01	< 0.01 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.01	< 0.01 U
53-70-3	Dibenz(a,h)anthracene	0.01	< 0.01 U
191-24-2	Benzo(g,h,i)perylene	0.01	< 0.01 U
132-64-9	Dibenzofuran	0.01	< 0.01 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	70.3%
d14-Dibenzo(a,h)anthracen	55.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: DUP
SAMPLE

Lab Sample ID: KI11G
LIMS ID: 06-24547
Matrix: Water
Data Release Authorized:
Reported: 12/20/06

QC Report No: KI11-URS Corp
Project: LAUREL STATION
Event: 33759339
Date Sampled: 12/08/06
Date Received: 12/09/06

Date Extracted: 12/13/06
Date Analyzed: 12/16/06 18:20
Instrument/Analyst: NT1/VTS

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	0.01	< 0.01 U
91-57-6	2-Methylnaphthalene	0.01	< 0.01 U
208-96-8	Acenaphthylene	0.01	< 0.01 U
83-32-9	Acenaphthene	0.01	< 0.01 U
86-73-7	Fluorene	0.01	< 0.01 U
85-01-8	Phenanthrene	0.01	< 0.01 U
120-12-7	Anthracene	0.01	< 0.01 U
206-44-0	Fluoranthene	0.01	< 0.01 U
129-00-0	Pyrene	0.01	< 0.01 U
56-55-3	Benzo(a)anthracene	0.01	< 0.01 U
218-01-9	Chrysene	0.01	< 0.01 U
205-99-2	Benzo(b)fluoranthene	0.01	< 0.01 U
207-08-9	Benzo(k)fluoranthene	0.01	< 0.01 U
50-32-8	Benzo(a)pyrene	0.01	< 0.01 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.01	< 0.01 U
53-70-3	Dibenz(a,h)anthracene	0.01	< 0.01 U
191-24-2	Benzo(g,h,i)perylene	0.01	< 0.01 U
132-64-9	Dibenzofuran	0.01	< 0.01 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	68.3%
d14-Dibenzo(a,h)anthracen	44.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
Page 1 of 1

Sample ID: SW-2
MATRIX SPIKE

Lab Sample ID: KI11E
LIMS ID: 06-24545
Matrix: Water
Data Release Authorized:
Reported: 12/20/06

QC Report No: KI11-URS Corp
Project: LAUREL STATION
Event: 33759339
Date Sampled: 12/08/06
Date Received: 12/09/06

Date Extracted MS/MSD: 12/13/06

Date Analyzed MS: 12/16/06 17:02
MSD: 12/16/06 17:28
Instrument/Analyst MS: NT1/VTS
MSD: NT1/VTS

Sample Amount MS: 500 mL
MSD: 500 mL
Final Extract Volume MS: 0.50 mL
MSD: 0.50 mL
Dilution Factor MS: 1.00
MSD: 1.00

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Phenanthrene	< 0.01 U	0.28	0.30	93.3%	0.27	0.30	90.0%	3.6%
Chrysene	< 0.01 U	0.21	0.30	70.0%	0.21	0.30	70.0%	0.0%
Benzo(k)fluoranthene	< 0.01 U	0.13	0.30	43.3%	0.13	0.30	43.3%	0.0%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: LCS-121306
LAB CONTROL SAMPLE

Lab Sample ID: LCS-121306
LIMS ID: 06-24545
Matrix: Water
Data Release Authorized:
Reported: 12/20/06

QC Report No: KI11-URS Corp
Project: LAUREL STATION
Event: 33759339
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 12/13/06
Date Analyzed LCS: 12/16/06 14:26
Instrument/Analyst LCS: NT1/VTS

Sample Amount LCS: 500 mL
Final Extract Volume LCS: 0.50 mL
Dilution Factor LCS: 1.00

Analyte	LCS	Spike Added	Recovery
Naphthalene	0.19	0.30	63.3%
Acenaphthylene	0.24	0.30	80.0%
Acenaphthene	0.24	0.30	80.0%
Fluorene	0.29	0.30	96.7%
Phenanthrene	0.26	0.30	86.7%
Anthracene	0.24	0.30	80.0%
Fluoranthene	0.27	0.30	90.0%
Pyrene	0.26	0.30	86.7%
Benzo(a)anthracene	0.23	0.30	76.7%
Chrysene	0.30	0.30	100%
Benzo(b)fluoranthene	0.28	0.30	93.3%
Benzo(k)fluoranthene	0.26	0.30	86.7%
Benzo(a)pyrene	0.17	0.30	56.7%
Indeno(1,2,3-cd)pyrene	0.24	0.30	80.0%
Dibenz(a,h)anthracene	0.23	0.30	76.7%
Benzo(g,h,i)perylene	0.24	0.30	80.0%
Dibenzofuran	0.22	0.30	73.3%

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	76.3%
d14-Dibenzo(a,h)anthracen	82.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD by GC/FID
Page 1 of 1
Matrix: Water

QC Report No: KI11-URS Corp
Project: LAUREL STATION
33759339
Date Received: 12/09/06

Data Release Authorized:
Reported: 12/18/06

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range	Result
KI11A	DW-1	12/13/06	12/14/06	1.00	Diesel	< 0.25 U
06-24541	HC ID: **DRO/RRO**		FID3A	1.0	Motor Oil	< 0.50 U
					o-Terphenyl	87.3%
KI11B	DW-2	12/13/06	12/14/06	1.00	Diesel	< 0.25 U
06-24542	HC ID: ---		FID3A	1.0	Motor Oil	< 0.50 U
					o-Terphenyl	86.4%
KI11C	DW-3	12/13/06	12/14/06	1.00	Diesel	< 0.25 U
06-24543	HC ID: ---		FID3A	1.0	Motor Oil	< 0.50 U
					o-Terphenyl	85.3%
KI11D	DW-4	12/13/06	12/14/06	1.00	Diesel	< 0.25 U
06-24544	HC ID: ---		FID3A	1.0	Motor Oil	< 0.50 U
					o-Terphenyl	90.0%
MB-121306	Method Blank	12/13/06	12/14/06	1.00	Diesel	< 0.25 U
06-24545	HC ID: ---		FID3A	1.0	Motor Oil	< 0.50 U
					o-Terphenyl	80.0%
KI11E	SW-2	12/13/06	12/14/06	1.00	Diesel	< 0.25 U
06-24545	HC ID: ---		FID3A	1.0	Motor Oil	< 0.50 U
					o-Terphenyl	88.0%
KI11F	DW-5	12/13/06	12/14/06	1.00	Diesel	< 0.25 U
06-24546	HC ID: ---		FID3A	1.0	Motor Oil	< 0.50 U
					o-Terphenyl	87.1%
KI11G	DUP	12/13/06	12/14/06	1.00	Diesel	< 0.25 U
06-24547	HC ID: ---		FID3A	1.0	Motor Oil	< 0.50 U
					o-Terphenyl	87.1%

Reported in mg/L (ppm)

EFV-Effective Final Volume in mL.
DL-Dilution of extract prior to analysis.

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.
HC ID: DRO/RRO indicates results of organics or additional hydrocarbons in ranges are not identifiable.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPHD by GC/FID
Page 1 of 1

Sample ID: SW-2
MS/MSD

Lab Sample ID: KI11E
LIMS ID: 06-24545
Matrix: Water
Data Release Authorized:
Reported: 12/18/06

QC Report No: KI11-URS Corp
Project: LAUREL STATION
33759339
Date Sampled: 12/08/06
Date Received: 12/09/06

Date Extracted MS/MSD: 12/13/06

Date Analyzed MS: 12/14/06 13:47
MSD: 12/14/06 14:02
Instrument/Analyst MS: FID3A/JGR
MSD: FID3A/JGR

Sample Amount MS: 500 mL
MSD: 500 mL
Final Extract Volume MS: 1.0 mL
MSD: 1.0 mL
Dilution Factor MS: 1.00
MSD: 1.00

Range	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Diesel	< 0.25 U	2.09	3.00	69.7%	2.32	3.00	77.3%	10.4%

TPHD Surrogate Recovery

	MS	MSD
o-Terphenyl	82.7%	89.6%

Results reported in mg/L
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPHD by GC/FID
Page 1 of 1

Sample ID: LCS-121306
LAB CONTROL

Lab Sample ID: LCS-121306
LIMS ID: 06-24545
Matrix: Water
Data Release Authorized:
Reported: 12/18/06

QC Report No: KI11-URS Corp
Project: LAUREL STATION
33759339
Date Sampled: NA
Date Received: NA

Date Extracted: 12/13/06
Date Analyzed: 12/14/06 12:15
Instrument/Analyst: FID3A/JGR

Sample Amount: 500 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00

Range	Lab Control	Spike Added	Recovery
Diesel	2.02	3.00	67.3%

TPHD Surrogate Recovery

o-Terphenyl	80.0%

Results reported in mg/L

Analytical Resources Inc.
TPH Quantitation Report

Data file: /chem3/fid3a.i/20061214.b/1214a008.d
Method: /chem3/fid3a.i/20061214.b/ftphfid3a.m
Instrument: fid3a.i
Operator: JR
Report Date: 12/16/2006
Macro: FID:3A121406

ARI ID: KI11MBW1
Client ID:
Injection: 14-DEC-2006 12:00
Dilution Factor: 1

FID:3A RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	----				GAS (Tol-C12)	629785	28
C8	1.288	0.003	14344	10312	DIESEL (C12-C24)	216827	15
C10	2.597	0.002	3901	1765	M.OIL (C24-C38)	42725	5
C12	3.106	0.002	4240	1684	AK-102 (C10-C25)	361833	20
C14	3.414	-0.008	4148	3715	AK-103 (C25-C36)	31463	5
C16	3.686	0.000	3360	801			
C18	3.924	-0.002	2732	543			
C20	4.154	0.004	3286	2075	JET-A (C10-C18)	313792	27
C22	4.364	-0.004	1574	960	MIN.OIL (C24-C38)	42725	4
C24	4.580	0.000	866	169	MSPIRIT (Tol-C12)	629785	40
C25	4.690	0.002	596	175	TRANOIL (C12-C28)	227778	14
C26	4.797	0.002	388	106	KEROSEN (Tol-C18)	798571	52
C28	5.019	0.005	575	335			
C32	5.466	0.011	632	657	FUEL OIL(C10-C24)	361833	1
C34	5.662	-0.006	485	421			
Filter Peak	6.233	-0.007	783	506	JP-4 (Tol-C14)	708431	64
C36	5.878	0.001	672	494	CREOSOT (C12-C22)	206992	54
C38	6.094	-0.004	816	753	HYDRAUL (C24-C38)	42725	5
C40	6.370	-0.001	684	379	BUNKERC (C10-C38)	404559	134

Range Times: NW Diesel(3.154 - 4.630) NW Gas(1.073 - 3.154) NW M.Oil(4.630 - 6.148)
AK102(2.545 - 4.638) AK103(4.638 - 5.927) Jet A(2.545 - 3.976)

Surrogate	Area	Amount	%Rec
o-Terphenyl	653666	36.0	80.0
Triacontane	591982	44.1	97.9

JR 12/16/06

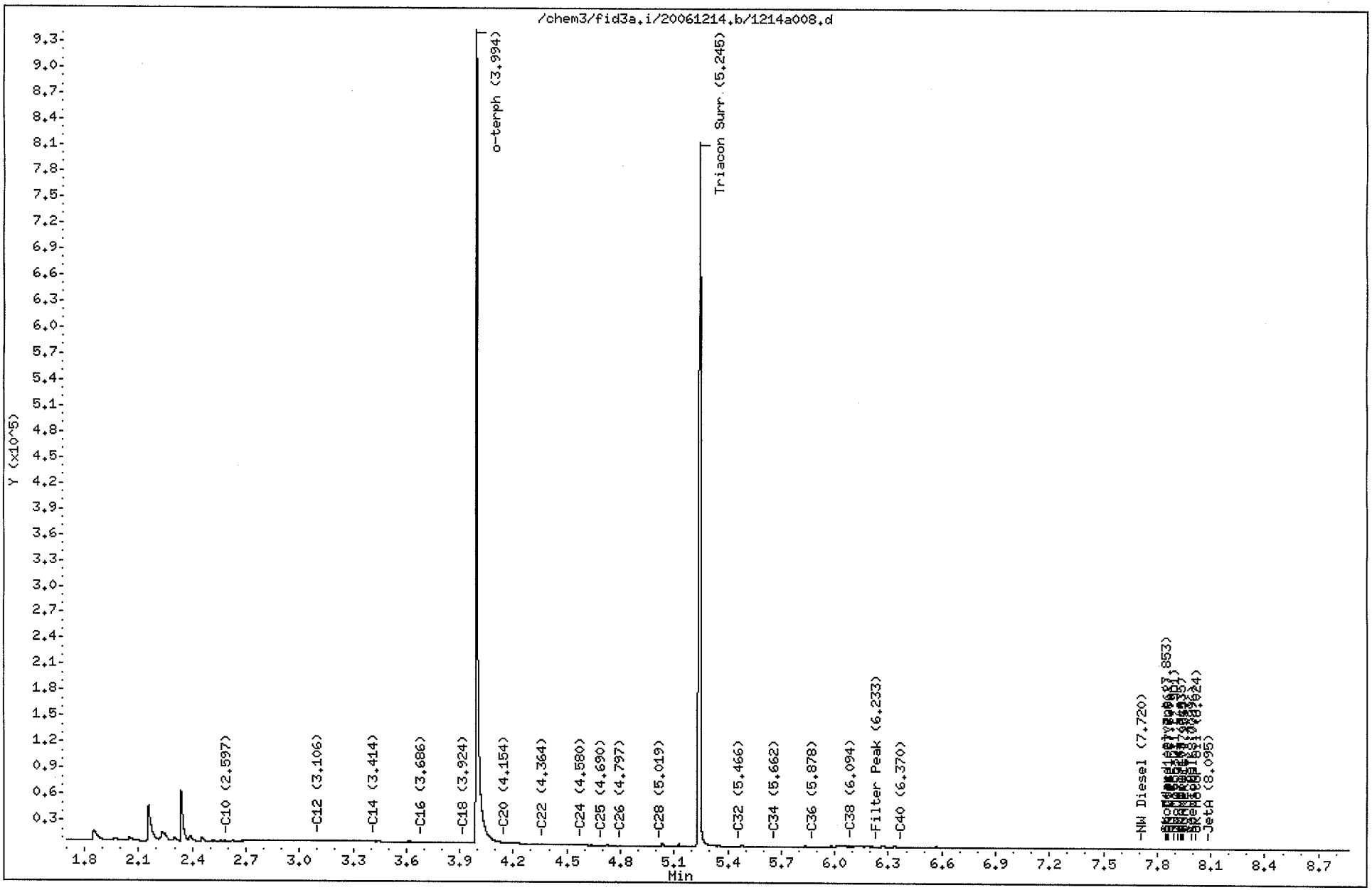
Analyte	RF	Curve Date
o-Terph Surr	18157.8	15-NOV-2006
Triacon Surr	13431.5	10-OCT-2006
Gas	22216.5	14-DEC-2006
Diesel	14864.3	15-NOV-2006
Motor Oil	8614.6	10-OCT-2006
AK102	18075.2	15-NOV-2006
AK103	6781.5	18-OCT-2006
JP4	11125.0	12-APR-2004
JP5	8746364.4	10-FEB-1999
JetA	11580.5	15-JUL-2006
Min Oil	11957.0	12-JUL-2004
Min Spirit	15825.3	15-APR-2005
Tran Oil	16409.1	30-SEP-2006
Kerosene	15426.1	09-NOV-2004
Bunker C	3023.0	29-JUL-2005
Creosote	3823.0	24-MAR-2005
Hydraulic	8899.0	12-JUL-2004
Diesel 1	100000.0	20-JUN-2001
Fuel Oil	530568.2	13-AUG-2002

Data File: /chem3/fid3a.i/20061214.b/1214a008.d
Date : 14-DEC-2006 12:00
Client ID:
Sample Info: KI11MBW1

Instrument: fid3a.i

Operator: JR
Column diameter: 0.25

Column phase: RTX-1



Analytical Resources Inc.
TPH Quantitation Report

Data file: /chem3/fid3a.i/20061214.b/1214a009.d
Method: /chem3/fid3a.i/20061214.b/ftphfid3a.m
Instrument: fid3a.i
Operator: JR
Report Date: 12/16/2006
Macro: FID:3A121406

ARI ID: KI11LCSW1
Client ID:
Injection: 14-DEC-2006 12:15
Dilution Factor: 1

FID:3A RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	1.149	0.026	43831	63500	GAS (Tol-C12)	3673495	165
C8	1.291	0.006	15443	18959	DIESEL (C12-C24)	15035136	1011
C10	2.601	0.006	168906	116532	M.OIL (C24-C38)	266097	31
C12	3.105	0.000	591726	253948	AK-102 (C10-C25)	17555187	971
C14	3.423	0.001	806355	408181	AK-103 (C25-C36)	250132	37
C16	3.688	0.003	854799	629899			
C18	3.928	0.003	583742	447599			
C20	4.152	0.002	442854	265021	JET-A (C10-C18)	13440848	1161
C22	4.367	-0.001	173647	117608	MIN.OIL (C24-C38)	266097	22
C24	4.579	-0.001	65179	45095	MSPIRIT (Tol-C12)	3673495	232
C25	4.686	-0.002	35841	38453	TRANOIL (C12-C28)	15264357	930
C26	4.795	0.000	18740	16636	KEROSEN (Tol-C18)	14604418	947
C28	5.014	0.000	4979	3677			
C32	5.452	-0.003	568	132	FUEL OIL(C10-C24)	17545061	33
C34	5.672	0.004	275	79			
Filter Peak	6.234	-0.005	428	243	JP-4 (Tol-C14)	7375148	663
C36	5.878	0.001	334	151	CREOSOT (C12-C22)	14583004	3815
C38	6.094	-0.003	456	107	HYDRAUL (C24-C38)	266097	30
C40	6.372	0.001	325	69	BUNKERC (C10-C38)	17811158	5892

Range Times: NW Diesel(3.154 - 4.630) NW Gas(1.073 - 3.154) NW M.Oil(4.630 - 6.148)
AK102(2.545 - 4.638) AK103(4.638 - 5.927) Jet A(2.545 - 3.976)

Surrogate	Area	Amount	%Rec
o-Terphenyl	654350	36.0	80.1
Triacontane	585864	43.6	96.9

JR 12/16/06

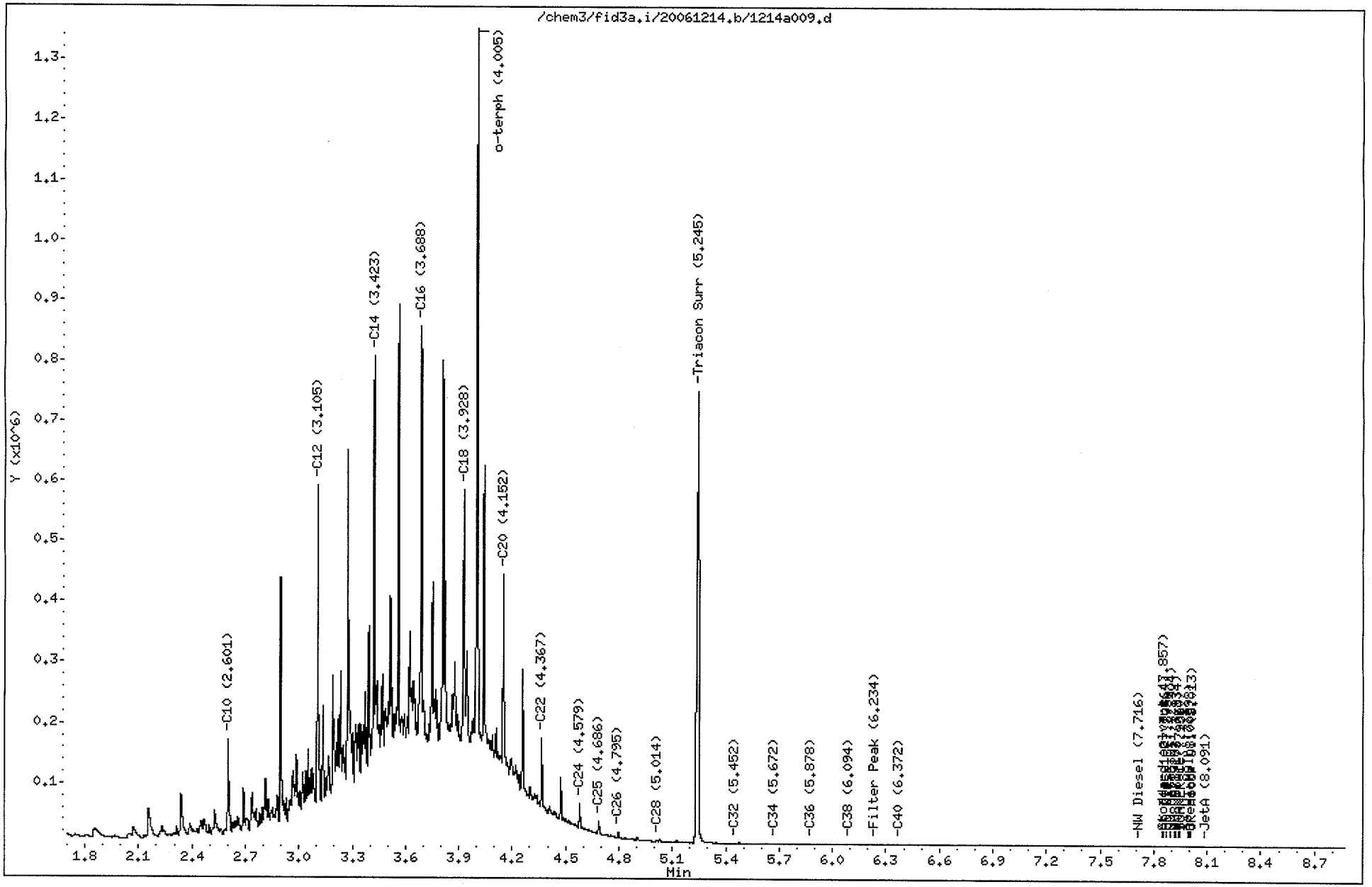
Analyte	RF	Curve Date
o-Terph Surr	18157.8	15-NOV-2006
Triacon Surr	13431.5	10-OCT-2006
Gas	22216.5	14-DEC-2006
Diesel	14864.3	15-NOV-2006
Motor Oil	8614.6	10-OCT-2006
AK102	18075.2	15-NOV-2006
AK103	6781.5	18-OCT-2006
JP4	11125.0	12-APR-2004
JP5	8746364.4	10-FEB-1999
JetA	11580.5	15-JUL-2006
Min Oil	11957.0	12-JUL-2004
Min Spirit	15825.3	15-APR-2005
Tran Oil	16409.1	30-SEP-2006
Kerosene	15426.1	09-NOV-2004
Bunker C	3023.0	29-JUL-2005
Creosote	3823.0	24-MAR-2005
Hydraulic	8899.0	12-JUL-2004
Diesel 1	100000.0	20-JUN-2001
Fuel Oil	530568.2	13-AUG-2002

Data File: /chem3/fid3a.i/20061214.b/1214a009.d
Date : 14-DEC-2006 12:15
Client ID:
Sample Info: KI11LCSW1

Column phase: RTX-1

Instrument: fid3a.i

Operator: JR
Column diameter: 0.25



Analytical Resources Inc.
TPH Quantitation Report

Data file: /chem3/fid3a.i/20061214.b/1214a010.d
Method: /chem3/fid3a.i/20061214.b/ftphfid3a.m
Instrument: fid3a.i
Operator: JR
Report Date: 12/16/2006
Macro: FID:3A121406

ARI ID: KI11A
Client ID:
Injection: 14-DEC-2006 12:30
Dilution Factor: 1

FID:3A RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	1.145	0.022	36885	180359	GAS (Tol-C12)	931324	42
C8	1.294	0.009	18000	52069	DIESEL (C12-C24)	1025388	69
C10	2.594	-0.001	3806	2864	M.OIL (C24-C38)	1798007	209
C12	3.105	0.001	10017	1796	AK-102 (C10-C25)	1260167	70
C14	3.442	0.020	7788	3238	AK-103 (C25-C36)	1637865	242
C16	3.692	0.006	8578	3528			
C18	3.927	0.001	9357	5686			
C20	4.153	0.003	9928	2340	JET-A (C10-C18)	687712	59
C22	4.375	0.008	12144	2626	MIN.OIL (C24-C38)	1798007	150
C24	4.571	-0.008	27412	22505	MSPIRIT (Tol-C12)	931324	59
C25	4.678	-0.010	23008	18892	TRANOIL (C12-C28)	1871338	114
C26	4.788	-0.007	30162	28024	KEROSEN (Tol-C18)	1393556	90
C28	5.007	-0.007	48541	50329			
C32	5.450	-0.005	27773	32231	FUEL OIL(C10-C24)	1250868	2
C34	5.676	0.007	15357	9495			
Filter Peak	6.240	0.001	6244	3715	JP-4 (Tol-C14)	1118419	101
C36	5.879	0.002	10649	4203	CREOSOT (C12-C22)	786951	206
C38	6.102	0.004	11502	3313	HYDRAUL (C24-C38)	1798007	202
C40	6.361	-0.010	5394	5874	BUNKERC (C10-C38)	3048875	1009

Range Times: NW Diesel(3.154 - 4.630) NW Gas(1.073 - 3.154) NW M.Oil(4.630 - 6.148)
AK102(2.545 - 4.638) AK103(4.638 - 5.927) Jet A(2.545 - 3.976)

Surrogate	Area	Amount	%Rec
o-Terphenyl	712842	39.3	87.2
Triacontane	662908	49.4	109.7

Analyte	RF	Curve Date
o-Terph Surr	18157.8	15-NOV-2006
Triacon Surr	13431.5	10-OCT-2006
Gas	22216.5	14-DEC-2006
Diesel	14864.3	15-NOV-2006
Motor Oil	8614.6	10-OCT-2006
AK102	18075.2	15-NOV-2006
AK103	6781.5	18-OCT-2006
JP4	11125.0	12-APR-2004
JP5	8746364.4	10-FEB-1999
JetA	11580.5	15-JUL-2006
Min Oil	11957.0	12-JUL-2004
Min Spirit	15825.3	15-APR-2005
Tran Oil	16409.1	30-SEP-2006
Kerosene	15426.1	09-NOV-2004
Bunker C	3023.0	29-JUL-2005
Creosote	3823.0	24-MAR-2005
Hydraulic	8899.0	12-JUL-2004
Diesel 1	100000.0	20-JUN-2001
Fuel Oil	530568.2	13-AUG-2002

JR 12/16/06

Data File: /chem3/fid3a.i/20061214.b/1214a010.d
Date : 14-DEC-2006 12:30
Client ID:
Sample Info: KI11A

Instrument: fid3a.i

Operator: JR
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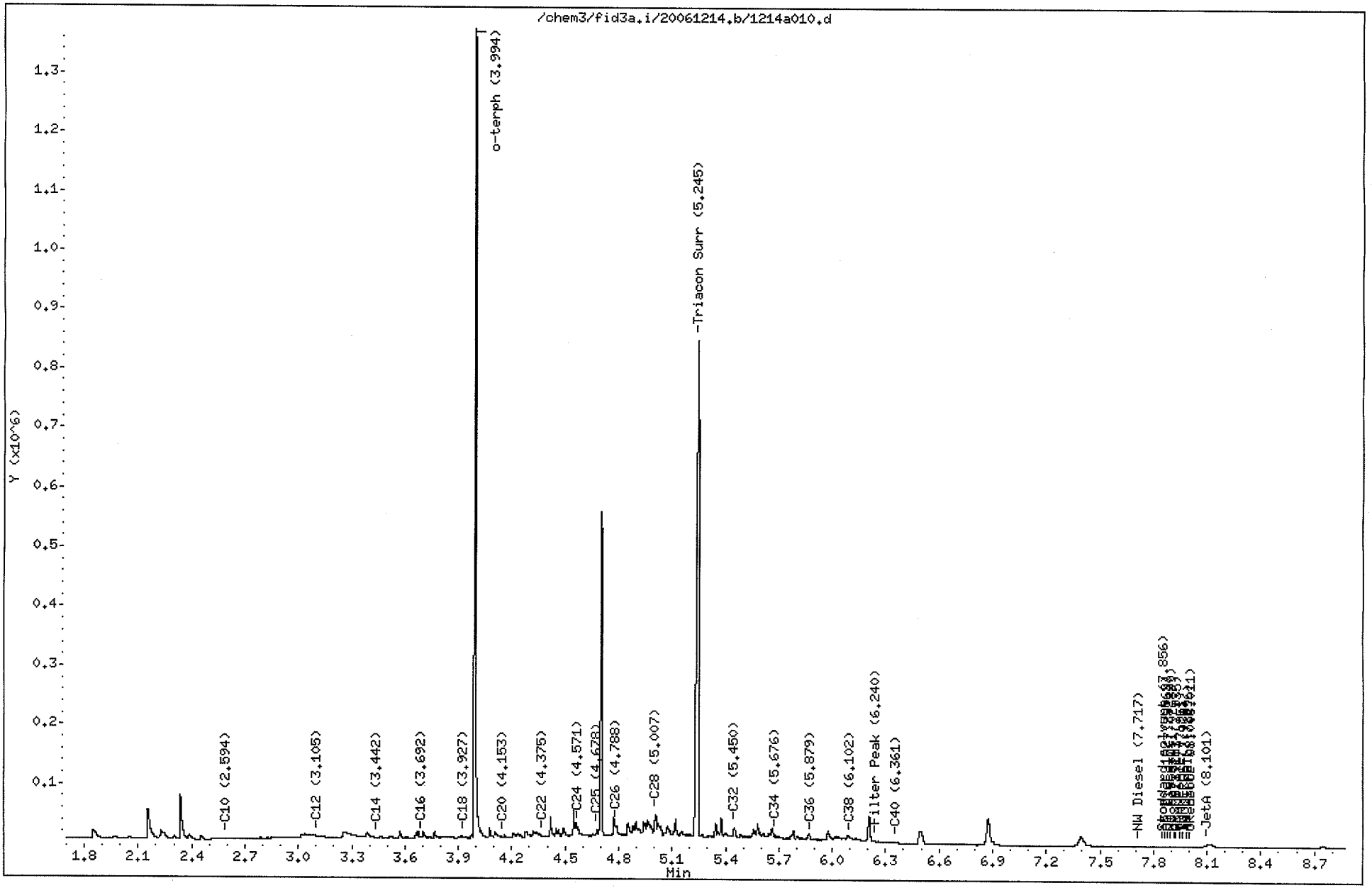


Analytical Resources Inc.
TPH Quantitation Report

Data file: /chem3/fid3a.i/20061214.b/1214a011.d
Method: /chem3/fid3a.i/20061214.b/ftphfid3a.m
Instrument: fid3a.i
Operator: JR
Report Date: 12/16/2006
Macro: FID:3A121406

ARI ID: KI11B
Client ID:
Injection: 14-DEC-2006 12:45
Dilution Factor: 1

FID:3A RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	----				GAS (Tol-C12)	757947	34
C8	1.292	0.007	19126	53105	DIESEL (C12-C24)	571389	38
C10	2.596	0.001	3727	3085	M.OIL (C24-C38)	736465	85
C12	3.109	0.004	10944	23915	AK-102 (C10-C25)	784306	43
C14	3.421	-0.001	7705	4397	AK-103 (C25-C36)	649061	96
C16	3.680	-0.005	8280	11262			
C18	3.921	-0.004	7471	10778			
C20	4.149	-0.001	8615	8064	JET-A (C10-C18)	550691	48
C22	4.365	-0.003	17332	23992	MIN.OIL (C24-C38)	736465	62
C24	4.575	-0.004	13313	11142	MSPIRIT (Tol-C12)	757947	48
C25	4.682	-0.006	17404	12695	TRANOIL (C12-C28)	822379	50
C26	4.790	-0.005	12525	10628	KEROSEN (Tol-C18)	1096532	71
C28	5.010	-0.004	20383	17413			
C32	5.453	-0.003	19753	18340	FUEL OIL(C10-C24)	783496	1
C34	5.665	-0.003	17417	21726			
Filter Peak	6.237	-0.003	3870	2303	JP-4 (Tol-C14)	886555	80
C36	5.874	-0.003	13092	11956	CREOSOT (C12-C22)	494493	129
C38	6.094	-0.003	10926	14464	HYDRAUL (C24-C38)	736465	83
C40	6.371	-0.001	3847	6573	BUNKERC (C10-C38)	1519961	503

Range Times: NW Diesel(3.154 - 4.630) NW Gas(1.073 - 3.154) NW M.Oil(4.630 - 6.148)
AK102(2.545 - 4.638) AK103(4.638 - 5.927) Jet A(2.545 - 3.976)

Surrogate	Area	Amount	%Rec
o-Terphenyl	707021	38.9	86.5
Triacontane	642765	47.9	106.3

JR 12/16/06

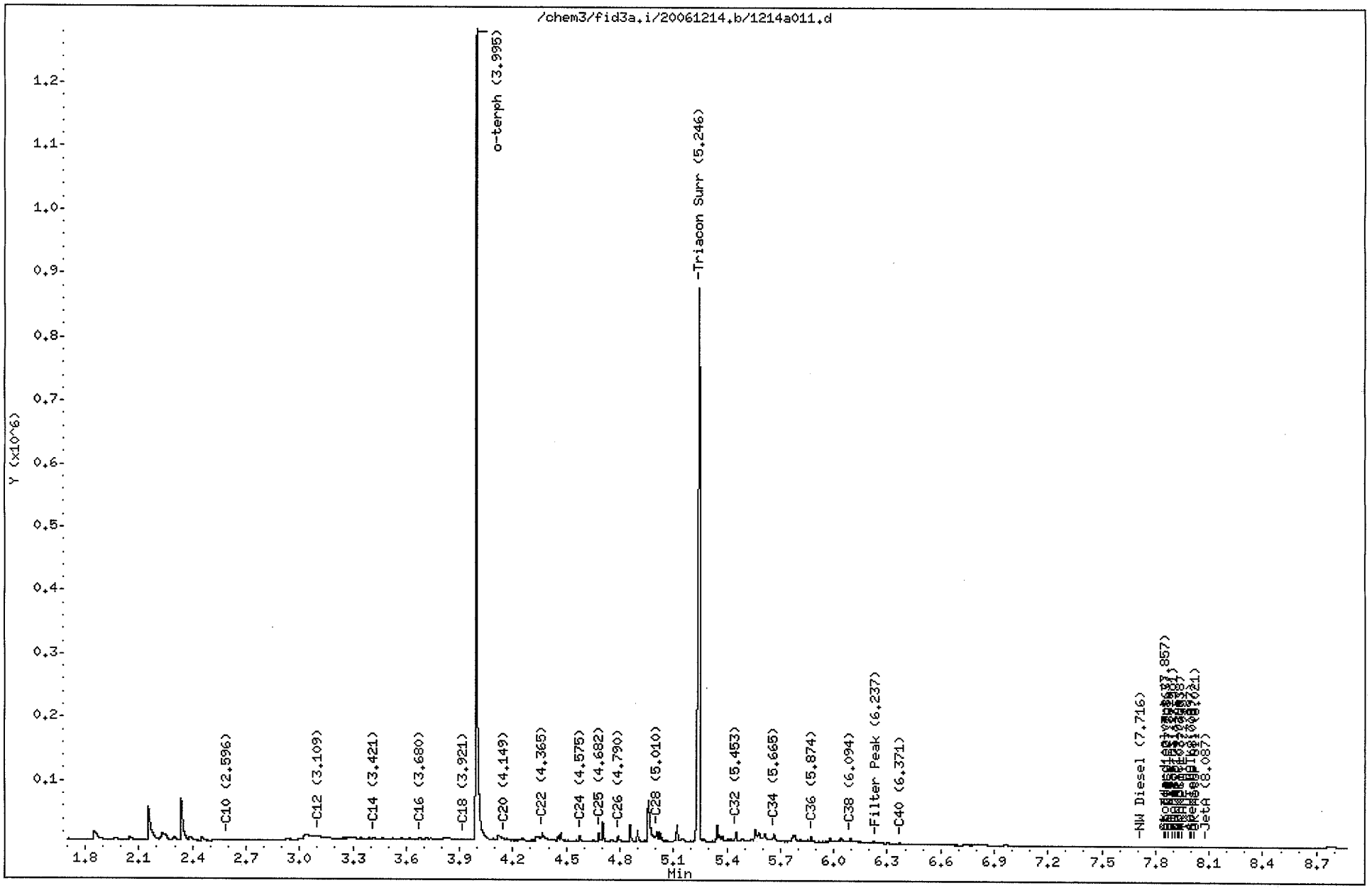
Analyte	RF	Curve Date
o-Terph Surr	18157.8	15-NOV-2006
Triacon Surr	13431.5	10-OCT-2006
Gas	22216.5	14-DEC-2006
Diesel	14864.3	15-NOV-2006
Motor Oil	8614.6	10-OCT-2006
AK102	18075.2	15-NOV-2006
AK103	6781.5	18-OCT-2006
JP4	11125.0	12-APR-2004
JP5	8746364.4	10-FEB-1999
JetA	11580.5	15-JUL-2006
Min Oil	11957.0	12-JUL-2004
Min Spirit	15825.3	15-APR-2005
Tran Oil	16409.1	30-SEP-2006
Kerosene	15426.1	09-NOV-2004
Bunker C	3023.0	29-JUL-2005
Creosote	3823.0	24-MAR-2005
Hydraulic	8899.0	12-JUL-2004
Diesel 1	100000.0	20-JUN-2001
Fuel Oil	530568.2	13-AUG-2002

Data File: /chem3/fid3a.i/20061214.b/1214a011.d
Date : 14-DEC-2006 12:45
Client ID:
Sample Info: KI11B

Instrument: fid3a.i

Operator: JR
Column diameter: 0.25

Column phase: RTX-1



Analytical Resources Inc.
TPH Quantitation Report

Data file: /chem3/fid3a.i/20061214.b/1214a012.d
Method: /chem3/fid3a.i/20061214.b/ftphfid3a.m
Instrument: fid3a.i
Operator: JR
Report Date: 12/16/2006
Macro: FID:3A121406

ARI ID: KI11C
Client ID:
Injection: 14-DEC-2006 13:01
Dilution Factor: 1

FID:3A RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	1.143	0.020	38354	110458	GAS (Tol-C12)	930137	42
C8	1.284	-0.002	15615	7664	DIESEL (C12-C24)	318077	21
C10	2.596	0.001	3765	4396	M.OIL (C24-C38)	266828	31
C12	3.104	-0.001	4369	1306	AK-102 (C10-C25)	464504	26
C14	3.424	0.002	4508	1165	AK-103 (C25-C36)	239176	35
C16	3.690	0.004	4356	4855			
C18	3.930	0.005	3281	1544			
C20	4.145	-0.005	4119	3082	JET-A (C10-C18)	338154	29
C22	4.365	-0.003	3219	1269	MIN.OIL (C24-C38)	266828	22
C24	4.587	0.008	4499	6810	MSPIRIT (Tol-C12)	930137	59
C25	4.692	0.004	4877	5285	TRANOIL (C12-C28)	405407	25
C26	4.799	0.004	4540	5931	KEROSEN (Tol-C18)	1122340	73
C28	5.014	0.000	7931	6284			
C32	5.456	0.001	7312	8072	FUEL OIL(C10-C24)	464028	1
C34	5.670	0.001	5509	7723			
Filter Peak	6.250	0.011	1551	807	JP-4 (Tol-C14)	1012945	91
C36	5.877	0.000	3876	3376	CREOSOT (C12-C22)	276339	72
C38	6.096	-0.002	2676	4046	HYDRAUL (C24-C38)	266828	30
C40	6.374	0.003	1423	1141	BUNKERC (C10-C38)	730857	242

Range Times: NW Diesel(3.154 - 4.630) NW Gas(1.073 - 3.154) NW M.Oil(4.630 - 6.148)
AK102(2.545 - 4.638) AK103(4.638 - 5.927) Jet A(2.545 - 3.976)

Surrogate	Area	Amount	%Rec
o-Terphenyl	696979	38.4	85.3
Triacontane	638132	47.5	105.6

12/16/06

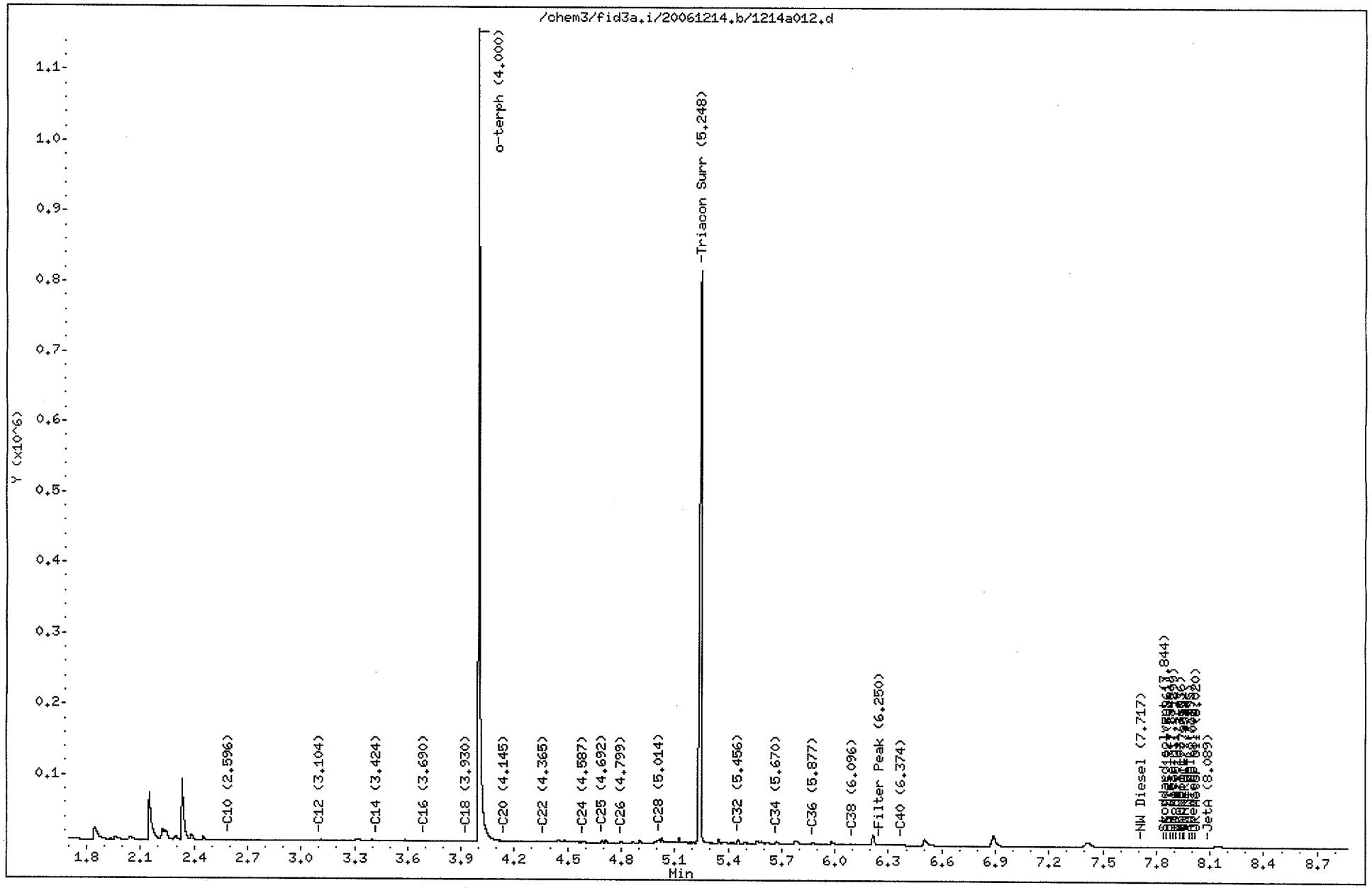
Analyte	RF	Curve Date
o-Terph Surr	18157.8	15-NOV-2006
Triacon Surr	13431.5	10-OCT-2006
Gas	22216.5	14-DEC-2006
Diesel	14864.3	15-NOV-2006
Motor Oil	8614.6	10-OCT-2006
AK102	18075.2	15-NOV-2006
AK103	6781.5	18-OCT-2006
JP4	11125.0	12-APR-2004
JP5	8746364.4	10-FEB-1999
JetA	11580.5	15-JUL-2006
Min Oil	11957.0	12-JUL-2004
Min Spirit	15825.3	15-APR-2005
Tran Oil	16409.1	30-SEP-2006
Kerosene	15426.1	09-NOV-2004
Bunker C	3023.0	29-JUL-2005
Creosote	3823.0	24-MAR-2005
Hydraulic	8899.0	12-JUL-2004
Diesel 1	100000.0	20-JUN-2001
Fuel Oil	530568.2	13-AUG-2002

Data File: /chem3/fid3a.i/20061214.b/1214a012.d
Date : 14-DEC-2006 13:01
Client ID:
Sample Info: KI11C

Instrument: fid3a.i

Operator: JR
Column diameter: 0.25

Column phase: RTX-1



Analytical Resources Inc.
TPH Quantitation Report

Data file: /chem3/fid3a.i/20061214.b/1214a013.d
Method: /chem3/fid3a.i/20061214.b/ftphfid3a.m
Instrument: fid3a.i
Operator: JR
Report Date: 12/16/2006
Macro: FID:3A121406

ARI ID: KI11D
Client ID:
Injection: 14-DEC-2006 13:16
Dilution Factor: 1

FID:3A RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	1.142	0.020	37717	120599	GAS (Tol-C12)	870861	39
C8	1.286	0.000	15721	8565	DIESEL (C12-C24)	387266	26
C10	2.596	0.001	3872	4345	M.OIL (C24-C38)	386470	45
C12	3.104	-0.001	10450	17396	AK-102 (C10-C25)	564062	31
C14	3.421	-0.001	5446	4015	AK-103 (C25-C36)	339886	50
C16	3.685	0.000	5686	6577			
C18	3.922	-0.004	4221	3104			
C20	4.155	0.005	5828	11325	JET-A (C10-C18)	408502	35
C22	4.368	0.000	7697	6236	MIN.OIL (C24-C38)	386470	32
C24	4.577	-0.002	6695	6908	MSPIRIT (Tol-C12)	870861	55
C25	4.684	-0.004	6927	5155	TRANOIL (C12-C28)	531092	32
C26	4.791	-0.004	6345	4852	KEROSEN (Tol-C18)	1105560	72
C28	5.010	-0.004	11688	7548			
C32	5.453	-0.003	9879	9139	FUEL OIL(C10-C24)	561069	1
C34	5.672	0.004	11247	12067			
Filter Peak	6.223	-0.017	3955	7814	JP-4 (Tol-C14)	969235	87
C36	5.873	-0.004	5840	8656	CREOSOT (C12-C22)	328010	86
C38	6.093	-0.005	4869	6516	HYDRAUL (C24-C38)	386470	43
C40	6.370	-0.002	2462	4281	BUNKERC (C10-C38)	947539	313

Range Times: NW Diesel(3.154 - 4.630) NW Gas(1.073 - 3.154) NW M.Oil(4.630 - 6.148)
AK102(2.545 - 4.638) AK103(4.638 - 5.927) Jet A(2.545 - 3.976)

Surrogate	Area	Amount	%Rec
o-Terphenyl	734750	40.5	89.9
Triacontane	672756	50.1	111.3

JR 12/16/06

Analyte	RF	Curve Date
o-Terph Surr	18157.8	15-NOV-2006
Triacon Surr	13431.5	10-OCT-2006
Gas	22216.5	14-DEC-2006
Diesel	14864.3	15-NOV-2006
Motor Oil	8614.6	10-OCT-2006
AK102	18075.2	15-NOV-2006
AK103	6781.5	18-OCT-2006
JP4	11125.0	12-APR-2004
JP5	8746364.4	10-FEB-1999
JetA	11580.5	15-JUL-2006
Min Oil	11957.0	12-JUL-2004
Min Spirit	15825.3	15-APR-2005
Tran Oil	16409.1	30-SEP-2006
Kerosene	15426.1	09-NOV-2004
Bunker C	3023.0	29-JUL-2005
Creosote	3823.0	24-MAR-2005
Hydraulic	8899.0	12-JUL-2004
Diesel 1	100000.0	20-JUN-2001
Fuel Oil	530568.2	13-AUG-2002

Data File: /chem3/fid3a.i/20061214.b/1214a013.d
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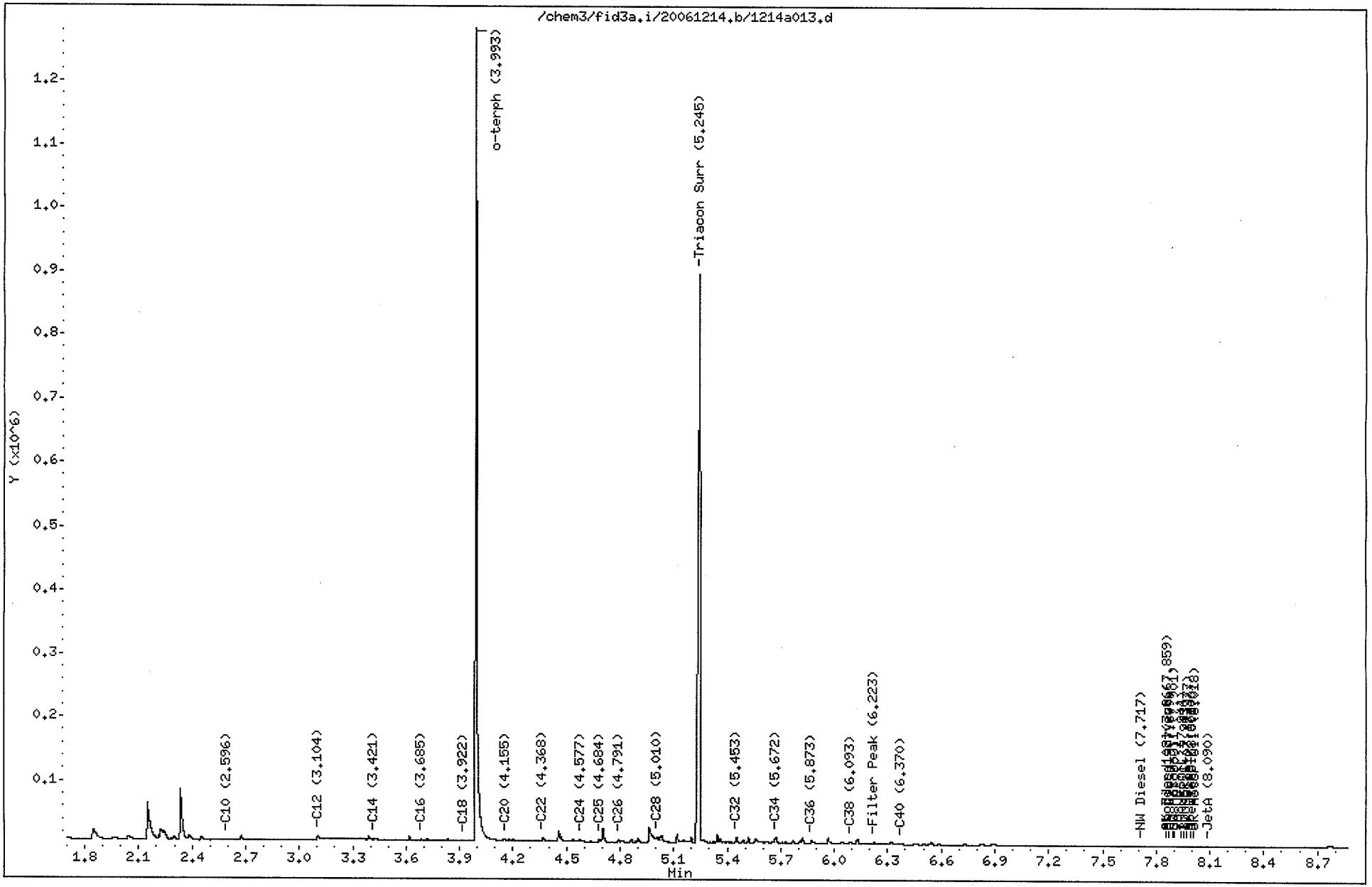
Client ID:
Sample Info: KI11D

Column phase: RTX-1

Instrument: fid3a.i

Operator: JR
Column diameter: 0.25



Analytical Resources Inc.
TPH Quantitation Report

Data file: /chem3/fid3a.i/20061214.b/1214a014.d
Method: /chem3/fid3a.i/20061214.b/ftphfid3a.m
Instrument: fid3a.i
Operator: JR
Report Date: 12/16/2006
Macro: FID:3A121406

ARI ID: KI11E
Client ID:
Injection: 14-DEC-2006 13:31
Dilution Factor: 1

FID:3A RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	1.145	0.023	37157	110054	GAS (Tol-C12)	878151	40
C8	1.298	0.012	15478	48682	DIESEL (C12-C24)	466331	31
C10	2.596	0.001	3657	1153	M.OIL (C24-C38)	628310	73
C12	3.105	0.001	9368	2790	AK-102 (C10-C25)	646260	36
C14	3.420	-0.002	5374	1601	AK-103 (C25-C36)	596463	88
C16	3.677	-0.009	24444	29575			
C18	3.925	-0.001	4909	4845			
C20	4.150	0.000	5855	3309	JET-A (C10-C18)	486508	42
C22	4.372	0.004	6433	9301	MIN.OIL (C24-C38)	628310	53
C24	4.579	-0.001	5010	4394	MSPIRIT (Tol-C12)	878151	55
C25	4.684	-0.004	5019	3102	TRANOIL (C12-C28)	900224	55
C26	4.789	-0.006	4967	3117	KEROSEN (Tol-C18)	1184730	77
C28	5.013	0.000	9772	8267			
C32	5.452	-0.004	5547	7087	FUEL OIL(C10-C24)	646260	1
C34	5.667	-0.001	4199	3660			
Filter Peak	6.242	0.003	1646	544	JP-4 (Tol-C14)	968623	87
C36	5.879	0.002	3162	559	CREOSOT (C12-C22)	403736	106
C38	6.092	-0.006	2554	3056	HYDRAUL (C24-C38)	628310	71
C40	6.367	-0.005	1450	2265	BUNKERC (C10-C38)	1274570	422

Range Times: NW Diesel(3.154 - 4.630) NW Gas(1.073 - 3.154) NW M.Oil(4.630 - 6.148)
AK102(2.545 - 4.638) AK103(4.638 - 5.927) Jet A(2.545 - 3.976)

Surrogate	Area	Amount	%Rec
o-Terphenyl	719964	39.7	88.1
Triacontane	654199	48.7	108.2

JR 12/16/06

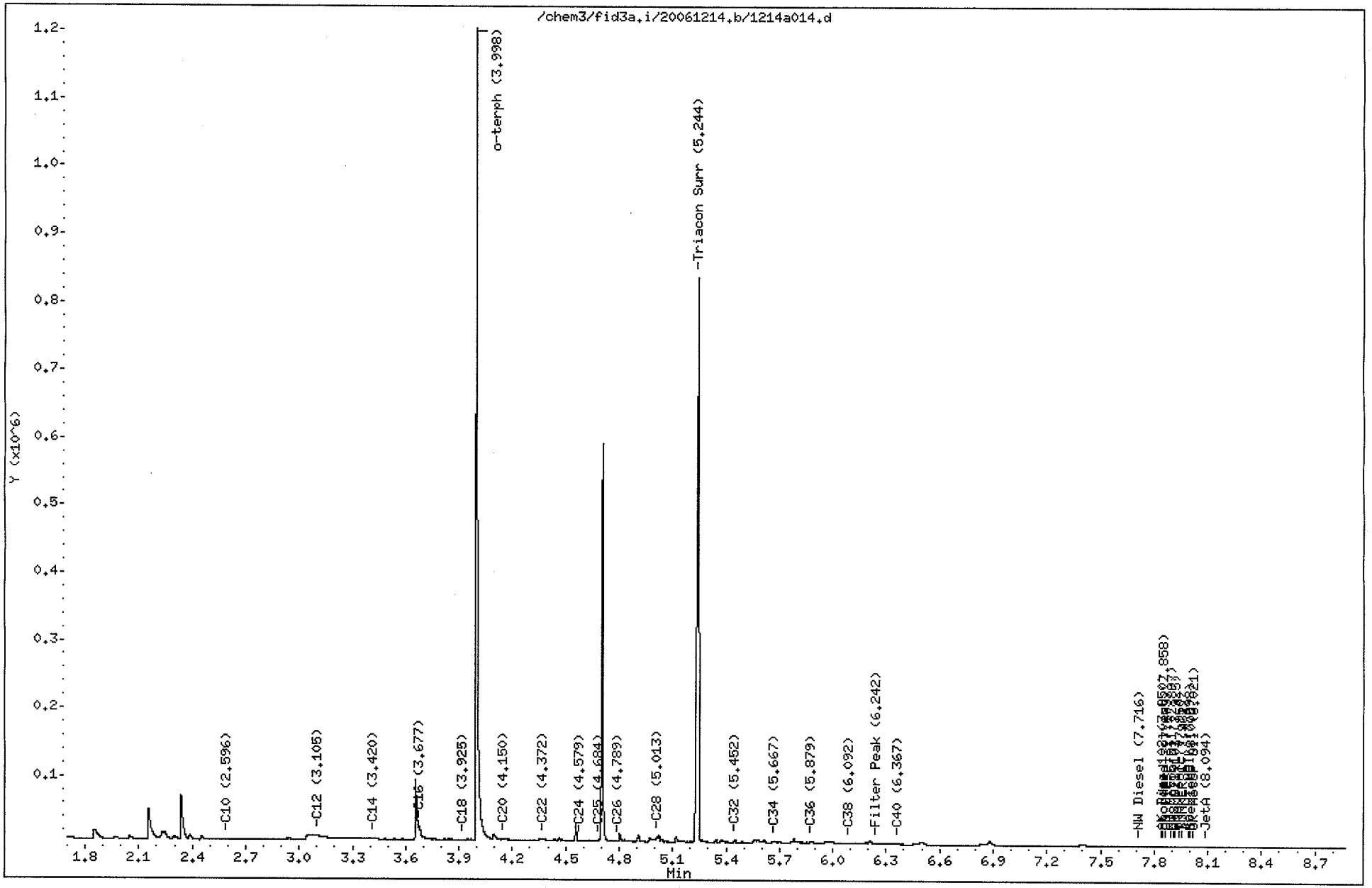
Analyte	RF	Curve Date
o-Terph Surr	18157.8	15-NOV-2006
Triacon Surr	13431.5	10-OCT-2006
Gas	22216.5	14-DEC-2006
Diesel	14864.3	15-NOV-2006
Motor Oil	8614.6	10-OCT-2006
AK102	18075.2	15-NOV-2006
AK103	6781.5	18-OCT-2006
JP4	11125.0	12-APR-2004
JP5	8746364.4	10-FEB-1999
JetA	11580.5	15-JUL-2006
Min Oil	11957.0	12-JUL-2004
Min Spirit	15825.3	15-APR-2005
Tran Oil	16409.1	30-SEP-2006
Kerosene	15426.1	09-NOV-2004
Bunker C	3023.0	29-JUL-2005
Creosote	3823.0	24-MAR-2005
Hydraulic	8899.0	12-JUL-2004
Diesel 1	100000.0	20-JUN-2001
Fuel Oil	530568.2	13-AUG-2002

Data File: /chem3/fid3a.i/20061214.b/1214a014.d
Date : 14-DEC-2006 13:31
Client ID:
Sample Info: KI11E

Instrument: fid3a.i

Operator: JR
Column diameter: 0.25

Column phase: RTX-1



Analytical Resources Inc.
TPH Quantitation Report

Data file: /chem3/fid3a.i/20061214.b/1214a020.d
Method: /chem3/fid3a.i/20061214.b/ftphfid3a.m
Instrument: fid3a.i
Operator: JR
Report Date: 12/16/2006
Macro: FID:3A121406

ARI ID: KI11F
Client ID:
Injection: 14-DEC-2006 15:04
Dilution Factor: 1

FID:3A RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	1.208	0.085	22453	77464	GAS (Tol-C12)	687375	31
C8	1.298	0.012	14904	18194	DIESEL (C12-C24)	398071	27
C10	2.594	0.000	3662	2549	M.OIL (C24-C38)	544453	63
C12	3.104	0.000	9004	7273	AK-102 (C10-C25)	562092	31
C14	3.421	-0.001	4597	2566	AK-103 (C25-C36)	514435	76
C16	3.687	0.001	4033	2155			
C18	3.925	-0.001	4354	3351			
C20	4.154	0.004	6524	8561	JET-A (C10-C18)	377268	33
C22	4.368	0.001	9145	11359	MIN.OIL (C24-C38)	544453	46
C24	4.577	-0.002	7724	7594	MSPIRIT (Tol-C12)	687375	43
C25	4.683	-0.005	7719	5206	TRANOIL (C12-C28)	707944	43
C26	4.789	-0.006	7992	5453	KEROSEN (Tol-C18)	901204	58
C28	5.012	-0.002	11914	9257			
C32	5.454	-0.001	10618	11253	FUEL OIL(C10-C24)	561510	1
C34	5.668	0.000	7297	9100			
Filter Peak	6.243	0.004	1651	1035	JP-4 (Tol-C14)	780258	70
C36	5.876	-0.001	5600	6480	CREOSOT (C12-C22)	328729	86
C38	6.096	-0.002	3600	5503	HYDRAUL (C24-C38)	544453	61
C40	6.374	0.003	2079	2337	BUNKERC (C10-C38)	1105963	366

Range Times: NW Diesel(3.154 - 4.630) NW Gas(1.073 - 3.154) NW M.Oil(4.630 - 6.148)
AK102(2.545 - 4.638) AK103(4.638 - 5.927) Jet A(2.545 - 3.976)

Surrogate	Area	Amount	%Rec
o-Terphenyl	711918	39.2	87.1
Triacontane	639478	47.6	105.8

JR 12/16/06

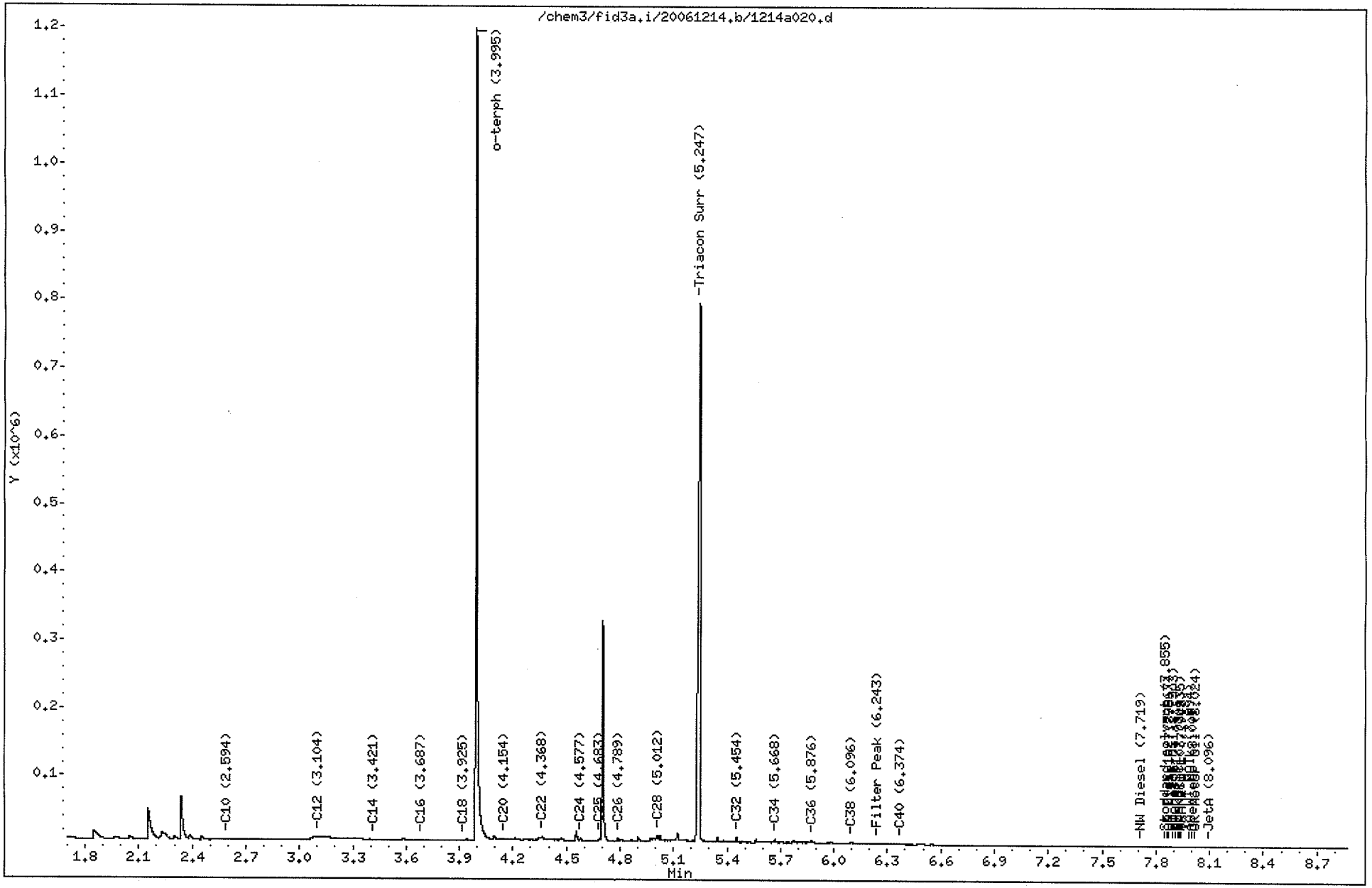
Analyte	RF	Curve Date
o-Terph Surr	18157.8	15-NOV-2006
Triacon Surr	13431.5	10-OCT-2006
Gas	22216.5	14-DEC-2006
Diesel	14864.3	15-NOV-2006
Motor Oil	8614.6	10-OCT-2006
AK102	18075.2	15-NOV-2006
AK103	6781.5	18-OCT-2006
JP4	11125.0	12-APR-2004
JP5	8746364.4	10-FEB-1999
JetA	11580.5	15-JUL-2006
Min Oil	11957.0	12-JUL-2004
Min Spirit	15825.3	15-APR-2005
Tran Oil	16409.1	30-SEP-2006
Kerosene	15426.1	09-NOV-2004
Bunker C	3023.0	29-JUL-2005
Creosote	3823.0	24-MAR-2005
Hydraulic	8899.0	12-JUL-2004
Diesel 1	100000.0	20-JUN-2001
Fuel Oil	530568.2	13-AUG-2002

Data File: /chem3/fid3a.i/20061214.b/1214a020.d
Date : 14-DEC-2006 15:04
Client ID:
Sample Info: KI11F

Instrument: fid3a.i

Operator: JR
Column diameter: 0.25

Column phase: RTX-1



Analytical Resources Inc.
TPH Quantitation Report

Data file: /chem3/fid3a.i/20061214.b/1214a021.d
Method: /chem3/fid3a.i/20061214.b/ftphfid3a.m
Instrument: fid3a.i
Operator: JR
Report Date: 12/16/2006
Macro: FID:3A121406

ARI ID: KI11G
Client ID:
Injection: 14-DEC-2006 15:19
Dilution Factor: 1

FID:3A RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	1.146	0.023	36802	107183	GAS (Tol-C12)	868947	39
C8	1.291	0.005	15076	8402	DIESEL (C12-C24)	331206	22
C10	2.591	-0.003	3772	526	M.OIL (C24-C38)	295262	34
C12	3.110	0.006	6869	9223	AK-102 (C10-C25)	496260	27
C14	3.423	0.001	5005	2392	AK-103 (C25-C36)	257707	38
C16	3.690	0.004	4918	8685			
C18	3.926	0.000	3723	2719			
C20	4.150	0.000	3931	1477	JET-A (C10-C18)	377677	33
C22	4.376	0.009	7139	12501	MIN.OIL (C24-C38)	295262	25
C24	4.583	0.003	5394	6283	MSPIRIT (Tol-C12)	868947	55
C25	4.688	0.000	5520	4110	TRANOIL (C12-C28)	448139	27
C26	4.795	0.000	5122	4118	KEROSEN (Tol-C18)	1084565	70
C28	5.011	-0.003	10327	8458			
C32	5.455	0.000	7557	7511	FUEL OIL(C10-C24)	493265	1
C34	5.675	0.007	9572	9410			
Filter Peak	6.231	-0.009	2938	5691	JP-4 (Tol-C14)	964035	87
C36	5.879	0.002	4353	6064	CREOSOT (C12-C22)	285409	75
C38	6.097	0.000	3056	2028	HYDRAUL (C24-C38)	295262	33
C40	6.378	0.007	1689	2941	BUNKERC (C10-C38)	788527	261

Range Times: NW Diesel(3.154 - 4.630) NW Gas(1.073 - 3.154) NW M.Oil(4.630 - 6.148)
AK102(2.545 - 4.638) AK103(4.638 - 5.927) Jet A(2.545 - 3.976)

Surrogate	Area	Amount	%Rec
o-Terphenyl	711073	39.2	87.0
Triacontane	654272	48.7	108.2

JR 12/14/06

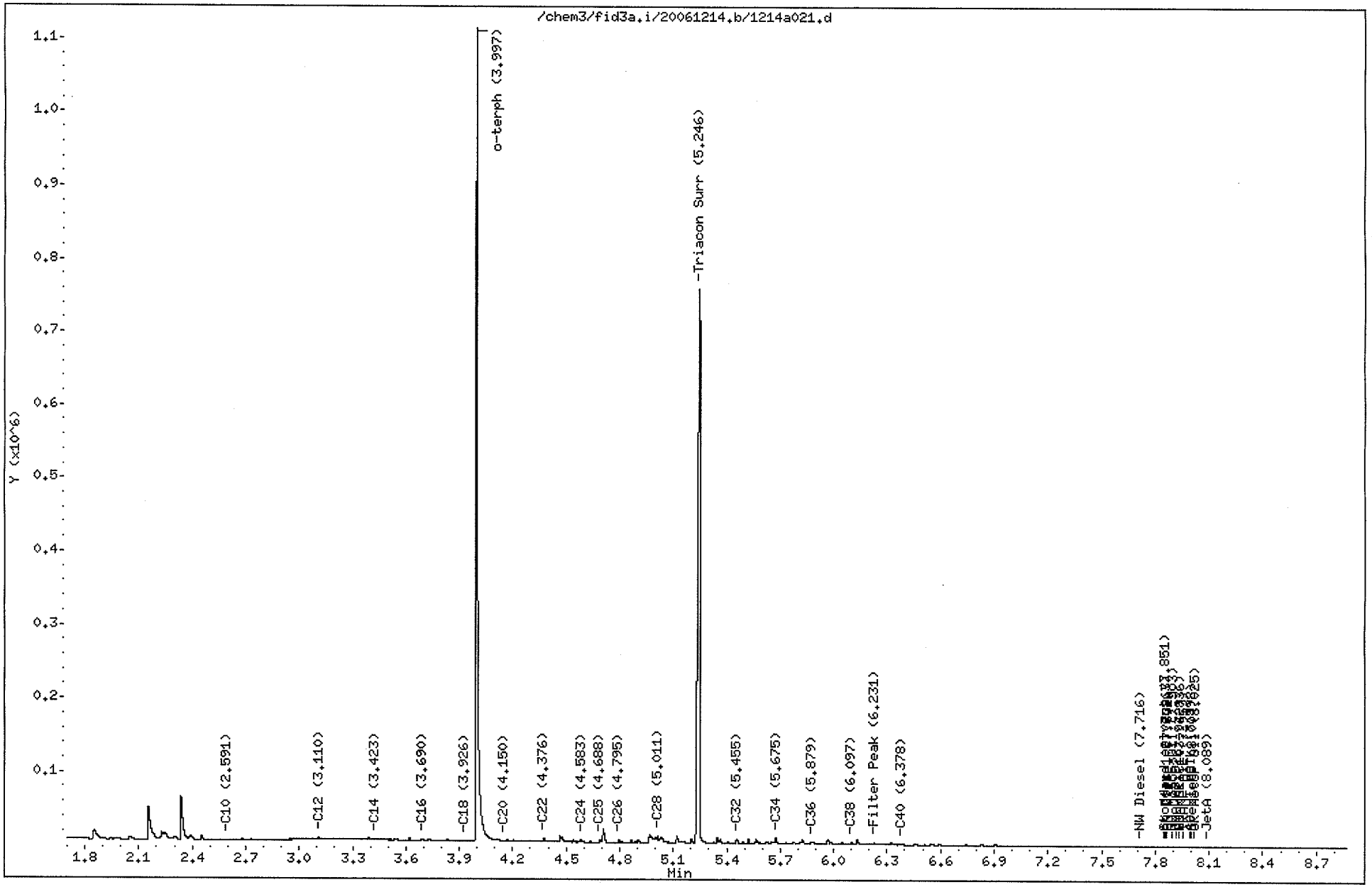
Analyte	RF	Curve Date
o-Terph Surr	18157.8	15-NOV-2006
Triacon Surr	13431.5	10-OCT-2006
Gas	22216.5	14-DEC-2006
Diesel	14864.3	15-NOV-2006
Motor Oil	8614.6	10-OCT-2006
AK102	18075.2	15-NOV-2006
AK103	6781.5	18-OCT-2006
JP4	11125.0	12-APR-2004
JP5	8746364.4	10-FEB-1999
JetA	11580.5	15-JUL-2006
Min Oil	11957.0	12-JUL-2004
Min Spirit	15825.3	15-APR-2005
Tran Oil	16409.1	30-SEP-2006
Kerosene	15426.1	09-NOV-2004
Bunker C	3023.0	29-JUL-2005
Creosote	3823.0	24-MAR-2005
Hydraulic	8899.0	12-JUL-2004
Diesel 1	100000.0	20-JUN-2001
Fuel Oil	530568.2	13-AUG-2002

Data File: /chem3/fid3a.i/20061214.b/1214a021.d
Date : 14-DEC-2006 15:19
Client ID:
Sample Info: KI11G

Instrument: fid3a.i

Operator: JR
Column diameter: 0.25

Column phase: RTX-1



Analytical Resources Inc.
TPH Quantitation Report

Data file: /chem3/fid3a.i/20061214.b/1214a015.d
Method: /chem3/fid3a.i/20061214.b/ftphfid3a.m
Instrument: fid3a.i
Operator: JR
Report Date: 12/16/2006
Macro: FID:3A121406

ARI ID: KI11EMS
Client ID:
Injection: 14-DEC-2006 13:47
Dilution Factor: 1

FID:3A RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	1.107	-0.016	53163	93158	GAS (Tol-C12)	3902999	176
C8	1.288	0.002	14342	15588	DIESEL (C12-C24)	15517211	1044
C10	2.601	0.006	181435	122527	M.OIL (C24-C38)	991563	115
C12	3.104	0.000	649340	274390	AK-102 (C10-C25)	18159986	1005
C14	3.422	0.000	878124	409961	AK-103 (C25-C36)	949213	140
C16	3.687	0.002	862943	506855			
C18	3.924	-0.001	606449	447672			
C20	4.147	-0.003	446292	266653	JET-A (C10-C18)	13960307	1205
C22	4.363	-0.005	183778	120733	MIN.OIL (C24-C38)	991563	83
C24	4.574	-0.006	74475	55004	MSPIRIT (Tol-C12)	3902999	247
C25	4.690	0.002	28339	4951	TRANOIL (C12-C28)	16269094	991
C26	4.791	-0.004	27466	16035	KEROSEN (Tol-C18)	15226523	987
C28	5.012	-0.002	13721	11180			
C32	5.455	0.000	6808	9325	FUEL OIL(C10-C24)	18153994	34
C34	5.669	0.000	5047	4850			
Filter Peak	6.239	0.000	1803	631	JP-4 (Tol-C14)	7750819	697
C36	5.877	0.000	4010	2931	CREOSOT (C12-C22)	14998297	3923
C38	6.094	-0.004	2907	2237	HYDRAUL (C24-C38)	991563	111
C40	6.369	-0.003	1586	1874	BUNKERC (C10-C38)	19145557	6333

Range Times: NW Diesel(3.154 - 4.630) NW Gas(1.073 - 3.154) NW M.Oil(4.630 - 6.148)
AK102(2.545 - 4.638) AK103(4.638 - 5.927) Jet A(2.545 - 3.976)

Surrogate	Area	Amount	%Rec
o-Terphenyl	675966	37.2	82.7
Triacontane	614784	45.8	101.7

JR 12/16/06

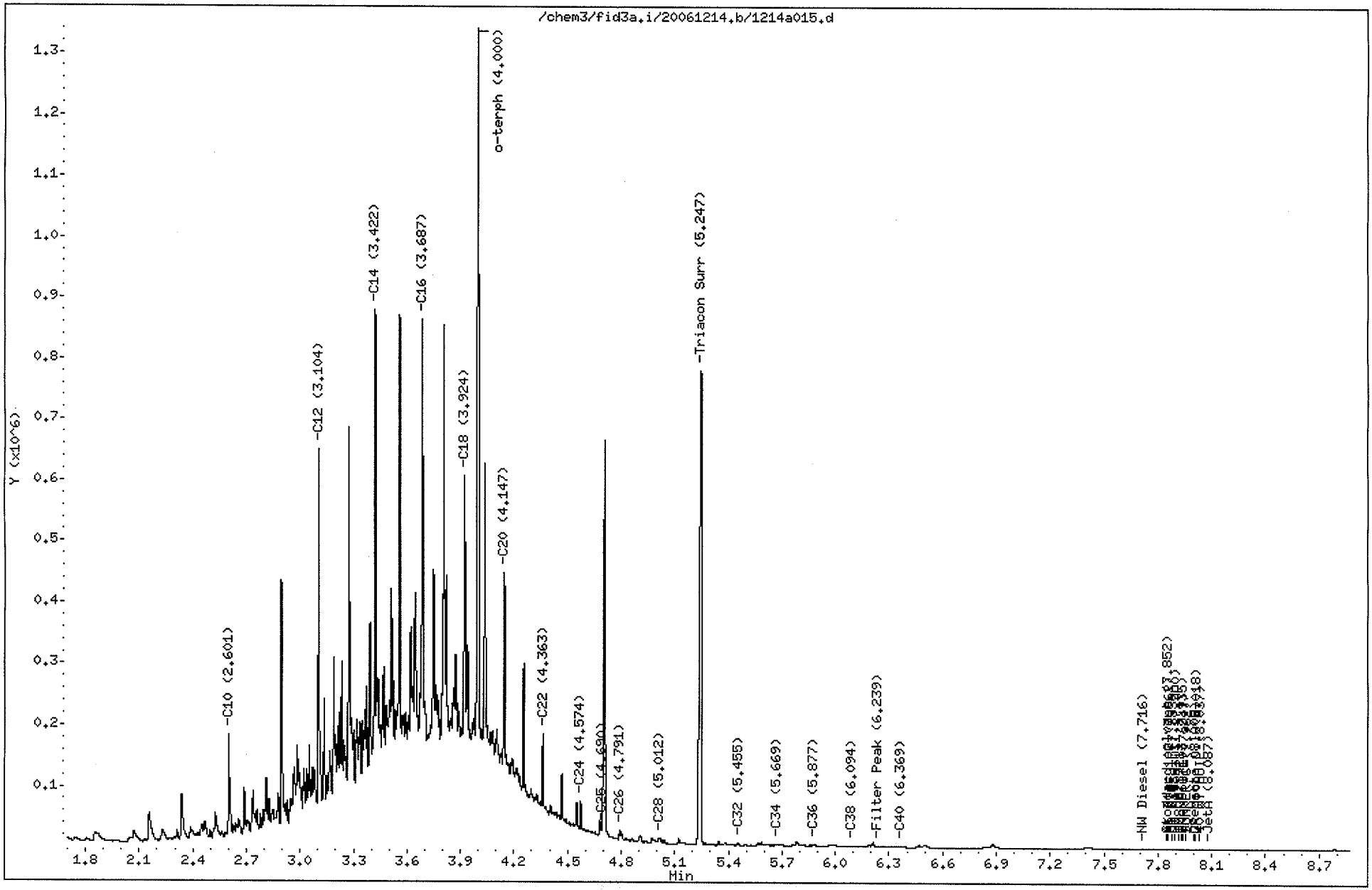
Analyte	RF	Curve Date
o-Terph Surr	18157.8	15-NOV-2006
Triacon Surr	13431.5	10-OCT-2006
Gas	22216.5	14-DEC-2006
Diesel	14864.3	15-NOV-2006
Motor Oil	8614.6	10-OCT-2006
AK102	18075.2	15-NOV-2006
AK103	6781.5	18-OCT-2006
JP4	11125.0	12-APR-2004
JP5	8746364.4	10-FEB-1999
JetA	11580.5	15-JUL-2006
Min Oil	11957.0	12-JUL-2004
Min Spirit	15825.3	15-APR-2005
Tran Oil	16409.1	30-SEP-2006
Kerosene	15426.1	09-NOV-2004
Bunker C	3023.0	29-JUL-2005
Creosote	3823.0	24-MAR-2005
Hydraulic	8899.0	12-JUL-2004
Diesel 1	100000.0	20-JUN-2001
Fuel Oil	530568.2	13-AUG-2002

Data File: /chem3/fid3a.i/20061214.b/1214a015.d
Date : 14-DEC-2006 13:47
Client ID:
Sample Info: KI11EMS

Instrument: fid3a.i

Operator: JR
Column diameter: 0.25

Column phase: RTX-1



Analytical Resources Inc.
TPH Quantitation Report

Data file: /chem3/fid3a.i/20061214.b/1214a016.d
Method: /chem3/fid3a.i/20061214.b/ftphfid3a.m
Instrument: fid3a.i
Operator: JR
Report Date: 12/16/2006
Macro: FID:3A121406

ARI ID: KI11EMSD
Client ID:
Injection: 14-DEC-2006 14:02
Dilution Factor: 1

FID:3A RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	1.149	0.026	40724	46419	GAS (Tol-C12)	4291668	193
C8	1.280	-0.006	14477	8966	DIESEL (C12-C24)	17271496	1162
C10	2.600	0.006	209143	134385	M.OIL (C24-C38)	558045	65
C12	3.104	0.000	718620	305558	AK-102 (C10-C25)	20286312	1122
C14	3.422	0.000	927814	478115	AK-103 (C25-C36)	531980	78
C16	3.689	0.003	927854	535740			
C18	3.931	0.005	615346	534437			
C20	4.154	0.004	509642	378308	JET-A (C10-C18)	15556850	1343
C22	4.369	0.001	200585	126004	MIN.OIL (C24-C38)	558045	47
C24	4.579	-0.001	82576	75347	MSPIRIT (Tol-C12)	4291668	271
C25	4.685	-0.003	46312	30867	TRANOIL (C12-C28)	17686510	1078
C26	4.792	-0.003	24726	17450	KEROSEN (Tol-C18)	16841656	1092
C28	5.012	-0.002	10680	13236			
C32	5.458	0.003	4452	5511	FUEL OIL(C10-C24)	20278358	38
C34	5.671	0.003	2545	1031			
Filter Peak	6.247	0.008	1100	943	JP-4 (Tol-C14)	8580188	771
C36	5.876	-0.001	1946	1225	CREOSOT (C12-C22)	16710463	4371
C38	6.097	-0.001	1518	673	HYDRAUL (C24-C38)	558045	63
C40	6.374	0.003	906	698	BUNKERC (C10-C38)	20836403	6893

Range Times: NW Diesel(3.154 - 4.630) NW Gas(1.073 - 3.154) NW M.Oil(4.630 - 6.148)
AK102(2.545 - 4.638) AK103(4.638 - 5.927) Jet A(2.545 - 3.976)

Surrogate	Area	Amount	%Rec
o-Terphenyl	731206	40.3	89.5
Triacontane	661079	49.2	109.4

JR 12/16/06

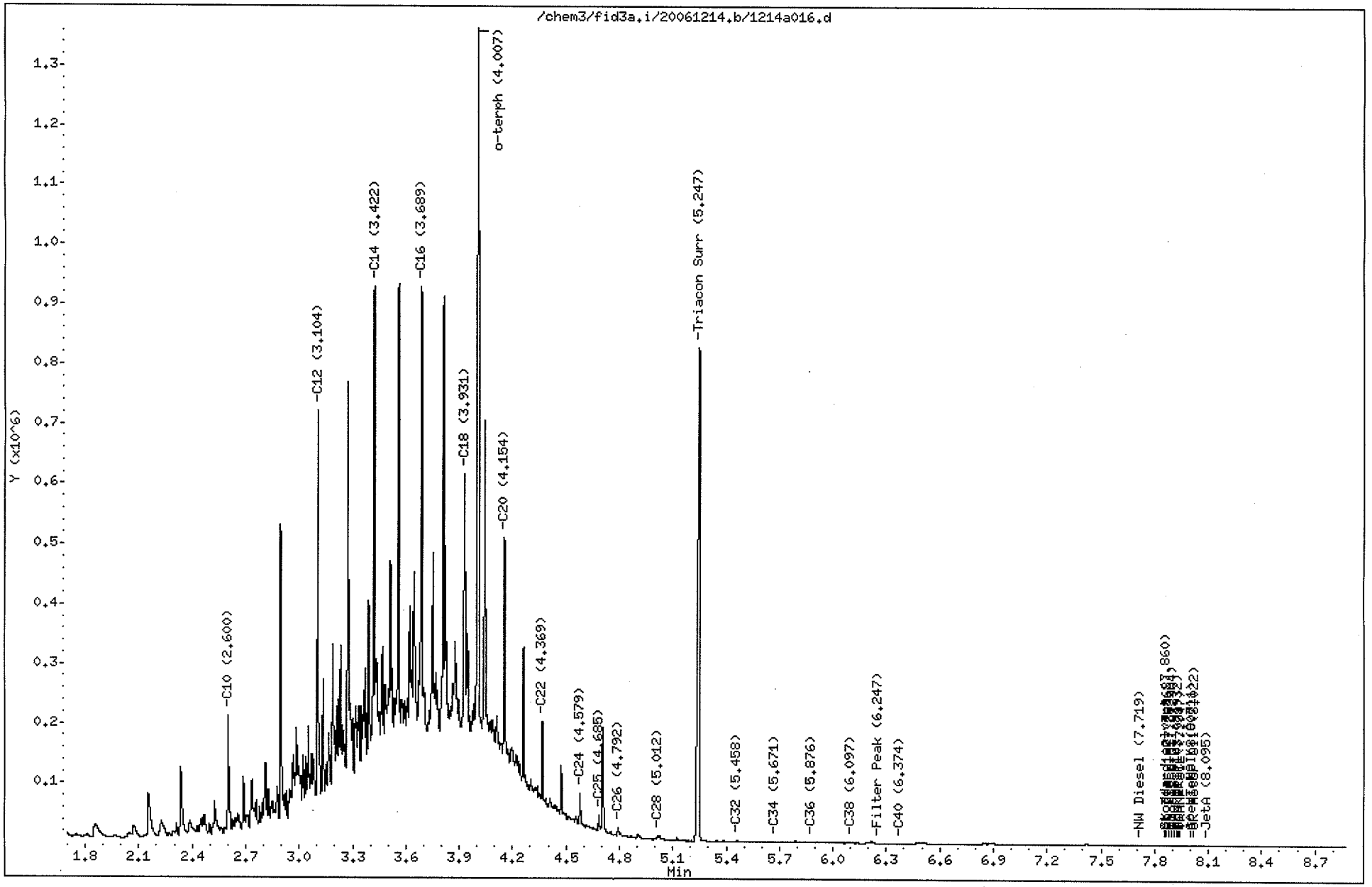
Analyte	RF	Curve Date
o-Terph Surr	18157.8	15-NOV-2006
Triacon Surr	13431.5	10-OCT-2006
Gas	22216.5	14-DEC-2006
Diesel	14864.3	15-NOV-2006
Motor Oil	8614.6	10-OCT-2006
AK102	18075.2	15-NOV-2006
AK103	6781.5	18-OCT-2006
JP4	11125.0	12-APR-2004
JP5	8746364.4	10-FEB-1999
JetA	11580.5	15-JUL-2006
Min Oil	11957.0	12-JUL-2004
Min Spirit	15825.3	15-APR-2005
Tran Oil	16409.1	30-SEP-2006
Kerosene	15426.1	09-NOV-2004
Bunker C	3023.0	29-JUL-2005
Creosote	3823.0	24-MAR-2005
Hydraulic	8899.0	12-JUL-2004
Diesel 1	100000.0	20-JUN-2001
Fuel Oil	530568.2	13-AUG-2002

Data File: /chem3/fid3a.i/20061214.b/1214a016.d
Date : 14-DEC-2006 14:02
Client ID:
Sample Info: KI11EMSD

Column phase: RTX-1

Instrument: fid3a.i

Operator: JR
Column diameter: 0.25



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Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
541.383.9310 fax 541.382.7588

Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/07/00 17:27

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SW-1	B0J0800-01	Water	10/31/00 11:45	10/31/00 17:55
SW-2	B0J0800-02	Water	10/31/00 12:05	10/31/00 17:55
DW-2	B0J0800-03	Water	10/31/00 13:40	10/31/00 17:55
DW-3	B0J0800-04	Water	10/31/00 13:50	10/31/00 17:55

North Creek Analytical - Bothell

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.

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/07/00 17:27

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SW-1 (B0J0800-01) Water Sampled: 10/31/00 11:45 Received: 10/31/00 17:55									
Gasoline Range Hydrocarbons	ND	50.0	ug/l	1	0K02011	11/02/00	11/02/00	NWTPH-Gx/8021B	
Benzene	ND	0.500	"	"	"	"	"	"	
Toluene	ND	0.500	"	"	"	"	"	"	
Ethylbenzene	ND	0.500	"	"	"	"	"	"	
Xylenes (total)	ND	1.00	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*103 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*95.4 %*	*50-150*			"	"	"	"	
SW-2 (B0J0800-02) Water Sampled: 10/31/00 12:05 Received: 10/31/00 17:55									
Gasoline Range Hydrocarbons	ND	50.0	ug/l	1	0K02011	11/02/00	11/02/00	NWTPH-Gx/8021B	
Benzene	ND	0.500	"	"	"	"	"	"	
Toluene	ND	0.500	"	"	"	"	"	"	
Ethylbenzene	ND	0.500	"	"	"	"	"	"	
Xylenes (total)	ND	1.00	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*92.1 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*95.2 %*	*50-150*			"	"	"	"	
DW-2 (B0J0800-03) Water Sampled: 10/31/00 13:40 Received: 10/31/00 17:55									
Gasoline Range Hydrocarbons	ND	50.0	ug/l	1	0K02011	11/02/00	11/02/00	NWTPH-Gx/8021B	
Benzene	ND	0.500	"	"	"	"	"	"	
Toluene	ND	0.500	"	"	"	"	"	"	
Ethylbenzene	ND	0.500	"	"	"	"	"	"	
Xylenes (total)	ND	1.00	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*102 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*95.2 %*	*50-150*			"	"	"	"	

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541.383.9310 fax 541.382.7588

Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/07/00 17:27

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
DW-3 (B0J0800-04) Water Sampled: 10/31/00 13:50 Received: 10/31/00 17:55									
Gasoline Range Hydrocarbons	ND	50.0	ug/l	1	0K02011	11/02/00	11/03/00	NWTPH-Gx/8021B	
Benzene	ND	0.500	"	"	"	"	"	"	
Toluene	**0.771**	0.500	"	"	"	"	"	"	
Ethylbenzene	ND	0.500	"	"	"	"	"	"	
Xylenes (total)	**1.25**	1.00	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*101 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*95.6 %*	*50-150*			"	"	"	"	

North Creek Analytical - Bothell

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Kirk Gendron, Project Manager

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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

Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/07/00 17:27

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SW-1 (B0J0800-01) Water Sampled: 10/31/00 11:45 Received: 10/31/00 17:55									
Diesel Range Hydrocarbons	**0.370**	0.250	mg/l	1	0K01010	11/01/00	11/02/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	0.500	"	"	"	"	"	"	
Surrogate: 2-FBP	*124 %*	*50-150*			"	"	"	"	
SW-2 (B0J0800-02) Water Sampled: 10/31/00 12:05 Received: 10/31/00 17:55									
Diesel Range Hydrocarbons	**0.253**	0.250	mg/l	1	0K01010	11/01/00	11/02/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	0.500	"	"	"	"	"	"	
Surrogate: 2-FBP	*102 %*	*50-150*			"	"	"	"	
DW-2 (B0J0800-03) Water Sampled: 10/31/00 13:40 Received: 10/31/00 17:55									
Diesel Range Hydrocarbons	ND	0.250	mg/l	1	0K01010	11/01/00	11/02/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	0.500	"	"	"	"	"	"	
Surrogate: 2-FBP	*106 %*	*50-150*			"	"	"	"	
DW-3 (B0J0800-04) Water Sampled: 10/31/00 13:50 Received: 10/31/00 17:55									
Diesel Range Hydrocarbons	ND	0.250	mg/l	1	0K01010	11/01/00	11/02/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	0.500	"	"	"	"	"	"	
Surrogate: 2-FBP	*94.6 %*	*50-150*			"	"	"	"	

Kirk Gendron, Project Manager

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541.383.9310 fax 541.382.7588

Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/07/00 17:27

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0K02011: Prepared 11/02/00 Using EPA 5030B (P/T)										
Blank (0K02011-BLK1)										
Gasoline Range Hydrocarbons	ND	50.0	ug/l							
Benzene	ND	0.500	"							
Toluene	ND	0.500	"							
Ethylbenzene	ND	0.500	"							
Xylenes (total)	ND	1.00	"							
Surrogate: 4-BFB (FID)	*48.3*		"	*48.0*		*101*	*50-150*			
Surrogate: 4-BFB (PID)	*43.8*		"	*48.0*		*91.2*	*50-150*			
LCS (0K02011-BS1)										
Gasoline Range Hydrocarbons	461	50.0	ug/l	500		92.2	70-130			
Surrogate: 4-BFB (FID)	*53.0*		"	*48.0*		*110*	*50-150*			
Duplicate (0K02011-DUP1)					**Source: B0J0800-01**					
Gasoline Range Hydrocarbons	ND	50.0	ug/l		ND			35.9	25	Q-05
Surrogate: 4-BFB (FID)	*41.3*		"	*48.0*		*86.0*	*50-150*			
Matrix Spike (0K02011-MS1)					**Source: B0J0800-03**					
Benzene	9.70	0.500	ug/l	10.0	ND	97.0	70-130			
Toluene	9.59	0.500	"	10.0	ND	95.9	70-130			
Ethylbenzene	9.82	0.500	"	10.0	ND	98.2	70-130			
Xylenes (total)	29.2	1.00	"	30.0	ND	97.3	70-130			
Surrogate: 4-BFB (PID)	*45.4*		"	*48.0*		*94.6*	*50-150*			
Matrix Spike Dup (0K02011-MSD1)					**Source: B0J0800-03**					
Benzene	9.67	0.500	ug/l	10.0	ND	96.7	70-130	0.310	15	
Toluene	9.49	0.500	"	10.0	ND	94.9	70-130	1.05	15	
Ethylbenzene	9.62	0.500	"	10.0	ND	96.2	70-130	2.06	15	
Xylenes (total)	28.6	1.00	"	30.0	ND	95.3	70-130	2.08	15	
Surrogate: 4-BFB (PID)	*45.5*		"	*48.0*		*94.8*	*50-150*			

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/07/00 17:27

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up) - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0K01010: Prepared 11/01/00 Using EPA 3520C/600 Series										
Blank (0K01010-BLK1)										
Diesel Range Hydrocarbons	ND	0.250	mg/l							
Lube Oil Range Hydrocarbons	ND	0.500	"							
Surrogate: 2-FBP	*0.358*		"	*0.320*		*112*	*50-150*			
LCS (0K01010-BS1)										
Diesel Range Hydrocarbons	2.02	0.250	mg/l	2.00		101	60-140			
Surrogate: 2-FBP	*0.356*		"	*0.320*		*111*	*50-150*			
LCS Dup (0K01010-BSD1)										
Diesel Range Hydrocarbons	1.92	0.250	mg/l	2.00		96.0	60-140	5.08	40	
Surrogate: 2-FBP	*0.364*		"	*0.320*		*114*	*50-150*			

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/07/00 17:27

Notes and Definitions

Q-05	Analyses are not controlled on RPD values from sample concentrations less than 10 times the reporting limit.
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 - Bothell

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Kirk Gendron, Project Manager

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CHAIN OF CUSTODY REPORT

Work Order #: B0J0800

CLIENT: URS
REPORT TO: David Rubsoyel
ADDRESS: 2025 First Ave, Ste 500
Seattle WA 98374
PHONE: 1-206-728-0744 FAX: 1-206-727-3350

INVOICE TO: Same as report to
P.O. NUMBER:

PROJECT NAME: True Mountain - Laurel Sta.
PROJECT NUMBER:
SAMPLED BY: DRQ, KM

TURNAROUND REQUEST in Business Days*
Organic & Inorganic Analyses: 10 | 7 | 5 | 4 | 3 | 2 | 1 | <1
STD. Petroleum Hydrocarbon Analyses: [5] | 4 | 3 | 2 | 1 | <1
STD. OTHER Please Specify
*Turnaround Requests less than standard may incur Rush Charges.

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NWTPH-Gx	BETX	NWTPH-Dx											MATRIX (W, S, O)	# OF CONT.	COMMENTS	NCA WO ID
			REQUESTED ANALYSES																
1.	SW-1	10-31-00 / 1145	X	X	X										01	SW	3		
2.	SW-2	10-31-00 / 1205	X	X	X										02	SW	3		
3.	DW-2	10-31-00 / 1340	X	X	X										03	SW	3		
4.	DW-3	10-31-00 / 1350	X	X	X										04				
5.																			
6.																			
7.																			
8.																			
9.																			
10.																			
11.																			
12.																			
13.																			
14.																			
15.																			

RELINQUISHED BY: [signature] DATE: 10-31-00
PRINT NAME: Kevin L Mixon FIRM: URS TIME: 1755

RECEIVED BY: [signature]
PRINT NAME: S. Yalamanchi FIRM: NCA DATE: 10-31-00 TIME: 17:55

RELINQUISHED BY: DATE:
PRINT NAME: FIRM: TIME:

RECEIVED BY: DATE:
PRINT NAME: FIRM: TIME:

ADDITIONAL REMARKS:

TEMP: 1.1.9 MC

REV PAGE

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/06/00 15:43

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
PEX-6-S-5	B0K0103-02	Soil	11/02/00 13:30	11/03/00 17:30
PEX-1-11	B0K0103-03	Soil	11/02/00 09:20	11/03/00 17:30

North Creek Analytical - Bothell

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Scott A. Woerman, Project Manager

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/06/00 15:43

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-6-S-5 (B0K0103-02) Soil Sampled: 11/02/00 13:30 Received: 11/03/00 17:30									
Gasoline Range Hydrocarbons	**5.41**	5.00	mg/kg dry	1	0K04006	11/04/00	11/05/00	NWTPH-Gx/80	
Benzene	ND	0.0500	"	"	"	"	"	21B	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)		*85.2 %*	*50-150*		"	"	"	"	
Surrogate: 4-BFB (PID)		*91.6 %*	*50-150*		"	"	"	"	
PEX-1-11 (B0K0103-03) Soil Sampled: 11/02/00 09:20 Received: 11/03/00 17:30									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K04006	11/04/00	11/05/00	NWTPH-Gx/80	
Benzene	ND	0.0500	"	"	"	"	"	21B	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)		*72.1 %*	*50-150*		"	"	"	"	
Surrogate: 4-BFB (PID)		*87.0 %*	*50-150*		"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/06/00 15:43

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-6-S-5 (B0K0103-02) Soil Sampled: 11/02/00 13:30 Received: 11/03/00 17:30									
Diesel Range Hydrocarbons	**767**	10.0	mg/kg dry	1	0K04005	11/04/00	11/04/00	NWTPH-Dx	D-09
Lube Oil Range Hydrocarbons	**503**	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP		*79.5 %*	*50-150*		"	"	"	"	
PEX-1-11 (B0K0103-03) Soil Sampled: 11/02/00 09:20 Received: 11/03/00 17:30									
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K04005	11/04/00	11/04/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP		*74.6 %*	*50-150*		"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/06/00 15:43

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-6-S-5 (B0K0103-02) Soil Sampled: 11/02/00 13:30 Received: 11/03/00 17:30									
Dry Weight	**90.9**	1.00	%	1	0K05004	11/05/00	11/06/00	BSOPSPL003R 07	
PEX-1-11 (B0K0103-03) Soil Sampled: 11/02/00 09:20 Received: 11/03/00 17:30									
Dry Weight	**79.8**	1.00	%	1	0K05004	11/05/00	11/06/00	BSOPSPL003R 07	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/06/00 15:43

Notes and Definitions

D-09	Results in the diesel organics range are primarily due to overlap from a heavy oil range product.
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

Scott A. Woerman, Project Manager

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CHAIN OF CUSTODY REPORT

Work Order #: BOK0103

CLIENT: URS
REPORT TO: David Rubsvagel
ADDRESS: 2025 First Ave Ste 500 Seattle, WA 98174
PHONE: 206-728-0744 FAX: 206-727-3350

INVOICE TO: Same as report to
P.O. NUMBER:

PROJECT NAME: Trans Mtn Kinder Point
PROJECT NUMBER:
SAMPLED BY: KM / KWL

TURNAROUND REQUEST in Business Days*
Organic & Inorganic Analyses: 10 | 7 | 5 | 4 | 3 | 2 | 1 | <1 (STD.)
Petroleum Hydrocarbon Analyses: 5 | 4 | 3 | 2 | 1 | <1 (STD.)
OTHER — Please Specify 24hr
*Turnaround Requests less than standard may incur Rush Charges.

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	Hold	NWTPH-Dx/BTEX	NWTPH-Dx	MATRIX (W, S, O)	# OF CONT.	COMMENTS	NCA WO ID
1.	Test Pit Forest	11-2-00 / 1135	X					BOK0103	-01
2.	PEX-6-S-5	11-2-00 / 1330		X	X				-02
3.	PEX-1-11	11-2-00 / 0920		X	X				-03
4.	PEX-2-Side-5	11-2-00 / 0930	X						-04
5.	~~Pex-3 side~~								-05
6.	PEX-3-~~base~~ B -3	11-2-00 / 0935	X						-06
7.	PEX-4-B-11	11-2-00 / 0940	X						-07
8.	PEX-5-B-5	11-2-00 / 0941	X						-08
9.									
10.									
11.									
12.									
13.									
14.									
15.									

REQUESTED ANALYSES

RELINQUISHED BY: [signature] DATE: 11-3-00
PRINT NAME: Kim L. Mills FIRM: URS TIME: 1425
RECEIVED BY: [signature] DATE: 11/3/00
PRINT NAME: Karla Kuczorowski FIRM: NCA TIME: 17:30

RELINQUISHED BY: DATE:
PRINT NAME: FIRM: TIME:
RECEIVED BY: DATE:
PRINT NAME: FIRM: TIME:

ADDITIONAL REMARKS:

COC REV 3/99

TEMP: 10 GE 1 of 1

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/07/00 14:17

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
PEX-8-B-10	B0K0106-01	Soil	11/03/00 11:06	11/03/00 19:15
PEX-9-B-10	B0K0106-02	Soil	11/03/00 11:11	11/03/00 19:15
PEX-10-B-6	B0K0106-03	Soil	11/03/00 11:54	11/03/00 19:15
PEX-11-S-7	B0K0106-04	Soil	11/03/00 16:05	11/03/00 19:15
PEX-12-S-7	B0K0106-05	Soil	11/03/00 16:10	11/03/00 19:15
PEX-13-S-5	B0K0106-06	Soil	11/03/00 16:15	11/03/00 19:15
PEX-14-S-1	B0K0106-07	Soil	11/03/00 15:15	11/03/00 19:15

North Creek Analytical - Bothell

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/07/00 14:17

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-8-B-10 (B0K0106-01) Soil Sampled: 11/03/00 11:06 Received: 11/03/00 19:15									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K04006	11/04/00	11/05/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*83.5 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*89.2 %*	*50-150*			"	"	"	"	
PEX-9-B-10 (B0K0106-02) Soil Sampled: 11/03/00 11:11 Received: 11/03/00 19:15									
Gasoline Range Hydrocarbons	**129**	10.0	mg/kg dry	2	0K04006	11/04/00	11/05/00	NWTPH-Gx/8021B	
Benzene	ND	0.100	"	"	"	"	"	"	
Toluene	ND	0.100	"	"	"	"	"	"	
Ethylbenzene	ND	0.840	"	"	"	"	"	"	R-03
Xylenes (total)	**1.34**	0.200	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*115 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*104 %*	*50-150*			"	"	"	"	
PEX-10-B-6 (B0K0106-03) Soil Sampled: 11/03/00 11:54 Received: 11/03/00 19:15									
Gasoline Range Hydrocarbons	**17.6**	5.00	mg/kg dry	1	0K04006	11/04/00	11/05/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*83.3 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*83.5 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/07/00 14:17

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-11-S-7 (B0K0106-04) Soil Sampled: 11/03/00 16:05 Received: 11/03/00 19:15									
Gasoline Range Hydrocarbons	**997**	50.0	mg/kg dry	10	0K04006	11/04/00	11/05/00	NWTPH-Gx/8021B	
Benzene	ND	2.00	"	"	"	"	"	"	R-03
Toluene	ND	0.500	"	"	"	"	"	"	
Ethylbenzene	ND	7.00	"	"	"	"	"	"	R-03
Xylenes (total)	**45.0**	1.00	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*248 %*	*50-150*			"	"	"	"	*S-02*
Surrogate: 4-BFB (PID)	*138 %*	*50-150*			"	"	"	"	
PEX-12-S-7 (B0K0106-05) Soil Sampled: 11/03/00 16:10 Received: 11/03/00 19:15									
Gasoline Range Hydrocarbons	**869**	100	mg/kg dry	20	0K04006	11/04/00	11/05/00	NWTPH-Gx/8021B	
Benzene	ND	1.00	"	"	"	"	"	"	
Toluene	ND	1.00	"	"	"	"	"	"	
Ethylbenzene	ND	6.00	"	"	"	"	"	"	R-03
Xylenes (total)	**32.3**	2.00	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*236 %*	*50-150*			"	"	"	"	*S-06*
Surrogate: 4-BFB (PID)	*141 %*	*50-150*			"	"	"	"	
PEX-13-S-5 (B0K0106-06) Soil Sampled: 11/03/00 16:15 Received: 11/03/00 19:15									
Gasoline Range Hydrocarbons	**38.2**	5.00	mg/kg dry	1	0K04006	11/04/00	11/05/00	NWTPH-Gx/8021B	
Benzene	**0.573**	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.150	"	"	"	"	"	"	R-03
Xylenes (total)	**2.57**	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*85.1 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*97.0 %*	*50-150*			"	"	"	"	

North Creek Analytical - Bothell

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/07/00 14:17

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-14-S-1 (B0K0106-07) Soil	**Sampled: 11/03/00 15:15**	**Received: 11/03/00 19:15**							
Gasoline Range Hydrocarbons	**190**	10.0	mg/kg dry	2	0K04006	11/04/00	11/05/00	NWTPH-Gx/8021B	
Benzene	ND	0.400	"	"	"	"	"	"	R-03
Toluene	**1.27**	0.100	"	"	"	"	"	"	
Ethylbenzene	ND	0.800	"	"	"	"	"	"	R-03
Xylenes (total)	**3.79**	0.200	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*126 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*110 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/07/00 14:17

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-8-B-10 (B0K0106-01) Soil Sampled: 11/03/00 11:06 Received: 11/03/00 19:15									
Diesel Range Hydrocarbons	**21.9**	10.0	mg/kg dry	1	0K04005	11/04/00	11/04/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*63.9 %*	*50-150*			"	"	"	"	
PEX-9-B-10 (B0K0106-02) Soil Sampled: 11/03/00 11:11 Received: 11/03/00 19:15									
Diesel Range Hydrocarbons	**157**	10.0	mg/kg dry	1	0K04005	11/04/00	11/04/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*111 %*	*50-150*			"	"	"	"	
PEX-10-B-6 (B0K0106-03) Soil Sampled: 11/03/00 11:54 Received: 11/03/00 19:15									
Diesel Range Hydrocarbons	**29.4**	10.0	mg/kg dry	1	0K04005	11/04/00	11/04/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*61.9 %*	*50-150*			"	"	"	"	
PEX-11-S-7 (B0K0106-04) Soil Sampled: 11/03/00 16:05 Received: 11/03/00 19:15									
Diesel Range Hydrocarbons	**670**	10.0	mg/kg dry	1	0K04005	11/04/00	11/04/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	**30.0**	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*%*	*50-150*			"	"	"	"	*S-05*
Surrogate: Octacosane	*90.4 %*	*50-150*			"	"	"	"	
PEX-12-S-7 (B0K0106-05) Soil Sampled: 11/03/00 16:10 Received: 11/03/00 19:15									
Diesel Range Hydrocarbons	**431**	10.0	mg/kg dry	1	0K04005	11/04/00	11/04/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*116 %*	*50-150*			"	"	"	"	

North Creek Analytical - Bothell

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/07/00 14:17

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-13-S-5 (B0K0106-06) Soil	**Sampled: 11/03/00 16:15**		**Received: 11/03/00 19:15**						
Diesel Range Hydrocarbons	**28.8**	10.0	mg/kg dry	1	0K04005	11/04/00	11/04/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*89.5 %*	*50-150*			"	"	"	"	
PEX-14-S-1 (B0K0106-07) Soil	**Sampled: 11/03/00 15:15**		**Received: 11/03/00 19:15**						
Diesel Range Hydrocarbons	**681**	110	mg/kg dry	11	0K06032	11/06/00	11/06/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	**392**	275	"	"	"	"	"	"	
Surrogate: 2-FBP	*%*	*50-150*			"	"	"	"	*S-01*
Surrogate: Octacosane	*119 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/07/00 14:17

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-8-B-10 (B0K0106-01) Soil	**Sampled: 11/03/00 11:06**	**Received: 11/03/00 19:15**							
Dry Weight	**86.8**	1.00	%	1	0K05004	11/05/00	11/06/00	BSOPSPL003R07	
PEX-9-B-10 (B0K0106-02) Soil	**Sampled: 11/03/00 11:11**	**Received: 11/03/00 19:15**							
Dry Weight	**85.5**	1.00	%	1	0K05004	11/05/00	11/06/00	BSOPSPL003R07	
PEX-10-B-6 (B0K0106-03) Soil	**Sampled: 11/03/00 11:54**	**Received: 11/03/00 19:15**							
Dry Weight	**84.6**	1.00	%	1	0K05004	11/05/00	11/06/00	BSOPSPL003R07	
PEX-11-S-7 (B0K0106-04) Soil	**Sampled: 11/03/00 16:05**	**Received: 11/03/00 19:15**							
Dry Weight	**68.1**	1.00	%	1	0K05004	11/05/00	11/06/00	BSOPSPL003R07	
PEX-12-S-7 (B0K0106-05) Soil	**Sampled: 11/03/00 16:10**	**Received: 11/03/00 19:15**							
Dry Weight	**72.0**	1.00	%	1	0K05004	11/05/00	11/06/00	BSOPSPL003R07	
PEX-13-S-5 (B0K0106-06) Soil	**Sampled: 11/03/00 16:15**	**Received: 11/03/00 19:15**							
Dry Weight	**70.3**	1.00	%	1	0K05004	11/05/00	11/06/00	BSOPSPL003R07	
PEX-14-S-1 (B0K0106-07) Soil	**Sampled: 11/03/00 15:15**	**Received: 11/03/00 19:15**							
Dry Weight	**79.2**	1.00	%	1	0K05004	11/05/00	11/06/00	BSOPSPL003R07	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/07/00 14:17

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0K04006: Prepared 11/04/00 Using EPA 5030B (MeOH)										
Blank (0K04006-BLK1)										
Gasoline Range Hydrocarbons	ND	5.00	mg/kg wet							
Benzene	ND	0.0500	"							
Toluene	ND	0.0500	"							
Ethylbenzene	ND	0.0500	"							
Xylenes (total)	ND	0.100	"							
Surrogate: 4-BFB (FID)	*3.69*		"	*4.00*		*92.3*	*50-150*			
Surrogate: 4-BFB (PID)	*3.92*		"	*4.00*		*98.0*	*50-150*			
LCS (0K04006-BS1)										
Gasoline Range Hydrocarbons	23.5	5.00	mg/kg wet	25.0		94.0	70-130			
Surrogate: 4-BFB (FID)	*3.78*		"	*4.00*		*94.5*	*50-150*			
Duplicate (0K04006-DUP1)					**Source: B0K0106-07**					
Gasoline Range Hydrocarbons	143	10.0	mg/kg dry		190			28.2	50	
Surrogate: 4-BFB (FID)	*5.06*		"	*5.05*		*100*	*50-150*			
Matrix Spike (0K04006-MS1)					**Source: B0K0052-01**					
Benzene	0.501	0.0500	mg/kg dry	0.589	ND	85.1	60-140			
Toluene	0.509	0.0500	"	0.589	ND	83.5	60-140			
Ethylbenzene	0.497	0.0500	"	0.589	ND	84.4	60-140			
Xylenes (total)	1.54	0.100	"	1.77	ND	86.0	60-140			
Surrogate: 4-BFB (PID)	*3.80*		"	*4.71*		*80.7*	*50-150*			
Matrix Spike Dup (0K04006-MSD1)					**Source: B0K0052-01**					
Benzene	0.503	0.0500	mg/kg dry	0.589	ND	85.4	60-140	0.398	20	
Toluene	0.504	0.0500	"	0.589	ND	82.7	60-140	0.987	20	
Ethylbenzene	0.491	0.0500	"	0.589	ND	83.4	60-140	1.21	20	
Xylenes (total)	1.52	0.100	"	1.77	ND	84.9	60-140	1.31	20	
Surrogate: 4-BFB (PID)	*3.96*		"	*4.71*		*84.1*	*50-150*			

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500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/07/00 14:17

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up) - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0K04005: Prepared 11/04/00 Using EPA 3550B										
Blank (0K04005-BLK1)										
Diesel Range Hydrocarbons	ND	10.0	mg/kg wet							
Lube Oil Range Hydrocarbons	ND	25.0	"							
Surrogate: 2-FBP	*7.45*		"	*10.7*		*69.6*	*50-150*			
LCS (0K04005-BS1)										
Diesel Range Hydrocarbons	54.2	10.0	mg/kg wet	66.7		81.3	60-140			
Surrogate: 2-FBP	*8.30*		"	*10.7*		*77.6*	*50-150*			
Duplicate (0K04005-DUP1)					**Source: B0K0106-03**					
Diesel Range Hydrocarbons	19.7	10.0	mg/kg dry		29.4			39.5	50	
Lube Oil Range Hydrocarbons	ND	25.0	"		ND			29.2	50	
Surrogate: 2-FBP	*9.85*		"	*12.6*		*78.2*	*50-150*			
Batch 0K06032: Prepared 11/06/00 Using EPA 3550B										
Blank (0K06032-BLK1)										
Diesel Range Hydrocarbons	ND	10.0	mg/kg wet							
Lube Oil Range Hydrocarbons	ND	25.0	"							
Surrogate: 2-FBP	*9.24*		"	*10.7*		*86.4*	*50-150*			
LCS (0K06032-BS1)										
Diesel Range Hydrocarbons	60.9	10.0	mg/kg wet	66.7		91.3	60-140			
Surrogate: 2-FBP	*9.16*		"	*10.7*		*85.6*	*50-150*			
Duplicate (0K06032-DUP1)					**Source: B0K0081-09**					
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry		ND			11.1	50	
Lube Oil Range Hydrocarbons	ND	25.0	"		ND			0.725	50	
Surrogate: 2-FBP	*9.74*		"	*12.8*		*76.1*	*50-150*			

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/07/00 14:17

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 0K05004: Prepared 11/05/00 Using Dry Weight										
Blank (0K05004-BLK1)										
Dry Weight	100	1.00	%							

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/07/00 14:17

Notes and Definitions

R-03	The reporting limit for this analyte has been raised to account for interference from coeluting organic compounds 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.
S-05	Due to interference from coeluting organic compounds with the primary surrogate, results of the secondary surrogate have been used to control the analysis.
S-06	The recovery of this surrogate is outside control limits due to sample dilution required from high analyte concentration and/or matrix interferences.
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

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CHAIN OF CUSTODY REPORT

Work Order #: B0K0106

CLIENT: URS

REPORT TO: David Raubvogel

ADDRESS: 2025 1st Ave Ste. 500
Seattle, WA 98121

PHONE: 206-728-0744 FAX:

INVOICE TO: SAME

P.O. NUMBER:

PROJECT NAME: TRANS MOUNTAIN

PROJECT NUMBER:

SAMPLED BY: KEVIN LUNDMARK

TURNAROUND REQUEST in Business Days*

Organic & Inorganic Analyses: 10 | 7 | 5 | 4 | 3 | 2 | 1 | <1

Petroleum Hydrocarbon Analyses (STD.): 5 | 4 | 3 | 2 | X | <1 (STD.)

OTHER — Please Specify

*Turnaround Requests less than standard may incur Rush Charges.

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NW TPH-Dx	NW TPH-Gx / BTEX	MATRIX (W, S, O)	# OF CONT.	COMMENTS	NCA WO ID
1. PEX-8-B-10	11/3/00 1106	X	X	S	1		-01
2. PEX-9-B-10	11/3/00 1111	X	X	S	1		-02
3. PEX-10-B-6	11/3/00 1154	X	X	S	1		-03
4. PEX-11-S-7	11/3/00 1605	X	X				-04
5. PEX-12-S-7	11/3/00 1610	X	X				-05
6. PEX-13-S-5	11/3/00 1615	X	X				-06
7.							
8.							
9.							
10.							
11.							
12.							
13.							
14.							
15.							

RELINQUISHED BY: Kevin Lundmark DATE: 11/3/00
PRINT NAME: KEVIN LUNDMARK FIRM: URS TIME: 1915

RECEIVED BY:
PRINT NAME: Granny Tonty FIRM: NCA DATE: 11/3/00
TIME: 1915

RELINQUISHED BY:
PRINT NAME: FIRM: DATE: TIME:

RECEIVED BY:
PRINT NAME: FIRM: DATE: TIME:

ADDITIONAL REMARKS:

COC REV 3/99

TEMP: 5.8 °C

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Environmental Laboratory Network
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11720 [illegible] Creek Pkwy N, S[illegible]00, Bo[illegible]/A 980[illegible]23 [illegible] 420-[illegible] FA[illegible]9210
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20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 (541) 383-9310 FAX 382-7588

CHAIN OF CUSTODY REPORT

Work Order #: B0K0106

CLIENT: URS

REPORT TO: DAVID RAUBVOGEL
ADDRESS: 2025 1ST AVE STE. 500
SEATTLE, WA 98121
PHONE: 206-728-0744 FAX:

INVOICE TO: SAME

P.O. NUMBER:

PROJECT NAME: TRANS MOUNTAIN
PROJECT NUMBER:
SAMPLED BY: KEVIN LUNDMARK

TURNAROUND REQUEST in Business Days*
Organic & Inorganic Analyses: 10 | 7 | 5 | 4 | 3 | 2 | 1 | <1
STD.
Petroleum Hydrocarbon Analyses: ~~5~~ | 4 | 3 | 2 | 1 | <1
STD.
OTHER Please Specify
*Turnaround Requests less than standard may incur Rush Charges.

REQUESTED ANALYSES

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NWTPH-Dx	NWTPH-Gx/BTEX	MATRIX (W, S, O)	# OF CONT.	COMMENTS	NCA WO ID
1. REX-14-S-1	11/3/00 1555	X	X	S	1		-07
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							
11.							
12.							
13.							
14.							
15.							

RELINQUISHED BY: [signature] DATE: 11/3/00
PRINT NAME: KEVIN LUNDMARK FIRM: URS TIME: 1915

RECEIVED BY: [signature] DATE: 11/3/00
PRINT NAME: PRANY TONTY FIRM: NCA TIME: 1915

RELINQUISHED BY: DATE:
PRINT NAME: FIRM: TIME:

RECEIVED BY: DATE:
PRINT NAME: FIRM: TIME:

ADDITIONAL REMARKS:

COC REV 3/99

TEMP:

PAGE OF

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/17/00 16:26

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
PEX-16-S-3	B0K0272-01	Soil	11/09/00 14:31	11/10/00 15:00
PEX-17-B-5	B0K0272-02	Soil	11/09/00 14:35	11/10/00 15:00
PEX-18-S-3	B0K0272-03	Soil	11/09/00 14:40	11/10/00 15:00
PEX-19-S-3	B0K0272-04	Soil	11/09/00 14:45	11/10/00 15:00
PEX-20-B-5	B0K0272-05	Soil	11/09/00 14:50	11/10/00 15:00
PEX-21-S-3	B0K0272-06	Soil	11/09/00 14:55	11/10/00 15:00
PEX-22-S-4	B0K0272-07	Soil	11/09/00 15:05	11/10/00 15:00
PEX-23-B-6	B0K0272-08	Soil	11/09/00 15:10	11/10/00 15:00
PEX-24-S-4	B0K0272-09	Soil	11/09/00 15:25	11/10/00 15:00

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/17/00 16:26

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-16-S-3 (B0K0272-01) Soil Sampled: 11/09/00 14:31 Received: 11/10/00 15:00									
Gasoline Range Hydrocarbons	**25.2**	5.00	mg/kg dry	1	0K13016	11/13/00	11/14/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0520	"	"	"	"	"	"	R-03
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	**0.166**	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*107 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*89.1 %*	*50-150*			"	"	"	"	
PEX-17-B-5 (B0K0272-02) Soil Sampled: 11/09/00 14:35 Received: 11/10/00 15:00									
Gasoline Range Hydrocarbons	**11.3**	5.00	mg/kg dry	1	0K11008	11/11/00	11/12/00	NWTPH-Gx/8021B	
Benzene	**0.139**	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	**0.224**	0.0500	"	"	"	"	"	"	
Xylenes (total)	**1.65**	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*86.5 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*85.1 %*	*50-150*			"	"	"	"	
PEX-18-S-3 (B0K0272-03) Soil Sampled: 11/09/00 14:40 Received: 11/10/00 15:00									
Gasoline Range Hydrocarbons	**8.68**	5.00	mg/kg dry	1	0K13016	11/13/00	11/14/00	NWTPH-Gx/8021B	
Benzene	**0.0961**	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	**0.461**	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*86.8 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*82.0 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/17/00 16:26

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-19-S-3 (B0K0272-04) Soil Sampled: 11/09/00 14:45 Received: 11/10/00 15:00									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K13016	11/13/00	11/14/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*73.1 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*80.9 %*	*50-150*			"	"	"	"	
PEX-20-B-5 (B0K0272-05) Soil Sampled: 11/09/00 14:50 Received: 11/10/00 15:00									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K13016	11/13/00	11/14/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*71.2 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*75.8 %*	*50-150*			"	"	"	"	
PEX-21-S-3 (B0K0272-06) Soil Sampled: 11/09/00 14:55 Received: 11/10/00 15:00									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K13016	11/13/00	11/14/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*71.0 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*79.1 %*	*50-150*			"	"	"	"	

North Creek Analytical - Bothell

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.

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/17/00 16:26

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-22-S-4 (B0K0272-07) Soil Sampled: 11/09/00 15:05 Received: 11/10/00 15:00									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K13016	11/13/00	11/14/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	**0.107**	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*77.8 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*86.7 %*	*50-150*			"	"	"	"	
PEX-23-B-6 (B0K0272-08) Soil Sampled: 11/09/00 15:10 Received: 11/10/00 15:00									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K11008	11/11/00	11/12/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*97.2 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*87.8 %*	*50-150*			"	"	"	"	
PEX-24-S-4 (B0K0272-09) Soil Sampled: 11/09/00 15:25 Received: 11/10/00 15:00									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K13016	11/13/00	11/14/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*78.6 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*83.2 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/17/00 16:26

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-16-S-3 (B0K0272-01) Soil	**Sampled: 11/09/00 14:31**		**Received: 11/10/00 15:00**						
Diesel Range Hydrocarbons	**88.6**	10.0	mg/kg dry	1	0K14020	11/14/00	11/15/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	**92.0**	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*73.4 %*	*50-150*			"	"	"	"	
PEX-17-B-5 (B0K0272-02) Soil	**Sampled: 11/09/00 14:35**		**Received: 11/10/00 15:00**						
Diesel Range Hydrocarbons	**13.1**	5.00	mg/kg dry	1	0K12011	11/12/00	11/13/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	**19.1**	12.5	"	"	"	"	"	"	
Surrogate: 2-FBP	*71.7 %*	*50-150*			"	"	"	"	
PEX-18-S-3 (B0K0272-03) Soil	**Sampled: 11/09/00 14:40**		**Received: 11/10/00 15:00**						
Diesel Range Hydrocarbons	**18.5**	10.0	mg/kg dry	1	0K14020	11/14/00	11/15/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	**31.7**	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*72.0 %*	*50-150*			"	"	"	"	
PEX-19-S-3 (B0K0272-04) Soil	**Sampled: 11/09/00 14:45**		**Received: 11/10/00 15:00**						
Diesel Range Hydrocarbons	**38.3**	10.0	mg/kg dry	1	0K14020	11/14/00	11/15/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	**48.7**	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*75.0 %*	*50-150*			"	"	"	"	
PEX-20-B-5 (B0K0272-05) Soil	**Sampled: 11/09/00 14:50**		**Received: 11/10/00 15:00**						
Diesel Range Hydrocarbons	**16.1**	10.0	mg/kg dry	1	0K14020	11/14/00	11/15/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*65.3 %*	*50-150*			"	"	"	"	
PEX-21-S-3 (B0K0272-06) Soil	**Sampled: 11/09/00 14:55**		**Received: 11/10/00 15:00**						
Diesel Range Hydrocarbons	**18.3**	10.0	mg/kg dry	1	0K14020	11/14/00	11/15/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*69.0 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/17/00 16:26

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-22-S-4 (B0K0272-07) Soil	**Sampled: 11/09/00 15:05 Received: 11/10/00 15:00**								
Diesel Range Hydrocarbons	**28.4**	10.0	mg/kg dry	1	0K14020	11/14/00	11/15/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	**34.0**	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*74.2 %*	*50-150*			"	"	"	"	
PEX-23-B-6 (B0K0272-08) Soil	**Sampled: 11/09/00 15:10 Received: 11/10/00 15:00**								
Diesel Range Hydrocarbons	**10.1**	5.00	mg/kg dry	1	0K12011	11/12/00	11/13/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	12.5	"	"	"	"	"	"	
Surrogate: 2-FBP	*73.9 %*	*50-150*			"	"	"	"	
PEX-24-S-4 (B0K0272-09) Soil	**Sampled: 11/09/00 15:25 Received: 11/10/00 15:00**								
Diesel Range Hydrocarbons	**23.4**	10.0	mg/kg dry	1	0K14020	11/14/00	11/15/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*73.2 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/17/00 16:26

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-16-S-3 (B0K0272-01) Soil	**Sampled: 11/09/00 14:31**	**Received: 11/10/00 15:00**							
Dry Weight	**85.3**	1.00	%	1	0K13038	11/13/00	11/14/00	BSOPSPL003R07	
PEX-17-B-5 (B0K0272-02) Soil	**Sampled: 11/09/00 14:35**	**Received: 11/10/00 15:00**							
Dry Weight	**79.5**	1.00	%	1	0K10040	11/10/00	11/13/00	BSOPSPL003R07	
PEX-18-S-3 (B0K0272-03) Soil	**Sampled: 11/09/00 14:40**	**Received: 11/10/00 15:00**							
Dry Weight	**87.9**	1.00	%	1	0K13038	11/13/00	11/14/00	BSOPSPL003R07	
PEX-19-S-3 (B0K0272-04) Soil	**Sampled: 11/09/00 14:45**	**Received: 11/10/00 15:00**							
Dry Weight	**85.9**	1.00	%	1	0K13038	11/13/00	11/14/00	BSOPSPL003R07	
PEX-20-B-5 (B0K0272-05) Soil	**Sampled: 11/09/00 14:50**	**Received: 11/10/00 15:00**							
Dry Weight	**77.4**	1.00	%	1	0K13038	11/13/00	11/14/00	BSOPSPL003R07	
PEX-21-S-3 (B0K0272-06) Soil	**Sampled: 11/09/00 14:55**	**Received: 11/10/00 15:00**							
Dry Weight	**87.2**	1.00	%	1	0K13038	11/13/00	11/14/00	BSOPSPL003R07	
PEX-22-S-4 (B0K0272-07) Soil	**Sampled: 11/09/00 15:05**	**Received: 11/10/00 15:00**							
Dry Weight	**88.6**	1.00	%	1	0K13038	11/13/00	11/14/00	BSOPSPL003R07	
PEX-23-B-6 (B0K0272-08) Soil	**Sampled: 11/09/00 15:10**	**Received: 11/10/00 15:00**							
Dry Weight	**80.0**	1.00	%	1	0K13019	11/13/00	11/13/00	BSOPSPL003R07	
PEX-24-S-4 (B0K0272-09) Soil	**Sampled: 11/09/00 15:25**	**Received: 11/10/00 15:00**							
Dry Weight	**83.8**	1.00	%	1	0K13038	11/13/00	11/14/00	BSOPSPL003R07	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/17/00 16:26

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0K11008: Prepared 11/11/00 Using EPA 5030B (MeOH)										
Blank (0K11008-BLK1)										
Gasoline Range Hydrocarbons	ND	5.00	mg/kg wet							
Benzene	ND	0.0500	"							
Toluene	ND	0.0500	"							
Ethylbenzene	ND	0.0500	"							
Xylenes (total)	ND	0.100	"							
Surrogate: 4-BFB (FID)	*4.19*		"	*4.00*		*105*	*50-150*			
Surrogate: 4-BFB (PID)	*3.70*		"	*4.00*		*92.5*	*50-150*			
LCS (0K11008-BS1)										
Gasoline Range Hydrocarbons	20.8	5.00	mg/kg wet	25.0		83.2	70-130			
Surrogate: 4-BFB (FID)	*4.12*		"	*4.00*		*103*	*50-150*			
Duplicate (0K11008-DUP1)					**Source: B0K0272-02**					
Gasoline Range Hydrocarbons	10.5	5.00	mg/kg dry		11.3			7.34	50	
Surrogate: 4-BFB (FID)	*4.13*		"	*5.03*		*82.1*	*50-150*			
Matrix Spike (0K11008-MS1)					**Source: B0K0272-08**					
Benzene	0.452	0.0500	mg/kg dry	0.625	ND	72.3	60-140			
Toluene	0.453	0.0500	"	0.625	ND	71.0	60-140			
Ethylbenzene	0.492	0.0500	"	0.625	ND	78.7	60-140			
Xylenes (total)	1.52	0.100	"	1.88	ND	79.9	60-140			
Surrogate: 4-BFB (PID)	*3.98*		"	*5.00*		*79.6*	*50-150*			
Matrix Spike Dup (0K11008-MSD1)					**Source: B0K0272-08**					
Benzene	0.463	0.0500	mg/kg dry	0.625	ND	74.1	60-140	2.40	20	
Toluene	0.468	0.0500	"	0.625	ND	73.4	60-140	3.26	20	
Ethylbenzene	0.495	0.0500	"	0.625	ND	79.2	60-140	0.608	20	
Xylenes (total)	1.53	0.100	"	1.88	ND	80.5	60-140	0.656	20	
Surrogate: 4-BFB (PID)	*4.21*		"	*5.00*		*84.2*	*50-150*			

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/17/00 16:26

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0K13016: Prepared 11/13/00 Using EPA 5030B (MeOH)										
Blank (0K13016-BLK1)										
Gasoline Range Hydrocarbons	ND	5.00	mg/kg wet							
Benzene	ND	0.0500	"							
Toluene	ND	0.0500	"							
Ethylbenzene	ND	0.0500	"							
Xylenes (total)	ND	0.100	"							
Surrogate: 4-BFB (FID)	*2.95*		"	*4.00*		*73.8*	*50-150*			
Surrogate: 4-BFB (PID)	*3.29*		"	*4.00*		*82.2*	*50-150*			
LCS (0K13016-BS1)										
Gasoline Range Hydrocarbons	26.4	5.00	mg/kg wet	25.0		106	70-130			
Surrogate: 4-BFB (FID)	*3.63*		"	*4.00*		*90.8*	*50-150*			
Duplicate (0K13016-DUP1)					**Source: B0K0256-02**					
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry		ND			47.7	50	
Surrogate: 4-BFB (FID)	*3.50*		"	*4.11*		*85.2*	*50-150*			
Duplicate (0K13016-DUP2)					**Source: B0K0256-03**					
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry		ND			15.4	50	
Surrogate: 4-BFB (FID)	*3.52*		"	*4.67*		*75.4*	*50-150*			
Matrix Spike (0K13016-MS1)					**Source: B0K0256-01**					
Benzene	0.493	0.0500	mg/kg dry	0.571	ND	83.9	60-140			
Toluene	0.521	0.0500	"	0.571	0.0673	79.5	60-140			
Ethylbenzene	0.500	0.0500	"	0.571	ND	85.6	60-140			
Xylenes (total)	1.54	0.100	"	1.71	ND	86.9	60-140			
Surrogate: 4-BFB (PID)	*3.78*		"	*4.57*		*82.7*	*50-150*			
Matrix Spike Dup (0K13016-MSD1)					**Source: B0K0256-01**					
Benzene	0.508	0.0500	mg/kg dry	0.571	ND	86.5	60-140	3.00	20	
Toluene	0.531	0.0500	"	0.571	0.0673	81.2	60-140	1.90	20	
Ethylbenzene	0.509	0.0500	"	0.571	ND	87.2	60-140	1.78	20	
Xylenes (total)	1.57	0.100	"	1.71	ND	88.6	60-140	1.93	20	
Surrogate: 4-BFB (PID)	*3.85*		"	*4.57*		*84.2*	*50-150*			

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/17/00 16:26

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up) - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0K12011: Prepared 11/12/00 Using EPA 3550B										
Blank (0K12011-BLK1)										
Diesel Range Hydrocarbons	ND	5.00	mg/kg wet							
Lube Oil Range Hydrocarbons	ND	12.5	"							
Surrogate: 2-FBP	*7.19*		"	*10.7*		*67.2*	*50-150*			
LCS (0K12011-BS1)										
Diesel Range Hydrocarbons	51.1	5.00	mg/kg wet	66.7		76.6	60-140			
Surrogate: 2-FBP	*8.01*		"	*10.7*		*74.9*	*50-150*			
Duplicate (0K12011-DUP1)					**Source: B0K0272-02**					
Diesel Range Hydrocarbons	20.3	5.00	mg/kg dry		13.1			43.1	50	
Lube Oil Range Hydrocarbons	13.0	12.5	"		19.1			38.0	50	
Surrogate: 2-FBP	*10.0*		"	*13.4*		*74.6*	*50-150*			
Batch 0K14020: Prepared 11/14/00 Using EPA 3550B										
Blank (0K14020-BLK1)										
Diesel Range Hydrocarbons	ND	10.0	mg/kg wet							
Lube Oil Range Hydrocarbons	ND	25.0	"							
Surrogate: 2-FBP	*6.77*		"	*10.7*		*63.3*	*50-150*			
LCS (0K14020-BS1)										
Diesel Range Hydrocarbons	55.8	10.0	mg/kg wet	66.7		83.7	60-140			
Surrogate: 2-FBP	*7.82*		"	*10.7*		*73.1*	*50-150*			
Duplicate (0K14020-DUP1)					**Source: B0K0340-02**					
Diesel Range Hydrocarbons	5890	849	mg/kg dry		7260			20.8	50	
Lube Oil Range Hydrocarbons	4680	2120	"		5590			17.7	50	
Surrogate: 2-FBP	*0*		"	*22.0*			*50-150*			*S-01*

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/17/00 16:26

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up) - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0K14020: Prepared 11/14/00 Using EPA 3550B										
Duplicate (0K14020-DUP2)					**Source: B0K0337-10**					
Diesel Range Hydrocarbons	61.7	10.0	mg/kg dry		69.2			11.5	50	
Lube Oil Range Hydrocarbons	44.1	25.0	"		45.4			2.91	50	
Surrogate: 2-FBP	*10.9*		"	*14.2*		*76.8*	*50-150*			

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Seattle WA, 98121	Project Manager: David Raubvogel	11/17/00 16:26

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 0K10040: Prepared 11/10/00 Using Dry Weight										
Blank (0K10040-BLK1)										
Dry Weight	100	1.00	%							
Batch 0K13019: Prepared 11/13/00 Using Dry Weight										
Blank (0K13019-BLK1)										
Dry Weight	99.8	1.00	%							
Batch 0K13038: Prepared 11/13/00 Using Dry Weight										
Blank (0K13038-BLK1)										
Dry Weight	100	1.00	%							

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500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/17/00 16:26

Notes and Definitions

R-03	The reporting limit for this analyte has been raised to account for interference from coeluting organic compounds 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.
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

Quantitation Report

Data File : D:\HPCHEM\1\DATA\K13018.D
Acq On : 11-13-00 9:20:14
Sample : b0k0272-02
Misc : S

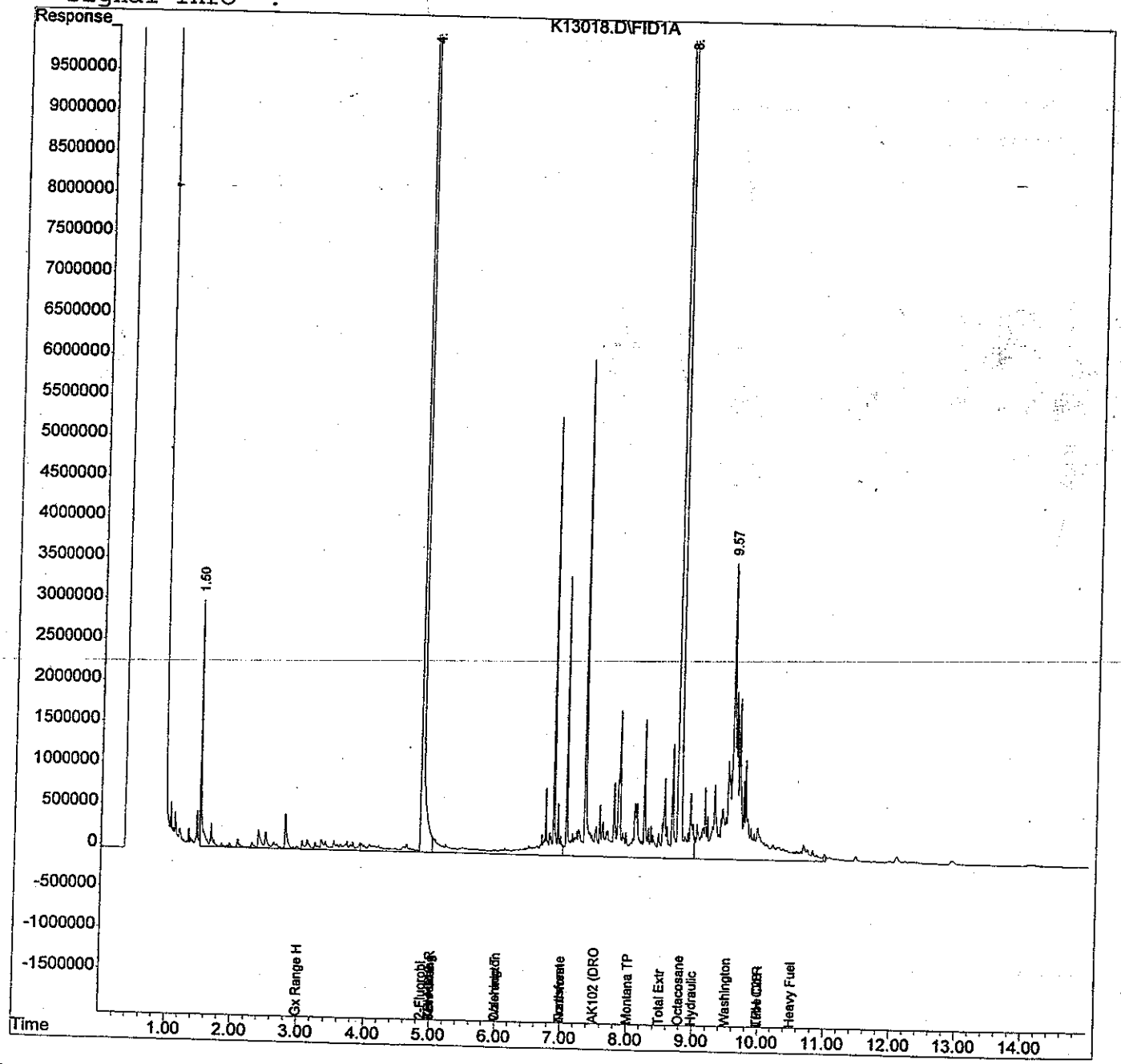
Vial: 13
Operator: BN
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

IntFile : SURR.E

Quant Time: Nov 13 11:10 2000 Quant Results File: TPHD.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Mon Oct 23 14:21:52 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Data File : D:\HPCHEM\1\DATA.SEC\K13021.D
Acq On : 11-13-00 10:04:57
Sample : b0k0272-08
Misc : S

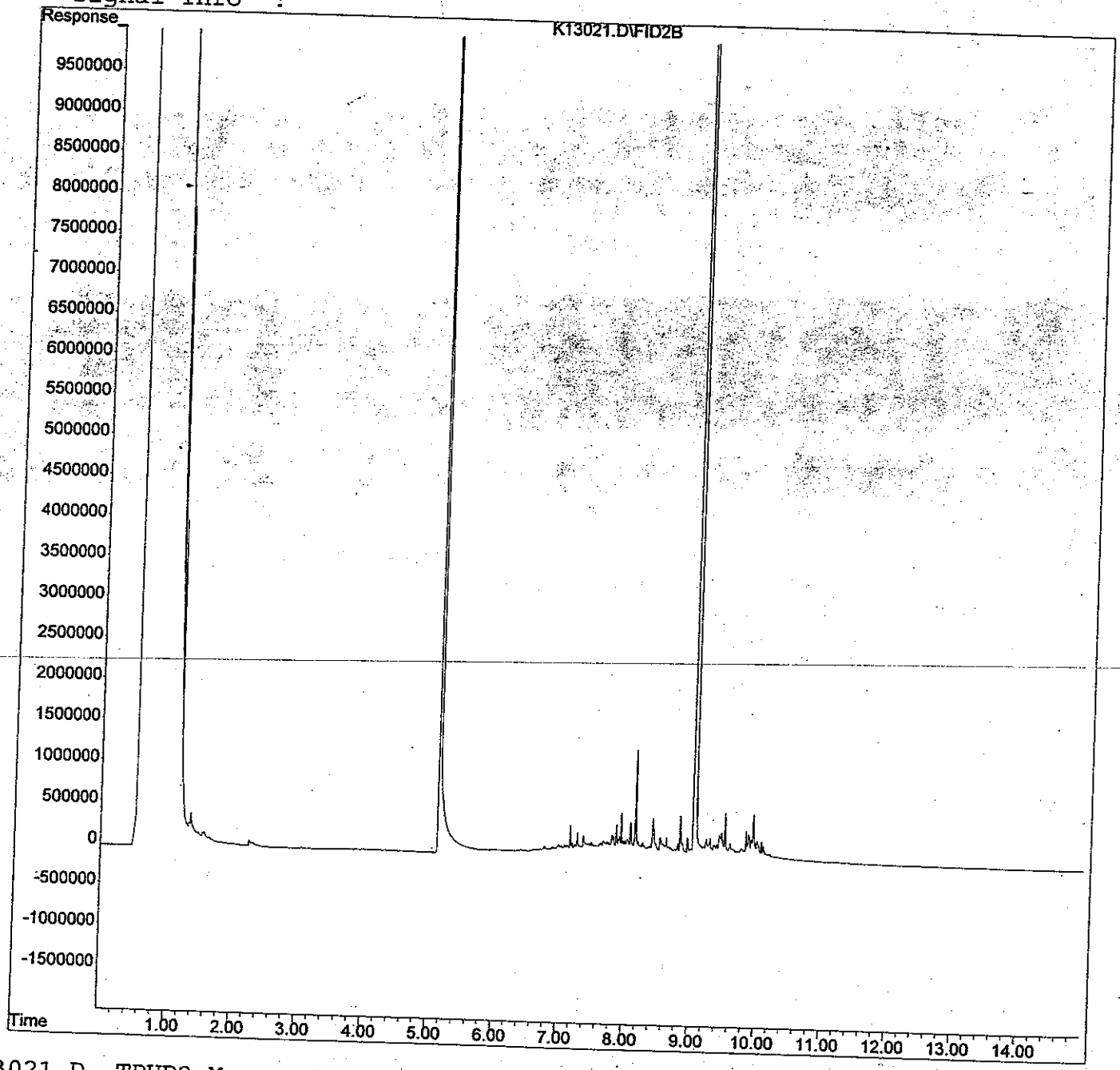
IntFile : SURR.E

Vial: 14
Operator: BN
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Nov 13 10:20 2000 Quant Results File: TPHD2.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD2.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Mon Oct 23 14:17:42 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report

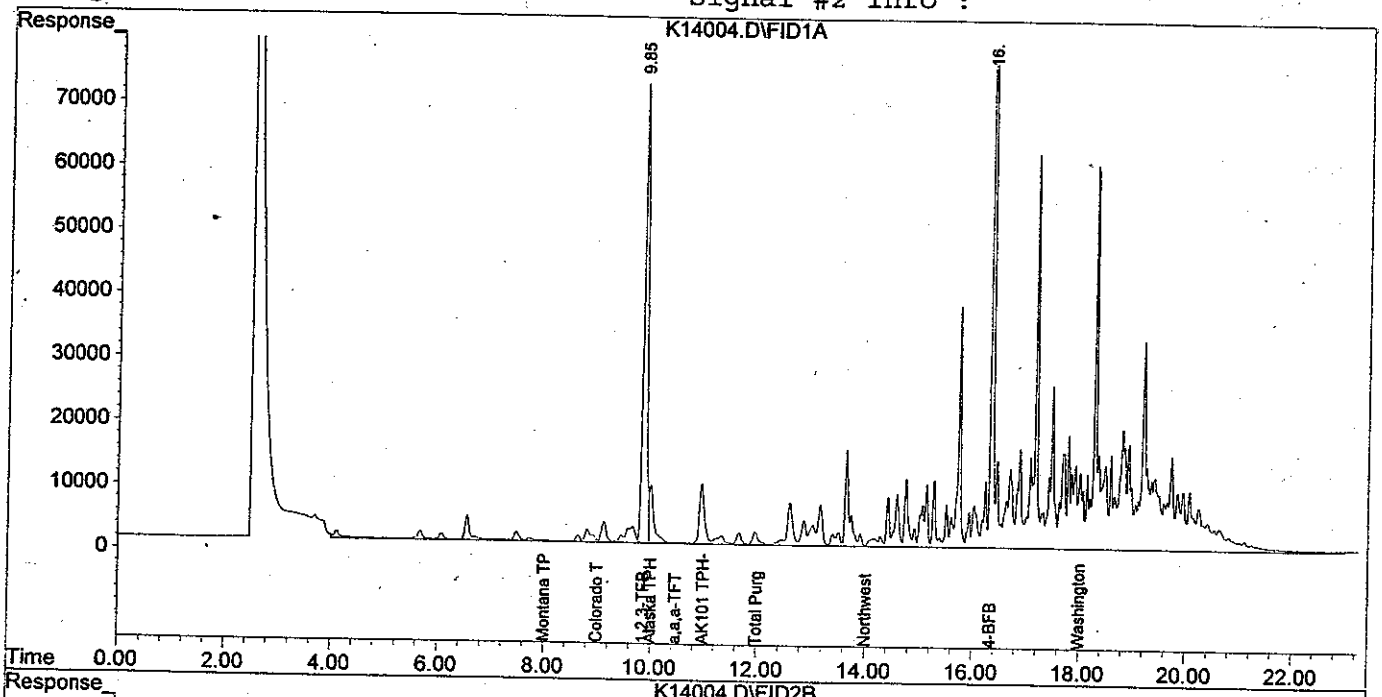
Signal #1 : C:\HPCHEM\2\DATA\111400\K14004.D\FID1A.CH Vial: 4
Signal #2 : C:\HPCHEM\2\DATA\111400\K14004.D\FID2B.CH
Acq On : 14 Nov 2000 10:13 am Operator: lp
Sample : b0k0272-01 r1 Inst : GC #4
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00

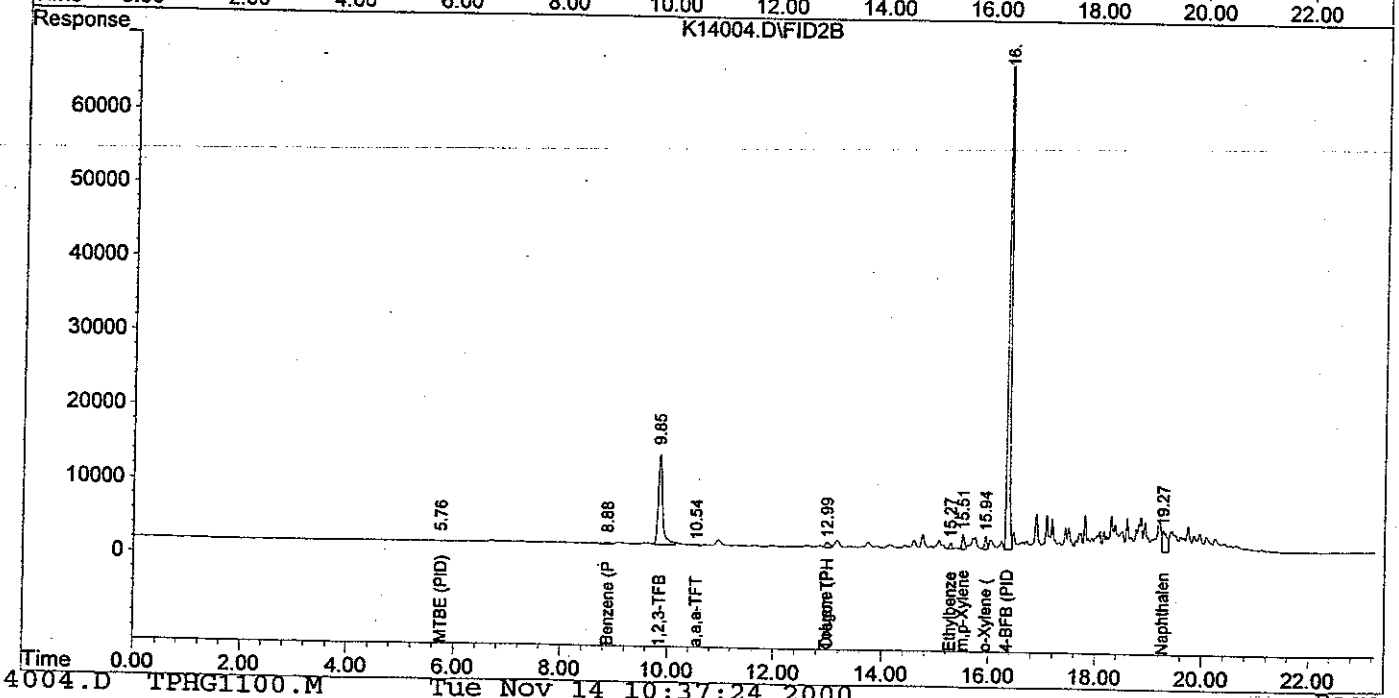
IntFile Signal #1: SURR.E IntFile Signal #2: SURR2.E

Quant Time: Nov 14 10:37 2000 Quant Results File: TPHG1100.RES

Quant Method : C:\HPCHEM\2\METHODS\TPHG1100.M (Chemstation Integrator)
Title : TPH-G Method
Last Update : Thu Nov 09 12:22:22 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG1100.M

Volume Inj. :
Signal #1 Phase :
Signal #1 Info :
Signal #2 Phase:
Signal #2 Info :





Quantitation Report

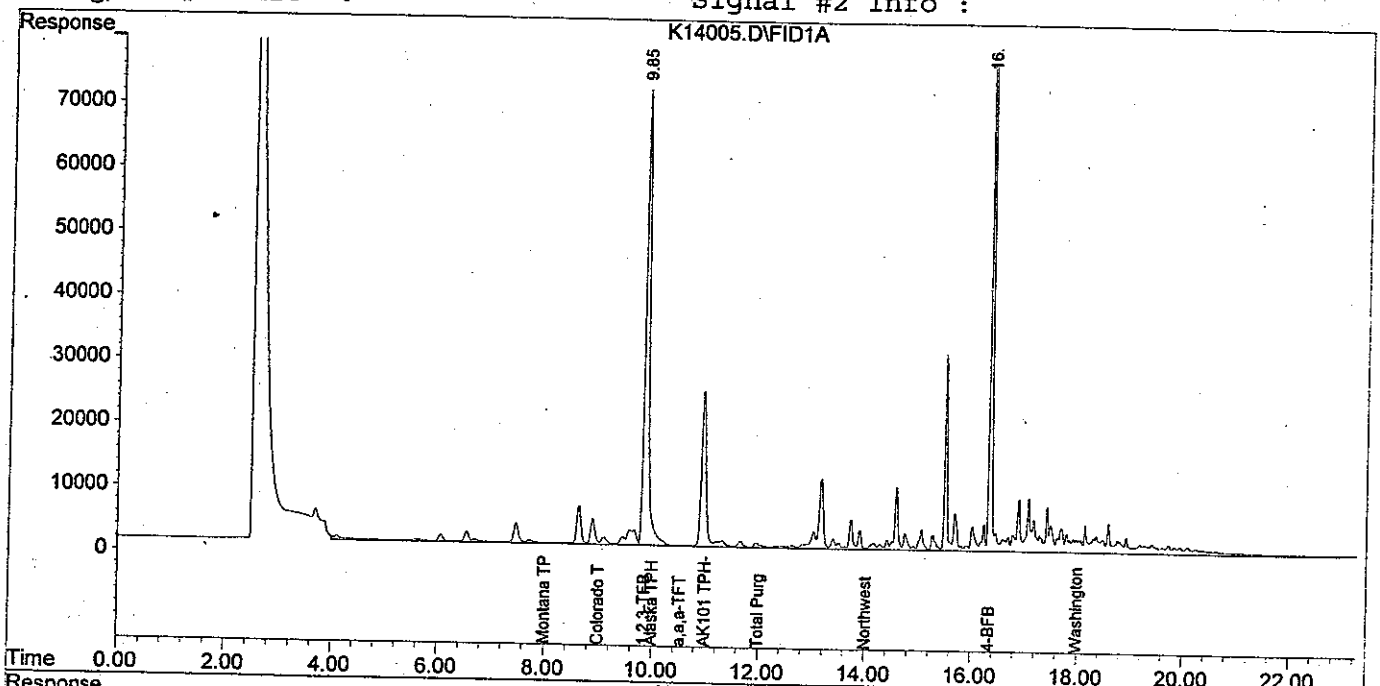
Signal #1 : C:\HPCHEM\2\DATA\111400\K14005.D\FID1A.CH Vial: 5
Signal #2 : C:\HPCHEM\2\DATA\111400\K14005.D\FID2B.CH
Acq On : 14 Nov 2000 10:43 am Operator: lp
Sample : b0k0272-03 r1 Inst : GC #4
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00

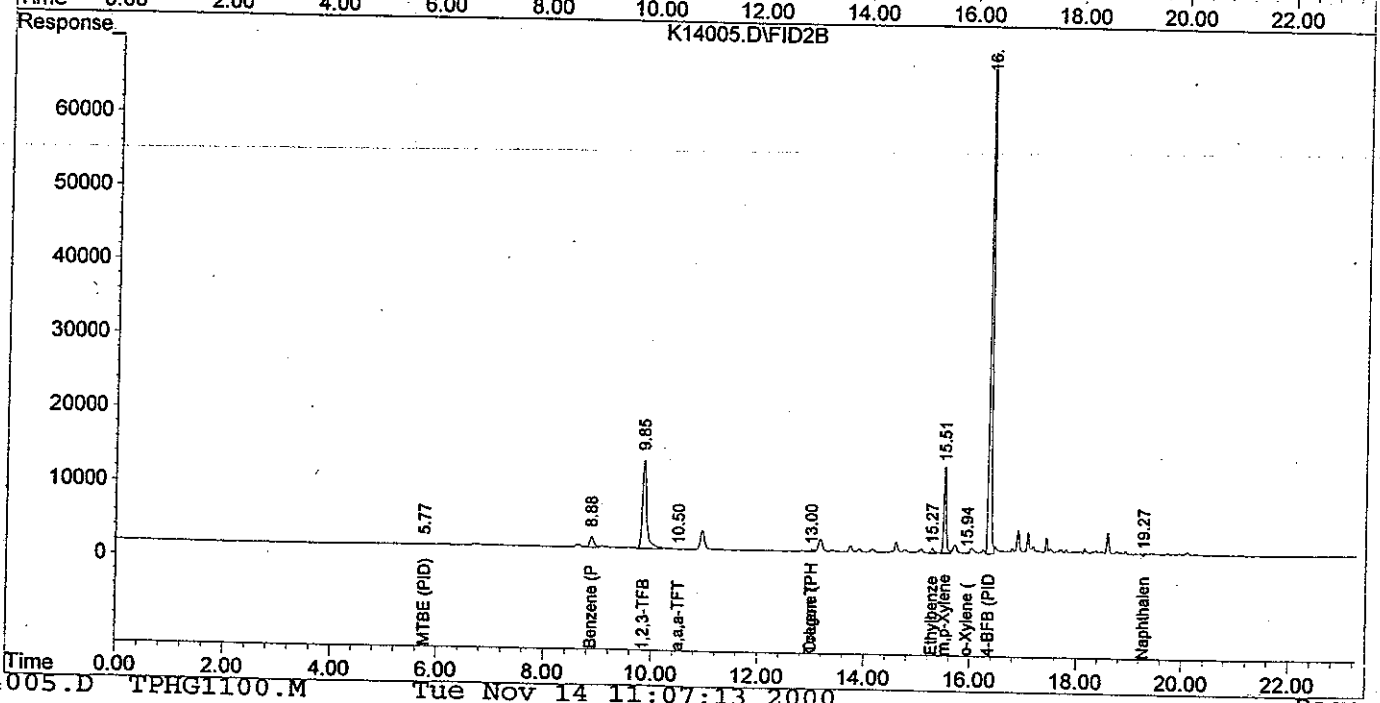
IntFile Signal #1: SURR.E IntFile Signal #2: SURR2.E

Quant Time: Nov 14 11:07 2000 Quant Results File: TPHG1100.RES

Quant Method : C:\HPCHEM\2\METHODS\TPHG1100.M (Chemstation Integrator)
Title : TPH-G Method
Last Update : Thu Nov 09 12:22:22 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG1100.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report

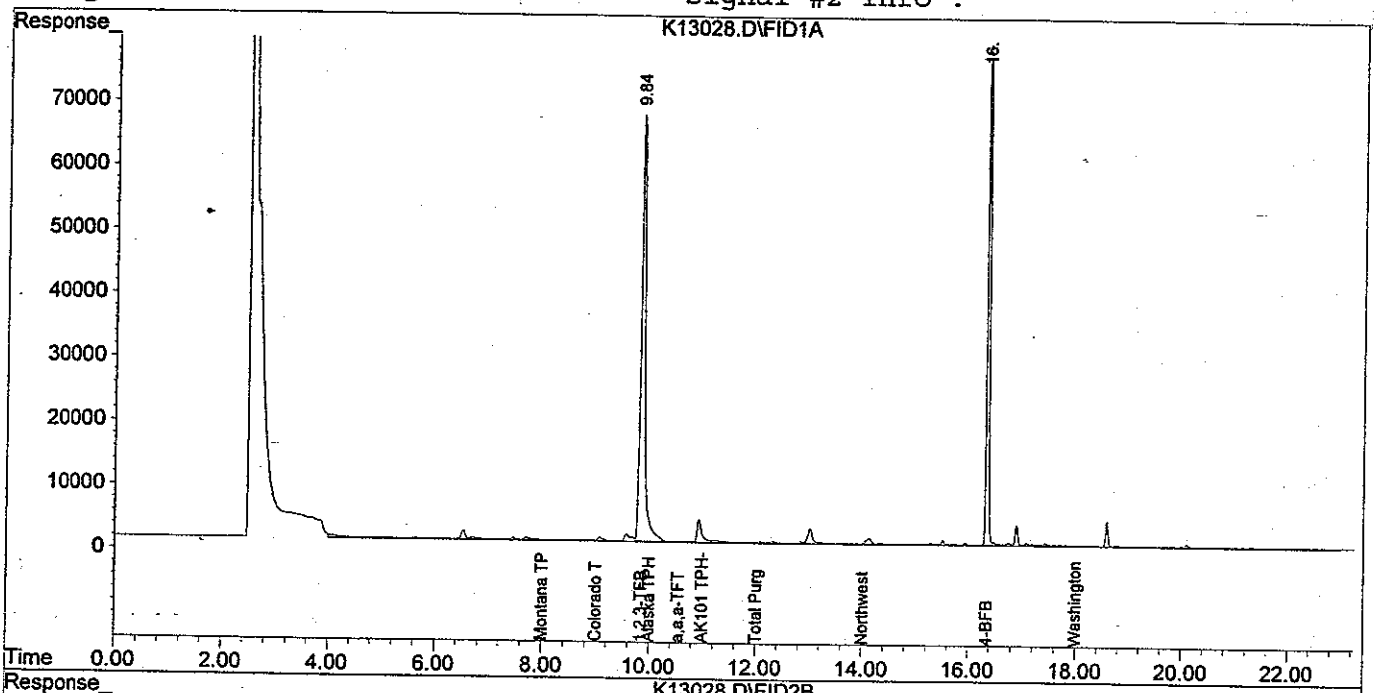
Signal #1 : C:\HPCHEM\2\DATA\111300\K13028.D\FID1A.CH Vial: 28
Signal #2 : C:\HPCHEM\2\DATA\111300\K13028.D\FID2B.CH
Acq On : 14 Nov 2000 1:41 Operator: lp
Sample : b0K0272-04 Inst : GC #4
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00

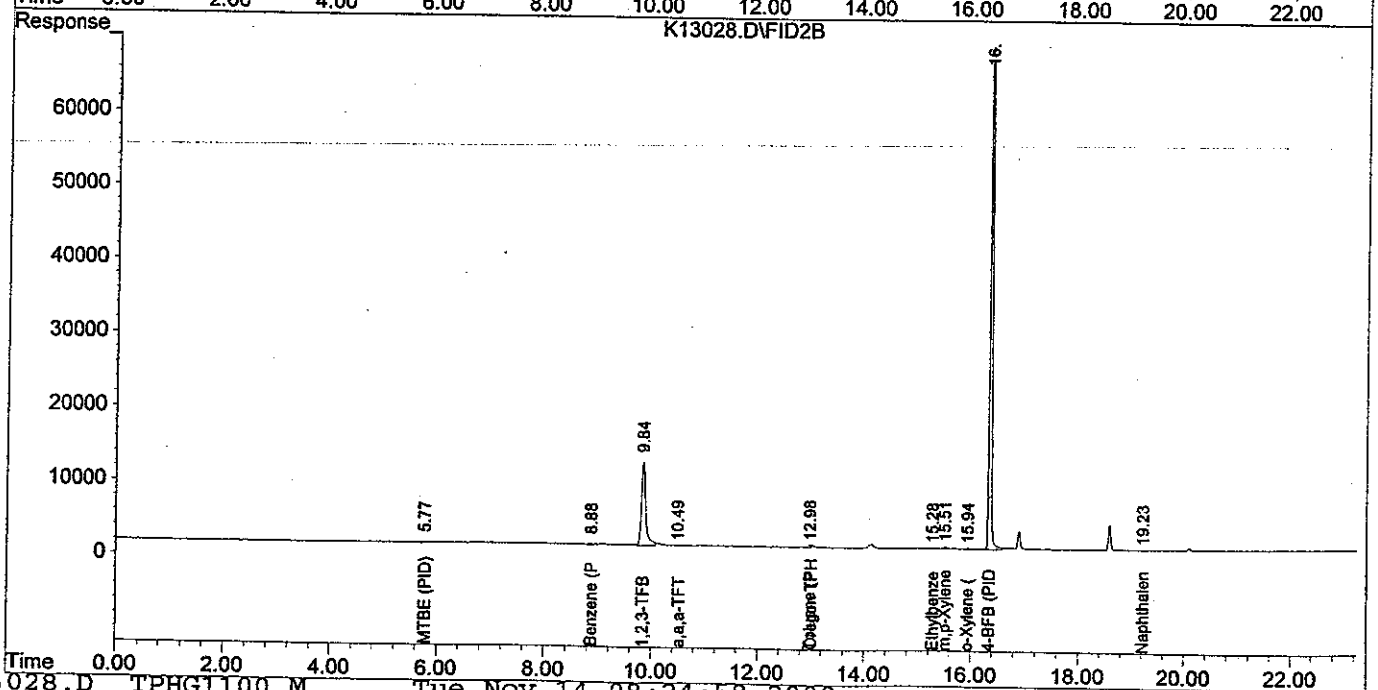
IntFile Signal #1: SURR.E IntFile Signal #2: SURR2.E

Quant Time: Nov 14 8:24 2000 Quant Results File: TPHG1100.RES

Quant Method : C:\HPCHEM\2\METHODS\TPHG1100.M (Chemstation Integrator)
Title : TPH-G Method
Last Update : Thu Nov 09 12:22:22 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG1100.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





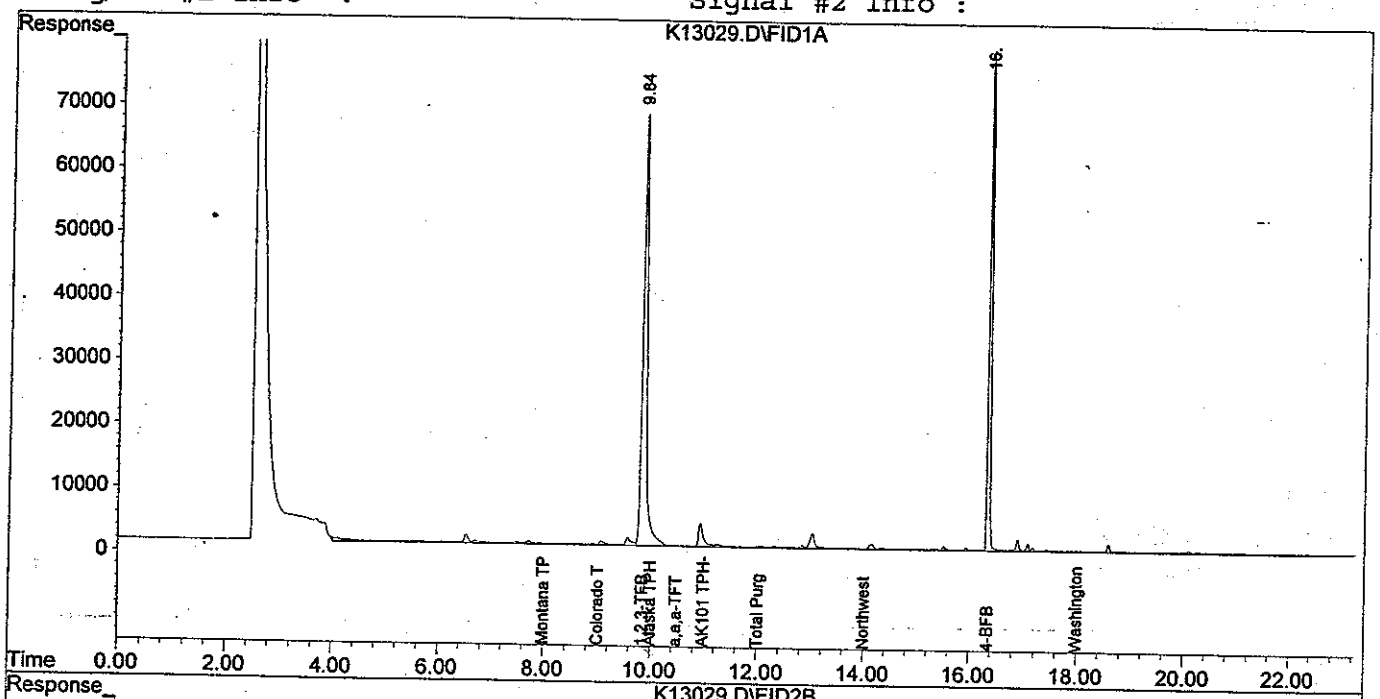
Signal #1 : C:\HPCHEM\2\DATA\111300\K13029.D\FID1A.CH Vial: 29
Signal #2 : C:\HPCHEM\2\DATA\111300\K13029.D\FID2B.CH
Acq On : 14 Nov 2000 2:11 Operator: lp
Sample : b0K0272-05 Inst : GC #4
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00

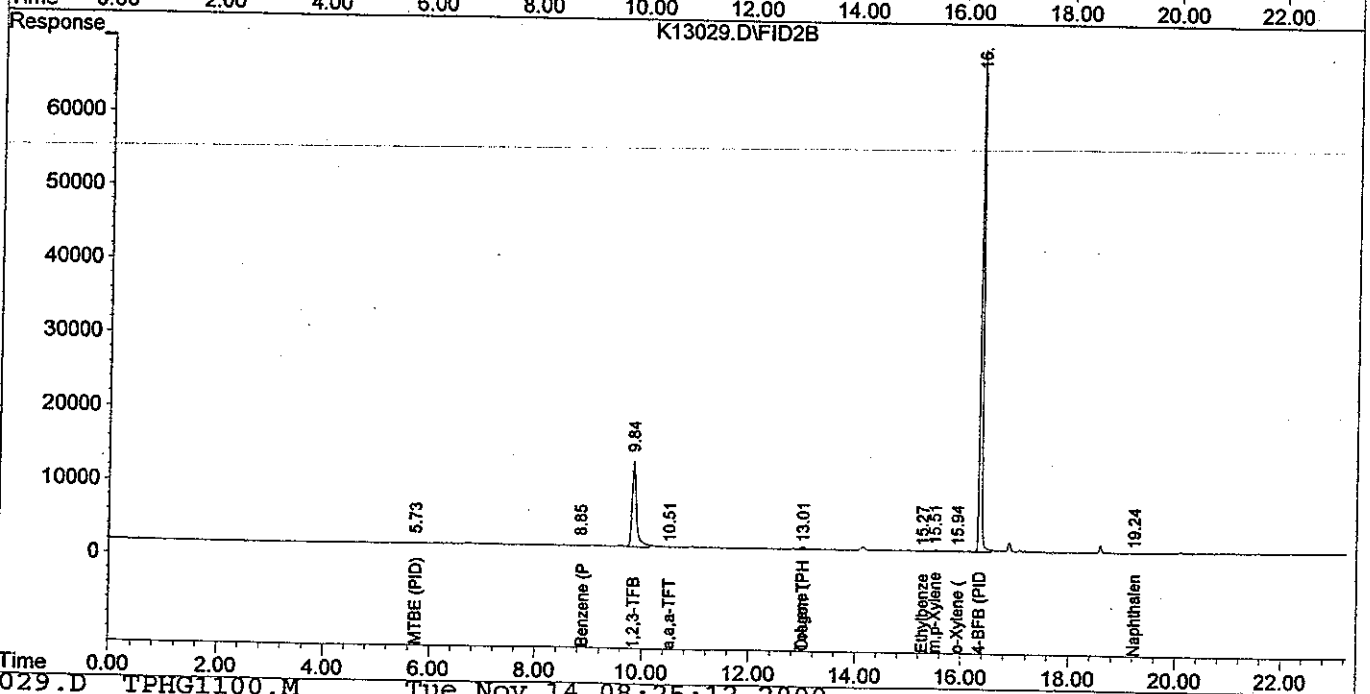
IntFile Signal #1: SURR.E IntFile Signal #2: SURR2.E

Quant Time: Nov 14 8:25 2000 Quant Results File: TPHG1100.RES

Quant Method : C:\HPCHEM\2\METHODS\TPHG1100.M (Chemstation Integrator)
Title : TPH-G Method
Last Update : Thu Nov 09 12:22:22 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG1100.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report

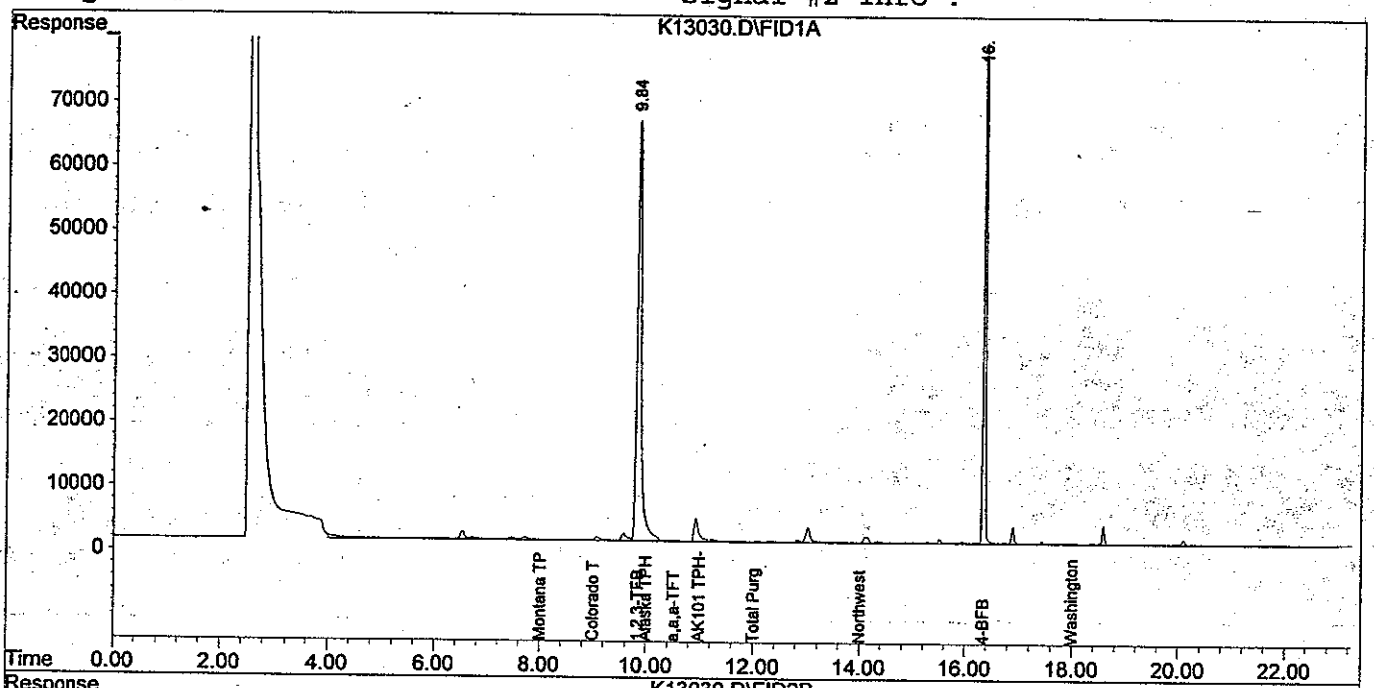
Signal #1 : C:\HPCHEM\2\DATA\111300\K13030.D\FID1A.CH Vial: 30
Signal #2 : C:\HPCHEM\2\DATA\111300\K13030.D\FID2B.CH
Acq On : 14 Nov 2000 2:41 Operator: lp
Sample : b0K0272-06 Inst : GC #4
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00

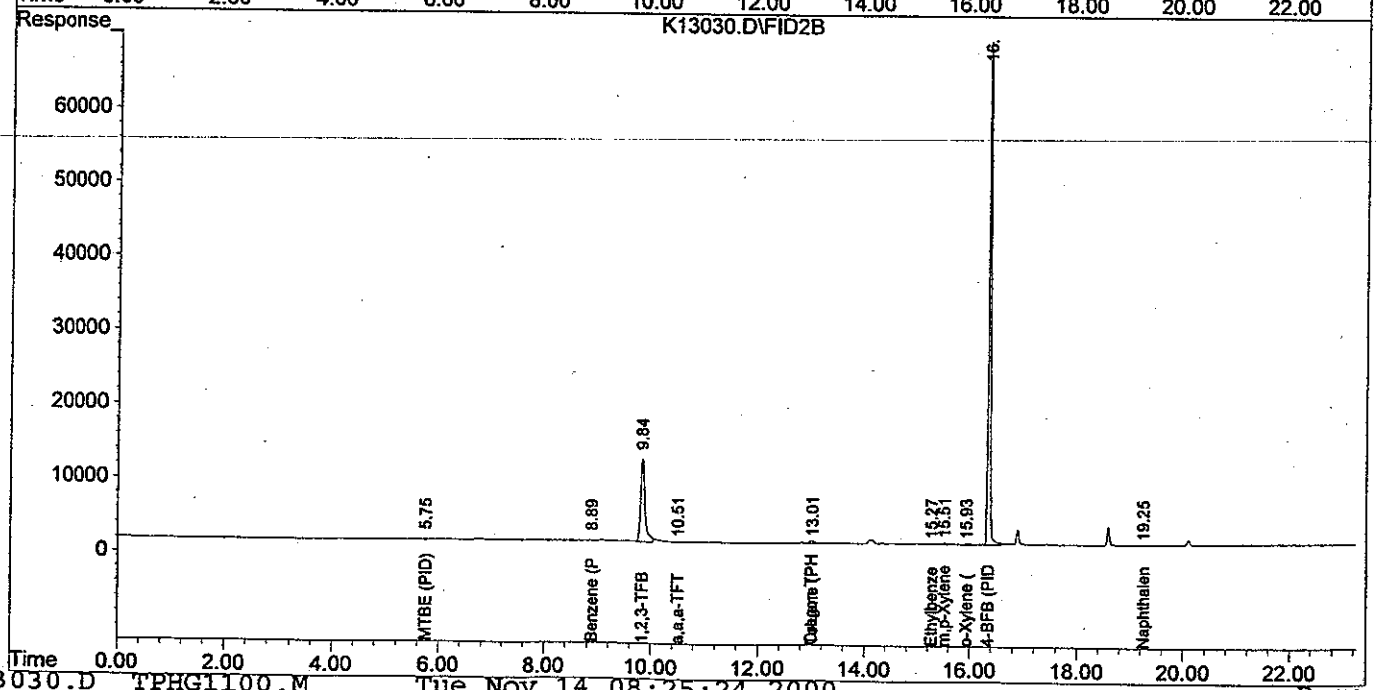
IntFile Signal #1: SURR.E IntFile Signal #2: SURR2.E

Quant Time: Nov 14 8:25 2000 Quant Results File: TPHG1100.RES

Quant Method : C:\HPCHEM\2\METHODS\TPHG1100.M (Chemstation Integrator)
Title : TPH-G Method
Last Update : Thu Nov 09 12:22:22 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG1100.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report

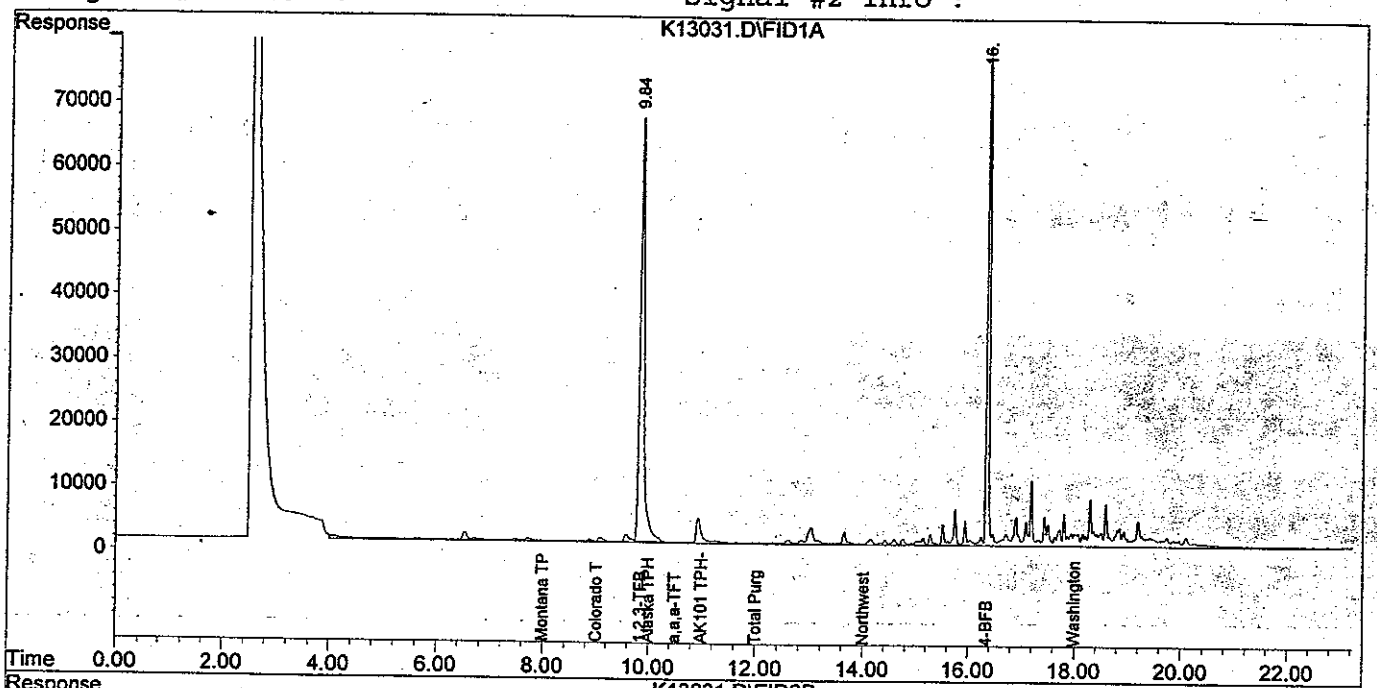
Signal #1 : C:\HPCHEM\2\DATA\111300\K13031.D\FID1A.CH Vial: 31
Signal #2 : C:\HPCHEM\2\DATA\111300\K13031.D\FID2B.CH
Acq On : 14 Nov 2000 3:11 Operator: lp
Sample : b0K0272-07 Inst : GC #4
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00

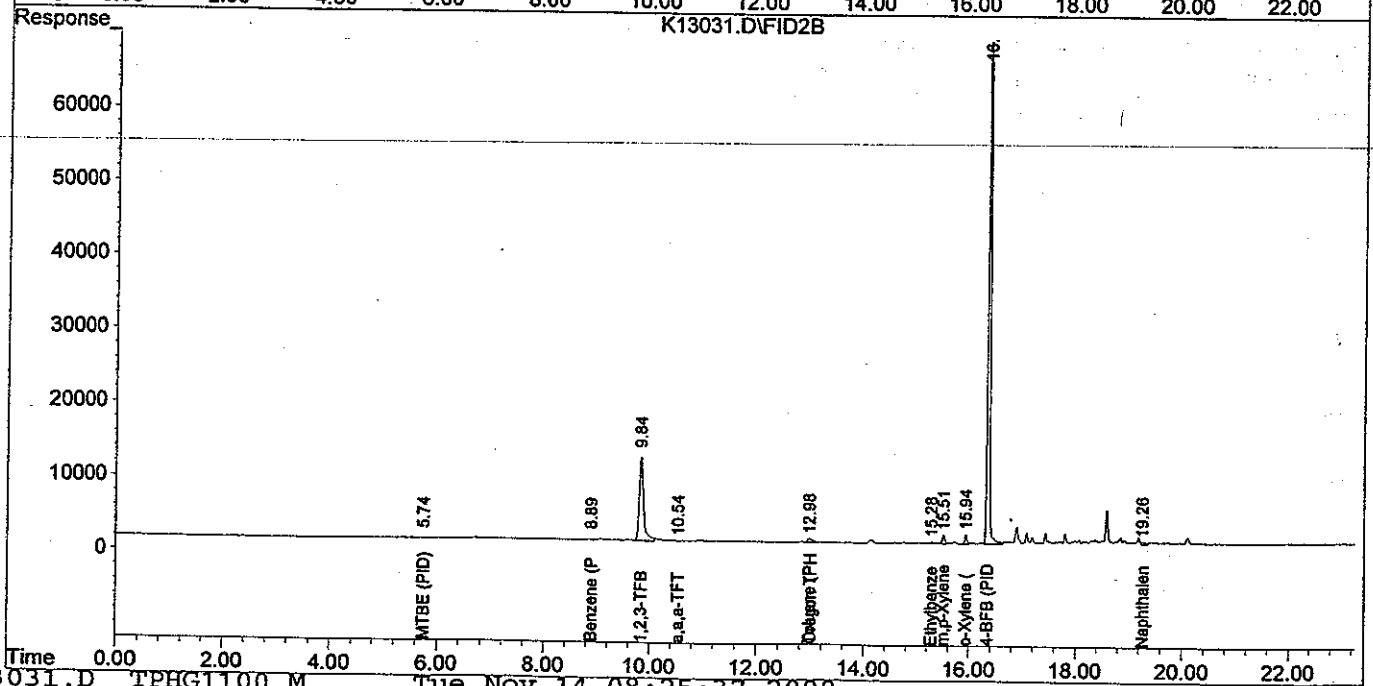
IntFile Signal #1: SURR.E IntFile Signal #2: SURR2.E

Quant Time: Nov 14 8:25 2000 Quant Results File: TPHG1100.RES

Quant Method : C:\HPCHEM\2\METHODS\TPHG1100.M (Chemstation Integrator)
Title : TPH-G Method
Last Update : Thu Nov 09 12:22:22 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG1100.M

Volume Inj. :
Signal #1 Phase :
Signal #1 Info :
Signal #2 Phase:
Signal #2 Info :





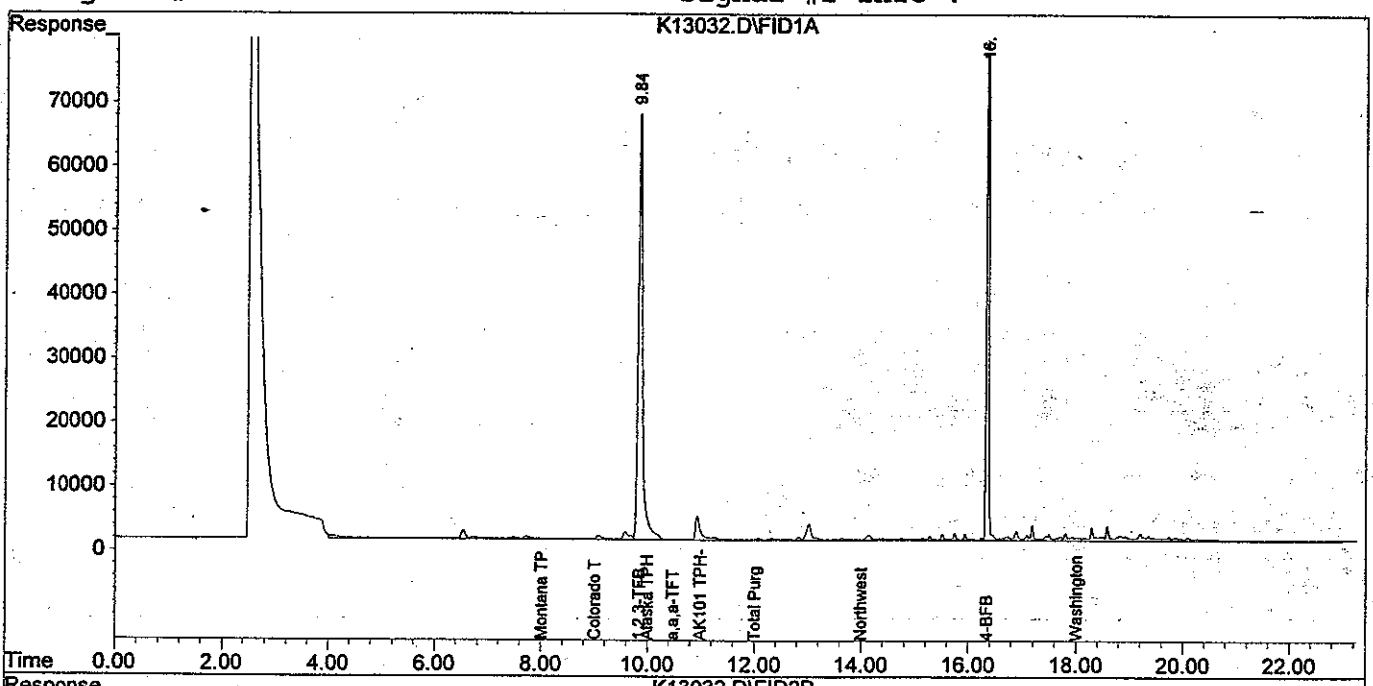
Signal #1 : C:\HPCHEM\2\DATA\111300\K13032.D\FID1A.CH Vial: 32
Signal #2 : C:\HPCHEM\2\DATA\111300\K13032.D\FID2B.CH
Acq On : 14 Nov 2000 3:41 Operator: lp
Sample : b0K0272-09 Inst : GC #4
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00

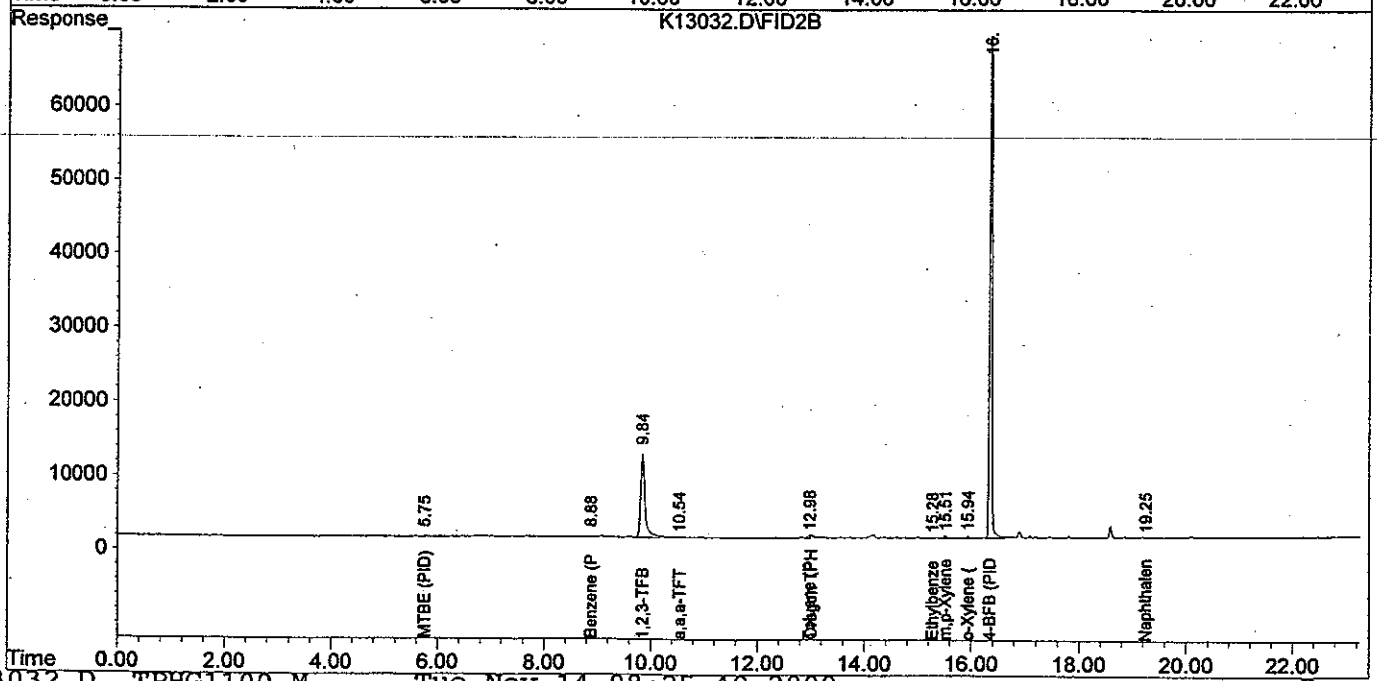
IntFile Signal #1: SURR.E IntFile Signal #2: SURR2.E

Quant Time: Nov 14 8:25 2000 Quant Results File: TPHG1100.RES

Quant Method : C:\HPCHEM\2\METHODS\TPHG1100.M (Chemstation Integrator)
Title : TPH-G Method
Last Update : Thu Nov 09 12:22:22 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG1100.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





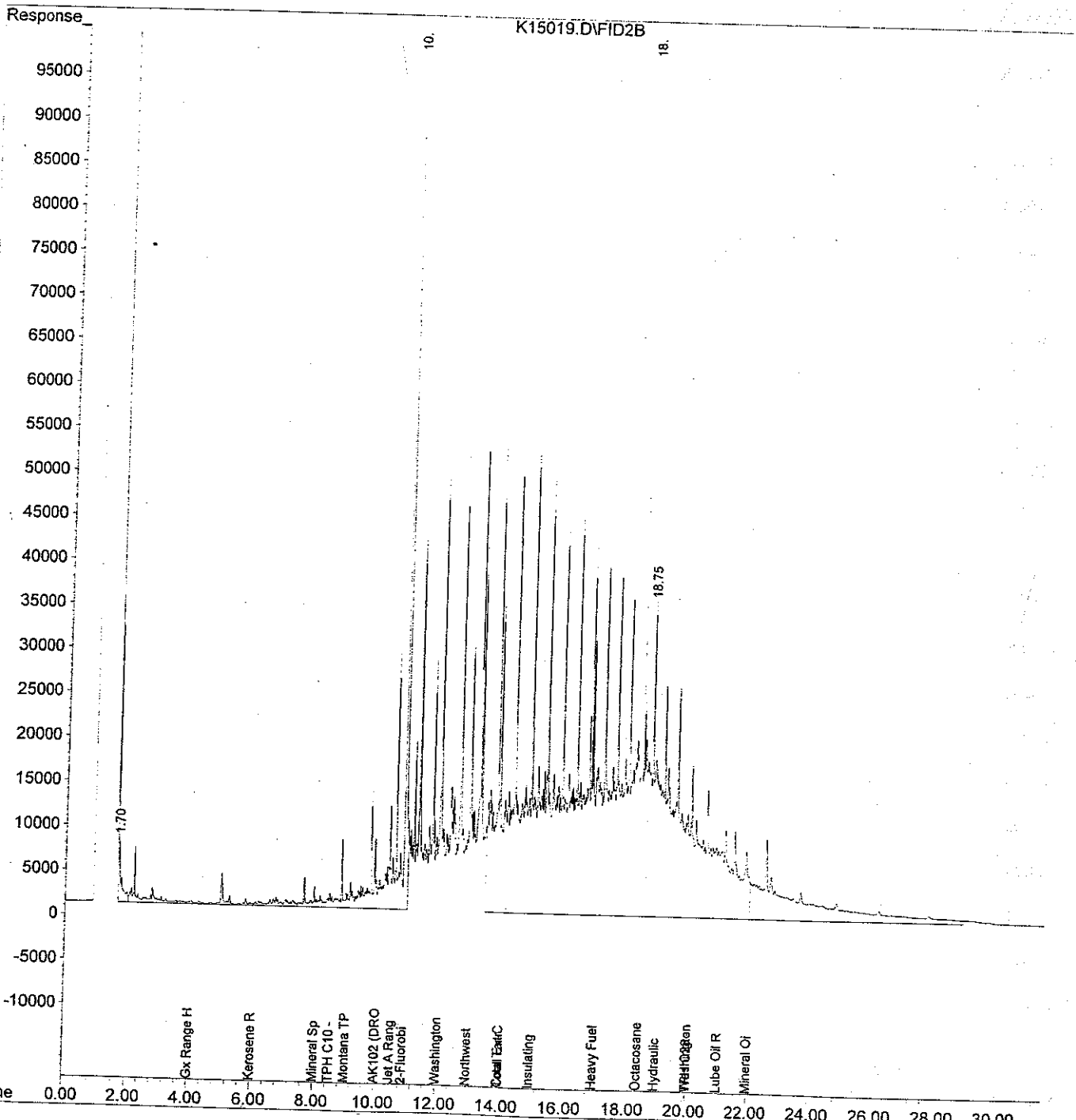
Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K15019.D
Acq On : 15 Nov 2000 1:47 pm
Sample : b0k0272-01
Misc :
IntFile : SURR.E
Quant Time: Nov 15 14:20 2000 Quant Results File: TPHD2.RES

Vial: 11
Operator: db
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\TPHD2.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Sep 27 08:25:47 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :

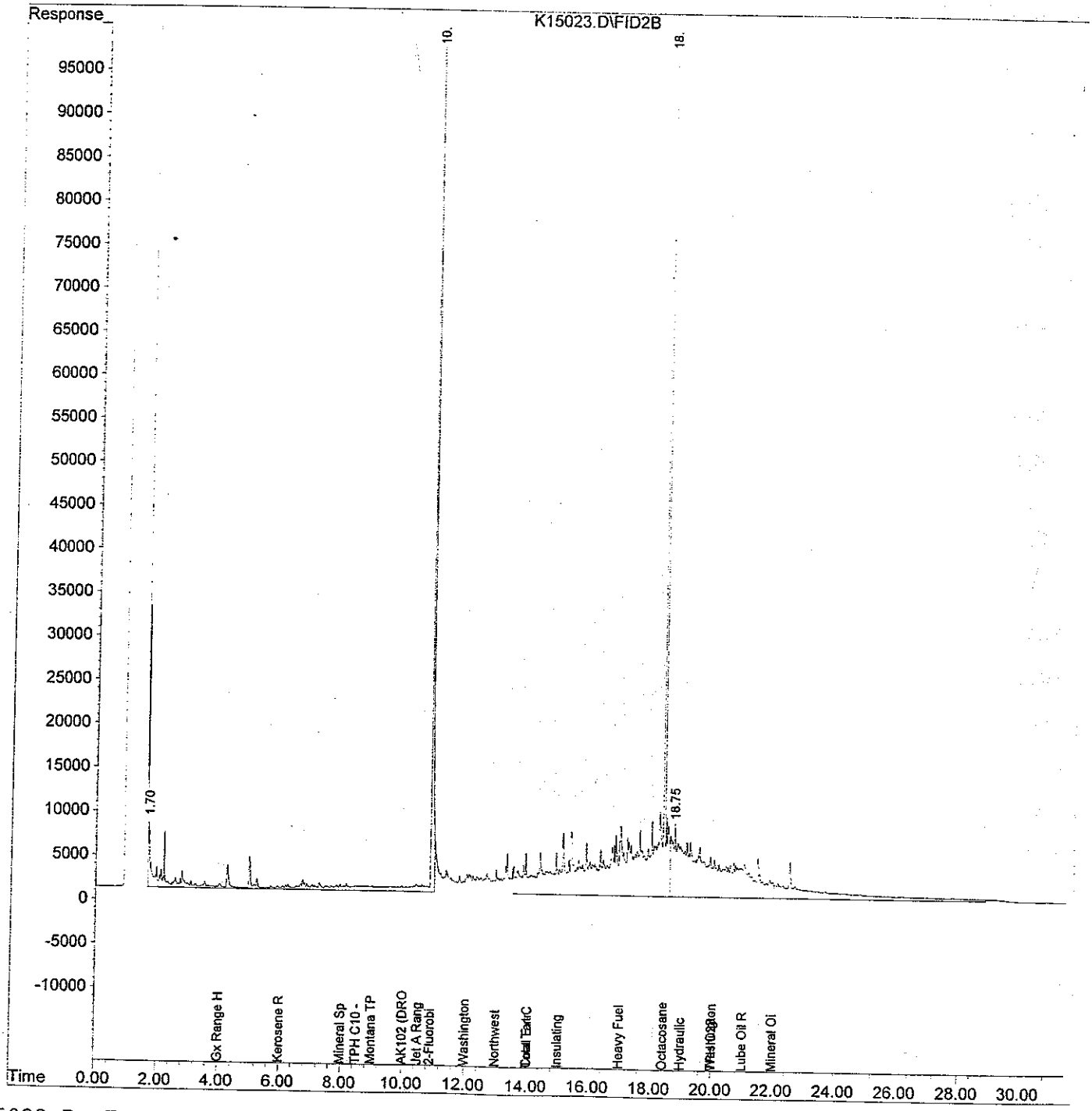


Data File : C:\HPCHEM\3\DATA.SEC\K15023.D
Acq On : 15 Nov 2000 3:10 pm
Sample : b0k0272-03
Misc : S
IntFile : SURR.E
Quant Time: Nov 15 15:42 2000 Quant Results File: TPHD2.RES

Vial: 12
Operator: db
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\TPHD2.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Sep 27 08:25:47 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



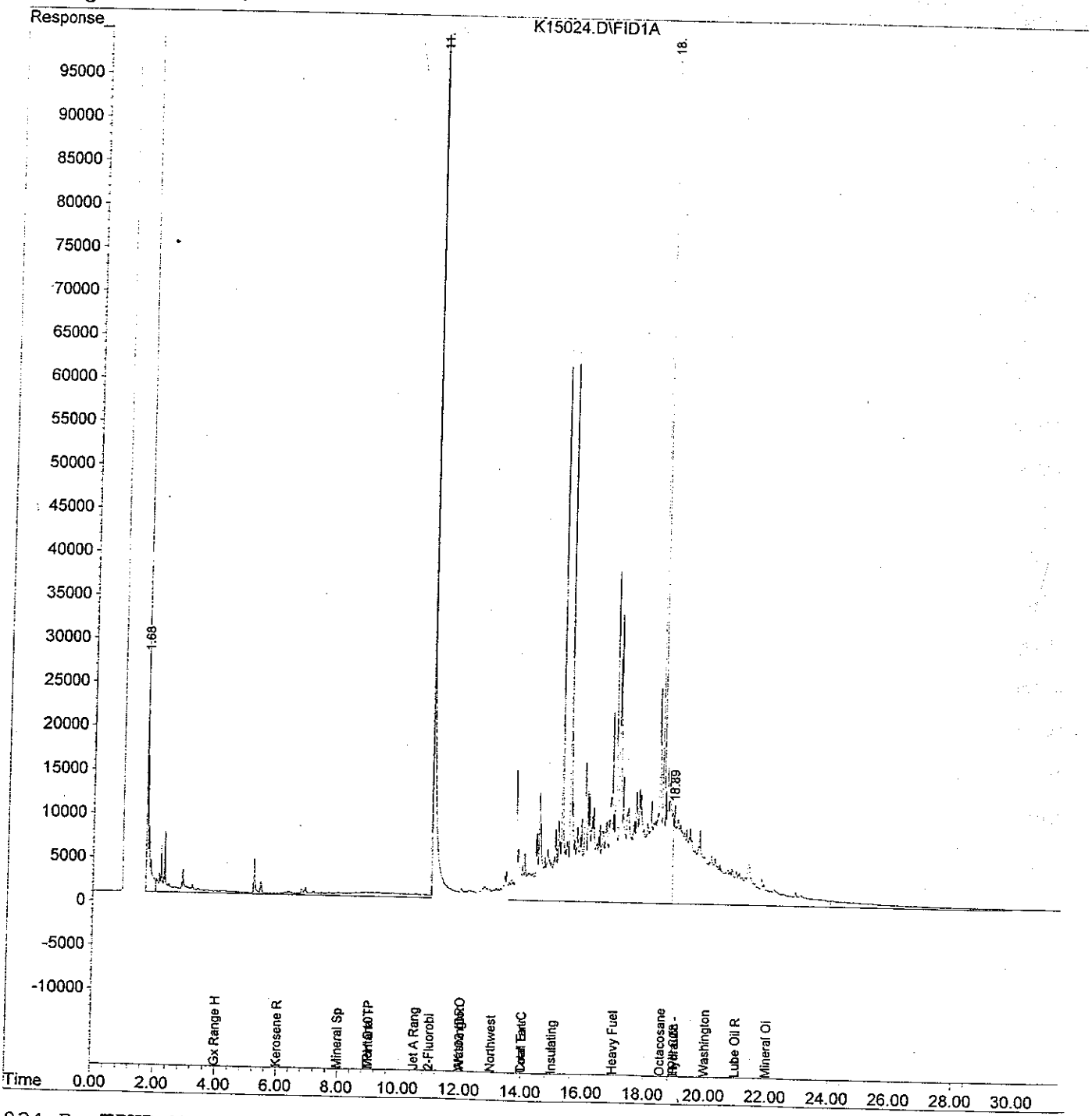
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K15024.D
Acq On : 15 Nov 2000 3:10 pm
Sample : b0k0272-04
Misc : S
IntFile : SURR.E
Quant Time: Nov 15 15:42 2000 Quant Results File: TPHD.RES

Vial: 13
Operator: db
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\TPHD.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Sep 27 08:12:03 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



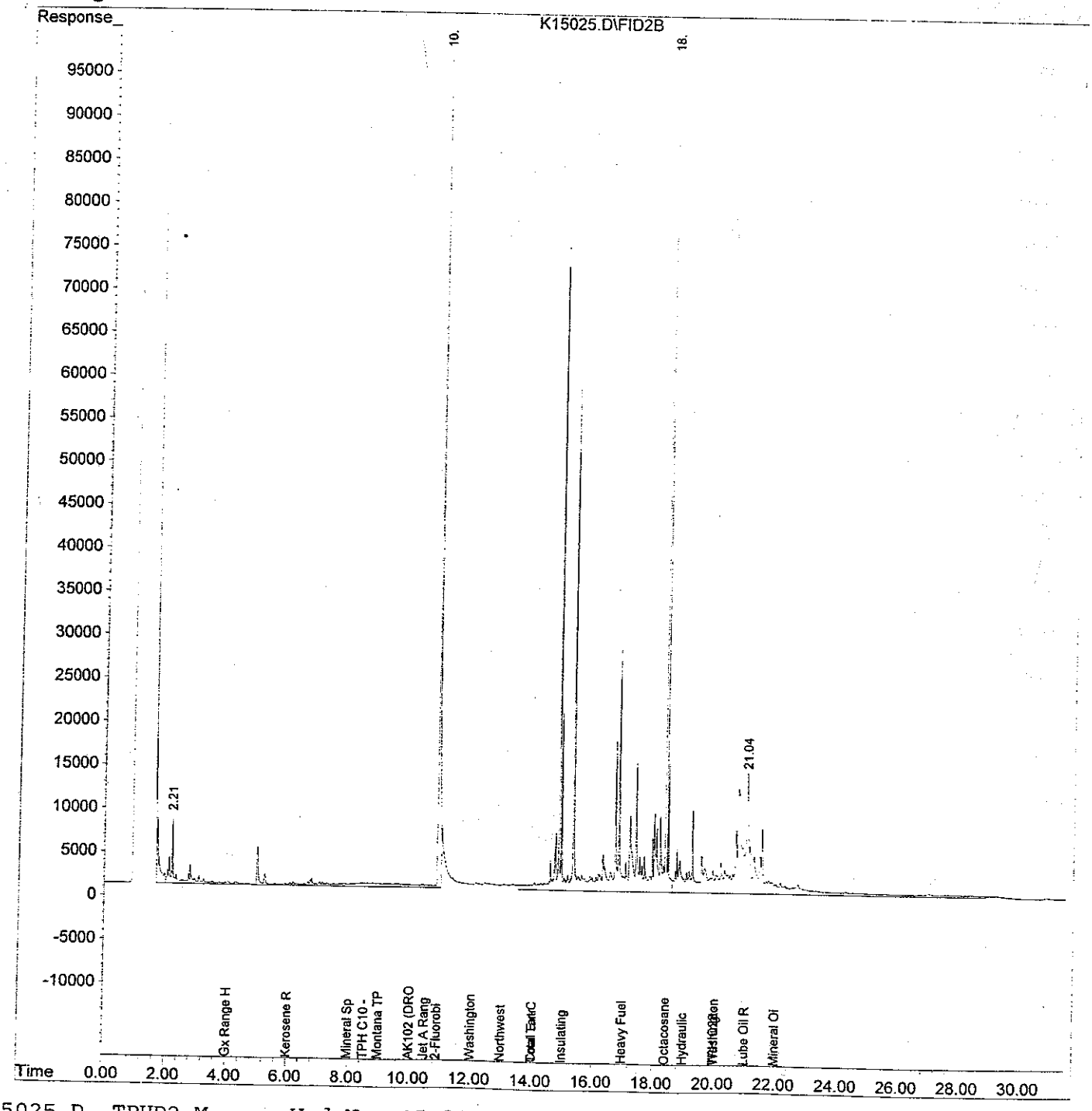
Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K15025.D
Acq On : 15 Nov 2000 3:51 pm
Sample : b0k0272-05
Misc : S
IntFile : SURR.E
Quant Time: Nov 15 16:23 2000 Quant Results File: TPHD2.RES

Vial: 14
Operator: db
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\TPHD2.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Sep 27 08:25:47 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



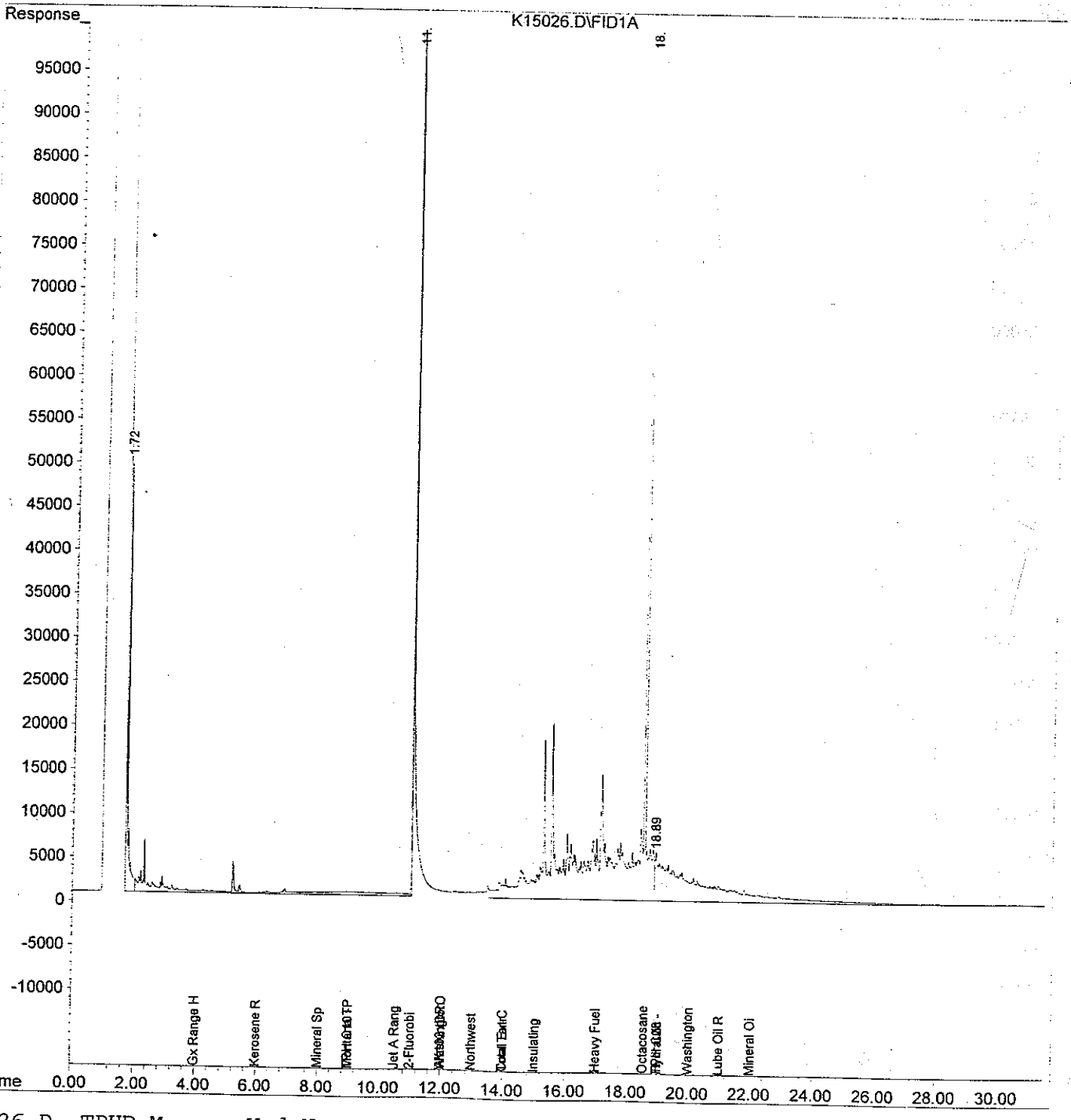
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K15026.D
Acq On : 15 Nov 2000 3:51 pm
Sample : b0k0272-06
Misc : S
IntFile : SURR.E
Quant Time: Nov 15 16:23 2000 Quant Results File: TPHD.RES

Vial: 15
Operator: db
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\TPHD.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Sep 27 08:12:03 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :

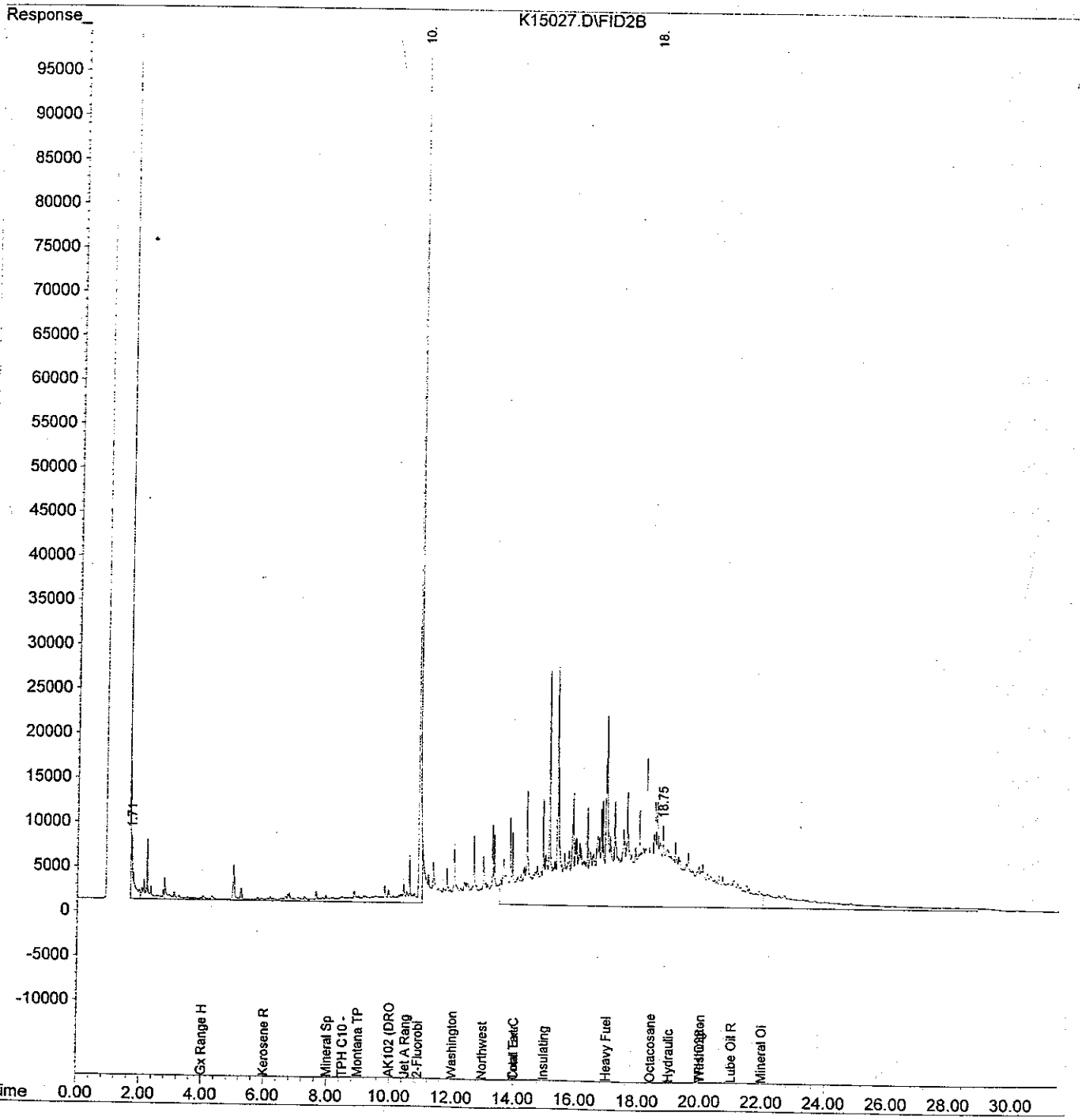


Data File : C:\HPCHEM\3\DATA.SEC\K15027.D
Acq On : 15 Nov 2000 4:31 pm
Sample : b0k0272-07
Misc : S
IntFile : SURR.E
Quant Time: Nov 15 17:04 2000 Quant Results File: TPHD2.RES

Vial: 16
Operator: db
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\TPHD2.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Sep 27 08:25:47 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



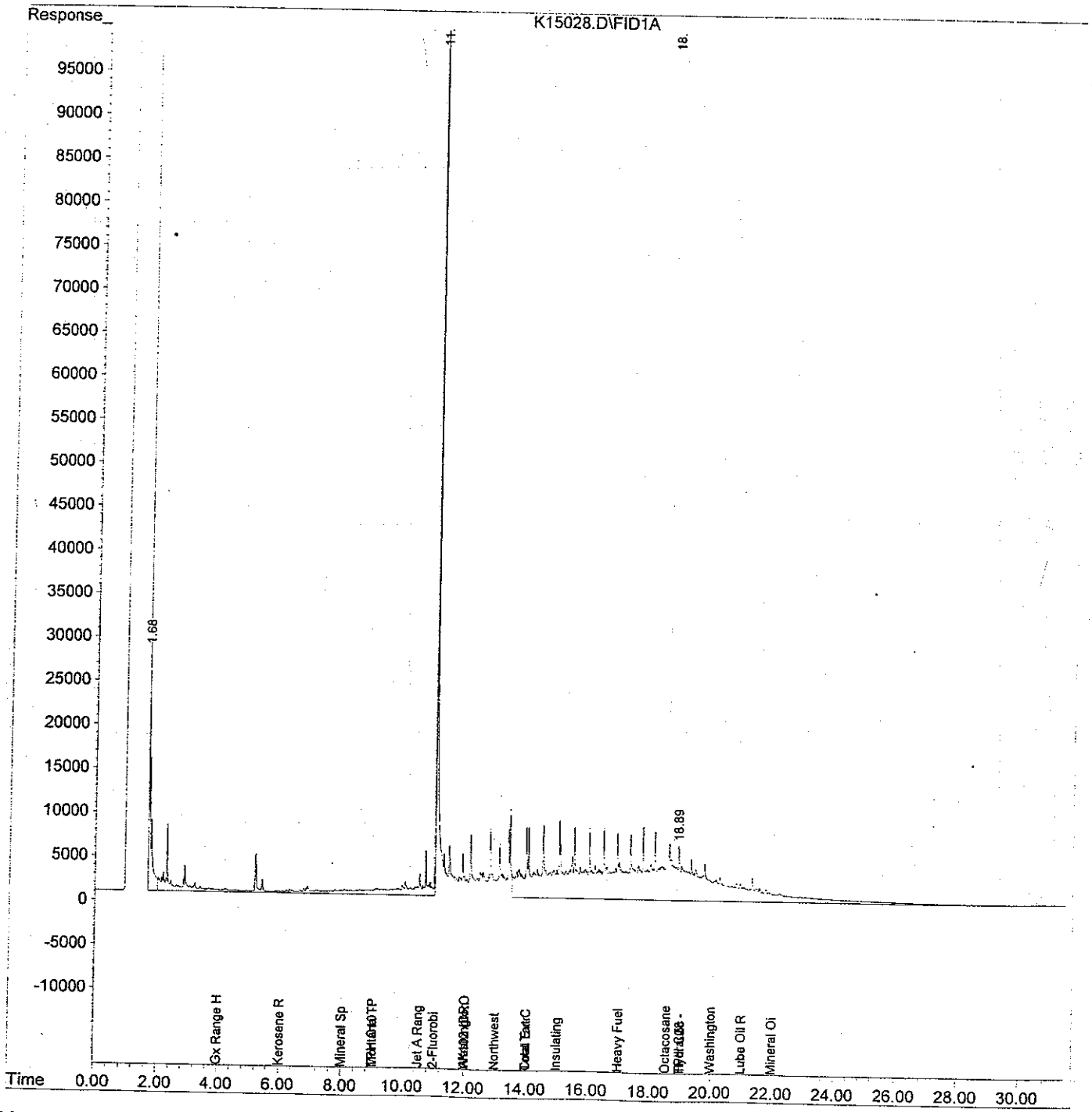
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K15028.D
Acq On : 15 Nov 2000 4:31 pm
Sample : b0k0272-09
Misc : S
IntFile : SURR.E
Quant Time: Nov 15 17:03 2000 Quant Results File: TPHD.RES

Vial: 17
Operator: db
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\TPHD.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Sep 27 08:12:03 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



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20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 (541) 383-9310 FAX 382-7588

CHAIN OF CUSTODY REPORT

Work Order #: BOK0272

CLIENT: UPS

REPORT TO: DAVID RAUBIGER

ADDRESS: 2025 1ST AVE STE. 500
SEATTLE, WA 98121

PHONE: 206-728-0744 FAX: 206-727-3350

INVOICE TO: SAME

P.O. NUMBER:

PROJECT NAME: TRANS MOUNTAIN

PROJECT NUMBER:

SAMPLED BY: KEVIN LUNDMARK

TURNAROUND REQUEST in Business Days*

Organic & Inorganic Analyses: 10 | 7 | 5 | 4 | 3 | 2 | 1 | <1

STD. Petroleum Hydrocarbon Analyses: ~~X~~ | 4 | 3 | 2 | ~~X~~ | <1 STD.

OTHER Please Specify: SEE COMMENTS!

*Turnaround Requests less than standard may incur Rush Charges.

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	REQUESTED ANALYSES: NWTPH-Dx	NWTPH-Gx/BTEX	MATRIX (W, S, O)	# OF CONT.	COMMENTS (BOK0272)	NCA WO ID
1.	PEX-16-S-3	11-09-00 1431	X	X	S	1	STD. TURNAROUND	-01
2.	PEX-17-B-5	11-09-00 1435	X	X	S	1	24 HR. TURNAROUND	-02
3.	PEX-18-S-3	11-09-00 1440	X	X	S	1		-03
4.	PEX-19-S-3	11-09-00 1445	X	X	S	1		-04
5.	PEX-20-B-5	11-09-00 1450	X	X	S	1	STD. TURNAROUND	-05
6.	PEX-21-S-3	11-09-00 1455	X	X	S	1		-06
7.	PEX-22-S-4	11-09-00 1505	X	X	S	1		-07
8.	PEX-23-B-6	11-09-00 1510	X	X	S	1	24 HR. TURNAROUND	-08
9.	PEX-24-S-4	11-09-00 1525	X	X	S	1	STD. TURNAROUND	-09
10.								
11.								
12.								
13.								
14.								
15.								

SAMPLES WERE NOT @ 2-6C UPON RECEIPT

RELINQUISHED BY: [signature] DATE: 11-10-00
PRINT NAME: KEVIN LUNDMARK FIRM: UPS TIME: 1205

RECEIVED BY: [signature] DATE: 11/10/00
PRINT NAME: Kasia Kaczorowska FIRM: NCA TIME: 15:00

RELINQUISHED BY: DATE:
PRINT NAME: FIRM: TIME:

RECEIVED BY: DATE:
PRINT NAME: FIRM: TIME:

ADDITIONAL REMARKS: 24 HOUR TURNAROUND FOR PEX-23-B-6 AND PEX-17-B-5 ONLY. STD. TURNAROUND FOR ALL OTHERS

TEMP: 7.4

COC REV 3/99

PAGE OF

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/17/00 15:36

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
PEX-15-S-2	B0K0285-01	Soil	11/06/00 16:05	11/10/00 15:00

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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.

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/17/00 15:36

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-15-S-2 (B0K0285-01) Soil Sampled: 11/06/00 16:05 Received: 11/10/00 15:00									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K13029	11/13/00	11/16/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*78.9 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*86.8 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/17/00 15:36

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-15-S-2 (B0K0285-01) Soil Sampled: 11/06/00 16:05 Received: 11/10/00 15:00									
Diesel Range Hydrocarbons	**73.9**	10.0	mg/kg dry	1	0K14001	11/14/00	11/15/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	**33.3**	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*93.5 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/17/00 15:36

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-15-S-2 (B0K0285-01) Soil Sampled: 11/06/00 16:05 Received: 11/10/00 15:00									
Dry Weight	**85.3**	1.00	%	1	0K14029	11/14/00	11/15/00	BSOPSPL003R07	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/17/00 15:36

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0K13029: Prepared 11/13/00 Using EPA 5030B (MeOH)										
Blank (0K13029-BLK1)										
Gasoline Range Hydrocarbons	ND	5.00	mg/kg wet							
Benzene	ND	0.0500	"							
Toluene	ND	0.0500	"							
Ethylbenzene	ND	0.0500	"							
Xylenes (total)	ND	0.100	"							
Surrogate: 4-BFB (FID)	*3.72*		"	*4.00*		*93.0*	*50-150*			
Surrogate: 4-BFB (PID)	*3.47*		"	*4.00*		*86.8*	*50-150*			
LCS (0K13029-BS1)										
Gasoline Range Hydrocarbons	22.3	5.00	mg/kg wet	25.0		89.2	70-130			
Surrogate: 4-BFB (FID)	*4.27*		"	*4.00*		*107*	*50-150*			
Duplicate (0K13029-DUP1)					**Source: B0K0151-04**					
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry		ND			58.3	50	R-03
Surrogate: 4-BFB (FID)	*3.83*		"	*4.33*		*88.5*	*50-150*			
Duplicate (0K13029-DUP2)					**Source: B0K0151-09**					
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry		ND			71.1	50	R-03
Surrogate: 4-BFB (FID)	*3.86*		"	*4.38*		*88.1*	*50-150*			
Matrix Spike (0K13029-MS1)					**Source: B0K0151-21**					
Benzene	0.452	0.0500	mg/kg dry	0.543	ND	82.5	60-140			
Toluene	0.454	0.0500	"	0.543	ND	81.5	60-140			
Ethylbenzene	0.485	0.0500	"	0.543	ND	88.4	60-140			
Xylenes (total)	1.48	0.100	"	1.63	ND	89.2	60-140			
Surrogate: 4-BFB (PID)	*3.92*		"	*4.34*		*90.3*	*50-150*			
Matrix Spike Dup (0K13029-MSD1)					**Source: B0K0151-21**					
Benzene	0.451	0.0500	mg/kg dry	0.543	ND	82.3	60-140	0.221	20	
Toluene	0.442	0.0500	"	0.543	ND	79.2	60-140	2.68	20	
Ethylbenzene	0.467	0.0500	"	0.543	ND	85.1	60-140	3.78	20	
Xylenes (total)	1.41	0.100	"	1.63	ND	84.9	60-140	4.84	20	
Surrogate: 4-BFB (PID)	*3.68*		"	*4.34*		*84.8*	*50-150*			

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/17/00 15:36

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up) - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0K14001: Prepared 11/14/00 Using EPA 3550B										
Blank (0K14001-BLK1)										
Diesel Range Hydrocarbons	ND	10.0	mg/kg wet							
Lube Oil Range Hydrocarbons	ND	25.0	"							
Surrogate: 2-FBP	*9.29*		*"*	*10.7*		*86.8*	*50-150*			
LCS (0K14001-BS1)										
Diesel Range Hydrocarbons	67.8	10.0	mg/kg wet	66.7		102	60-140			
Surrogate: 2-FBP	*10.8*		*"*	*10.7*		*101*	*50-150*			
Duplicate (0K14001-DUP1)					**Source: B0K0256-10**					
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry		13.5			41.9	50	
Lube Oil Range Hydrocarbons	ND	25.0	"		35.8			55.3	50	Q-05
Surrogate: 2-FBP	*9.23*		*"*	*11.1*		*83.2*	*50-150*			
Duplicate (0K14001-DUP2)					**Source: B0K0256-11**					
Diesel Range Hydrocarbons	23.0	10.0	mg/kg dry		14.4			46.0	50	
Lube Oil Range Hydrocarbons	55.1	25.0	"		45.4			19.3	50	
Surrogate: 2-FBP	*11.6*		*"*	*11.5*		*101*	*50-150*			

North Creek Analytical - Bothell

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Kirk Gendron For Scott A. Woerman, Project Manager

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/17/00 15:36

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 0K14029: Prepared 11/14/00 Using Dry Weight										
Blank (0K14029-BLK1)										
Dry Weight	100	1.00	%							

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/17/00 15:36

Notes and Definitions

Q-05	Analyses are not controlled on RPD values from sample concentrations less than 10 times the reporting limit.
R-03	The reporting limit for this analyte has been raised to account for 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

North Creek Analytical - Bothell

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Quantitation Report

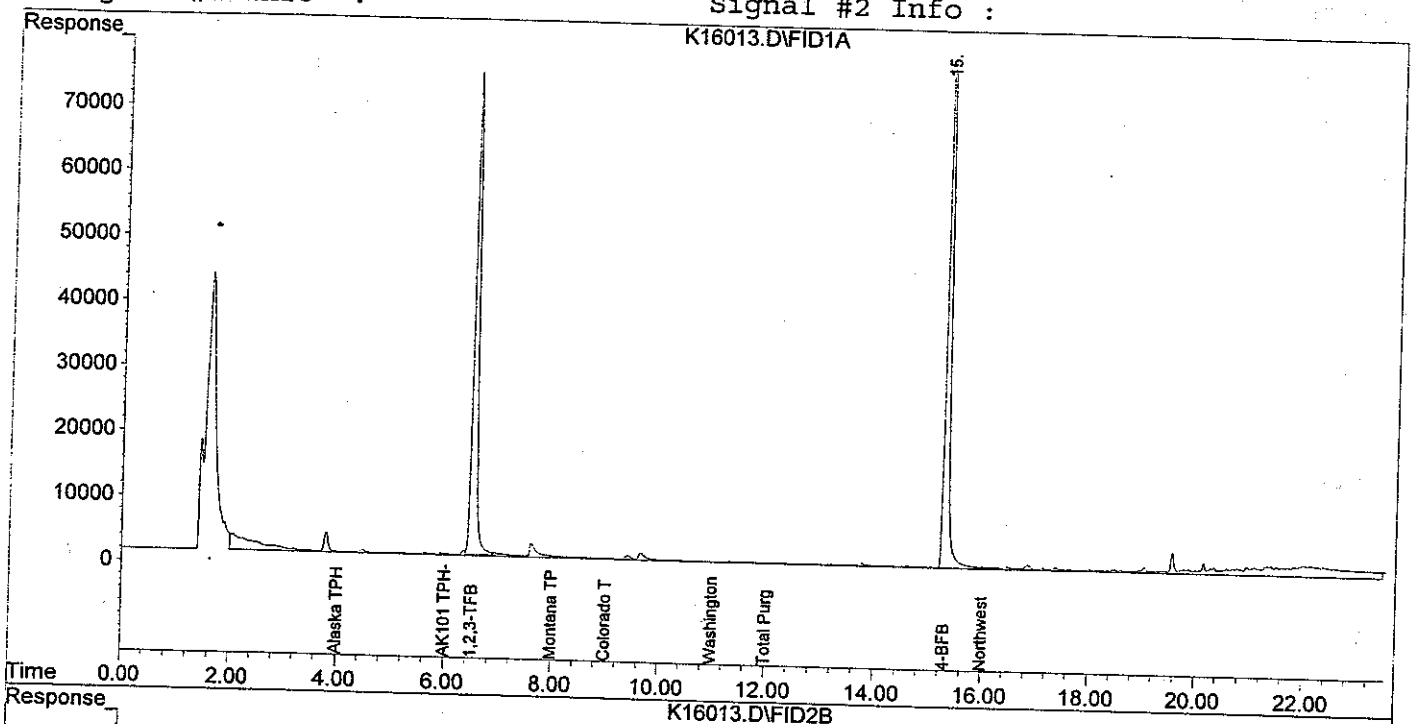
Signal #1 : D:\HPCHEM\3\DATA\111600\K16013.D\FID1A.CH Vial: 13
Signal #2 : D:\HPCHEM\3\DATA\111600\K16013.D\FID2B.CH
Acq On : 16 Nov 2000 2:21 pm Operator: GAP
Sample : b0k0285-01 Inst : GC #6
Misc : 100 uL 0k13029 Multiplr: 1.00
Sample Amount: 0.00

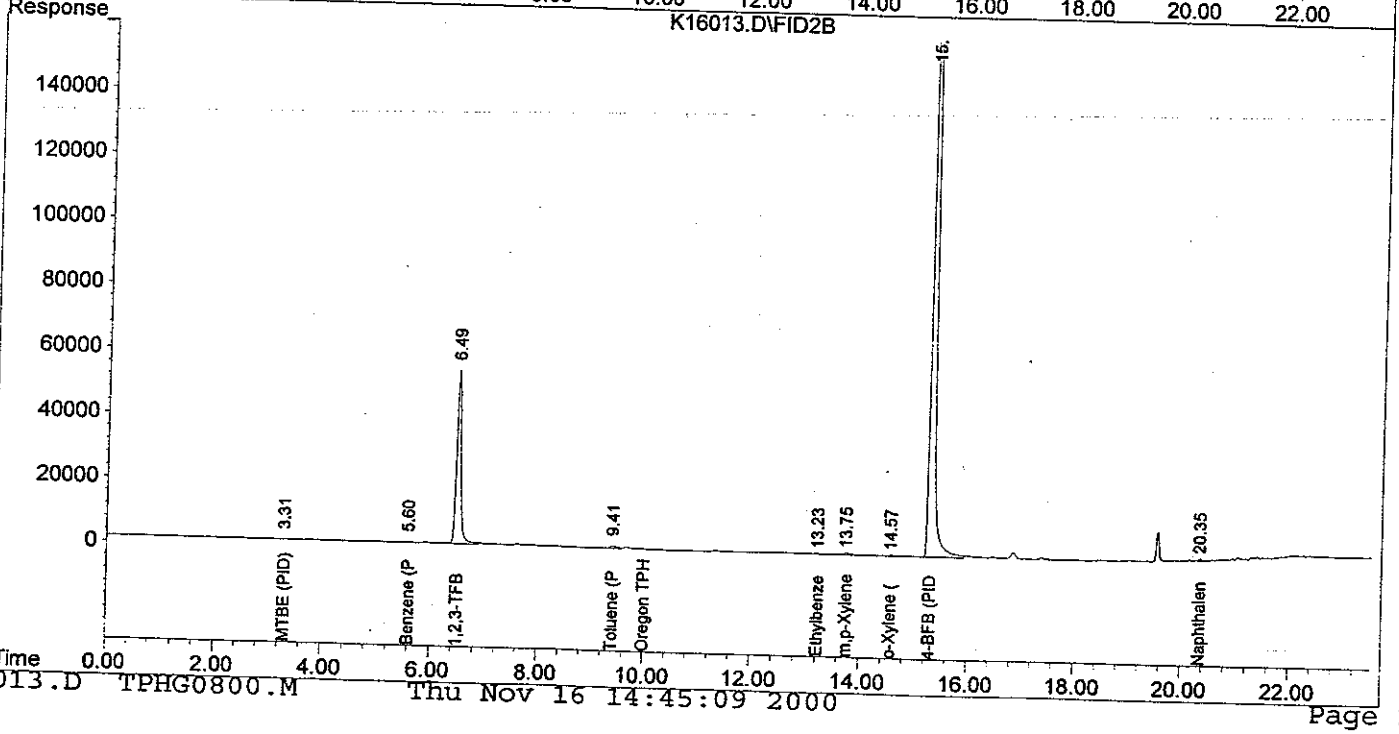
IntFile Signal #1: SURR.E IntFile Signal #2: SURR2.E

Quant Time: Nov 16 14:45 2000 Quant Results File: TPHG0800.RES

Quant Method : D:\HPCHEM\3\METHODS\TPHG0800.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Tue Nov 14 14:57:50 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG0800.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report

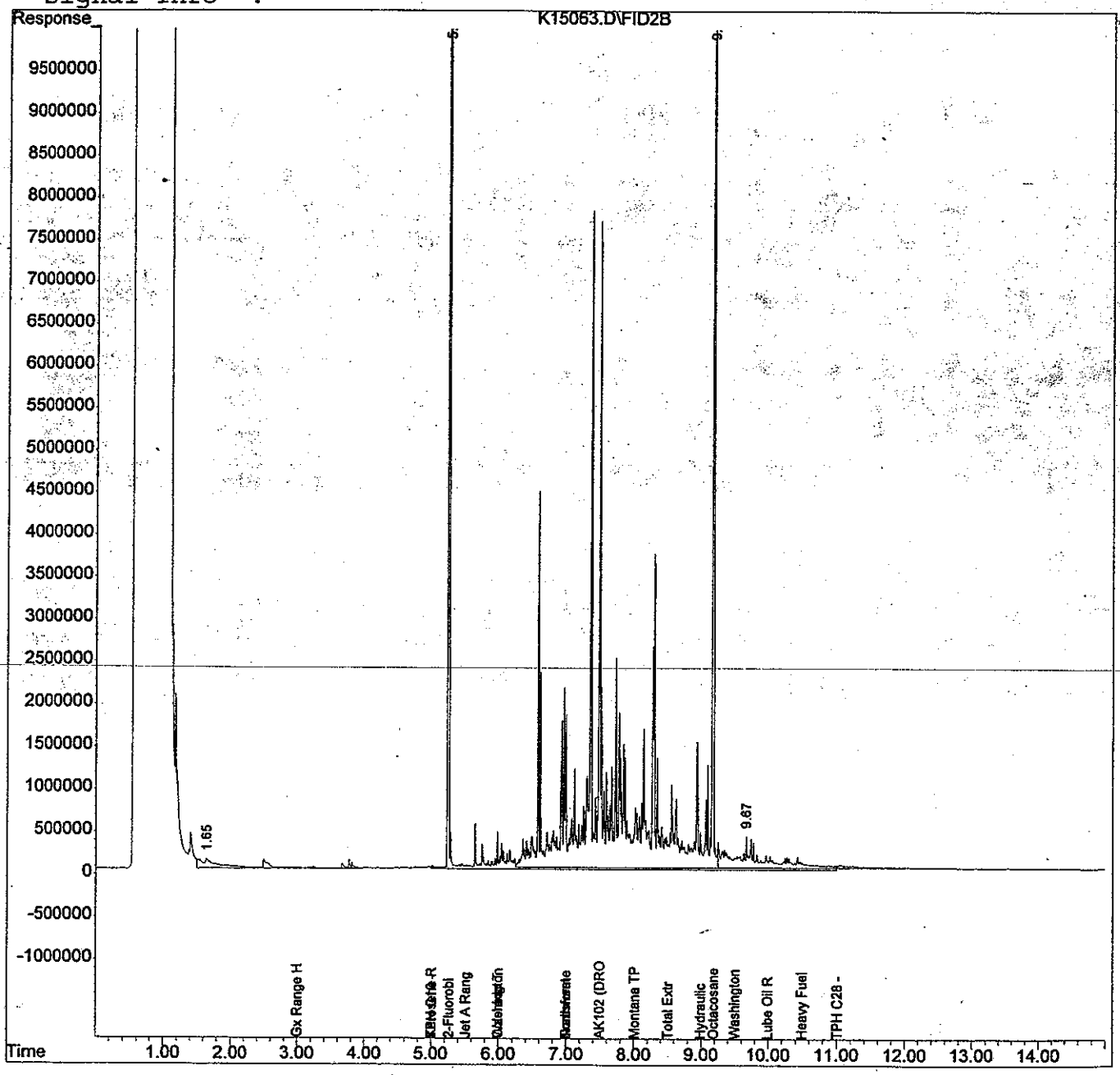
Data File : D:\HPCHEM\4\DATA.SEC\K15063.D Vial: 29
Acq On : 11-15-00 20:56:48 Operator: DB
Sample : b0k0285-01 Inst : GC# 7
Misc : S RE1 Multiplr: 1.00
Sample Amount: 0.00

IntFile : SURR.E

Quant Time: Nov 15 21:12 2000 Quant Results File: TPHD2.RES

Quant Method : D:\HPCHEM\4\METHODS\TPHD2.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 06:58:16 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



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CHAIN OF CUSTODY REPORT

Work Order #: B0K0285

CLIENT: URS

REPORT TO: DAVID RAMBO GEL
ADDRESS: 2025 FIRST AVE STE 500
SEATTLE, WA 98121
PHONE: 206-728-0744 FAX:

INVOICE TO: SAME

P.O. NUMBER:

PROJECT NAME: TRANS MTN. ~~LARET~~ LAUREL
PROJECT NUMBER:
SAMPLED BY: K. LUNDMARK

TURNAROUND REQUEST in Business Days*
Organic & Inorganic Analyses: 10 | 7 | 5 | 4 | 3 | 2 | 1 | <1
STD. Petroleum Hydrocarbon Analyses: ~~5~~ | 4 | 3 | 2 | 1 | <1
STD.
OTHER Please Specify
*Turnaround Requests less than standard may incur Rush Charges.

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	REQUESTED ANALYSES: NWTPH-Dx	NWTPH-Gx/BETX											MATRIX (W, S, O)	# OF CONT.	COMMENTS	NCA WO ID
1.	PEX-15-S-2	11/6/00 1605	X	X									01		S	1	8 OZ. JAR	
2.																		
3.																		
4.																		
5.																		
6.																		
7.																		
8.																		
9.																		
10.																		
11.																		
12.																		
13.																		
14.																	SAMPLES WERE NOT 2-6C UPON RECEIPT	
15.																	SAMPLES WERE 2-6C UPON RECEIPT	

RELINQUISHED BY: Kevin Lundmark
PRINT NAME: KEVIN LUNDMARK FIRM: URS
DATE: 11-10-00 TIME: 1205

RECEIVED BY:
PRINT NAME: S. YARAMUSH FIRM: NCA
DATE: 11/10/00 TIME: 5:02

RELINQUISHED BY:
PRINT NAME: FIRM:
DATE: TIME:

RECEIVED BY:
PRINT NAME: FIRM:
DATE: TIME:

ADDITIONAL REMARKS:
W/O
TEMP: 7.4°

COC REV 3/99 PAGE OF

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/20/00 13:15

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
PEX-28-S-3	B0K0337-01	Soil	11/13/00 08:10	11/13/00 19:10
PEX-27-S-3	B0K0337-02	Soil	11/13/00 08:15	11/13/00 19:10
PEX-26-S-3	B0K0337-03	Soil	11/13/00 08:19	11/13/00 19:10
PEX-25-S-3	B0K0337-04	Soil	11/13/00 08:24	11/13/00 19:10
PEX-29-S-1.5	B0K0337-05	Soil	11/13/00 08:45	11/13/00 19:10
PEX-30-S-2	B0K0337-06	Soil	11/13/00 08:49	11/13/00 19:10
PEX-31-S-2	B0K0337-07	Soil	11/13/00 09:04	11/13/00 19:10
PEX-32-S-1.5	B0K0337-08	Soil	11/13/00 09:07	11/13/00 19:10
PEX-33-S-1.5	B0K0337-09	Soil	11/13/00 09:11	11/13/00 19:10
PEX-34-S-1	B0K0337-10	Soil	11/13/00 09:55	11/13/00 19:10
PEX-36-S-1	B0K0337-11	Soil	11/13/00 10:00	11/13/00 19:10
PEX-35-S-1	B0K0337-12	Soil	11/13/00 10:05	11/13/00 19:10
PEX-37-S-3	B0K0337-13	Soil	11/13/00 10:34	11/13/00 19:10
PEX-38-S-4	B0K0337-14	Soil	11/13/00 11:27	11/13/00 19:10
PEX-39-B-10	B0K0337-15	Soil	11/13/00 11:45	11/13/00 19:10
PEX-46-B-11	B0K0337-16	Soil	11/13/00 13:09	11/13/00 19:10
PEX-47-S-5	B0K0337-17	Soil	11/13/00 13:41	11/13/00 19:10
PEX-48-S-4	B0K0337-18	Soil	11/13/00 14:32	11/13/00 19:10
PEX-40-B-4	B0K0337-19	Soil	11/13/00 12:45	11/13/00 19:10
PEX-41-B-4	B0K0337-20	Soil	11/13/00 12:50	11/13/00 19:10
PEX-42-B-4	B0K0337-21	Soil	11/13/00 14:05	11/13/00 19:10
PEX-43-B-4	B0K0337-22	Soil	11/13/00 14:10	11/13/00 19:10
PEX-44-B-4	B0K0337-23	Soil	11/13/00 15:02	11/13/00 19:10
PEX-45-B-3	B0K0337-24	Soil	11/13/00 14:58	11/13/00 19:10

North Creek Analytical - Bothell

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Kirk Gendron For Scott A. Woerman, Project Manager

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/20/00 13:15

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-28-S-3 (B0K0337-01) Soil Sampled: 11/13/00 08:10 Received: 11/13/00 19:10									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K15009	11/15/00	11/16/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*69.9 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*72.4 %*	*50-150*			"	"	"	"	
PEX-27-S-3 (B0K0337-02) Soil Sampled: 11/13/00 08:15 Received: 11/13/00 19:10									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K15009	11/15/00	11/16/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*69.7 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*73.3 %*	*50-150*			"	"	"	"	
PEX-26-S-3 (B0K0337-03) Soil Sampled: 11/13/00 08:19 Received: 11/13/00 19:10									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K15009	11/15/00	11/16/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*70.6 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*73.9 %*	*50-150*			"	"	"	"	

North Creek Analytical - Bothell

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/20/00 13:15

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-25-S-3 (B0K0337-04) Soil Sampled: 11/13/00 08:24 Received: 11/13/00 19:10									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K15009	11/15/00	11/16/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*79.5 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*82.9 %*	*50-150*			"	"	"	"	
PEX-29-S-1.5 (B0K0337-05) Soil Sampled: 11/13/00 08:45 Received: 11/13/00 19:10									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K15009	11/15/00	11/16/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*66.5 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*72.0 %*	*50-150*			"	"	"	"	
PEX-30-S-2 (B0K0337-06) Soil Sampled: 11/13/00 08:49 Received: 11/13/00 19:10									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K15009	11/15/00	11/16/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*76.4 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*82.4 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/20/00 13:15

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-31-S-2 (B0K0337-07) Soil Sampled: 11/13/00 09:04 Received: 11/13/00 19:10									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K15009	11/15/00	11/16/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*66.8 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*69.5 %*	*50-150*			"	"	"	"	
PEX-32-S-1.5 (B0K0337-08) Soil Sampled: 11/13/00 09:07 Received: 11/13/00 19:10									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K15009	11/15/00	11/16/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*63.2 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*66.9 %*	*50-150*			"	"	"	"	
PEX-33-S-1.5 (B0K0337-09) Soil Sampled: 11/13/00 09:11 Received: 11/13/00 19:10									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K15009	11/15/00	11/16/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*65.0 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*69.9 %*	*50-150*			"	"	"	"	

North Creek Analytical - Bothell

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/20/00 13:15

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-34-S-1 (B0K0337-10) Soil Sampled: 11/13/00 09:55 Received: 11/13/00 19:10									
Gasoline Range Hydrocarbons	**11.5**	5.00	mg/kg dry	1	0K14005	11/14/00	11/15/00	NWTPH-Gx/8021B	
Benzene	**0.125**	0.0500	"	"	"	"	"	"	
Toluene	**0.332**	0.0500	"	"	"	"	"	"	
Ethylbenzene	**0.0896**	0.0500	"	"	"	"	"	"	
Xylenes (total)	**0.605**	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*85.3 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*79.0 %*	*50-150*			"	"	"	"	
PEX-36-S-1 (B0K0337-11) Soil Sampled: 11/13/00 10:00 Received: 11/13/00 19:10									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K15009	11/15/00	11/16/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*68.7 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*74.0 %*	*50-150*			"	"	"	"	
PEX-35-S-1 (B0K0337-12) Soil Sampled: 11/13/00 10:05 Received: 11/13/00 19:10									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K15009	11/15/00	11/16/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*64.3 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*69.8 %*	*50-150*			"	"	"	"	

North Creek Analytical - Bothell

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Kirk Gendron For Scott A. Woerman, Project Manager

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/20/00 13:15

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-37-S-3 (B0K0337-13) Soil Sampled: 11/13/00 10:34 Received: 11/13/00 19:10									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K15009	11/15/00	11/16/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*72.5 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*78.8 %*	*50-150*			"	"	"	"	
PEX-38-S-4 (B0K0337-14) Soil Sampled: 11/13/00 11:27 Received: 11/13/00 19:10									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K15009	11/15/00	11/17/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*72.7 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*78.9 %*	*50-150*			"	"	"	"	
PEX-39-B-10 (B0K0337-15) Soil Sampled: 11/13/00 11:45 Received: 11/13/00 19:10									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K15009	11/15/00	11/17/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*70.7 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*79.0 %*	*50-150*			"	"	"	"	

North Creek Analytical - Bothell

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/20/00 13:15

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-46-B-11 (B0K0337-16) Soil Sampled: 11/13/00 13:09 Received: 11/13/00 19:10									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K15009	11/15/00	11/17/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*73.7 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*78.3 %*	*50-150*			"	"	"	"	
PEX-47-S-5 (B0K0337-17) Soil Sampled: 11/13/00 13:41 Received: 11/13/00 19:10									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K15009	11/15/00	11/17/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*73.1 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*75.9 %*	*50-150*			"	"	"	"	
PEX-48-S-4 (B0K0337-18) Soil Sampled: 11/13/00 14:32 Received: 11/13/00 19:10									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K15009	11/15/00	11/17/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*71.0 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*77.4 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/20/00 13:15

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-40-B-4 (B0K0337-19) Soil Sampled: 11/13/00 12:45 Received: 11/13/00 19:10									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K14005	11/14/00	11/14/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*93.7 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*82.7 %*	*50-150*			"	"	"	"	
PEX-41-B-4 (B0K0337-20) Soil Sampled: 11/13/00 12:50 Received: 11/13/00 19:10									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K15009	11/15/00	11/17/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*65.8 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*71.9 %*	*50-150*			"	"	"	"	
PEX-42-B-4 (B0K0337-21) Soil Sampled: 11/13/00 14:05 Received: 11/13/00 19:10									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K15009	11/15/00	11/17/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*76.8 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*76.0 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/20/00 13:15

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-43-B-4 (B0K0337-22) Soil Sampled: 11/13/00 14:10 Received: 11/13/00 19:10									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K15009	11/15/00	11/17/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*75.7 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*74.4 %*	*50-150*			"	"	"	"	
PEX-44-B-4 (B0K0337-23) Soil Sampled: 11/13/00 15:02 Received: 11/13/00 19:10									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K16010	11/16/00	11/19/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*90.3 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*85.7 %*	*50-150*			"	"	"	"	
PEX-45-B-3 (B0K0337-24) Soil Sampled: 11/13/00 14:58 Received: 11/13/00 19:10									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K16010	11/16/00	11/19/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*84.0 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*87.9 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/20/00 13:15

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-28-S-3 (B0K0337-01) Soil	**Sampled: 11/13/00 08:10**		**Received: 11/13/00 19:10**						
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K16033	11/16/00	11/17/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*55.7 %*	*50-150*			"	"	"	"	
PEX-27-S-3 (B0K0337-02) Soil	**Sampled: 11/13/00 08:15**		**Received: 11/13/00 19:10**						
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K16033	11/16/00	11/17/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*66.0 %*	*50-150*			"	"	"	"	
PEX-26-S-3 (B0K0337-03) Soil	**Sampled: 11/13/00 08:19**		**Received: 11/13/00 19:10**						
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K16033	11/16/00	11/17/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*61.1 %*	*50-150*			"	"	"	"	
PEX-25-S-3 (B0K0337-04) Soil	**Sampled: 11/13/00 08:24**		**Received: 11/13/00 19:10**						
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K16033	11/16/00	11/17/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*50.7 %*	*50-150*			"	"	"	"	
PEX-29-S-1.5 (B0K0337-05) Soil	**Sampled: 11/13/00 08:45**		**Received: 11/13/00 19:10**						
Diesel Range Hydrocarbons	**16.8**	10.0	mg/kg dry	1	0K16033	11/16/00	11/17/00	NWTPH-Dx	D-06
Lube Oil Range Hydrocarbons	**27.9**	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*62.7 %*	*50-150*			"	"	"	"	
PEX-30-S-2 (B0K0337-06) Soil	**Sampled: 11/13/00 08:49**		**Received: 11/13/00 19:10**						
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K16033	11/16/00	11/17/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*68.2 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/20/00 13:15

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-31-S-2 (B0K0337-07) Soil	**Sampled: 11/13/00 09:04**	**Received: 11/13/00 19:10**							
Diesel Range Hydrocarbons	**10.7**	10.0	mg/kg dry	1	0K16033	11/16/00	11/17/00	NWTPH-Dx	D-06
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*61.6 %*	*50-150*			"	"	"	"	
PEX-32-S-1.5 (B0K0337-08) Soil	**Sampled: 11/13/00 09:07**	**Received: 11/13/00 19:10**							
Diesel Range Hydrocarbons	**10.3**	10.0	mg/kg dry	1	0K16033	11/16/00	11/17/00	NWTPH-Dx	D-06
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*66.9 %*	*50-150*			"	"	"	"	
PEX-33-S-1.5 (B0K0337-09) Soil	**Sampled: 11/13/00 09:11**	**Received: 11/13/00 19:10**							
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K16033	11/16/00	11/17/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*73.2 %*	*50-150*			"	"	"	"	
PEX-34-S-1 (B0K0337-10) Soil	**Sampled: 11/13/00 09:55**	**Received: 11/13/00 19:10**							
Diesel Range Hydrocarbons	**69.2**	10.0	mg/kg dry	1	0K14020	11/14/00	11/15/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	**45.4**	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*72.5 %*	*50-150*			"	"	"	"	
PEX-36-S-1 (B0K0337-11) Soil	**Sampled: 11/13/00 10:00**	**Received: 11/13/00 19:10**							
Diesel Range Hydrocarbons	**20.6**	10.0	mg/kg dry	1	0K16033	11/16/00	11/17/00	NWTPH-Dx	D-06
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*76.7 %*	*50-150*			"	"	"	"	
PEX-35-S-1 (B0K0337-12) Soil	**Sampled: 11/13/00 10:05**	**Received: 11/13/00 19:10**							
Diesel Range Hydrocarbons	**14.0**	10.0	mg/kg dry	1	0K16033	11/16/00	11/17/00	NWTPH-Dx	D-06
Lube Oil Range Hydrocarbons	**30.5**	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*69.5 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/20/00 13:15

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-37-S-3 (B0K0337-13) Soil	**Sampled: 11/13/00 10:34**		**Received: 11/13/00 19:10**						
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K16033	11/16/00	11/17/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*72.9 %*	*50-150*			"	"	"	"	
PEX-38-S-4 (B0K0337-14) Soil	**Sampled: 11/13/00 11:27**		**Received: 11/13/00 19:10**						
Diesel Range Hydrocarbons	**20.7**	10.0	mg/kg dry	1	0K16033	11/16/00	11/17/00	NWTPH-Dx	D-06
Lube Oil Range Hydrocarbons	**41.1**	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*75.4 %*	*50-150*			"	"	"	"	
PEX-39-B-10 (B0K0337-15) Soil	**Sampled: 11/13/00 11:45**		**Received: 11/13/00 19:10**						
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K16033	11/16/00	11/17/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*69.6 %*	*50-150*			"	"	"	"	
PEX-46-B-11 (B0K0337-16) Soil	**Sampled: 11/13/00 13:09**		**Received: 11/13/00 19:10**						
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K16033	11/16/00	11/17/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*72.0 %*	*50-150*			"	"	"	"	
PEX-47-S-5 (B0K0337-17) Soil	**Sampled: 11/13/00 13:41**		**Received: 11/13/00 19:10**						
Diesel Range Hydrocarbons	**16.7**	10.0	mg/kg dry	1	0K16033	11/16/00	11/17/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	**31.5**	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*70.5 %*	*50-150*			"	"	"	"	
PEX-48-S-4 (B0K0337-18) Soil	**Sampled: 11/13/00 14:32**		**Received: 11/13/00 19:10**						
Diesel Range Hydrocarbons	**57.8**	10.0	mg/kg dry	1	0K17030	11/17/00	11/19/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	**76.4**	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*74.4 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/20/00 13:15

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-40-B-4 (B0K0337-19) Soil Sampled: 11/13/00 12:45 Received: 11/13/00 19:10									
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K14020	11/14/00	11/15/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*65.2 %*	*50-150*			"	"	"	"	
PEX-41-B-4 (B0K0337-20) Soil Sampled: 11/13/00 12:50 Received: 11/13/00 19:10									
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K17030	11/17/00	11/19/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*72.6 %*	*50-150*			"	"	"	"	
PEX-42-B-4 (B0K0337-21) Soil Sampled: 11/13/00 14:05 Received: 11/13/00 19:10									
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K17030	11/17/00	11/19/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*68.8 %*	*50-150*			"	"	"	"	
PEX-43-B-4 (B0K0337-22) Soil Sampled: 11/13/00 14:10 Received: 11/13/00 19:10									
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K17030	11/17/00	11/19/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*68.5 %*	*50-150*			"	"	"	"	
PEX-44-B-4 (B0K0337-23) Soil Sampled: 11/13/00 15:02 Received: 11/13/00 19:10									
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K17030	11/17/00	11/19/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*67.3 %*	*50-150*			"	"	"	"	
PEX-45-B-3 (B0K0337-24) Soil Sampled: 11/13/00 14:58 Received: 11/13/00 19:10									
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K17030	11/17/00	11/19/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*71.0 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/20/00 13:15

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-28-S-3 (B0K0337-01) Soil	**Sampled: 11/13/00 08:10**	**Received: 11/13/00 19:10**							
Dry Weight	**82.5**	1.00	%	1	0K15047	11/15/00	11/16/00	BSOPSPL003R07	
PEX-27-S-3 (B0K0337-02) Soil	**Sampled: 11/13/00 08:15**	**Received: 11/13/00 19:10**							
Dry Weight	**80.2**	1.00	%	1	0K15047	11/15/00	11/16/00	BSOPSPL003R07	
PEX-26-S-3 (B0K0337-03) Soil	**Sampled: 11/13/00 08:19**	**Received: 11/13/00 19:10**							
Dry Weight	**74.5**	1.00	%	1	0K15048	11/15/00	11/16/00	BSOPSPL003R07	
PEX-25-S-3 (B0K0337-04) Soil	**Sampled: 11/13/00 08:24**	**Received: 11/13/00 19:10**							
Dry Weight	**85.4**	1.00	%	1	0K15048	11/15/00	11/16/00	BSOPSPL003R07	
PEX-29-S-1.5 (B0K0337-05) Soil	**Sampled: 11/13/00 08:45**	**Received: 11/13/00 19:10**							
Dry Weight	**79.0**	1.00	%	1	0K15048	11/15/00	11/16/00	BSOPSPL003R07	
PEX-30-S-2 (B0K0337-06) Soil	**Sampled: 11/13/00 08:49**	**Received: 11/13/00 19:10**							
Dry Weight	**84.9**	1.00	%	1	0K15048	11/15/00	11/16/00	BSOPSPL003R07	
PEX-31-S-2 (B0K0337-07) Soil	**Sampled: 11/13/00 09:04**	**Received: 11/13/00 19:10**							
Dry Weight	**67.4**	1.00	%	1	0K15048	11/15/00	11/16/00	BSOPSPL003R07	
PEX-32-S-1.5 (B0K0337-08) Soil	**Sampled: 11/13/00 09:07**	**Received: 11/13/00 19:10**							
Dry Weight	**67.9**	1.00	%	1	0K15048	11/15/00	11/16/00	BSOPSPL003R07	
PEX-33-S-1.5 (B0K0337-09) Soil	**Sampled: 11/13/00 09:11**	**Received: 11/13/00 19:10**							
Dry Weight	**69.6**	1.00	%	1	0K15048	11/15/00	11/16/00	BSOPSPL003R07	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/20/00 13:15

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-34-S-1 (B0K0337-10) Soil	**Sampled: 11/13/00 09:55**	**Received: 11/13/00 19:10**							
Dry Weight	**74.5**	1.00	%	1	0K14029	11/14/00	11/15/00	BSOPSPL003R07	
PEX-36-S-1 (B0K0337-11) Soil	**Sampled: 11/13/00 10:00**	**Received: 11/13/00 19:10**							
Dry Weight	**73.1**	1.00	%	1	0K15048	11/15/00	11/16/00	BSOPSPL003R07	
PEX-35-S-1 (B0K0337-12) Soil	**Sampled: 11/13/00 10:05**	**Received: 11/13/00 19:10**							
Dry Weight	**70.7**	1.00	%	1	0K15048	11/15/00	11/16/00	BSOPSPL003R07	
PEX-37-S-3 (B0K0337-13) Soil	**Sampled: 11/13/00 10:34**	**Received: 11/13/00 19:10**							
Dry Weight	**85.9**	1.00	%	1	0K15048	11/15/00	11/16/00	BSOPSPL003R07	
PEX-38-S-4 (B0K0337-14) Soil	**Sampled: 11/13/00 11:27**	**Received: 11/13/00 19:10**							
Dry Weight	**87.8**	1.00	%	1	0K15048	11/15/00	11/16/00	BSOPSPL003R07	
PEX-39-B-10 (B0K0337-15) Soil	**Sampled: 11/13/00 11:45**	**Received: 11/13/00 19:10**							
Dry Weight	**86.7**	1.00	%	1	0K15048	11/15/00	11/16/00	BSOPSPL003R07	
PEX-46-B-11 (B0K0337-16) Soil	**Sampled: 11/13/00 13:09**	**Received: 11/13/00 19:10**							
Dry Weight	**86.9**	1.00	%	1	0K15048	11/15/00	11/16/00	BSOPSPL003R07	
PEX-47-S-5 (B0K0337-17) Soil	**Sampled: 11/13/00 13:41**	**Received: 11/13/00 19:10**							
Dry Weight	**92.6**	1.00	%	1	0K15048	11/15/00	11/16/00	BSOPSPL003R07	
PEX-48-S-4 (B0K0337-18) Soil	**Sampled: 11/13/00 14:32**	**Received: 11/13/00 19:10**							
Dry Weight	**91.3**	1.00	%	1	0K15048	11/15/00	11/16/00	BSOPSPL003R07	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/20/00 13:15

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-40-B-4 (B0K0337-19) Soil	**Sampled: 11/13/00 12:45**		**Received: 11/13/00 19:10**						
Dry Weight	**81.4**	1.00	%	1	0K14029	11/14/00	11/15/00	BSOPSPL003R07	
PEX-41-B-4 (B0K0337-20) Soil	**Sampled: 11/13/00 12:50**		**Received: 11/13/00 19:10**						
Dry Weight	**81.5**	1.00	%	1	0K15048	11/15/00	11/16/00	BSOPSPL003R07	
PEX-42-B-4 (B0K0337-21) Soil	**Sampled: 11/13/00 14:05**		**Received: 11/13/00 19:10**						
Dry Weight	**82.2**	1.00	%	1	0K15048	11/15/00	11/16/00	BSOPSPL003R07	
PEX-43-B-4 (B0K0337-22) Soil	**Sampled: 11/13/00 14:10**		**Received: 11/13/00 19:10**						
Dry Weight	**85.2**	1.00	%	1	0K15048	11/15/00	11/16/00	BSOPSPL003R07	
PEX-44-B-4 (B0K0337-23) Soil	**Sampled: 11/13/00 15:02**		**Received: 11/13/00 19:10**						
Dry Weight	**82.8**	1.00	%	1	0K16029	11/16/00	11/17/00	BSOPSPL003R07	
PEX-45-B-3 (B0K0337-24) Soil	**Sampled: 11/13/00 14:58**		**Received: 11/13/00 19:10**						
Dry Weight	**81.0**	1.00	%	1	0K16029	11/16/00	11/17/00	BSOPSPL003R07	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/20/00 13:15

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0K14005: Prepared 11/14/00 Using EPA 5030B (MeOH)										
Blank (0K14005-BLK1)										
Gasoline Range Hydrocarbons	ND	5.00	mg/kg wet							
Benzene	ND	0.0500	"							
Toluene	ND	0.0500	"							
Ethylbenzene	ND	0.0500	"							
Xylenes (total)	ND	0.100	"							
Surrogate: 4-BFB (FID)	*4.18*		"	*4.00*		*104*	*50-150*			
Surrogate: 4-BFB (PID)	*3.61*		"	*4.00*		*90.2*	*50-150*			
LCS (0K14005-BS1)										
Gasoline Range Hydrocarbons	21.7	5.00	mg/kg wet	25.0		86.8	70-130			
Surrogate: 4-BFB (FID)	*4.27*		"	*4.00*		*107*	*50-150*			
Duplicate (0K14005-DUP1)					**Source: B0K0273-03**					
Gasoline Range Hydrocarbons	21.6	5.00	mg/kg dry		8.07			91.2	50	Q-05
Surrogate: 4-BFB (FID)	*4.87*		"	*5.21*		*93.5*	*50-150*			
Duplicate (0K14005-DUP2)					**Source: B0K0273-06**					
Gasoline Range Hydrocarbons	11.2	5.00	mg/kg dry		16.6			38.8	50	
Surrogate: 4-BFB (FID)	*5.99*		"	*6.44*		*93.0*	*50-150*			
Matrix Spike (0K14005-MS1)					**Source: B0K0273-11**					
Benzene	0.488	0.0500	mg/kg dry	0.614	ND	78.9	60-140			
Toluene	0.485	0.0500	"	0.614	ND	77.1	60-140			
Ethylbenzene	0.507	0.0500	"	0.614	ND	82.6	60-140			
Xylenes (total)	1.54	0.100	"	1.84	ND	83.0	60-140			
Surrogate: 4-BFB (PID)	*4.09*		"	*4.91*		*83.3*	*50-150*			
Matrix Spike Dup (0K14005-MSD1)					**Source: B0K0273-11**					
Benzene	0.503	0.0500	mg/kg dry	0.614	ND	81.4	60-140	3.03	20	
Toluene	0.494	0.0500	"	0.614	ND	78.6	60-140	1.84	20	
Ethylbenzene	0.519	0.0500	"	0.614	ND	84.5	60-140	2.34	20	
Xylenes (total)	1.58	0.100	"	1.84	ND	85.2	60-140	2.56	20	
Surrogate: 4-BFB (PID)	*4.14*		"	*4.91*		*84.3*	*50-150*			

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/20/00 13:15

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0K15009: Prepared 11/15/00 Using EPA 5030B (MeOH)										
Blank (0K15009-BLK1)										
Gasoline Range Hydrocarbons	ND	5.00	mg/kg wet							
Benzene	ND	0.0500	"							
Toluene	ND	0.0500	"							
Ethylbenzene	ND	0.0500	"							
Xylenes (total)	ND	0.100	"							
Surrogate: 4-BFB (FID)	*3.45*		"	*4.00*		*86.3*	*50-150*			
Surrogate: 4-BFB (PID)	*3.51*		"	*4.00*		*87.7*	*50-150*			
LCS (0K15009-BS1)										
Gasoline Range Hydrocarbons	25.3	5.00	mg/kg wet	25.0		101	70-130			
Surrogate: 4-BFB (FID)	*3.87*		"	*4.00*		*96.7*	*50-150*			
Duplicate (0K15009-DUP1)					**Source: B0K0337-08**					
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry		ND			7.81	50	
Surrogate: 4-BFB (FID)	*3.83*		"	*5.89*		*65.0*	*50-150*			
Duplicate (0K15009-DUP2)					**Source: B0K0337-16**					
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry		ND			5.60	50	
Surrogate: 4-BFB (FID)	*3.42*		"	*4.60*		*74.3*	*50-150*			
Matrix Spike (0K15009-MS1)					**Source: B0K0337-01**					
Benzene	0.510	0.0500	mg/kg dry	0.606	ND	82.8	60-140			
Toluene	0.530	0.0500	"	0.606	ND	84.4	60-140			
Ethylbenzene	0.514	0.0500	"	0.606	ND	83.0	60-140			
Xylenes (total)	1.57	0.100	"	1.82	ND	84.3	60-140			
Surrogate: 4-BFB (PID)	*3.72*		"	*4.85*		*76.7*	*50-150*			
Matrix Spike Dup (0K15009-MSD1)					**Source: B0K0337-01**					
Benzene	0.509	0.0500	mg/kg dry	0.606	ND	82.6	60-140	0.196	20	
Toluene	0.551	0.0500	"	0.606	ND	87.8	60-140	3.89	20	
Ethylbenzene	0.527	0.0500	"	0.606	ND	85.1	60-140	2.50	20	
Xylenes (total)	1.61	0.100	"	1.82	ND	86.5	60-140	2.52	20	
Surrogate: 4-BFB (PID)	*3.73*		"	*4.85*		*76.9*	*50-150*			

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/20/00 13:15

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0K16010: Prepared 11/16/00 Using EPA 5030B (MeOH)										
Blank (0K16010-BLK1)										
Gasoline Range Hydrocarbons	ND	5.00	mg/kg wet							
Benzene	ND	0.0500	"							
Toluene	ND	0.0500	"							
Ethylbenzene	ND	0.0500	"							
Xylenes (total)	ND	0.100	"							
Surrogate: 4-BFB (FID)	*4.11*		"	*4.00*		*103*	*50-150*			
Surrogate: 4-BFB (PID)	*3.68*		"	*4.00*		*92.0*	*50-150*			
Blank (0K16010-BLK2)										
Gasoline Range Hydrocarbons	ND	5.00	mg/kg wet							
Benzene	ND	0.0500	"							
Toluene	ND	0.0500	"							
Ethylbenzene	ND	0.0500	"							
Xylenes (total)	ND	0.100	"							
Surrogate: 4-BFB (FID)	*4.14*		"	*4.00*		*103*	*50-150*			
Surrogate: 4-BFB (PID)	*4.01*		"	*4.00*		*100*	*50-150*			
LCS (0K16010-BS1)										
Gasoline Range Hydrocarbons	22.8	5.00	mg/kg wet	25.0		91.2	70-130			
Surrogate: 4-BFB (FID)	*4.23*		"	*4.00*		*106*	*50-150*			
Duplicate (0K16010-DUP1)					**Source: B0K0372-01**					
Gasoline Range Hydrocarbons	23.6	5.00	mg/kg dry		74.2			103	50	Q-14
Surrogate: 4-BFB (FID)	*2.36*		"	*4.14*		*57.0*	*50-150*			
Duplicate (0K16010-DUP2)					**Source: B0K0337-23**					
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry		ND			88.8	50	Q-05
Surrogate: 4-BFB (FID)	*4.13*		"	*4.83*		*85.5*	*50-150*			

North Creek Analytical - Bothell

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/20/00 13:15

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0K16010: Prepared 11/16/00 Using EPA 5030B (MeOH)										
Matrix Spike (0K16010-MS1)					**Source: B0K0372-03**					
Benzene	0.476	0.0500	mg/kg dry	0.521	ND	90.6	60-140			
Toluene	0.473	0.0500	"	0.521	ND	87.4	60-140			
Ethylbenzene	0.507	0.0500	"	0.521	ND	96.3	60-140			
Xylenes (total)	1.55	0.100	"	1.56	ND	94.7	60-140			
Surrogate: 4-BFB (PID)	*4.00*		*"*	*4.17*		*95.9*	*50-150*			
Matrix Spike Dup (0K16010-MSD1)					**Source: B0K0372-03**					
Benzene	0.494	0.0500	mg/kg dry	0.521	ND	94.1	60-140	3.71	20	
Toluene	0.479	0.0500	"	0.521	ND	88.6	60-140	1.26	20	
Ethylbenzene	0.511	0.0500	"	0.521	ND	97.0	60-140	0.786	20	
Xylenes (total)	1.57	0.100	"	1.56	ND	96.0	60-140	1.28	20	
Surrogate: 4-BFB (PID)	*3.88*		*"*	*4.17*		*93.0*	*50-150*			

North Creek Analytical - Bothell

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/20/00 13:15

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up) - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0K14020: Prepared 11/14/00 Using EPA 3550B										
Blank (0K14020-BLK1)										
Diesel Range Hydrocarbons	ND	10.0	mg/kg wet							
Lube Oil Range Hydrocarbons	ND	25.0	"							
Surrogate: 2-FBP	*6.77*		"	*10.7*		*63.3*	*50-150*			
LCS (0K14020-BS1)										
Diesel Range Hydrocarbons	55.8	10.0	mg/kg wet	66.7		83.7	60-140			
Surrogate: 2-FBP	*7.82*		"	*10.7*		*73.1*	*50-150*			
Duplicate (0K14020-DUP1)					**Source: B0K0340-02**					
Diesel Range Hydrocarbons	5890	849	mg/kg dry		7260			20.8	50	
Lube Oil Range Hydrocarbons	4680	2120	"		5590			17.7	50	
Surrogate: 2-FBP	*0*		"	*22.0*			*50-150*			*S-01*
Duplicate (0K14020-DUP2)					**Source: B0K0337-10**					
Diesel Range Hydrocarbons	61.7	10.0	mg/kg dry		69.2			11.5	50	
Lube Oil Range Hydrocarbons	44.1	25.0	"		45.4			2.91	50	
Surrogate: 2-FBP	*10.9*		"	*14.2*		*76.8*	*50-150*			
Batch 0K16033: Prepared 11/16/00 Using EPA 3550B										
Blank (0K16033-BLK1)										
Diesel Range Hydrocarbons	ND	10.0	mg/kg wet							
Lube Oil Range Hydrocarbons	ND	25.0	"							
Surrogate: 2-FBP	*6.48*		"	*10.7*		*60.6*	*50-150*			
LCS (0K16033-BS1)										
Diesel Range Hydrocarbons	60.8	10.0	mg/kg wet	66.7		91.2	60-140			
Surrogate: 2-FBP	*7.36*		"	*10.7*		*68.8*	*50-150*			

North Creek Analytical - Bothell

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/20/00 13:15

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up) - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0K16033: Prepared 11/16/00 Using EPA 3550B										
Duplicate (0K16033-DUP1)					**Source: B0K0423-06**					
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry		ND			5.04	50	
Lube Oil Range Hydrocarbons	ND	25.0	"		ND			24.7	50	
Surrogate: 2-FBP	*7.91*		"	*11.7*		*67.6*	*50-150*			
Duplicate (0K16033-DUP2)					**Source: B0K0423-09**					
Diesel Range Hydrocarbons	4210	210	mg/kg dry		5080			18.7	50	
Lube Oil Range Hydrocarbons	ND	525	"		ND			28.6	50	
Surrogate: 2-FBP	*0*		"	*12.0*			*50-150*			*S-05*
Surrogate: Octacosane	*11.4*		"	*12.0*		*95.0*	*50-150*			
Batch 0K17030: Prepared 11/17/00 Using EPA 3550B										
Blank (0K17030-BLK1)										
Diesel Range Hydrocarbons	ND	10.0	mg/kg wet							
Lube Oil Range Hydrocarbons	ND	25.0	"							
Surrogate: 2-FBP	*7.83*		"	*10.7*		*73.2*	*50-150*			
LCS (0K17030-BS1)										
Diesel Range Hydrocarbons	56.5	10.0	mg/kg wet	66.7		84.7	60-140			
Surrogate: 2-FBP	*7.83*		"	*10.7*		*73.2*	*50-150*			
LCS Dup (0K17030-BSD1)										
Diesel Range Hydrocarbons	62.3	10.0	mg/kg wet	66.7		93.4	60-140	9.76	40	
Surrogate: 2-FBP	*7.29*		"	*10.7*		*68.1*	*50-150*			
Duplicate (0K17030-DUP1)					**Source: B0K0337-24**					
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry		ND				50	
Lube Oil Range Hydrocarbons	ND	25.0	"		ND				50	
Surrogate: 2-FBP	*8.52*		"	*13.1*		*65.0*	*50-150*			

North Creek Analytical - Bothell

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/20/00 13:15

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 0K14029: Prepared 11/14/00 Using Dry Weight										
Blank (0K14029-BLK1)										
Dry Weight	100	1.00	%							
Batch 0K15047: Prepared 11/15/00 Using Dry Weight										
Blank (0K15047-BLK1)										
Dry Weight	99.8	1.00	%							
Batch 0K15048: Prepared 11/15/00 Using Dry Weight										
Blank (0K15048-BLK1)										
Dry Weight	99.8	1.00	%							
Batch 0K16029: Prepared 11/16/00 Using Dry Weight										
Blank (0K16029-BLK1)										
Dry Weight	100	1.00	%							

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/20/00 13:15

Notes and Definitions

D-06	The sample chromatographic pattern does not resemble the fuel standard used for quantitation.
Q-05	Analyses are not controlled on RPD values from sample concentrations less than 10 times the reporting limit.
Q-14	Visual examination indicates the RPD and/or matrix spike recovery is outside the control limit due to a non-homogeneous sample matrix.
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-05	Due to interference from coeluting organic compounds with the primary surrogate, results of the secondary surrogate have been used to control the analysis.
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 - Bothell

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/21/00 14:14

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
PEX-49-S-6	B0K0362-01	Soil	11/14/00 10:20	11/14/00 18:38
PEX-50-S-1	B0K0362-02	Soil	11/14/00 13:30	11/14/00 18:38
PEX-51-S-2	B0K0362-03	Soil	11/14/00 13:33	11/14/00 18:38
PEX-52-S-2	B0K0362-04	Soil	11/14/00 13:35	11/14/00 18:38
PEX-53-S-1.5	B0K0362-05	Soil	11/14/00 13:39	11/14/00 18:38
PEX-54-B-8	B0K0362-06	Soil	11/14/00 13:45	11/14/00 18:38
PEX-55-S-2	B0K0362-07	Soil	11/14/00 13:50	11/14/00 18:38
PEX-56-B-5	B0K0362-08	Soil	11/14/00 13:55	11/14/00 18:38
PEX-57-B-8	B0K0362-09	Soil	11/14/00 14:13	11/14/00 18:38
PEX-58-S-3	B0K0362-10	Soil	11/14/00 14:17	11/14/00 18:38
PEX-59-S-2	B0K0362-11	Soil	11/14/00 14:22	11/14/00 18:38
PEX-60-B-4	B0K0362-12	Soil	11/14/00 14:28	11/14/00 18:38
PEX-61-S-1.5	B0K0362-13	Soil	11/14/00 14:33	11/14/00 18:38
PEX-62-B-6	B0K0362-14	Soil	11/14/00 14:44	11/14/00 18:38
PEX-63-B-6	B0K0362-15	Soil	11/14/00 14:49	11/14/00 18:38
PEX-64-S-4	B0K0362-16	Soil	11/14/00 14:57	11/14/00 18:38
PEX-65-S-4	B0K0362-17	Soil	11/14/00 15:02	11/14/00 18:38
PEX-66-S-3.5	B0K0362-18	Soil	11/14/00 15:10	11/14/00 18:38
PEX-67-S-2	B0K0362-19	Soil	11/14/00 15:20	11/14/00 18:38
PEX-68-B-2	B0K0362-20	Soil	11/14/00 15:46	11/14/00 18:38
PEX-69-B-2.5	B0K0362-21	Soil	11/14/00 15:50	11/14/00 18:38
PEX-70-B-3	B0K0362-22	Soil	11/14/00 15:53	11/14/00 18:38
PEX-71-B-3	B0K0362-23	Soil	11/14/00 15:57	11/14/00 18:38
PEX-72-B-1	B0K0362-24	Soil	11/14/00 16:12	11/14/00 18:38
PEX-73-B-1.5	B0K0362-25	Soil	11/14/00 16:20	11/14/00 18:38

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/21/00 14:14

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-49-S-6 (B0K0362-01) Soil	**Sampled: 11/14/00 10:20**		**Received: 11/14/00 18:38**						
Gasoline Range Hydrocarbons	**21.5**	5.00	mg/kg dry	1	0K17009	11/17/00	11/18/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0840	"	"	"	"	"	"	R-03
Ethylbenzene	ND	0.0600	"	"	"	"	"	"	R-03
Xylenes (total)	ND	0.500	"	"	"	"	"	"	R-03
Surrogate: 4-BFB (FID)	*95.5 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*96.3 %*	*50-150*			"	"	"	"	
PEX-50-S-1 (B0K0362-02) Soil	**Sampled: 11/14/00 13:30**		**Received: 11/14/00 18:38**						
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K17009	11/17/00	11/17/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*83.6 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*90.3 %*	*50-150*			"	"	"	"	
PEX-51-S-2 (B0K0362-03) Soil	**Sampled: 11/14/00 13:33**		**Received: 11/14/00 18:38**						
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K17009	11/17/00	11/17/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*96.7 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*91.9 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/21/00 14:14

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-52-S-2 (B0K0362-04) Soil Sampled: 11/14/00 13:35 Received: 11/14/00 18:38									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K17009	11/17/00	11/18/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*95.4 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*86.4 %*	*50-150*			"	"	"	"	
PEX-53-S-1.5 (B0K0362-05) Soil Sampled: 11/14/00 13:39 Received: 11/14/00 18:38									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K17009	11/17/00	11/18/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*90.2 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*88.1 %*	*50-150*			"	"	"	"	
PEX-54-B-8 (B0K0362-06) Soil Sampled: 11/14/00 13:45 Received: 11/14/00 18:38									
Gasoline Range Hydrocarbons	**30.5**	5.00	mg/kg dry	1	0K17009	11/17/00	11/18/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*124 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*93.6 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/21/00 14:14

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-55-S-2 (B0K0362-07) Soil Sampled: 11/14/00 13:50 Received: 11/14/00 18:38									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K17009	11/17/00	11/18/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*88.9 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*81.2 %*	*50-150*			"	"	"	"	
PEX-56-B-5 (B0K0362-08) Soil Sampled: 11/14/00 13:55 Received: 11/14/00 18:38									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K17009	11/17/00	11/18/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*86.5 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*81.9 %*	*50-150*			"	"	"	"	
PEX-57-B-8 (B0K0362-09) Soil Sampled: 11/14/00 14:13 Received: 11/14/00 18:38									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K17009	11/17/00	11/18/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*77.4 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*82.5 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/21/00 14:14

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-58-S-3 (B0K0362-10) Soil Sampled: 11/14/00 14:17 Received: 11/14/00 18:38									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K17009	11/17/00	11/18/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*92.9 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*89.7 %*	*50-150*			"	"	"	"	
PEX-59-S-2 (B0K0362-11) Soil Sampled: 11/14/00 14:22 Received: 11/14/00 18:38									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K17009	11/17/00	11/18/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*90.7 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*88.1 %*	*50-150*			"	"	"	"	
PEX-60-B-4 (B0K0362-12) Soil Sampled: 11/14/00 14:28 Received: 11/14/00 18:38									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K17009	11/17/00	11/18/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*93.9 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*93.6 %*	*50-150*			"	"	"	"	

North Creek Analytical - Bothell

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/21/00 14:14

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-61-S-1.5 (B0K0362-13) Soil Sampled: 11/14/00 14:33 Received: 11/14/00 18:38									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K17009	11/17/00	11/18/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*95.3 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*90.5 %*	*50-150*			"	"	"	"	
PEX-62-B-6 (B0K0362-14) Soil Sampled: 11/14/00 14:44 Received: 11/14/00 18:38									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K18010	11/18/00	11/19/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*103 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*96.4 %*	*50-150*			"	"	"	"	
PEX-63-B-6 (B0K0362-15) Soil Sampled: 11/14/00 14:49 Received: 11/14/00 18:38									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K18010	11/18/00	11/19/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*105 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*101 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/21/00 14:14

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-64-S-4 (B0K0362-16) Soil Sampled: 11/14/00 14:57 Received: 11/14/00 18:38									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K18010	11/18/00	11/21/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*100 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*94.6 %*	*50-150*			"	"	"	"	
PEX-65-S-4 (B0K0362-17) Soil Sampled: 11/14/00 15:02 Received: 11/14/00 18:38									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K18010	11/18/00	11/19/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*88.6 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*91.1 %*	*50-150*			"	"	"	"	
PEX-66-S-3.5 (B0K0362-18) Soil Sampled: 11/14/00 15:10 Received: 11/14/00 18:38									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K18010	11/18/00	11/19/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*94.5 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*88.8 %*	*50-150*			"	"	"	"	

North Creek Analytical - Bothell

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/21/00 14:14

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-67-S-2 (B0K0362-19) Soil Sampled: 11/14/00 15:20 Received: 11/14/00 18:38									
Gasoline Range Hydrocarbons	**69.5**	5.00	mg/kg dry	1	0K18010	11/18/00	11/19/00	NWTPH-Gx/8021B	
Benzene	ND	0.0600	"	"	"	"	"	"	R-03
Toluene	ND	0.120	"	"	"	"	"	"	R-03
Ethylbenzene	ND	0.154	"	"	"	"	"	"	R-03
Xylenes (total)	ND	0.585	"	"	"	"	"	"	R-03
Surrogate: 4-BFB (FID)	*131 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*96.2 %*	*50-150*			"	"	"	"	
PEX-68-B-2 (B0K0362-20) Soil Sampled: 11/14/00 15:46 Received: 11/14/00 18:38									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K18010	11/18/00	11/19/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*85.8 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*98.5 %*	*50-150*			"	"	"	"	
PEX-69-B-2.5 (B0K0362-21) Soil Sampled: 11/14/00 15:50 Received: 11/14/00 18:38									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K18010	11/18/00	11/19/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*93.2 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*98.5 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/21/00 14:14

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-70-B-3 (B0K0362-22) Soil Sampled: 11/14/00 15:53 Received: 11/14/00 18:38									
Gasoline Range Hydrocarbons	**6.76**	5.00	mg/kg dry	1	0K18010	11/18/00	11/19/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*104 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*96.5 %*	*50-150*			"	"	"	"	
PEX-71-B-3 (B0K0362-23) Soil Sampled: 11/14/00 15:57 Received: 11/14/00 18:38									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K18010	11/18/00	11/19/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*101 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*96.4 %*	*50-150*			"	"	"	"	
PEX-72-B-1 (B0K0362-24) Soil Sampled: 11/14/00 16:12 Received: 11/14/00 18:38									
Gasoline Range Hydrocarbons	**97.1**	5.00	mg/kg dry	1	0K18010	11/18/00	11/19/00	NWTPH-Gx/8021B	
Benzene	**0.181**	0.0500	"	"	"	"	"	"	
Toluene	**1.06**	0.0500	"	"	"	"	"	"	
Ethylbenzene	**0.580**	0.0500	"	"	"	"	"	"	
Xylenes (total)	**3.77**	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*165 %*	*50-150*			"	"	"	"	*S-02*
Surrogate: 4-BFB (PID)	*114 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/21/00 14:14

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-73-B-1.5 (B0K0362-25) Soil Sampled: 11/14/00 16:20 Received: 11/14/00 18:38									
Gasoline Range Hydrocarbons	**10.2**	5.00	mg/kg dry	1	0K18010	11/18/00	11/19/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*104 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*94.8 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/21/00 14:14

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-49-S-6 (B0K0362-01) Soil	**Sampled: 11/14/00 10:20**		**Received: 11/14/00 18:38**						
Diesel Range Hydrocarbons	**17.6**	10.0	mg/kg dry	1	0K18005	11/18/00	11/19/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*78.5 %*	*50-150*			"	"	"	"	
PEX-50-S-1 (B0K0362-02) Soil	**Sampled: 11/14/00 13:30**		**Received: 11/14/00 18:38**						
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K18005	11/18/00	11/19/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*78.7 %*	*50-150*			"	"	"	"	
PEX-51-S-2 (B0K0362-03) Soil	**Sampled: 11/14/00 13:33**		**Received: 11/14/00 18:38**						
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K18005	11/18/00	11/19/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*84.4 %*	*50-150*			"	"	"	"	
PEX-52-S-2 (B0K0362-04) Soil	**Sampled: 11/14/00 13:35**		**Received: 11/14/00 18:38**						
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K18005	11/18/00	11/19/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*73.1 %*	*50-150*			"	"	"	"	
PEX-53-S-1.5 (B0K0362-05) Soil	**Sampled: 11/14/00 13:39**		**Received: 11/14/00 18:38**						
Diesel Range Hydrocarbons	**16.2**	10.0	mg/kg dry	1	0K18005	11/18/00	11/19/00	NWTPH-Dx	D-06
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*91.1 %*	*50-150*			"	"	"	"	
PEX-54-B-8 (B0K0362-06) Soil	**Sampled: 11/14/00 13:45**		**Received: 11/14/00 18:38**						
Diesel Range Hydrocarbons	**113**	10.0	mg/kg dry	1	0K18005	11/18/00	11/19/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*87.7 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/21/00 14:14

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-55-S-2 (B0K0362-07) Soil	**Sampled: 11/14/00 13:50**		**Received: 11/14/00 18:38**						
Diesel Range Hydrocarbons	**22.4**	10.0	mg/kg dry	1	0K18005	11/18/00	11/19/00	NWTPH-Dx	D-06
Lube Oil Range Hydrocarbons	**28.3**	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*79.9 %*	*50-150*			"	"	"	"	
PEX-56-B-5 (B0K0362-08) Soil	**Sampled: 11/14/00 13:55**		**Received: 11/14/00 18:38**						
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K18005	11/18/00	11/19/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*72.9 %*	*50-150*			"	"	"	"	
PEX-57-B-8 (B0K0362-09) Soil	**Sampled: 11/14/00 14:13**		**Received: 11/14/00 18:38**						
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K18005	11/18/00	11/19/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*92.0 %*	*50-150*			"	"	"	"	
PEX-58-S-3 (B0K0362-10) Soil	**Sampled: 11/14/00 14:17**		**Received: 11/14/00 18:38**						
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K18005	11/18/00	11/19/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*65.0 %*	*50-150*			"	"	"	"	
PEX-59-S-2 (B0K0362-11) Soil	**Sampled: 11/14/00 14:22**		**Received: 11/14/00 18:38**						
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K18005	11/18/00	11/19/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*83.1 %*	*50-150*			"	"	"	"	
PEX-60-B-4 (B0K0362-12) Soil	**Sampled: 11/14/00 14:28**		**Received: 11/14/00 18:38**						
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K18005	11/18/00	11/19/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*65.0 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/21/00 14:14

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-61-S-1.5 (B0K0362-13) Soil Sampled: 11/14/00 14:33 Received: 11/14/00 18:38									
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K18005	11/18/00	11/19/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*82.5 %*	*50-150*			"	"	"	"	
PEX-62-B-6 (B0K0362-14) Soil Sampled: 11/14/00 14:44 Received: 11/14/00 18:38									
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K18005	11/18/00	11/19/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*68.3 %*	*50-150*			"	"	"	"	
PEX-63-B-6 (B0K0362-15) Soil Sampled: 11/14/00 14:49 Received: 11/14/00 18:38									
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K18005	11/18/00	11/19/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*84.8 %*	*50-150*			"	"	"	"	
PEX-64-S-4 (B0K0362-16) Soil Sampled: 11/14/00 14:57 Received: 11/14/00 18:38									
Diesel Range Hydrocarbons	**15.2**	10.0	mg/kg dry	1	0K18005	11/18/00	11/19/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*74.8 %*	*50-150*			"	"	"	"	
PEX-65-S-4 (B0K0362-17) Soil Sampled: 11/14/00 15:02 Received: 11/14/00 18:38									
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K18005	11/18/00	11/19/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*79.2 %*	*50-150*			"	"	"	"	
PEX-66-S-3.5 (B0K0362-18) Soil Sampled: 11/14/00 15:10 Received: 11/14/00 18:38									
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K18005	11/18/00	11/20/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*48.8 %*	*50-150*			"	"	"	"	*S-07*
Surrogate: Octacosane	*60.5 %*	*50-150*			"	"	"	"	

North Creek Analytical - Bothell

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.

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/21/00 14:14

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-67-S-2 (B0K0362-19) Soil	**Sampled: 11/14/00 15:20**		**Received: 11/14/00 18:38**						
Diesel Range Hydrocarbons	**50.6**	10.0	mg/kg dry	1	0K18005	11/18/00	11/19/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	**25.0**	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*88.7 %*	*50-150*			"	"	"	"	
PEX-68-B-2 (B0K0362-20) Soil	**Sampled: 11/14/00 15:46**		**Received: 11/14/00 18:38**						
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K18005	11/18/00	11/20/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*77.7 %*	*50-150*			"	"	"	"	
PEX-69-B-2.5 (B0K0362-21) Soil	**Sampled: 11/14/00 15:50**		**Received: 11/14/00 18:38**						
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K18006	11/18/00	11/20/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*91.8 %*	*50-150*			"	"	"	"	
PEX-70-B-3 (B0K0362-22) Soil	**Sampled: 11/14/00 15:53**		**Received: 11/14/00 18:38**						
Diesel Range Hydrocarbons	**18.8**	10.0	mg/kg dry	1	0K18006	11/18/00	11/20/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*77.0 %*	*50-150*			"	"	"	"	
PEX-71-B-3 (B0K0362-23) Soil	**Sampled: 11/14/00 15:57**		**Received: 11/14/00 18:38**						
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K18006	11/18/00	11/20/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*81.7 %*	*50-150*			"	"	"	"	
PEX-72-B-1 (B0K0362-24) Soil	**Sampled: 11/14/00 16:12**		**Received: 11/14/00 18:38**						
Diesel Range Hydrocarbons	**270**	10.0	mg/kg dry	1	0K18006	11/18/00	11/20/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	**173**	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*72.6 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/21/00 14:14

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-73-B-1.5 (B0K0362-25) Soil **Sampled: 11/14/00 16:20 Received: 11/14/00 18:38**									
Diesel Range Hydrocarbons	**50.8**	10.0	mg/kg dry	1	0K18006	11/18/00	11/20/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	**41.7**	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*89.9 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/21/00 14:14

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-49-S-6 (B0K0362-01) Soil	**Sampled: 11/14/00 10:20**	**Received: 11/14/00 18:38**							
Dry Weight	**82.3**	1.00	%	1	0K17051	11/17/00	11/20/00	BSOPSPL003R07	
PEX-50-S-1 (B0K0362-02) Soil	**Sampled: 11/14/00 13:30**	**Received: 11/14/00 18:38**							
Dry Weight	**84.2**	1.00	%	1	0K17051	11/17/00	11/20/00	BSOPSPL003R07	
PEX-51-S-2 (B0K0362-03) Soil	**Sampled: 11/14/00 13:33**	**Received: 11/14/00 18:38**							
Dry Weight	**87.5**	1.00	%	1	0K17051	11/17/00	11/20/00	BSOPSPL003R07	
PEX-52-S-2 (B0K0362-04) Soil	**Sampled: 11/14/00 13:35**	**Received: 11/14/00 18:38**							
Dry Weight	**88.0**	1.00	%	1	0K17051	11/17/00	11/20/00	BSOPSPL003R07	
PEX-53-S-1.5 (B0K0362-05) Soil	**Sampled: 11/14/00 13:39**	**Received: 11/14/00 18:38**							
Dry Weight	**86.8**	1.00	%	1	0K17051	11/17/00	11/20/00	BSOPSPL003R07	
PEX-54-B-8 (B0K0362-06) Soil	**Sampled: 11/14/00 13:45**	**Received: 11/14/00 18:38**							
Dry Weight	**82.4**	1.00	%	1	0K17051	11/17/00	11/20/00	BSOPSPL003R07	
PEX-55-S-2 (B0K0362-07) Soil	**Sampled: 11/14/00 13:50**	**Received: 11/14/00 18:38**							
Dry Weight	**71.7**	1.00	%	1	0K17051	11/17/00	11/20/00	BSOPSPL003R07	
PEX-56-B-5 (B0K0362-08) Soil	**Sampled: 11/14/00 13:55**	**Received: 11/14/00 18:38**							
Dry Weight	**84.5**	1.00	%	1	0K17051	11/17/00	11/20/00	BSOPSPL003R07	
PEX-57-B-8 (B0K0362-09) Soil	**Sampled: 11/14/00 14:13**	**Received: 11/14/00 18:38**							
Dry Weight	**85.2**	1.00	%	1	0K17051	11/17/00	11/20/00	BSOPSPL003R07	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/21/00 14:14

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-58-S-3 (B0K0362-10) Soil Sampled: 11/14/00 14:17 Received: 11/14/00 18:38									
Dry Weight	84.1	1.00	%	1	0K17051	11/17/00	11/20/00	BSOPSPL003R07	
PEX-59-S-2 (B0K0362-11) Soil Sampled: 11/14/00 14:22 Received: 11/14/00 18:38									
Dry Weight	86.2	1.00	%	1	0K17051	11/17/00	11/20/00	BSOPSPL003R07	
PEX-60-B-4 (B0K0362-12) Soil Sampled: 11/14/00 14:28 Received: 11/14/00 18:38									
Dry Weight	84.8	1.00	%	1	0K17051	11/17/00	11/20/00	BSOPSPL003R07	
PEX-61-S-1.5 (B0K0362-13) Soil Sampled: 11/14/00 14:33 Received: 11/14/00 18:38									
Dry Weight	84.8	1.00	%	1	0K17051	11/17/00	11/20/00	BSOPSPL003R07	
PEX-62-B-6 (B0K0362-14) Soil Sampled: 11/14/00 14:44 Received: 11/14/00 18:38									
Dry Weight	85.0	1.00	%	1	0K20044	11/20/00	11/21/00	BSOPSPL003R07	
PEX-63-B-6 (B0K0362-15) Soil Sampled: 11/14/00 14:49 Received: 11/14/00 18:38									
Dry Weight	85.5	1.00	%	1	0K20044	11/20/00	11/21/00	BSOPSPL003R07	
PEX-64-S-4 (B0K0362-16) Soil Sampled: 11/14/00 14:57 Received: 11/14/00 18:38									
Dry Weight	83.5	1.00	%	1	0K20044	11/20/00	11/21/00	BSOPSPL003R07	
PEX-65-S-4 (B0K0362-17) Soil Sampled: 11/14/00 15:02 Received: 11/14/00 18:38									
Dry Weight	84.5	1.00	%	1	0K20044	11/20/00	11/21/00	BSOPSPL003R07	
PEX-66-S-3.5 (B0K0362-18) Soil Sampled: 11/14/00 15:10 Received: 11/14/00 18:38									
Dry Weight	81.2	1.00	%	1	0K20044	11/20/00	11/21/00	BSOPSPL003R07	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/21/00 14:14

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-67-S-2 (B0K0362-19) Soil	**Sampled: 11/14/00 15:20**	**Received: 11/14/00 18:38**							
Dry Weight	**80.3**	1.00	%	1	0K20044	11/20/00	11/21/00	BSOPSPL003R07	
PEX-68-B-2 (B0K0362-20) Soil	**Sampled: 11/14/00 15:46**	**Received: 11/14/00 18:38**							
Dry Weight	**85.8**	1.00	%	1	0K20044	11/20/00	11/21/00	BSOPSPL003R07	
PEX-69-B-2.5 (B0K0362-21) Soil	**Sampled: 11/14/00 15:50**	**Received: 11/14/00 18:38**							
Dry Weight	**87.2**	1.00	%	1	0K20044	11/20/00	11/21/00	BSOPSPL003R07	
PEX-70-B-3 (B0K0362-22) Soil	**Sampled: 11/14/00 15:53**	**Received: 11/14/00 18:38**							
Dry Weight	**87.6**	1.00	%	1	0K20044	11/20/00	11/21/00	BSOPSPL003R07	
PEX-71-B-3 (B0K0362-23) Soil	**Sampled: 11/14/00 15:57**	**Received: 11/14/00 18:38**							
Dry Weight	**84.6**	1.00	%	1	0K20044	11/20/00	11/21/00	BSOPSPL003R07	
PEX-72-B-1 (B0K0362-24) Soil	**Sampled: 11/14/00 16:12**	**Received: 11/14/00 18:38**							
Dry Weight	**88.3**	1.00	%	1	0K20044	11/20/00	11/21/00	BSOPSPL003R07	
PEX-73-B-1.5 (B0K0362-25) Soil	**Sampled: 11/14/00 16:20**	**Received: 11/14/00 18:38**							
Dry Weight	**89.9**	1.00	%	1	0K20044	11/20/00	11/21/00	BSOPSPL003R07	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/21/00 14:14

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0K17009: Prepared 11/17/00 Using EPA 5030B (MeOH)										
Blank (0K17009-BLK1)										
Gasoline Range Hydrocarbons	ND	5.00	mg/kg wet							
Benzene	ND	0.0500	"							
Toluene	ND	0.0500	"							
Ethylbenzene	ND	0.0500	"							
Xylenes (total)	ND	0.100	"							
Surrogate: 4-BFB (FID)	*4.06*		"	*4.00*		*101*	*50-150*			
Surrogate: 4-BFB (PID)	*3.76*		"	*4.00*		*94.0*	*50-150*			
LCS (0K17009-BS1)										
Gasoline Range Hydrocarbons	21.9	5.00	mg/kg wet	25.0		87.6	70-130			
Surrogate: 4-BFB (FID)	*4.62*		"	*4.00*		*115*	*50-150*			
Duplicate (0K17009-DUP1)					**Source: B0K0342-45**					
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry		ND			2.37	50	
Surrogate: 4-BFB (FID)	*4.32*		"	*4.69*		*92.1*	*50-150*			
Duplicate (0K17009-DUP2)					**Source: B0K0342-47**					
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry		ND			15.7	50	
Surrogate: 4-BFB (FID)	*3.99*		"	*4.54*		*87.9*	*50-150*			
Matrix Spike (0K17009-MS1)					**Source: B0K0342-44**					
Benzene	0.434	0.0500	mg/kg dry	0.600	ND	72.3	60-140			
Toluene	0.433	0.0500	"	0.600	ND	70.8	60-140			
Ethylbenzene	0.463	0.0500	"	0.600	ND	77.2	60-140			
Xylenes (total)	1.42	0.100	"	1.80	ND	77.8	60-140			
Surrogate: 4-BFB (PID)	*3.85*		"	*4.80*		*80.2*	*50-150*			
Matrix Spike Dup (0K17009-MSD1)					**Source: B0K0342-44**					
Benzene	0.483	0.0500	mg/kg dry	0.600	ND	80.5	60-140	10.7	20	
Toluene	0.485	0.0500	"	0.600	ND	79.5	60-140	11.3	20	
Ethylbenzene	0.526	0.0500	"	0.600	ND	87.7	60-140	12.7	20	
Xylenes (total)	1.63	0.100	"	1.80	ND	89.5	60-140	13.8	20	
Surrogate: 4-BFB (PID)	*4.11*		"	*4.80*		*85.6*	*50-150*			

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/21/00 14:14

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0K18010: Prepared 11/18/00 Using EPA 5030B (MeOH)										
Blank (0K18010-BLK1)										
Gasoline Range Hydrocarbons	ND	5.00	mg/kg wet							
Benzene	ND	0.0500	"							
Toluene	ND	0.0500	"							
Ethylbenzene	ND	0.0500	"							
Xylenes (total)	ND	0.100	"							
Surrogate: 4-BFB (FID)	*4.23*		"	*4.00*		*106*	*50-150*			
Surrogate: 4-BFB (PID)	*4.04*		"	*4.00*		*101*	*50-150*			
LCS (0K18010-BS1)										
Gasoline Range Hydrocarbons	24.3	5.00	mg/kg wet	25.0		97.2	70-130			
Surrogate: 4-BFB (FID)	*4.84*		"	*4.00*		*121*	*50-150*			
Duplicate (0K18010-DUP1)					**Source: B0K0366-01**					
Gasoline Range Hydrocarbons	2660	250	mg/kg dry		3320			22.1	50	
Surrogate: 4-BFB (FID)	*0*		"	*4.44*			*50-150*			*S-01*
Duplicate (0K18010-DUP2)					**Source: B0K0367-04**					
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry		ND			82.7	50	Q-05
Surrogate: 4-BFB (FID)	*4.50*		"	*4.25*		*106*	*50-150*			
Matrix Spike (0K18010-MS1)					**Source: B0K0367-03**					
Benzene	0.469	0.0500	mg/kg dry	0.514	ND	90.7	60-140			
Toluene	0.479	0.0500	"	0.514	ND	91.7	60-140			
Ethylbenzene	0.513	0.0500	"	0.514	ND	98.9	60-140			
Xylenes (total)	1.53	0.100	"	1.54	ND	97.3	60-140			
Surrogate: 4-BFB (PID)	*4.27*		"	*4.12*		*104*	*50-150*			
Matrix Spike Dup (0K18010-MSD1)					**Source: B0K0367-03**					
Benzene	0.512	0.0500	mg/kg dry	0.514	ND	99.1	60-140	8.77	20	
Toluene	0.513	0.0500	"	0.514	ND	98.3	60-140	6.85	20	
Ethylbenzene	0.555	0.0500	"	0.514	ND	107	60-140	7.87	20	
Xylenes (total)	1.65	0.100	"	1.54	ND	105	60-140	7.55	20	
Surrogate: 4-BFB (PID)	*4.37*		"	*4.12*		*106*	*50-150*			

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/21/00 14:14

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up) - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0K18005: Prepared 11/18/00 Using EPA 3550B										
Blank (0K18005-BLK1)										
Diesel Range Hydrocarbons	ND	10.0	mg/kg wet							
Lube Oil Range Hydrocarbons	ND	25.0	"							
Surrogate: 2-FBP	*9.39*		"	*10.7*		*87.8*	*50-150*			
LCS (0K18005-BS1)										
Diesel Range Hydrocarbons	61.0	10.0	mg/kg wet	66.7		91.5	60-140			
Surrogate: 2-FBP	*9.84*		"	*10.7*		*92.0*	*50-150*			
Duplicate (0K18005-DUP1)					**Source: B0K0362-03**					
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry		ND			13.9	50	
Lube Oil Range Hydrocarbons	ND	25.0	"		ND			9.17	50	
Surrogate: 2-FBP	*10.4*		"	*12.2*		*85.2*	*50-150*			
Duplicate (0K18005-DUP2)					**Source: B0K0362-11**					
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry		ND			8.41	50	
Lube Oil Range Hydrocarbons	ND	25.0	"		ND			14.0	50	
Surrogate: 2-FBP	*8.82*		"	*12.4*		*71.1*	*50-150*			
Batch 0K18006: Prepared 11/18/00 Using EPA 3550B										
Blank (0K18006-BLK1)										
Diesel Range Hydrocarbons	ND	10.0	mg/kg wet							
Lube Oil Range Hydrocarbons	ND	25.0	"							
Surrogate: 2-FBP	*9.45*		"	*10.7*		*88.3*	*50-150*			
LCS (0K18006-BS1)										
Diesel Range Hydrocarbons	60.0	10.0	mg/kg wet	66.7		90.0	60-140			
Surrogate: 2-FBP	*7.65*		"	*10.7*		*71.5*	*50-150*			

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/21/00 14:14

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up) - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0K18006: Prepared 11/18/00 Using EPA 3550B										
Duplicate (0K18006-DUP1)					**Source: B0K0362-21**					
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry		ND				50	
Lube Oil Range Hydrocarbons	ND	25.0	"		ND			3.19	50	
Surrogate: 2-FBP	*9.49*		"	*12.2*		*77.8*	*50-150*			
Duplicate (0K18006-DUP2)					**Source: B0K0412-16**					
Diesel Range Hydrocarbons	273	10.0	mg/kg dry		217			22.9	50	
Lube Oil Range Hydrocarbons	307	25.0	"		260			16.6	50	
Surrogate: 2-FBP	*9.90*		"	*13.1*		*75.6*	*50-150*			

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/21/00 14:14

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 0K17051: Prepared 11/17/00 Using Dry Weight										
Blank (0K17051-BLK2)										
Dry Weight	100	1.00	%							
Batch 0K20044: Prepared 11/20/00 Using Dry Weight										
Blank (0K20044-BLK2)										
Dry Weight	100	1.00	%							

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/21/00 14:14

Notes and Definitions

D-06	The sample chromatographic pattern does not resemble the fuel standard used for quantitation.
Q-05	Analyses are not controlled on RPD values from sample concentrations less than 10 times the reporting limit.
R-03	The reporting limit for this analyte has been raised to account for interference from coeluting organic compounds 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.
S-07	Due to an extraction anomaly, results of the secondary surrogate have been used to control the analysis.
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

Quantitation Report

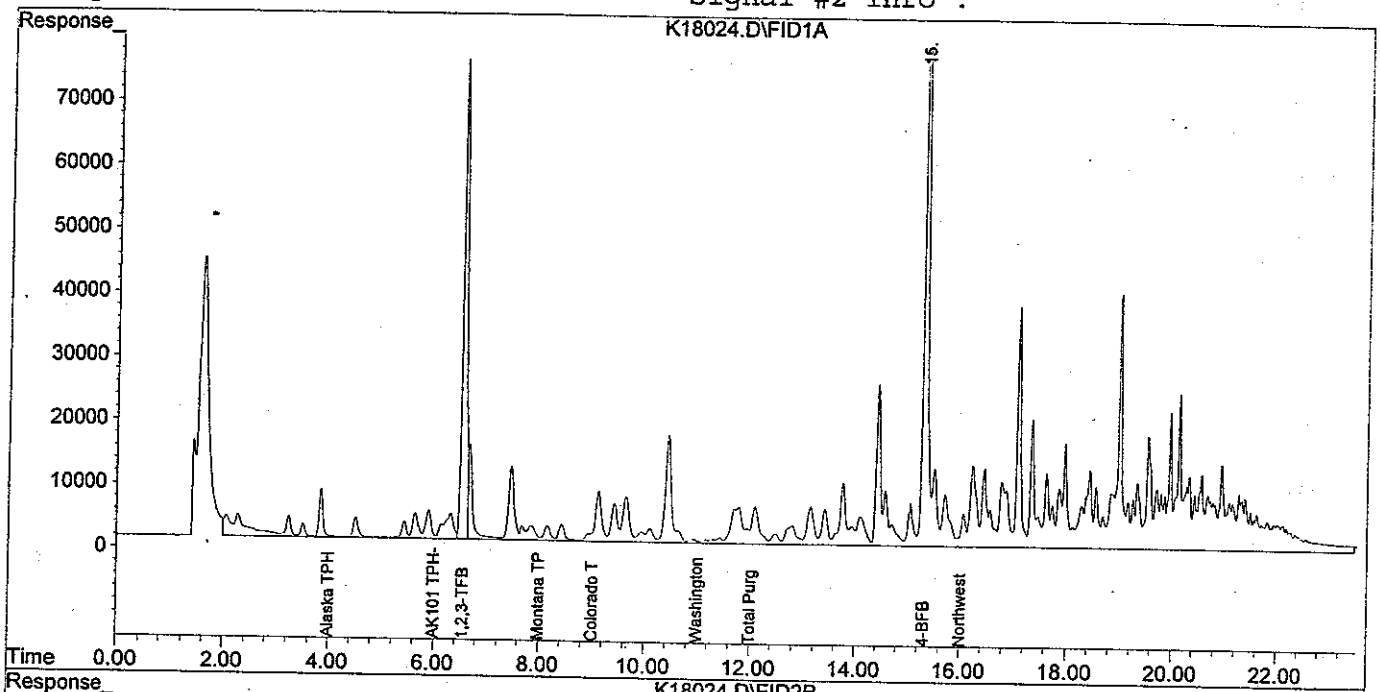
Signal #1 : D:\HPCHEM\3\DATA\111800\K18024.D\FID1A.CH Vial: 24
Signal #2 : D:\HPCHEM\3\DATA\111800\K18024.D\FID2B.CH
Acq On : 18 Nov 2000 18:37 Operator: GAP
Sample : b0k0362-01 r1 Inst : GC #6
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00

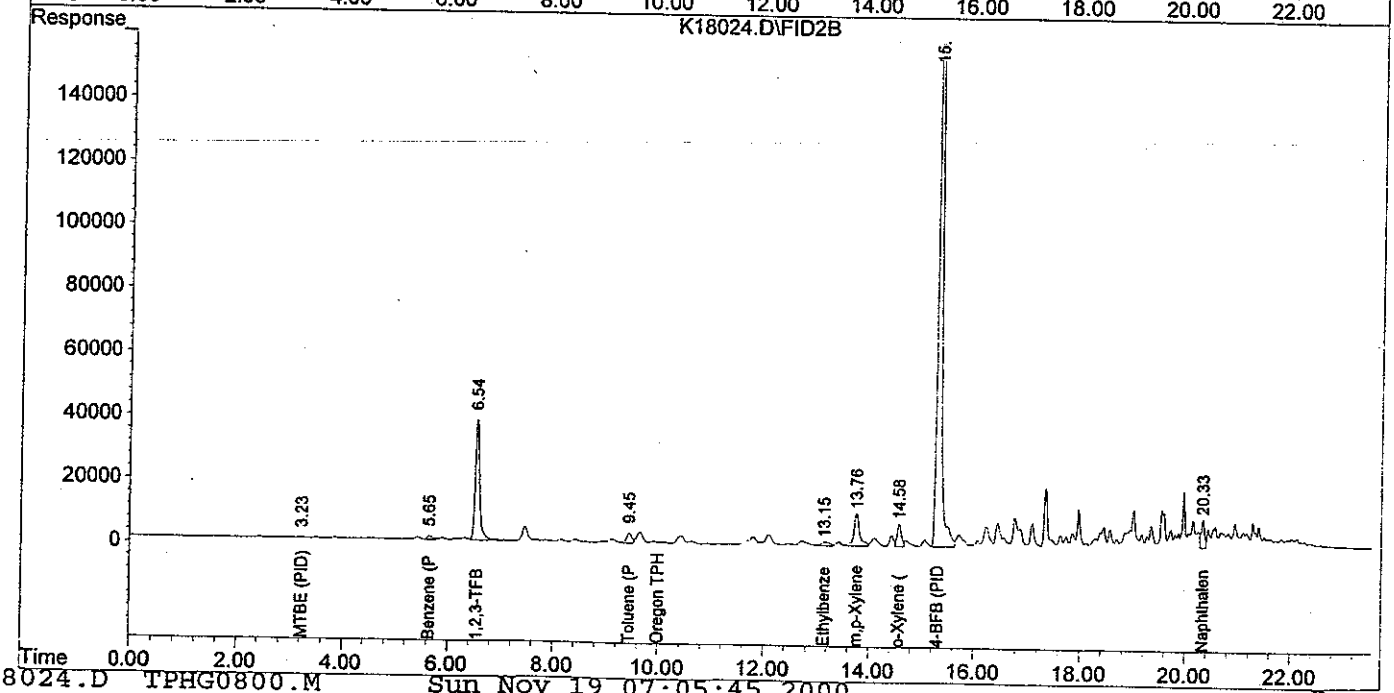
IntFile Signal #1: SURR.E IntFile Signal #2: SURR2.E

Quant Time: Nov 18 19:01 2000 Quant Results File: TPHG0800.RES

Quant Method : D:\HPCHEM\3\METHODS\TPHG0800.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Fri Nov 17 14:27:05 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG0800.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report

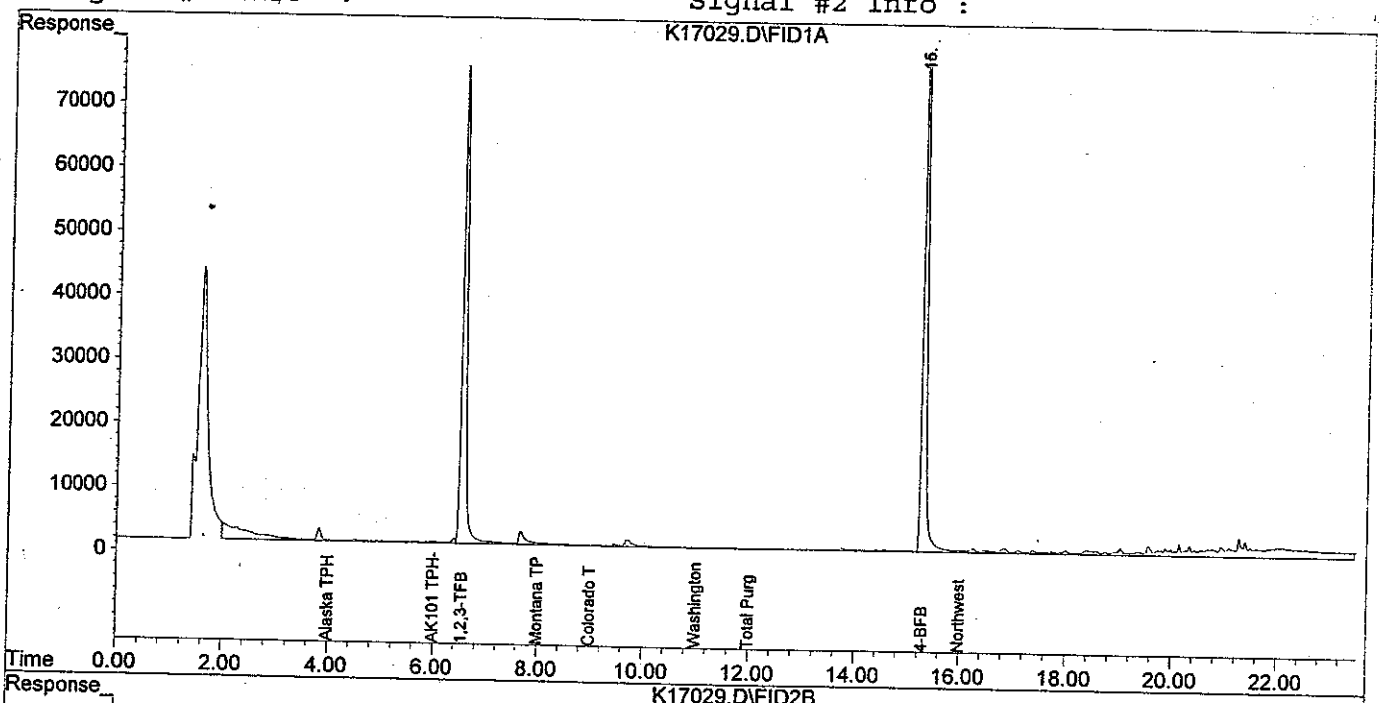
Signal #1 : D:\HPCHEM\3\DATA\111700\K17029.D\FID1A.CH Vial: 29
Signal #2 : D:\HPCHEM\3\DATA\111700\K17029.D\FID2B.CH
Acq On : 17 Nov 2000 21:00 Operator: GAP
Sample : B0K0362-02 Inst : GC #6
Misc : 100 ul Multiplr: 1.00
Sample Amount: 0.00

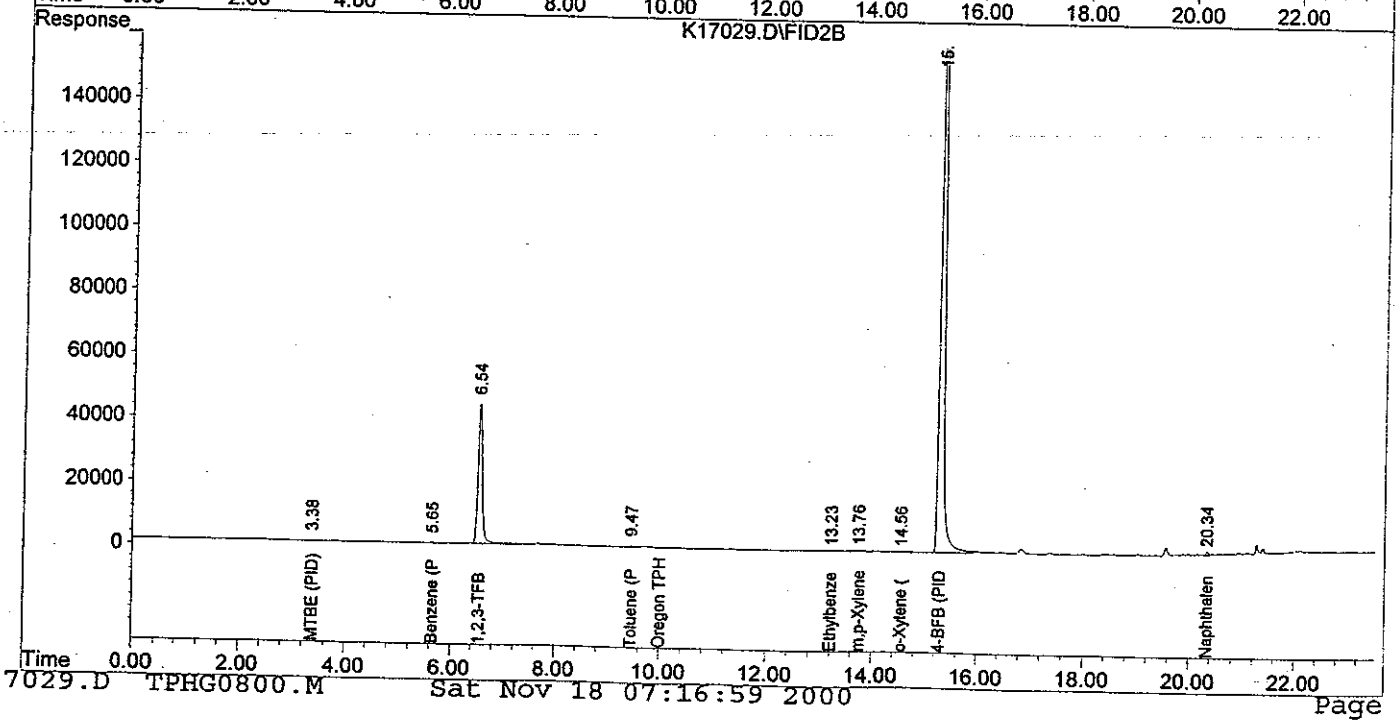
IntFile Signal #1: SURR.E IntFile Signal #2: SURR2.E

Quant Time: Nov 17 21:24 2000 Quant Results File: TPHG0800.RES

Quant Method : D:\HPCHEM\3\METHODS\TPHG0800.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Fri Nov 17 14:27:05 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG0800.M

Volume Inj. :
Signal #1 Phase :
Signal #1 Info :
Signal #2 Phase:
Signal #2 Info :





Quantitation Report

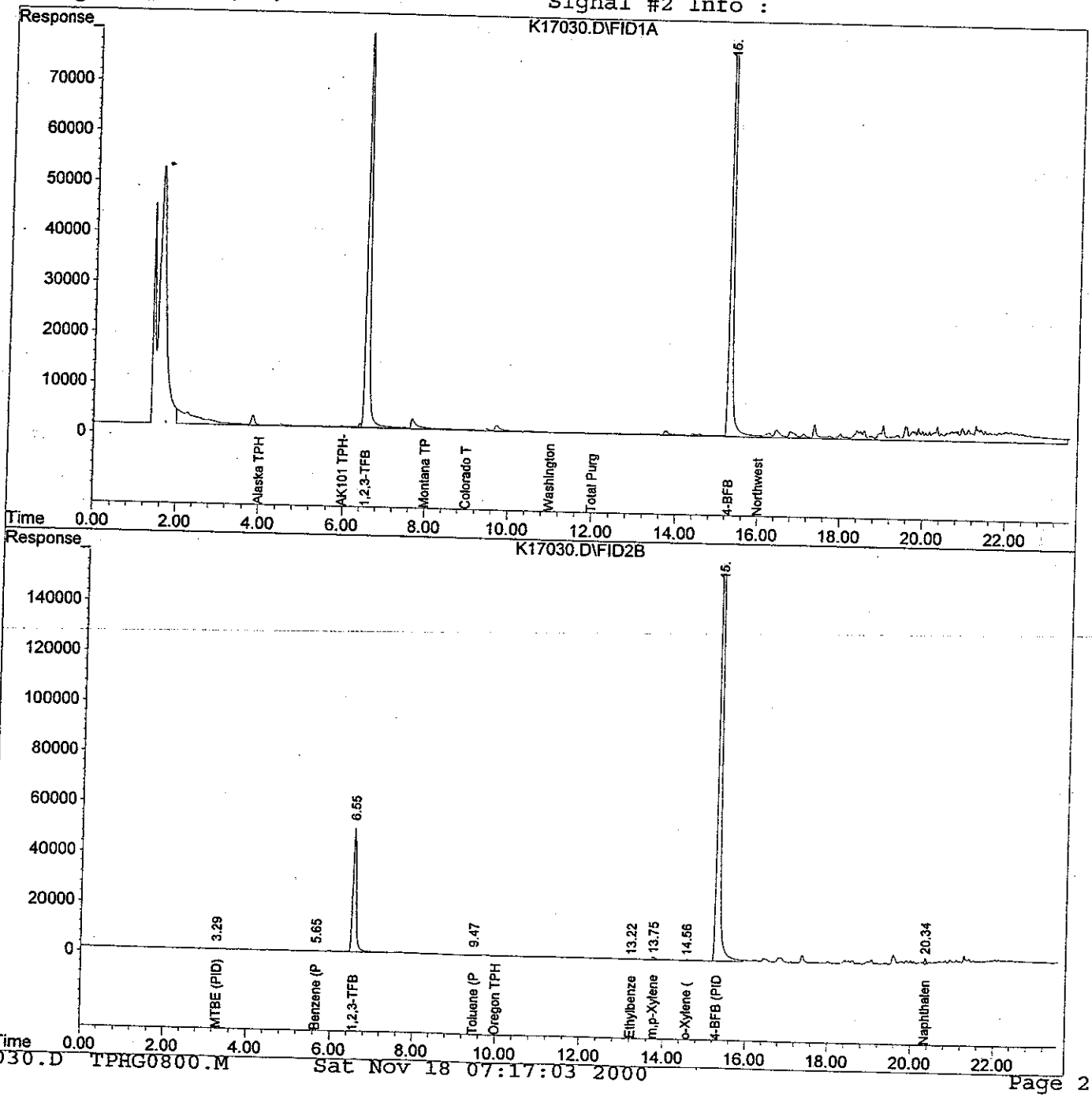
Signal #1 : D:\HPCHEM\3\DATA\111700\K17030.D\FID1A.CH Vial: 30
Signal #2 : D:\HPCHEM\3\DATA\111700\K17030.D\FID2B.CH
Acq On : 17 Nov 2000 21:30 Operator: GAP
Sample : B0K0362-03 Inst : GC #6
Misc : 100 ul Multiplr: 1.00
Sample Amount: 0.00

IntFile Signal #1: SURR.E IntFile Signal #2: SURR2.E

Quant Time: Nov 17 21:54 2000 Quant Results File: TPHG0800.RES

Quant Method : D:\HPCHEM\3\METHODS\TPHG0800.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Fri Nov 17 14:27:05 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG0800.M

Volume Inj. :
Signal #1 Phase :
Signal #1 Info :
Signal #2 Phase:
Signal #2 Info :



Quantitation Report

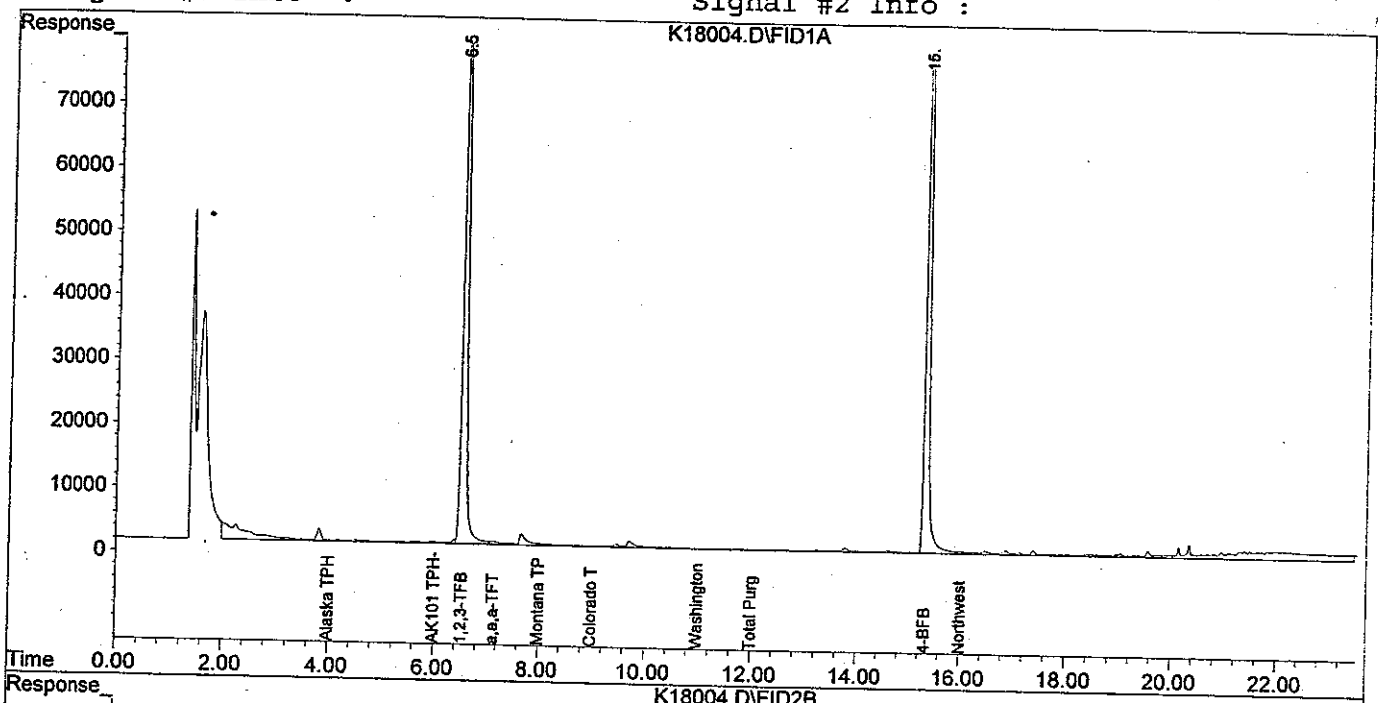
Signal #1 : D:\HPCHEM\3\DATA\111800\K18004.D\FID1A.CH Vial: 4
Signal #2 : D:\HPCHEM\3\DATA\111800\K18004.D\FID2B.CH
Acq On : 18 Nov 2000 8:39 am Operator: GAP
Sample : b0k0362-04 Inst : GC #6
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00

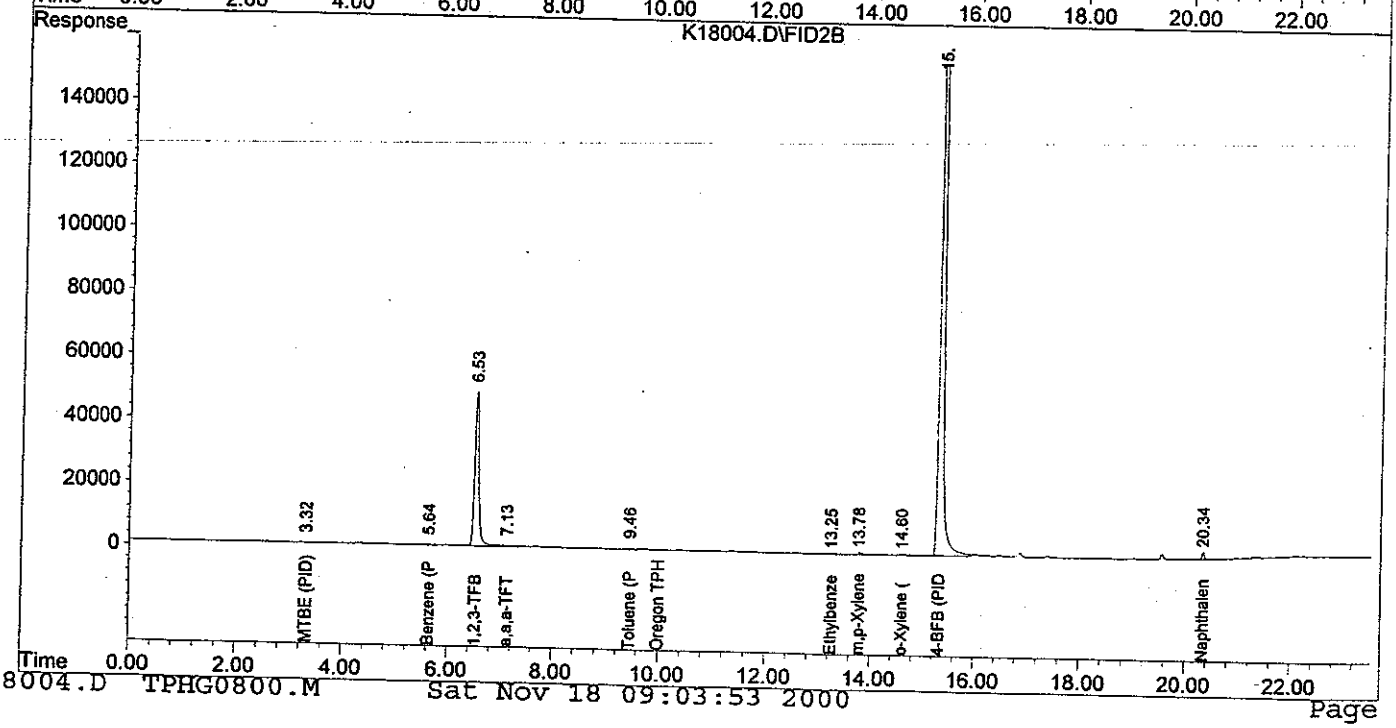
IntFile Signal #1: SURR.E IntFile Signal #2: SURR2.E

Quant Time: Nov 18 9:03 2000 Quant Results File: TPHG0800.RES

Quant Method : D:\HPCHEM\3\METHODS\TPHG0800.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Fri Nov 17 14:27:07 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG0800.M

Volume Inj. :
Signal #1 Phase :
Signal #1 Info :
Signal #2 Phase:
Signal #2 Info :





Quantitation Report

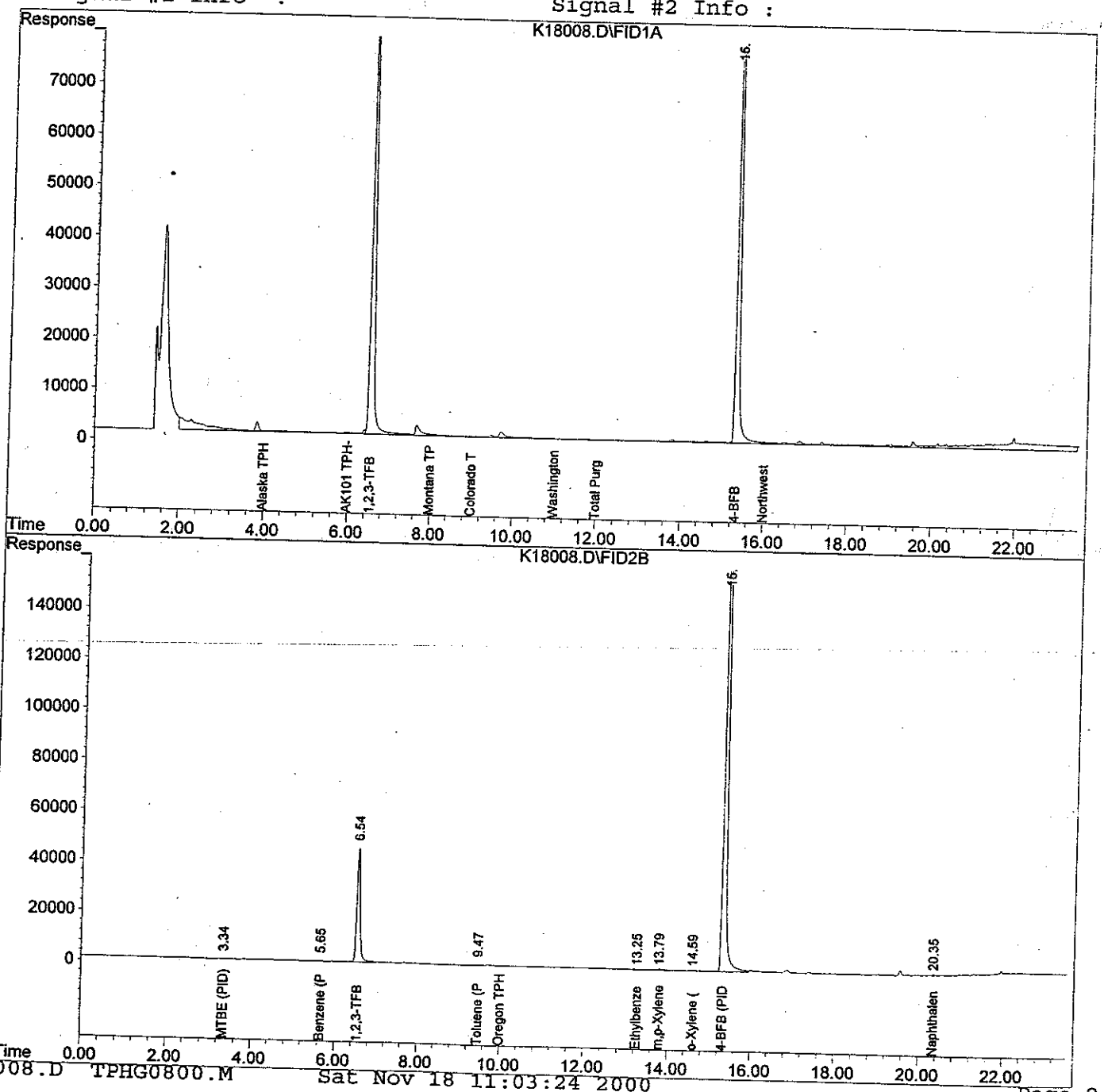
Signal #1 : D:\HPCHEM\3\DATA\111800\K18008.D\FID1A.CH Vial: 8
Signal #2 : D:\HPCHEM\3\DATA\111800\K18008.D\FID2B.CH
Acq On : 18 Nov 2000 10:39 am Operator: GAP
Sample : b0k0362-05 Inst : GC #6
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00

IntFile Signal #1: SURR.E IntFile Signal #2: SURR2.E

Quant Time: Nov 18 11:03 2000 Quant Results File: TPHG0800.RES

Quant Method : D:\HPCHEM\3\METHODS\TPHG0800.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Fri Nov 17 14:27:07 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG0800.M

Volume Inj. :
Signal #1 Phase :
Signal #1 Info :
Signal #2 Phase:
Signal #2 Info :



Quantitation Report

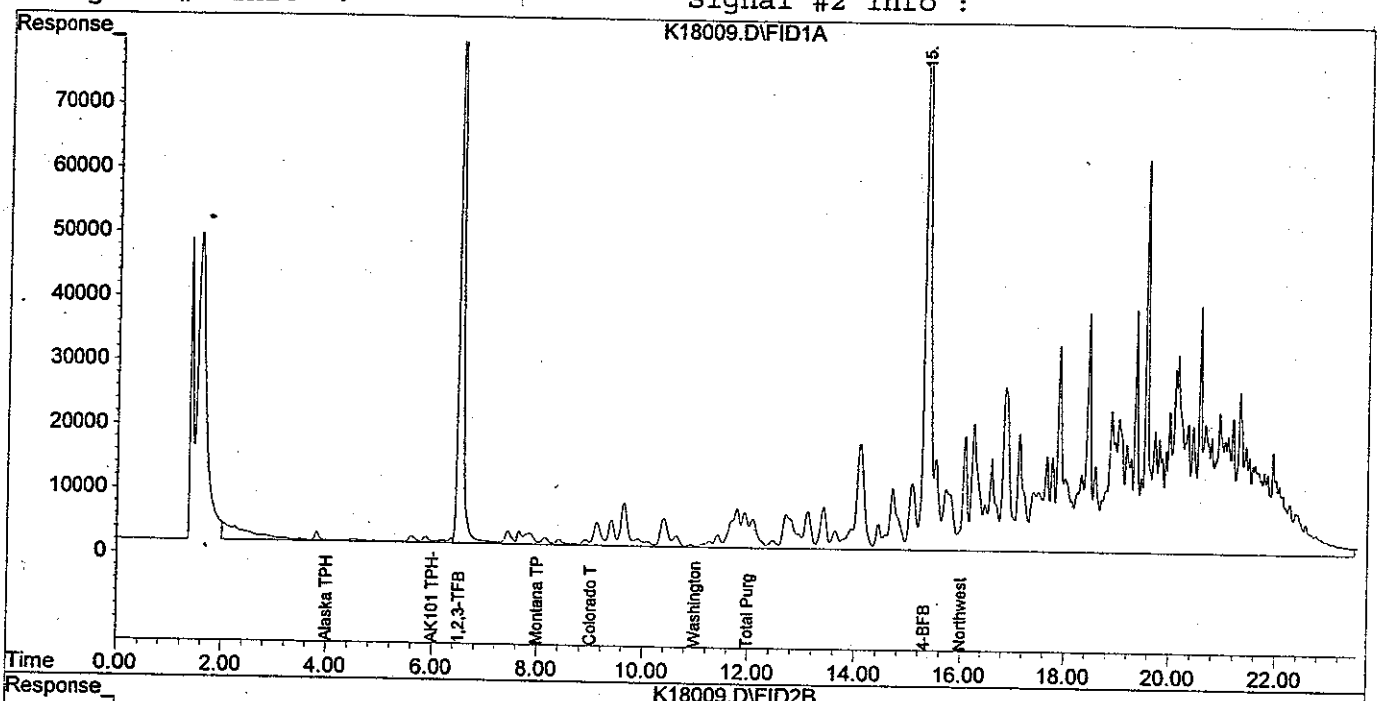
Signal #1 : D:\HPCHEM\3\DATA\111800\K18009.D\FID1A.CH Vial: 9
Signal #2 : D:\HPCHEM\3\DATA\111800\K18009.D\FID2B.CH
Acq On : 18 Nov 2000 11:09 am Operator: GAP
Sample : b0k0362-06 Inst : GC #6
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00

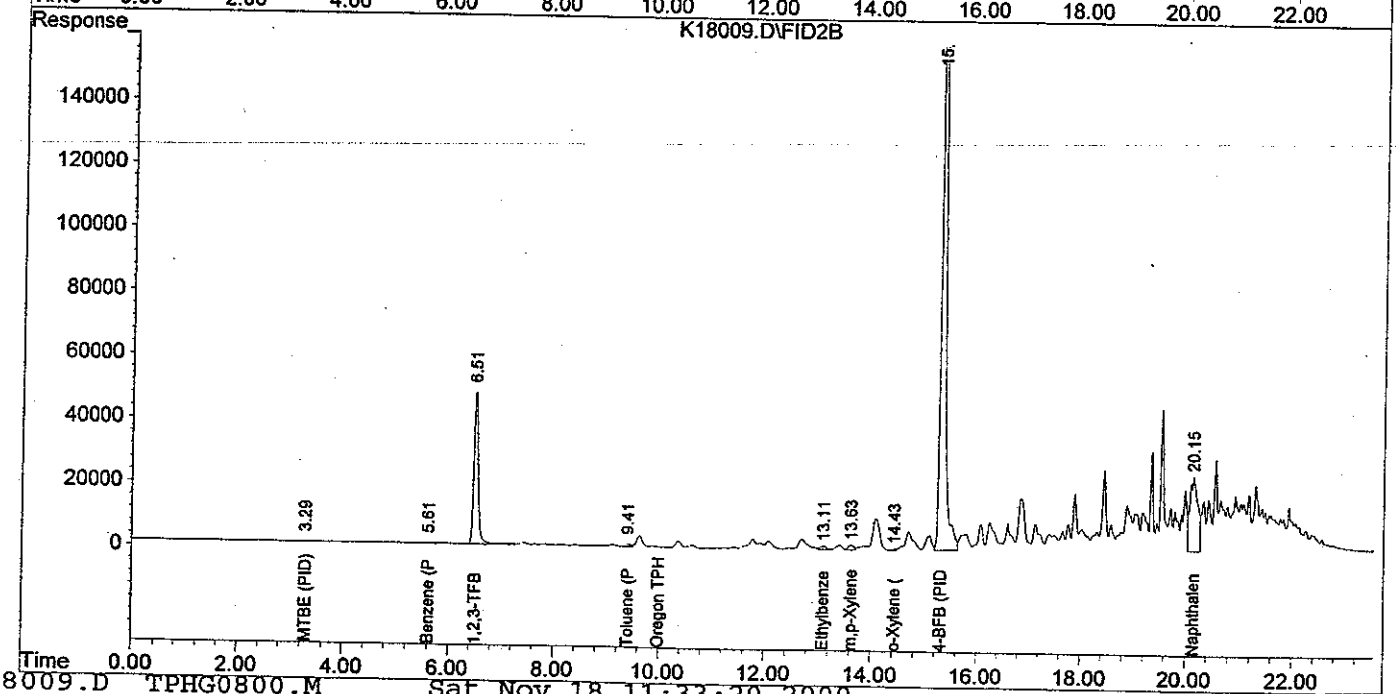
IntFile Signal #1: SURR.E IntFile Signal #2: SURR2.E

Quant Time: Nov 18 11:33 2000 Quant Results File: TPHG0800.RES

Quant Method : D:\HPCHEM\3\METHODS\TPHG0800.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Fri Nov 17 14:27:07 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG0800.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report

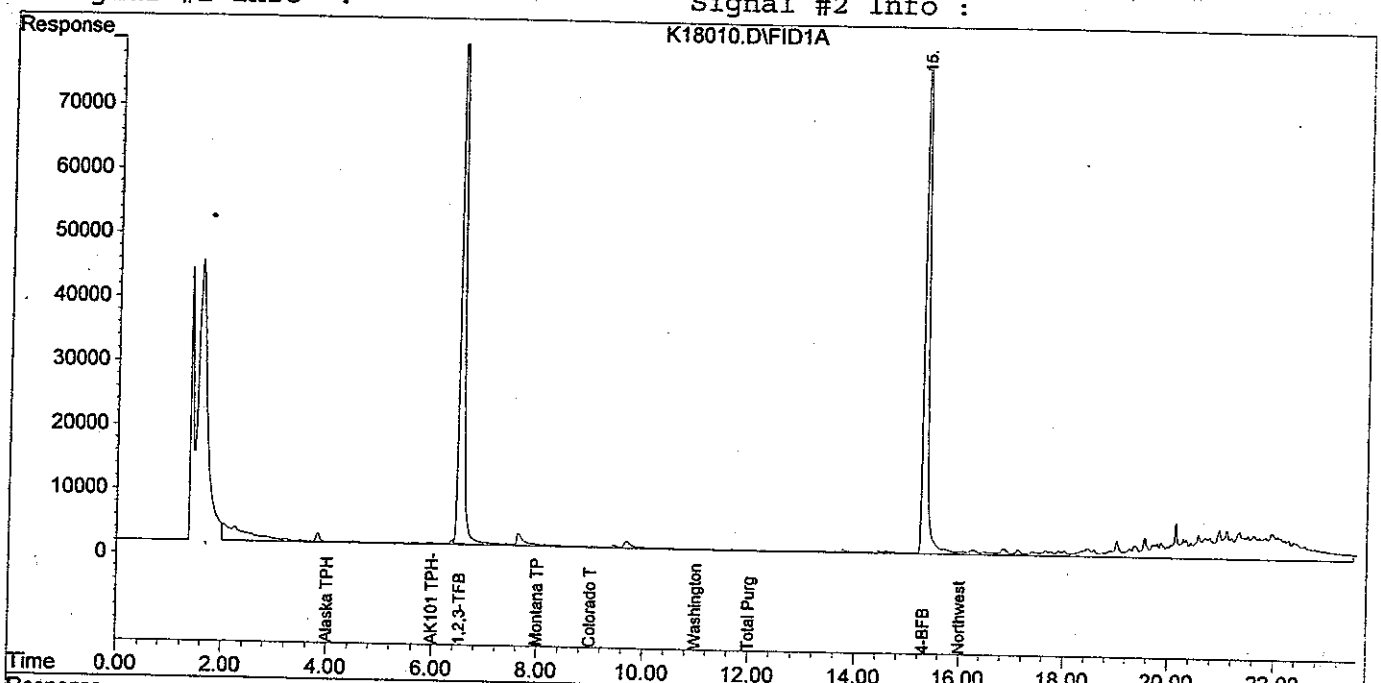
Signal #1 : D:\HPCHEM\3\DATA\111800\K18010.D\FID1A.CH Vial: 10
Signal #2 : D:\HPCHEM\3\DATA\111800\K18010.D\FID2B.CH
Acq On : 18 Nov 2000 11:39 am Operator: GAP
Sample : b0k0362-07 Inst : GC #6
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00

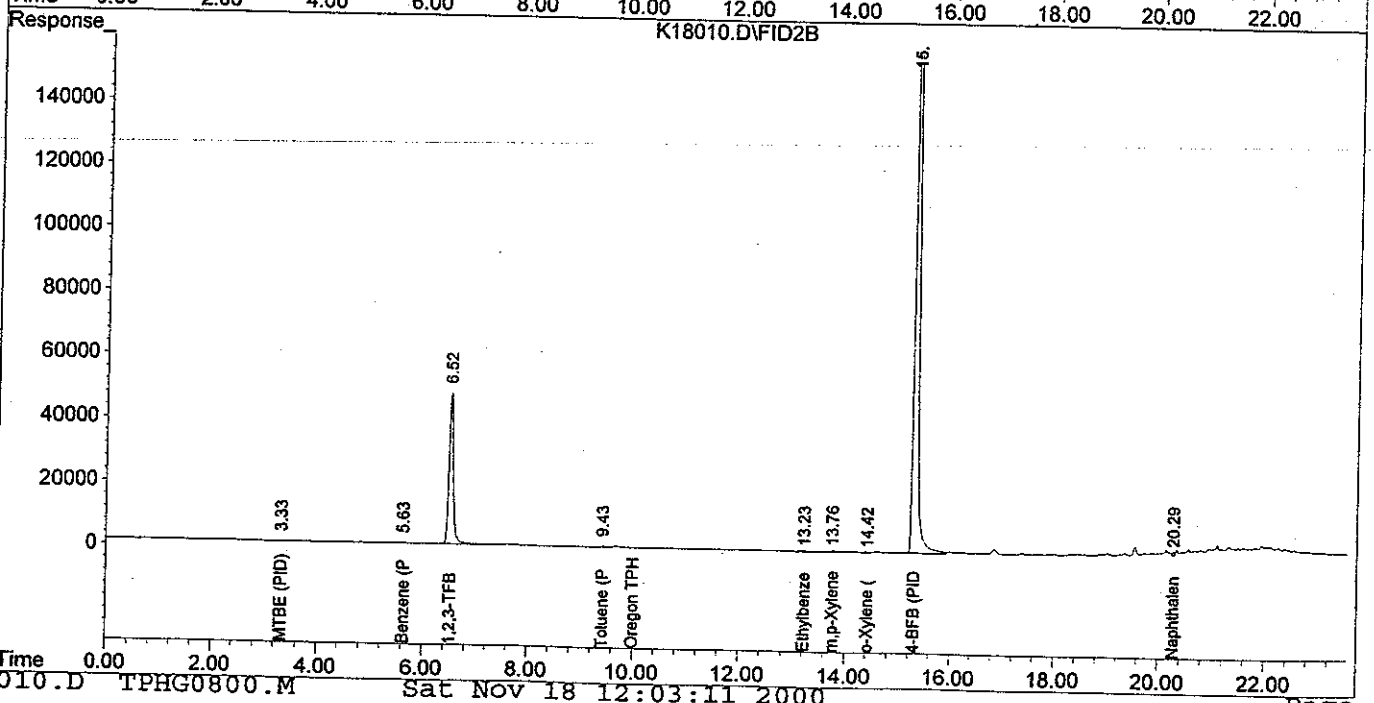
IntFile Signal #1: SURR.E IntFile Signal #2: SURR2.E

Quant Time: Nov 18 12:03 2000 Quant Results File: TPHG0800.RES

Quant Method : D:\HPCHEM\3\METHODS\TPHG0800.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Fri Nov 17 14:27:07 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG0800.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report

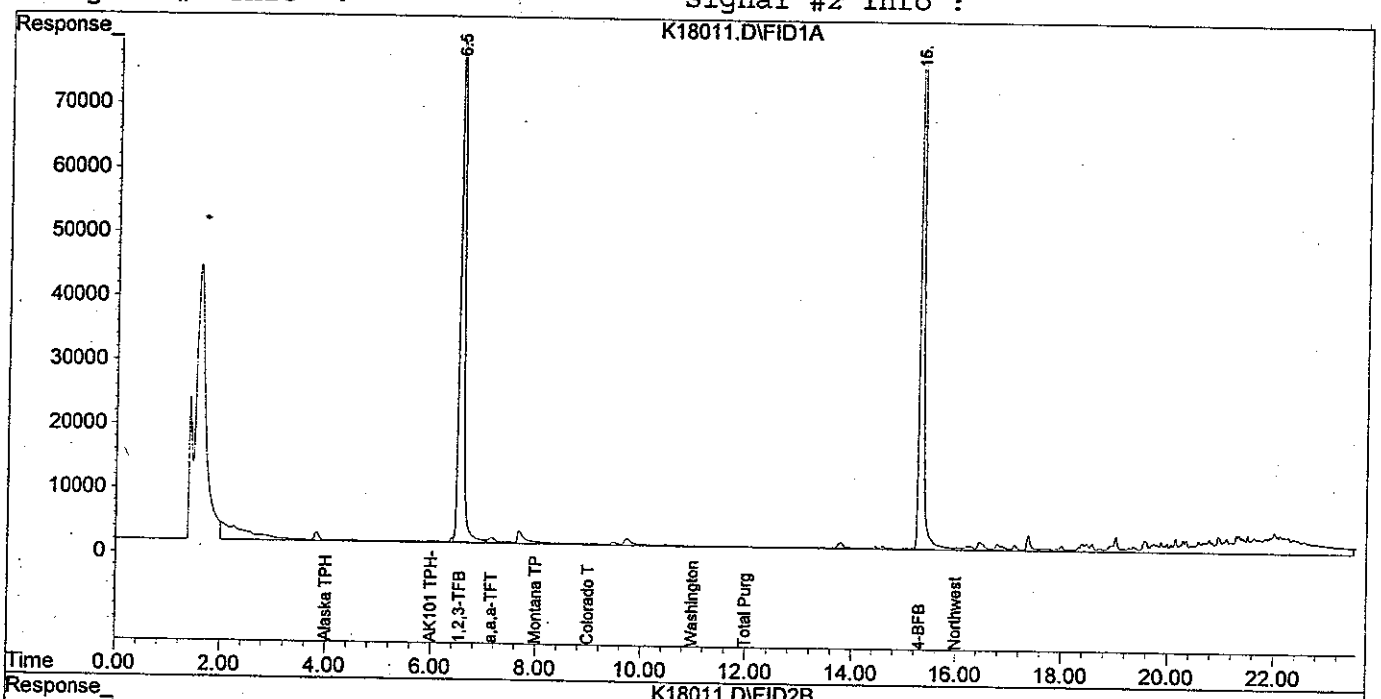
Signal #1 : D:\HPCHEM\3\DATA\111800\K18011.D\FID1A.CH Vial: 11
Signal #2 : D:\HPCHEM\3\DATA\111800\K18011.D\FID2B.CH
Acq On : 18 Nov 2000 12:09 pm Operator: GAP
Sample : b0k0362-08 Inst : GC #6
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00

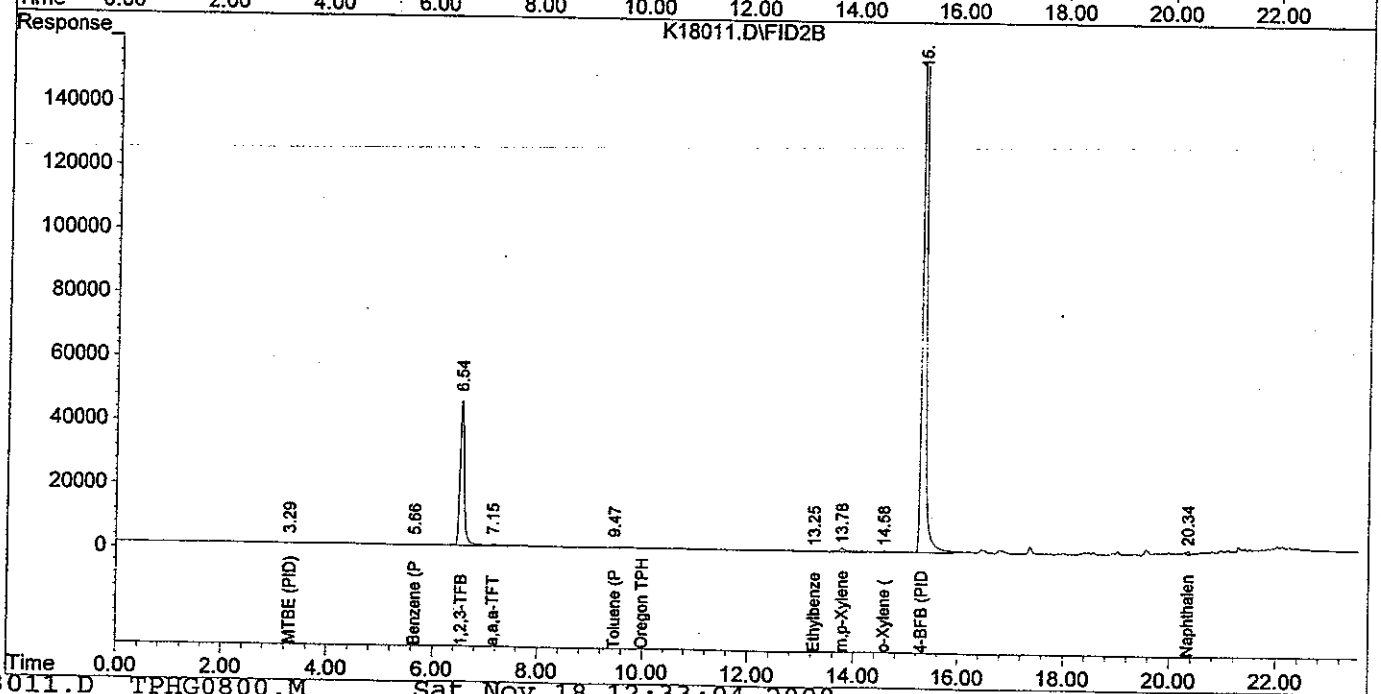
IntFile Signal #1: SURR.E IntFile Signal #2: SURR2.E

Quant Time: Nov 18 12:33 2000 Quant Results File: TPHG0800.RES

Quant Method : D:\HPCHEM\3\METHODS\TPHG0800.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Fri Nov 17 14:27:07 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG0800.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report

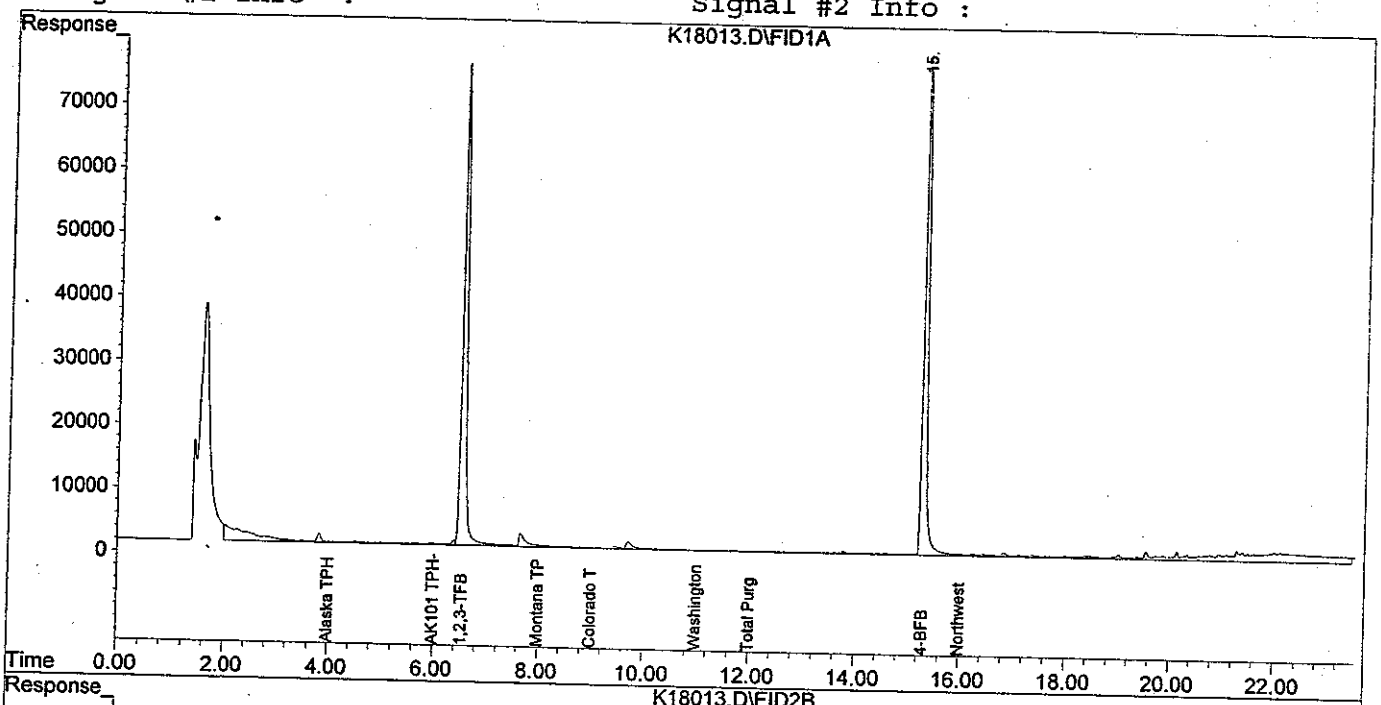
Signal #1 : D:\HPCHEM\3\DATA\111800\K18013.D\FID1A.CH Vial: 13
Signal #2 : D:\HPCHEM\3\DATA\111800\K18013.D\FID2B.CH
Acq On : 18 Nov 2000 1:08 pm Operator: GAP
Sample : b0k0362-09 Inst : GC #6
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00

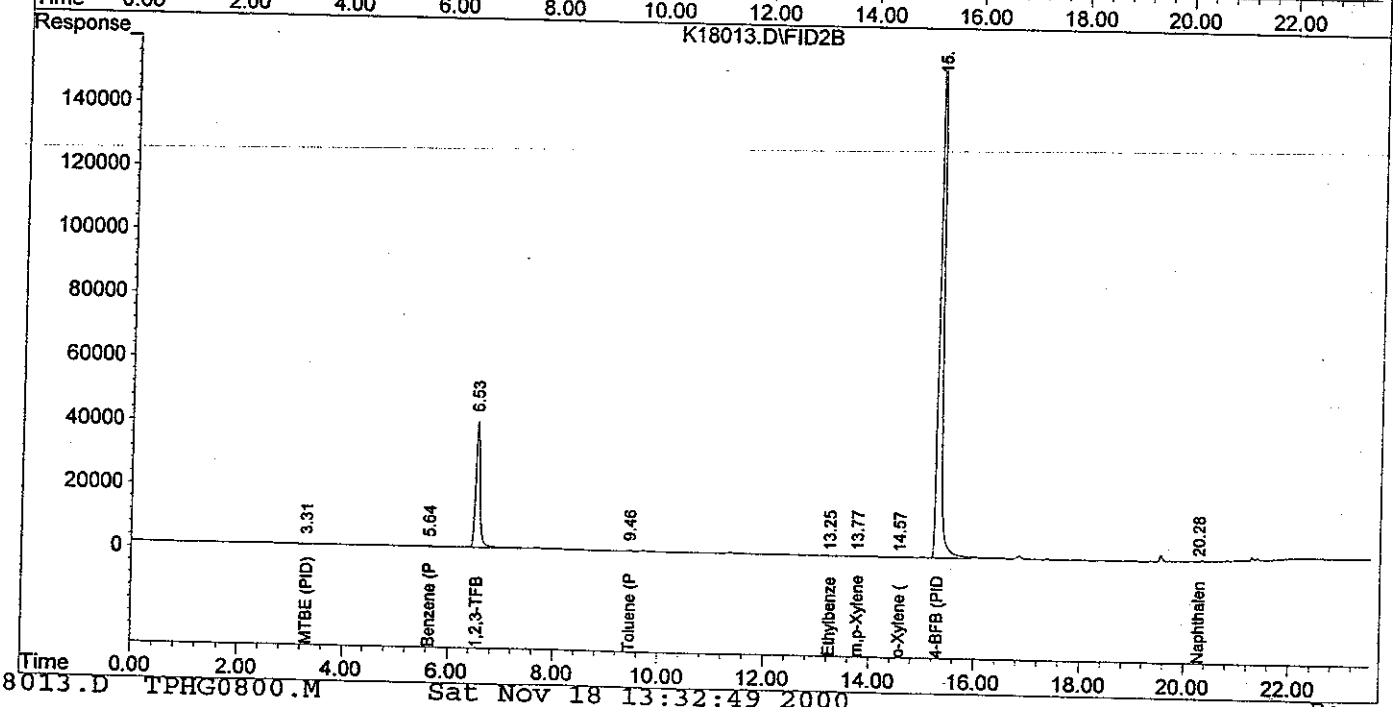
IntFile Signal #1: SURR.E IntFile Signal #2: SURR2.E

Quant Time: Nov 18 13:32 2000 Quant Results File: TPHG0800.RES

Quant Method : D:\HPCHEM\3\METHODS\TPHG0800.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Fri Nov 17 14:27:07 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG0800.M

Volume Inj. :
Signal #1 Phase :
Signal #1 Info :
Signal #2 Phase:
Signal #2 Info :





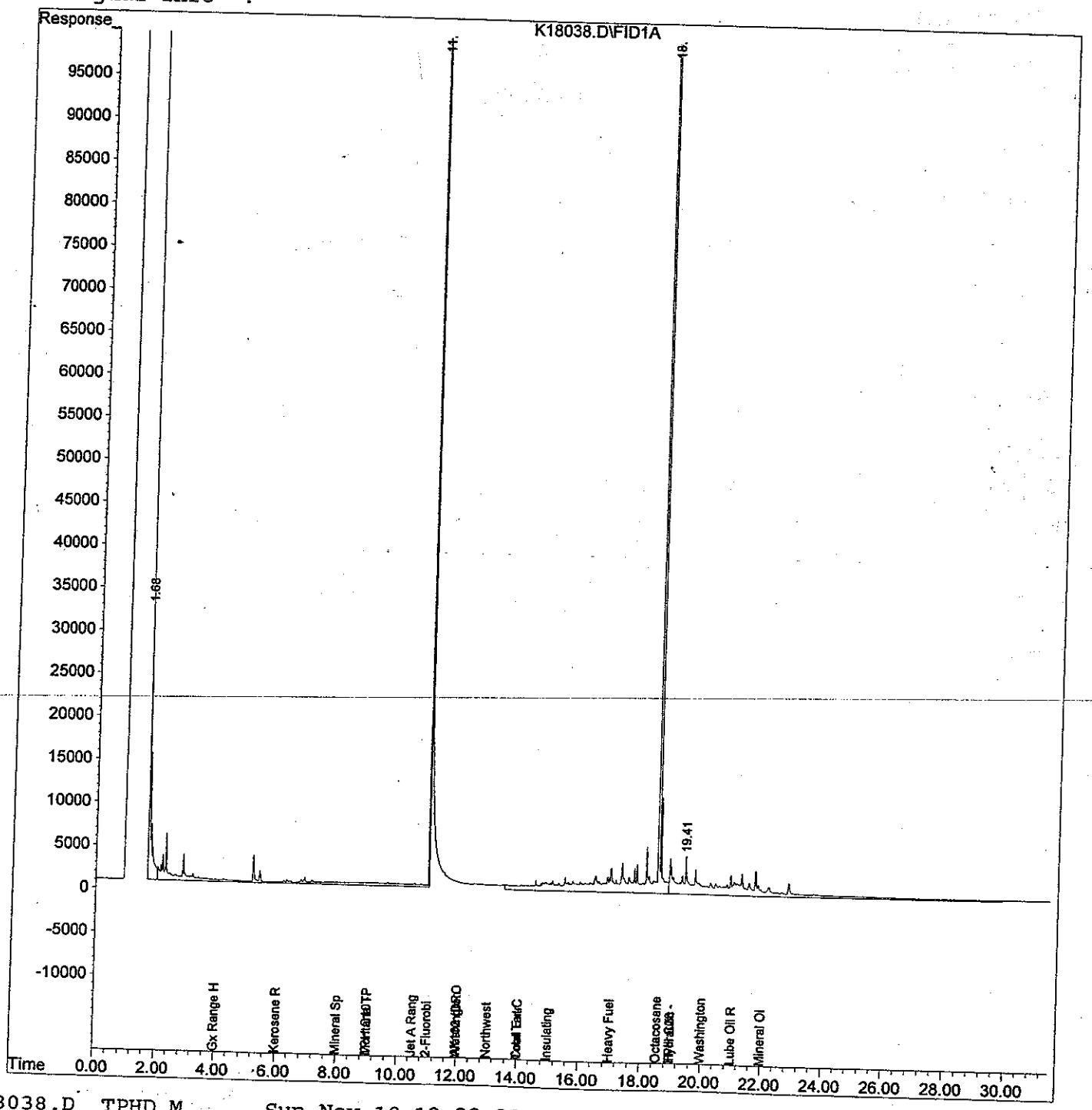
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K18038.D
Acq On : 18 Nov 2000 10:49 pm
Sample : b0k0~~449~~-01
Misc : S ~~455~~-01
IntFile : SURR.E
Quant Time: Nov 18 23:21 2000 Quant Results File: TPHD.RES

Vial: 33
Operator: db
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\TPHD.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Sep 27 08:12:03 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



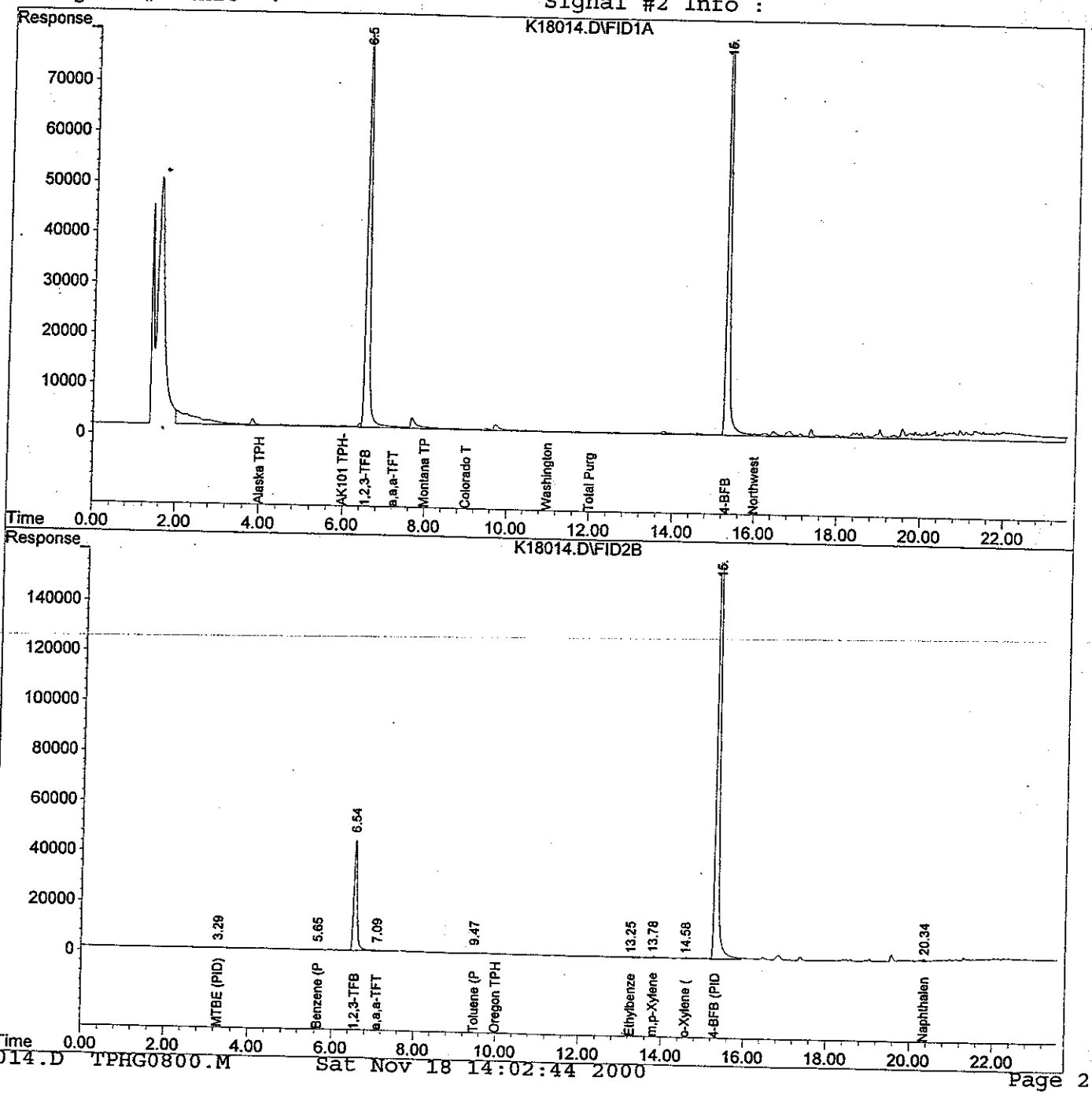
Signal #1 : D:\HPCHEM\3\DATA\111800\K18014.D\FID1A.CH Vial: 14
Signal #2 : D:\HPCHEM\3\DATA\111800\K18014.D\FID2B.CH
Acq On : 18 Nov 2000 1:38 pm Operator: GAP
Sample : b0k0362-10 Inst : GC #6
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00

IntFile Signal #1: SURR.E IntFile Signal #2: SURR2.E

Quant Time: Nov 18 14:02 2000 Quant Results File: TPHG0800.RES

Quant Method : D:\HPCHEM\3\METHODS\TPHG0800.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Fri Nov 17 14:27:07 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG0800.M

Volume Inj. :
Signal #1 Phase :
Signal #1 Info :
Signal #2 Phase:
Signal #2 Info :



Quantitation Report

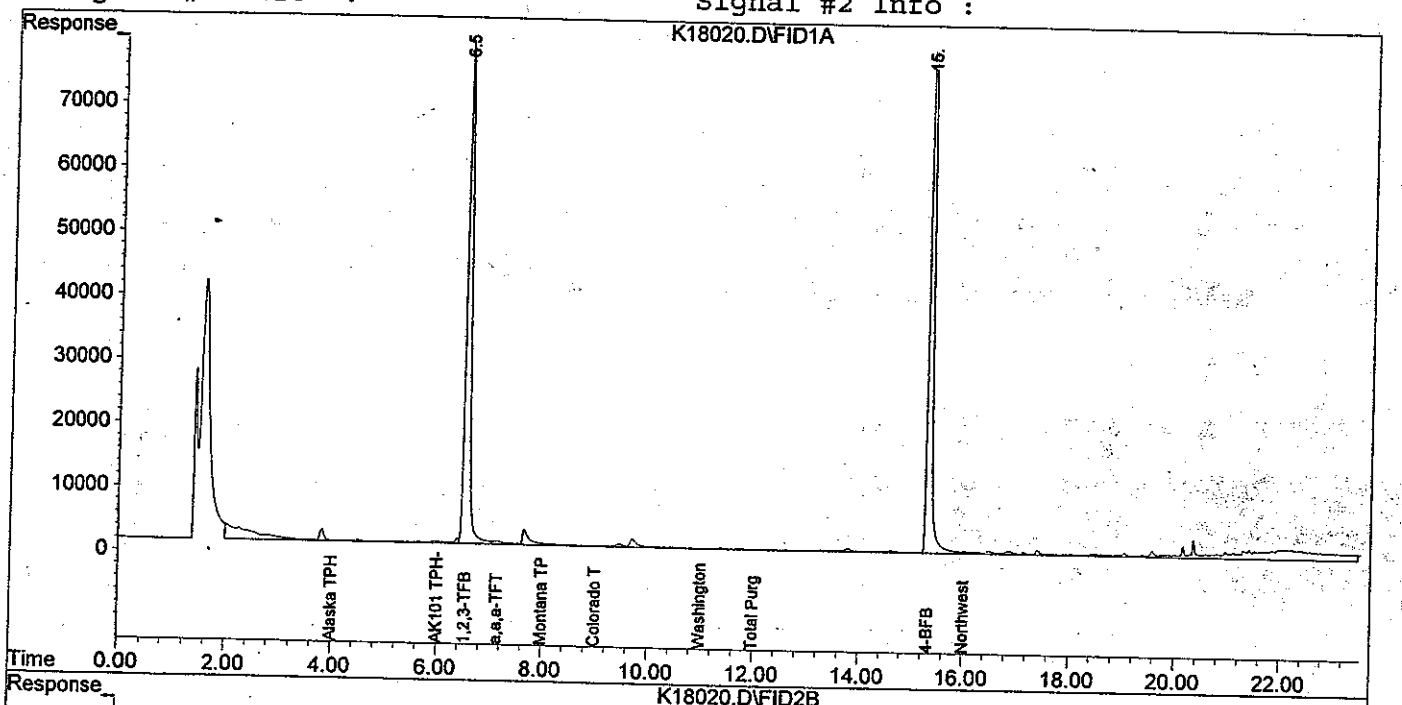
Signal #1 : D:\HPCHEM\3\DATA\111800\K18020.D\FID1A.CH Vial: 20
Signal #2 : D:\HPCHEM\3\DATA\111800\K18020.D\FID2B.CH
Acq On : 18 Nov 2000 4:38 pm Operator: GAP
Sample : b0k0362-12 Inst : GC #6
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00

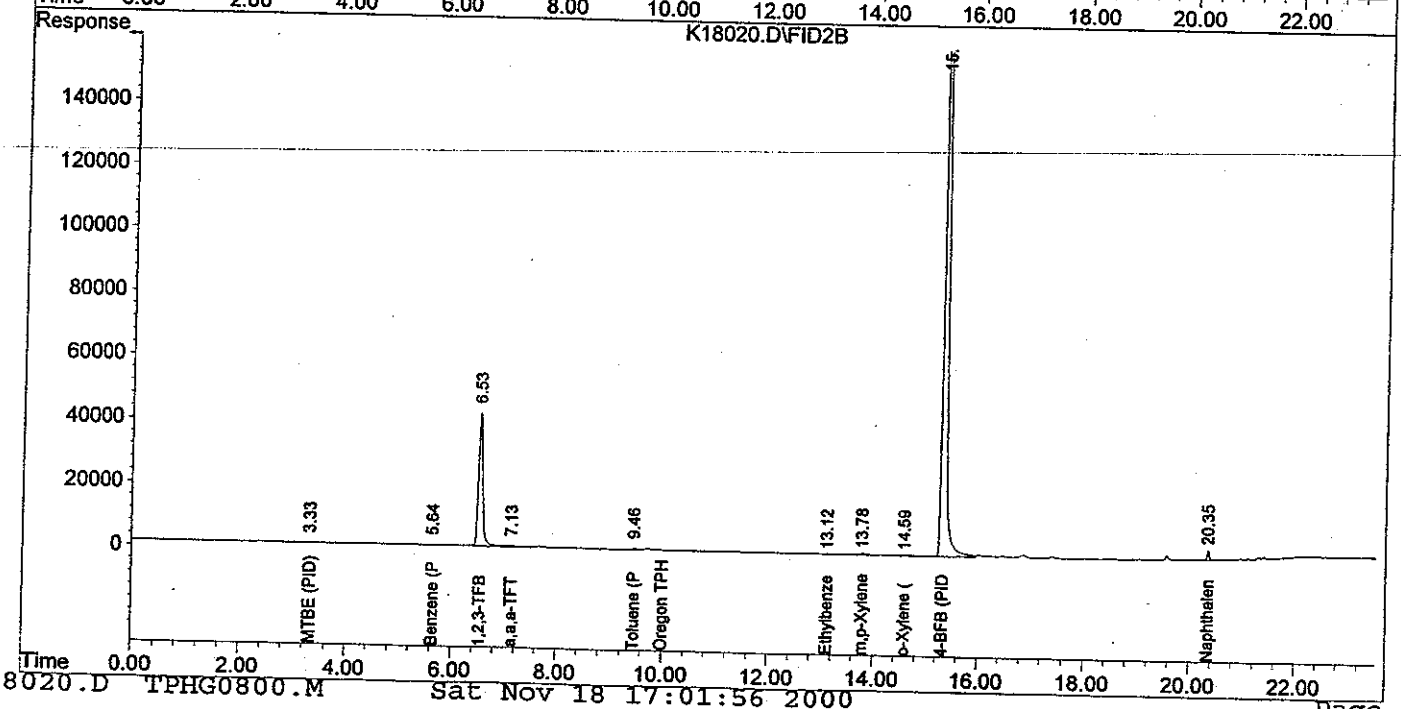
IntFile Signal #1: SURR.E IntFile Signal #2: SURR2.E

Quant Time: Nov 18 17:01 2000 Quant Results File: TPHG0800.RES

Quant Method : D:\HPCHEM\3\METHODS\TPHG0800.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Fri Nov 17 14:27:07 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG0800.M

Volume Inj. :
Signal #1 Phase :
Signal #1 Info :
Signal #2 Phase:
Signal #2 Info :





Quantitation Report

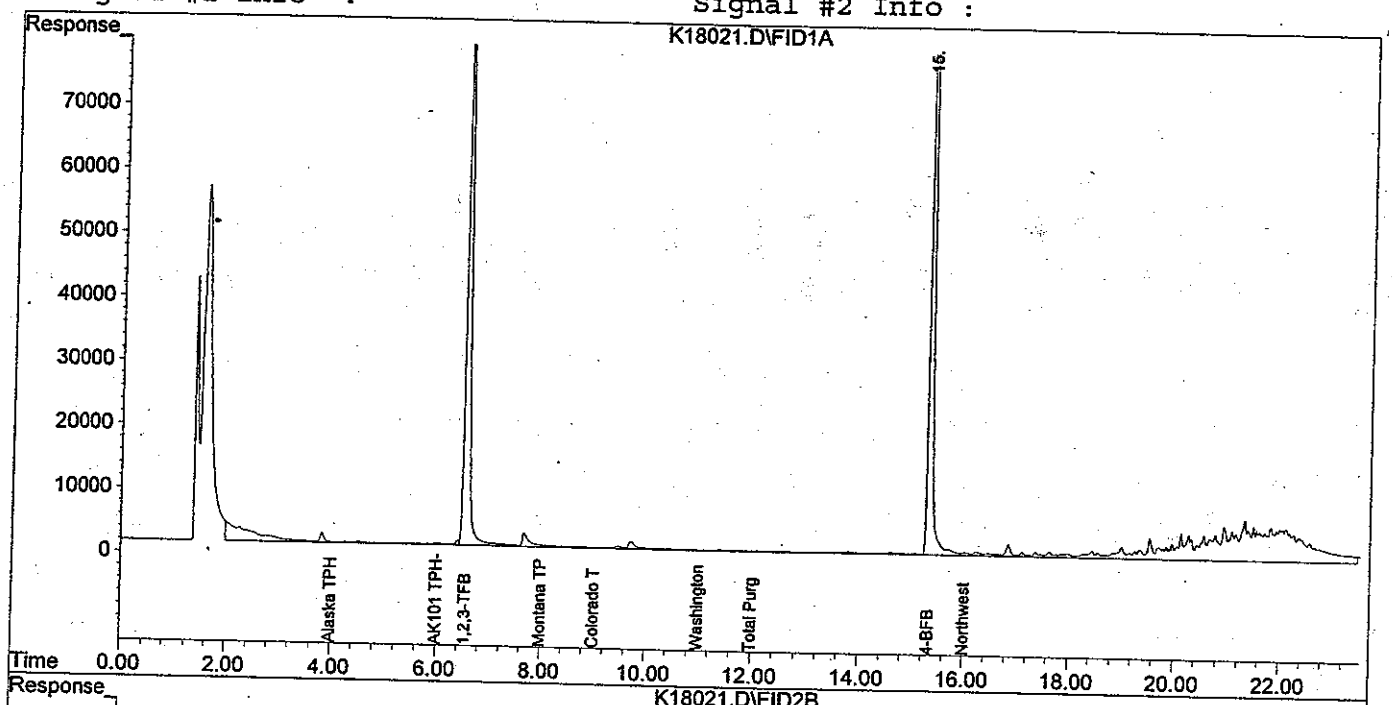
Signal #1 : D:\HPCHEM\3\DATA\111800\K18021.D\FID1A.CH Vial: 21
Signal #2 : D:\HPCHEM\3\DATA\111800\K18021.D\FID2B.CH
Acq On : 18 Nov 2000 5:07 pm Operator: GAP
Sample : b0k0362-13 Inst : GC #6
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00

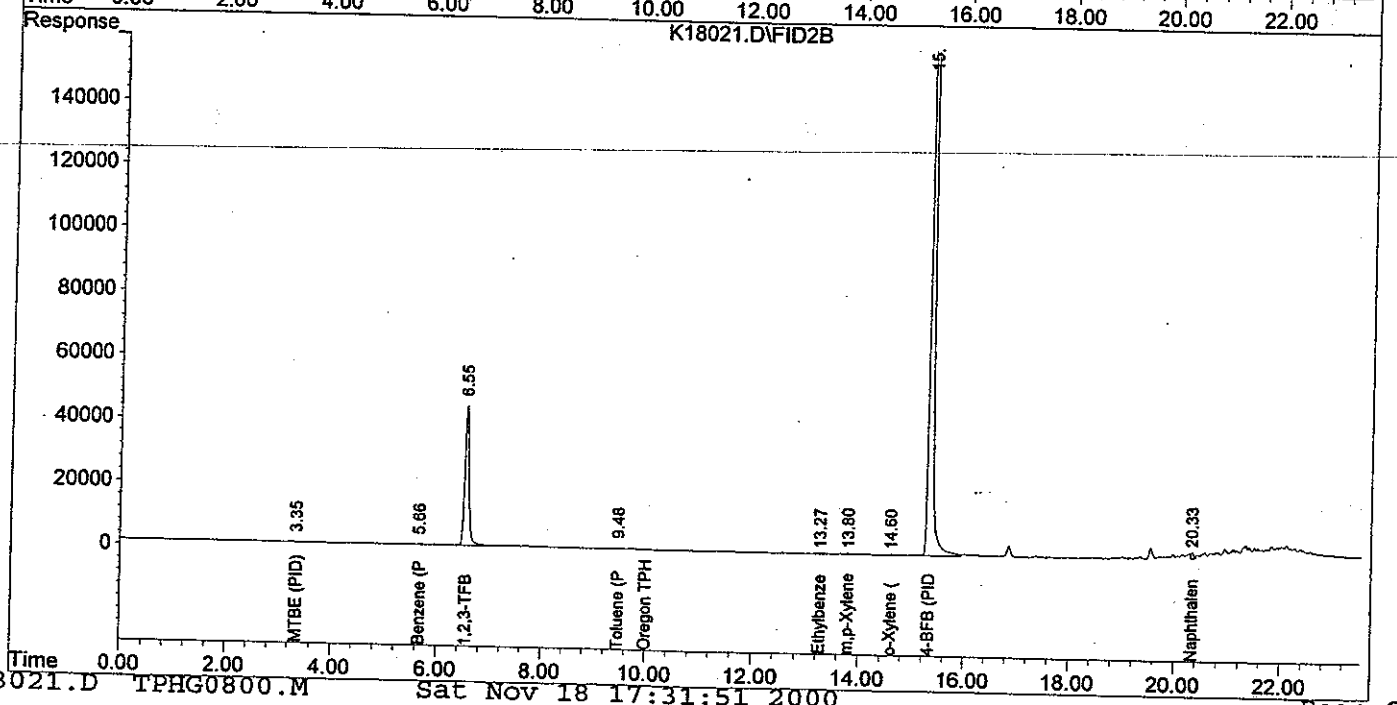
IntFile Signal #1: SURR.E IntFile Signal #2: SURR2.E

Quant Time: Nov 18 17:31 2000 Quant Results File: TPHG0800.RES

Quant Method : D:\HPCHEM\3\METHODS\TPHG0800.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Fri Nov 17 14:27:07 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG0800.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report

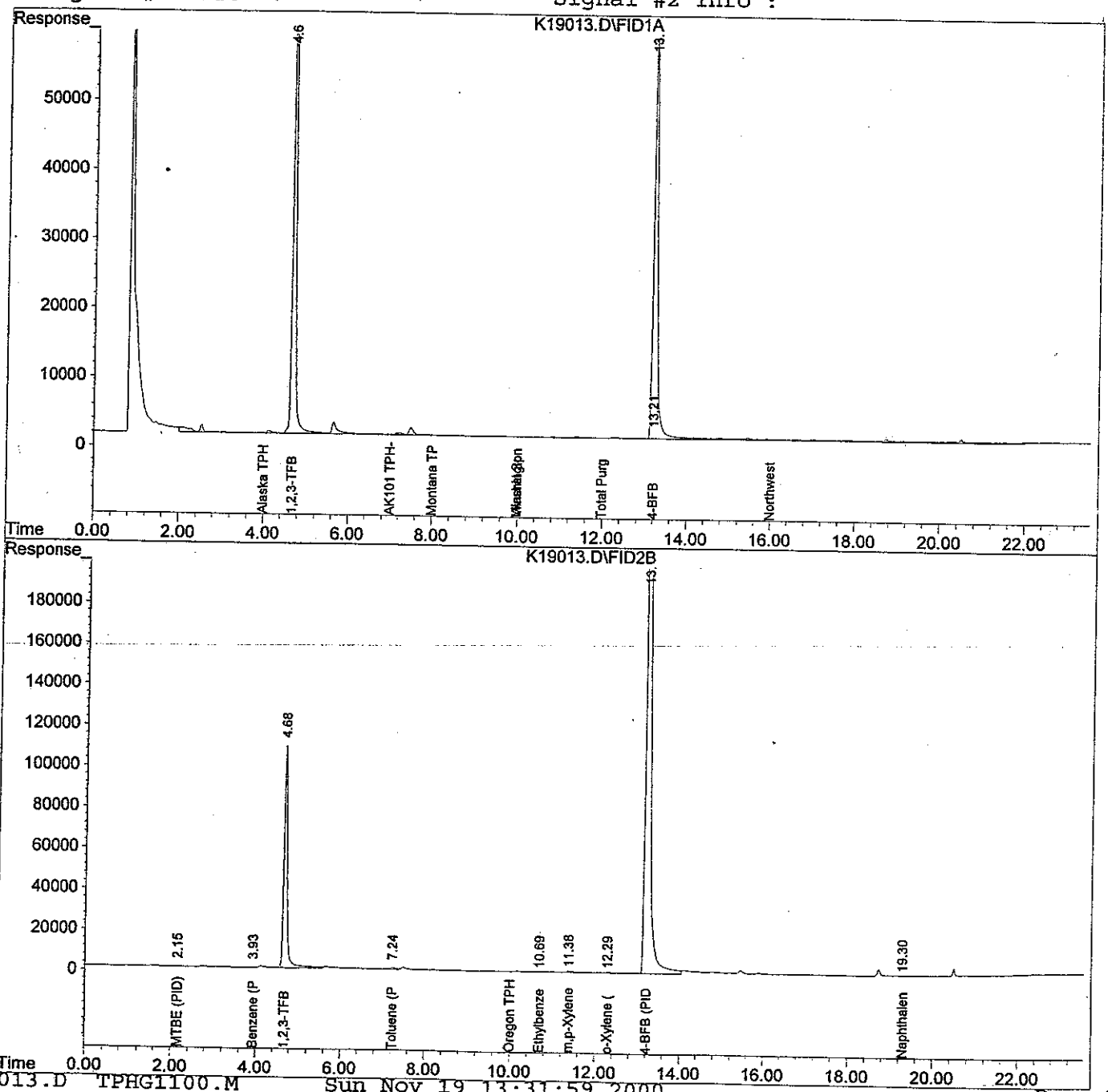
Signal #1 : D:\HPCHEM\4\DATA\111900\K19013.D\FID1A.CH Vial: 13
Signal #2 : D:\HPCHEM\4\DATA\111900\K19013.D\FID2B.CH
Acq On : 19 Nov 2000 1:07 pm Operator: GAP
Sample : b0k0362-14 Inst : GC #8
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00

IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E

Quant Time: Nov 19 13:31 2000 Quant Results File: TPHG1100.RES

Quant Method : D:\HPCHEM\4\METHODS\TPHG1100.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Fri Nov 17 09:37:09 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG1100.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Quantitation Report

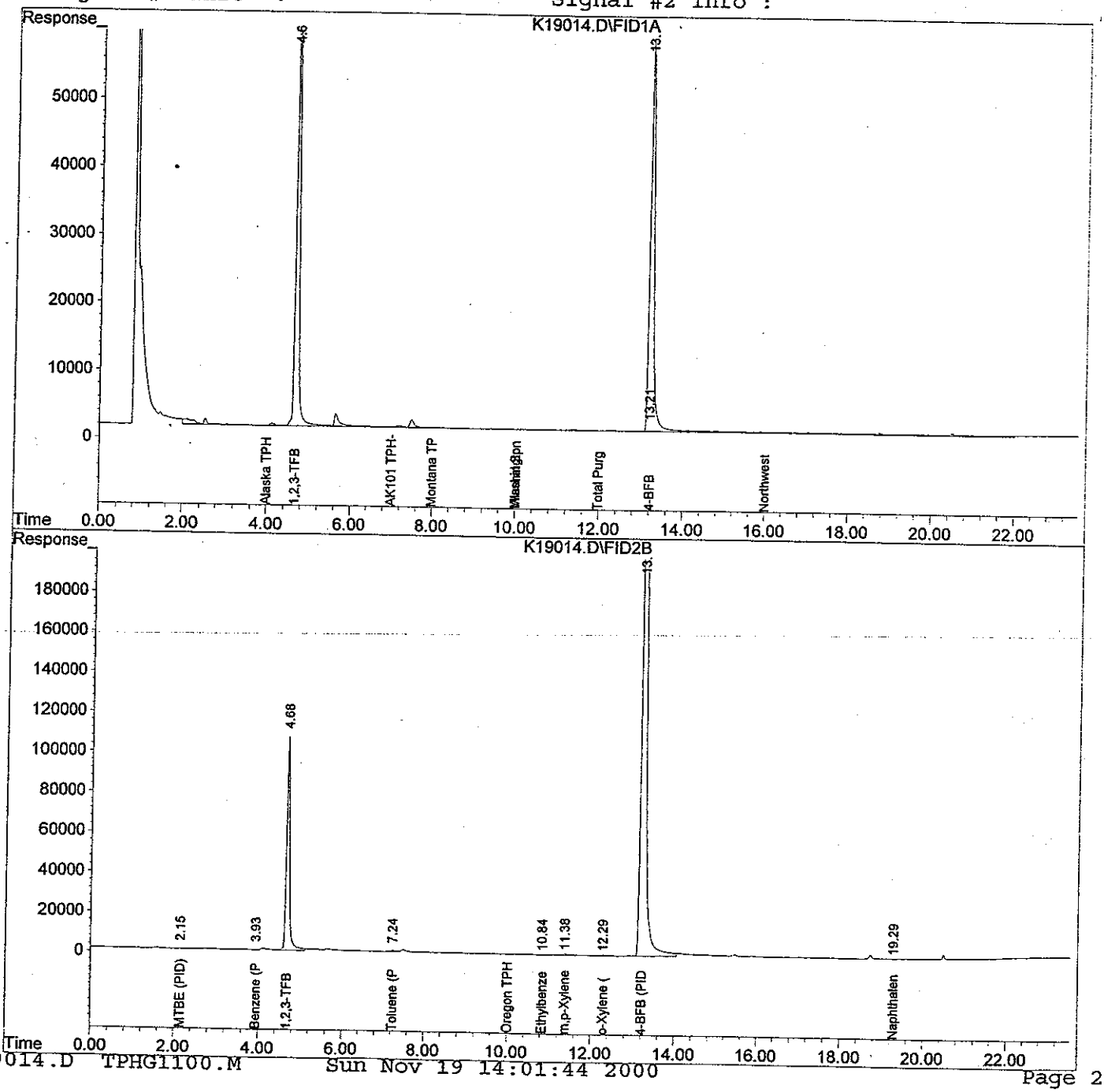
Signal #1 : D:\HPCHEM\4\DATA\111900\K19014.D\FID1A.CH Vial: 14
Signal #2 : D:\HPCHEM\4\DATA\111900\K19014.D\FID2B.CH
Acq On : 19 Nov 2000 1:37 pm Operator: GAP
Sample : b0k0362-15 Inst : GC #8
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00

IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E

Quant Time: Nov 19 14:01 2000 Quant Results File: TPHG1100.RES

Quant Method : D:\HPCHEM\4\METHODS\TPHG1100.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Fri Nov 17 09:37:09 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG1100.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Quantitation Report

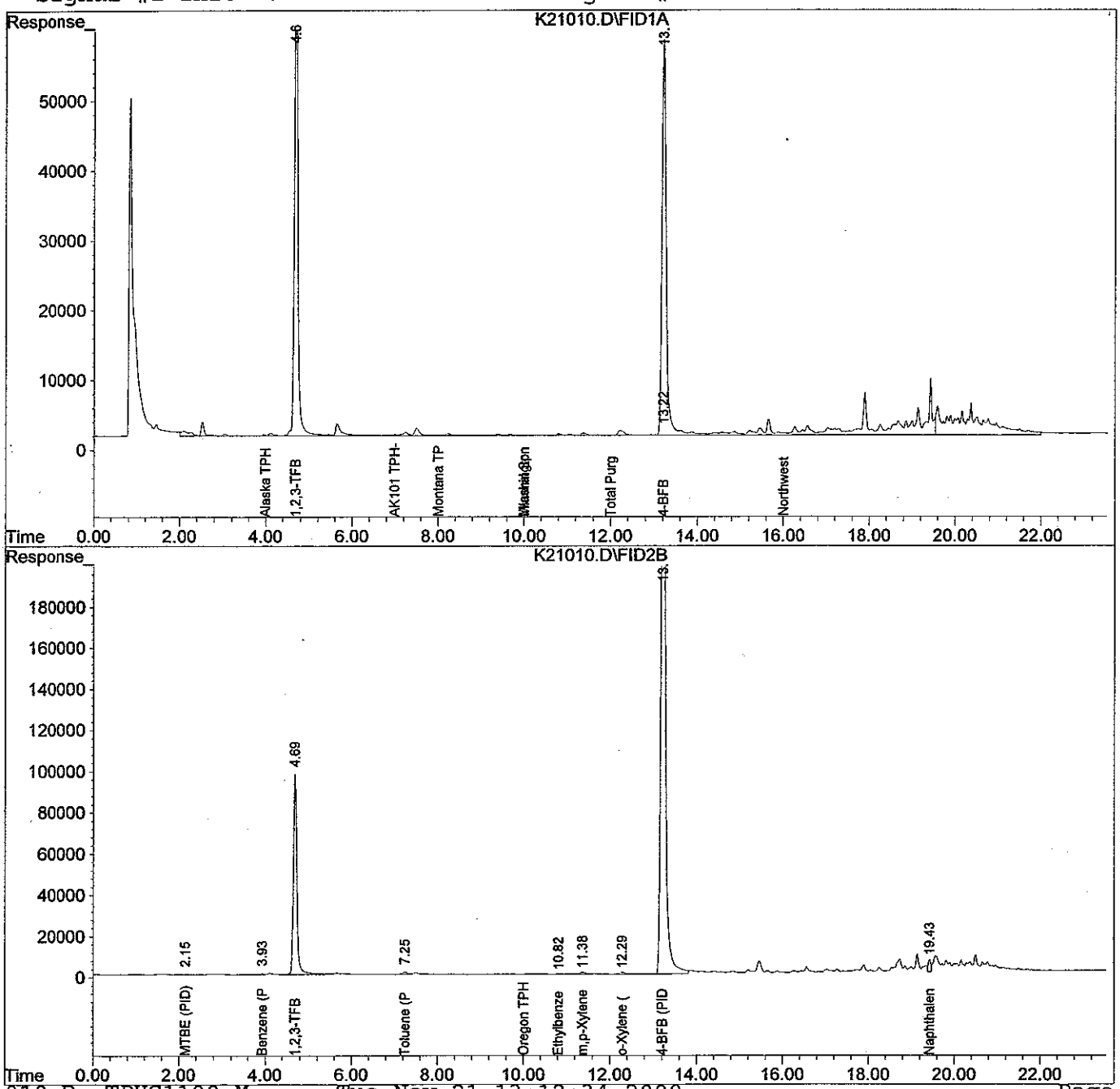
Signal #1 : D:\HPCHEM\4\DATA\112100\K21010.D\FID1A.CH Vial: 10
Signal #2 : D:\HPCHEM\4\DATA\112100\K21010.D\FID2B.CH
Acq On : 21 Nov 2000 12:35 Operator: GAP
Sample : b0k0362-16 Inst : GC #8
Misc : 100 ul r1 Multiplr: 1.00
Sample Amount: 0.00

IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E

Quant Time: Nov 21 12:59 2000 Quant Results File: TPHG1100.RES

Quant Method : D:\HPCHEM\4\METHODS\TPHG1100.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Mon Nov 20 13:42:44 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG1100.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Quantitation Report

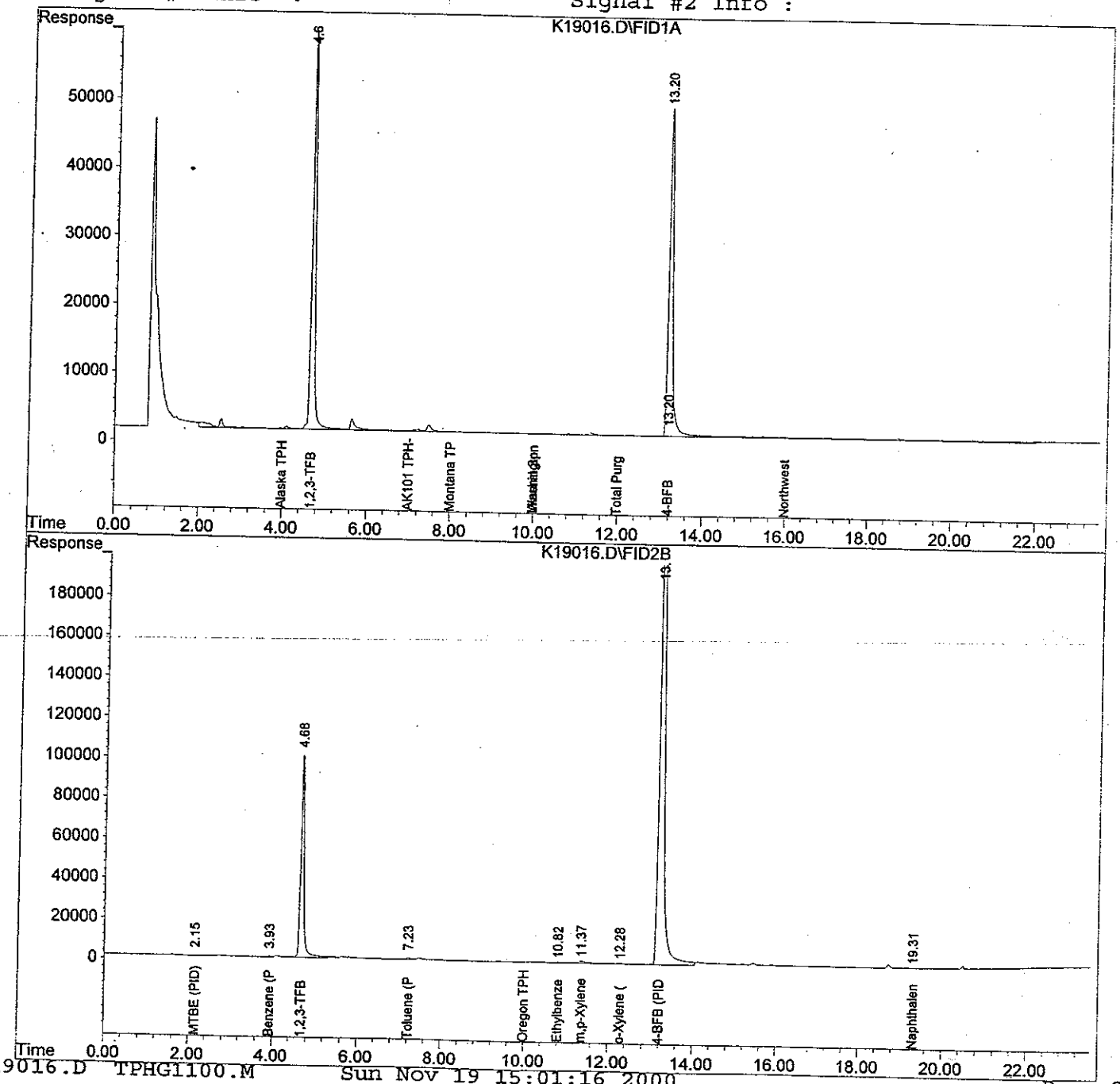
Signal #1 : D:\HPCHEM\4\DATA\111900\K19016.D\FID1A.CH Vial: 16
Signal #2 : D:\HPCHEM\4\DATA\111900\K19016.D\FID2B.CH
Acq On : 19 Nov 2000 2:37 pm Operator: GAP
Sample : b0k0362-17 Inst : GC #8
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00

IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E

Quant Time: Nov 19 15:01 2000 Quant Results File: TPHG1100.RES

Quant Method : D:\HPCHEM\4\METHODS\TPHG1100.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Fri Nov 17 09:37:09 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG1100.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Quantitation Report

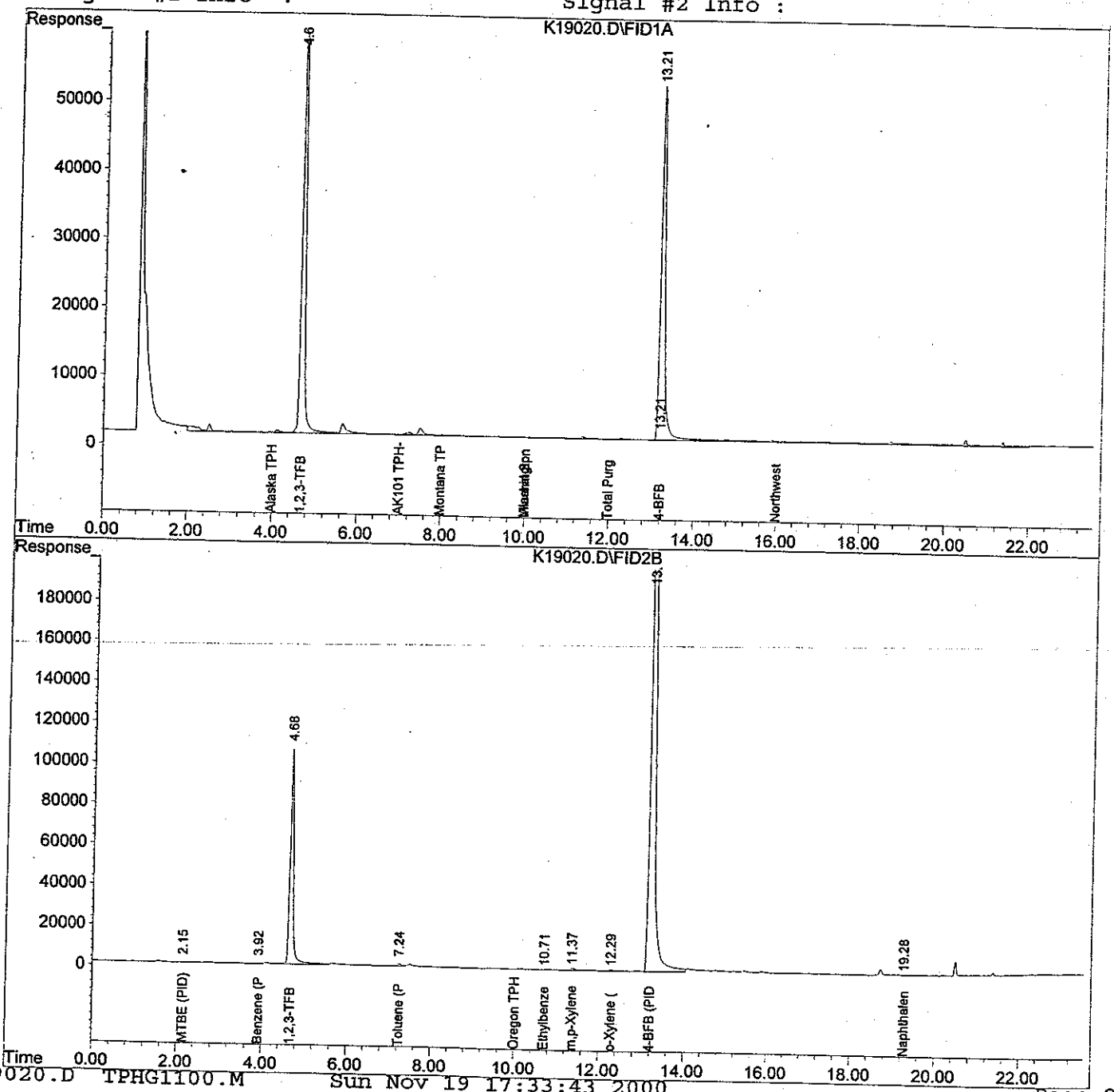
Signal #1 : D:\HPCHEM\4\DATA\111900\K19020.D\FID1A.CH Vial: 20
Signal #2 : D:\HPCHEM\4\DATA\111900\K19020.D\FID2B.CH
Acq On : 19 Nov 2000 5:09 pm Operator: GAP
Sample : b0k0362-18 Inst : GC #8
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00

IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E

Quant Time: Nov 19 17:33 2000 Quant Results File: TPHG1100.RES

Quant Method : D:\HPCHEM\4\METHODS\TPHG1100.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Fri Nov 17 09:37:09 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG1100.M

Volume Inj. :
Signal #1 Phase :
Signal #1 Info :
Signal #2 Phase:
Signal #2 Info :



Quantitation Report

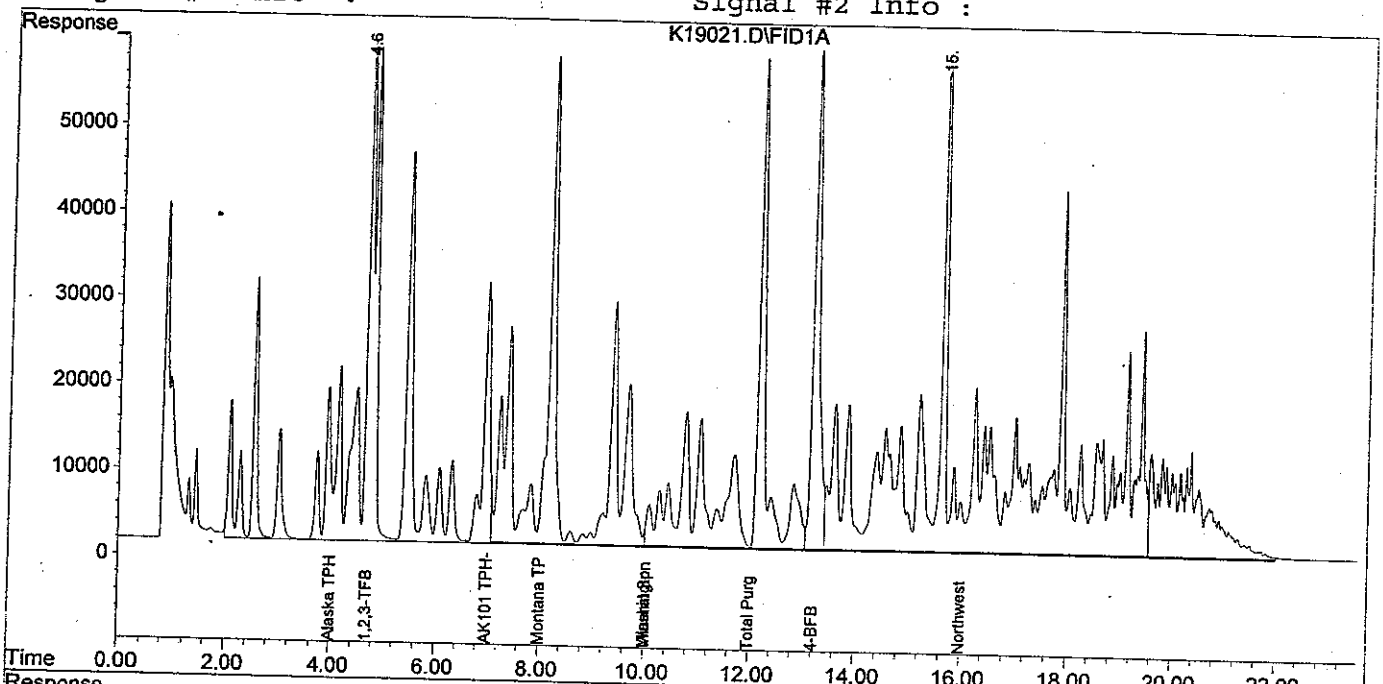
Signal #1 : D:\HPCHEM\4\DATA\111900\K19021.D\FID1A.CH Vial: 21
Signal #2 : D:\HPCHEM\4\DATA\111900\K19021.D\FID2B.CH
Acq On : 19 Nov 2000 5:39 pm Operator: GAP
Sample : b0k0362-19 Inst : GC #8
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00

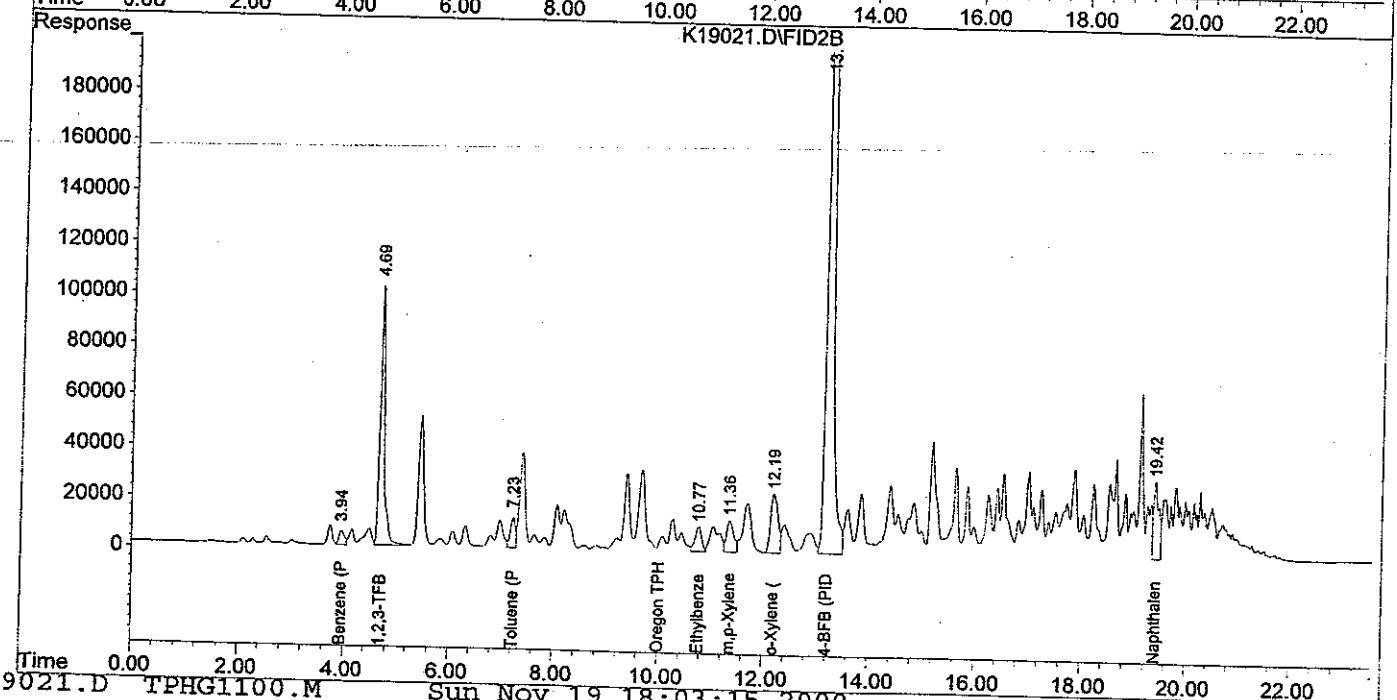
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E

Quant Time: Nov 19 18:03 2000 Quant Results File: TPHG1100.RES

Quant Method : D:\HPCHEM\4\METHODS\TPHG1100.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Fri Nov 17 09:37:09 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG1100.M

Volume Inj. :
Signal #1 Phase :
Signal #1 Info :
Signal #2 Phase:
Signal #2 Info :





Quantitation Report

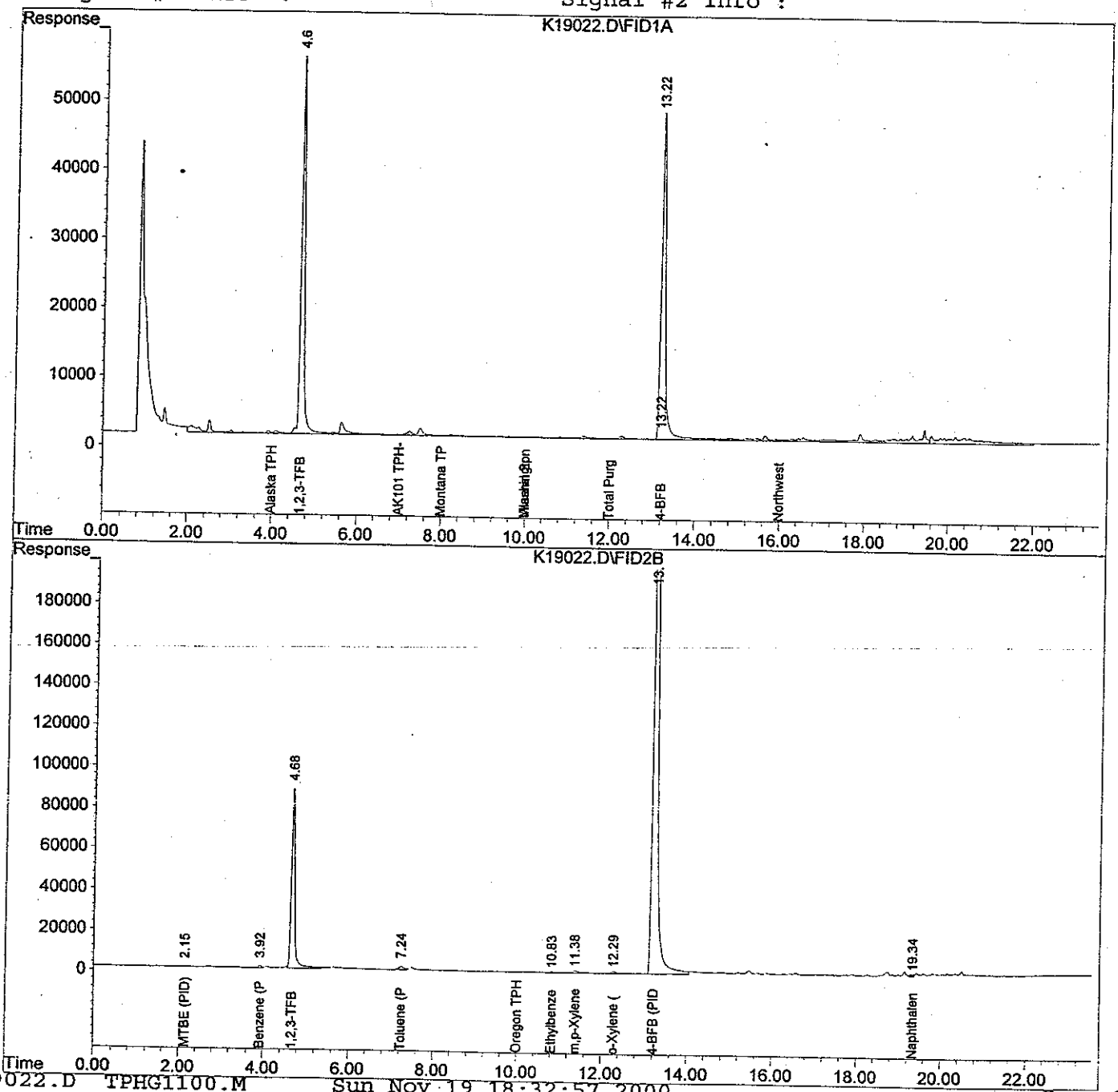
Signal #1 : D:\HPCHEM\4\DATA\111900\K19022.D\FID1A.CH Vial: 22
Signal #2 : D:\HPCHEM\4\DATA\111900\K19022.D\FID2B.CH
Acq On : 19 Nov 2000 6:09 pm Operator: GAP
Sample : b0k0362-20 Inst : GC #8
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00

IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E

Quant Time: Nov 19 18:32 2000 Quant Results File: TPHG1100.RES

Quant Method : D:\HPCHEM\4\METHODS\TPHG1100.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Fri Nov 17 09:37:09 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG1100.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Quantitation Report

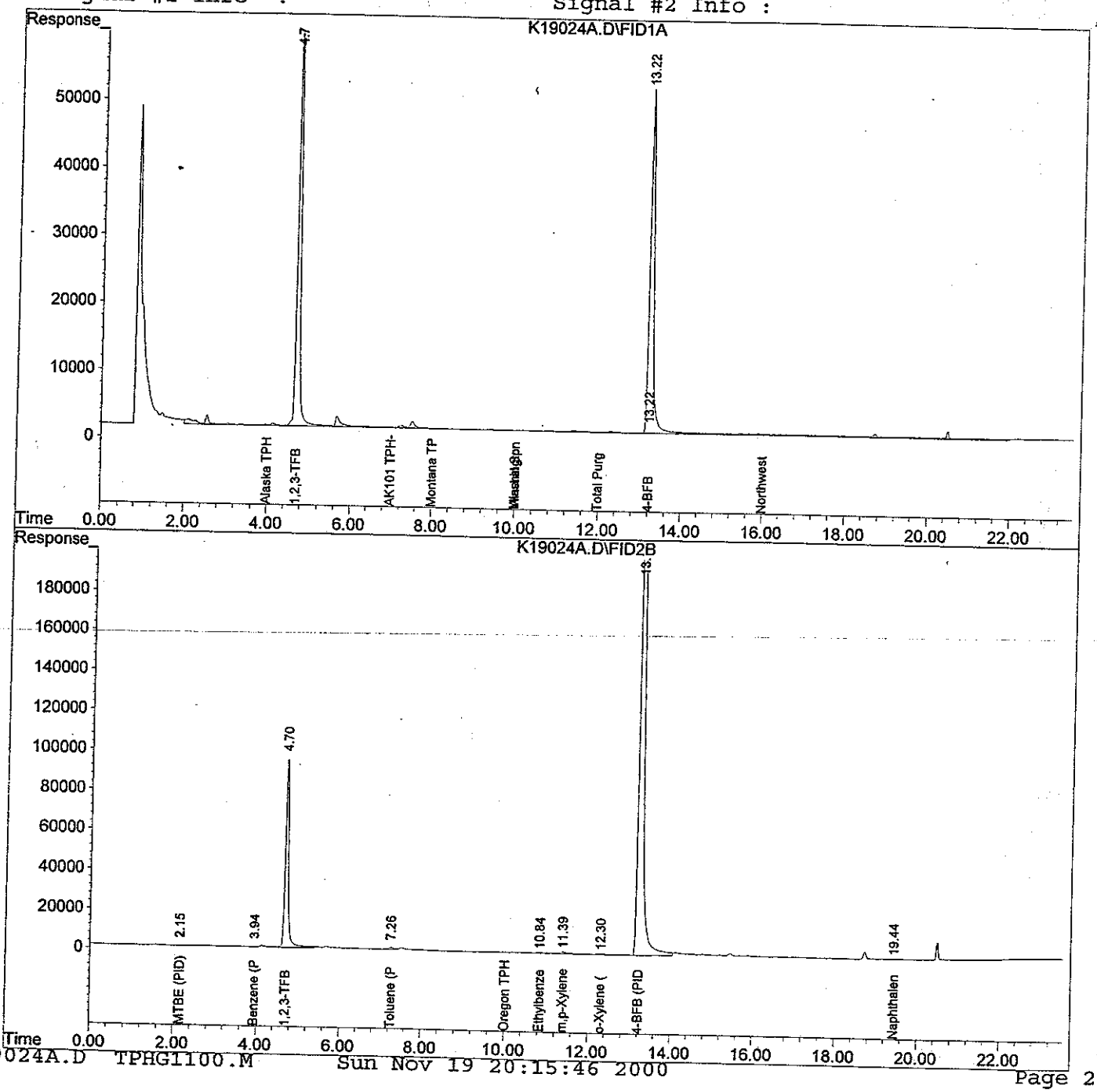
Signal #1 : D:\HPCHEM\4\DATA\111900\K19024A.D\FID1A.CH Vial: 23
Signal #2 : D:\HPCHEM\4\DATA\111900\K19024A.D\FID2B.CH
Acq On : 19 Nov 2000 7:51 pm Operator: GAP
Sample : b0k0362-21 Inst : GC #8
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00

IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E

Quant Time: Nov 19 20:15 2000 Quant Results File: TPHG1100.RES

Quant Method : D:\HPCHEM\4\METHODS\TPHG1100.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Fri Nov 17 09:37:09 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG1100.M

Volume Inj. :
Signal #1 Phase :
Signal #1 Info :
Signal #2 Phase:
Signal #2 Info :



Quantitation Report

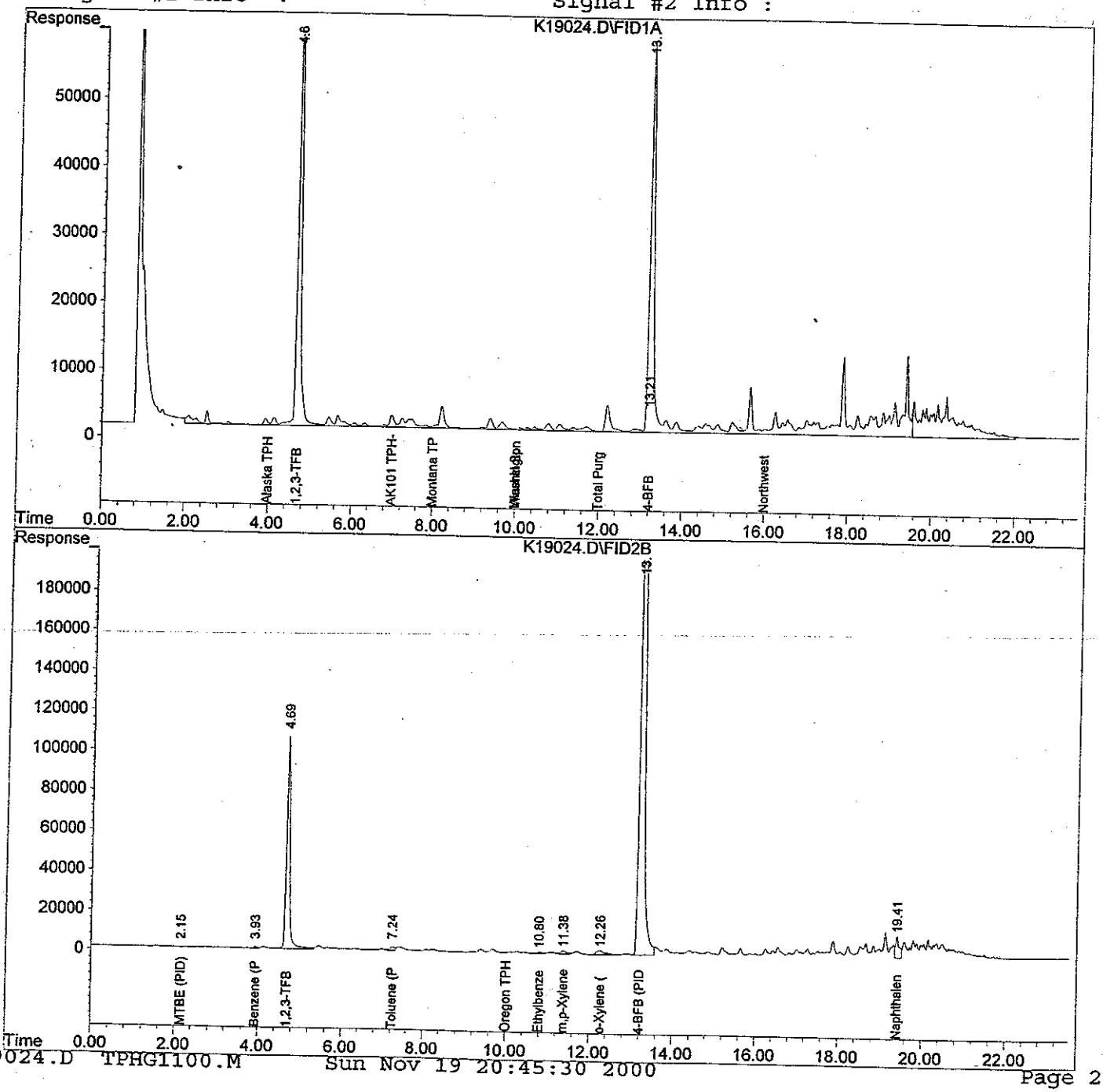
Signal #1 : D:\HPCHEM\4\DATA\111900\K19024.D\FID1A.CH Vial: 24
Signal #2 : D:\HPCHEM\4\DATA\111900\K19024.D\FID2B.CH
Acq On : 19 Nov 2000 8:21 pm Operator: GAP
Sample : b0k0362-22 Inst : GC #8
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00

IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E

Quant Time: Nov 19 20:45 2000 Quant Results File: TPHG1100.RES

Quant Method : D:\HPCHEM\4\METHODS\TPHG1100.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Fri Nov 17 09:37:09 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG1100.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Quantitation Report

Signal #1 : D:\HPCHEM\4\DATA\111900\K19026.D\FID1A.CH Vial: 26
Signal #2 : D:\HPCHEM\4\DATA\111900\K19026.D\FID2B.CH
Acq On : 19 Nov 2000 9:21 pm
Sample : b0k0362-23
Misc : 100 uL

Operator: GAP
Inst : GC #8
Multiplr: 1.00
Sample Amount: 0.00

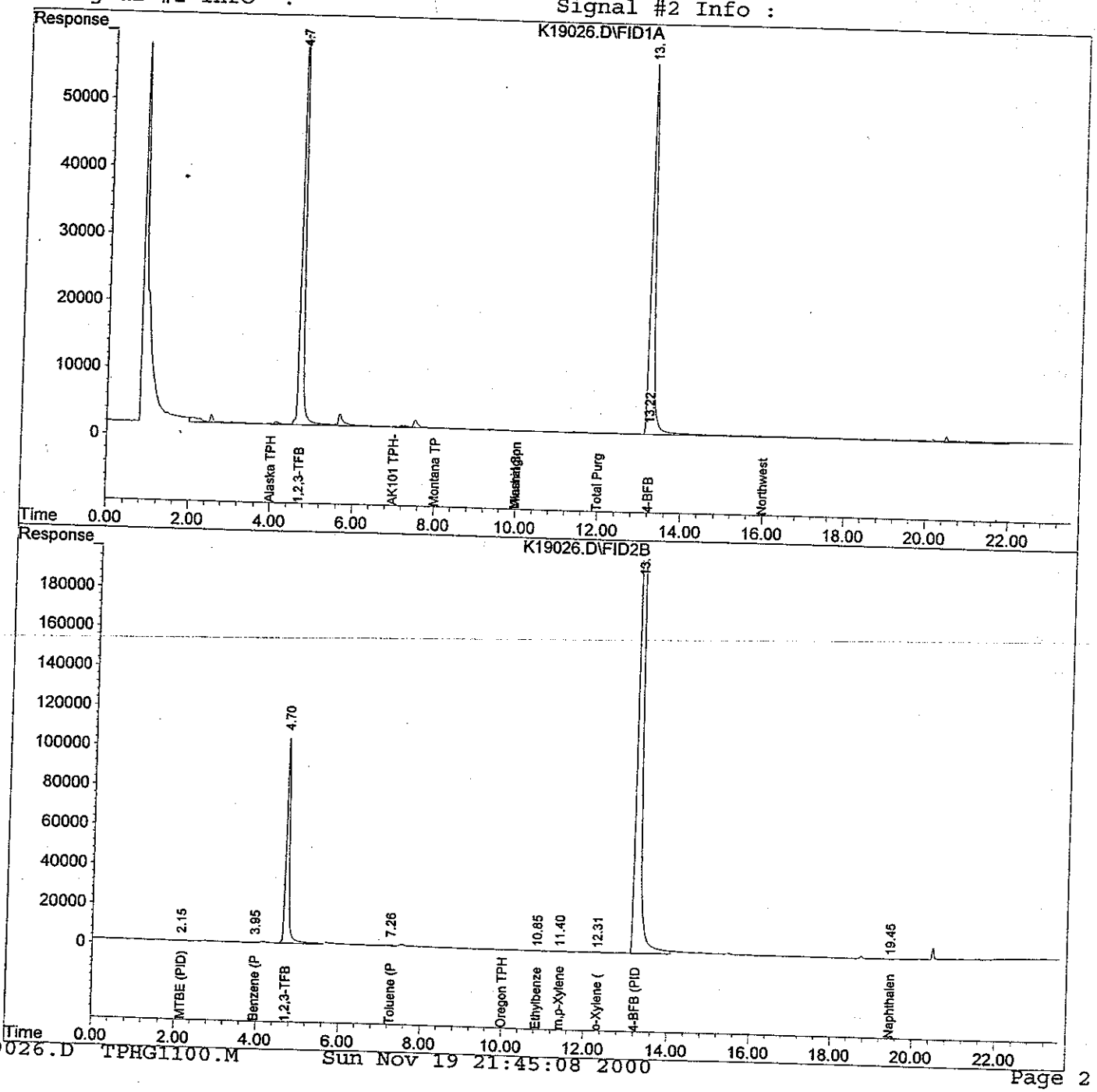
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E

Quant Time: Nov 19 21:45 2000 Quant Results File: TPHG1100.RES

Quant Method : D:\HPCHEM\4\METHODS\TPHG1100.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Fri Nov 17 09:37:09 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG1100.M

Volume Inj. :
Signal #1 Phase :
Signal #1 Info :

Signal #2 Phase:
Signal #2 Info :



Quantitation Report

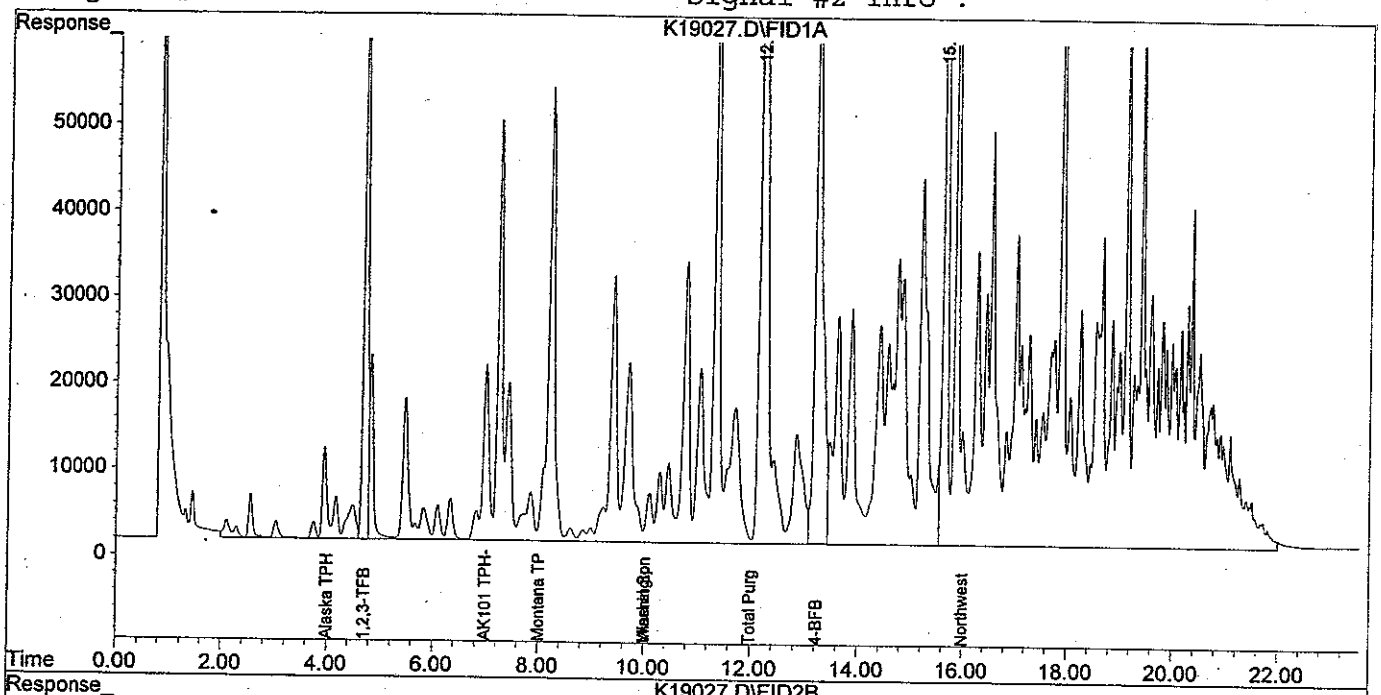
Signal #1 : D:\HPCHEM\4\DATA\111900\K19027.D\FID1A.CH Vial: 27
Signal #2 : D:\HPCHEM\4\DATA\111900\K19027.D\FID2B.CH
Acq On : 19 Nov 2000 9:50 pm Operator: GAP
Sample : b0k0362-24 Inst : GC #8
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00

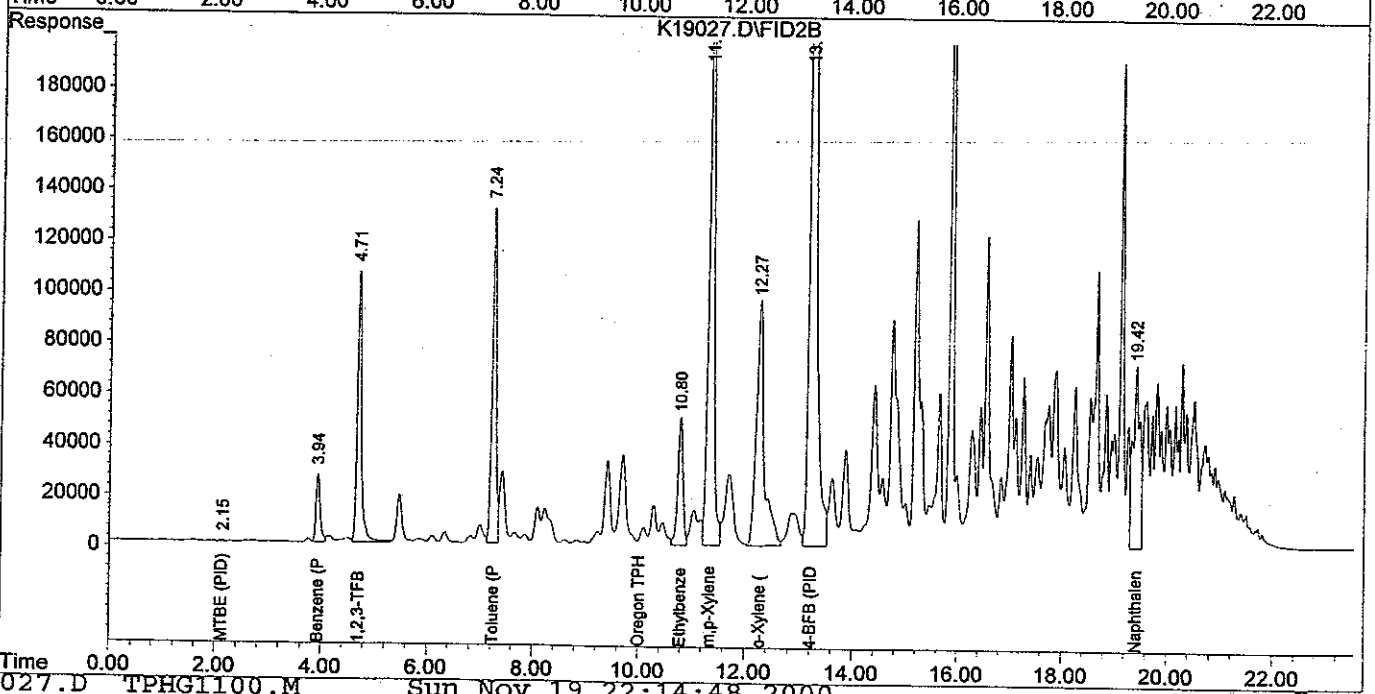
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E

Quant Time: Nov 19 22:14 2000 Quant Results File: TPHG1100.RES

Quant Method : D:\HPCHEM\4\METHODS\TPHG1100.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Fri Nov 17 09:37:09 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG1100.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





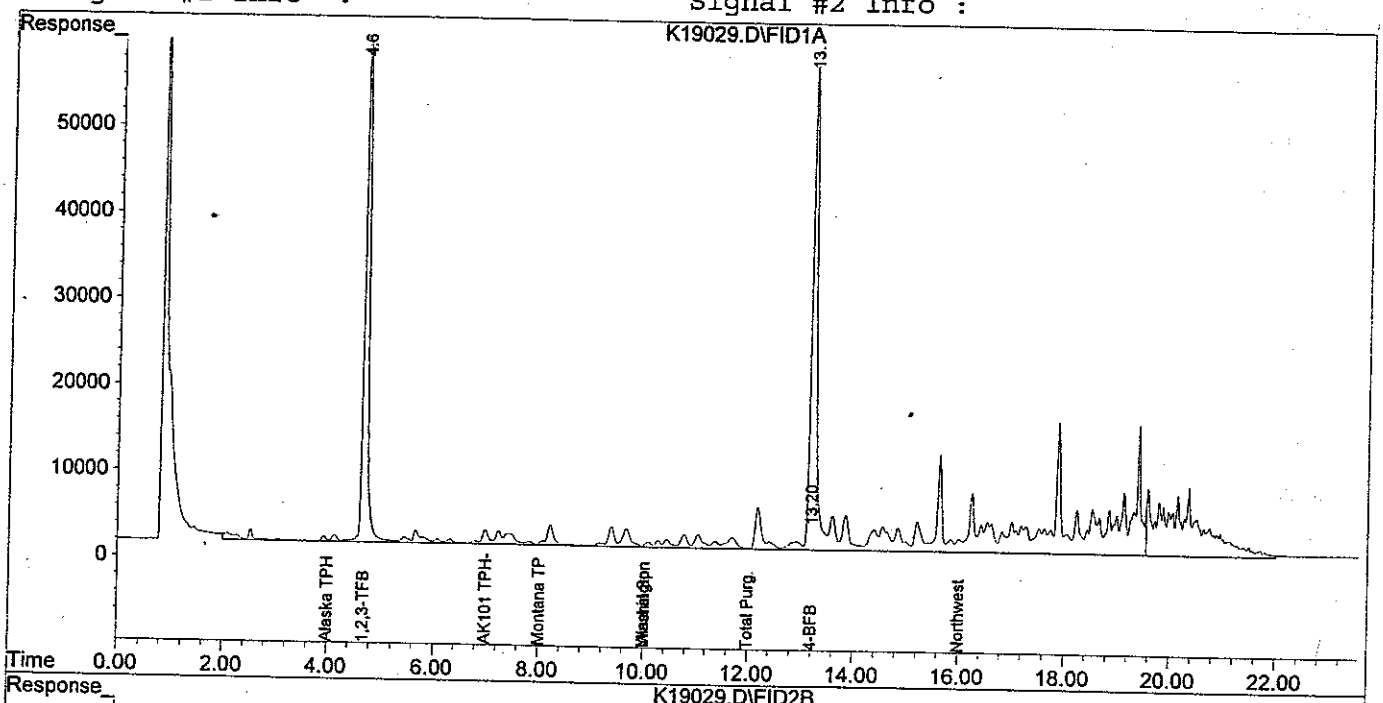
Signal #1 : D:\HPCHEM\4\DATA\111900\K19029.D\FID1A.CH Vial: 29
Signal #2 : D:\HPCHEM\4\DATA\111900\K19029.D\FID2B.CH
Acq On : 19 Nov 2000 10:50 pm Operator: GAP
Sample : b0k0362-25 Inst : GC #8
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00

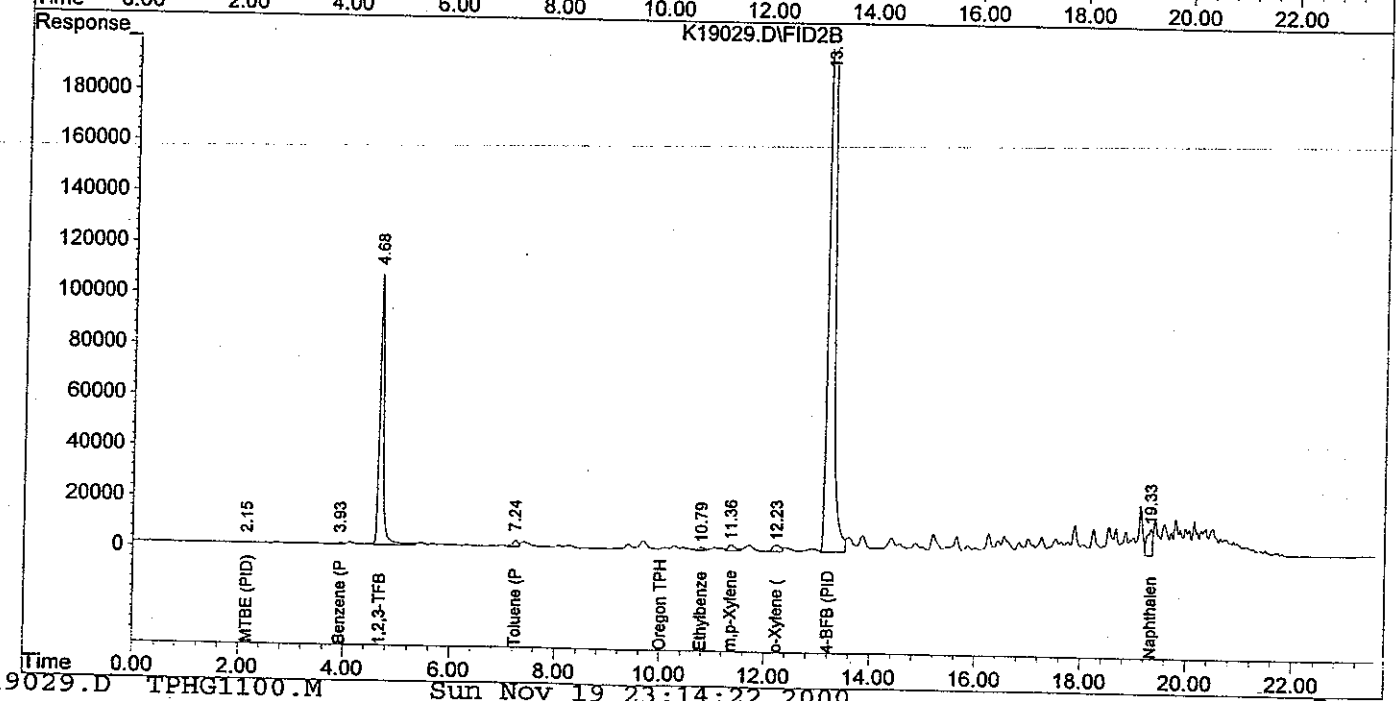
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E

Quant Time: Nov 19 23:14 2000 Quant Results File: TPHG1100.RES

Quant Method : D:\HPCHEM\4\METHODS\TPHG1100.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Fri Nov 17 09:37:09 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG1100.M

Volume Inj. :
Signal #1 Phase :
Signal #1 Info :
Signal #2 Phase:
Signal #2 Info :





Quantitation Report

Data File : D:\HPCHEM\1\DATA.SEC\K19011.D
Acq On : 11-19-00 16:47:28
Sample : b0k0362-01
Misc : s

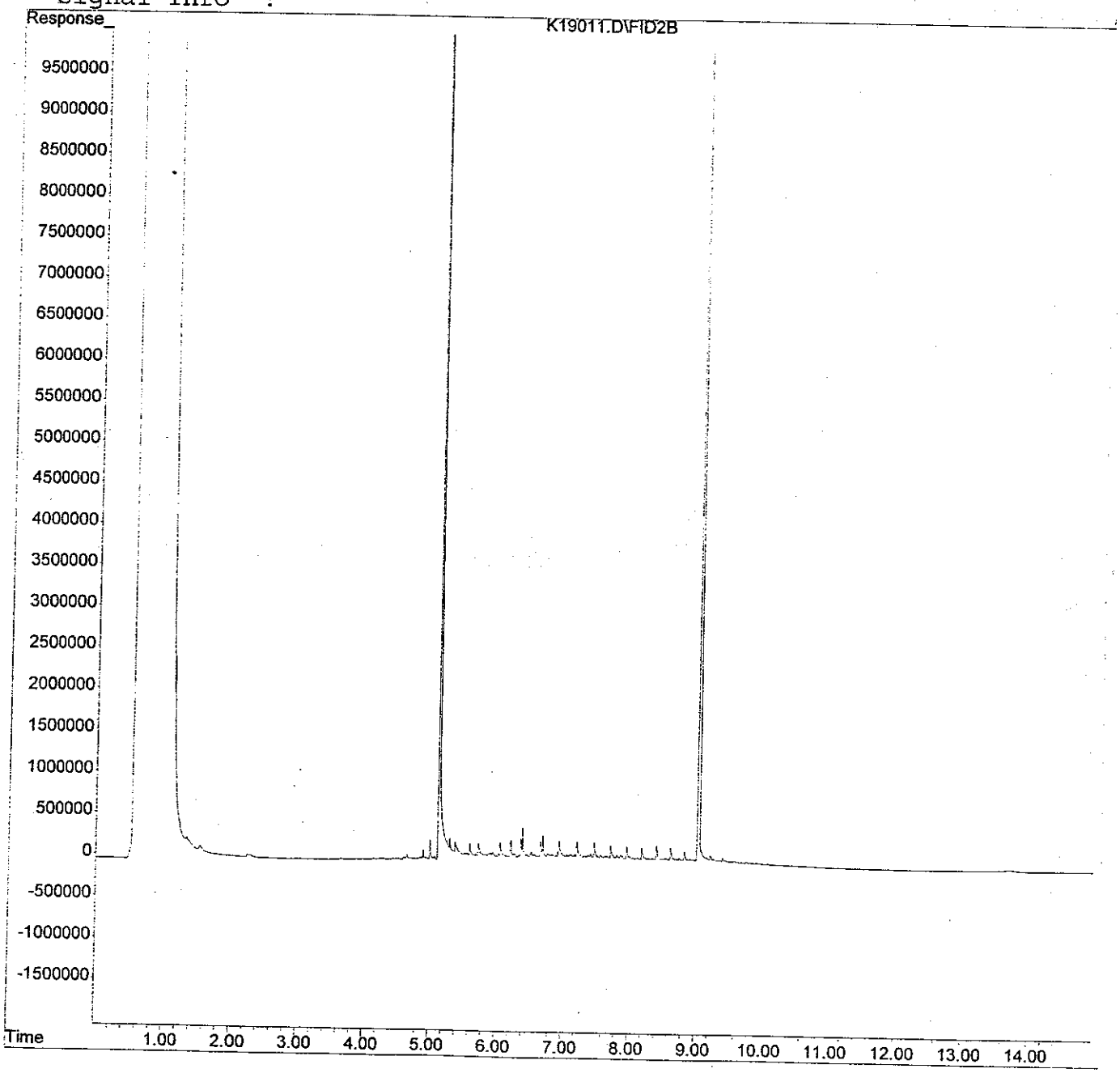
IntFile : SURR.E

Vial: 8
Operator: BN
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Nov 19 17:03 2000 Quant Results File: TPHD2.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD2.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:12:24 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report

Data File : D:\HPCHEM\1\DATA\K19012.D
Acq On : 11-19-00 16:47:28
Sample : b0k0362-02
Misc : s

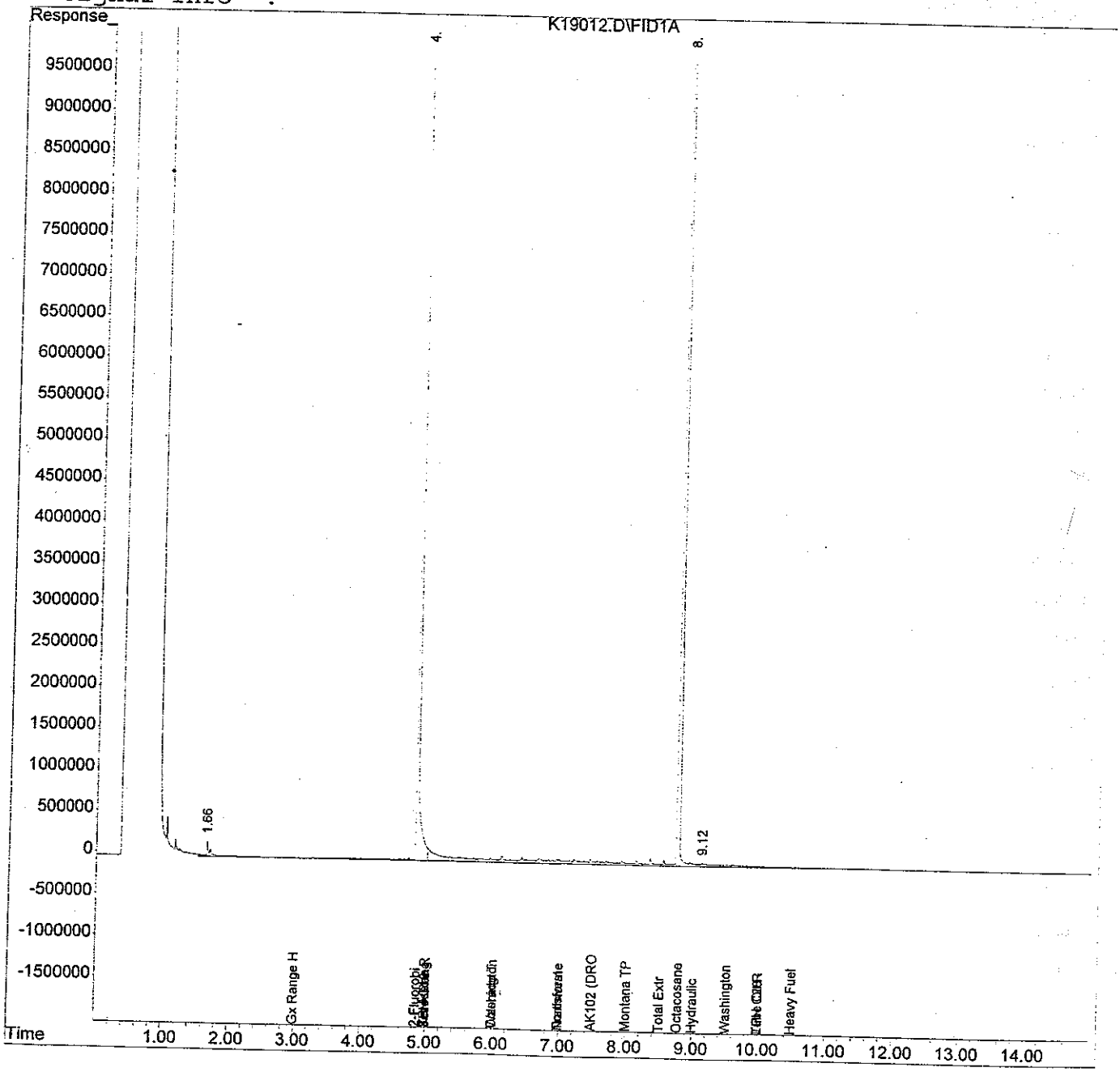
IntFile : SURR.E

Vial: 9
Operator: BN
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Nov 19 17:02 2000 Quant Results File: TPHD.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:07:18 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report

Data File : D:\HPCHEM\1\DATA.SEC\K19013.D
Acq On : 11-19-00 17:09:06
Sample : b0k0362-03
Misc : s

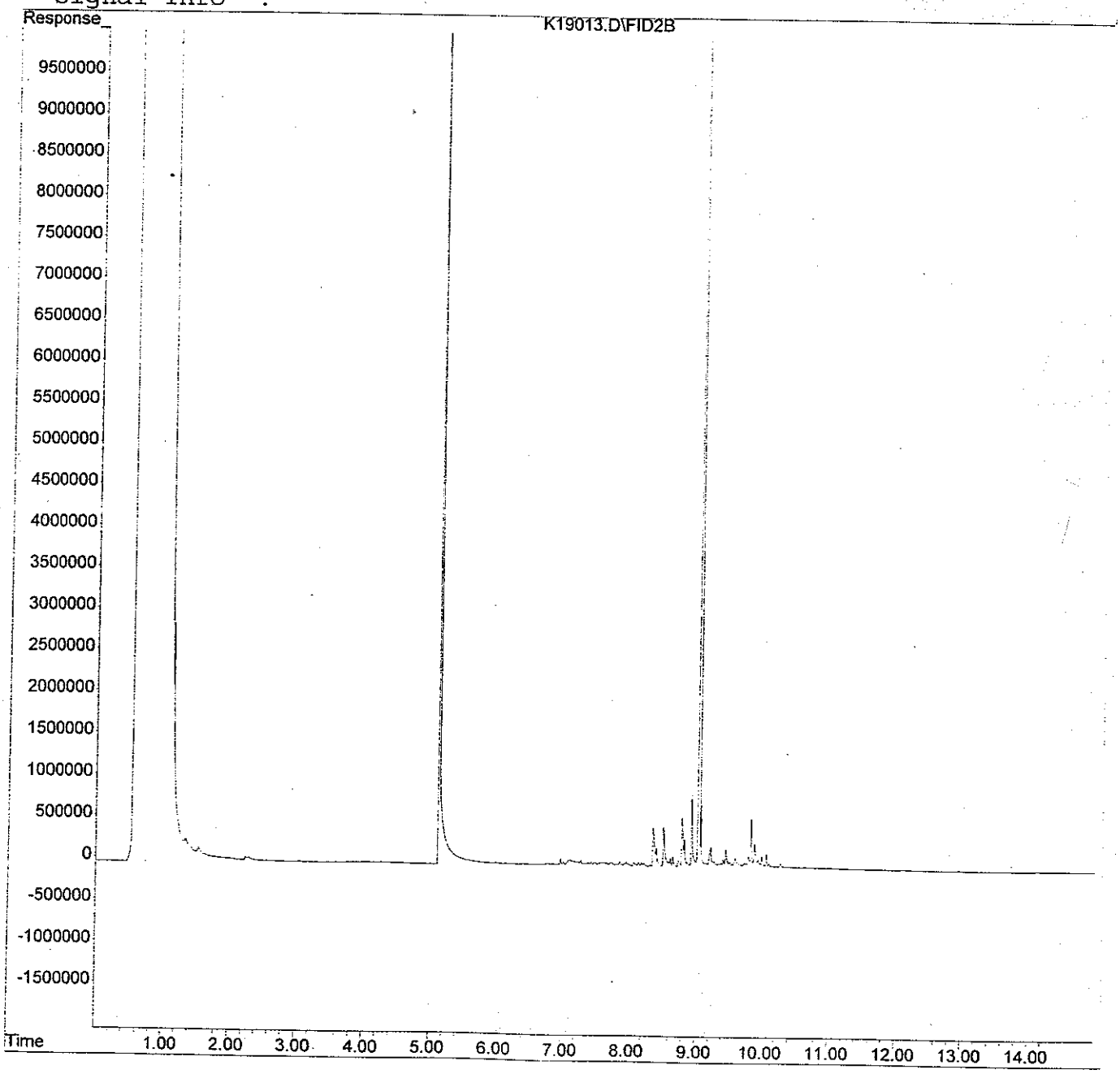
IntFile : SURR.E

Vial: 10
Operator: BN
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Nov 19 17:24 2000 Quant Results File: TPHD2.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD2.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:12:24 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report

Data File : D:\HPCHEM\1\DATA\K19014.D
Acq On : 11-19-00 17:09:06
Sample : b0k0362-04
Misc : s

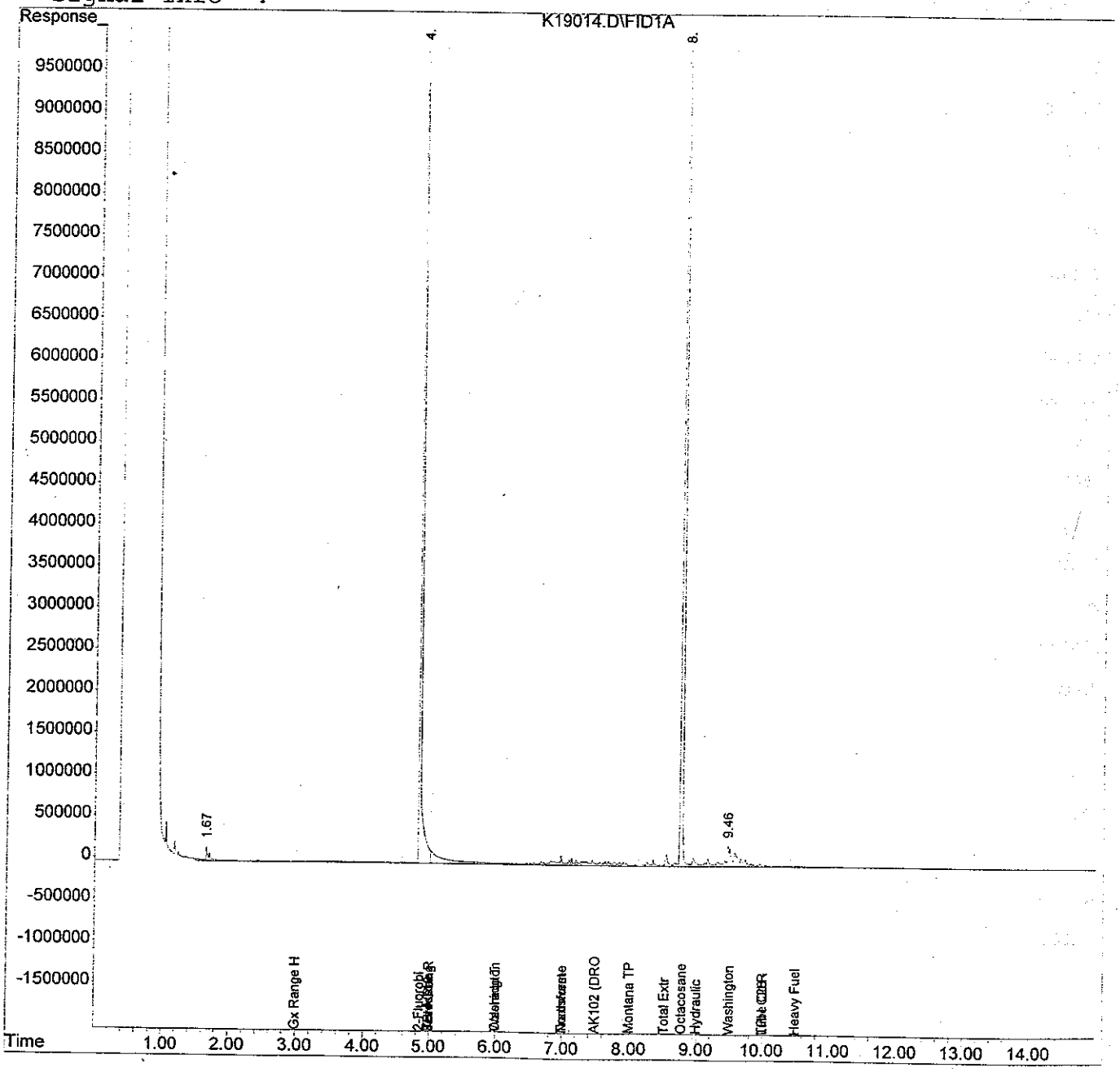
IntFile : SURR.E

Vial: 11
Operator: BN
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Nov 19 17:24 2000 Quant Results File: TPHD.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:07:18 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report

Data File : D:\HPCHEM\1\DATA.SEC\K19015.D
Acq On : 11-19-00 17:31:11
Sample : b0k0362-05
Misc : s

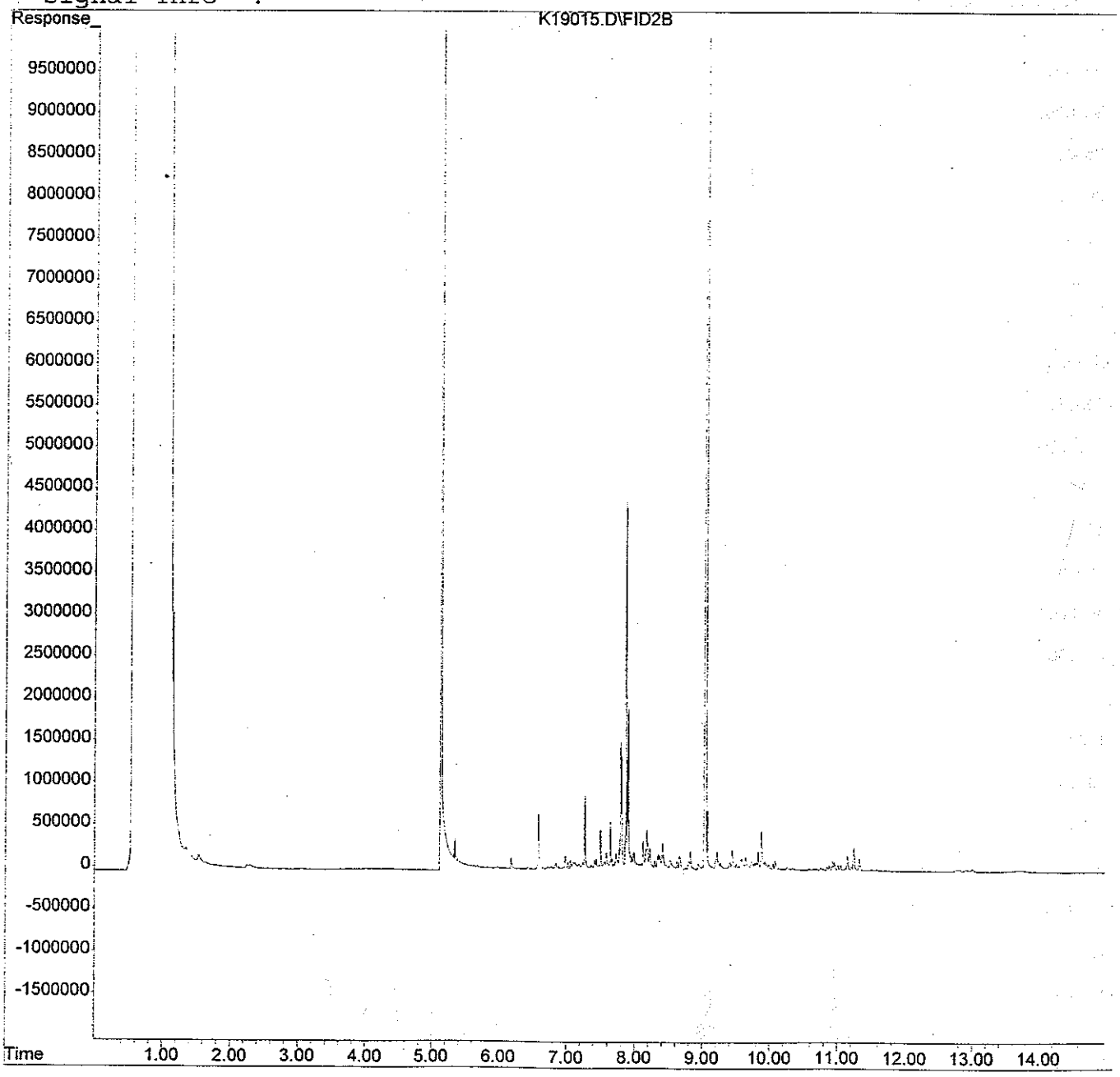
Vial: 12
Operator: BN
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

IntFile : SURR.E

Quant Time: Nov 19 17:46 2000 Quant Results File: TPHD2.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD2.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:12:24 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report

Data File : D:\HPCHEM\1\DATA\K19016.D
Acq On : 11-19-00 17:31:11
Sample : b0k0362-06
Misc : s

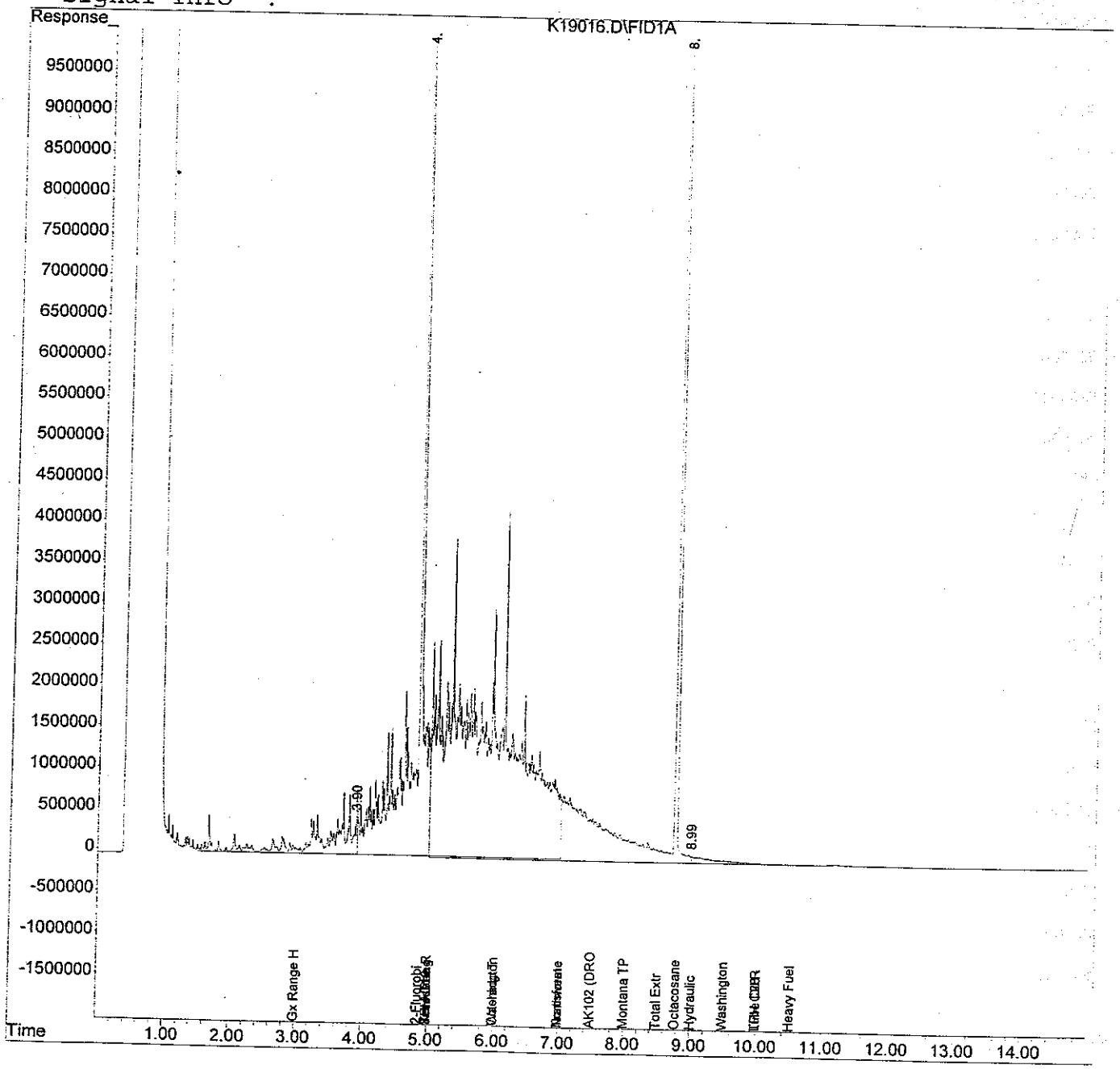
Vial: 13
Operator: BN
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

IntFile : SURR.E

Quant Time: Nov 19 17:46 2000 Quant Results File: TPHD.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:07:18 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report

Data File : D:\HPCHEM\1\DATA.SEC\K19019.D
Acq On : 11-19-00 18:15:50
Sample : b0k0362-07
Misc : s

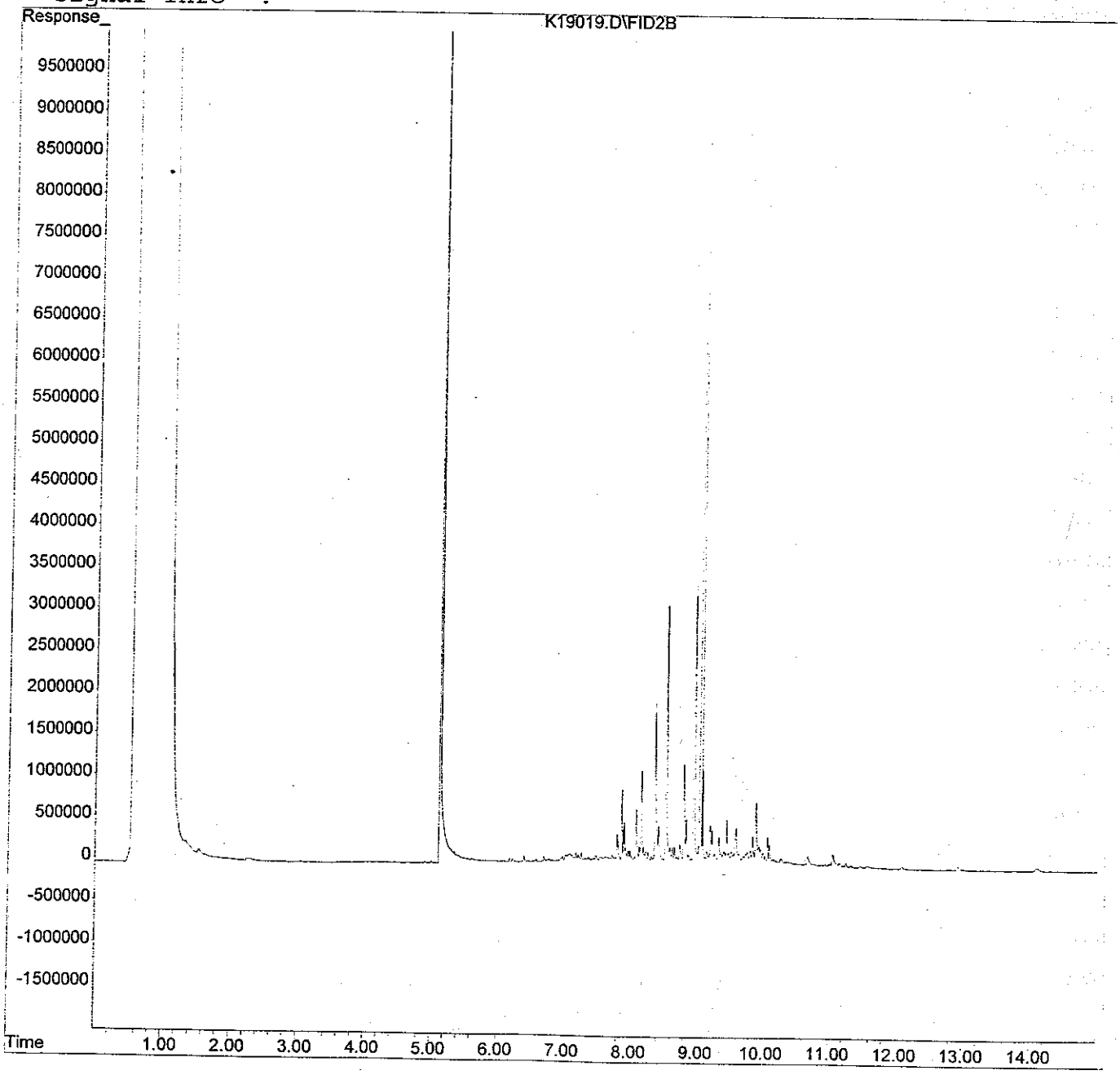
IntFile : SURR.E

Vial: 14
Operator: BN
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Nov 19 18:31 2000 Quant Results File: TPHD2.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD2.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:12:24 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report

Data File : D:\HPCHEM\1\DATA\K19020.D
Acq On : 11-19-00 18:15:50
Sample : b0k0362-08
Misc : s

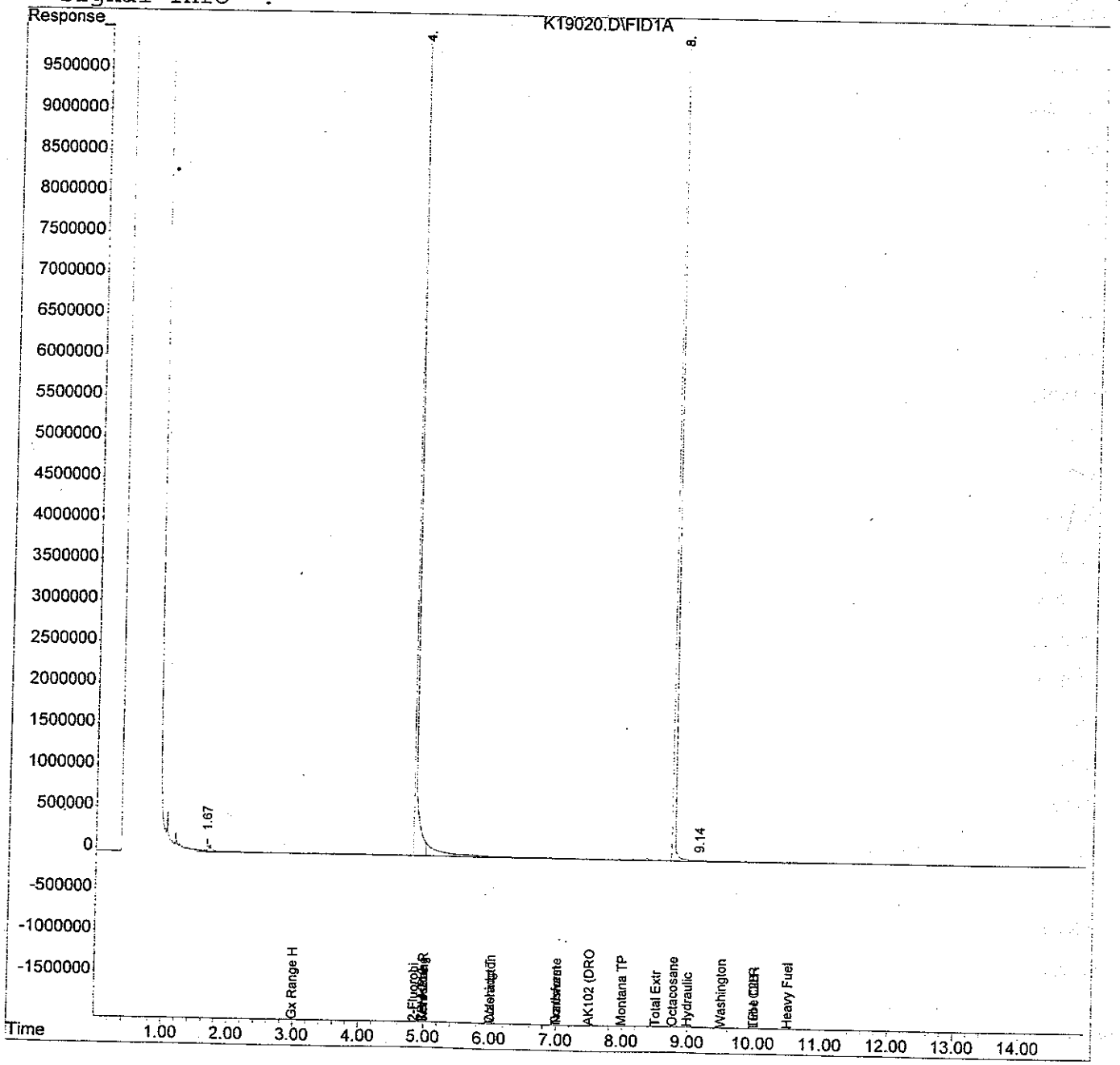
IntFile : SURR.E

Vial: 15
Operator: BN
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Nov 19 18:31 2000 Quant Results File: TPHD.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:07:18 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report

Data File : D:\HPCHEM\1\DATA.SEC\K19021.D
Acq On : 11-19-00 18:37:38
Sample : b0k0362-09
Misc : s

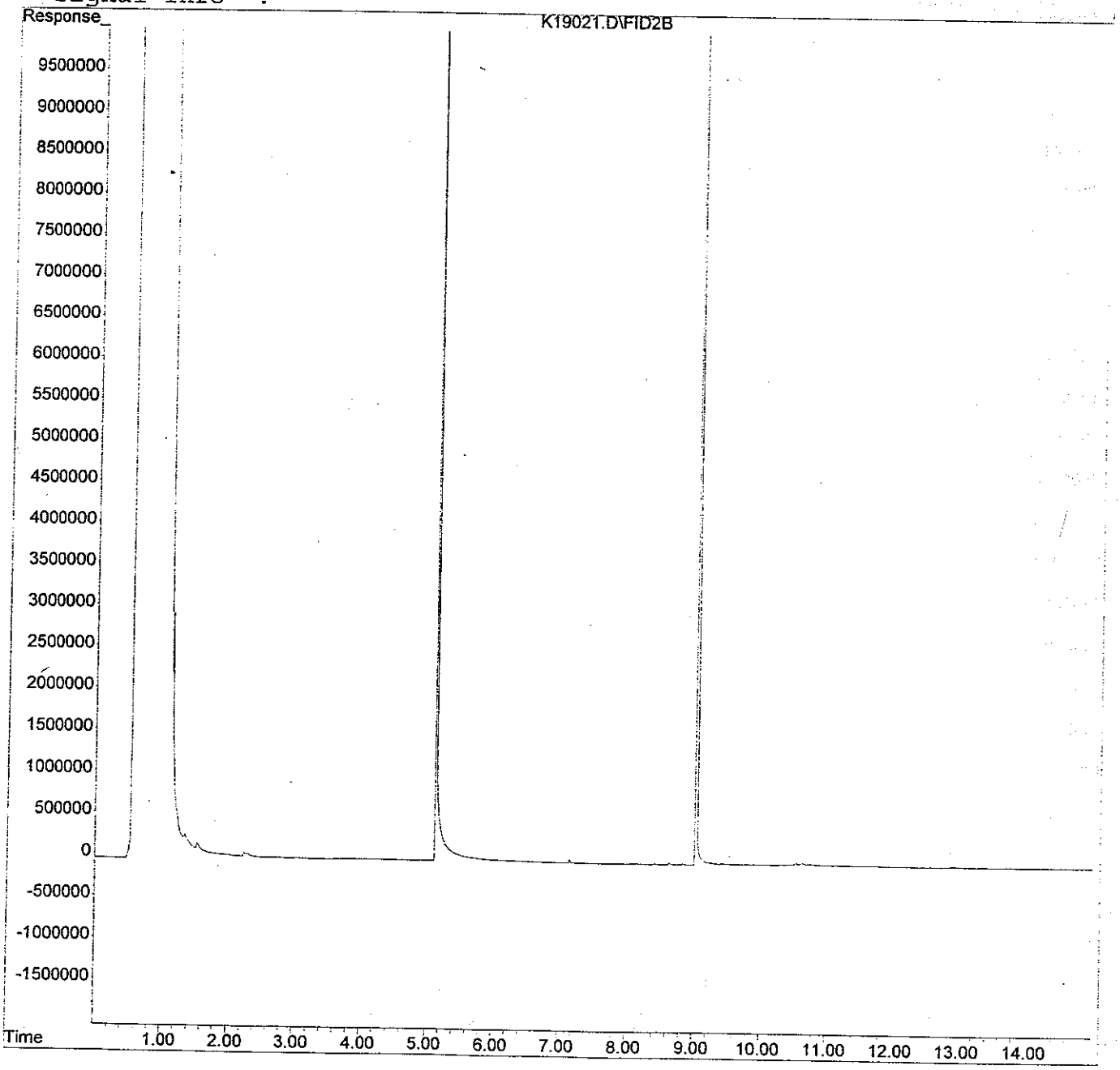
IntFile : SURR.E

Vial: 16
Operator: BN
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Nov 19 18:53 2000 Quant Results File: TPHD2.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD2.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:12:24 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report

Data File : D:\HPCHEM\1\DATA\K19022.D
Acq On : 11-19-00 18:37:38
Sample : b0k0362-10
Misc : s

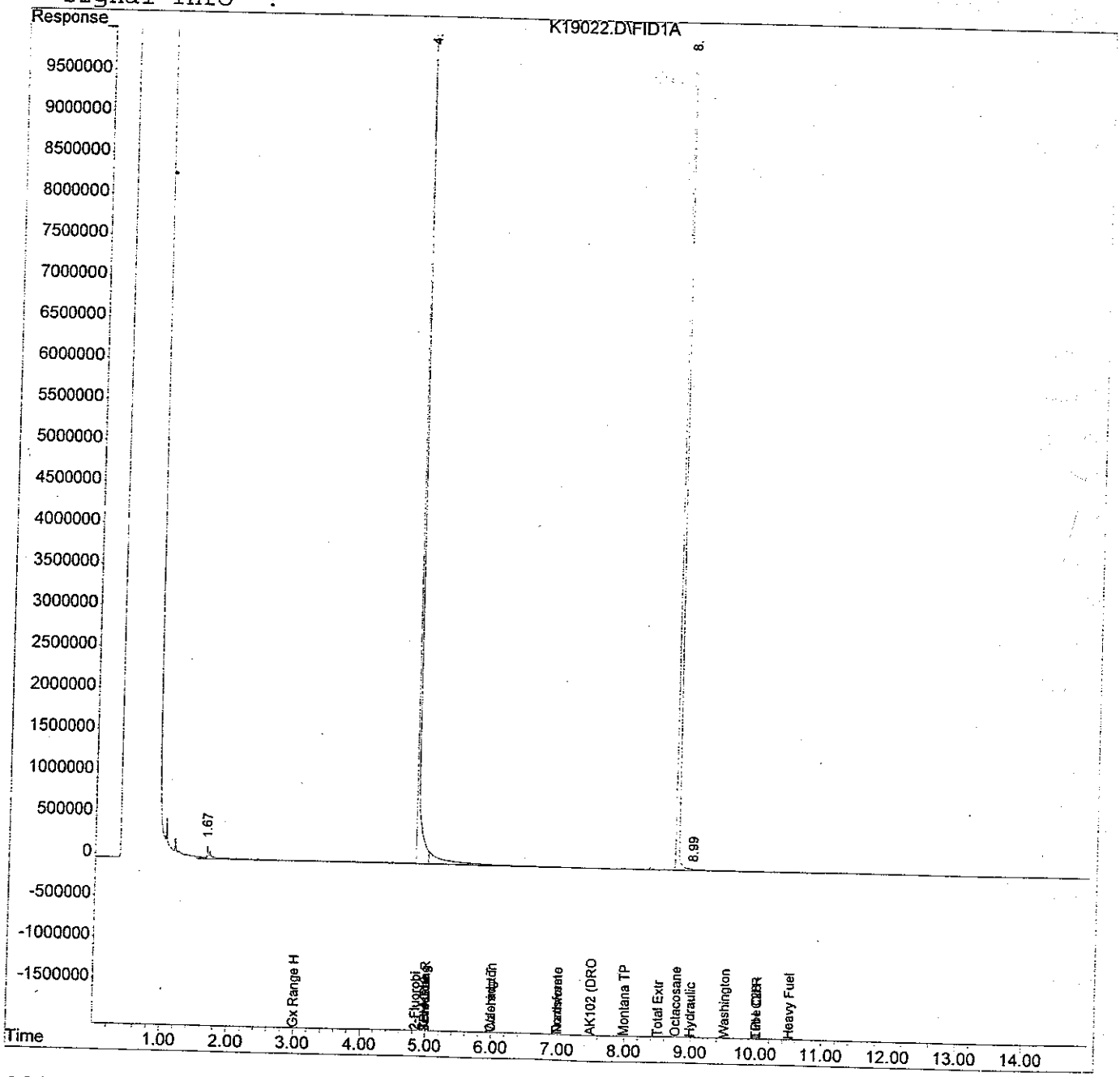
Vial: 17
Operator: BN
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

IntFile : SURR.E

Quant Time: Nov 19 18:52 2000 Quant Results File: TPHD.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:07:18 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report

Data File : D:\HPCHEM\1\DATA.SEC\K19023.D
Acq On : 11-19-00 18:59:33
Sample : b0k0362-11
Misc : s

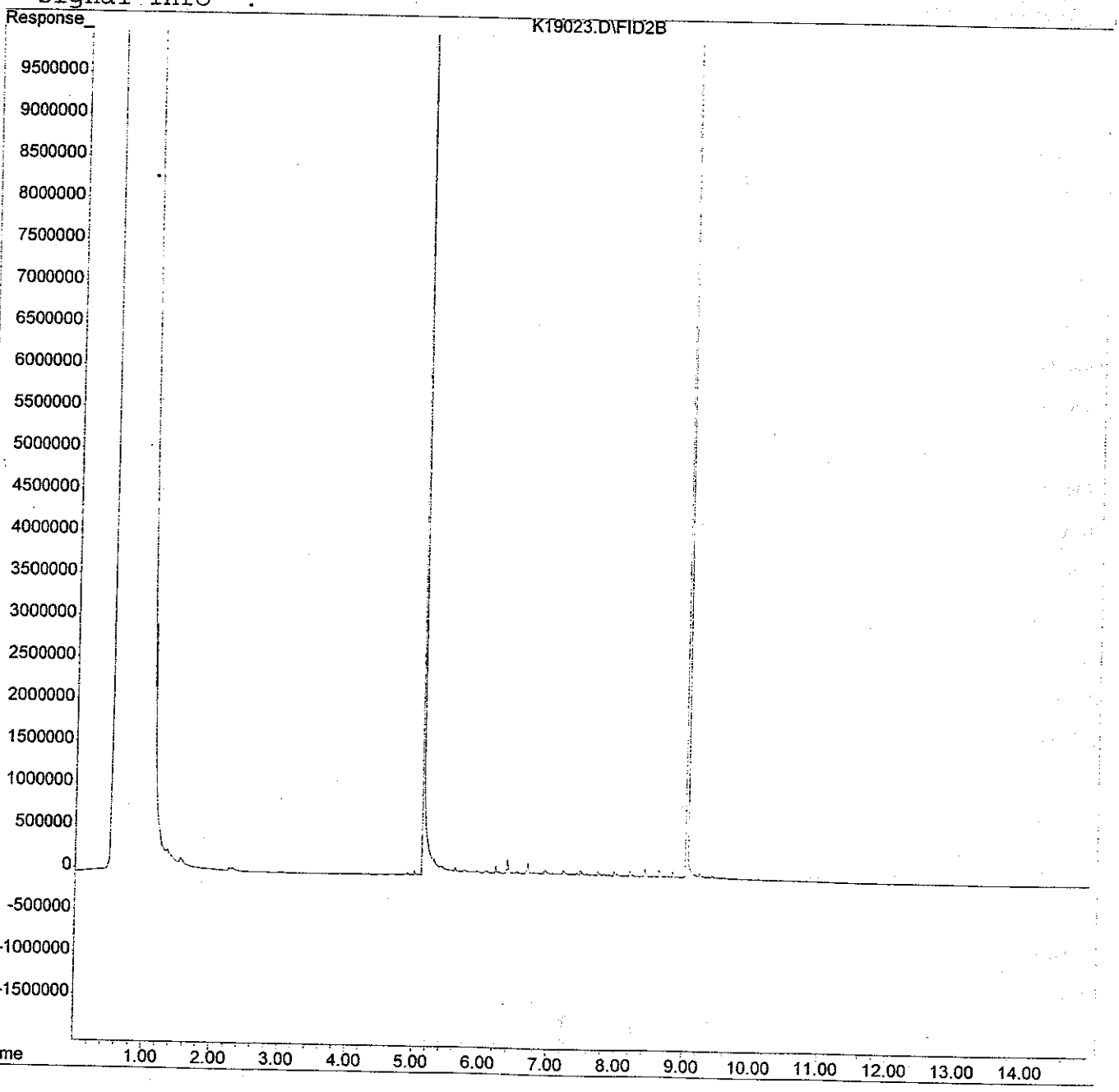
IntFile : SURR.E

Vial: 18
Operator: BN
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Nov 19 19:15 2000 Quant Results File: TPHD2.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD2.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:12:24 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Data File : D:\HPCHEM\1\DATA\K19024.D
Acq On : 11-19-00 18:59:33
Sample : b0k0362-12
Misc : s

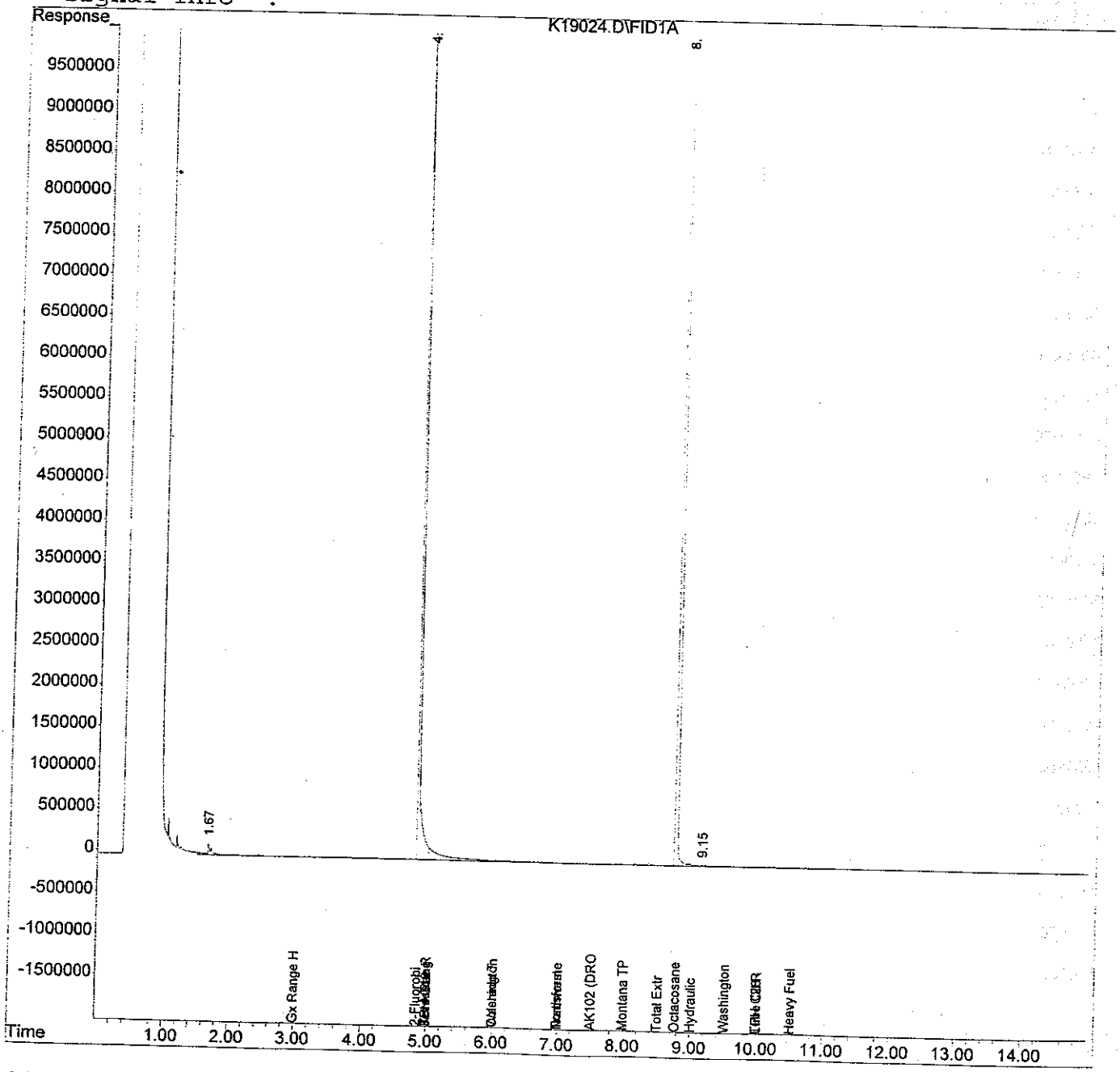
IntFile : SURR.E

Vial: 19
Operator: BN
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Nov 19 19:14 2000 Quant Results File: TPHD.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:07:18 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report

Data File : D:\HPCHEM\1\DATA.SEC\K19025.D
Acq On : 11-19-00 19:21:47
Sample : b0k0362-13
Misc : s

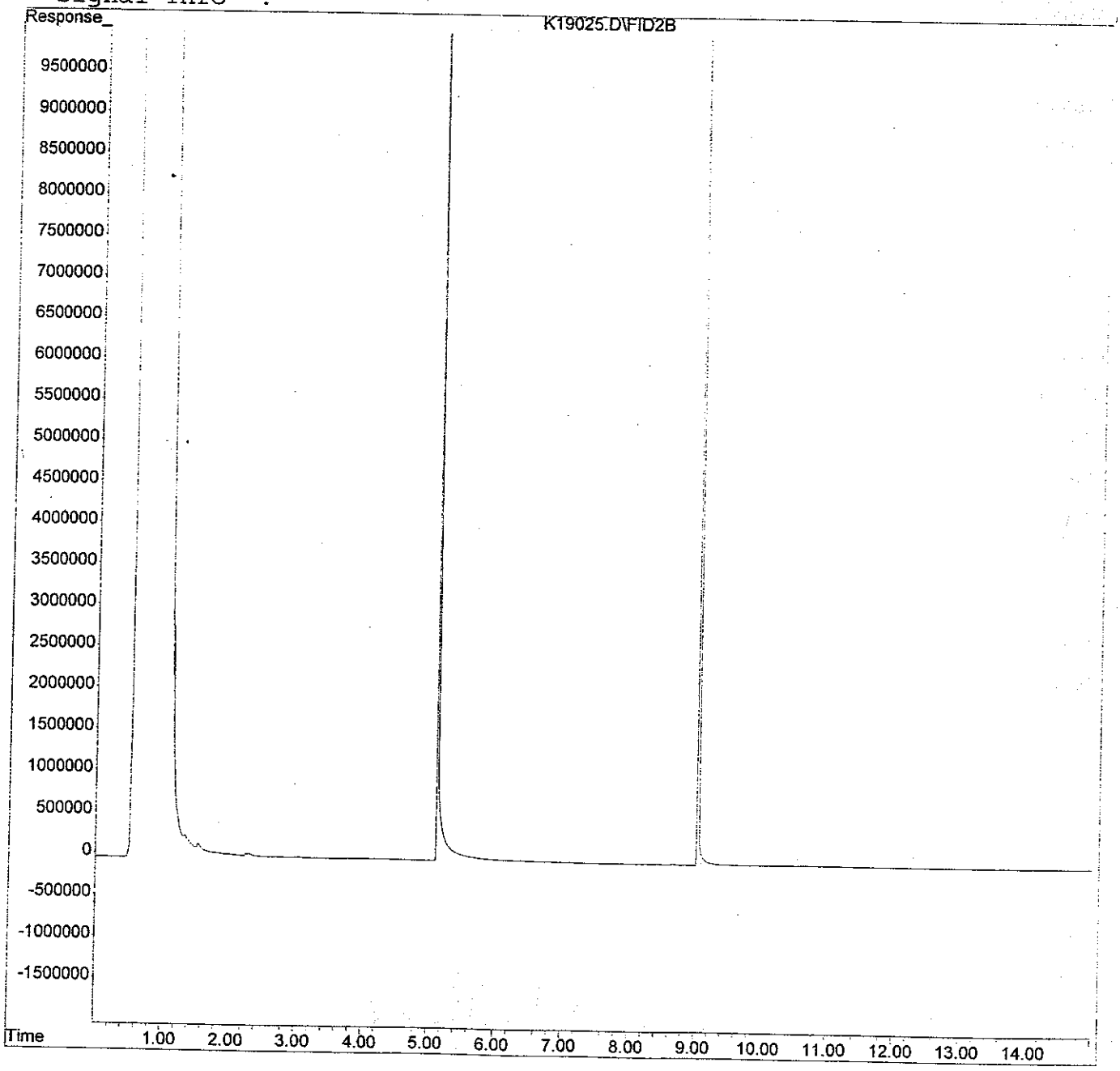
IntFile : SURR.E

Vial: 20
Operator: BN
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Nov 19 19:37 2000 Quant Results File: TPHD2.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD2.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:12:24 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Data File : D:\HPCHEM\1\DATA\K19026.D
Acq On : 11-19-00 19:21:47
Sample : b0k0362-14
Misc : s

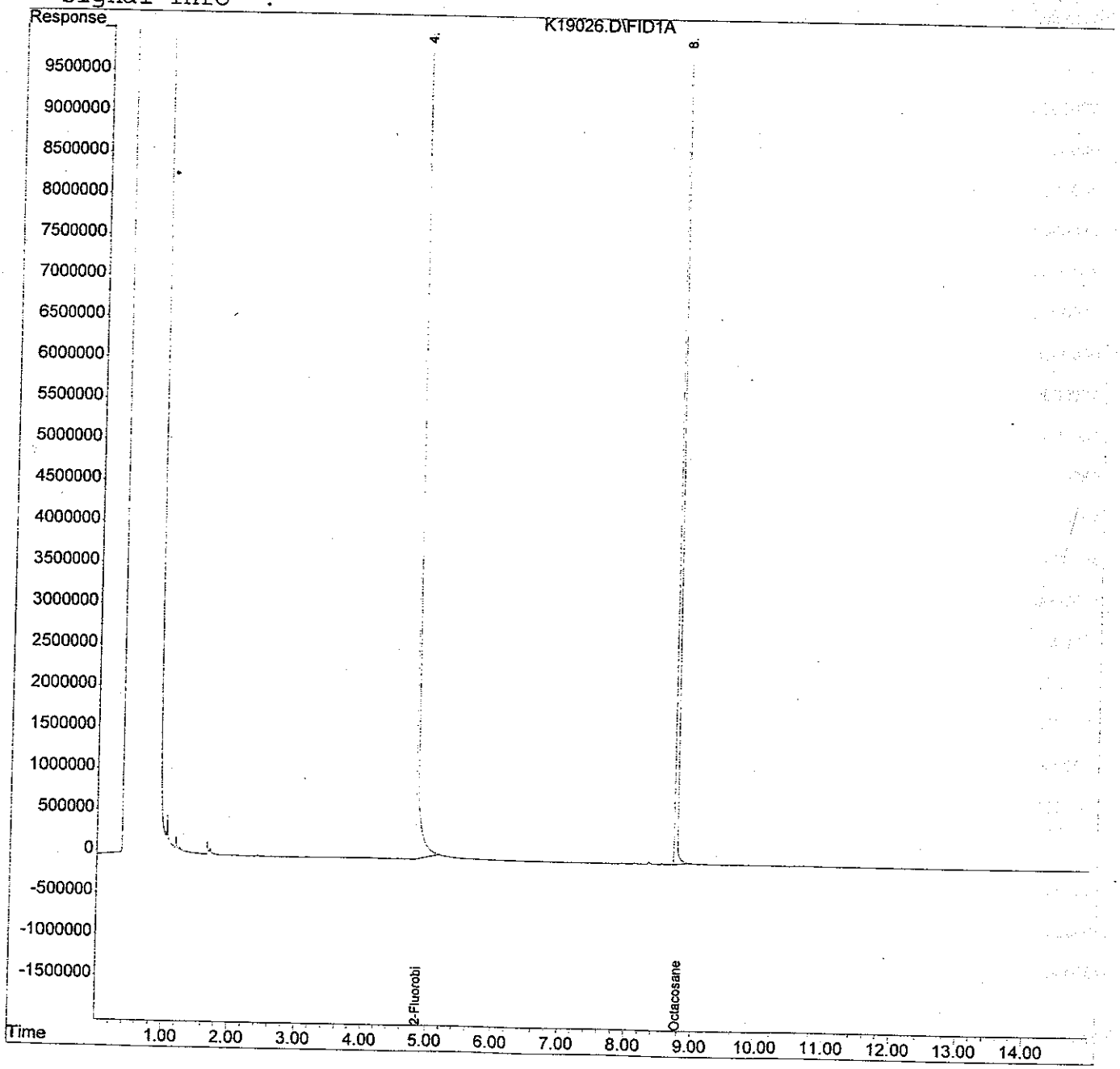
IntFile : SURR.E

Vial: 21
Operator: BN
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Nov 19 19:37 2000 Quant Results File: TPHD.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:07:18 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report

Data File : D:\HPCHEM\1\DATA.SEC\K19027.D
Acq On : 11-19-00 19:44:10
Sample : b0k0362-15
Misc : s

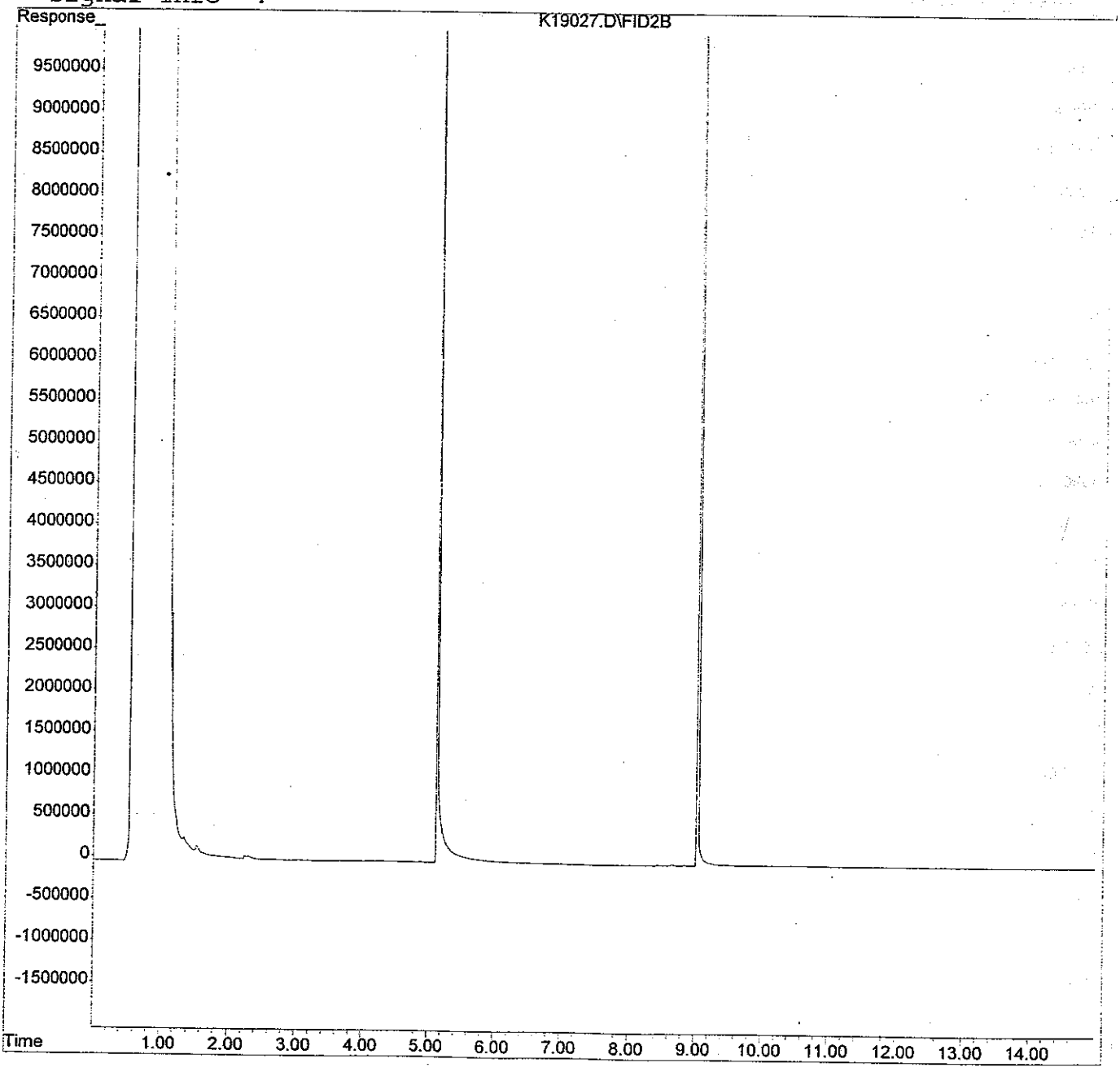
IntFile : SURR.E

Vial: 22
Operator: BN
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Nov 19 19:59 2000 Quant Results File: TPHD2.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD2.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:12:24 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report

Data File : D:\HPCHEM\1\DATA\K19028.D
Acq On : 11-19-00 19:44:10
Sample : b0k0362-16
Misc : s

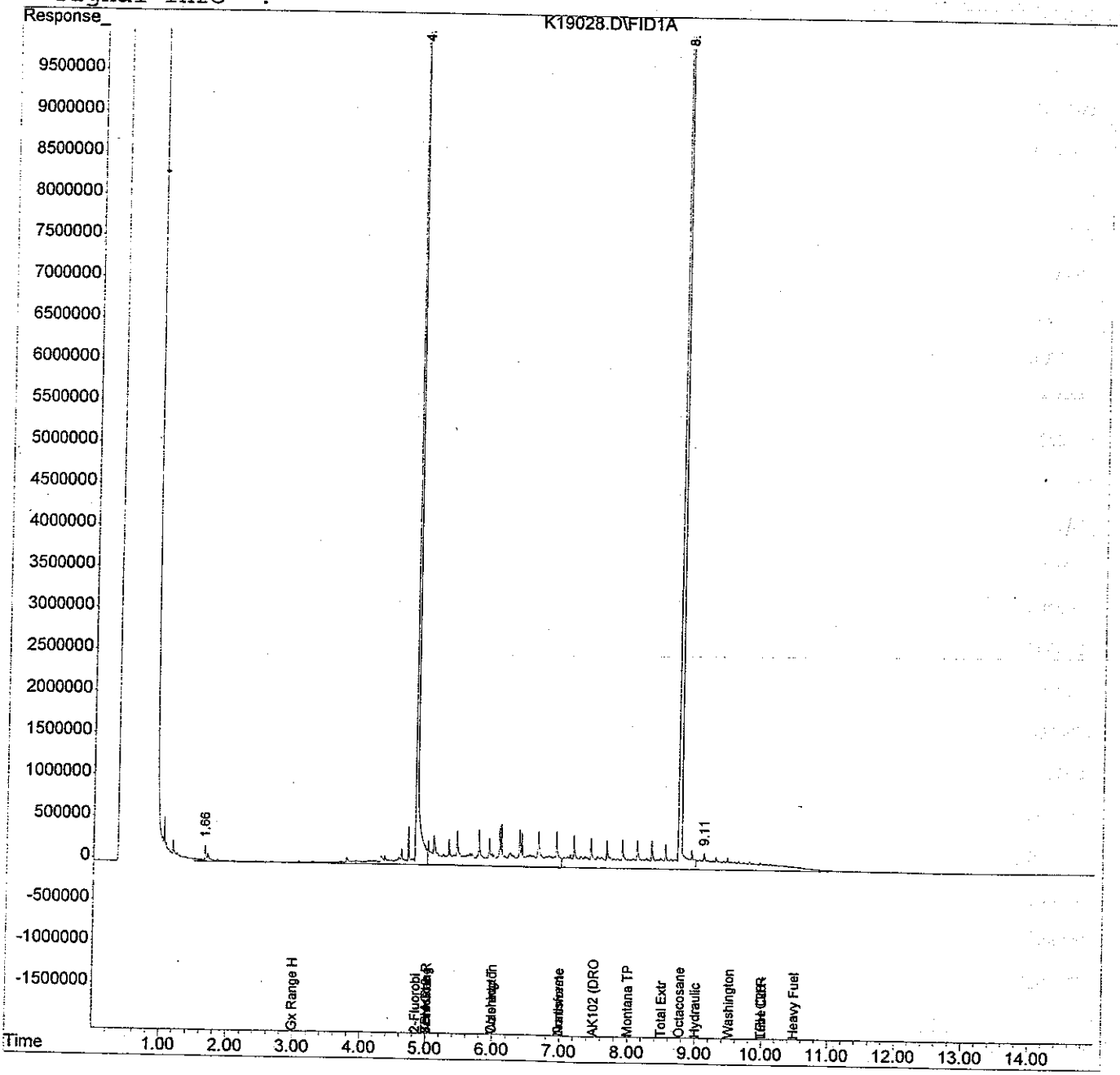
IntFile : SURR.E

Vial: 23
Operator: BN
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Nov 19 19:59 2000 Quant Results File: TPHD.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:07:18 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report

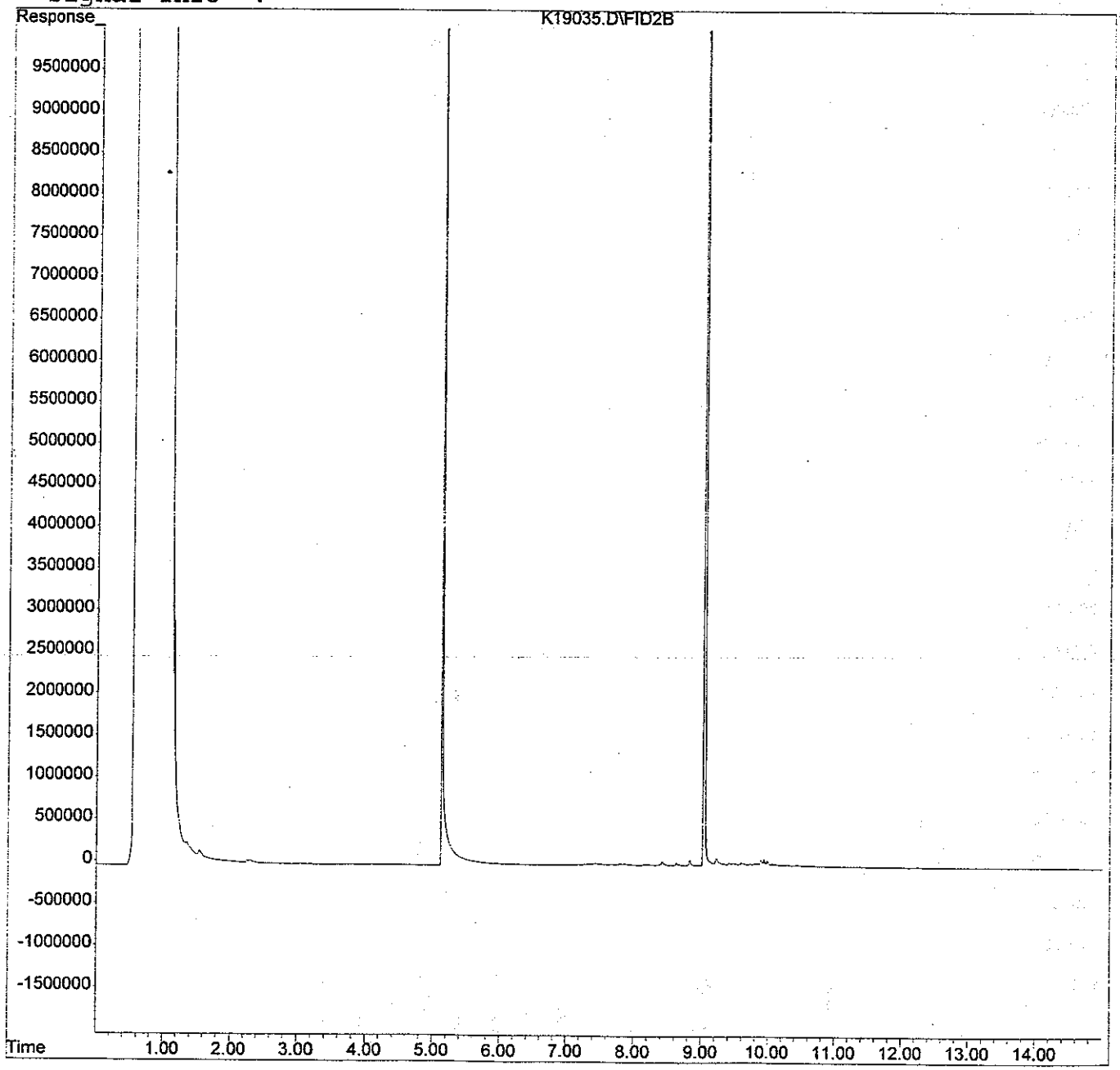
Data File : D:\HPCHEM\1\DATA.SEC\K19035.D
Acq On : 11-19-00 21:12:12
Sample : b0k0364-17
Misc : s 2 BN 11/20
IntFile : SURR.E

Vial: 24
Operator: BN
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Nov 19 21:27 2000 Quant Results File: TPHD2.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD2.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:12:24 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Data File : D:\HPCHEM\1\DATA.SEC\K20007.D
Acq On : 11-20-00 6:28:19
Sample : b0k0362-18
Misc : S R1

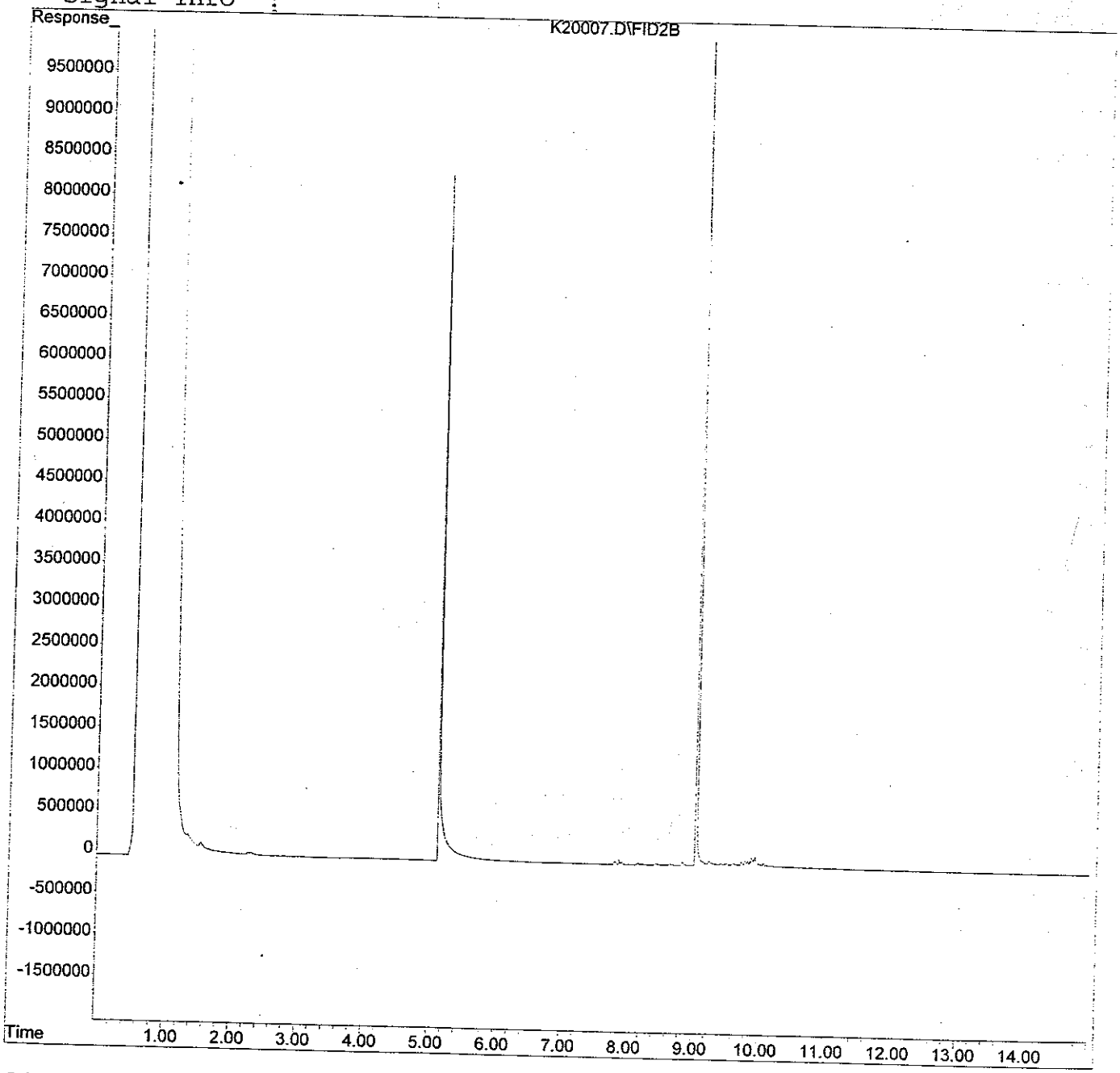
IntFile : SURR.E

Vial: 4
Operator: BN
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Nov 20 6:44 2000 Quant Results File: TPHD2.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD2.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:12:24 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report

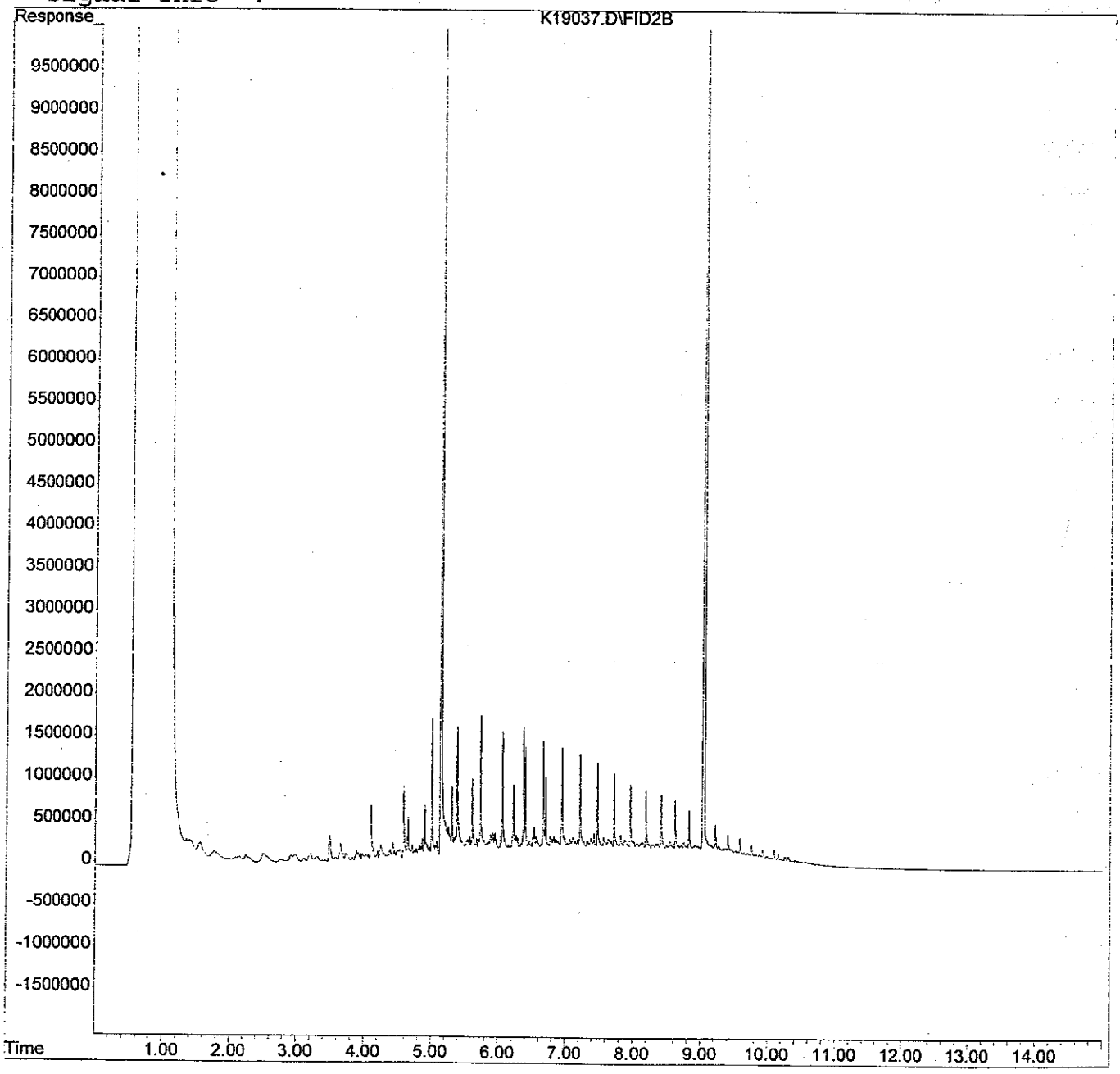
Data File : D:\HPCHEM\1\DATA.SEC\K19037.D
Acq On : 11-19-00 21:34:28
Sample : b0k0364-19
Misc : s 2 8/1120
IntFile : SURR.E

Vial: 26
Operator: BN
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Nov 19 21:50 2000 Quant Results File: TPHD2.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD2.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:12:24 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report

Data File : D:\HPCHEM\1\DATA\K20008.D
Acq On : 11-20-00 6:28:19
Sample : b0k0362-20
Misc : S R1

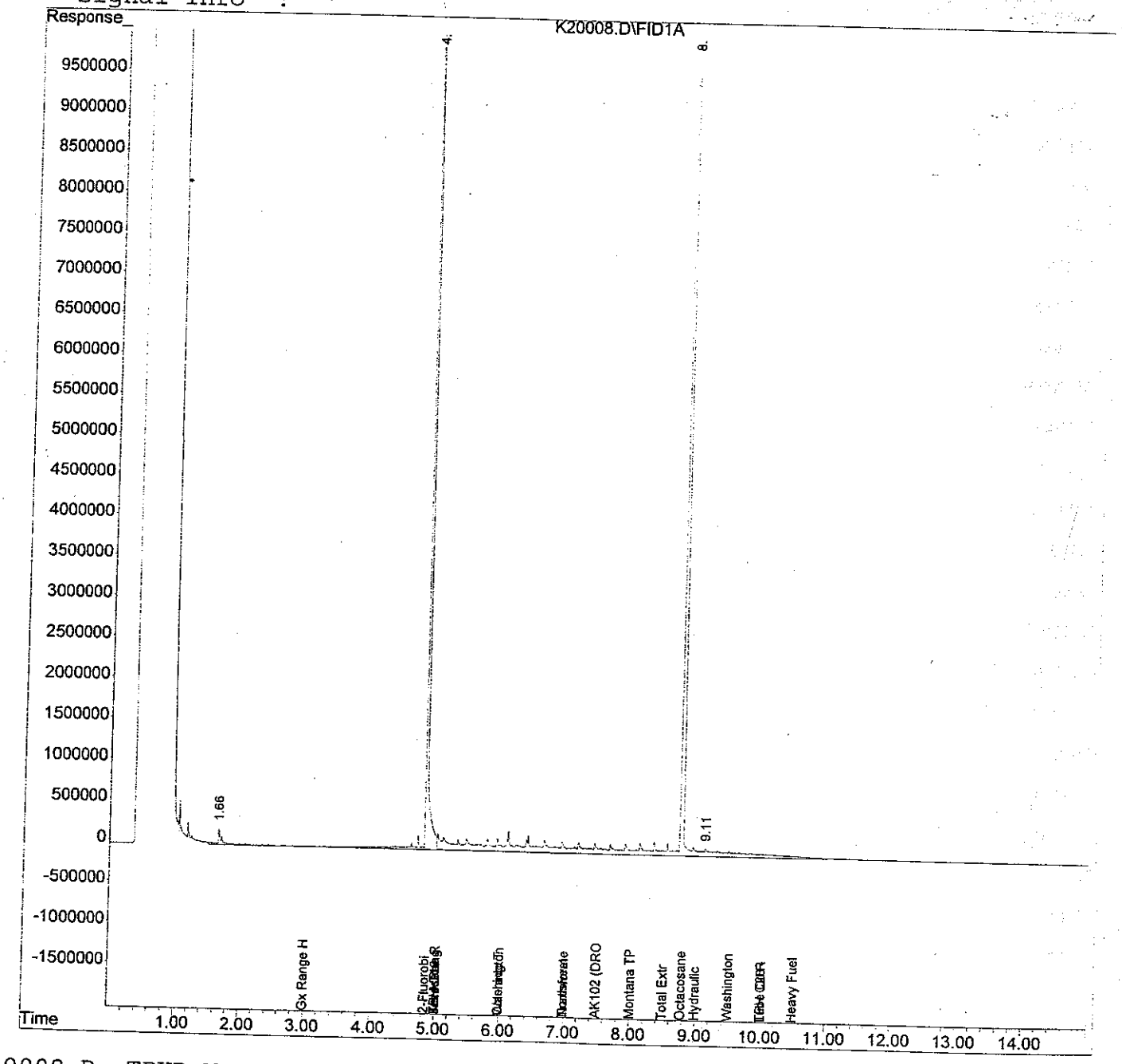
IntFile : SURR.E

Vial: 5
Operator: BN
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Nov 20 6:43 2000 Quant Results File: TPHD.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:07:18 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Data File : D:\HPCHEM\1\DATA.SEC\K20013.D
Acq On : 11-20-00 7:34:35
Sample : b0k0362-21
Misc : S

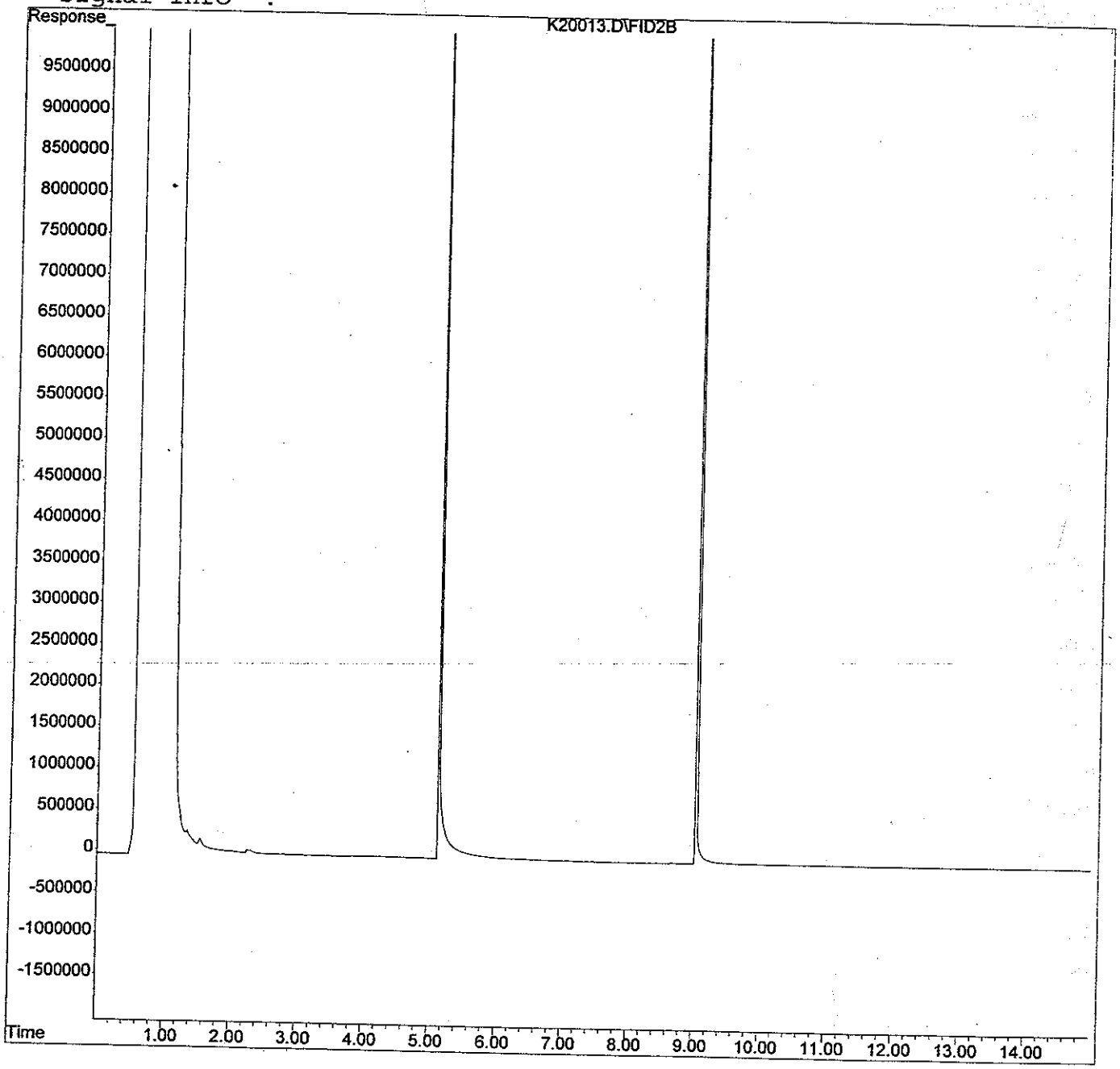
IntFile : SURR.E

Vial: 10
Operator: BN
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Nov 20 7:50 2000 Quant Results File: TPHD2.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD2.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:12:24 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Data File : D:\HPCHEM\1\DATA\K20014.D
Acq On : 11-20-00 7:34:35
Sample : b0k0362-22
Misc : S

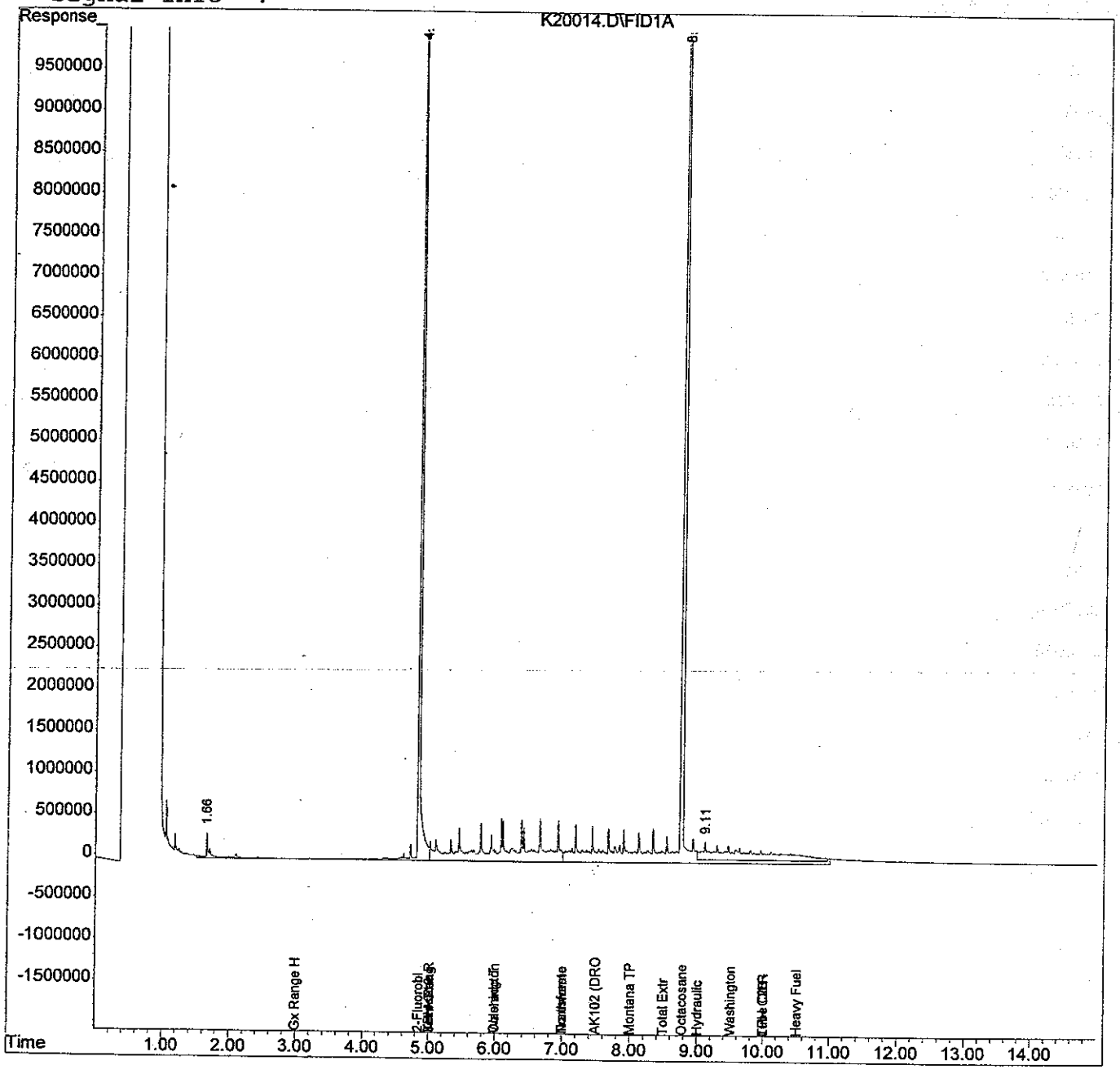
IntFile : SURR.E

Vial: 11
Operator: BN
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Nov 20 7:49 2000 Quant Results File: TPHD.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:07:18 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Data File : D:\HPCHEM\1\DATA.SEC\K20015.D
Acq On : 11-20-00 7:56:41
Sample : b0k0362-23
Misc : S

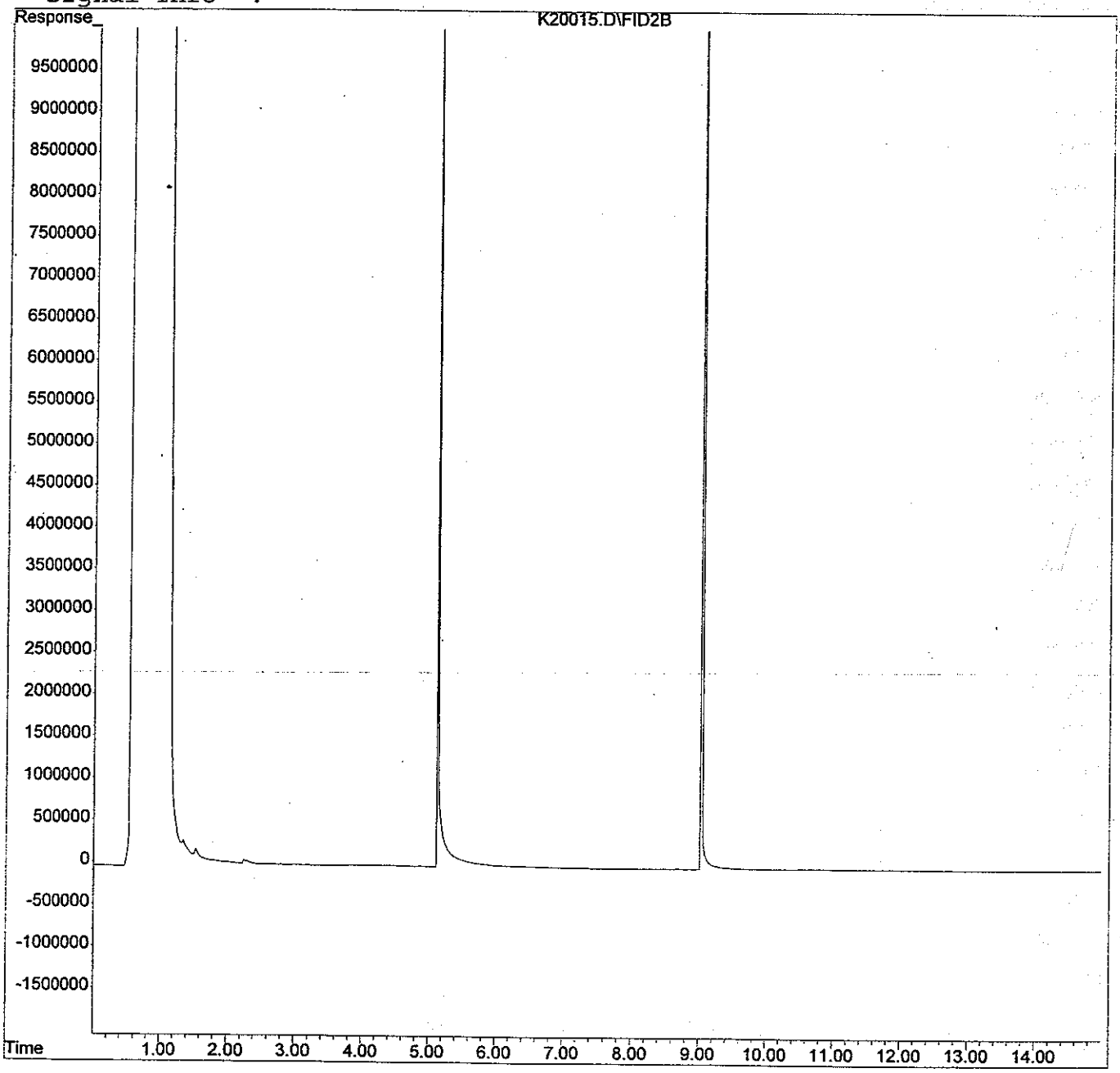
Vial: 12
Operator: BN
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

IntFile : SURR.E

Quant Time: Nov 20 8:12 2000 Quant Results File: TPHD2.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD2.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:12:24 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Data File : D:\HPCHEM\1\DATA\K20016.D
Acq On : 11-20-00 7:56:41
Sample : b0k0362-24
Misc : S

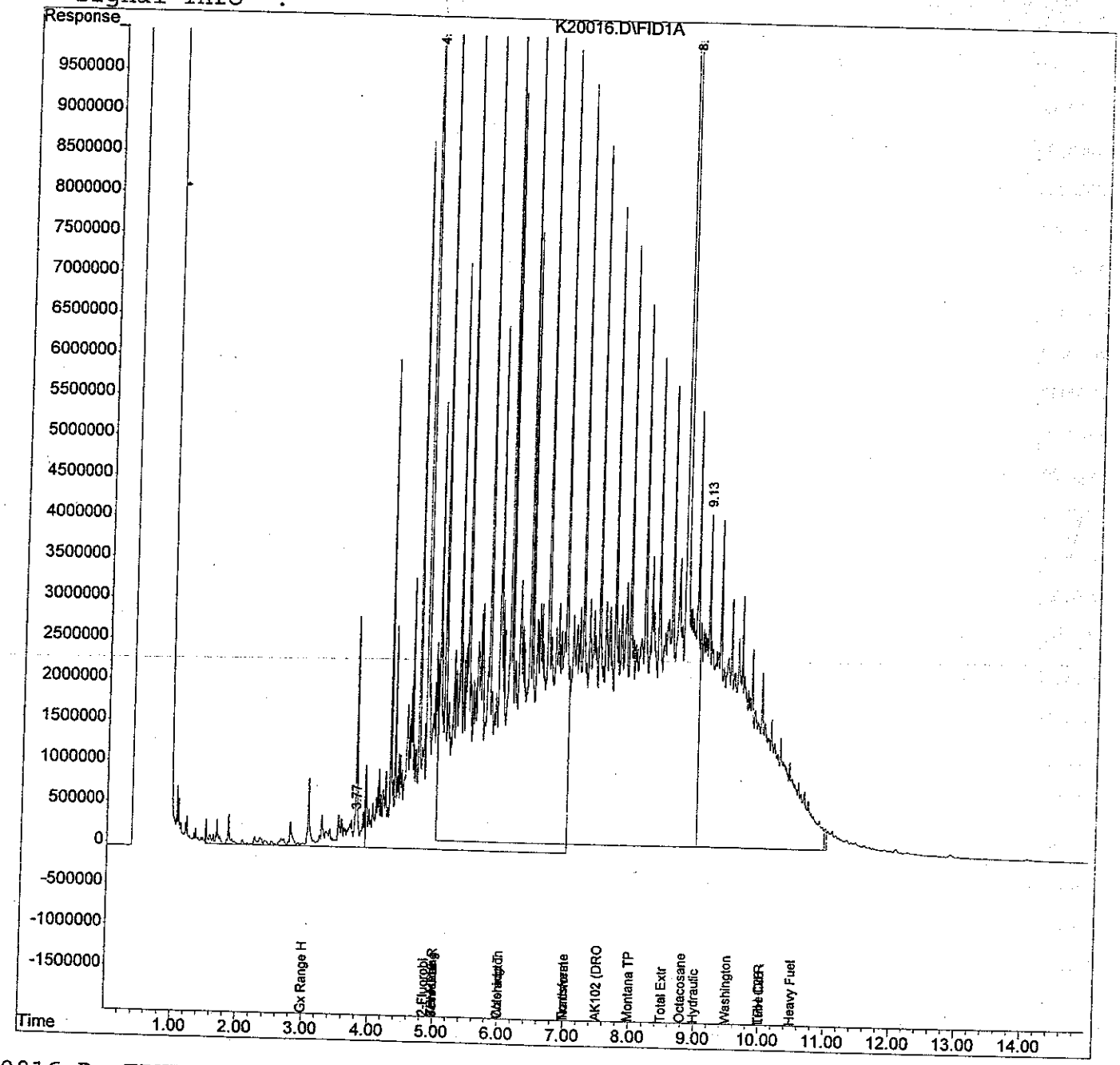
IntFile : SURR.E

Vial: 13
Operator: BN
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Nov 20 10:30 2000 Quant Results File: TPHD.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:07:18 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Data File : D:\HPCHEM\1\DATA.SEC\K20019.D
Acq On : 11-20-00 8:41:11
Sample : b0k0362-25
Misc : S

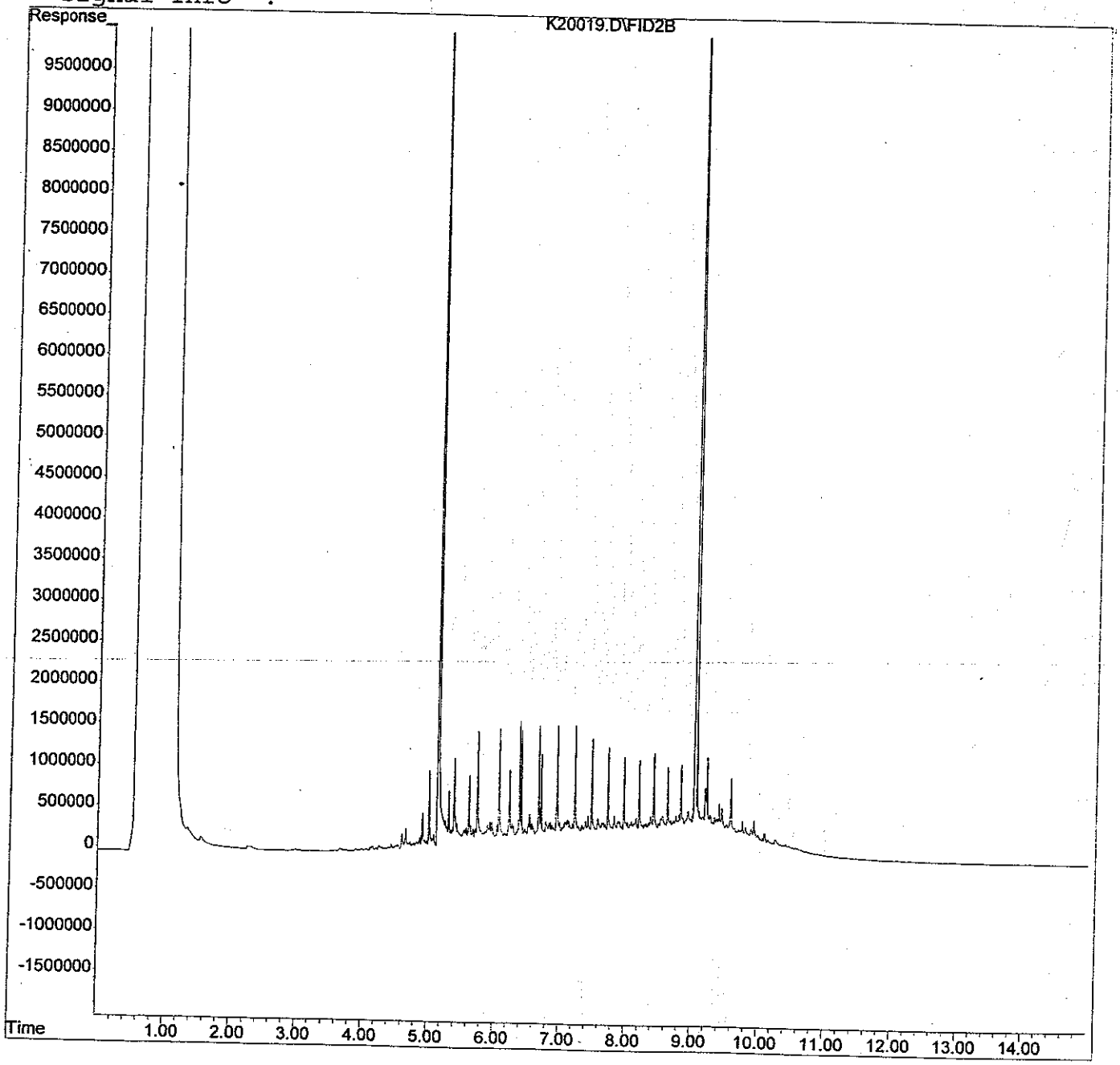
IntFile : SURR.E

Vial: 14
Operator: BN
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Nov 20 8:56 2000 Quant Results File: TPHD2.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD2.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:12:24 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



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CHAIN OF CUSTODY REPORT

Work Order #: B0K0362

CLIENT: URS

REPORT TO: DAVID RAUBVOGEL
ADDRESS: 2025 FIRST AVE STE 500 SEATTLE, WA 98121
PHONE: 206-728-0744 FAX: 206-727-3350

INVOICE TO: SAME

P.O. NUMBER:

PROJECT NAME: TRANS MOUNTAIN
PROJECT NUMBER:
SAMPLED BY: KEVIN LUNDMARK

TURNAROUND REQUEST in Business Days*

Organic & Inorganic Analyses: 10 | 7 | 5 | 4 | 3 | 2 | 1 | <1

Petroleum Hydrocarbon Analyses (STD.): ~~5~~ | 4 | 3 | 2 | 1 | <1 (STD.)

OTHER — Please Specify

*Turnaround Requests less than standard may incur Rush Charges.

REQUESTED ANALYSES

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NWTPH-GX/BTEX	NWTPH-DX	MATRIX (W, S, O)	# OF CONT.	COMMENTS	NCA WO ID
1. PEX-49-S-6	11/14/00 1020	X	X	S	1		-01
2. PEX-50-S-1	11/14/00 1330						-02
3. PEX-51-S-2	11/14/00 1333						-03
4. PEX-52-S-2	11/14/00 1335						-04
5. PEX-53-S-1.5	11/14/00 1339						-05
6. PEX-54-B-4	11/14/00 1345						-06
7. PEX-55-S-2	11/14/00 1350						-07
8. PEX-56-B-5	11/14/00 1355						-08
9. PEX-57-B-4	11/14/00 1413						-09
10. PEX-58-S-3	11/14/00 1417						-10
11. PEX-59-S-2	11/14/00 1422						-11
12. PEX-60-B-4	11/14/00 1428						-12
13. PEX-61-S-1.5	11/14/00 1433						-13
14. PEX-62-B-6	11/14/00 1444						-14
15. PEX-63-B-6	11/14/00 1449						-15

RELINQUISHED BY: Kevin Lundmark
PRINT NAME: KEVIN LUNDMARK FIRM: URS
DATE: 11/14/00 TIME: 1840

RECEIVED BY: Brany Tonty
PRINT NAME: BRANY TONTY FIRM: NCA
DATE: 11/14/00 TIME: 1838

RELINQUISHED BY:
PRINT NAME: FIRM:
DATE: TIME:

RECEIVED BY:
PRINT NAME: FIRM:
DATE: TIME:

SAMPLES WILL BE HELD FOR 2 WEEKS UPON RECEIPT

ADDITIONAL REMARKS:

COC REV 3/99

TEMP: W/O 16.4

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CHAIN OF CUSTODY REPORT

Work Order #: BOK0362

CLIENT: URS

REPORT TO: DAVID RAMBUSCHER
ADDRESS: 2025 1ST AVE STE 500
SEATTLE WA 98121
PHONE: 206-728-0744 FAX: 206-727-3350

INVOICE TO: SAME

P.O. NUMBER:

PROJECT NAME: TRANS MOUNTAIN
PROJECT NUMBER:
SAMPLED BY: KEVIN LUNDMARK

TURNAROUND REQUEST in Business Days*
Organic & Inorganic Analyses: 10 | 7 | 5 | 4 | 3 | 2 | 1 | <1
Petroleum Hydrocarbon Analyses: STD. | 4 | 3 | 2 | 1 | <1
OTHER — Please Specify
*Turnaround Requests less than standard may incur Rush Charges.

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NWTPH-Dx	NWTPH-Gx / BETX	MATRIX (W, S, O)	# OF CONT.	COMMENTS	NCA WO ID
1. PEX-64-S-4	11/14/00 1457	X	X	S	1		-16
2. PEX-65-S-4	11/14/00 1502						-17
3. PEX-66-S-3.5	11/14/00 1510						-18
4. PEX-67-S-2	11/14/00 1520						-19
5. PEX-68-B-2	11/14/00 1546						-20
6. PEX-69-B-2.5	11/14/00 1550						-21
7. PEX-70-B-3	11/14/00 1553						-22
8. PEX-71-B-3	11/14/00 1557						-23
9. PEX-72-B-1	11/14/00 1612						-24
10. PEX-73-B-1.5	11/14/00 1620						-25
11.							
12.							
13.							
14.							
15.							

RELINQUISHED BY: Kevin Lundmark DATE: 11/14/00
PRINT NAME: Kevin Lundmark FIRM: URS TIME: 1837

RECEIVED BY: Jimmy Tonty DATE: 11/14/00
PRINT NAME: JIMMY TONTY FIRM: NCA TIME: 1838

RELINQUISHED BY: DATE:
PRINT NAME: FIRM: TIME:

RECEIVED BY: DATE:
PRINT NAME: FIRM: TIME:

ADDITIONAL REMARKS:
SAMPLES WERE NOT @ 2-6C UPON RECEIPT

TEMP: N/D 16.9°

COC REV 3/99

PAGE 2 OF 2

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Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
541.383.9310 fax 541.382.7588

Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	12/04/00 15:36

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Stock-1	B0K0455-01	Soil	11/16/00 15:05	11/16/00 18:45
Stock-2	B0K0455-02	Soil	11/16/00 15:10	11/16/00 18:45
Baker-3-F	B0K0455-03	Water	11/16/00 15:25	11/16/00 18:45
Baker-4-N	B0K0455-04	Water	11/16/00 15:30	11/16/00 18:45
CELL2-G	B0K0455-05	Soil	11/16/00 16:30	11/16/00 18:45
CELL2-H	B0K0455-06	Soil	11/16/00 16:33	11/16/00 18:45
CELL2-J	B0K0455-08	Soil	11/16/00 16:38	11/16/00 18:45
CELL2-K	B0K0455-09	Soil	11/16/00 16:40	11/16/00 18:45
CELL2-L	B0K0455-10	Soil	11/16/00 16:43	11/16/00 18:45
CELL2-M	B0K0455-11	Soil	11/16/00 16:45	11/16/00 18:45
CELL2-N	B0K0455-12	Soil	11/16/00 16:48	11/16/00 18:45
PEX-74-B-4	B0K0455-13	Soil	11/16/00 12:00	11/16/00 18:45
PEX-75-B-4	B0K0455-14	Soil	11/16/00 12:00	11/16/00 18:45

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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.

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	12/04/00 15:36

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Stock-1 (B0K0455-01) Soil Sampled: 11/16/00 15:05 Received: 11/16/00 18:45									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K17009	11/17/00	11/17/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*94.9 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*83.5 %*	*50-150*			"	"	"	"	
Stock-2 (B0K0455-02) Soil Sampled: 11/16/00 15:10 Received: 11/16/00 18:45									
Gasoline Range Hydrocarbons	**6.67**	5.00	mg/kg dry	1	0K17009	11/17/00	11/17/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*95.8 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*84.1 %*	*50-150*			"	"	"	"	
Baker-3-F (B0K0455-03) Water Sampled: 11/16/00 15:25 Received: 11/16/00 18:45									
Gasoline Range Hydrocarbons	**258**	50.0	ug/l	1	0K16036	11/16/00	11/16/00	NWTPH-Gx/8021B	
Benzene	**33.8**	0.500	"	"	"	"	"	"	
Toluene	**38.6**	0.500	"	"	"	"	"	"	
Ethylbenzene	**2.14**	0.500	"	"	"	"	"	"	
Xylenes (total)	**25.8**	1.00	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*110 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*108 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	12/04/00 15:36

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Baker-4-N (B0K0455-04) Water Sampled: 11/16/00 15:30 Received: 11/16/00 18:45									
Gasoline Range Hydrocarbons	**9230**	2500	ug/l	50	0K16036	11/16/00	11/16/00	NWTPH-Gx/8021B	
Benzene	**1200**	25.0	"	"	"	"	"	"	
Toluene	**2180**	25.0	"	"	"	"	"	"	
Ethylbenzene	**123**	25.0	"	"	"	"	"	"	
Xylenes (total)	**1340**	50.0	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*102 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*109 %*	*50-150*			"	"	"	"	
CELL2-G (B0K0455-05) Soil Sampled: 11/16/00 16:30 Received: 11/16/00 18:45									
Gasoline Range Hydrocarbons	**56.6**	5.00	mg/kg dry	1	0K22020	11/22/00	11/25/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.117	"	"	"	"	"	"	R-03
Ethylbenzene	**0.149**	0.0500	"	"	"	"	"	"	
Xylenes (total)	**0.881**	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*133 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*98.0 %*	*50-150*			"	"	"	"	
CELL2-H (B0K0455-06) Soil Sampled: 11/16/00 16:33 Received: 11/16/00 18:45									
Gasoline Range Hydrocarbons	**26.9**	5.00	mg/kg dry	1	0K22020	11/22/00	11/25/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	**0.0521**	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.231	"	"	"	"	"	"	R-03
Surrogate: 4-BFB (FID)	*115 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*98.9 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	12/04/00 15:36

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
CELL2-J (B0K0455-08) Soil Sampled: 11/16/00 16:38 Received: 11/16/00 18:45									
Gasoline Range Hydrocarbons	**41.3**	5.00	mg/kg dry	1	0K22020	11/22/00	11/25/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0844	"	"	"	"	"	"	R-03
Ethylbenzene	**0.0925**	0.0500	"	"	"	"	"	"	
Xylenes (total)	**0.484**	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*136 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*103 %*	*50-150*			"	"	"	"	
CELL2-K (B0K0455-09) Soil Sampled: 11/16/00 16:40 Received: 11/16/00 18:45									
Gasoline Range Hydrocarbons	**115**	5.00	mg/kg dry	1	0K22020	11/22/00	11/25/00	NWTPH-Gx/8021B	
Benzene	ND	0.0851	"	"	"	"	"	"	R-03
Toluene	ND	0.205	"	"	"	"	"	"	R-03
Ethylbenzene	**0.296**	0.0500	"	"	"	"	"	"	
Xylenes (total)	**1.23**	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*199 %*	*50-150*			"	"	"	"	*S-06*
Surrogate: 4-BFB (PID)	*111 %*	*50-150*			"	"	"	"	
CELL2-L (B0K0455-10) Soil Sampled: 11/16/00 16:43 Received: 11/16/00 18:45									
Gasoline Range Hydrocarbons	**73.2**	5.00	mg/kg dry	1	0K22020	11/22/00	11/25/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0849	"	"	"	"	"	"	R-03
Ethylbenzene	ND	0.149	"	"	"	"	"	"	R-03
Xylenes (total)	ND	0.656	"	"	"	"	"	"	R-03
Surrogate: 4-BFB (FID)	*133 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*101 %*	*50-150*			"	"	"	"	

Scott A. Woerman, Project Manager

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	12/04/00 15:36

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
CELL2-M (B0K0455-11) Soil Sampled: 11/16/00 16:45 Received: 11/16/00 18:45									
Gasoline Range Hydrocarbons	**62.7**	5.00	mg/kg dry	1	0K22020	11/22/00	11/25/00	NWTPH-Gx/8021B	
Benzene	**0.0567**	0.0500	"	"	"	"	"	"	
Toluene	ND	0.171	"	"	"	"	"	"	R-03
Ethylbenzene	**0.158**	0.0500	"	"	"	"	"	"	
Xylenes (total)	**0.919**	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*142 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*99.6 %*	*50-150*			"	"	"	"	
CELL2-N (B0K0455-12) Soil Sampled: 11/16/00 16:48 Received: 11/16/00 18:45									
Gasoline Range Hydrocarbons	**69.3**	5.00	mg/kg dry	1	0K22020	11/22/00	11/25/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.114	"	"	"	"	"	"	R-03
Ethylbenzene	ND	0.146	"	"	"	"	"	"	R-03
Xylenes (total)	ND	0.513	"	"	"	"	"	"	R-03
Surrogate: 4-BFB (FID)	*139 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*97.2 %*	*50-150*			"	"	"	"	
PEX-74-B-4 (B0K0455-13) Soil Sampled: 11/16/00 12:00 Received: 11/16/00 18:45									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K22020	11/22/00	11/24/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*111 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*103 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	12/04/00 15:36

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-75-B-4 (B0K0455-14) Soil Sampled: 11/16/00 12:00 Received: 11/16/00 18:45									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K22020	11/22/00	11/24/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*108 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*100 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	12/04/00 15:36

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Stock-1 (B0K0455-01) Soil Sampled: 11/16/00 15:05 Received: 11/16/00 18:45									
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K17005	11/17/00	11/18/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*80.0 %*	*50-150*			"	"	"	"	
Stock-2 (B0K0455-02) Soil Sampled: 11/16/00 15:10 Received: 11/16/00 18:45									
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K17005	11/17/00	11/19/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*79.7 %*	*50-150*			"	"	"	"	
Baker-3-F (B0K0455-03) Water Sampled: 11/16/00 15:25 Received: 11/16/00 18:45									
Diesel Range Hydrocarbons	ND	0.250	mg/l	1	0K17010	11/17/00	11/17/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	0.500	"	"	"	"	"	"	
Surrogate: 2-FBP	*84.2 %*	*50-150*			"	"	"	"	
Baker-4-N (B0K0455-04) Water Sampled: 11/16/00 15:30 Received: 11/16/00 18:45									
Diesel Range Hydrocarbons	**2.68**	0.250	mg/l	1	0K17010	11/17/00	11/17/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	**0.840**	0.500	"	"	"	"	"	"	
Surrogate: 2-FBP	*95.7 %*	*50-150*			"	"	"	"	
CELL2-G (B0K0455-05) Soil Sampled: 11/16/00 16:30 Received: 11/16/00 18:45									
Diesel Range Hydrocarbons	**86.2**	10.0	mg/kg dry	1	0K24013	11/24/00	11/26/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	**72.1**	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*73.8 %*	*50-150*			"	"	"	"	
Surrogate: Octacosane	*94.7 %*	*50-150*			"	"	"	"	

North Creek Analytical - Bothell

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	12/04/00 15:36

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
CELL2-H (B0K0455-06) Soil Sampled: 11/16/00 16:33 Received: 11/16/00 18:45									
Diesel Range Hydrocarbons	**113**	10.0	mg/kg dry	1	0K24013	11/24/00	11/26/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	**75.4**	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*92.1 %*	*50-150*			"	"	"	"	
Surrogate: Octacosane	*84.1 %*	*50-150*			"	"	"	"	
CELL2-J (B0K0455-08) Soil Sampled: 11/16/00 16:38 Received: 11/16/00 18:45									
Diesel Range Hydrocarbons	**82.0**	10.0	mg/kg dry	1	0K24013	11/24/00	11/26/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	**54.1**	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*72.0 %*	*50-150*			"	"	"	"	
Surrogate: Octacosane	*101 %*	*50-150*			"	"	"	"	
CELL2-K (B0K0455-09) Soil Sampled: 11/16/00 16:40 Received: 11/16/00 18:45									
Diesel Range Hydrocarbons	**92.4**	10.0	mg/kg dry	1	0K24013	11/24/00	11/26/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	**41.5**	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*66.0 %*	*50-150*			"	"	"	"	
Surrogate: Octacosane	*78.2 %*	*50-150*			"	"	"	"	
CELL2-L (B0K0455-10) Soil Sampled: 11/16/00 16:43 Received: 11/16/00 18:45									
Diesel Range Hydrocarbons	**169**	10.0	mg/kg dry	1	0K24013	11/24/00	11/26/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	**94.7**	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*66.4 %*	*50-150*			"	"	"	"	
Surrogate: Octacosane	*84.1 %*	*50-150*			"	"	"	"	
CELL2-M (B0K0455-11) Soil Sampled: 11/16/00 16:45 Received: 11/16/00 18:45									
Diesel Range Hydrocarbons	**60.4**	10.0	mg/kg dry	1	0K24013	11/24/00	11/26/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	**30.0**	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*84.2 %*	*50-150*			"	"	"	"	
Surrogate: Octacosane	*83.5 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	12/04/00 15:36

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
CELL2-N (B0K0455-12) Soil Sampled: 11/16/00 16:48 Received: 11/16/00 18:45									
Diesel Range Hydrocarbons	**42.4**	10.0	mg/kg dry	1	0K24013	11/24/00	11/26/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	**27.1**	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*85.4 %*	*50-150*			"	"	"	"	
Surrogate: Octacosane	*103 %*	*50-150*			"	"	"	"	
PEX-74-B-4 (B0K0455-13) Soil Sampled: 11/16/00 12:00 Received: 11/16/00 18:45									
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K24013	11/24/00	11/26/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*95.9 %*	*50-150*			"	"	"	"	
Surrogate: Octacosane	*88.6 %*	*50-150*			"	"	"	"	
PEX-75-B-4 (B0K0455-14) Soil Sampled: 11/16/00 12:00 Received: 11/16/00 18:45									
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K24013	11/24/00	11/26/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*74.2 %*	*50-150*			"	"	"	"	
Surrogate: Octacosane	*85.8 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	12/04/00 15:36

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Stock-1 (B0K0455-01) Soil Sampled: 11/16/00 15:05 Received: 11/16/00 18:45									
Dry Weight	**85.6**	1.00	%	1	0K16055	11/16/00	11/17/00	BSOPSPL003R07	
Stock-2 (B0K0455-02) Soil Sampled: 11/16/00 15:10 Received: 11/16/00 18:45									
Dry Weight	**83.8**	1.00	%	1	0K16055	11/16/00	11/17/00	BSOPSPL003R07	
CELL2-G (B0K0455-05) Soil Sampled: 11/16/00 16:30 Received: 11/16/00 18:45									
Dry Weight	**80.0**	1.00	%	1	0L01042	12/01/00	12/02/00	BSOPSPL003R07	
CELL2-H (B0K0455-06) Soil Sampled: 11/16/00 16:33 Received: 11/16/00 18:45									
Dry Weight	**84.4**	1.00	%	1	0L01042	12/01/00	12/02/00	BSOPSPL003R07	
CELL2-J (B0K0455-08) Soil Sampled: 11/16/00 16:38 Received: 11/16/00 18:45									
Dry Weight	**80.0**	1.00	%	1	0L01042	12/01/00	12/02/00	BSOPSPL003R07	
CELL2-K (B0K0455-09) Soil Sampled: 11/16/00 16:40 Received: 11/16/00 18:45									
Dry Weight	**80.4**	1.00	%	1	0L01042	12/01/00	12/02/00	BSOPSPL003R07	
CELL2-L (B0K0455-10) Soil Sampled: 11/16/00 16:43 Received: 11/16/00 18:45									
Dry Weight	**81.1**	1.00	%	1	0L01042	12/01/00	12/02/00	BSOPSPL003R07	
CELL2-M (B0K0455-11) Soil Sampled: 11/16/00 16:45 Received: 11/16/00 18:45									
Dry Weight	**80.2**	1.00	%	1	0L01042	12/01/00	12/02/00	BSOPSPL003R07	
CELL2-N (B0K0455-12) Soil Sampled: 11/16/00 16:48 Received: 11/16/00 18:45									
Dry Weight	**86.4**	1.00	%	1	0L01042	12/01/00	12/02/00	BSOPSPL003R07	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	12/04/00 15:36

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-74-B-4 (B0K0455-13) Soil	**Sampled: 11/16/00 12:00**		**Received: 11/16/00 18:45**						
Dry Weight	**86.8**	1.00	%	1	0K24004	11/24/00	11/27/00	BSOPSPL003R07	
PEX-75-B-4 (B0K0455-14) Soil	**Sampled: 11/16/00 12:00**		**Received: 11/16/00 18:45**						
Dry Weight	**88.9**	1.00	%	1	0K24004	11/24/00	11/27/00	BSOPSPL003R07	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	12/04/00 15:36

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0K16036: Prepared 11/16/00 Using EPA 5030B (P/T)										
Blank (0K16036-BLK1)										
Gasoline Range Hydrocarbons	ND	50.0	ug/l							
Benzene	ND	0.500	"							
Toluene	ND	0.500	"							
Ethylbenzene	ND	0.500	"							
Xylenes (total)	ND	1.00	"							
Surrogate: 4-BFB (FID)	*54.7*		"	*48.0*		*114*	*50-150*			
Surrogate: 4-BFB (PID)	*53.0*		"	*48.0*		*110*	*50-150*			
Blank (0K16036-BLK2)										
Gasoline Range Hydrocarbons	ND	50.0	ug/l							
Benzene	ND	0.500	"							
Toluene	ND	0.500	"							
Ethylbenzene	ND	0.500	"							
Xylenes (total)	ND	1.00	"							
Surrogate: 4-BFB (FID)	*54.3*		"	*48.0*		*113*	*50-150*			
Surrogate: 4-BFB (PID)	*51.8*		"	*48.0*		*108*	*50-150*			
LCS (0K16036-BS1)										
Gasoline Range Hydrocarbons	484	50.0	ug/l	500		96.8	70-130			
Surrogate: 4-BFB (FID)	*55.6*		"	*48.0*		*116*	*50-150*			
LCS (0K16036-BS2)										
Gasoline Range Hydrocarbons	499	50.0	ug/l	500		99.8	70-130			
Surrogate: 4-BFB (FID)	*57.4*		"	*48.0*		*120*	*50-150*			
Duplicate (0K16036-DUP1)					**Source: B0K0414-06**					
Gasoline Range Hydrocarbons	2430	50.0	ug/l		2010			18.9	25	
Surrogate: 4-BFB (FID)	*134*		"	*48.0*		*279*	*50-150*			*S-02*

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	12/04/00 15:36

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0K16036: Prepared 11/16/00 Using EPA 5030B (P/T)										
Duplicate (0K16036-DUP2)					**Source: B0K0422-02**					
Gasoline Range Hydrocarbons	ND	50.0	ug/l		ND				25	
Surrogate: 4-BFB (FID)	*48.3*		"	*48.0*		*101*	*50-150*			
Matrix Spike (0K16036-MS1)					**Source: B0K0414-01**					
Benzene	10.4	0.500	ug/l	10.0	ND	102	70-130			
Toluene	11.7	0.500	"	10.0	0.750	109	70-130			
Ethylbenzene	11.4	0.500	"	10.0	ND	113	70-130			
Xylenes (total)	33.8	1.00	"	30.0	ND	110	70-130			
Surrogate: 4-BFB (PID)	*53.7*		"	*48.0*		*112*	*50-150*			
Matrix Spike Dup (0K16036-MSD1)					**Source: B0K0414-01**					
Benzene	10.7	0.500	ug/l	10.0	ND	105	70-130	2.84	15	
Toluene	11.9	0.500	"	10.0	0.750	111	70-130	1.69	15	
Ethylbenzene	11.6	0.500	"	10.0	ND	115	70-130	1.74	15	
Surrogate: 4-BFB (PID)	*53.3*		"	*48.0*		*111*	*50-150*			
Batch 0K17009: Prepared 11/17/00 Using EPA 5030B (MeOH)										
Blank (0K17009-BLK1)										
Gasoline Range Hydrocarbons	ND	5.00	mg/kg wet							
Benzene	ND	0.0500	"							
Toluene	ND	0.0500	"							
Ethylbenzene	ND	0.0500	"							
Xylenes (total)	ND	0.100	"							
Surrogate: 4-BFB (FID)	*4.06*		"	*4.00*		*101*	*50-150*			
Surrogate: 4-BFB (PID)	*3.76*		"	*4.00*		*94.0*	*50-150*			

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	12/04/00 15:36

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B - Quality Control

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0K17009: Prepared 11/17/00 Using EPA 5030B (MeOH)										
LCS (0K17009-BS1)										
Gasoline Range Hydrocarbons	21.9	5.00	mg/kg wet	25.0		87.6	70-130			
Surrogate: 4-BFB (FID)	*4.62*		"	*4.00*		*115*	*50-150*			
Duplicate (0K17009-DUP1)					**Source: B0K0342-45**					
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry		ND			2.37	50	
Surrogate: 4-BFB (FID)	*4.32*		"	*4.69*		*92.1*	*50-150*			
Duplicate (0K17009-DUP2)					**Source: B0K0342-47**					
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry		ND			15.7	50	
Surrogate: 4-BFB (FID)	*3.99*		"	*4.54*		*87.9*	*50-150*			
Matrix Spike (0K17009-MS1)					**Source: B0K0342-44**					
Benzene	0.434	0.0500	mg/kg dry	0.600	ND	72.3	60-140			
Toluene	0.433	0.0500	"	0.600	ND	70.8	60-140			
Ethylbenzene	0.463	0.0500	"	0.600	ND	77.2	60-140			
Xylenes (total)	1.42	0.100	"	1.80	ND	77.8	60-140			
Surrogate: 4-BFB (PID)	*3.85*		"	*4.80*		*80.2*	*50-150*			
Matrix Spike Dup (0K17009-MSD1)					**Source: B0K0342-44**					
Benzene	0.483	0.0500	mg/kg dry	0.600	ND	80.5	60-140	10.7	20	
Toluene	0.485	0.0500	"	0.600	ND	79.5	60-140	11.3	20	
Ethylbenzene	0.526	0.0500	"	0.600	ND	87.7	60-140	12.7	20	
Xylenes (total)	1.63	0.100	"	1.80	ND	89.5	60-140	13.8	20	
Surrogate: 4-BFB (PID)	*4.11*		"	*4.80*		*85.6*	*50-150*			
Batch 0K22020: Prepared 11/22/00 Using EPA 5030B (MeOH)										
Blank (0K22020-BLK1)										
Gasoline Range Hydrocarbons	ND	5.00	mg/kg wet							
Benzene	ND	0.0500	"							
Toluene	ND	0.0500	"							
Ethylbenzene	ND	0.0500	"							
Xylenes (total)	ND	0.100	"							
Surrogate: 4-BFB (FID)	*4.03*		"	*4.00*		*101*	*50-150*			
Surrogate: 4-BFB (PID)	*4.06*		"	*4.00*		*101*	*50-150*			

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	12/04/00 15:36

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0K22020: Prepared 11/22/00 Using EPA 5030B (MeOH)										
LCS (0K22020-BS1)										
Gasoline Range Hydrocarbons	21.8	5.00	mg/kg wet	25.0		87.2	70-130			
Surrogate: 4-BFB (FID)	*4.28*		"	*4.00*		*107*	*50-150*			
Duplicate (0K22020-DUP1)					**Source: B0K0455-14**					
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry		ND			33.7	50	
Surrogate: 4-BFB (FID)	*4.77*		"	*4.50*		*106*	*50-150*			
Duplicate (0K22020-DUP2)					**Source: B0K0602-01**					
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry		ND			32.8	50	
Surrogate: 4-BFB (FID)	*4.60*		"	*4.10*		*112*	*50-150*			
Matrix Spike (0K22020-MS1)					**Source: B0K0455-13**					
Benzene	0.540	0.0500	mg/kg dry	0.576	ND	93.8	60-140			
Toluene	0.540	0.0500	"	0.576	ND	91.5	60-140			
Ethylbenzene	0.587	0.0500	"	0.576	ND	102	60-140			
Xylenes (total)	1.76	0.100	"	1.73	ND	101	60-140			
Surrogate: 4-BFB (PID)	*4.53*		"	*4.61*		*98.3*	*50-150*			
Matrix Spike Dup (0K22020-MSD1)					**Source: B0K0455-13**					
Benzene	0.533	0.0500	mg/kg dry	0.576	ND	92.5	60-140	1.30	20	
Toluene	0.535	0.0500	"	0.576	ND	90.7	60-140	0.930	20	
Ethylbenzene	0.582	0.0500	"	0.576	ND	101	60-140	0.855	20	
Xylenes (total)	1.75	0.100	"	1.73	ND	100	60-140	0.570	20	
Surrogate: 4-BFB (PID)	*4.45*		"	*4.61*		*96.5*	*50-150*			

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	12/04/00 15:36

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up) - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0K17005: Prepared 11/17/00 Using EPA 3550B										
Blank (0K17005-BLK1)										
Diesel Range Hydrocarbons	ND	10.0	mg/kg wet							
Lube Oil Range Hydrocarbons	ND	25.0	"							
Surrogate: 2-FBP	*5.64*		"	*10.7*		*52.7*	*50-150*			
LCS (0K17005-BS1)										
Diesel Range Hydrocarbons	56.5	10.0	mg/kg wet	66.7		84.7	60-140			
Surrogate: 2-FBP	*8.42*		"	*10.7*		*78.7*	*50-150*			
Duplicate (0K17005-DUP1)					**Source: B0K0310-02**					
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry		10.2			19.5	50	
Lube Oil Range Hydrocarbons	ND	25.0	"		ND			29.5	50	
Surrogate: 2-FBP	*10.4*		"	*15.3*		*68.0*	*50-150*			
Batch 0K17010: Prepared 11/17/00 Using EPA 3510C/600 Series										
Blank (0K17010-BLK1)										
Diesel Range Hydrocarbons	ND	0.250	mg/l							
Lube Oil Range Hydrocarbons	ND	0.500	"							
Surrogate: 2-FBP	*0.259*		"	*0.320*		*80.9*	*50-150*			
LCS (0K17010-BS1)										
Diesel Range Hydrocarbons	1.43	0.250	mg/l	2.00		71.5	60-140			
Surrogate: 2-FBP	*0.272*		"	*0.320*		*85.0*	*50-150*			
LCS Dup (0K17010-BSD1)										
Diesel Range Hydrocarbons	1.37	0.250	mg/l	2.00		68.5	60-140	4.29	40	
Surrogate: 2-FBP	*0.263*		"	*0.320*		*82.2*	*50-150*			

Scott A. Woerman, Project Manager

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	12/04/00 15:36

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up) - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0K24013: Prepared 11/24/00 Using EPA 3550B										
Blank (0K24013-BLK1)										
Diesel Range Hydrocarbons	ND	10.0	mg/kg wet							
Lube Oil Range Hydrocarbons	ND	25.0	"							
Surrogate: 2-FBP	*8.38*		"	*10.7*		*78.3*	*50-150*			
Surrogate: Octacosane	*8.67*		"	*10.7*		*81.0*	*50-150*			
LCS (0K24013-BS1)										
Diesel Range Hydrocarbons	62.9	10.0	mg/kg wet	66.7		94.3	60-140			
Surrogate: 2-FBP	*8.35*		"	*10.7*		*78.0*	*50-150*			
Duplicate (0K24013-DUP2)					**Source: B0K0612-10**					
Diesel Range Hydrocarbons	41.0	10.0	mg/kg dry		50.4			20.6	50	
Lube Oil Range Hydrocarbons	138	25.0	"		211			41.8	50	
Surrogate: 2-FBP	*10.5*		"	*11.8*		*89.0*	*50-150*			
Surrogate: Octacosane	*8.97*		"	*11.8*		*76.0*	*50-150*			

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	12/04/00 15:36

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 0K16055: Prepared 11/16/00 Using Dry Weight										
Blank (0K16055-BLK1)										
Dry Weight	100	1.00	%							
Batch 0K24004: Prepared 11/24/00 Using Dry Weight										
Blank (0K24004-BLK2)										
Dry Weight	100	1.00	%							
Batch 0L01042: Prepared 12/01/00 Using Dry Weight										
Blank (0L01042-BLK1)										
Dry Weight	100	1.00	%							

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	12/04/00 15:36

Notes and Definitions

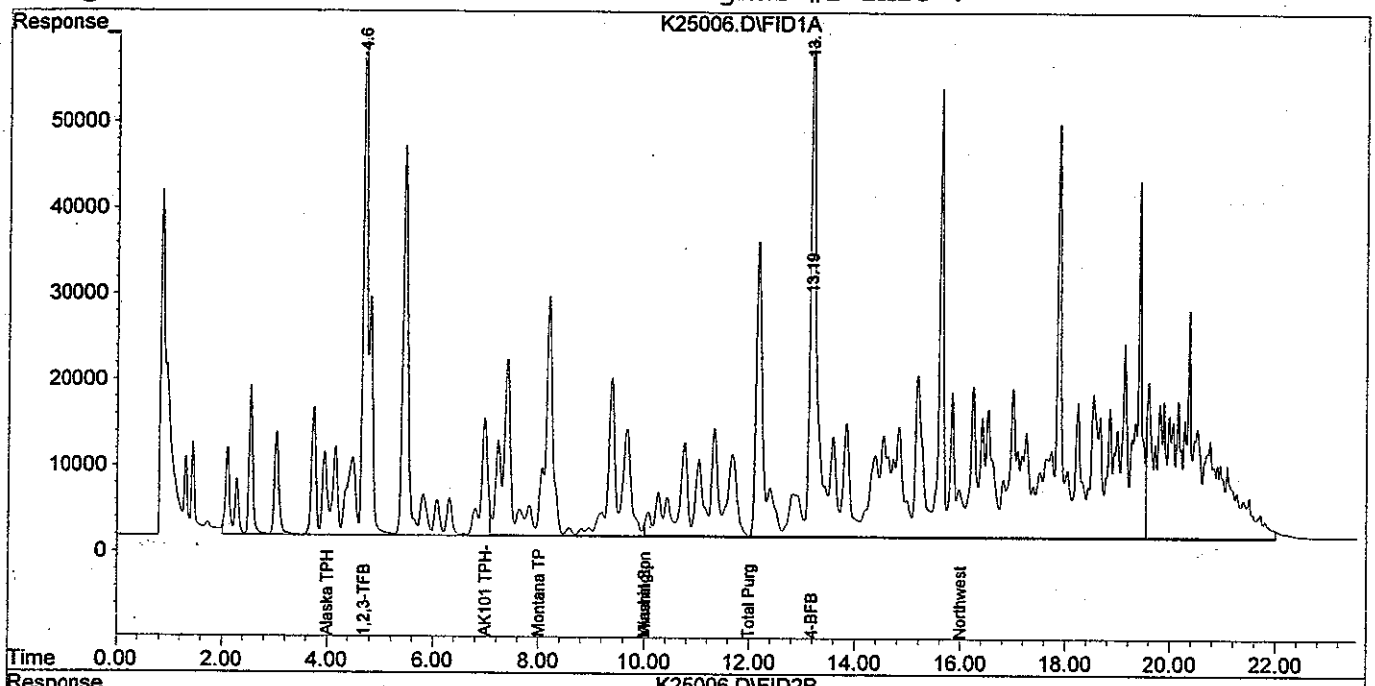
R-03	The reporting limit for this analyte has been raised to account for interference from coeluting organic compounds present in the sample.
S-02	The surrogate recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample.
S-06	The recovery of this surrogate is outside control limits due to sample dilution required from high analyte concentration and/or matrix interferences.
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

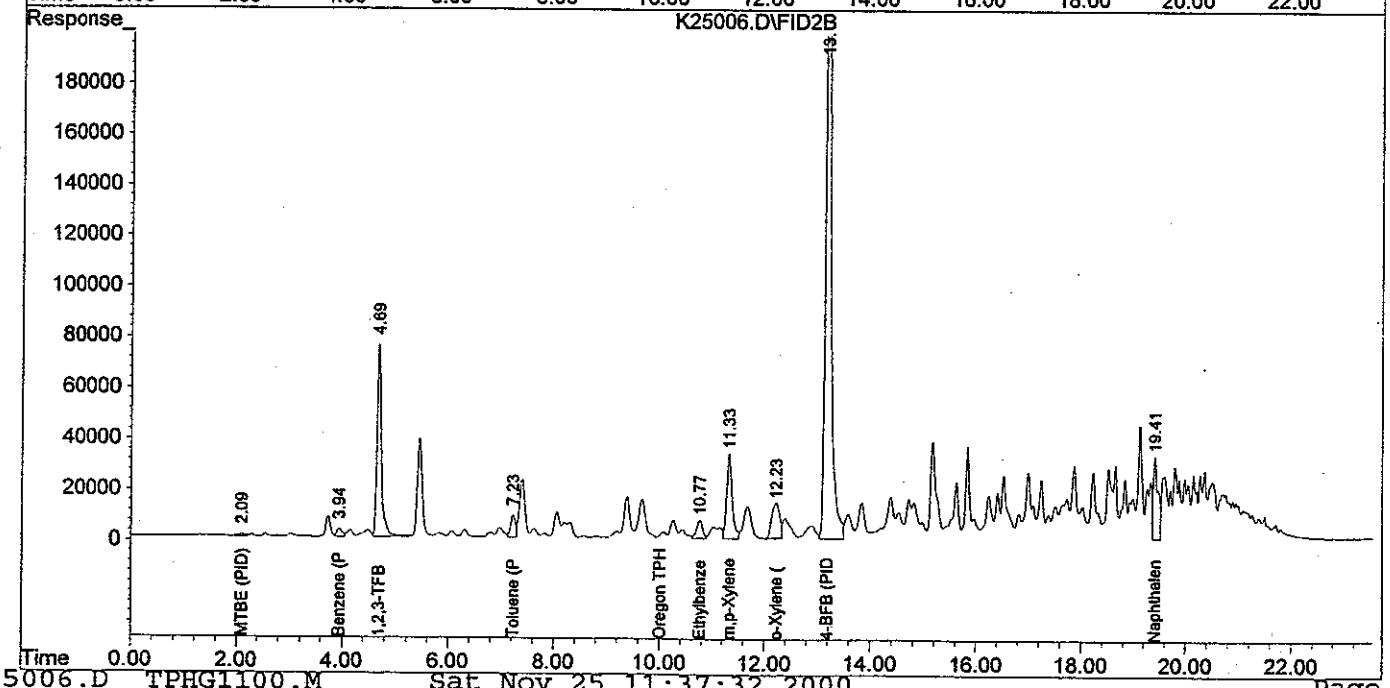
Signal #1 : D:\HPCHEM\4\DATA\112500\K25006.D\FID1A.CH Vial: 6
Signal #2 : D:\HPCHEM\4\DATA\112500\K25006.D\FID2B.CH
Acq On : 25 Nov 2000 11:13 am Operator: GAP
Sample : b0k0455-05 r1 Inst : GC #8
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E

Quant Time: Nov 25 11:37 2000 Quant Results File: TPHG1100.RES

Quant Method : D:\HPCHEM\4\METHODS\TPHG1100.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Mon Nov 20 13:50:56 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG1100.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



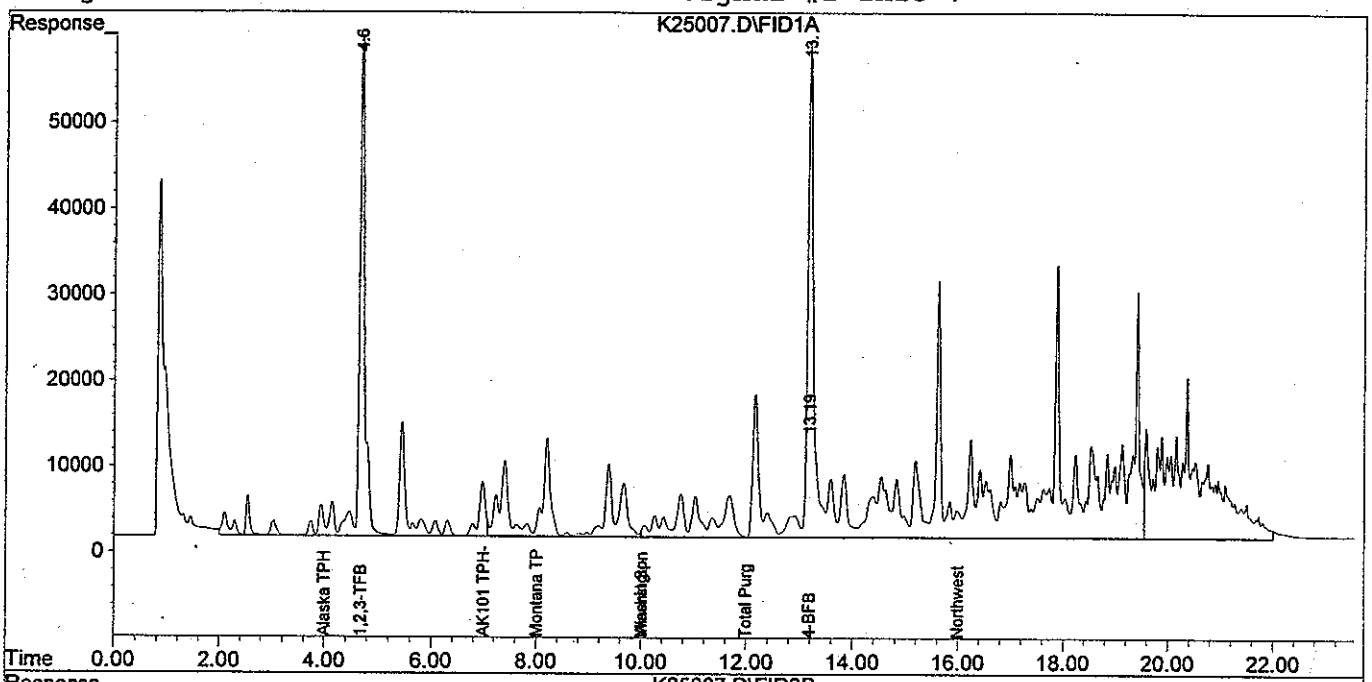


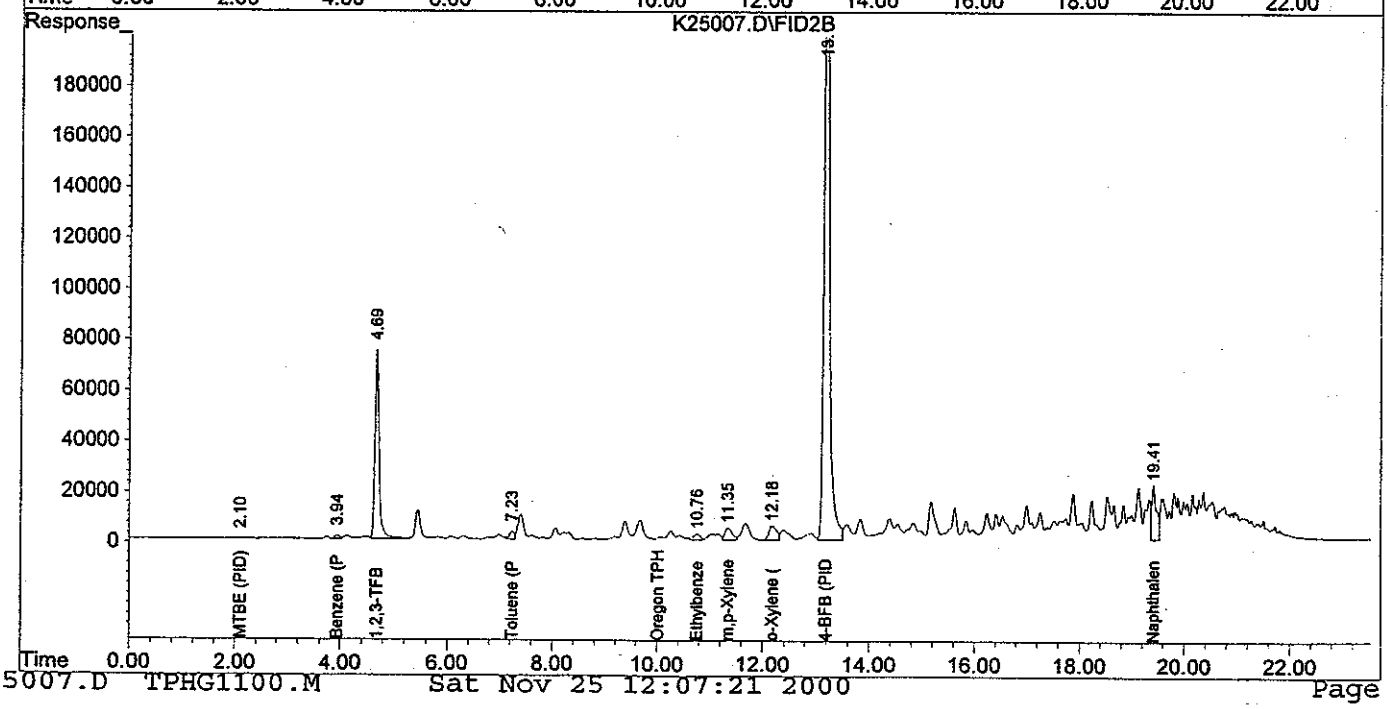
Signal #1 : D:\HPCHEM\4\DATA\112500\K25007.D\FID1A.CH Vial: 7
Signal #2 : D:\HPCHEM\4\DATA\112500\K25007.D\FID2B.CH
Acq On : 25 Nov 2000 11:43 am Operator: GAP
Sample : b0k0455-06 r1 Inst : GC #8
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E

Quant Time: Nov 25 12:07 2000 Quant Results File: TPHG1100.RES

Quant Method : D:\HPCHEM\4\METHODS\TPHG1100.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Mon Nov 20 13:50:56 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG1100.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



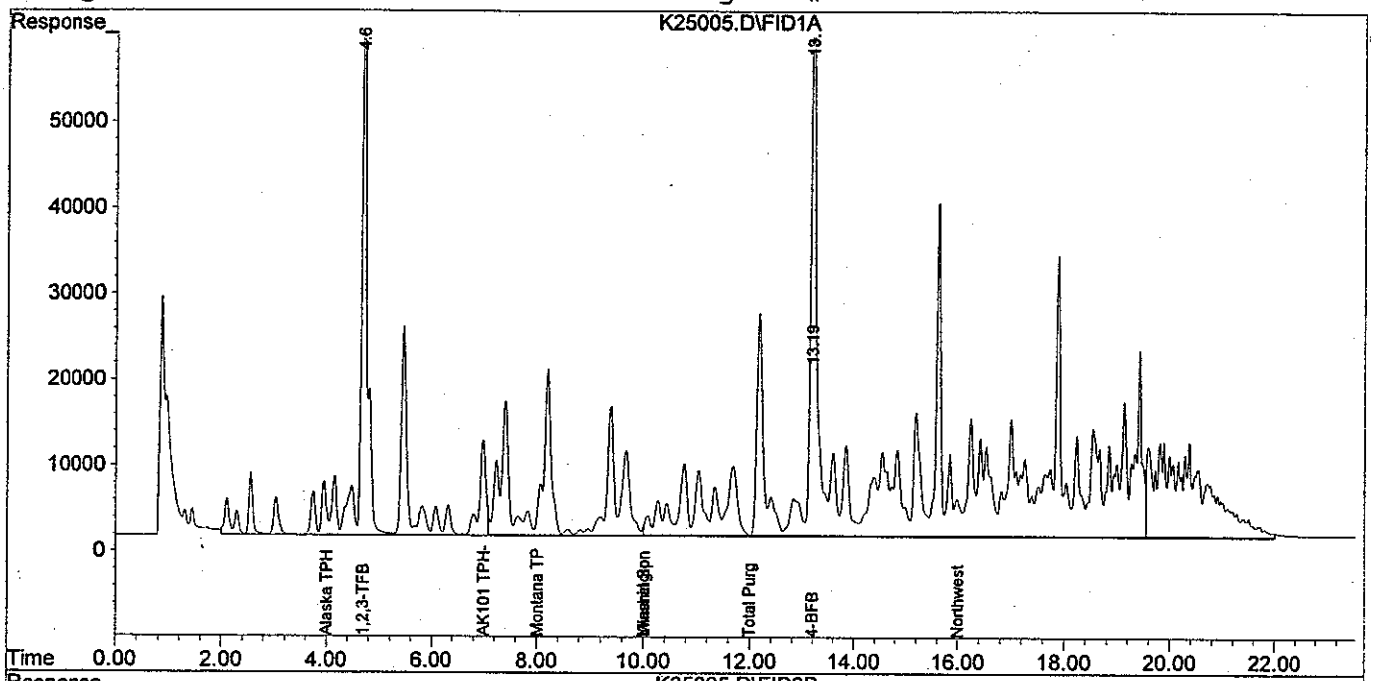


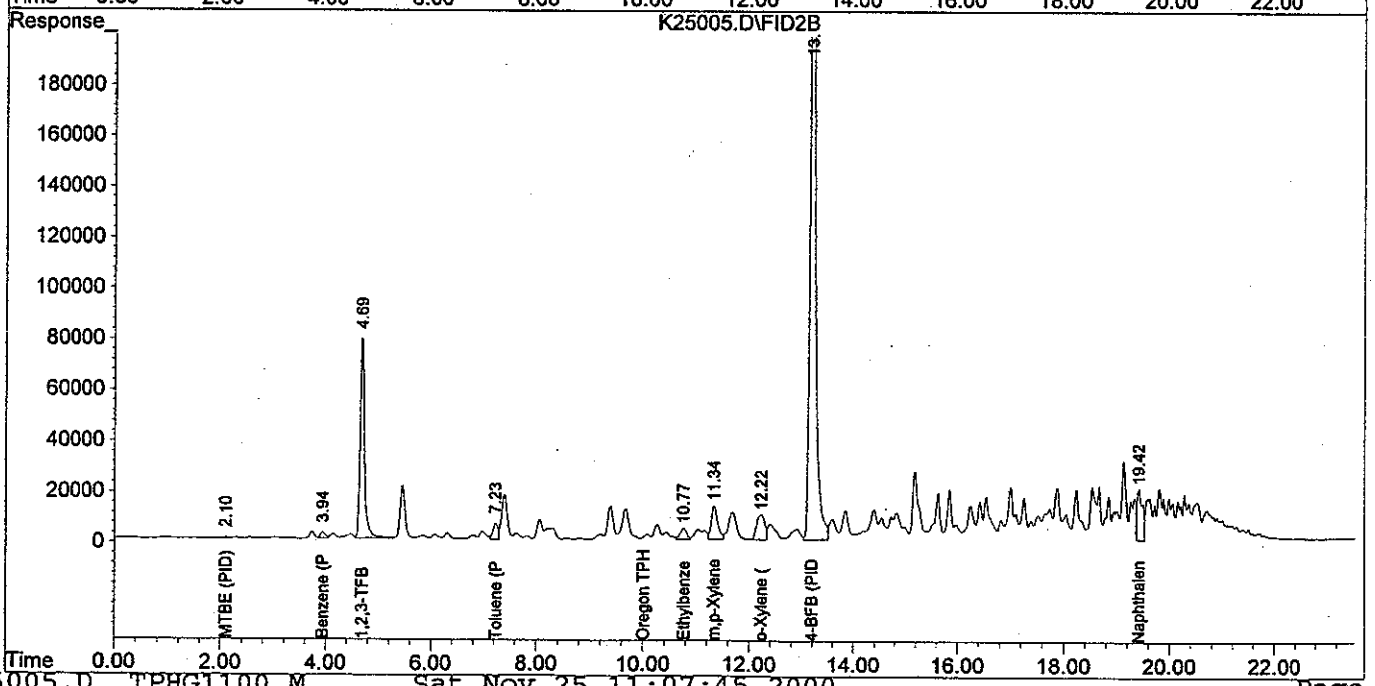
Signal #1 : D:\HPCHEM\4\DATA\112500\K25005.D\FID1A.CH Vial: 5
Signal #2 : D:\HPCHEM\4\DATA\112500\K25005.D\FID2B.CH
Acq On : 25 Nov 2000 10:43 am Operator: GAP
Sample : b0k0455-08 r1 Inst : GC #8
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E

Quant Time: Nov 25 11:07 2000 Quant Results File: TPHG1100.RES

Quant Method : D:\HPCHEM\4\METHODS\TPHG1100.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Mon Nov 20 13:50:56 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG1100.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





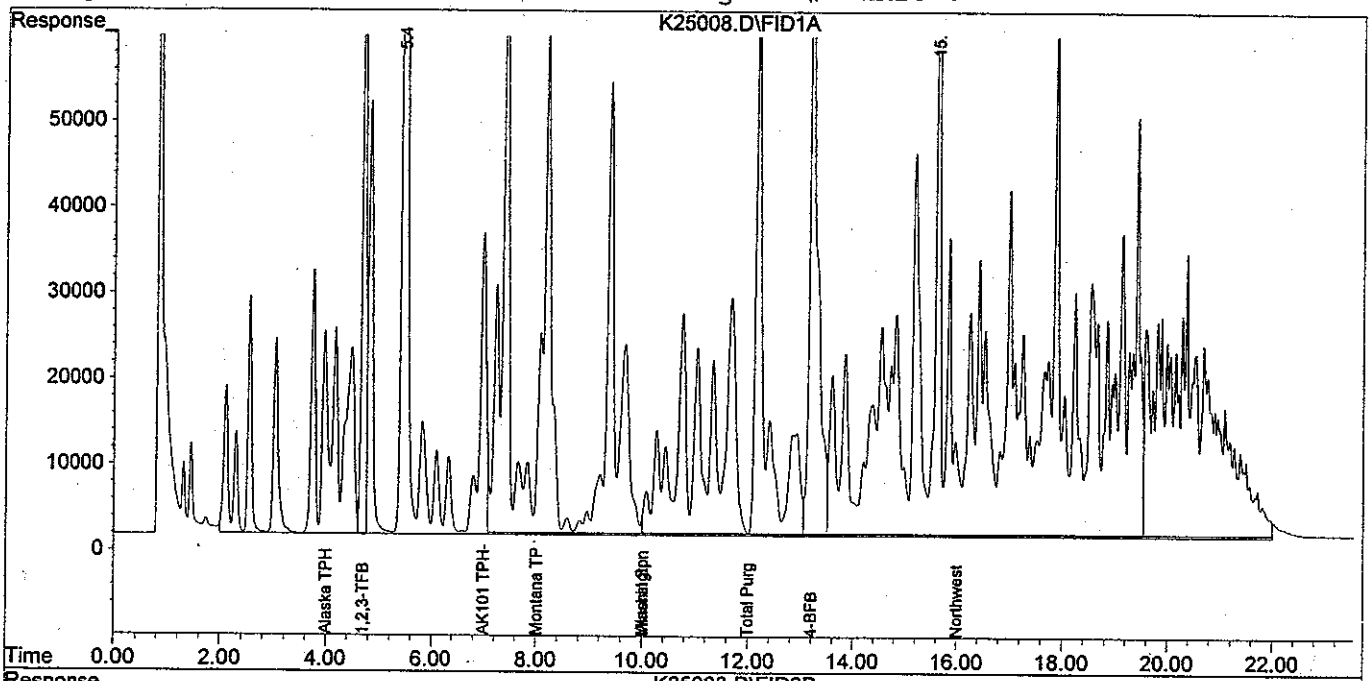
Signal #1 : D:\HPCHEM\4\DATA\112500\K25008.D\FID1A.CH Vial: 8
Signal #2 : D:\HPCHEM\4\DATA\112500\K25008.D\FID2B.CH
Acq On : 25 Nov 2000 12:13 pm Operator: GAP
Sample : b0k0455-09 r1 Inst : GC #8
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00

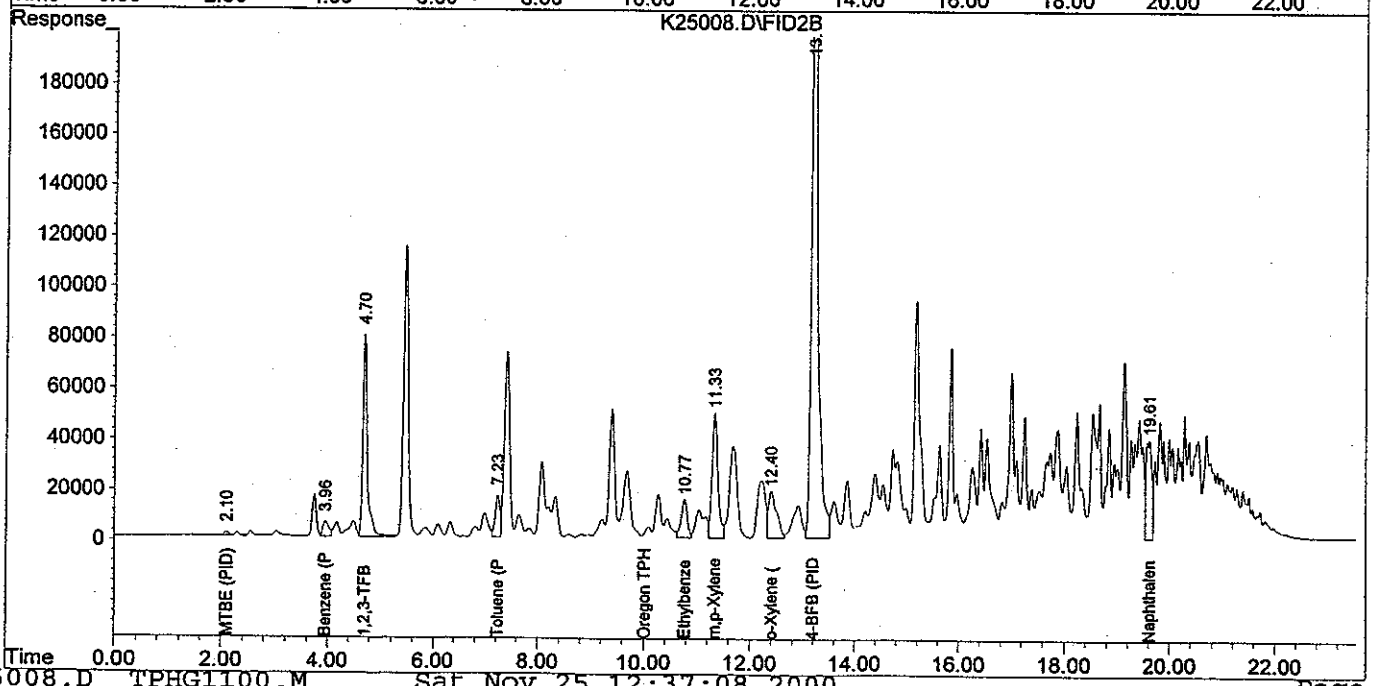
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E

Quant Time: Nov 25 12:37 2000 Quant Results File: TPHG1100.RES

Quant Method : D:\HPCHEM\4\METHODS\TPHG1100.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Mon Nov 20 13:50:56 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG1100.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report

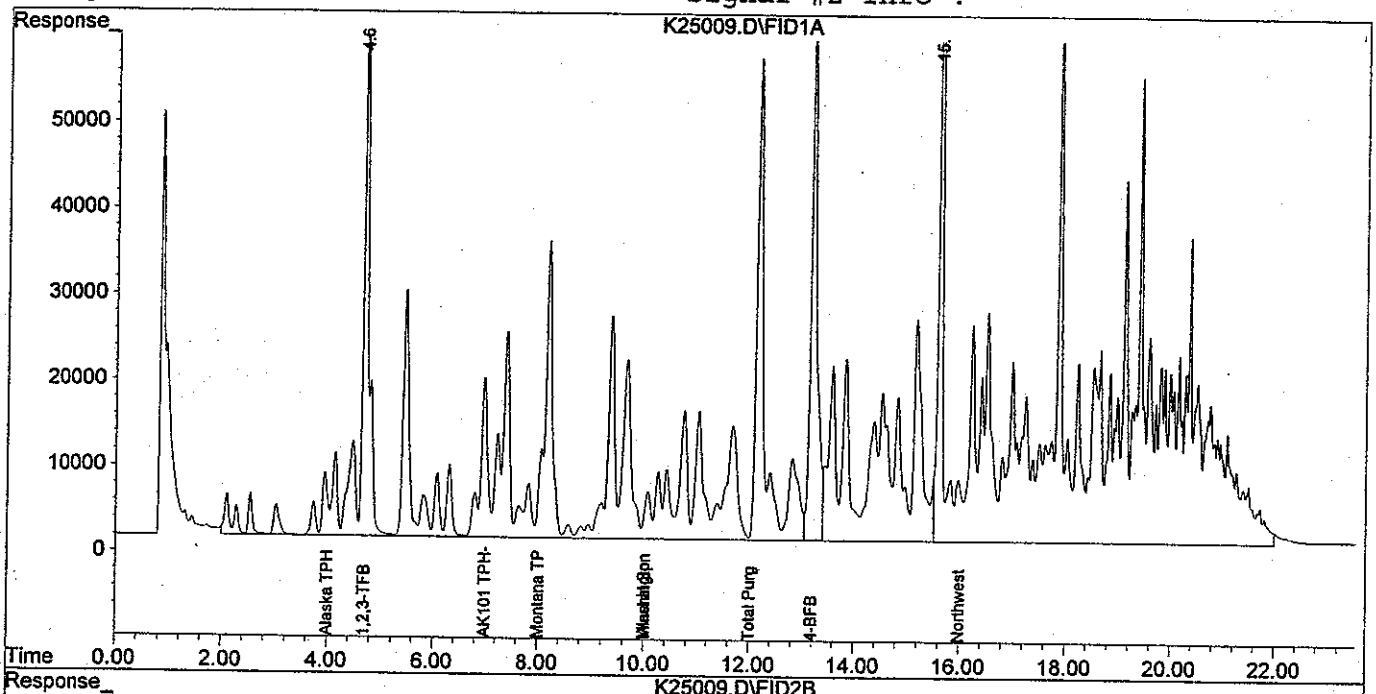
Signal #1 : D:\HPCHEM\4\DATA\112500\K25009.D\FID1A.CH Vial: 9
Signal #2 : D:\HPCHEM\4\DATA\112500\K25009.D\FID2B.CH
Acq On : 25 Nov 2000 12:43 pm Operator: GAP
Sample : b0k0455-10 r1 Inst : GC #8
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00

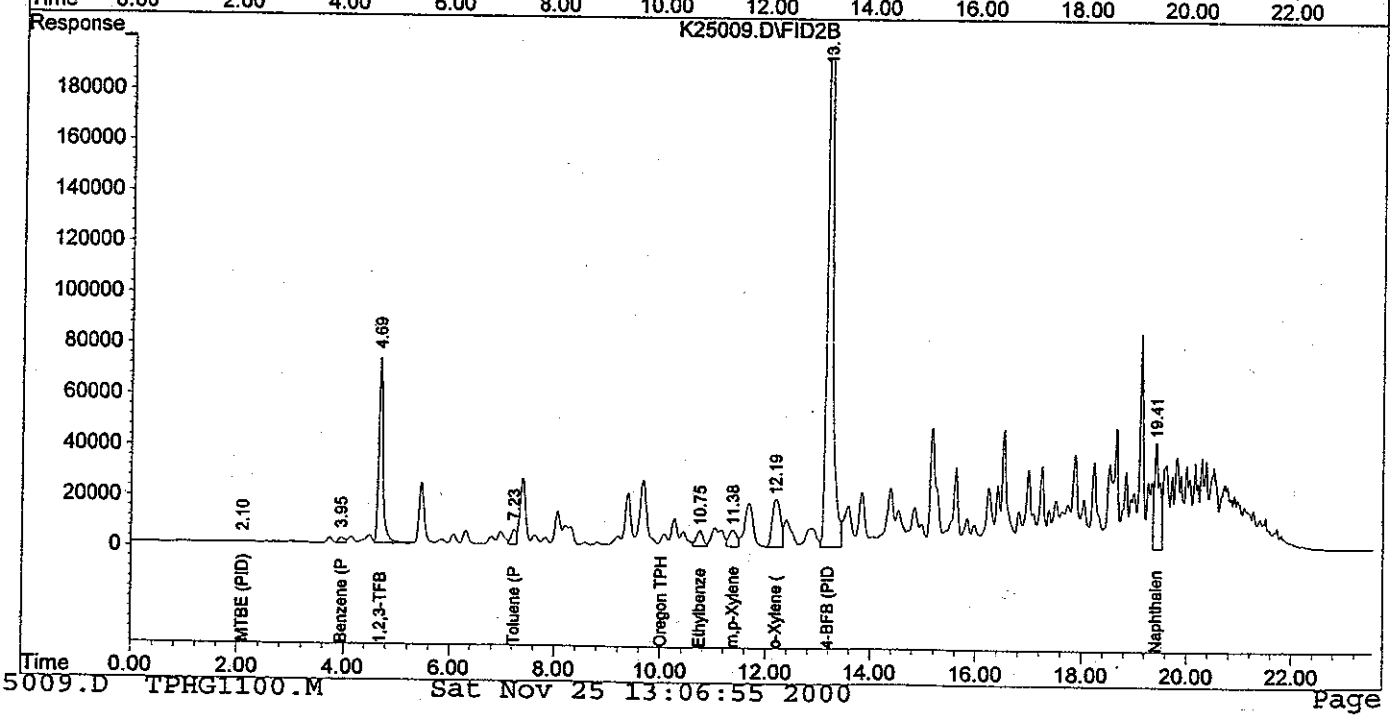
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E

Quant Time: Nov 25 13:06 2000 Quant Results File: TPHG1100.RES

Quant Method : D:\HPCHEM\4\METHODS\TPHG1100.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Mon Nov 20 13:50:56 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG1100.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





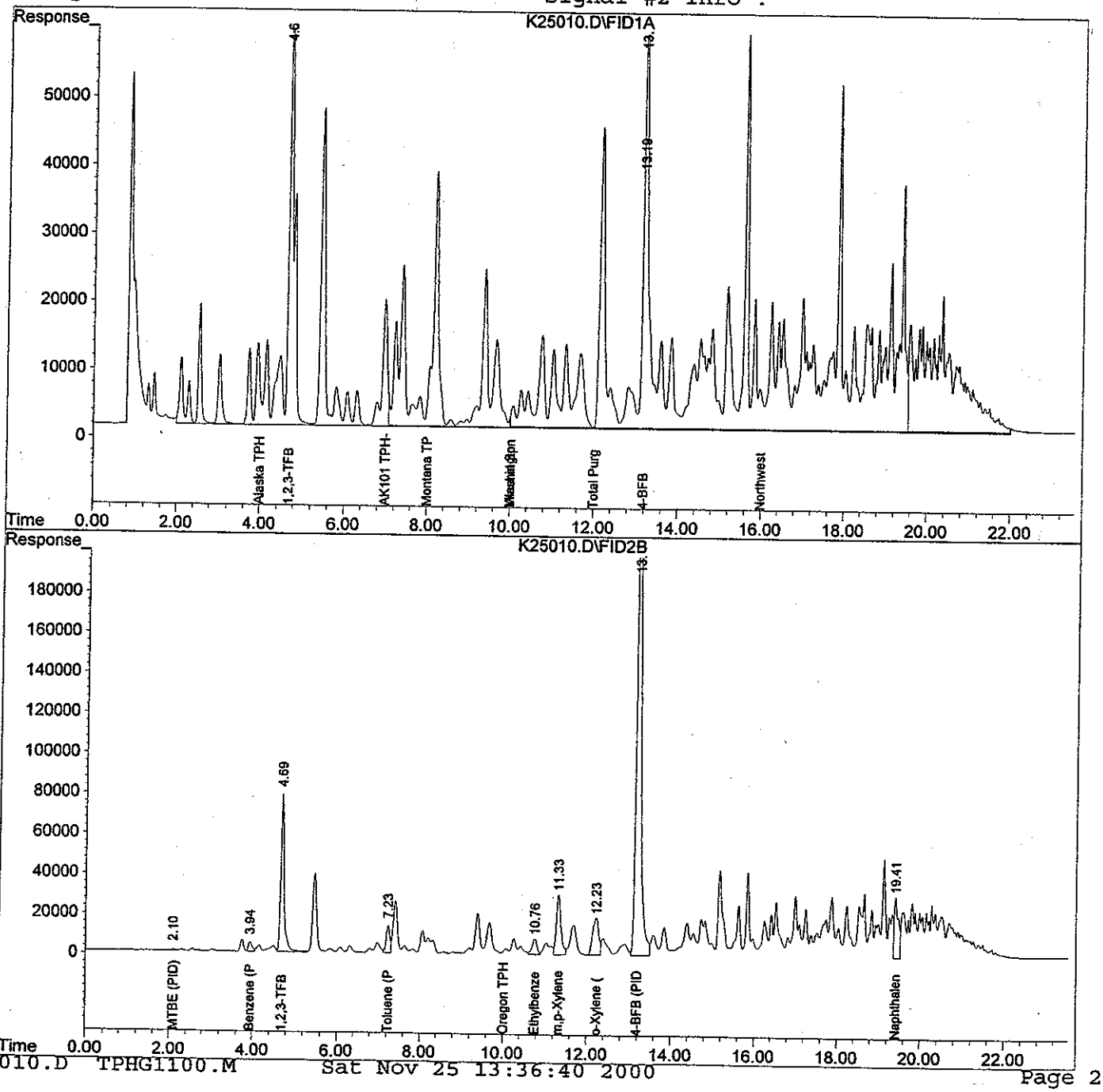
Signal #1 : D:\HPCHEM\4\DATA\112500\K25010.D\FID1A.CH Vial: 10
Signal #2 : D:\HPCHEM\4\DATA\112500\K25010.D\FID2B.CH
Acq On : 25 Nov 2000 1:12 pm Operator: GAP
Sample : b0k0455-11 r1 Inst : GC #8
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00

IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E

Quant Time: Nov 25 13:36 2000 Quant Results File: TPHG1100.RES

Quant Method : D:\HPCHEM\4\METHODS\TPHG1100.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Mon Nov 20 13:50:56 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG1100.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



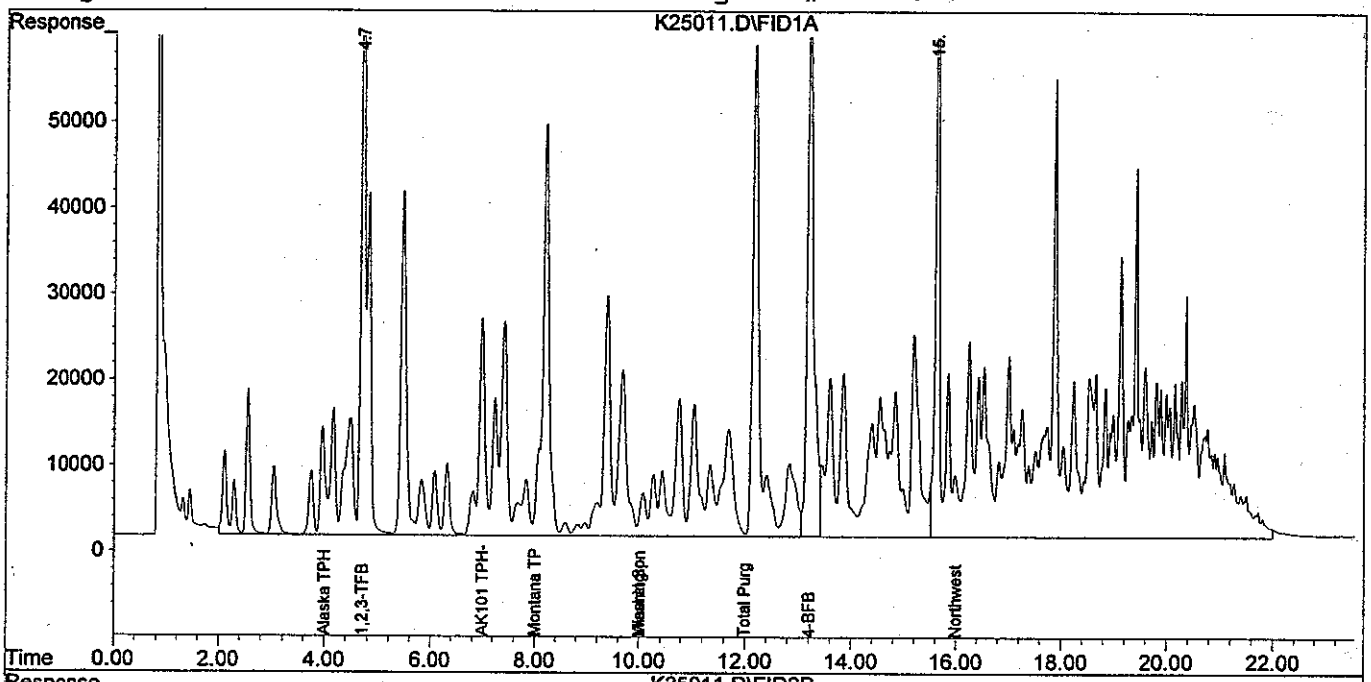
Quantitation Report

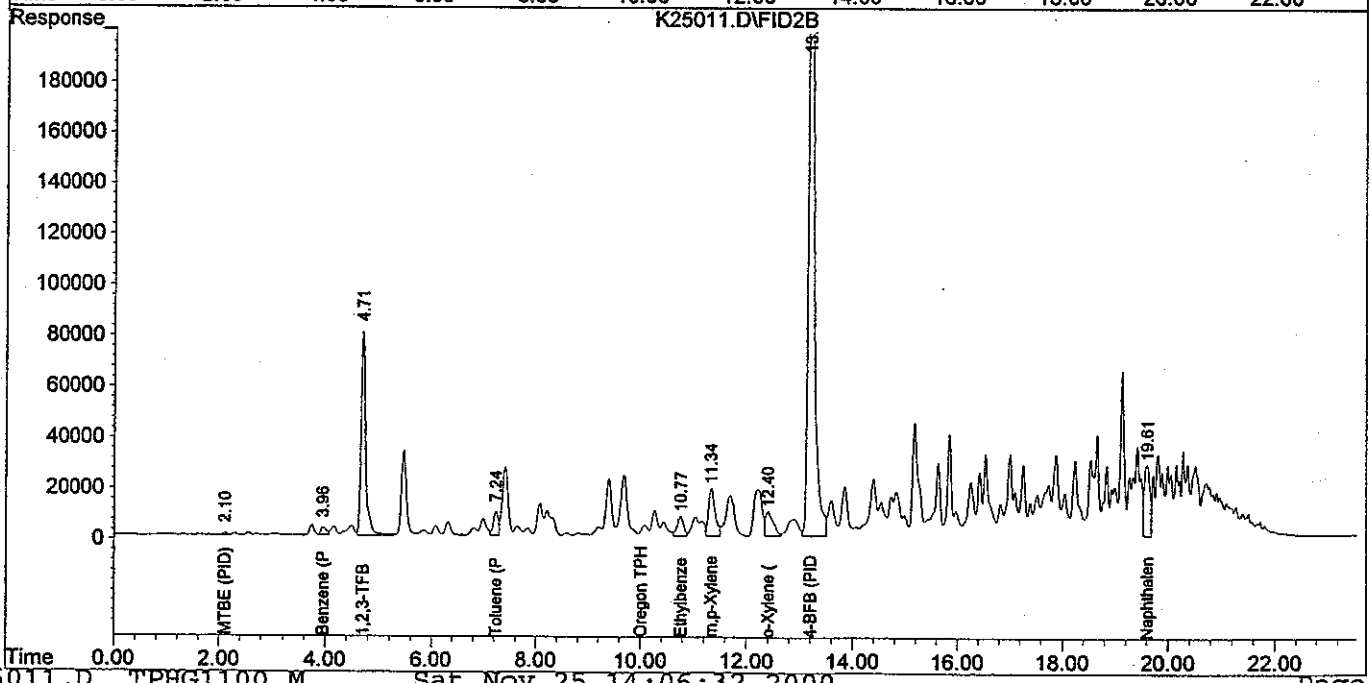
Signal #1 : D:\HPCHEM\4\DATA\112500\K25011.D\FID1A.CH Vial: 11
Signal #2 : D:\HPCHEM\4\DATA\112500\K25011.D\FID2B.CH
Acq On : 25 Nov 2000 1:42 pm Operator: GAP
Sample : b0k0455-12 r1 Inst : GC #8
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E

Quant Time: Nov 25 14:06 2000 Quant Results File: TPHG1100.RES

Quant Method : D:\HPCHEM\4\METHODS\TPHG1100.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Mon Nov 20 13:50:56 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG1100.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Signal #1 : D:\HPCHEM\3\DATA\111700\K17009.D\FID1A.CH Vial: 9
Signal #2 : D:\HPCHEM\3\DATA\111700\K17009.D\FID2B.CH
Acq On : 17 Nov 2000 10:50 am
Sample : B0K0455-01
Misc : 100 ul

Operator: GAP
Inst : GC #6
Multiplr: 1.00
Sample Amount: 0.00

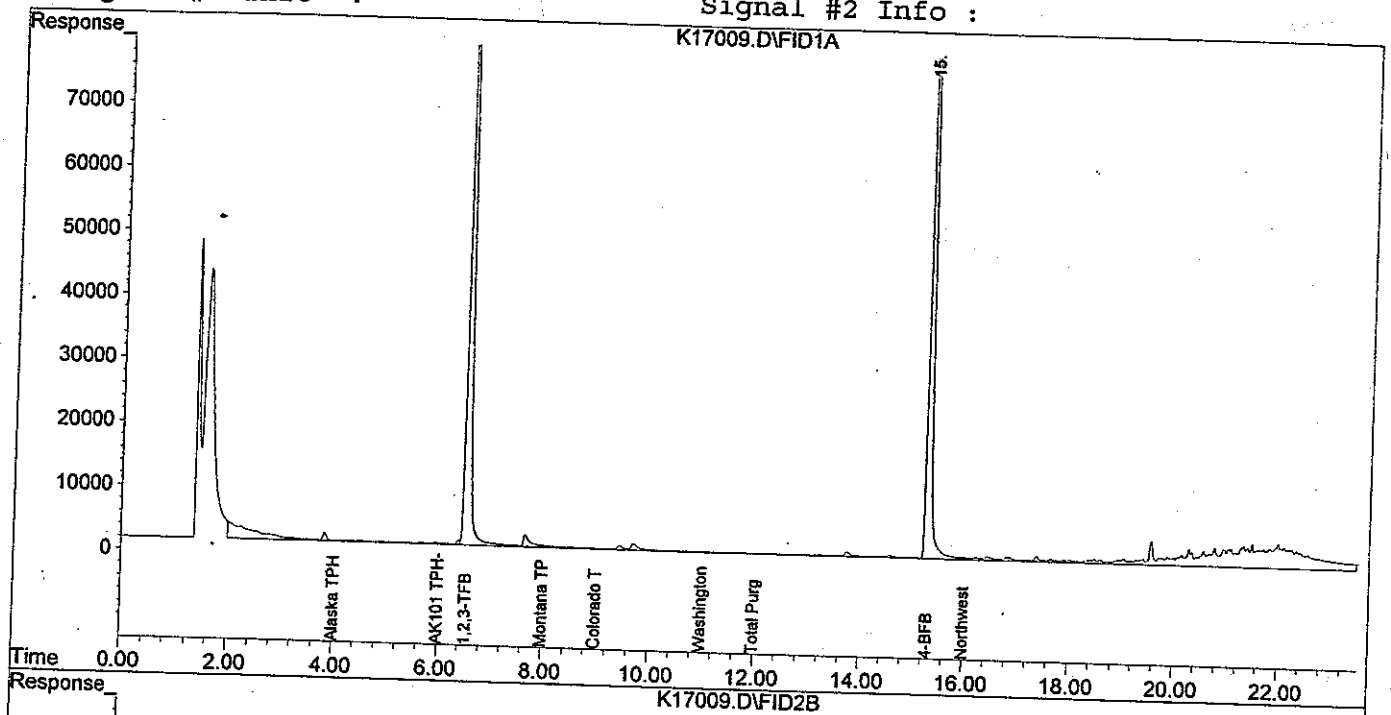
IntFile Signal #1: SURR.E IntFile Signal #2: SURR2.E

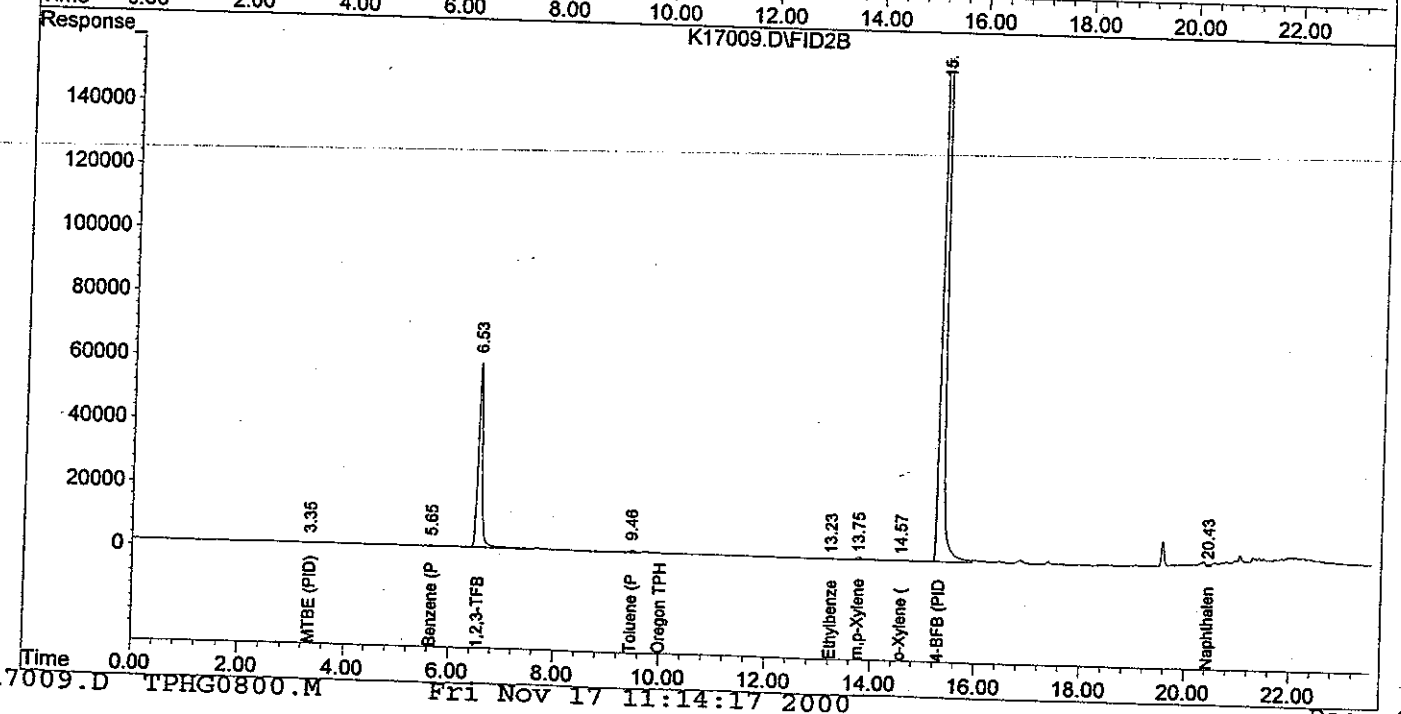
Quant Time: Nov 17 11:14 2000 Quant Results File: TPHG0800.RES

Quant Method : D:\HPCHEM\3\METHODS\TPHG0800.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Tue Nov 14 14:57:50 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG0800.M

Volume Inj. :
Signal #1 Phase :
Signal #1 Info :

Signal #2 Phase:
Signal #2 Info :





Quantitation Report

Signal #1 : D:\HPCHEM\3\DATA\111700\K17010.D\FID1A.CH Vial: 10
Signal #2 : D:\HPCHEM\3\DATA\111700\K17010.D\FID2B.CH
Acq On : 17 Nov 2000 11:20 am
Sample : B0K0455-02
Misc : 100 ul

Operator: GAP
Inst : GC #6
Multiplr: 1.00
Sample Amount: 0.00

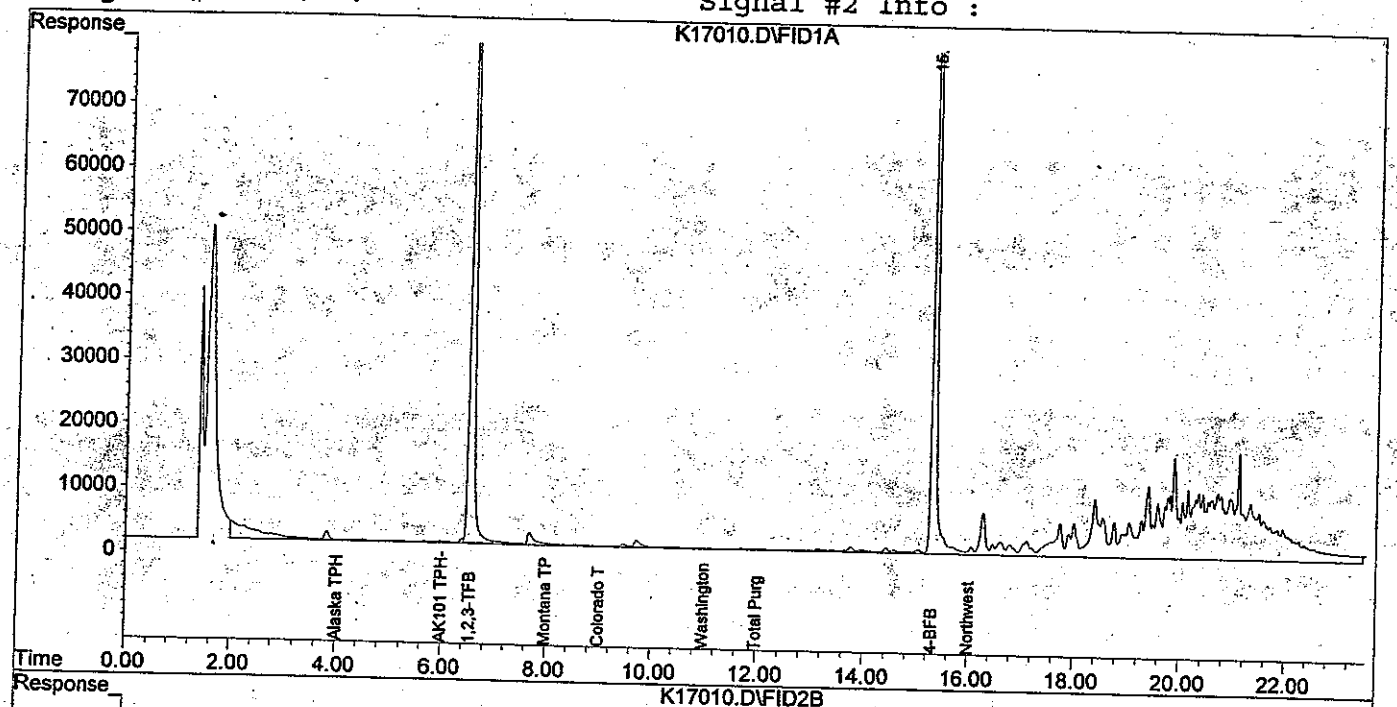
IntFile Signal #1: SURR.E IntFile Signal #2: SURR2.E

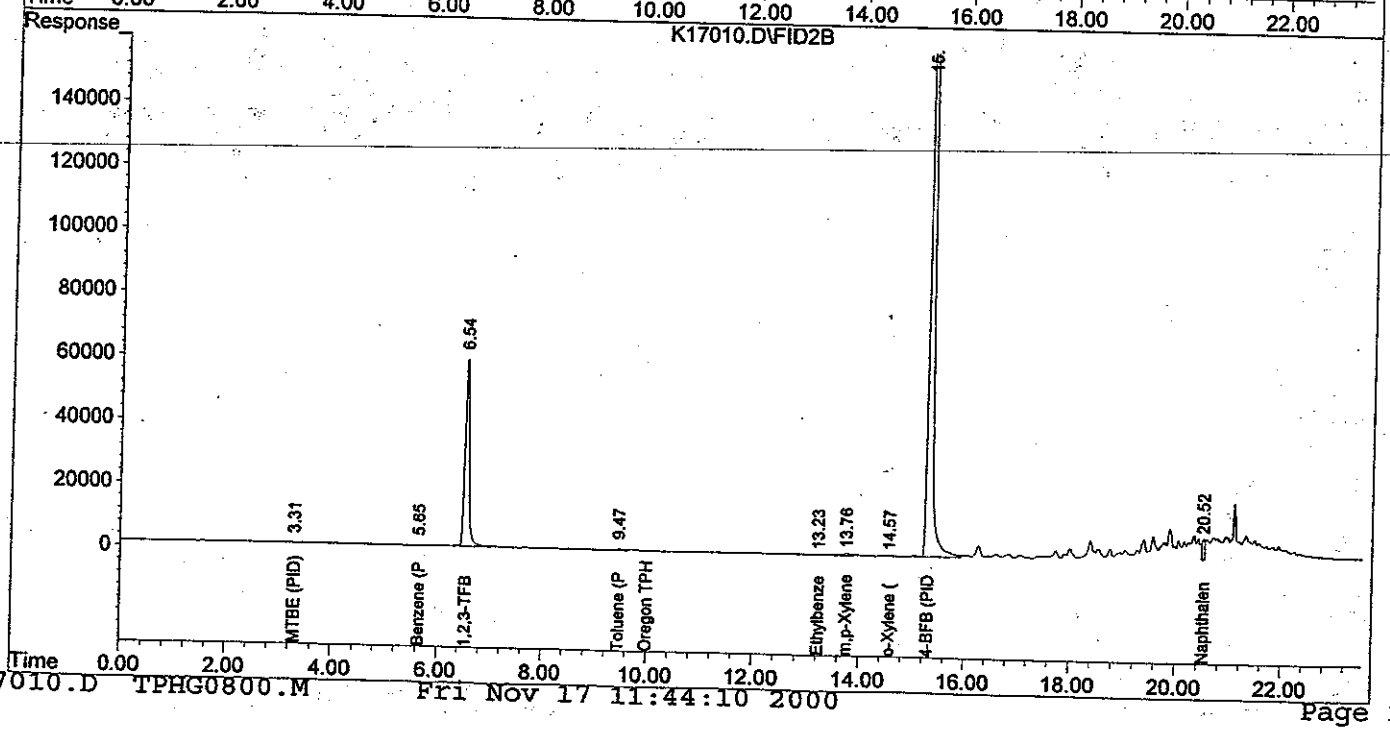
Quant Time: Nov 17 11:44 2000 Quant Results File: TPHG0800.RES

Quant Method : D:\HPCHEM\3\METHODS\TPHG0800.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Tue Nov 14 14:57:50 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG0800.M

Volume Inj. :
Signal #1 Phase :
Signal #1 Info :

Signal #2 Phase:
Signal #2 Info :





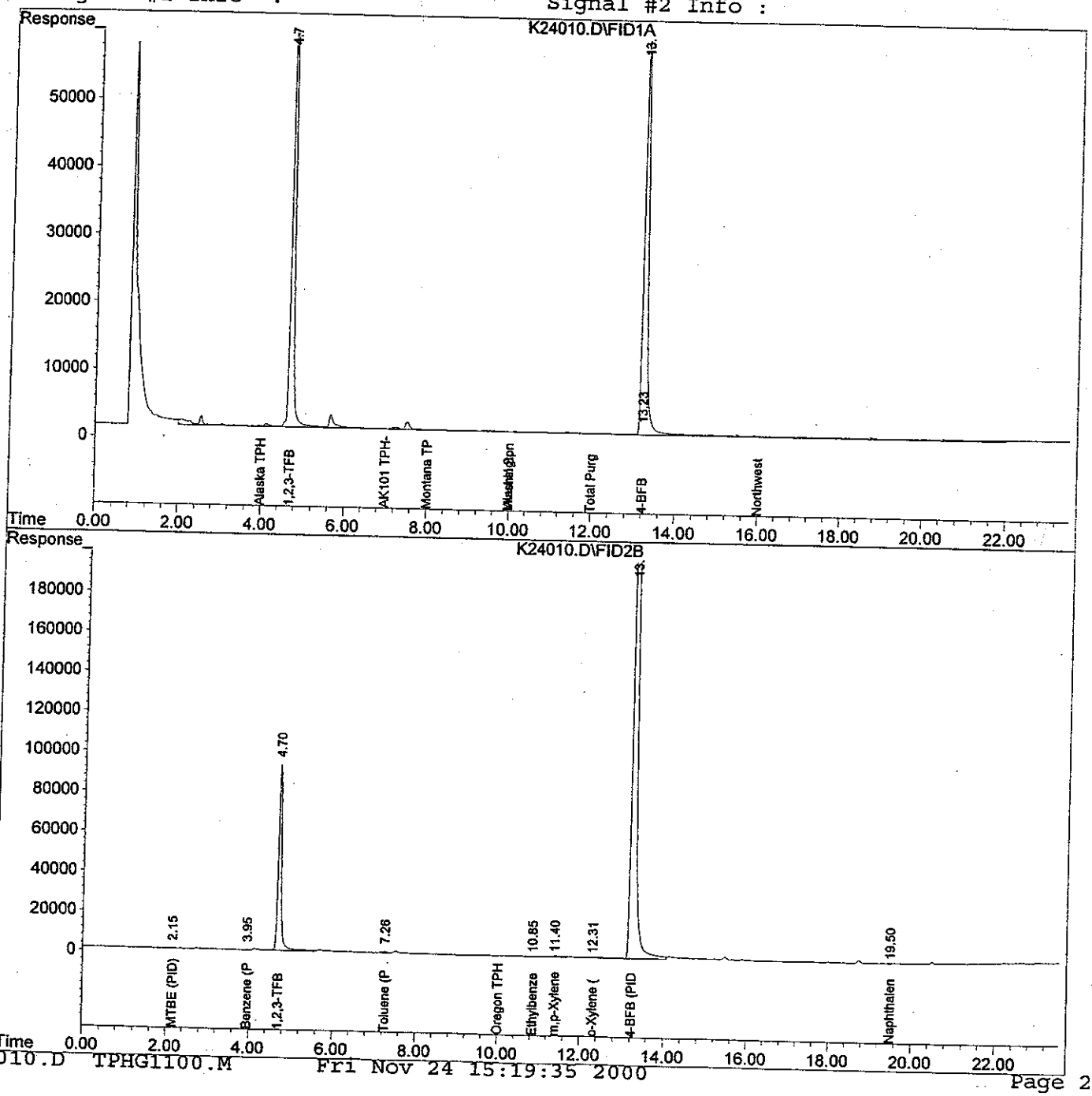
Signal #1 : D:\HPCHEM\4\DATA\112400\K24010.D\FID1A.CH Vial: 10
Signal #2 : D:\HPCHEM\4\DATA\112400\K24010.D\FID2B.CH
Acq On : 24 Nov 2000 2:55 pm Operator: GAP
Sample : b0k0455-13 Inst : GC #8
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00

IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E

Quant Time: Nov 24 15:19 2000 Quant Results File: TPHG1100.RES

Quant Method : D:\HPCHEM\4\METHODS\TPHG1100.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Mon Nov 20 13:50:56 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG1100.M

Volume Inj. :
Signal #1 Phase :
Signal #1 Info :
Signal #2 Phase:
Signal #2 Info :



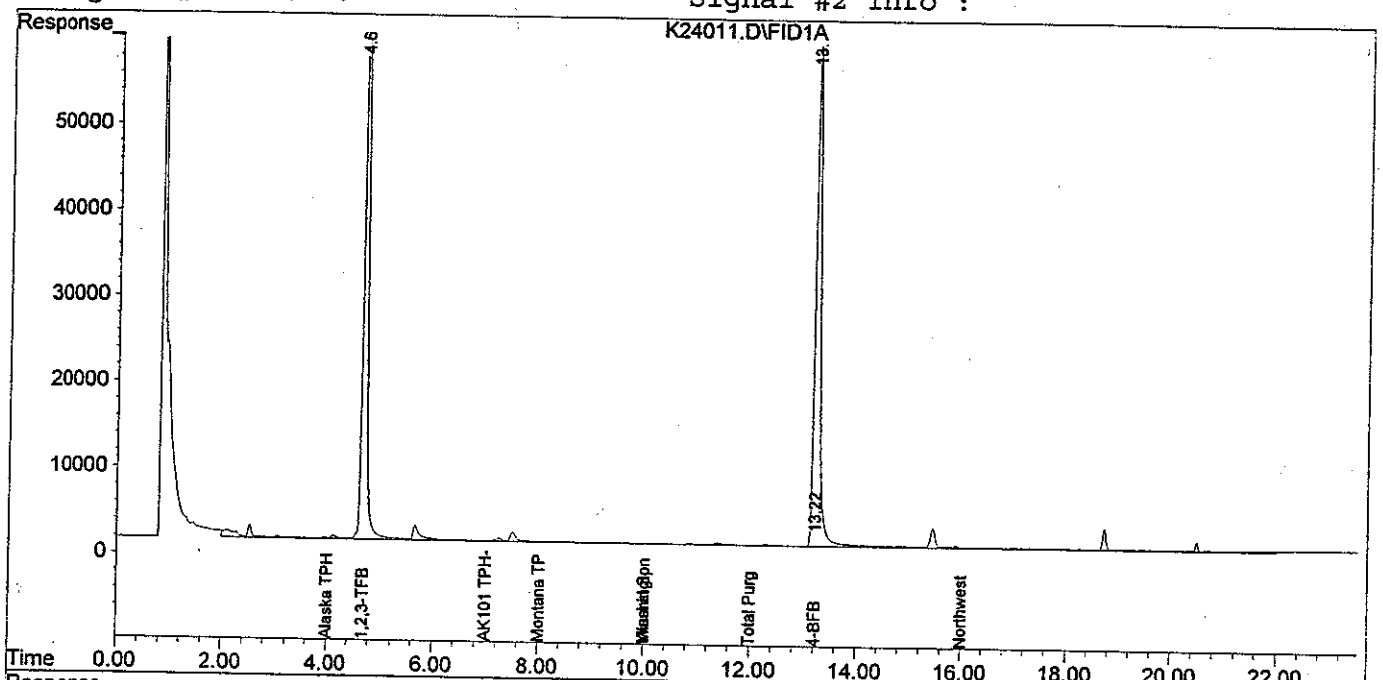
Signal #1 : D:\HPCHEM\4\DATA\112400\K24011.D\FID1A.CH Vial: 11
Signal #2 : D:\HPCHEM\4\DATA\112400\K24011.D\FID2B.CH
Acq On : 24 Nov 2000 3:25 pm Operator: GAP
Sample : b0k0455-14 Inst : GC #8
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00

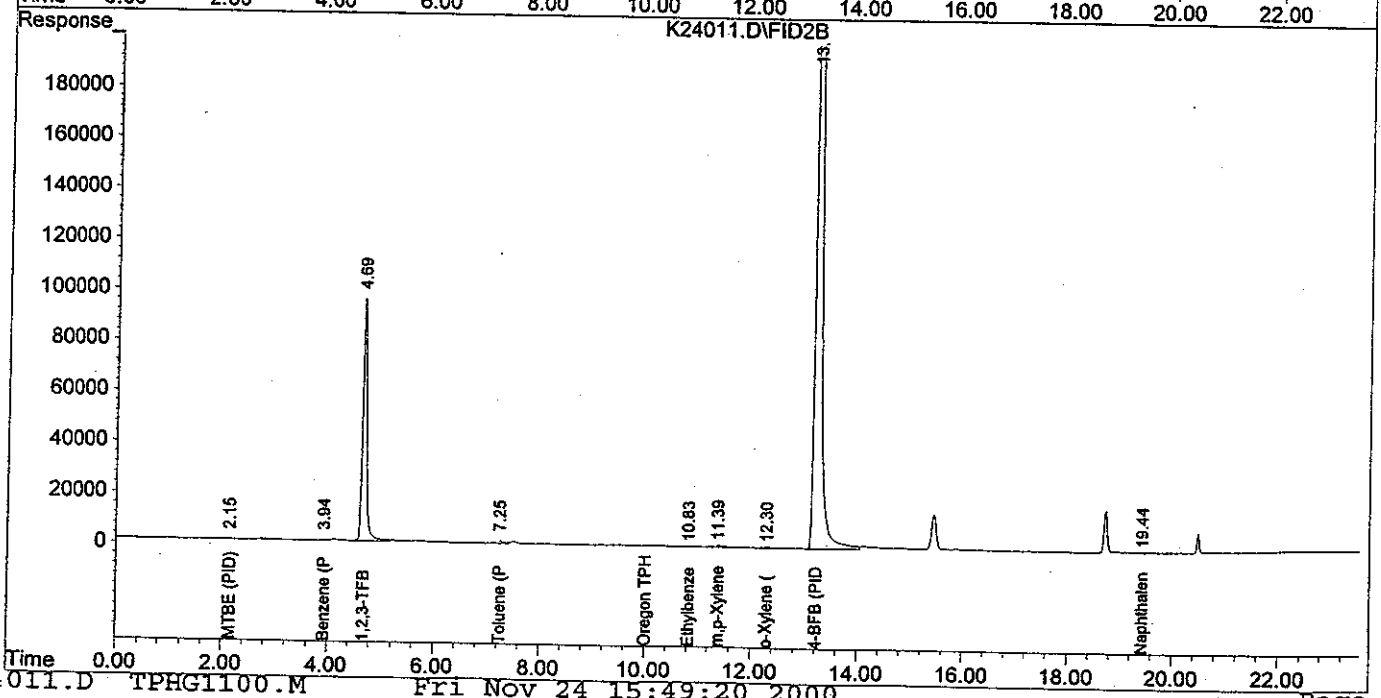
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E

Quant Time: Nov 24 15:49 2000 Quant Results File: TPHG1100.RES

Quant Method : D:\HPCHEM\4\METHODS\TPHG1100.M (Chemstation Integrator)
Title : TPH-G Water Method
Last Update : Mon Nov 20 13:50:56 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG1100.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report

Data File : D:\HPCHEM\4\DATA.SEC\K17027.D
Acq On : 11-17-00 11:22:17
Sample : b0k0455-03
Misc : w

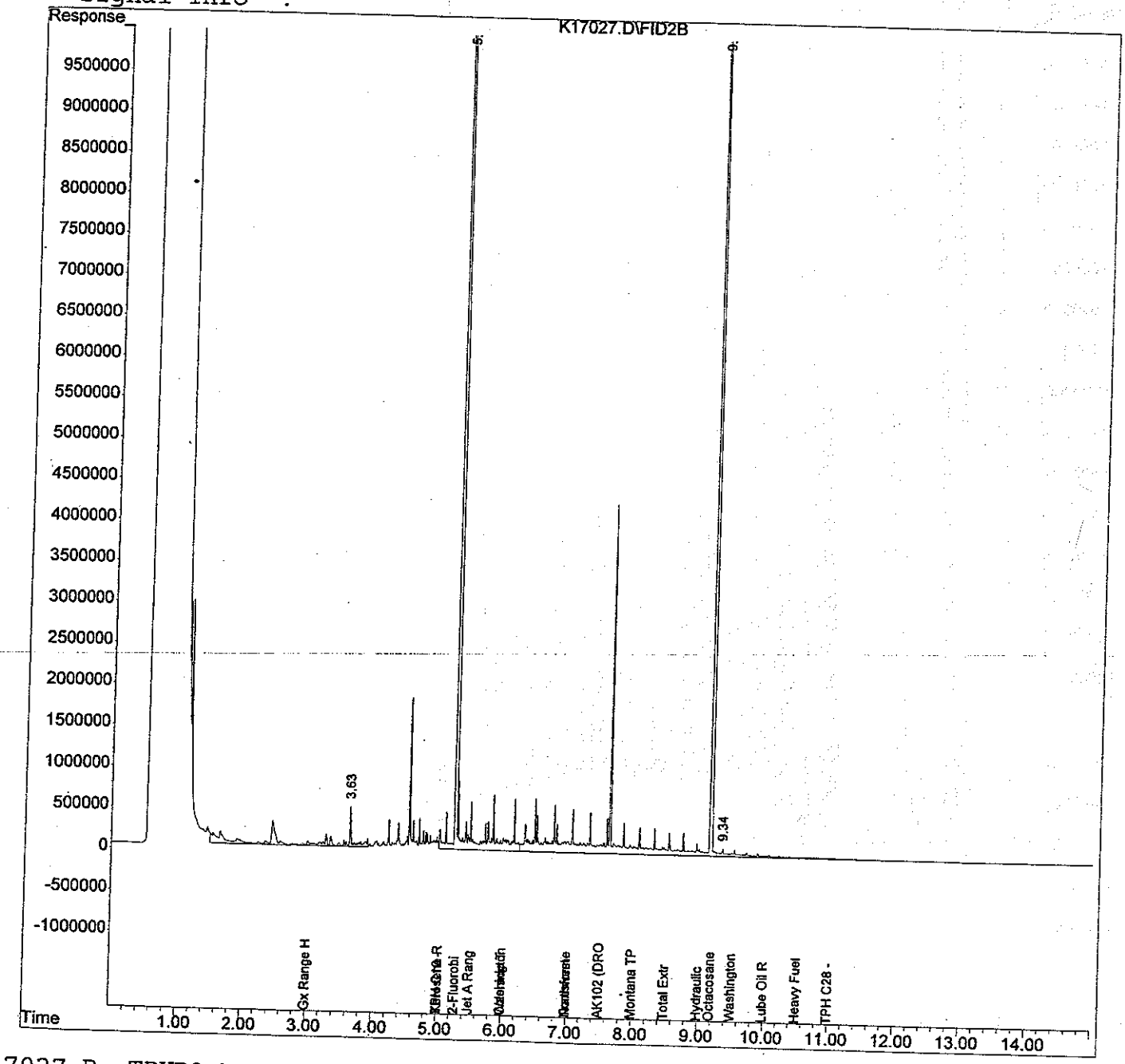
IntFile : SURR.E

Vial: 21
Operator: DB
Inst : GC# 7
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Nov 17 11:37 2000 Quant Results File: TPHD2.RES

Quant Method : D:\HPCHEM\4\METHODS\TPHD2.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 06:58:16 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Data File : D:\HPCHEM\4\DATA.SEC\K17043.D
Acq On : 11-17-00 14:20:37
Sample : b0k0455-04
Misc : W R1

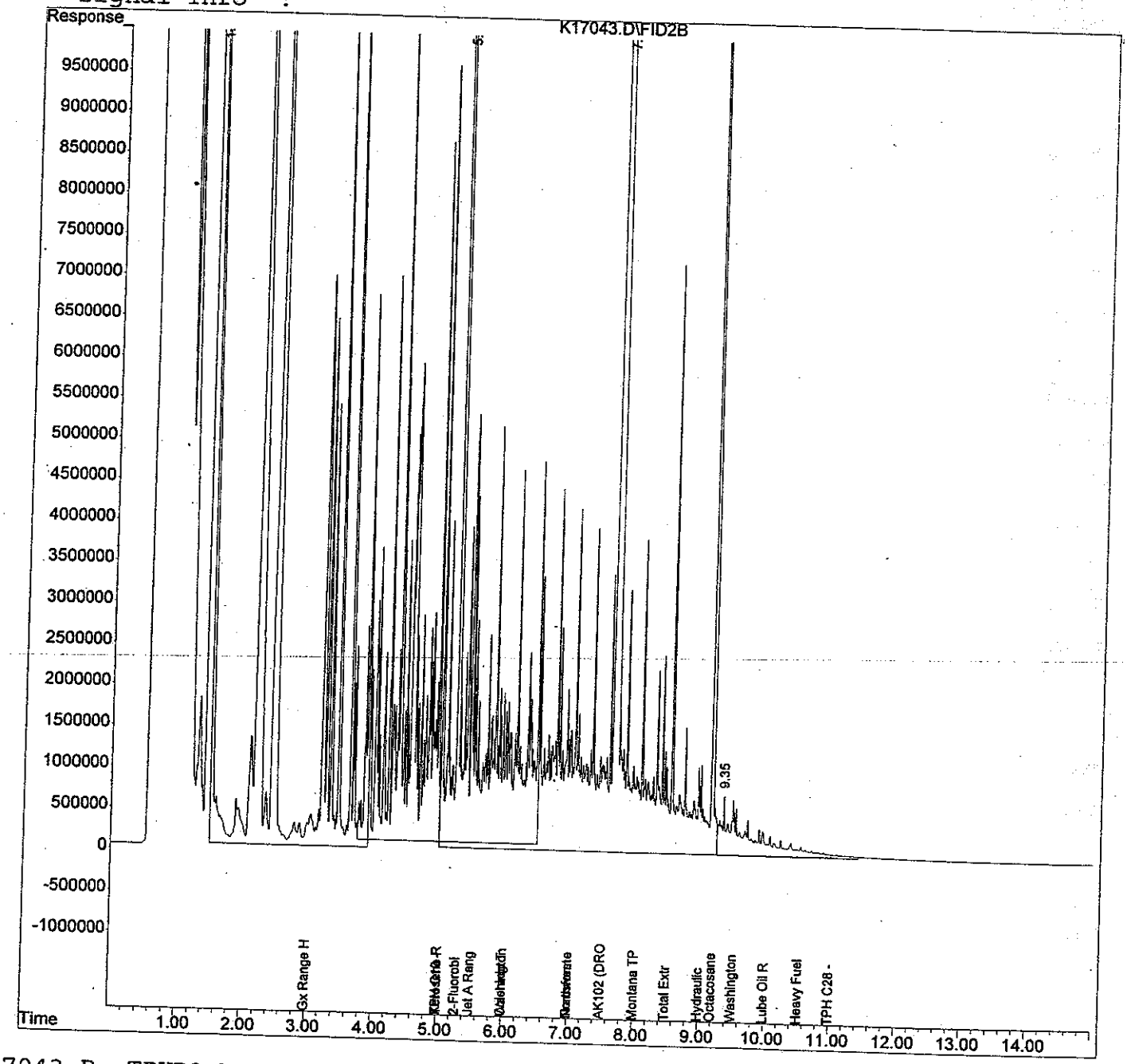
IntFile : SURR.E

Vial: 22
Operator: DB
Inst : GC# 7
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Nov 17 14:36 2000 Quant Results File: TPHD2.RES

Quant Method : D:\HPCHEM\4\METHODS\TPHD2.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 06:58:16 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :

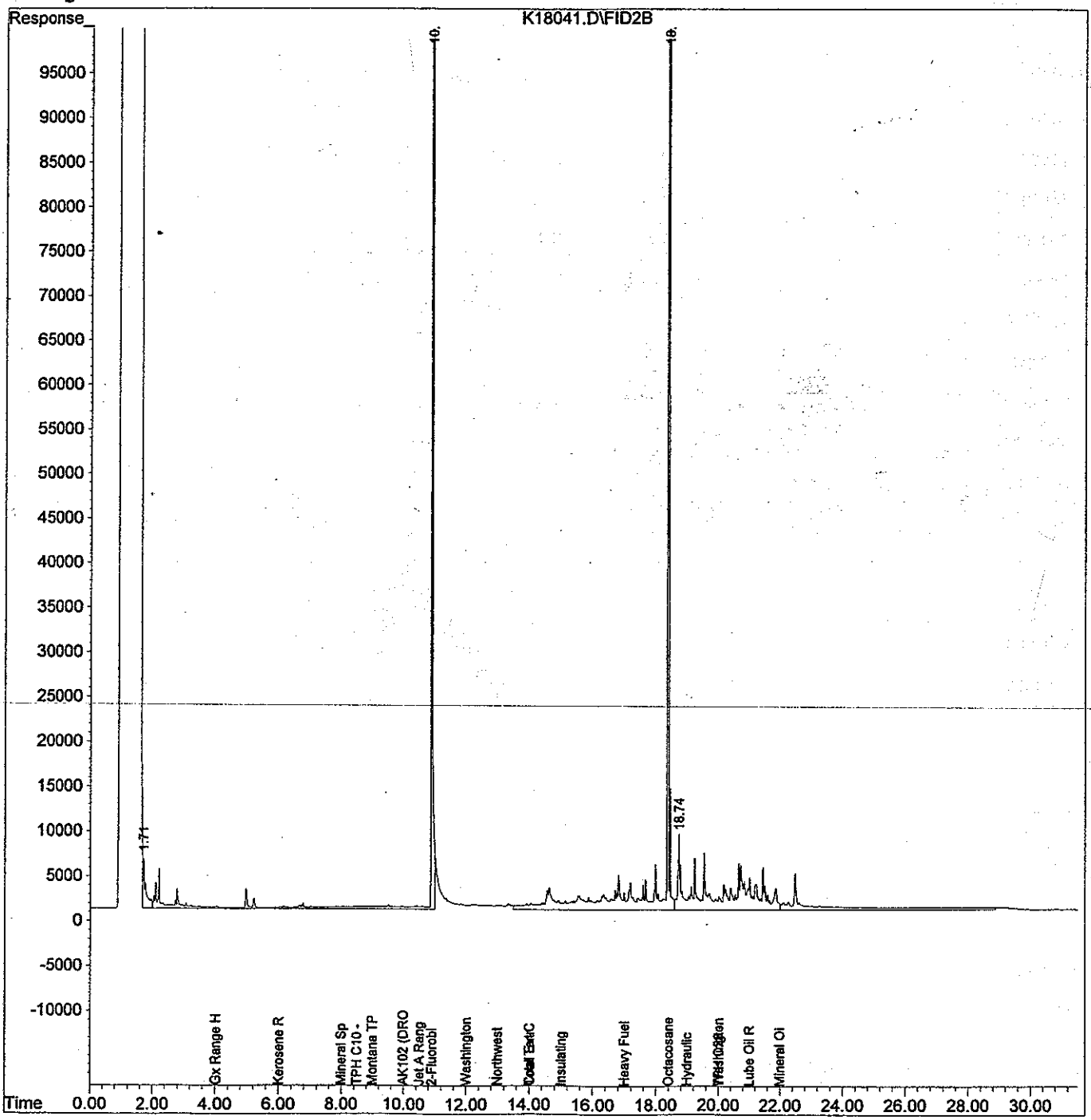


Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K18041.D Vial: 34
Acq On : 19 Nov 2000 12:10 am Operator: db
Sample : b0k0455-02 Inst : GC #5
Misc : S Multiplr: 1.00
IntFile : SURR.E
Quant Time: Nov 19 0:43 2000 Quant Results File: TPHD2.RES

Quant Method : C:\HPCHEM\3\METHODS\TPHD2.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Sep 27 08:25:47 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Data File : D:\HPCHEM\1\DATA.SEC\K17037.D
Acq On : 11-17-00 13:22:27
Sample : b0k0445-09
Misc : S

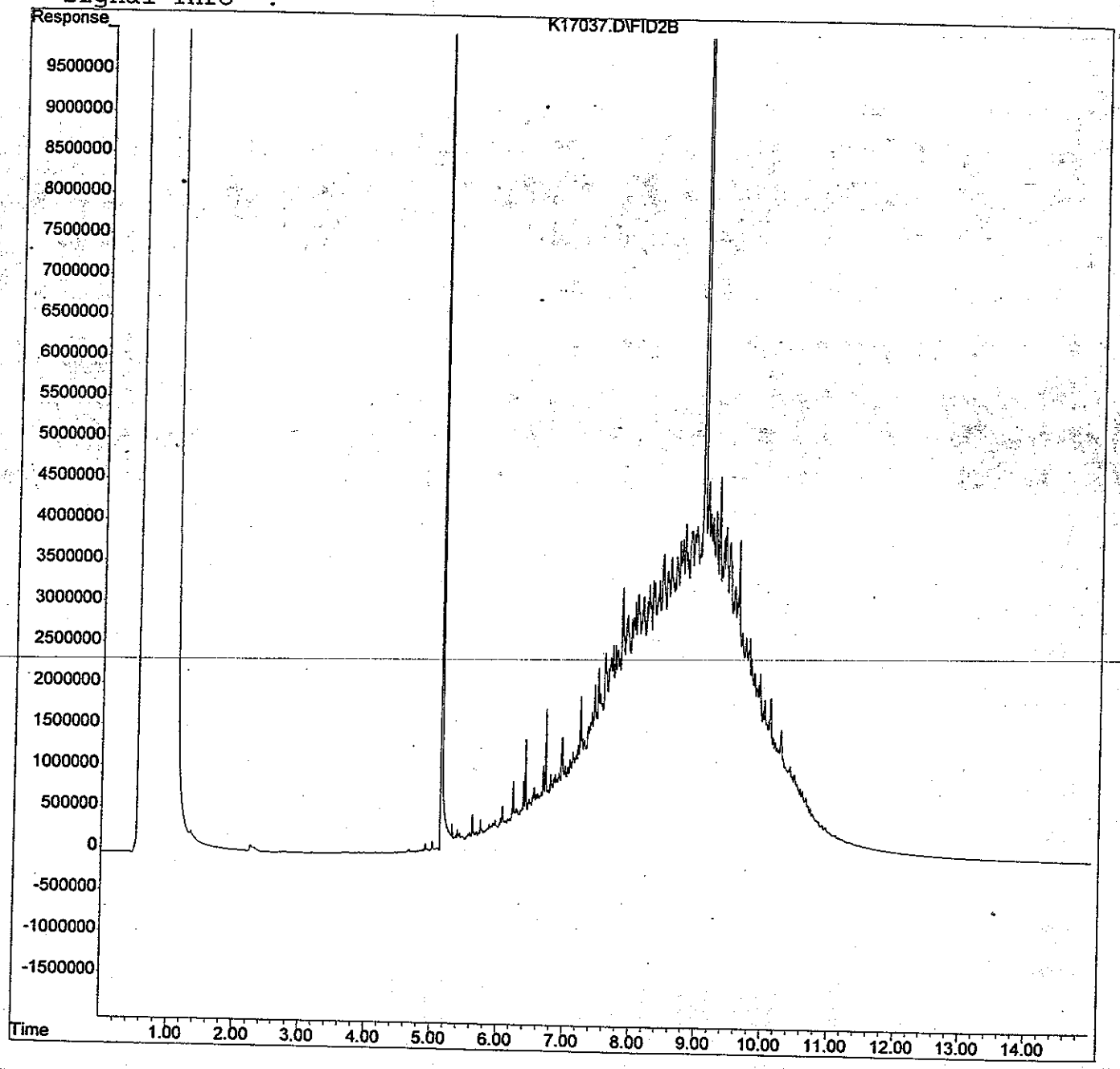
Vial: 24
Operator: BN
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

IntFile : SURR.E

Quant Time: Nov 17 13:38 2000 Quant Results File: TPHD2.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD2.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:12:24 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Data File : D:\HPCHEM\1\DATA\K17038.D
Acq On : 11-17-00 13:22:27
Sample : b0k0445-10
Misc : S

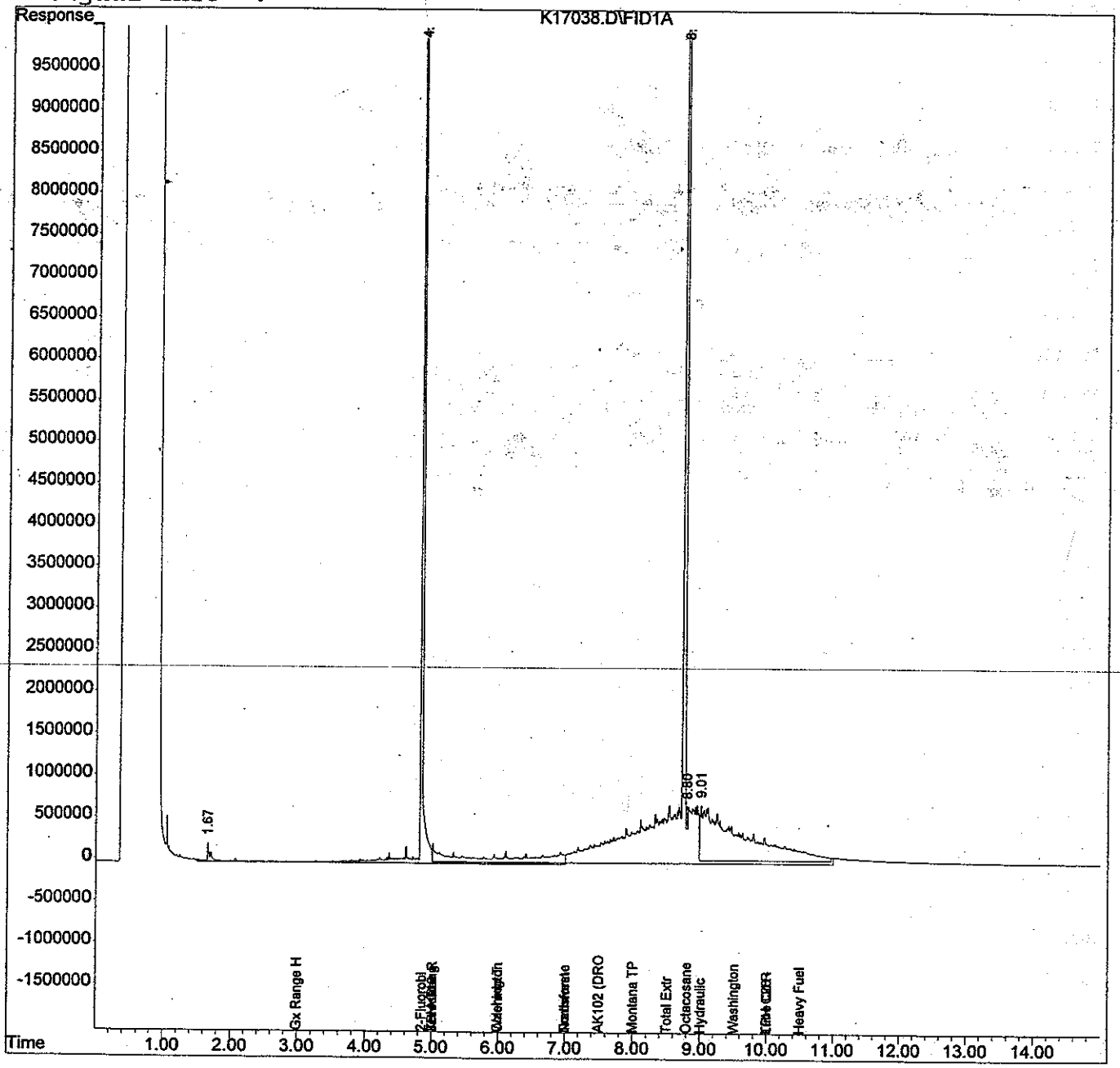
IntFile : SURR.E

Vial: 25
Operator: BN
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Nov 17 13:37 2000 Quant Results File: TPHD.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:07:18 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Data File : D:\HPCHEM\1\DATA\K26014.D
Acq On : 11-26-00 8:33:25
Sample : b0k0455-05
Misc : s ~~Sx~~

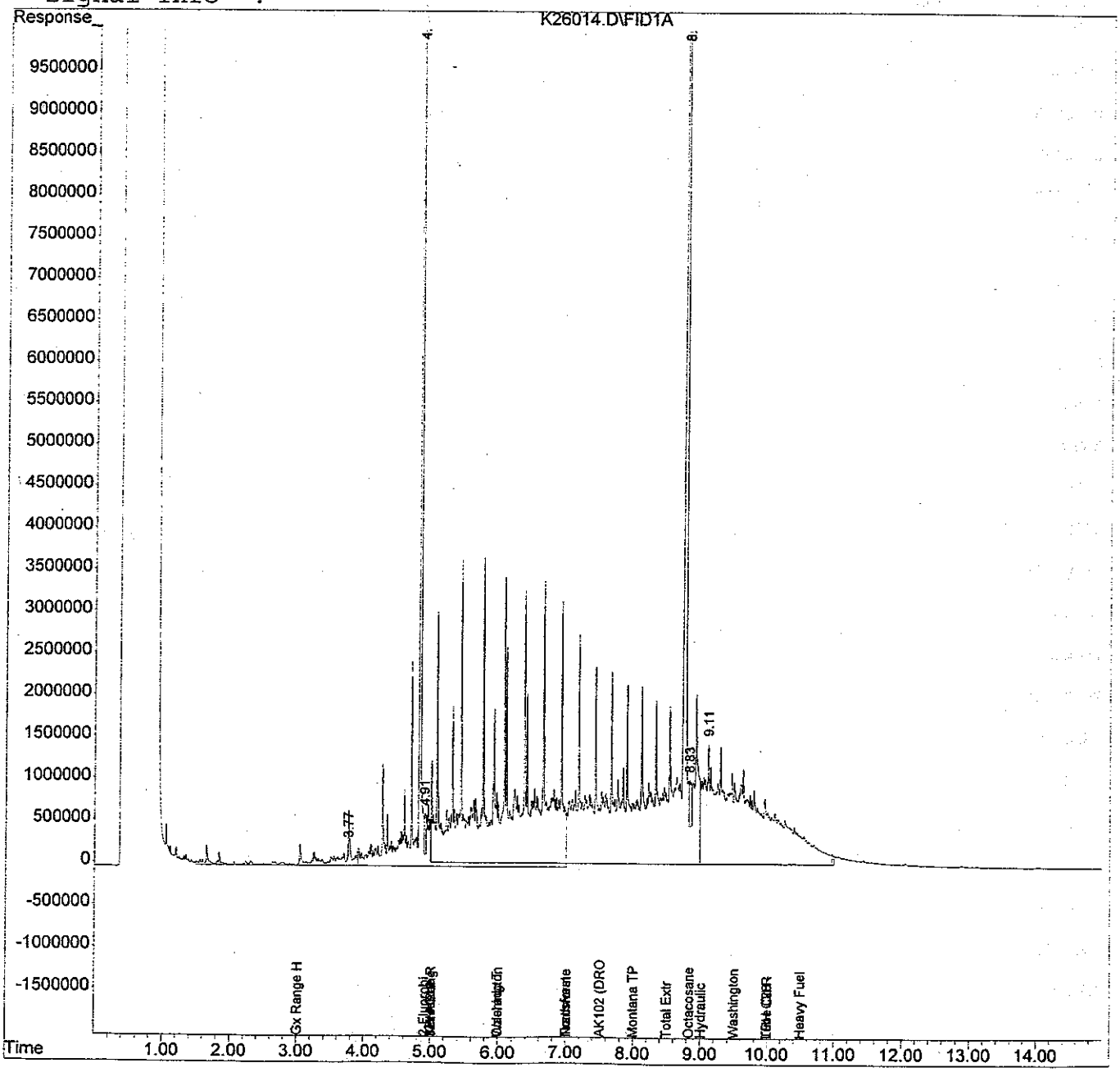
IntFile : SURR.E

Vial: 11
Operator: EP
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Nov 26 8:48 2000 Quant Results File: TPHD.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:07:18 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Data File : D:\HPCHEM\1\DATA.SEC\K26015.D
Acq On : 11-26-00 8:55:25
Sample : b0k0455-06
Misc : s 5

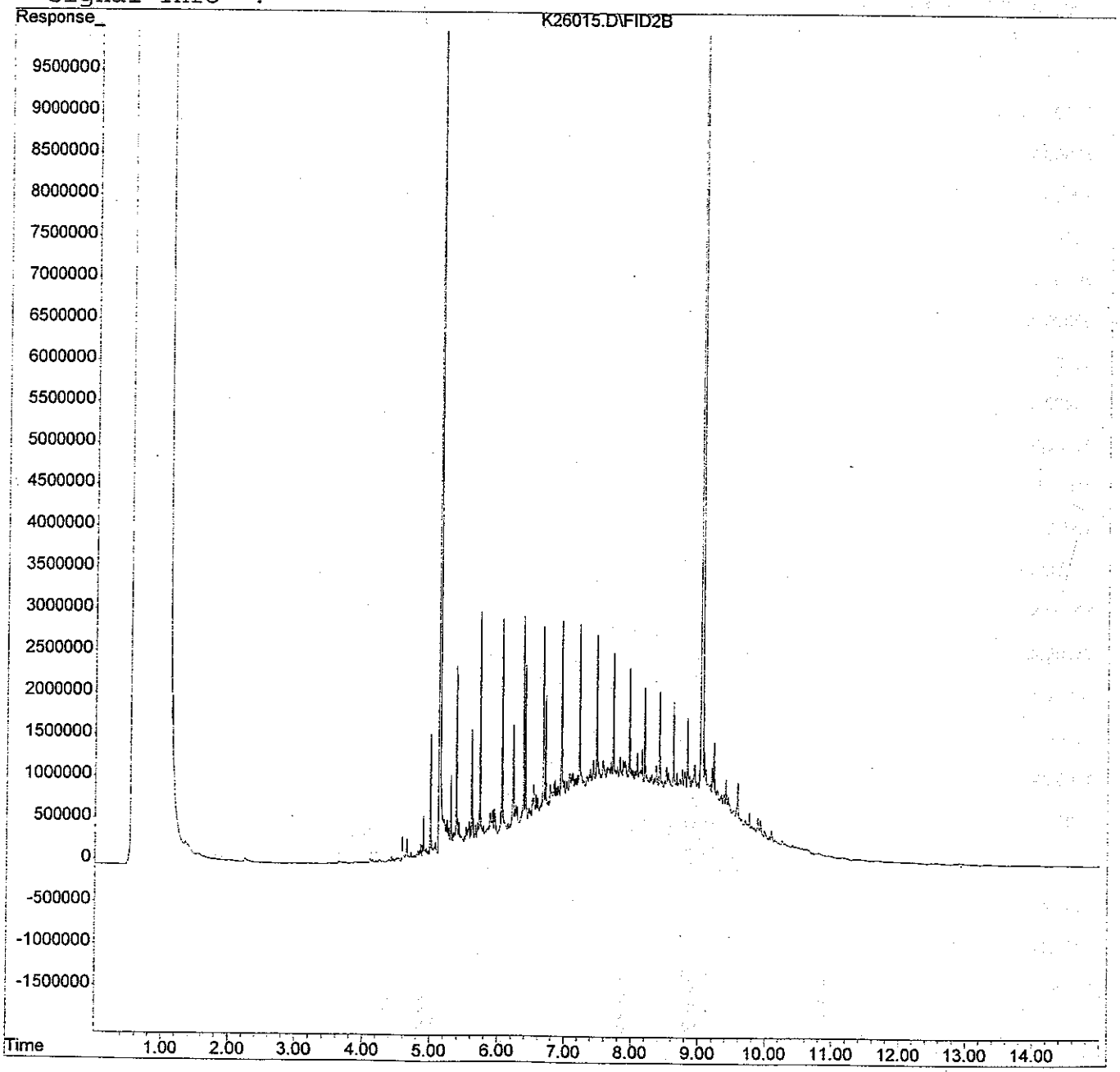
IntFile : SURR.E

Vial: 12
Operator: EP
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Nov 26 9:11 2000 Quant Results File: TPHD2.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD2.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:12:24 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Data File : D:\HPCHEM\1\DATA\K26016.D
Acq On : 11-26-00 8:55:25
Sample : b0k0455-08
Misc : s ~~5x~~

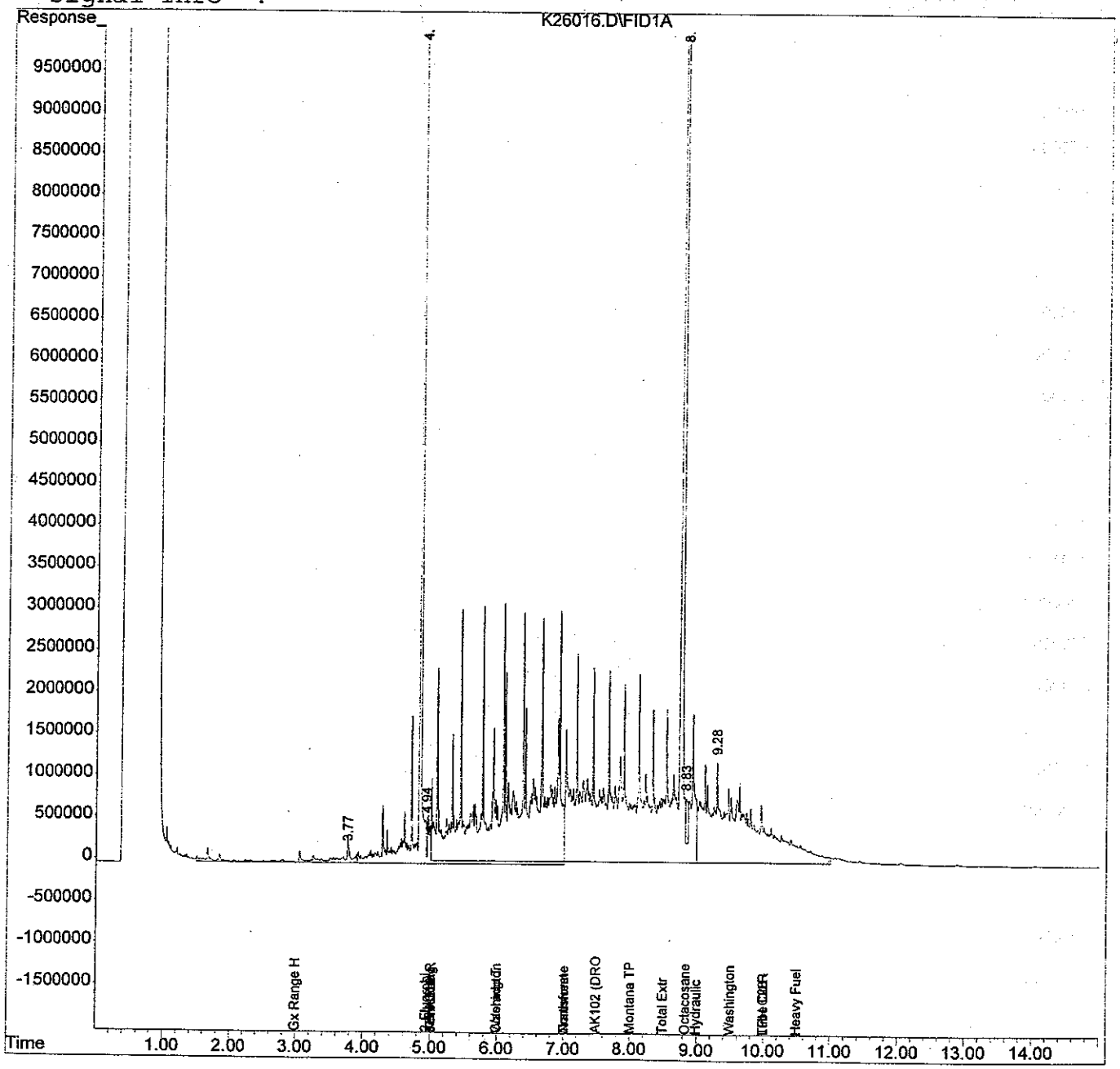
IntFile : SURR.E

Vial: 13
Operator: EP
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Nov 26 9:10 2000 Quant Results File: TPHD.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:07:18 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Data File : D:\HPCHEM\1\DATA.SEC\K26019.D
Acq On : 11-26-00 9:40:31
Sample : b0k0455-09
Misc : s

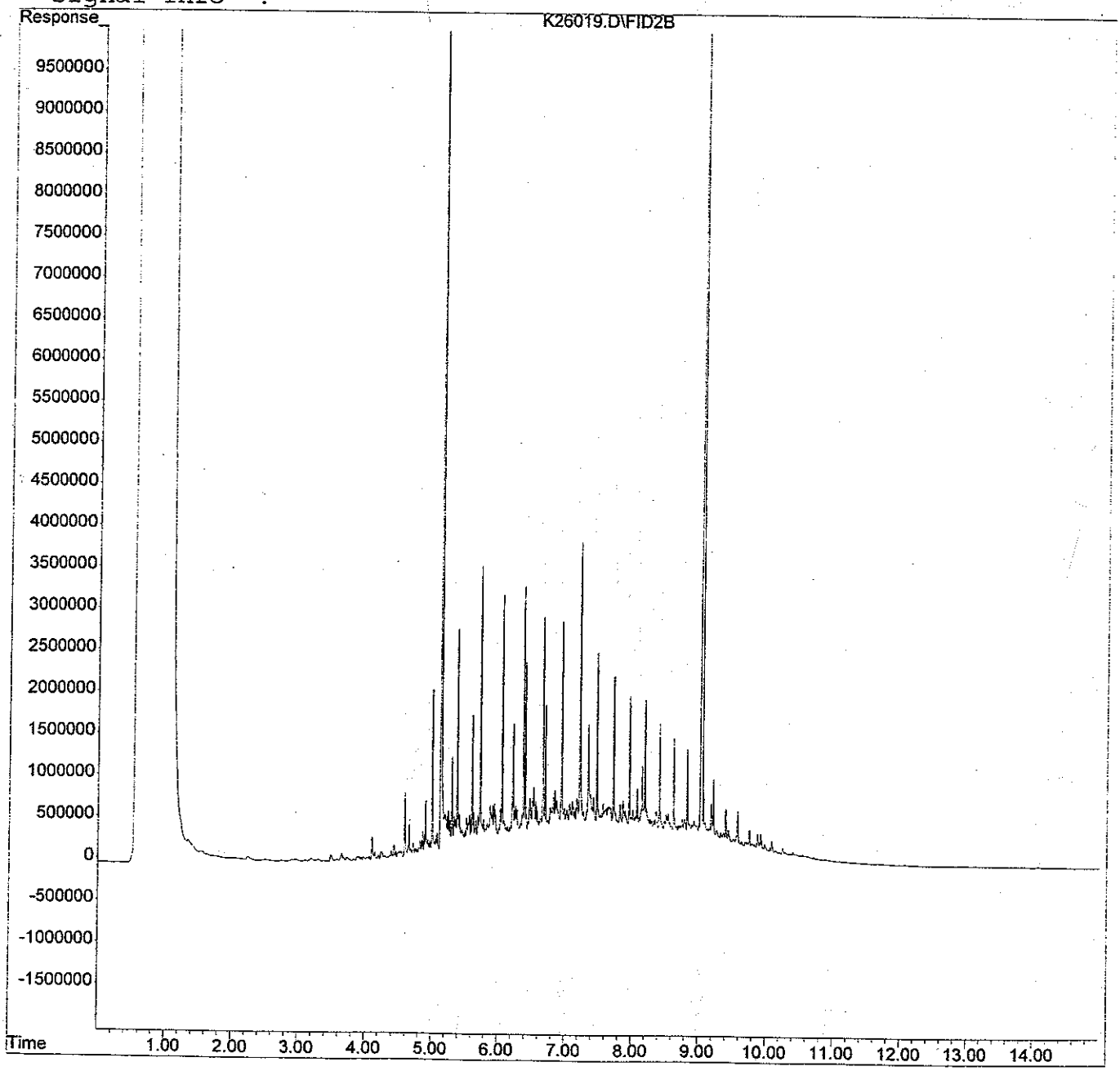
IntFile : SURR.E

Vial: 14
Operator: EP
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Nov 26 9:56 2000 Quant Results File: TPHD2.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD2.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:12:24 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Data File : D:\HPCHEM\1\DATA\K26020.D
Acq On : 11-26-00 9:40:31
Sample : b0k0455-10
Misc : s

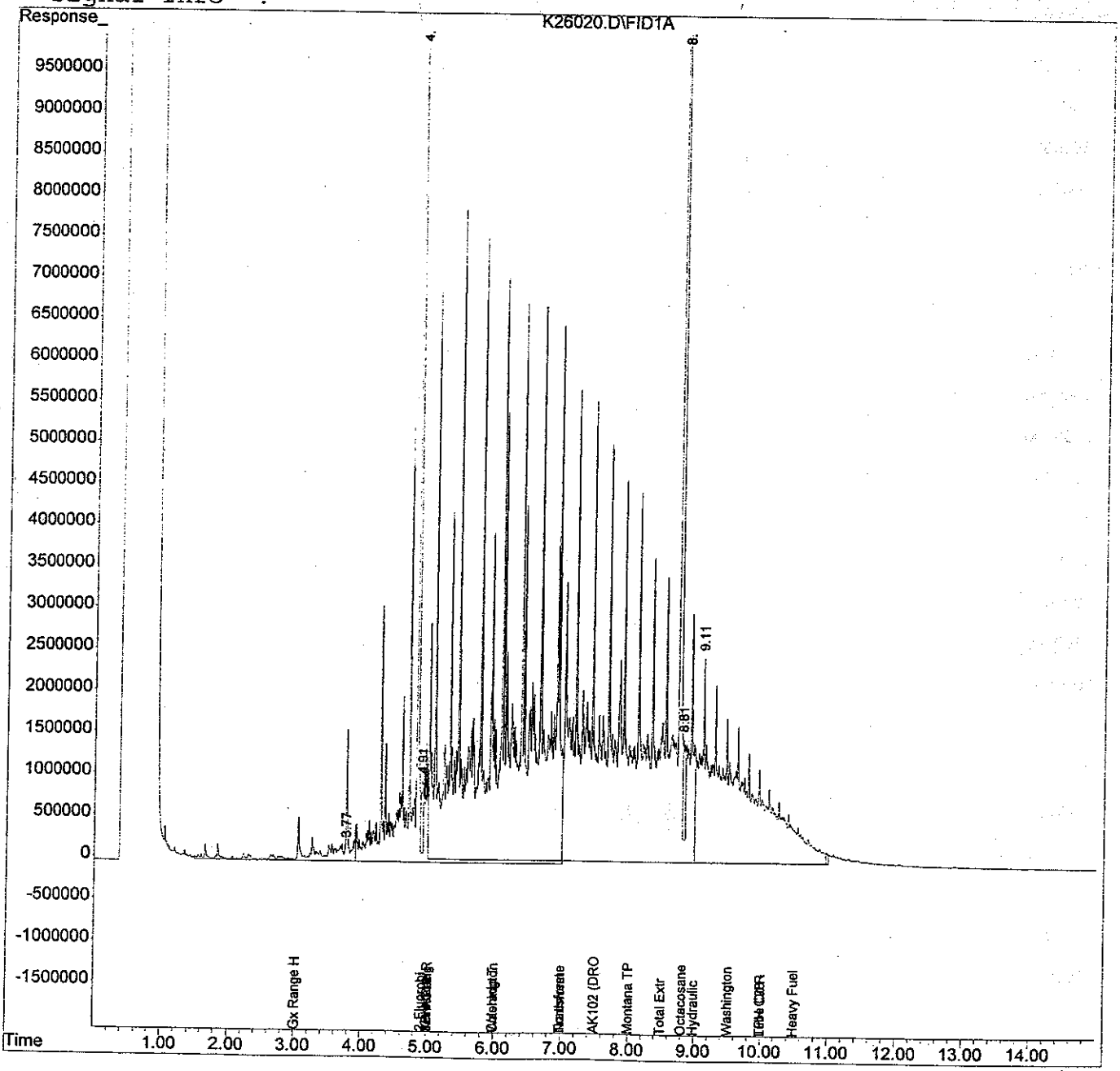
IntFile : SURR.E

Vial: 15
Operator: EP
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Nov 26 9:55 2000 Quant Results File: TPHD.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:07:18 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Data File : D:\HPCHEM\1\DATA.SEC\K26021.D
Acq On : 11-26-00 10:02:46
Sample : b0k0455-11
Misc : s

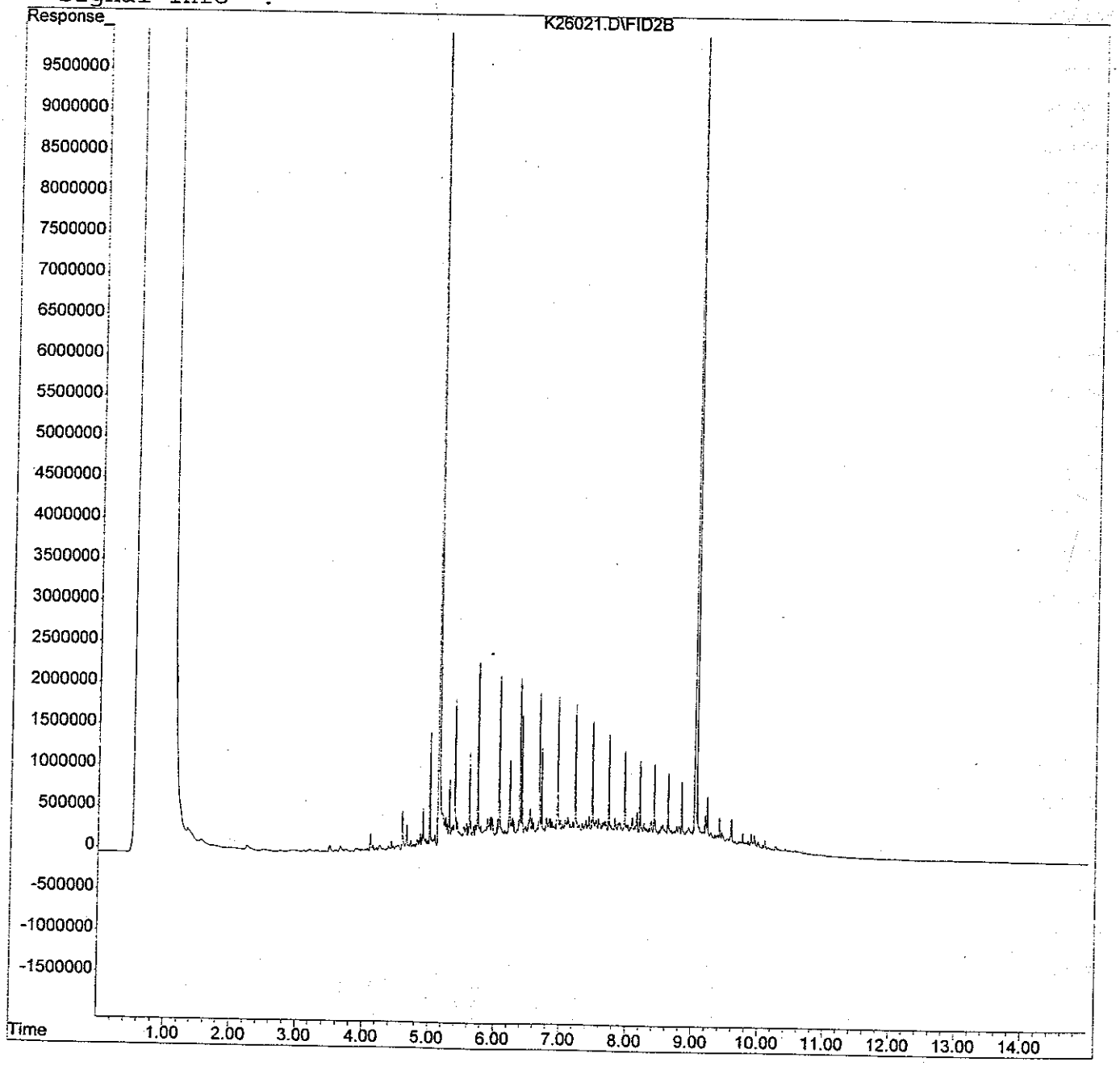
IntFile : SURR.E

Vial: 16
Operator: EP
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Nov 26 10:18 2000 Quant Results File: TPHD2.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD2.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:12:24 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Data File : D:\HPCHEM\1\DATA\K26022.D
Acq On : 11-26-00 10:02:46
Sample : b0k0455-12
Misc : s

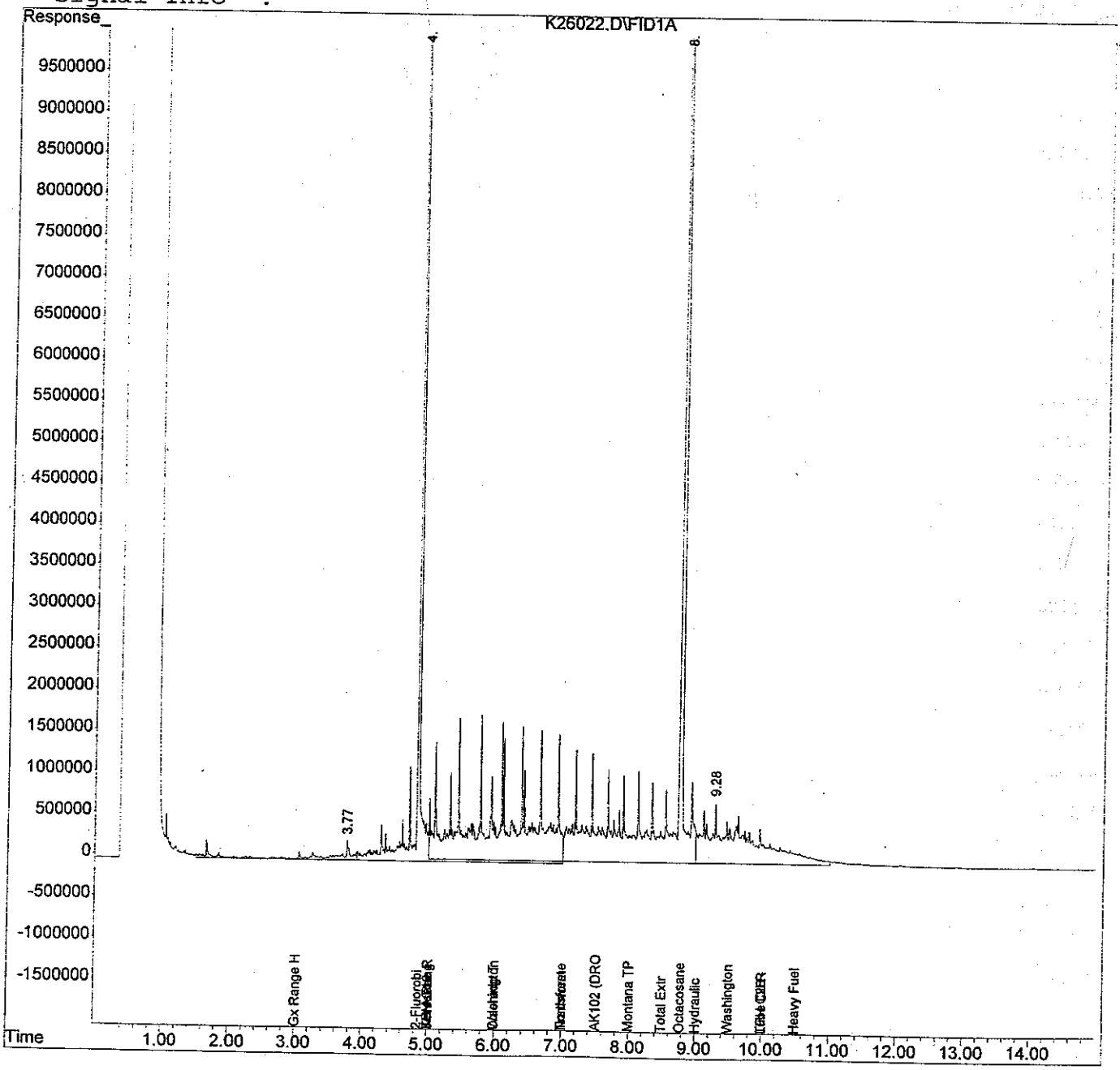
IntFile : SURR.E

Vial: 17
Operator: EP
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Nov 26 10:18 2000 Quant Results File: TPHD.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:07:18 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Data File : D:\HPCHEM\1\DATA.SEC\K26023.D
Acq On : 11-26-00 10:24:43
Sample : b0k0455-13
Misc : s

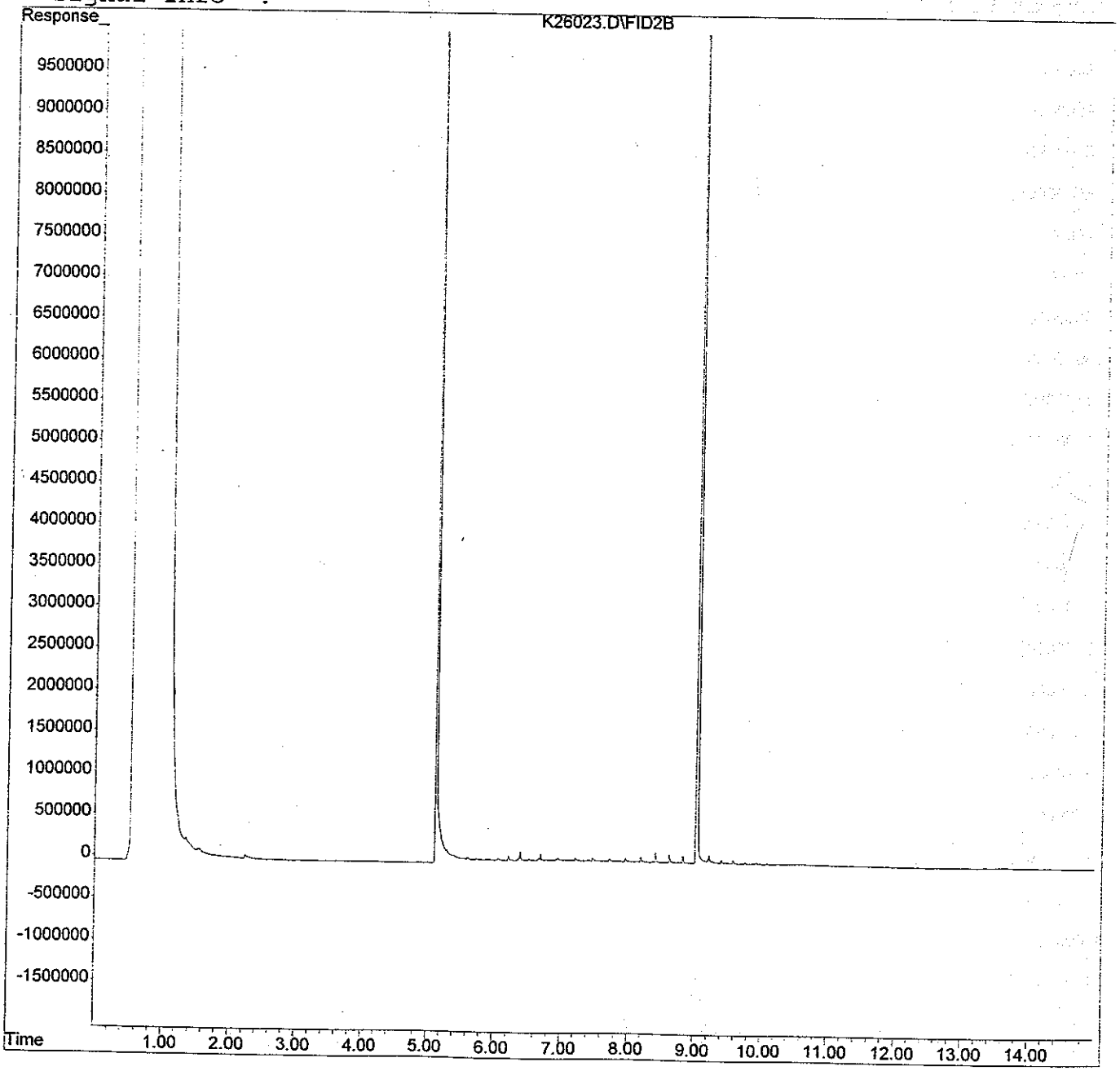
IntFile : SURR.E

Vial: 18
Operator: EP
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Nov 26 10:40 2000 Quant Results File: TPHD2.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD2.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:12:24 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Data File : D:\HPCHEM\1\DATA\K26024.D
Acq On : 11-26-00 10:24:43
Sample : b0k0455-14
Misc : s

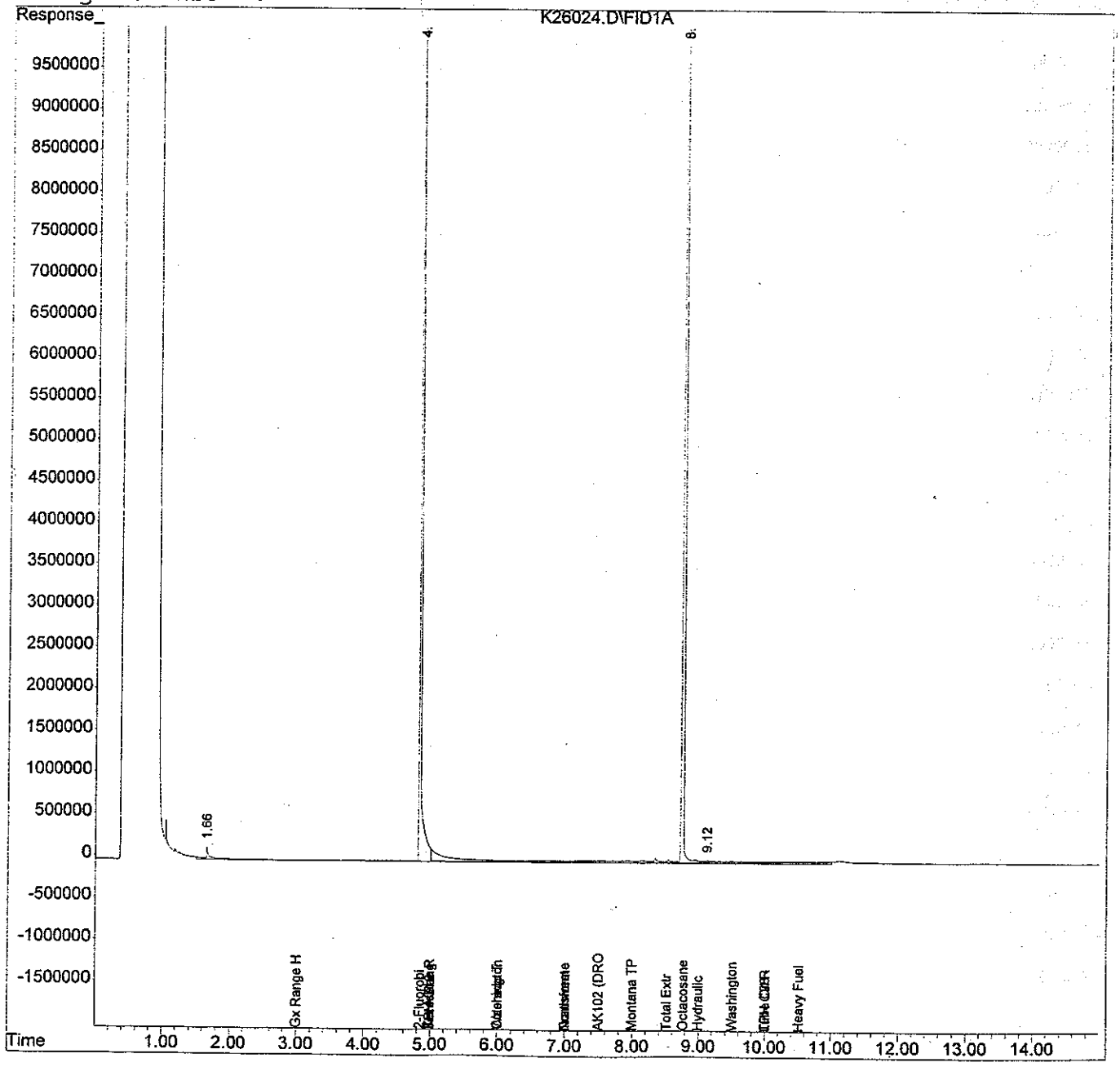
Vial: 19
Operator: EP
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

IntFile : SURR.E

Quant Time: Nov 26 10:40 2000 Quant Results File: TPHD.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:07:18 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



North Creek Analytical, Inc.
Environmental Laboratory Network
www.ncalabs.com

11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8244 (425) 420-9200 FAX 420-9210
[illegible]115 Mo[illegible]nery, [illegible], Spo[illegible], WA 99[illegible]76 ([illegible]) 924-[illegible] FA[illegible]9290
9405 S.W. Nimbus Avenue, Beaverton, OR 97008-7132 (503) 906-9200 FAX 906-9210
20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 (541) 383-9310 FAX 382-7588

CHAIN OF CUSTODY REPORT

Work Order #: BOK0455

CLIENT: URS

REPORT TO: DAVID RAUBVOGEL

ADDRESS: 2025 FIRST AVE. STE 500
SEATTLE, WA 98121

PHONE: 206-728-0744 FAX: 206-727-3550

INVOICE TO: SAME

P.O. NUMBER:

PROJECT NAME: TRANS MTN.

PROJECT NUMBER:

SAMPLED BY: KEVIN LUNDMARK

TURNAROUND REQUEST in Business Days*

Organic & Inorganic Analyses: 10 | 7 | 5 | 4 | 3 | 2 | 1 | STD. [X]

Petroleum Hydrocarbon Analyses: 5 | 4 | 3 | 2 | 1 | STD. [X] — see remarks

OTHER — Please Specify

*Turnaround Requests less than standard may incur Rush Charges.

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NWTPH-Dx	NWTPH-Gx/BTEX	HOLD	MATRIX (W, S, O)	# OF CONT.	COMMENTS	NCA WO ID
1. STOCK-1	11/16/00 1505	X	X		01 S	1	SEE REMARKS' RESULTS NEEDED 11/20/00	
2. STOCK-2	11/16/00 1510	X	X		02 S	1		
3. BAKER-3-F	11/16/00 1525	X	X		03 W	3		
4. BAKER-4-N	11/16/00 1530	X	X		04 W	3		
5. CELL2-G	11/16/00 1630	X	X		05 S	1	STD' T.A.T.	
6. CELL2-H	11/16/00 1633	X	X		06 S	1		
7. CELL2-I	11/16/00 1635	X	X		07 S	1		
8. CELL2-J	11/16/00 1638	X	X		08 S	1		
9. CELL2-K	11/16/00 1640	X	X		09 S	1		
10. CELL2-L	11/16/00 1643	X	X		10 S	1		
11. CELL2-M	11/16/00 1645	X	X		11 S	1		
12. CELL2-N	11/16/00 1648	X	X		12 S	1		
13. PEX-74-B-4	11/16/00			X	13 S	1		
14. PEX-75-B-4	11/16/00			X	14 S	1		
15.								

RELINQUISHED BY: [signature] DATE: 11/16/00
PRINT NAME: KEVIN LUNDMARK FIRM: URS TIME: 1845

RECEIVED BY: [signature] DATE: 11/16/00
PRINT NAME: SPRAMY TONY FIRM: NCA TIME: 1845

RELINQUISHED BY: DATE:
PRINT NAME: FIRM: TIME:

RECEIVED BY: DATE:
PRINT NAME: FIRM: TIME:

ADDITIONAL REMARKS: DATA NEEDED MONDAY 11-20-00 MORNING FOR SAMPLES STOCK-1, STOCK-2, BAKER-3-F, AND BAKER-4-N, (STD. T.A.T. FOR OTHERS)

COC REV 3/99

TEMP: W 16.8°

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Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
541.383.9310 fax 541.382.7588

Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/28/00 17:54

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
PEX-76-B-4	B0K0591-01	Soil	11/22/00 12:12	11/22/00 12:12
PEX-77-B-11	B0K0591-02	Soil	11/22/00 09:10	11/22/00 12:12

North Creek Analytical - Bothell

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.

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/28/00 17:54

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-76-B-4 (B0K0591-01) Soil Sampled: 11/22/00 12:12 Received: 11/22/00 12:12									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K26005	11/26/00	11/28/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*79.0 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*82.7 %*	*50-150*			"	"	"	"	
PEX-77-B-11 (B0K0591-02) Soil Sampled: 11/22/00 09:10 Received: 11/22/00 12:12									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0K26005	11/26/00	11/28/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*82.2 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*84.4 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/28/00 17:54

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-76-B-4 (B0K0591-01) Soil Sampled: 11/22/00 12:12 Received: 11/22/00 12:12									
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K27023	11/27/00	11/28/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*76.2 %*	*50-150*			"	"	"	"	
Surrogate: Octacosane	*76.4 %*	*50-150*			"	"	"	"	
PEX-77-B-11 (B0K0591-02) Soil Sampled: 11/22/00 09:10 Received: 11/22/00 12:12									
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	0K27023	11/27/00	11/28/00	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*80.6 %*	*50-150*			"	"	"	"	
Surrogate: Octacosane	*79.9 %*	*50-150*			"	"	"	"	

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/28/00 17:54

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEX-76-B-4 (B0K0591-01) Soil Sampled: 11/22/00 12:12 Received: 11/22/00 12:12									
Dry Weight	**85.6**	1.00	%	1	0K27059	11/27/00	11/28/00	BSOPSPL003R07	
PEX-77-B-11 (B0K0591-02) Soil Sampled: 11/22/00 09:10 Received: 11/22/00 12:12									
Dry Weight	**86.8**	1.00	%	1	0K27059	11/27/00	11/28/00	BSOPSPL003R07	

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Scott A. Woerman, Project Manager

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/28/00 17:54

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0K26005: Prepared 11/26/00 Using EPA 5030B (MeOH)										
Blank (0K26005-BLK1)										
Gasoline Range Hydrocarbons	ND	5.00	mg/kg wet							
Benzene	ND	0.0500	"							
Toluene	ND	0.0500	"							
Ethylbenzene	ND	0.0500	"							
Xylenes (total)	ND	0.100	"							
Surrogate: 4-BFB (FID)	*3.47*		"	*4.00*		*86.8*	*50-150*			
Surrogate: 4-BFB (PID)	*3.59*		"	*4.00*		*89.7*	*50-150*			
LCS (0K26005-BS1)										
Gasoline Range Hydrocarbons	25.0	5.00	mg/kg wet	25.0		100	70-130			
Surrogate: 4-BFB (FID)	*3.98*		"	*4.00*		*99.5*	*50-150*			
Duplicate (0K26005-DUP2)					**Source: B0K0574-26**					
Gasoline Range Hydrocarbons	37.2	5.00	mg/kg wet		16.8			75.6	50	Q-13
Surrogate: 4-BFB (FID)	*4.88*		"	*4.00*		*122*	*50-150*			*Q-13*
Matrix Spike (0K26005-MS1)					**Source: B0K0563-03**					
Benzene	0.574	0.100	mg/kg dry	0.619	ND	90.6	60-140			
Toluene	0.590	0.100	"	0.619	ND	94.4	60-140			
Ethylbenzene	0.619	0.100	"	0.619	ND	94.2	60-140			
Xylenes (total)	1.87	0.200	"	1.86	ND	94.0	60-140			
Surrogate: 4-BFB (PID)	*5.06*		"	*4.95*		*102*	*50-150*			
Matrix Spike Dup (0K26005-MSD1)					**Source: B0K0563-03**					
Benzene	0.583	0.100	mg/kg dry	0.619	ND	92.1	60-140	1.56	20	
Toluene	0.578	0.100	"	0.619	ND	92.5	60-140	2.05	20	
Ethylbenzene	0.618	0.100	"	0.619	ND	94.0	60-140	0.162	20	
Xylenes (total)	1.93	0.200	"	1.86	ND	97.2	60-140	3.16	20	
Surrogate: 4-BFB (PID)	*5.35*		"	*4.95*		*108*	*50-150*			

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/28/00 17:54

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up) - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0K27023: Prepared 11/27/00 Using EPA 3550B										
Blank (0K27023-BLK1)										
Diesel Range Hydrocarbons	ND	10.0	mg/kg wet							
Lube Oil Range Hydrocarbons	ND	25.0	"							
Surrogate: 2-FBP	*9.38*		"	*10.7*		*87.7*	*50-150*			
Surrogate: Octacosane	*9.05*		"	*10.7*		*84.6*	*50-150*			
LCS (0K27023-BS1)										
Diesel Range Hydrocarbons	54.7	10.0	mg/kg wet	66.7		82.0	60-140			
Surrogate: 2-FBP	*9.38*		"	*10.7*		*87.7*	*50-150*			
Duplicate (0K27023-DUP1)					**Source: B0K0538-24**					
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry		ND				50	
Lube Oil Range Hydrocarbons	ND	25.0	"		ND			32.4	50	
Surrogate: 2-FBP	*11.6*		"	*13.2*		*87.9*	*50-150*			
Surrogate: Octacosane	*11.5*		"	*13.2*		*87.1*	*50-150*			
Duplicate (0K27023-DUP2)					**Source: B0K0538-23**					
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry		ND				50	
Lube Oil Range Hydrocarbons	ND	25.0	"		ND			55.7	50	Q-05
Surrogate: 2-FBP	*10.7*		"	*12.9*		*82.9*	*50-150*			
Surrogate: Octacosane	*11.7*		"	*12.9*		*90.7*	*50-150*			

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Dames and Moore- Seattle	Project: Trans Mountain - Laurel Station	
500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/28/00 17:54

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 0K27059: Prepared 11/27/00 Using Dry Weight										
Blank (0K27059-BLK1)										
Dry Weight	100	1.00	%							

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500 Market Place Tower, 2025 1st Ave	Project Number: not provided	**Reported:**
Seattle WA, 98121	Project Manager: David Raubvogel	11/28/00 17:54

Notes and Definitions

Q-05	Analyses are not controlled on RPD values from sample concentrations less than 10 times the reporting limit.
Q-13	Multiple analyses indicate the percent recovery is outside the control limits due to a matrix effect.
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

Scott A. Woerman, Project Manager

Quantitation Report

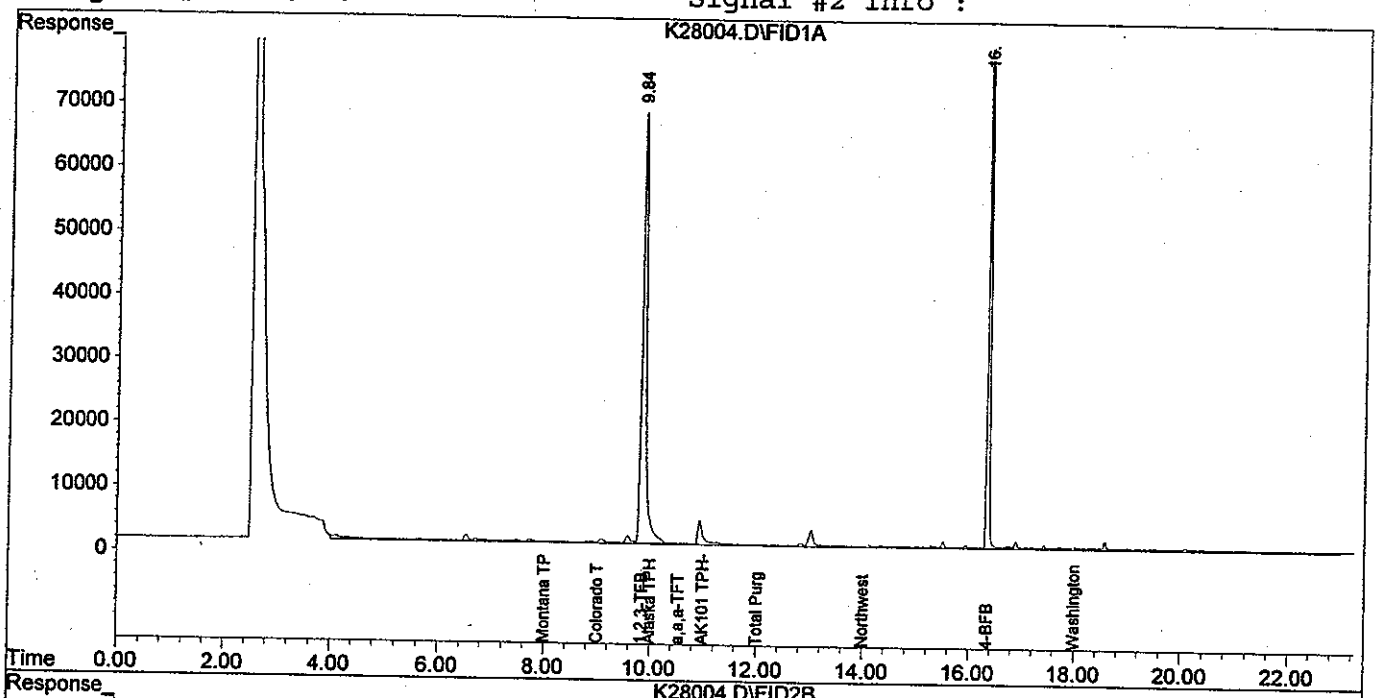
Signal #1 : C:\HPCHEM\2\DATA\112800\K28004.D\FID1A.CH Vial: 4
Signal #2 : C:\HPCHEM\2\DATA\112800\K28004.D\FID2B.CH
Acq On : 28 Nov 2000 10:19 am Operator: lp
Sample : b0k0591-01 Inst : GC #4
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00

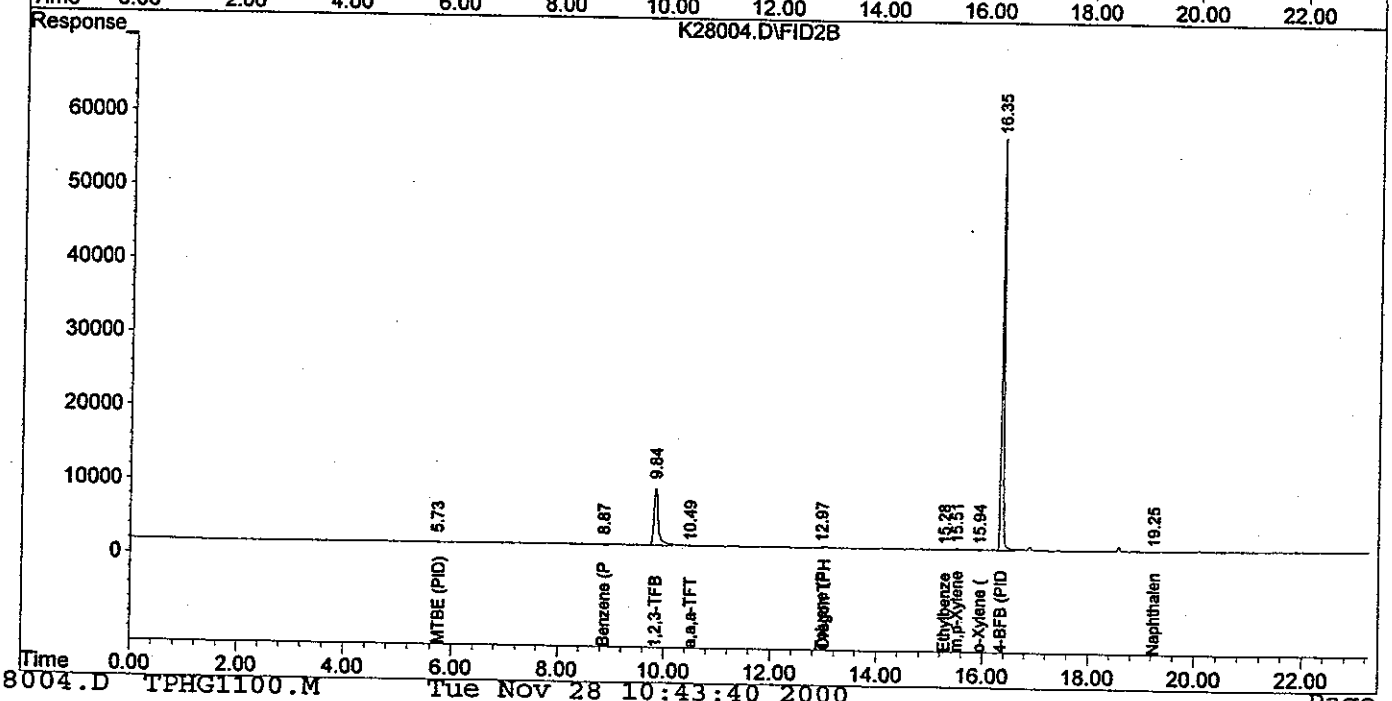
IntFile Signal #1: SURR.E IntFile Signal #2: SURR2.E

Quant Time: Nov 28 10:43 2000 Quant Results File: TPHG1100.RES

Quant Method : C:\HPCHEM\2\METHODS\TPHG1100.M (Chemstation Integrator)
Title : TPH-G Method
Last Update : Thu Nov 09 12:22:22 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG1100.M

Volume Inj. :
Signal #1 Phase :
Signal #1 Info :
Signal #2 Phase:
Signal #2 Info :





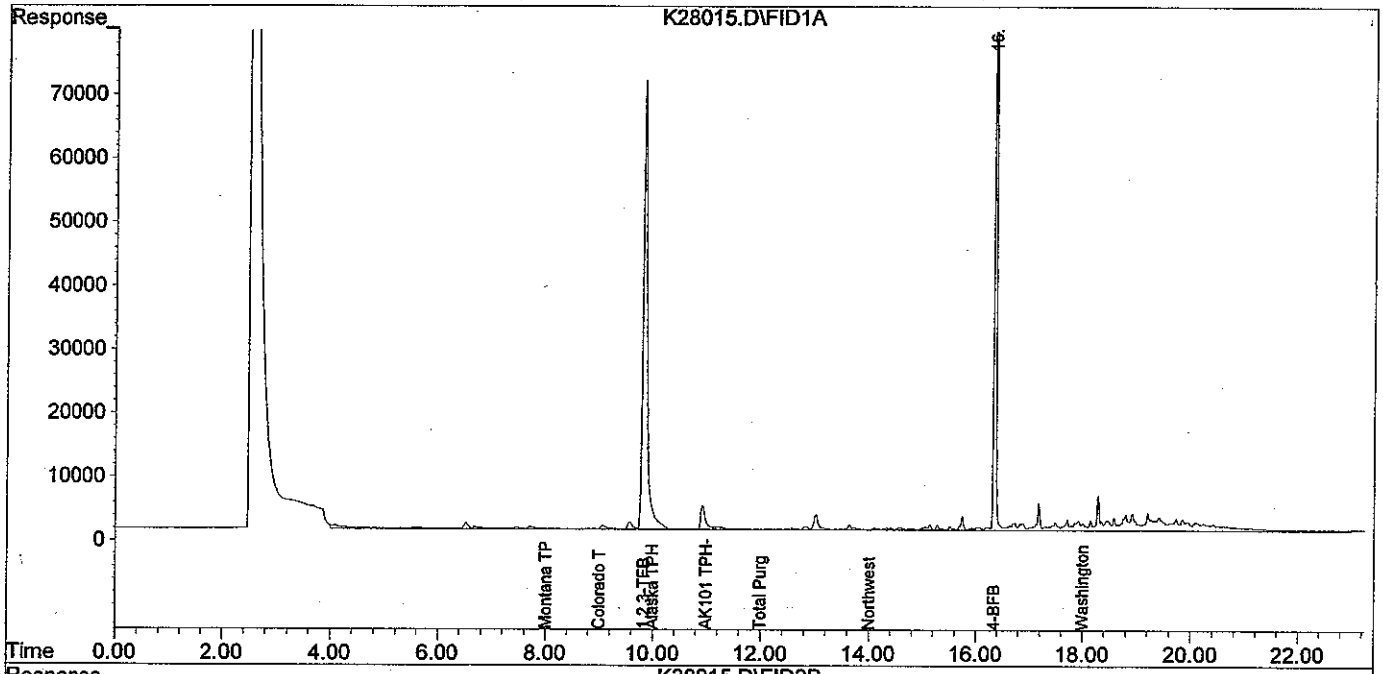
Quantitation Report

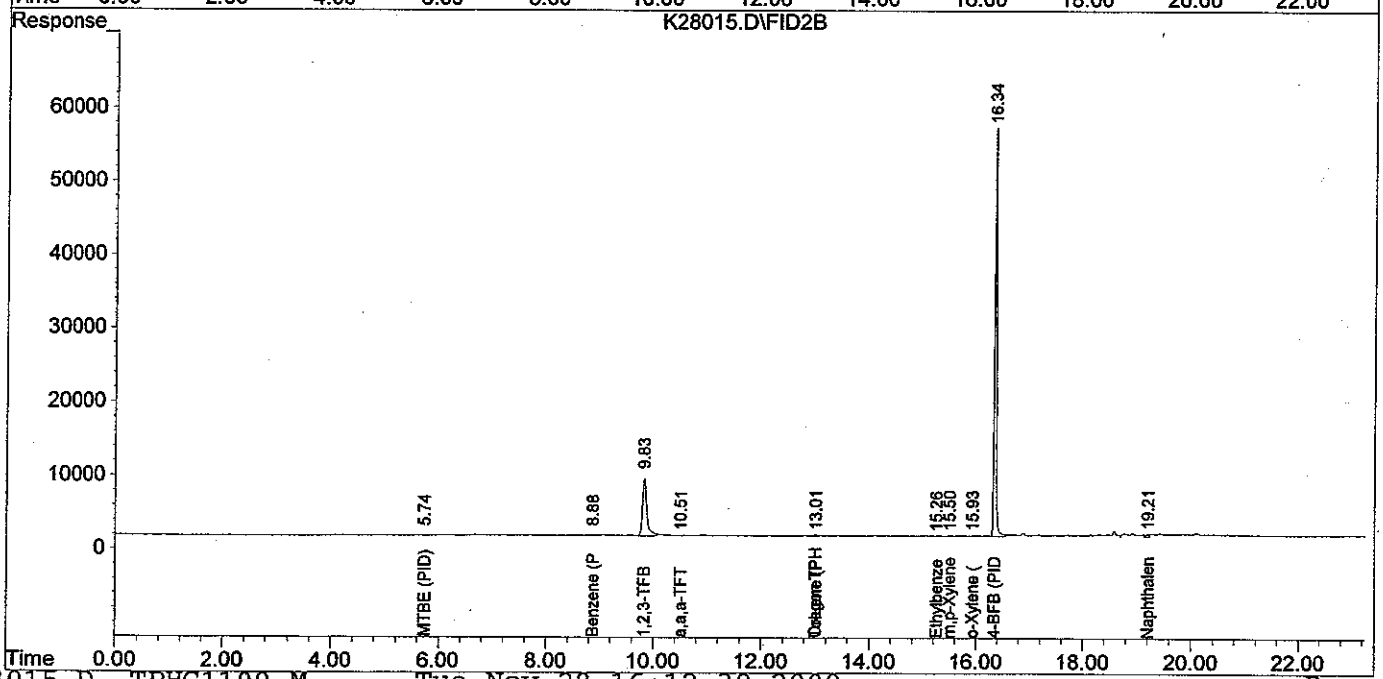
Signal #1 : C:\HPCHEM\2\DATA\112800\K28015.D\FID1A.CH Vial: 15
Signal #2 : C:\HPCHEM\2\DATA\112800\K28015.D\FID2B.CH
Acq On : 28 Nov 2000 3:49 pm Operator: lp
Sample : b0k0591-02 r1 Inst : GC #4
Misc : 100 uL Multiplr: 1.00
Sample Amount: 0.00
IntFile Signal #1: SURR.E IntFile Signal #2: SURR2.E

Quant Time: Nov 28 16:12 2000 Quant Results File: TPHG1100.RES

Quant Method : C:\HPCHEM\2\METHODS\TPHG1100.M (Chemstation Integrator)
Title : TPH-G Method
Last Update : Thu Nov 09 12:22:22 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHG1100.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data File : D:\HPCHEM\1\DATA.SEC\K27069.D
Acq On : 11-28-00 00:10:51
Sample : b0k0591-01
Misc : S

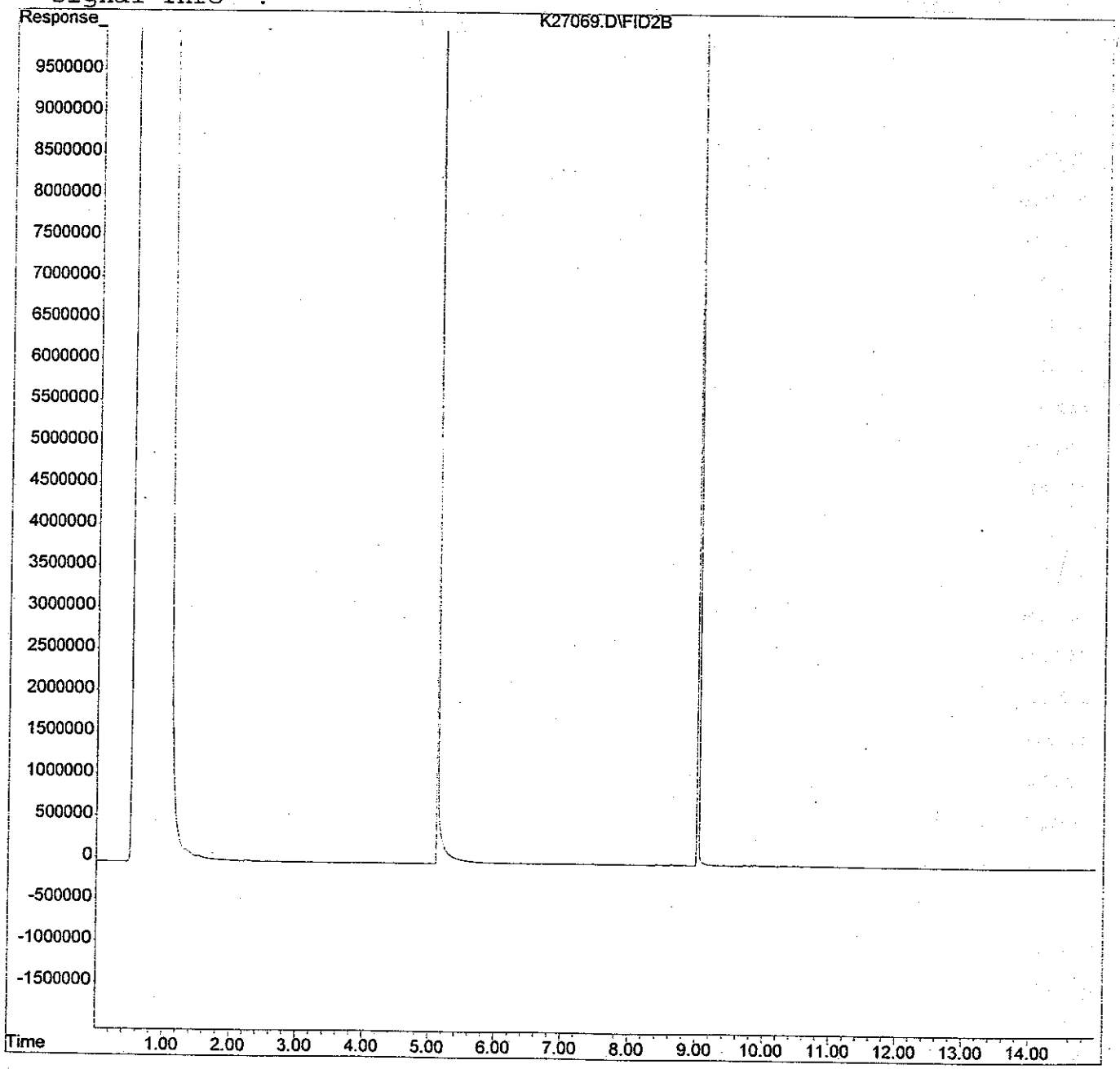
IntFile : SURR.E

Vial: 34
Operator: BN
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Nov 28 0:26 2000 Quant Results File: TPHD2.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD2.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:12:24 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



Data File : D:\HPCHEM\1\DATA.SEC\K28019.D
Acq On : 11-28-00 9:33:31
Sample : b0k0591-02
Misc : s r1

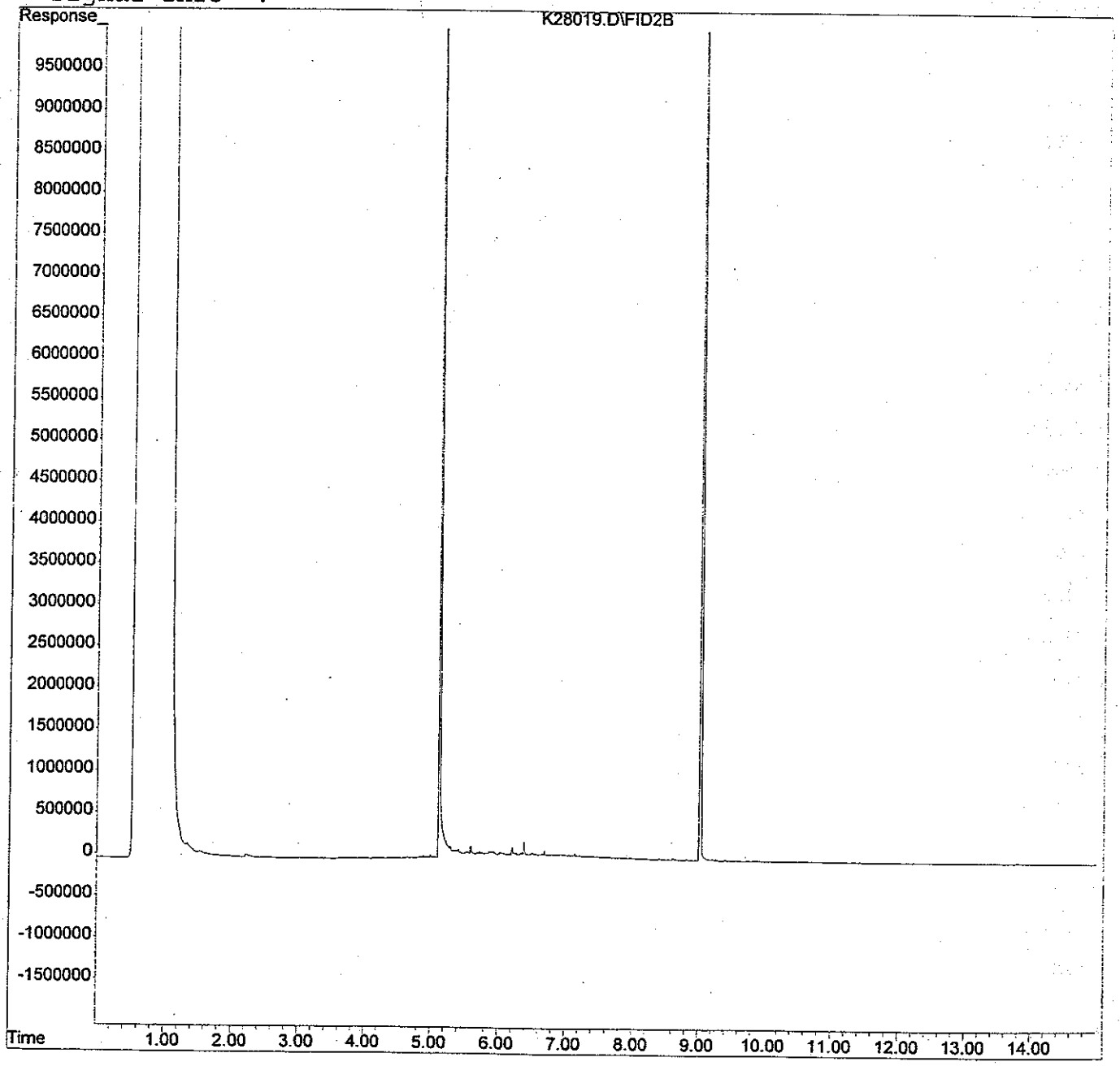
IntFile : SURR.E

Vial: 14
Operator: BN
Inst : GC# 9
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Nov 28 9:49 2000 Quant Results File: TPHD2.RES

Quant Method : D:\HPCHEM\1\METHODS\TPHD2.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Wed Nov 15 07:12:24 2000
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



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20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 (541) 383-9310 FAX 382-7588

CHAIN OF CUSTODY REPORT

Work Order #: BOK0591

CLIENT: URS

REPORT TO: DAVID RAUBVOGEL
ADDRESS: 2025 1st AVE STE. 500
SEATTLE, WA 98121
PHONE: 206-728-0744 FAX: 206-728-3350

INVOICE TO: SAME

P.O. NUMBER:

PROJECT NAME: TRANS MTN
PROJECT NUMBER:
SAMPLED BY: KEVIN LUNDMARK

TURNAROUND REQUEST in Business Days*
Organic & Inorganic Analyses: 10 | 7 | 5 | 4 | 3 | 2 | 1 | <1
Petroleum Hydrocarbon Analyses: ~~5~~ STD. | 4 | 3 | 2 | 1 | <1
OTHER — Please Specify
*Turnaround Requests less than standard may incur Rush Charges.

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NWTPH-DX	NWTPH-GX/BTEX												MATRIX (W, S, O)	# OF CONT.	COMMENTS	NCA WO ID
1.	PEX-76-B-4	11/22/00 0843	X	X											01	S	1		
2.	PEX-77-B-11	11/22/00 0910	X	X											02	S	1		
3.																			
4.																			
5.																			
6.																			
7.																			
8.																			
9.																			
10.																			
11.																			
12.																			
13.																			
14.																			
15.																			

REQUESTED ANALYSES

RELINQUISHED BY: [signature] DATE: 11/22/00
PRINT NAME: KEVIN LUNDMARK FIRM: URS TIME: 1212
RECEIVED BY: [signature] PRINT NAME: G. TAKAMATSU FIRM: NCA DATE: 11/22/00 TIME: 12:12

RELINQUISHED BY: DATE:
PRINT NAME: FIRM: TIME:
RECEIVED BY: DATE:
PRINT NAME: FIRM: TIME:

ADDITIONAL REMARKS:
SAMPLES WERE NOT @ 2-6C UPON RECEIPT
TEMP: 4.0 1.8

COC REV 3/99

CHAIN OF CUSTODY RECORD

Page 1 of 1

CUSTOMER: Trans Mountain

PROJECT: 91088 P.O./JOB NO.: 91088

SAMPLER: T. Robert

Lab No.	Sample No.	Date	Time	Cont.	Analysis Required
	A	1/17/91	P.m	H_2O	TPH 8015 (modified)
	B	1/17/91	P.m	"	"
	C	1/17/91	P.m.	"	" & BETX 8020
	D	1/17/91	P.m.	"	"
	E	1/17/91	P.m	"	"
	F	1/17/91	P.m	"	"

Relinquished by:	Date	Time	Received by:	Date	Time
T. Robert	1/18/91	11:00	Mary Lacher	1-18-91	155pm
Relinquished by:	Date	Time	Received by:	Date	Time

Dispatched by:	Date	Time	Received at lab by:	Date	Time

SOUND ANALYTICAL SERVICES, INC.
4630 Pacific Hwy East Suite B-14
Tacoma, WA 98424 (206) 922-2310

SOUND ANALYTICAL SERVICES, INC.

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JAN 24 1991

91008 TRANS m

Report To: W.D. Purnell & Assoc. Date: January 22, 1991

Report On: Analysis of Water Lab No.: 15544

IDENTIFICATION:
Samples Received on 01-18-91 Sampled 1-17-91
Project: 91008 Trans. Mountain

ANALYSIS:

Lab Sample No.	Client ID	*Total Petroleum Fuel Hydrocarbons, ppm
1	A (Control)	< 1.0
2	B (Drainage East of Site)	< 1.0
3	C (Site Outfall S. Smith Rd)	12 as Gas
4	D (Dam 1, N. Smith Rd.)	12 as Gas
5	E (Dam 2, Myers)	3.9 as Gas
6	F (Dam 3, Tennessee Rd)	1.6 as Gas

*TPH by EPA SW-846 Modified Method 8015

Lab Sample No. 3 Client ID: C

	Concentration, ppm
Benzene	1.40
Toluene	2.17
Ethyl Benzene	< 0.001
Xylenes	2.33

BTEX by EPA SW-846
Method 8020

SOUND ANALYTICAL SERVICES

C. LARRY ZURAW

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QUALITY CONTROL REPORT

DUPLICATES

Lab No: 15544 (3)
Date: January 22, 1991
Client: W.D. Purnell & Assoc.

Client ID: C
Matrix: Water
Units: ppm

Compound	Sample(S)	Duplicate(D)	RPD*
Benzene	1.40	1.43	2.1
Toluene	2.17	2.17	---
Ethyl Benzene	< 0.001	< 0.001	---
Xylenes	2.33	2.36	1.3
Total Petroleum Hydrocarbons	12	13	8.0

*RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

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JAN 24 1991

91008

TRANSMIT

Report To: W. D. Purnell & Assoc. Date: January 23, 1991

Report On: Analysis of Water Lab No.: 15573

IDENTIFICATION:
Samples Received on 01-21-91 Sampled on 1-18-91
Project: 91008 Trans Mountain

ANALYSIS:

Lab Sample No.	Client ID	*Total Petroleum Fuel Hydrocarbons, ppm
RUSH 1	D (Smith) Dam 1	3.8 Gas - Diesel
RUSH 2	E (Pond) Dam 2	2.4 Gas - Diesel
RUSH 3	F (Hannigan) Dam 3	2.3 Gas - Diesel
RUSH 4	G (Meridian)	< 1.0

*TPH by EPA SW-846 Modified Method 8015

* Note - Results reported on an as received, wet basis.

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QUALITY CONTROL REPORT

DUPLICATES

Lab No: 15573
Date: January 23, 1991
Client: W.D. Purnell & Assoc.

Client ID: G (Meridian)
Matrix: Water
Units: ppm

Compound	Sample(S)	Duplicate(D)	RPD*
Total Petroleum Fuel Hydrocarbons	< 1.0	< 1.0	---

*RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

CHAIN OF CUSTODY RECORD

JAN 24 1991
91008
TRANS MTN

Page 1 of 1

CUSTOMER: W.D. PURNELL & ASSOC. INC

PROJECT: TRANS MOUNTAIN P.O./JOB NO.: 91008

SAMPLER: TMC

Lab No.	Sample No.	Date	Time	Cont.	Analysis Required
	A (BACKGROUND)	1/19/91	12:30	H_2O	(TPH) 8015 MODIFIED
	D (SMITH) DAM 1	"		"	
	E (POND) DAM 2	"		"	
	F (HANNIGAN) DAM 3	"		"	
	G (MERIDIAN)	"		"	
					*NOTE - Sample A (Background
					was received broken (glass
					broken, water spilled out into
					cooler - contaminated and unable
					to use). Tim Roberts WAS
					notified of breakage, 1:15pm
					1-21-91.
					S.B. Giang

Relinquished by:	Date	Time	Received by:	Date	Time
T. Roberts	1/21/91				
Relinquished by:	Date	Time	Received by:	Date	Time
Dispatched by:	Date	Time	Received at lab by:	Date	Time
			S.B. Giang	1/21/91	1:38

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JAN 24 1991

91008

TRANSMIT

Report To: W. D. Purnell & Assoc. Date: January 23, 1991

Report On: Analysis of Water Lab No.: 15573

IDENTIFICATION:
Samples Received on 01-21-91 Sampled on 1-18-91
Project: 91008 Trans Mountain

ANALYSIS:

Lab Sample No.	Client ID	*Total Petroleum Fuel Hydrocarbons, ppm
RUSH 1	D (Smith) Dam 1	3.8 Gas - Diesel
RUSH 2	E (Pond) Dam 2	2.4 Gas - Diesel
RUSH 3	F (Hannigan) Dam 3	2.3 Gas - Diesel
RUSH 4	G (Meridian)	< 1.0

*TPH by EPA SW-846 Modified Method 8015

* Note - Results reported on an as received, wet basis.

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QUALITY CONTROL REPORT

DUPLICATES

Lab No: 15573
Date: January 23, 1991
Client: W.D. Purnell & Assoc.

Client ID: G (Meridian)
Matrix: Water
Units: ppm

Compound	Sample(S)	Duplicate(D)	RPD*
Total Petroleum Fuel Hydrocarbons	< 1.0	< 1.0	---

*RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

CHAIN OF CUSTODY RECORD

Page 1 of 1

CUSTOMER: W.D Purnell & Assoc. Inc.

PROJECT: Trans Mountain ~~P.O.~~/JOB NO.: ~~$~~ 92008

SAMPLER: THR

Lab No.	Sample No.	Date	Time	Cont.	Analysis Required
	A-3	1/21/91	2:20	H_2O	TPH 8015
	D-3	"	2:15	"	" "
	E-3	"	2:10	"	" "
	F-3	"	1:52	"	" "
	SATEC CREEK	1/22/91	1:30	"	" "
	SATEC	1/22/91	1:20	"	" "
	SATEC ICES	"	1:21	"	BETX 8020
	SF-1	1/20/91	12:30 ~~1155~~	"	TOTAL SOLIDS ~~160.3~~ 1-24-91 8:05 AM
	SF-2	"	AFTER-NOON	"	" " " "
	SF-3	1/21/91	1855	"	" " " "
					RUSH 24 hrs
	Please fax results ASAP				

Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Dispatched by:	Date	Time	Received at lab by:	Date	Time
				1/24/91	7:30 AM

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JAN 30 1991

Report To: W.D. Purnell & Assoc. Inc. Date: January 28, 1991

Report On: Analysis of Water Lab No.: 15645

IDENTIFICATION:
Samples Received on 01-24-91 Sampled 1-23-91
Project: 91008 Trans Mountain

ANALYSIS:

Lab Sample No.	Client ID	*Total Petroleum Fuel Hydrocarbons, mg/l
RUSH 1	A-3	< 1.0
RUSH 2	D-3	< 1.0
RUSH 3	E-3	< 1.0
RUSH 4	F-3	< 1.0
RUSH 5	Sater Creek	< 1.0
RUSH 6	Sater	< 1.0

*TPH by EPA SW-846 Modified Method 8015

Note - TPH 8015 results reported on an as received, wet basis.

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

W.D. Purnell & Assoc. Inc.
Project: 91008

Lab No. 15645
January 28, 1991

Lab Sample No. RUSH 7 — Client ID: Sater Res.

Benzene, mg/l	< 0.001
Toluene, mg/l	< 0.001
Ethyl Benzene, mg/l	< 0.001
Xylenes, mg/l	< 0.001

BTEX by EPA SW-846 Method 8020

Lab Sample No.	Client ID	Total Suspended Solids, mg/l
RUSH 8	SF-1	7.5
RUSH 9	SF-2	46
RUSH 10	SF-3	2.4

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QUALITY CONTROL REPORT

DUPLICATES

Lab No: 15645
Date: January 28, 1991
Client: W.D. Purnell & Assoc.

Client ID: A-3
Matrix: Water
Units: mg/l

Compound	Sample(S)	Duplicate(D)	RPD*
Total Petroleum Fuel Hydrocarbons	< 1.0	< 1.0	---

*RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

CHAIN OF CUSTODY RECORD

Page 1 of 1

CUSTOMER: W.D. Purnell & Assoc., Inc

PROJECT: Tigers Mountain P.O./JOB NO.: 91088

SAMPLER: THR

Lab No.	Sample No.	Date	Time	Cont.	Analysis Required
	A-4 (Control)	1/23/91			TPH 8015
	~~B-4~~	"			" "
	D-4 (Dam 1 Smith)	"			" " 24 hr
	E-4 (Dam 2 Pond)	"			" " Mask
	F-4 (Dam 3 Hammerquist)	"			" "
	D-4B (Dam 1)				BETX 8020 (Hold for now)

Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Dispatched by:	Date	Time	Received at lab by:	Date	Time
			Mary Coulter	1-24-91	2:30pm

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Report To: W.D. Purnell & Assoc. Date: January 28, 1991

Report On: Analysis of Water Lab No.: 15661

IDENTIFICATION:
Samples Received on 01-24-91
Project: 91008 Trans Mountain

ANALYSIS:

Lab Sample No.	Client ID	*Total Petroleum Fuel Hydrocarbons, ppm
RUSH 1	A-4	< 1.0
RUSH 2	D-4	< 1.0
RUSH 3	E-4	< 1.0
RUSH 4	F-4	2.2 Diesel

*TPH by EPA SW-846 Modified Method 8015

* Note - Results reported on an as received, wet basis.

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QUALITY CONTROL REPORT

DUPLICATES

Lab No: 15661
Date: January 28, 1991
Client: W.D. Purnell & Assoc.

Client ID: A-4
Matrix: Water
Units: mg/l

Compound	Sample(S)	Duplicate(D)	RPD*
Total Petroleum Fuel Hydrocarbons	< 1.0	< 1.0	---

*RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

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FEB 11 1991

Report To: W.D. Purnell & Assoc. Date: February 6, 1991

Report On: Analysis of Water Lab No.: 15829

IDENTIFICATION:
Samples Received on 02-05-91
Project: 91008 Trans Mountain
Client ID: RUSH Sater 2

ANALYSIS:

	Concentration, ppm
Benzene	< 0.001
Toluene	< 0.001
Ethyl Benzene	< 0.001
Xylenes	< 0.001

BTEX by EPA SW-846
Method 8020

Total Petroleum Fuel Hydrocarbons by EPA SW-846 Modified Method 8015	< 1.0

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QUALITY CONTROL REPORT

DUPLICATES

Lab No: 15829
Date: February 6, 1991
Client: W.D. Purnell & Assoc.

Client ID: Sater 2
Matrix: Water
Units: ppm

Compound	Sample(S)	Duplicate(D)	RPD*
Total Petroleum Fuel Hydrocarbons	< 1.0	< 1.0	---

*RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

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Report To: W.D. Purnell & Assoc. Date: February 12, 1991

Report On: Analysis of Water Lab No.: 15834

IDENTIFICATION:
Samples Received on 02-05-91
Project: Trans Mountain SAMPLED 2/1/91

ANALYSIS:

Lab Sample No.	Client ID	*Total Petroleum Fuel Hydrocarbons, ppm
1	Control	< 1.0
2	Dam 1	< 1.0
3	Dam 2	< 1.0
4	Dam 3	< 1.0

Lab Sample No. 4 Client ID: Dam 3

	Concentration, ppm
Benzene	< 0.001
Toluene	< 0.001
Ethyl Benzene	< 0.001
Xylenes	< 0.001

BTEX by EPA SW-846
Method 8020

Total Suspended Solids 3.6

*TPH by EPA SW-846 Modified Method 8015
Note - TPH 8015 and BTEX results reported on an as received, wet basis.

SOUND ANALYTICAL SERVICES

C. LARRY ZUCAW

CHAIN OF CUSTODY RECORD

Page 1 of 1

CUSTOMER: W D Purnell & Asso

PROJECT: Trans Mountain P.O./JOB NO.: 91008

SAMPLER: Doug Dillenberger

Lab No.	Sample No.	Date	Time	Cont.	Analysis Required
	Control	2-4-91		H_2O	TPH
	DAm 1	"		"	TPH
	DAm 3	"		"	TPH, BETH

Relinquished by:	Date	Time	Received by:	Date	Time
[signature]	2-6-91	10:24	John E. Coggle	2-6-91	1026
Relinquished by:	Date	Time	Received by:	Date	Time
			Mary Cutts	2/6/91	3pm
Dispatched by:	Date	Time	Received at lab by:	Date	Time

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FEB 12 1991

91008

Report To: W.D. Purnell & Assoc. Date: February 8, 1991

Report On: Analysis of Water Lab No.: 15861

IDENTIFICATION:
Samples Received on 02-06-91
Project: 91008 Trans Mountain Sapled 2-4

ANALYSIS:

Lab Sample No.	RUSH 1	RUSH 2	RUSH 3
Client Identification	Control	Dam 1	Dam 3
Matrix/Units	Water mg/l	Water mg/l	Water mg/l
Benzene	NT	NT	< 0.001
Toluene	NT	NT	< 0.001
Ethyl Benzene	NT	NT	< 0.001
Xylenes	NT	NT	< 0.001
BTEX by EPA SW-846 Method 8020			
Total Petroleum Fuel Hydrocarbons by EPA SW-846 Modified Method 8015	< 1.0	< 1.0	< 1.0

NT = Not Tested

Note - Results reported on an as received basis.

SOUND ANALYTICAL SERVICES

C. Larry Zuraw

C. LARRY ZURAW

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QUALITY CONTROL REPORT

DUPLICATES

Lab No: 15861 (3)
Date: February 8, 1991
Client: W.D. Purnell & Assoc.

Client ID: Dam 3
Matrix: Water
Units: mg/l

Compound	Sample(S)	Duplicate(D)	RPD*
Benzene	< 0.001	< 0.001	---
Toluene	< 0.001	< 0.001	---
Ethyl Benzene	< 0.001	< 0.001	---
Xylenes	< 0.001	< 0.001	---

*RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

Reg. Turnaround per D. Dillenberger 2-11-91 2:30pm per phone conv.

CHAIN OF CUSTODY RECORD

Page 1 of 2

CUSTOMER: W. D. Purnell & Asso

FEB 22 1991

PROJECT: Trans Mountain P.O./JOB NO.: 91008

SAMPLER: T. Roberts

Lab No.	Sample No.	Date	Time	Cont.	Analysis Required
	DAM 3	2-8-91	5:13	H_2O	TPH 8015
	DAM 2	2-8-91	4:58	H_2O	TPH 8015
	DAM 1	2-8-91	5:07	H_2O	TPH 8015
	DAM 3	2-8-91	5:13	H_2O	Total Suspended Solids
	DAM 3	2-8-91	5:13	H_2O	BETX

Relinquished by:	Date	Time	Received by:	Date	Time
Doug Dillenberger	2-11-91	9:50	John E. Coggle	2-11-91	9:50
Relinquished by:	Date	Time	Received by:	Date	Time

Dispatched by:	Date	Time	Received at lab by:	Date	Time
			Grang	2/11/91	2:30

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Report To: W. D. Purnell & Assoc. Date: February 19, 1991

Report On: Analysis of Water Lab No.: 15937

IDENTIFICATION:
Samples Received on 02-11-91 Sampled 2-7-91
Project: 91008 Trans Mountain

ANALYSIS:

Lab Sample No.	Client ID	*Total Petroleum Fuel Hydrocarbons, ppm
1	Dam 1	< 1.0
2	Dam 2	< 1.0
3	Dam 3	< 1.0

*TPH by EPA SW-846 Modified Method 8015

Lab Sample No. 4 Client ID: Dam 3

Benzene, ppm	< 0.001
Toluene, ppm	< 0.001
Ethyl Benzene, ppm	< 0.001
Xylenes, ppm	< 0.001

BTEX by EPA SW-846 Method 8020

Lab Sample No. 5 Client ID: Dam 3

Total Suspended Solids, ppm 17.7

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QUALITY CONTROL REPORT

DUPLICATES

Lab No: 15937 (4)
Date: February 20, 1991
Client: W.D. Purnell & Assoc.

Client ID: Dam 3
Matrix: Water
Units: ppm

Compound	Sample(S)	Duplicate(D)	RPD*
Benzene	< 0.05	< 0.05	---
Toluene	< 0.05	< 0.05	---
Ethyl Benzene	< 0.05	< 0.05	---
Xylenes	< 0.05	< 0.05	---

Lab No: 15937 (1)
Date: February 20, 1991
Client: W.D. Purnell & Assoc.

Client ID: Dam 1
Matrix: Water
Units: ppm

Compound	Sample(S)	Duplicate(D)	RPD*
Total Petroleum Fuel Hydrocarbons	< 1.0	< 1.0	---

*RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

FEB 22 1991

CHAIN OF CUSTODY RECORD

Page 1 of 1

CUSTOMER: W.D. Purnell & Asso.

PROJECT: Trans Mountain P.O./JOB NO.: 91008

SAMPLER: Doug Dillenberger

Lab No.	Sample No.	Date	Time	Cont.	Analysis Required
	Control	2-11-91	3:45	H_2O	TPH 8015
	DAM 1	2-11-91	3:54	H_2O	TPH 8015
	DAM 3	2-11-91	4:00	H_2O	TPH 8015
	DAM 3	2-11-91	4:00	H_2O	BETX

Relinquished by:	Date	Time	Received by:	Date	Time
Nikora Walker	2-12-91	10:14	John E. Loggen	2-12-91	1014
Relinquished by:	Date	Time	Received by:	Date	Time

Dispatched by:	Date	Time	Received at Lab by:	Date	Time
			S. Briang	2/12/91	2:40 pm

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FEB 22 1991

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Report To: W. D. Purnell & Assoc. Date: February 15, 1991

Report On: Analysis of Water Lab No.: 15964

IDENTIFICATION:
Samples Received on 02-12-91 Sampled 2-11-91
Project: 91008 Trans Mountain

ANALYSIS:

Lab Sample No.	Client ID	*Total Petroleum Fuel Hydrocarbons, ppm
1	Control	< 1.0
2	Dam 1	< 1.0
3	Dam 3	< 1.0

*TPH by EPA SW-846 Modified Method 8015

Lab Sample No. 4 Client ID: Dam 3

Benzene, ppm	< 0.001
Toluene, ppm	< 0.001
Ethyl Benzene, ppm	< 0.001
Xylenes, ppm	< 0.001

BTEX by EPA SW-846 8020

SOUND ANALYTICAL SERVICES

C. Larry Zuraw

C. LARRY ZURAW

SOUND ANALYTICAL SERVICES, INC.

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QUALITY CONTROL REPORT

DUPLICATES

Lab No: 15964 (4) Client ID: Dam 3
Date: February 15, 1991 Matrix: Water
Client: W.D. Purnell & Assoc. Units: ppm

Compound	Sample(S)	Duplicate(D)	RPD*
Benzene	< 0.001	< 0.001	---
Toluene	< 0.001	< 0.001	---
Ethyl Benzene	< 0.001	< 0.001	---
Xylenes	< 0.001	< 0.001	---

Lab No: 15964 (1) Client ID: Control
Date: February 15, 1991 Matrix: Water
Client: W.D. Purnell & Assoc. Units: ppm

Compound	Sample(S)	Duplicate(D)	RPD*
Total Petroleum Fuel Hydrocarbons	< 1.0	< 1.0	---

*RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

FEB 22 1991

CHAIN OF CUSTODY RECORD

Page 1 of 1

CUSTOMER: W. D. Purnell & Asso

PROJECT: ~~91008~~ Trans Mountain P.O./JOB NO.: 91008

SAMPLER: DD

Lab No.	Sample No.	Date	Time	Cont.	Analysis Required
	SATER-3	2-13-91	2:10	H_2O	TPH 8015
	SATER-3	2-13-91	2:10	H_2O	BETX

Relinquished by:	Date	Time	Received by:	Date	Time
Wayne Walker	2/14/91	10:05	John E. Cogger	2-14-91	1005
Relinquished by:	Date	Time	Received by:	Date	Time

Dispatched by:	Date	Time	Received at lab by:	Date	Time
			Mary Curtiss	2/14/91	2:30p

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Tacoma WA 98424 (206) 922-2310

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

FEB 22 1991

Report To: W.D. Purnell & Assoc. Date: February 19, 1991

Report On: Analysis of Water Lab No.: 16003

IDENTIFICATION:
Samples Received on 02-14-91 Sampled 2-13-91
Project: 91008 Trans Mountain
Client ID: Sater-3

ANALYSIS:

	Concentration, ppm
Benzene	< 0.001
Toluene	< 0.001
Ethyl Benzene	< 0.001
Xylenes	< 0.001
BTEX by EPA SW-846 Method 8020	
Total Petroleum Fuel Hydrocarbons by EPA SW-846 Modified Method 8015	< 1.0

SOUND ANALYTICAL SERVICES

C. Larry Zuraw

C. LARRY ZURAW

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QUALITY CONTROL REPORT

DUPLICATES

Lab No: 16003
Date: February 19, 1991
Client: W.D. Purnell & Assoc.

Client ID: Sater-3
Matrix: Water
Units: ppm

Compound	Sample(S)	Duplicate(D)	RPD*
Benzene	< 0.001	< 0.001	---
Toluene	< 0.001	< 0.001	---
Ethyl Benzene	< 0.001	< 0.001	---
Xylenes	< 0.001	< 0.001	---
Total Petroleum Fuel Hydrocarbons	< 1.0	< 1.0	---

*RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

3-DAY

MAR 5 199

CHAIN OF CUSTODY RECORD

Page 1 of 2

CUSTOMER: W D Purnell & Assoc.

PROJECT: [redacted] Trans Mountain P.O./JOB NO.: 91008

SAMPLER: DD

[redacted]

Lab No.	Sample No.	Date	Time	Cont.	Analysis Required
	JAR 1	2-14-91	1402	Soil	TPH, BETX
	JAR 2	"	1430	"	TPH, BETX
	Jar 3	"	1450	"	TPH, BETX
	Jar 4	"	1510	"	TPH
	Jar 5	"	1530	"	TPH, BETX
	Jar 6	"	1550	"	TPH, BETX
	Jar 7	"	1610	"	TPH, BETX
	Jar 8	2-15-91	1136	"	TPH, BETX
	Jar 9	"	1150	"	TPH
	Jar 10	"	1230	"	TPH, BETX
	Jar 11	"	1250	"	TPH, BETX
	Jar 12	"	1300	"	TPH
	Jar 13	"	1322	"	TPH, BETX
	Jar 14	"	1338	"	TPH
	Jar 15	"	1345	"	TPH, BETX

Relinquished by:	Date	Time	Received by:	Date	Time
Theresa Walker	2/18/91	10:20	[redacted] Assor Coolers	2/18/91	1030
Relinquished by:	Date	Time	Received by:	Date	Time

Dispatched by:	Date	Time	Received at lab by:	Date	Time
			A Giang	2/19/91	9:15

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3-DAY

MAR 5 1991

CHAIN OF CUSTODY RECORD

Page 2 of 2

CUSTOMER: W D Ownell & Asso

PROJECT: Trans Mountain P.O./JOB NO.: 91008

SAMPLER: DD

Lab No.	Sample No.	Date	Time	Cont.	Analysis Required
	Jar 16	2-15-91	1405	SOIL	TPH, BETX
	Jar 17	"	1420	"	TPH
	Jar 18	"	1437	"	TPH
	Jar 19	"	1456	"	TPH, BETX
	Jar 20	"	1505	"	TPH
	Jar 21	"	1519	"	TPH, BETX
	Jar 22	"	1526	"	TPH, BETX
	Jar 23	"	1536	"	TPH
	Jar 24	"	1545	"	TPH
	Jar 25	"	1554	"	TPH

Relinquished by:	Date	Time	Received by:	Date	Time
Nina Walker	2/18/91	10:30	[illegible] Assoc Courier	2/18/91	1030
Relinquished by:	Date	Time	Received by:	Date	Time

Dispatched by:	Date	Time	Received at lab by:	Date	Time
			[illegible]	2/19/91	9:15

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910086

MAR 5 1991

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS
4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: W D Purnell & Assoc. Date: February 28, 1991

Report On: Analysis of Soil Lab No.: 16045
Page 1 of 5

IDENTIFICATION:
Samples Received on 02-19-91 Sampled 2-14-91, 2-15-91
Project: 910086 Trans Mountain

ANALYSIS:

Lab Sample No.	1	2	3	4	5
Client ID	Jar 1	Jar 2	Jar 3	Jar 4	Jar 5
Matrix/Units	Soil ppm	Soil ppm	Soil ppm	Soil ppm	Soil ppm
Total Petroleum Fuel Hydrocarbons by EPA SW-846 Modified Method 8015	3,976	4,215	78	< 10	2,946
TPH as	Gas - Diesel	Gas - Diesel	Diesel		Aged Gas Diesel
Benzene	6.83	0.26	< 0.05	NT	< 0.05
Toluene	57.3	5.80	< 0.05	NT	< 0.05
Ethyl Benzene	8.64	0.67	< 0.05	NT	0.07
Xylenes	89.9	17.9	0.08	NT	0.88
BTEX by EPA SW-846 Method 8020					

NT - Not Tested.

Note - Results reported on an as received basis.

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

W D Purnell & Assoc.
Project: 91008

Lab No. 16045
February 28, 1991

Lab Sample No.	6	7	8	9	10
Client ID	Jar 6	Jar 7	Jar 8	Jar 9	Jar 10
Matrix/Units	Soil ppm	Soil ppm	Soil ppm	Soil ppm	Soil ppm
Total Petroleum Fuel Hydrocarbons by EPA SW-846 Modified Method 8015	8,085	1,863	1,551	< 10	857
TPH as	Aged Gas Diesel	Aged Gas Diesel	Aged Gas Diesel		Gas - Diesel
Benzene	< 0.05	< 0.05	< 0.05	NT	0.86
Toluene	1.68	0.21	0.28	NT	8.30
Ethyl Benzene	0.21	0.08	0.24	NT	0.42
Xylenes	3.73	1.54	5.00	NT	16.8
BTEX by EPA SW-846 Method 8020					

NT - Not Tested.

Note - Results reported on an as received basis.

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

W D Purnell & Assoc.
Project: 91008

Lab No. 16045
February 28, 1991

Lab Sample No.	11	12	13	14	15
Client ID	Jar 11	Jar 12	Jar 13	Jar 14	Jar 15
Matrix/Units	Soil ppm	Soil ppm	Soil ppm	Soil ppm	Soil ppm
Total Petroleum Fuel Hydrocarbons by EPA SW-846 Modified Method 8015	1,222	< 10	15,411	< 10	1,501
TPH as	Gas - Diesel		Gas - Diesel		Diesel
Benzene	< 0.05	NT	1.94	NT	< 0.05
Toluene	< 0.05	NT	31.4	NT	0.12
Ethyl Benzene	0.08	NT	6.01	NT	< 0.05
Xylenes	1.05	NT	109	NT	0.45
BTEX by EPA SW-846 Method 8020					

NT - Not Tested.

Note - Results reported on an as received basis.

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

W D Purnell & Assoc.
Project: 91008

Lab No. 16045
February 28, 1991

Lab Sample No.	16	17	18	19	20
Client ID	Jar 16	Jar 17	Jar 18	Jar 19	Jar 20
Matrix/Units	Soil ppm	Soil ppm	Soil ppm	Soil ppm	Soil ppm
Total Petroleum Fuel Hydrocarbons by EPA SW-846 Modified Method 8015	4,169	< 10	< 10	344	50
TPH as	Gas - Diesel			Diesel	Diesel
Benzene	0.13	NT	NT	< 0.05	NT
Toluene	3.70	NT	NT	< 0.05	NT
Ethyl Benzene	1.05	NT	NT	< 0.05	NT
Xylenes	19.8	NT	NT	0.18	NT
BTEX by EPA SW-846 Method 8020					

NT - Not Tested.

Note - Results reported on an as received basis.

Continued . . .

SOUND ANALYTICAL SERVICES, INC.

W D Purnell & Assoc.
Project: 91008

Lab No. 16045
February 28, 1991

Lab Sample No.	21	22	23	24	25
Client ID	Jar 21	Jar 22	Jar 23	Jar 24	Jar 25
Matrix/Units	Soil ppm	Soil ppm	Soil ppm	Soil ppm	Soil ppm
Total Petroleum Fuel Hydrocarbons by EPA SW-846 Modified Method 8015	12,523	3,649	< 10	< 10	< 10
TPH as	Gas - Diesel	Diesel			
Benzene	0.98	< 0.05	NT	NT	NT
Toluene	16.1	0.42	NT	NT	NT
Ethyl Benzene	1.75	0.13	NT	NT	NT
Xylenes	51.3	2.47	NT	NT	NT
BTEX by EPA SW-846 Method 8020					

NT - Not Tested.

Note - Results reported on an as received basis.

SOUND ANALYTICAL SERVICES

C. LARRY ZURAW

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SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

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QUALITY CONTROL REPORT

DUPLICATES

Lab No: 16045 (10) Client ID: Jar 10
Date: February 28, 1991 Matrix: Soil
Client: W D Purnell & Assoc. Units: ppm

Compound	Sample(S)	Duplicate(D)	RPD*
Benzene	0.86	0.87	1.1
Toluene	8.30	8.57	3.2
Ethyl Benzene	0.42	0.54	25.0
Xylenes	16.8	20.5	19.9
Total Petroleum Fuel Hydrocarbons	857	1,001	15.5

Lab No: 16045 (20) Client ID: Jar 20
Date: February 28, 1991 Matrix: Soil
Client: W D Purnell & Assoc. Units: ppm

Compound	Sample(S)	Duplicate(D)	RPD*
Total Petroleum Hydrocarbons	50	57	13.1

Lab No: 16045 (22) Client ID: Jar 22
Date: February 28, 1991 Matrix: Soil
Client: W D Purnell & Assoc. Units: ppm

Compound	Sample(S)	Duplicate(D)	RPD*
Benzene	< 0.05	< 0.05	---
Toluene	0.42	0.48	13.3
Ethyl Benzene	0.13	0.15	7.1
Xylenes	2.47	3.28	28.2

*RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

CHAIN OF CUSTODY RECORD

3 Days

Page 1 of 1

CUSTOMER: W D Purnell & Asso

PROJECT: Trans Mountain P.O./JOB NO.: 91008

SAMPLER: DD

915

Lab No.	Sample No.	Date	Time	Cont.	Analysis Required
	DAM 1	2-15-91	1615	H_2O	TPH
	DAM 2	"	"	"	TPH
	DAM 3	"	"	"	TPH, BETx, Suspended Solids
	Control	"	"	"	TPH

Relinquished by:	Date	Time	Received by:	Date	Time
Diane Walker	2/18/91	10:30	Jack Yoder (Roger) Assoc Couriers	2/18/91	1030
Relinquished by:	Date	Time	Received by:	Date	Time

Dispatched by:	Date	Time	Received at lab by:	Date	Time
			L Grang	2/19/91	9:15

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4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

MAR 1 1991

91008

Report To: W D Purnell & Assoc. Date: February 26, 1991

Report On: Analysis of Water Lab No.: 16046

IDENTIFICATION:
Samples Received on 02-19-91 Sampled 2-15-91
Project: 91008 Trans Mountain

ANALYSIS:

Lab Sample No.	Client ID	*Total Petroleum Fuel Hydrocarbons, mg/l
1	Dam 1	< 1.0
2	Dam 2	< 1.0
3	Dam 3	< 1.0
4	Control	< 1.0

*TPH by EPA SW-846 Modified Method 8015

Lab Sample No. 3 Client ID: Dam 3

BTEX by EPA SW-846 Method 8020

	Concentration, mg/l
Benzene	< 0.001
Toluene	< 0.001
Ethyl Benzene	< 0.001
Xylenes	< 0.001

Total Suspended Solids 6

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C. Larry Zuraw

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QUALITY CONTROL REPORT

DUPLICATES

Lab No: 16046 (3)
Date: February 26, 1991
Client: W D Purnell & Assoc.

Client ID: Dam 3
Matrix: Water
Units: mg/l

Compound	Sample(S)	Duplicate(D)	RPD*
Benzene	< 0.001	< 0.001	---
Toluene	< 0.001	< 0.001	---
Ethyl Benzene	< 0.001	< 0.001	---
Xylenes	< 0.001	< 0.001	---

Lab No: 16046 (4)
Date: February 26, 1991
Client: W D Purnell & Assoc.

Client ID: Control
Matrix: Water
Units: mg/l

Compound	Sample(S)	Duplicate(D)	RPD*
Total Petroleum Fuel Hydrocarbons	< 1.0	< 1.0	---

*RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

91005

SOUND ANALYTICAL SERVICES, INC.

MAR 1 1991

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS
4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: W D Purnell & Assoc. Date: February 27, 1991

Report On: Analysis of Water Lab No.: 16062

IDENTIFICATION:
Samples Received on 02-19-91 Sampled 2-18-91
Project: 91008 Trans Mountain

ANALYSIS:

Lab Sample No.	Client ID	*Total Petroleum Fuel Hydrocarbons, mg/l
1	Pond #1	< 1.0
2	West Boundary	< 1.0
3	Up Gradient	< 1.0
4	Dam 1	< 1.0
5	Dam 2 (Labeled: Control)	< 1.0
6	Dam 3	< 1.0

*TPH by EPA SW-846 Modified Method 8015

Lab Sample No. 6 Client ID: Dam 3

BTEX by EPA SW-846 Method 8020

	Concentration, mg/l
Benzene	< 0.001
Toluene	< 0.001
Ethyl Benzene	< 0.001
Xylenes	< 0.001

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QUALITY CONTROL REPORT

DUPLICATES

Lab No: 16062
Date: February 27, 1991
Client: W D Purnell & Assoc.

Client ID: Dam 3
Matrix: Water
Units: mg/l

Compound	Sample(S)	Duplicate(D)	RPD*
Benzene	< 0.001	< 0.001	---
Toluene	< 0.001	< 0.001	---
Ethyl Benzene	< 0.001	< 0.001	---
Xylenes	< 0.001	< 0.001	---
Total Petroleum Fuel Hydrocarbons	< 1.0	< 1.0	---

*RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

1 of 1

CHAIN OF CUSTODY RECORD

Page ~~1 of 2~~

CUSTOMER: W D Purnell & Asso

PROJECT: Tvaus Mountain P.O./JOB NO.: 91008

SAMPLER: DD

Lab No.	Sample No.	Date	Time	Cont.	Analysis Required
	Jar 26	2-18-91	10:55	~~SOIL~~	TPH 8015
	Jar 27	"	11:00	"	"
	Jar 28	"	11:15	"	"
	Jar 29	"	11:26	"	"
	Jar 30	"	11:37	"	"
	Jar 31	"	1:00	"	"
	Jar 32	"	1:10	"	"
	Jar 33	"	1:20	"	"
	Jar 34	"	1:30	"	"
	Jar 35	"	1:40	"	"

Relinquished by:	Date	Time	Received by:	Date	Time
Wesley Walker	2/19/91	10:35	John E. Cogger	2-19-91	1035
Relinquished by:	Date	Time	Received by:	Date	Time

Dispatched by:	Date	Time	Received at lab by:	Date	Time
			L Giacy	2/19/91	3pm

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SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

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MAR 5 1991

Report To: W D Purnell & Assoc. Date: February 27, 1991

Report On: Analysis of Soil Lab No.: 16063

IDENTIFICATION:
Samples Received on 02-19-91 Sampled 2-19-91
Project: 91008 Trans Mountain

ANALYSIS:

Lab Sample No.	Client ID	*Total Petroleum Fuel Hydrocarbons, ppm
1	Jar 26	< 10
2	Jar 27	< 10
3	Jar 28	< 10
4	Jar 29	< 10
5	Jar 30	< 10
6	Jar 31	863 Diesel
7	Jar 32	< 10
8	Jar 33	35 Gas, Diesel
9	Jar 34	65 Gas, Diesel
10	Jar 35	18 Gas

*TPH by EPA SW-846 Modified Method 8015

Note - Results reported on an as received basis.

SOUND ANALYTICAL SERVICES

C. Larry Zuraw

C. LARRY ZURAW

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QUALITY CONTROL REPORT

DUPLICATES

Lab No: 16063 (10)
Date: February 27, 1991
Client: W D Purnell & Assoc.

Client ID: Jar 35
Matrix: Soil
Units: ppm

Compound	Sample(S)	Duplicate(D)	RPD*
Total Petroleum Fuel Hydrocarbons	18	15	18.2

*RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

CHAIN OF CUSTODY RECORD

Page 1 of ___ MAR 6 1991

CUSTOMER: W D Purnell & Asso

PROJECT: Trans Mountain P.O./JOB NO.: 91008

SAMPLER: _____

(24-Hour RuSH on all TesTS)

Lab No.	Sample No.	Date	Time	Cont.	Analysis Required
	Jar 36	2-19-91	15:50	Soil	TPH (8015)
	Jar 37	"	1610	"	" "
	Jar 38	"	1630	"	" "
	Jar 39	"	1640	"	" "
	Jar 40	2-20-91	14:30	"	" "
	Jar 41	"	1440	"	" "
	TH-1	2-20-91	1030	H_2O/Soil	TPH (8015) BETX
	TH-3	"	1230	H_2O/Soil	" "
	TH-4	"	1340	H_2O/Soil	" "
				Did NOT receive	
	TH-1 Soil	TPH8015			Did receive
	TH-1 Water	TPH8015	BTEX		a total of
	TH-3 Soil	TPH8015			11 Samples
	TH-3 Water	TPH8015			

Relinquished by:	Date	Time	Received by:	Date	Time
Verona Walker	2/21/91	10:15	John E. Logger	2-21-91	1015
Relinquished by:	Date	Time	Received by:	Date	Time

Dispatched by:	Date	Time	Received at lab by:	Date	Time
			Mary Coates	2/21/91	3:15

SOUND ANALYTICAL SERVICES, INC.
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NOTE - Talked to D. Dillenberger 2-21-91 @ 3:40pm

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SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

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MAR 6 1991

Report To: W D Purnell & Assoc.

Date: February 25, 1991
Revised: February 28, 1991

Report On: Analysis of Soil & Water

Lab No.: 16127

IDENTIFICATION:
Samples Received on 02-21-91 Sampled 2-19 & 2-20-91
Project: 91008 Trans. Mountain

ANALYSIS:

Lab Sample No.	Client ID	*Total Petroleum Fuel Hydrocarbons, ppm
RUSH 1	Jar 36 (soil)	45 Diesel
RUSH 2	Jar 37 (soil)	194 Diesel
RUSH 3	Jar 38 (soil)	< 10
RUSH 4	Jar 39 (soil)	< 10
RUSH 5	Jar 40 (soil)	< 10
RUSH 6	Jar 41 (soil)	439 Diesel
RUSH 7	TH-1 (soil)	< 10
RUSH 8	TH-1 (water)	< 1.0
RUSH 9	TH-3 (soil)	72 Diesel
RUSH 10	TH-3 (water)	< 1.0
RUSH 11	TH-4 (soil)	12 Diesel

*TPH by EPA SW-846 Modified Method 8015

Note - Soil results reported on an as received basis.

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

W D Purnell & Assoc.
Project: 91008

Lab No. 16127
February 25, 1991
Revised on February 28, 1991

Lab Sample No. RUSH 8 — Client ID: TH-1 (Water)

	Concentration, ppm
Benzene	< 0.001
Toluene	< 0.001
Ethyl Benzene	< 0.001
Xylenes	< 0.001

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C. LARRY ZURAW

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

QUALITY CONTROL REPORT

DUPLICATES

Lab No: 16127 (8) Client ID: TH-1
Date: February 25, 1991 Matrix: Water
Client: W. D. Purnell & Assoc. Units: ppm

Compound	Sample(S)	Duplicate(D)	RPD*
Benzene	< 0.001	< 0.001	---
Toluene	< 0.001	< 0.001	---
Ethyl Benzene	< 0.001	< 0.001	---
Xylenes	< 0.001	< 0.001	---
Total Petroleum Fuel Hydrocarbons	< 1.0	< 1.0	---

Lab No: 16127 (6) Client ID: Jar 41
Date: February 28, 1991 Matrix: Soil
Client: W. D. Purnell & Assoc. Units: ppm

Compound	Sample(S)	Duplicate(D)	RPD*
Total Petroleum Fuel Hydrocarbons	439	471	7.0

*RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

CHAIN OF CUSTODY RECORD

Page 1 of 1

MAR 6 1991

CUSTOMER: WD Purnell & Asso

PROJECT: Trans Mountain P.O./JOB NO.: 91008

SAMPLER: DD

Lab No.	Sample No.	Date	Time	Cont.	Analysis Required
	Control	2-22-91	1524	H_2O	TPH 8015
	DAM 1	"	1540	"	" "
	DAM 2	"	1530	"	" "
	DAM 3	"	1545	"	" "
	DAM 3	"	"	"	BETX
	DAM 3	"	"	"	Suspended Solids
	Guide Meridian	"	1600	"	TPH 8015

Relinquished by:	Date	Time	Received by:	Date	Time
Verona Walker	2/25	10:30	John E. Loggy	2/25	10:30
Relinquished by:	Date	Time	Received by:	Date	Time

Dispatched by:	Date	Time	Received at lab by:	Date	Time
			Mary Cotton	2/25/91	4:30

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SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

MAR 6 1991

Report To: W D Purnell & Assoc. Date: March 4, 1991

Report On: Analysis of Water Lab No.: 16178

IDENTIFICATION:
Samples Received on 02-26-91 Sampled 2-25-91
Project: 91008 Trans Mountain

ANALYSIS:

Lab Sample No.	Client ID	*Total Petroleum Fuel Hydrocarbons, ppm
1	Control	< 1.0
2	Dam 1	< 1.0
3	Dam 2	< 1.0
4	Dam 3	< 1.0
5	Guide Meridian	< 1.0

*TPH by EPA SW-846 Modified Method 8015

Lab Sample No. 6 Client ID: Dam 3

Benzene, ppm	< 0.001
Toluene, ppm	< 0.001
Ethyl Benzene, ppm	< 0.001
Xylenes, ppm	< 0.001

BTEX by EPA SW-846 Method 8015

Lab Sample No. 7 Client ID: Dam 3

Total Suspended Solids, ppm 18

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C. Larry Zuraw

C. LARRY ZURAW

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QUALITY CONTROL REPORT

DUPLICATES

Lab No: 16178 (6)
Date: March 4, 1991
Client: W D Purnell & Assoc.

Client ID: Dam 3
Matrix: Water
Units: ppm

Compound	Sample(S)	Duplicate(D)	RPD*
Benzene	< 0.001	< 0.001	---
Toluene	< 0.001	< 0.001	---
Ethyl Benzene	< 0.001	< 0.001	---
Xylenes	< 0.001	< 0.001	---

Lab No: 16178 (1)
Date: March 4, 1991
Client: W D Purnell & Assoc.

Client ID: Control
Matrix: Water
Units: ppm

Compound	Sample(S)	Duplicate(D)	RPD*
Total Petroleum Fuel Hydrocarbons	< 1.0	< 1.0	---

*RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

CHAIN OF CUSTODY RECORD

MAR 19 1991

Page 1 of 1

CUSTOMER: WD Purnell & Asso

PROJECT: Trans Mountain P.O./JOB NO.: 91008

SAMPLER: DD

Lab No.	Sample No.	Date	Time	Cont.	Analysis Required
	Control	2-25-91	3:35	H_2O	TPH 8015
	Dam 1	"	3:40	"	" "
	Dam 3	"	3:45	"	" "
	Dam 3	"	3:45	"	BETX

Relinquished by:	Date	Time	Received by:	Date	Time
Doug DeHaven	2-27-91	0814	(Roger) Fuhrer	3/27/91	0815
Relinquished by:	Date	Time	Received by:	Date	Time

Dispatched by:	Date	Time	Received at lab by:	Date	Time
			Mary Coates	12/27/91	2:40p

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MAR 19 19

Report To: W.D. Purnell & Assoc. Date: March 6, 1991

Report On: Analysis of Water Lab No.: 16218

IDENTIFICATION:
Samples Received on 02-27-91 Sampled 2-25-91
Project: 91008 Trans. Mountain

ANALYSIS:

Lab Sample No.	Client ID	*Total Petroleum Fuel Hydrocarbons, ppm
1	Control	< 1.0
2	Dam 1	< 1.0
3	Dam 3	< 1.0

*TPH by EPA SW-846 Modified Method 8015

Lab Sample No. 4 Client ID: Dam 3

	Concentration, ppm
Benzene	< 0.001
Toluene	< 0.001
Ethyl Benzene	< 0.001
Xylenes	< 0.001

BTEX by EPA SW-846
Method 8020

Note - Results reported on an as received basis.

SOUND ANALYTICAL SERVICES

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MAR 15 199

CHAIN OF CUSTODY RECORD

Page 1 of ___

CUSTOMER: W D Purnell & Asso

PROJECT: Trans Mountain P.O./JOB NO.: 91008

SAMPLER: DD

Lab No.	Sample No.	Date	Time	Cont.	Analysis Required
	Control	3-1-91	3:56	H_2O	TPH 8015
	Dam 1	"	4:01	"	TPH 8015
	Dam 2	"	4:06	"	TPH 8015
	Dam 3	"	4:17	"	TPH 8015
	Dam 3	"	4:17	"	BETX
	Dam 3	"	4:17	"	Suspended Solids
	Guide Meridian	"	4:30	"	TPH 8015

Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Dispatched by:	Date	Time	Received at lab by:	Date	Time
			Mary Linton	3/4/91	4:35

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MAR 15 1991

Report To: W.D. Purnell & Assoc. Date: March 14, 1991

Report On: Analysis of Water Lab No.: 16308

IDENTIFICATION:
Samples Received on 03-04-91 Sampled 3-1-9
Project: 91008 Trans. Mountain

ANALYSIS:

Lab Sample No.	Client ID	*Total Petroleum Fuel Hydrocarbons, ppm
1	Control	< 1.0
2	Dam 1	< 1.0
3	Dam 2	< 1.0
4	Dam 3	< 1.0
5	Guide Meridian	< 1.0

*TPH by EPA SW-846 Modified Method 8015

Note - Results reported on an as received basis.

Continued . . .

SOUND ANALYTICAL SERVICES, INC.

W.D. Purnell & Assoc.
Project: 91008

Lab No. 16308
March 14, 1991

Lab Sample No. 6 **Client ID: Dam 3**

	Concentration, ppm
Benzene	< 0.001
Toluene	< 0.001
Ethyl Benzene	< 0.001
Xylenes	< 0.001

BTEX by EPA SW-846
Method 8020

Lab Sample No. 7 **Client ID: Dam 3**

Total Suspended Solids	5.33

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MAR 19 1991

CHAIN OF CUSTODY RECORD

Page 1 of 1

CUSTOMER: W D Purnell & Asso

PROJECT: Trans Mountain P.O./JOB NO.: 91008

SAMPLER: DD

Lab No.	Sample No.	Date	Time	Cont.	Analysis Required
	Control	3-4-91	4:00	H_2O	TPH 8015
	DAM 1	3-4-91	4:25	H_2O	TPH 8015
	DAM 3	3-4-91	4:30	H_2O	TPH 8015, BETX

Relinquished by:	Date	Time	Received by:	Date	Time
Nina Walker	3-5-91	10:40	John E. Coggeshall	3-5-91	1040
Relinquished by:	Date	Time	Received by:	Date	Time

Dispatched by:	Date	Time	Received at lab by:	Date	Time
			Mary Custer	3/5/91	2:30 pm

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Report To: W.D. Purnell & Assoc. Date: March 18, 1991

Report On: Analysis of Water Lab No.: 16329

IDENTIFICATION:
Samples Received on 03-05-91 Sampled 3-4-91
Project: 91008 Trans. Mountain

ANALYSIS:

Lab Sample No.	Client ID	*Total Petroleum Fuel Hydrocarbons, ppm
1	Dam 3	< 1.0
2	Control	< 1.0
3	Dam 1	< 1.0

*TPH by EPA SW-846 Modified Method 8015

Lab Sample No. 1	Client ID: Dam 3
Benzene, ppm	< 0.001
Toluene, ppm	< 0.001
Ethyl Benzene, ppm	< 0.001
Xylenes, ppm	< 0.001

BTEX by EPA SW-846
Method 8020

Note - Results reported on an as received basis.

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QUALITY CONTROL REPORT

DUPLICATES

Lab No: 16329 (2)
Date: March 18, 1991
Client: W.D. Purnell & Assoc.

Client ID: Control
Matrix: Water
Units: ppm

Compound	Sample(S)	Duplicate(D)	RPD*
Total Petroleum Fuel Hydrocarbons	< 1.0	< 1.0	---

*RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

CHAIN OF CUSTODY RECORD MAR 21 1991

Page 1 of ___

CUSTOMER: WD Purnell & Asso INC

PROJECT: Trans Mountain P.O./JOB NO.: 91008

SAMPLER: Doug Dillenberger

★ IF you have SUFFICIENT Sample

Lab No.	Sample No.	Date	Time	Cont.	Analysis Required
1	Control	3-8-91		H_2O	TPH 8015 & 418.1 ★
2	DAM 1	"		H_2O	TPH " "
3	DAM 2	"		H_2O	TPH " "
4	DAM 3	"		H_2O	TPH " "
	DAM 3	"		H_2O	BETX
	DAM 3	"		H_2O	Suspended Solids
5	Guide	"		H_2O	TPH 8015 & 418.1 ★

Relinquished by:	Date	Time	Received by:	Date	Time
Wayne Walker	3/12	3:20	[signature]	3/12	3:20
Relinquished by:	Date	Time	Received by:	Date	Time
			[signature]		
Dispatched by:	Date	Time	Received at lab by:	Date	Time
			[signature]	3/13/91	8:43 am

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MAR 21 1991

Report To: W D Purnell & Assoc. Date: March 19, 1991

Report On: Analysis of Water Lab No.: 16469

IDENTIFICATION:
Samples Received on 03-13-91 Sapled 3-8-91
Project: 91008 Trans. Mountain

ANALYSIS:

Lab Sample No.	1	2	3	4	5
Client ID	Control	Dam 1	Dam 2	Dam 3	Guide
Matrix/Units	Water mg/l	Water mg/l	Water mg/l	Water mg/l	Water mg/l
Total Petroleum Hydrocarbons by EPA Method 418.1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Petroleum Fuel Hydro-carbons by EPA SW-846 Modified Method 8015	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Lab Sample No. 6 **Client ID: Dam 3**

Benzene, mg/l	< 0.001
Toluene, mg/l	< 0.001
Ethyl Benzene, mg/l	< 0.001
Xylenes, mg/l	< 0.001

BTEX by EPA SW-846 Method 8020

Lab Sample No. 7 **Client ID: Dam 3**

Total Suspended Solids, mg/l 3

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QUALITY CONTROL REPORT

DUPLICATES

Lab No: 16469 (2)
Date: March 19, 1991
Client: W D Purnell & Assoc.

Client ID: Dam 1
Matrix: Water
Units: mg/l

Compound	Sample(S)	Duplicate(D)	RPD*
Total Petroleum Hydrocarbons	< 1.0	< 1.0	---
Total Petroleum Fuel Hydrocarbons	< 1.0	< 1.0	---

*RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

MAR 21 199
91008

CHAIN OF CUSTODY RECORD

Page ___ of ___

CUSTOMER: WD Durnell & Asso INC

PROJECT: Trans Mnt P.O./JOB NO.: 91008

SAMPLER: DD

1

Lab No.	Sample No.	Date	Time	Cont.	Analysis Required
1	Control	3-12-91	1600	H_2O	TPH (8015) (418.1)
2	Dam 1	"	1617	H_2O	" " "
3	Dam 3	"	1630	H_2O	" " "
	Dam 3	"	1630	H_2O	BETX 8020

Relinquished by:	Date	Time	Received by:	Date	Time
Wayne Walker	3-13	10:24	John E. Logger	3-13-91	10:24
Relinquished by:	Date	Time	Received by:	Date	Time

Dispatched by:	Date	Time	Received at lab by:	Date	Time
			Mary Cooley	3/13/91	2:25

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MAR 21 1991

Report To: W.D. Purnell & Assoc. Date: March 19, 1991

Report On: Analysis of Water Lab No.: 16483

IDENTIFICATION:
Samples Received on 03-13-91 Sampled 3-12-91
Project: 91008 Trans. Mountain

ANALYSIS:

Lab Sample No.	1	2	3
Client Identification	Control	Dam 1	Dam 3
Matrix/Units	Water mg/l	Water mg/l	Water mg/l
Benzene	NT	NT	< 0.001
Toluene	NT	NT	< 0.001
Ethyl Benzene	NT	NT	< 0.001
Xylenes	NT	NT	< 0.001
BTEX by EPA SW-846 Method 8020			
Total Petorleum Hydrocarbons by EPA Method 418.1	< 1.0	< 1.0	< 1.0
Total Petroleum Fuel Hydrocarbons by EPA SW-846 Modified Method 8015	< 1.0	< 1.0	< 1.0

NT = Not Tested

Note - Results reported on an as received basis.

SOUND ANALYTICAL SERVICES

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MAR 27 1991
91008

CHAIN OF CUSTODY RECORD

Page ___ of ___

CUSTOMER: W D Purnell & Asso

PROJECT: Trans Mgt P.O./JOB NO.: 91008

SAMPLER: DD

Lab No.	Sample No.	Date	Time	Cont.	Analysis Required
	MW-1	3-15-91	11:40	H_2O	TPH - 418.1
	MW-2	"	11:45	"	TPH - 418.1
	MW-3	"	11:50	"	TPH - 418.1
	B Control	"	12:20	"	TPH - 418.1
	DAM 1	"	12:30	"	TPH - 418.1
	DAM 2	"	12:30	"	TPH - 418.1
	DAM 3	"	12:45	"	TPH - 418.1
	"	"	12:45	"	BETX
	"	"	12:45	"	Total Suspended Solids

Relinquished by:	Date	Time	Received by:	Date	Time
Nuna Walker	3-18-91	11:05	John E. Loggen	3-18	11:05
Relinquished by:	Date	Time	Received by:	Date	Time

Dispatched by:	Date	Time	Received at lab by:	Date	Time
			SGiang	3/18/91	2:40 pm

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MAR 27 1991

Report To: W D Purnell & Assoc. Date: March 25, 1991

Report On: Analysis of Water Lab No.: 16561

IDENTIFICATION:
Samples Received on 03-18-91 Sampled 3-15-91
Project: 91008 Trans Mountain

ANALYSIS:

Lab Sample No.	1	2	3
Client Identification	MW-1	MW-2	MW-3
Matrix/Units	Water mg/l	Water mg/l	Water mg/l
Total Petroleum Hydrocarbons by EPA Method 418.1	< 1.0	25.8	< 1.0
Total Petroleum Fuel Hydrocarbons by EPA SW-846 Modified Method 8015	< 1.0	21.0	< 1.0
TPH as		Gasoline	

Lab Sample No.	4	5	6	7
Client Identification	Control	Dam 1	Dam 2	Dam 3
Matrix/Units	Water mg/l	Water mg/l	Water mg/l	Water mg/l
Total Petroleum Hydrocarbons by EPA Method 418.1	< 1.0	< 1.0	< 1.0	< 1.0
Total Petroleum Fuel Hydrocarbons by EPA SW-846 Modified Method 8015	< 1.0	< 1.0	< 1.0	< 1.0

Note - Results reported on an as received basis.

Continued . . .

SOUND ANALYTICAL SERVICES, INC.

W D Purnell & Assoc.
Page 2 of 2
Lab No. 16561
March 25, 1991

Lab Sample No. 8 **Client ID: Dam 3**

Benzene, mg/l	< 0.001
Toluene, mg/l	< 0.001
Ethyl Benzene, mg/l	< 0.001
Xylenes, mg/l	< 0.001

BTEX by EPA SW-846 Method 8020

Lab Sample No. 9 **Client ID: Dam 3**

Total Suspended Solids, mg/l	3

Note - BTEX results reported on an as received basis.

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CHAIN OF CUSTODY RECORD

Page 2 of 2

CUSTOMER: W D Purnell & Assoc Inc APR 1 1991

PROJECT: Travis Mint P.O./JOB NO.: 91008

SAMPLER: DD

Lab No.	Sample No.	Date	Time	Cont.	Analysis Required
	Control	3-20-91	10:50	H_2O	~~TPH 418.1~~ TPH 8015 Modified
	DAM 1	"	11:30	"	~~TPH 418.1~~ " "
	DAM 3	"	11:45	"	~~TPH 418.1~~ " "
	DAM 3	"	11:45	"	BETX
	DAM 3	"	11:45	"	Dissolved Solids
	Equip Meridian	"	12:15	"	TPH ~~418.1~~ 8015 Modified

Relinquished by:	Date	Time	Received by:	Date	Time
Wesora Walker	3/21	10:15	John E. Loggy	3/21	10:15
Relinquished by:	Date	Time	Received by:	Date	Time

Dispatched by:	Date	Time	Received at lab by:	Date	Time
			Mary Cantu	3/21/91	3:15 pm

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Report To: W.D. Purnell

Date: April 1, 1991

Report On: Analysis of Water

Lab No.: 16653

IDENTIFICATION:
Samples Received on 03-21-91 Sampled 3-20-91
Project: 91008 Trans. Mountain

ANALYSIS:

Lab Sample No. 1 **Client ID: Dam 3**

	Concentration, mg/l
Benzene	< 0.001
Toluene	< 0.001
Ethyl Benzene	< 0.001
Xylenes	< 0.001

BTEX by EPA SW-846
Method 8020

Lab Sample No. 2 **Client ID: Dam 3**

Total Petroleum Fuel Hydrocarbons, mg/l by EPA SW-846 Modified Method 8015	< 1.0

Lab Sample No. 3 **Client ID: Dam 3**

Total Dissolved Solids, mg/l	350

Continued . . .

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W.D. Purnell
Project: 91008

Lab No. 16653
April 1, 1991

Lab Sample No.	Client ID	*Total Petroleum Fuel Hydrocarbons, mg/l
4	Control	< 1.0
5	Dam 1	< 1.0
6	Guide Meridian	< 1.0

*TPH by EPA SW-846 Modified Method 8015

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QUALITY CONTROL REPORT

DUPLICATES

Lab No: 16653 (2)
Date: April 1, 1991
Client: W.D. Purnell & Assoc.

Client ID: Dam 3
Matrix: Water
Units: mg/l

Compound	Sample(S)	Duplicate(D)	RPD*
Total Petroleum Fuel Hydrocarbons	< 1.0	< 1.0	---

*RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

CHAIN OF CUSTODY RECORD

APR 4 1991

Page 1 of ___

CUSTOMER: WD Purnell & Asso

PROJECT: Trans Mnt P.O./JOB NO.: 91008

SAMPLER: DD

Lab No.	Sample No.	Date	Time	Cont.	Analysis Required
	Control	3-22-91	4:00	H_2O	TPH 8015
	DAM1	"	4:10	"	TPH 8015
	DAM2	"	4:30	"	TPH 8015
	DAM3	"	4:40	"	TPH 8015
	DAM3	"	4:40	"	BETX 8020
	DAM3	"	4:40	"	Total Suspended Solids
	Guide Meridian	"	5:00	"	TPH 8015

Relinquished by:	Date	Time	Received by:	Date	Time
Diane Walker	3-25	10:14	John E. Coggen	3-25-91	1014
Relinquished by:	Date	Time	Received by:	Date	Time

Dispatched by:	Date	Time	Received at lab by:	Date	Time
			Mary Custer	3/25/91	4 pm

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APR 4 1991

Report To: W.D. Purnell & Assoc. Date: April 2, 1991

Report On: Analysis of Water Lab No.: 16695

IDENTIFICATION:
Samples Received on 03-25-91 Sampled 3-22-91
Project: 91008 Trans. Mountain

ANALYSIS:

Lab Sample No.	Client ID	*Total Petroleum Fuel Hydrocarbons, mg/l
1	Control	< 1.0
2	Dam 1	< 1.0
3	Dam 2	< 1.0
4	Dam 3	< 1.0
5	Guide Meridian	< 1.0

*TPH by EPA SW-846 Modified Method 8015

Lab Sample No. 6 **Client ID: Dam 3**

	Concentration, mg/l
Benzene	< 0.001
Toluene	< 0.001
Ethyl Benzene	< 0.001
Xylenes	< 0.001

BTEX by EPA SW-846 Method 8020

Lab Sample No. 7 **Client ID: Dam 3**

Total Suspended Solids, mg/l 5

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QUALITY CONTROL REPORT

DUPLICATES

Lab No: 16695 (5)
Date: April 2, 1991
Client: W.D. Purnell & Assoc.

Client ID: Guide Meridian
Matrix: Water
Units: mg/l

Compound	Sample(S)	Duplicate(D)	RPD*
Total Petroleum Fuel Hydrocarbons	< 1.0	< 1.0	---

*RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

CHAIN OF CUSTODY RECORD

APR 5 1991

Page 1 of 1

CUSTOMER: W. D. Purnell and Associates

PROJECT: Trans Mountain P.O./JOB NO.: 91008

SAMPLER: Craig Erdman

Lab No.	Sample No.	Date	Time	Cont.	Analysis Required
	CONTROL	3/25/91	3:10PM	Water	TPH 8015
	DAM1	3/25/91	3:40PM	Water	TPH 8015
	DAM3	3/25/91	4:10PM	Water	TPH 8015
	DAM3	3/25/91	4:10PM	Water	Total Suspended Solids
	DAM3	3/25/91	4:05PM	Water	BETX
	~~GUIDE~~	~~3/25/91~~			

Relinquished by:	Date	Time	Received by:	Date	Time
Donna Walker	3-26	10:16	John E. Logger	3-26-91	1016
Relinquished by:	Date	Time	Received by:	Date	Time

Dispatched by:	Date	Time	Received at lab by:	Date	Time
			Mary Linton	3/26/91	4:40

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APR 5 1991

Report To: W.D. Purnell & Assoc. Date: April 3, 1991

Report On: Analysis of Water Lab No.: 16723

IDENTIFICATION:
Samples Received on 03-26-91 Sampled 3-25-91
Project: 91008 Trans. Mountain

ANALYSIS:

Lab Sample No.	Client ID	*Total Petroleum Fuel Hydrocarbons, ppm
1	Control	< 1.0
2	Dam 1	< 1.0
3	Dam 3	< 1.0

*TPH by EPA SW-846 Modified Method 8015

Lab Sample No. 4 **Client ID: Dam 3**

Total Suspended Solids, ppm 16

Lab Sample No. 5 **Client ID: Dam 3**

Benzene, ppm	< 0.001
Toluene, ppm	< 0.001
Ethyl Benzene, ppm	< 0.001
Xylenes, ppm	< 0.001

BTEX by EPA SW-846 Method 8020

SOUND ANALYTICAL SERVICES

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QUALITY CONTROL REPORT

DUPLICATES

Lab No: 16723 (1)
Date: April 3, 1991
Client: W.D. Purnell & Assoc.

Client ID: Control
Matrix: Water
Units: ppm

Compound	Sample(S)	Duplicate(D)	RPD*
Total Petroleum Fuel Hydrocarbons	< 1.0	< 1.0	---

*RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

CHAIN OF CUSTODY RECORD

APR 4 1991

91008

Page 1 of 1

CUSTOMER: W.D. Purnell & Assoc.

PROJECT: TRANS MOUNTAIN P.O./JOB NO.: 91008

SAMPLER: CE

Lab No.	Sample No.	Date	Time	Cont.	Analysis Required	
	COOK	3/28/91	17:15	H_2O	TPH 418.1	RUSH
	COOK	3/28/91	17:15	H_2O	BTEX 8020	RUSH
	ALLRED	3/29/91	8:40	H_2O	TPH 418.1	RUSH
	ALLRED	3/29/91	8:40	H_2O	BTEX 8020	RUSH
	GREY HOUSE	3/29/91	8:50	H_2O	TPH 418.1	RUSH
	GREY HOUSE	3/29/91	8:50	H_2O	BTEX 8020	RUSH

Relinquished by:	Date	Time	Received by:	Date	Time
Thomas Pappas	3/29/91	10:13	John E. Logger	3-29-91	1016
Relinquished by:	Date	Time	Received by:	Date	Time
Dispatched by:	Date	Time	Received at lab by:	Date	Time
			Sinna	3/29/91	

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APR 4 1991

91008

Report To: W. D. Purnell & Assoc. Date: April 1, 1991

Report On: Analysis of Water Lab No.: 16807

IDENTIFICATION:
Samples Received on 03-29-91
Project: 91008 Trans Mountain Sampled 3-28-91 & 3-29-91

ANALYSIS:

Lab Sample No.	RUSH 1	RUSH 2	RUSH 3
Client Identification	Cook	Allred	Grey House
Matrix/Units	Water mg/l	Water mg/l	Water mg/l
Benzene	< 0.001	< 0.001	< 0.001
Toluene	< 0.001	< 0.001	< 0.001
Ethyl Benzene	< 0.001	< 0.001	< 0.001
Xylenes	< 0.001	< 0.001	< 0.001
BTEX by EPA SW-846 Method 8020			
Total Petroleum Hydrocarbons by EPA Method 418.1	< 1.0	< 1.0	< 1.0

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QUALITY CONTROL REPORT

DUPLICATES

Lab No: 16807 (1)
Date: April 1, 1991
Client: W.D. Purnell & Assoc.

Client ID: Cook
Matrix: Water
Units: mg/l

Compound	Sample(S)	Duplicate(D)	RPD*
Benzene	< 0.001	< 0.001	---
Toluene	< 0.001	< 0.001	---
Ethyl Benzene	< 0.001	< 0.001	---
Xylene	< 0.001	< 0.001	---
Total Petroleum Hydrocarbons	< 1.0	< 1.0	---

*RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

CHAIN OF CUSTODY RECORD

Page 1 of 1

APR 11 1991

CUSTOMER: W D Purnell

PROJECT: Trans Mnt P.O./JOB NO.: 91008

SAMPLER: C E

Lab No.	Sample No.	Date	Time	Cont.	Analysis Required
	Control	3-29-91	15:30	Water	TPH 8015
	Dam 1	"	16:00	"	TPH 8015
	Dam 2	"	16:20	"	TPH 8015
	Dam 3	"	16:35	"	TPH 8015
	Dam 3	"	16:35	"	Total Suspended Solids
	Dam 3	"	16:35	"	~~E~~ BETX 8020
	Guide	"	17:00	"	TPH 8015
	Victor-TM	3-28-91	17:30	"	TPH 8015
	Victor-TM	"	17:30	"	Betx 8020
	Jar #42	"	14:30	Soil	TPH 418.1
	Jar #43	"	14:50	Soil	TPH 418.1
	Jar #44	"	15:15	Soil	TPH 418.1
	Jar #45	"	15:30	Soil	TPH 418.1

Relinquished by:	Date	Time	Received by:	Date	Time
Wesna Walker	4-2-91	10:30	John E. Logger	4-2-91	10:30
Relinquished by:	Date	Time	Received by:	Date	Time

Dispatched by:	Date	Time	Received at lab by:	Date	Time
			Mary Cotton	4/3/91	4pm

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APR 11 1991

Report To: W D Purnell & Assoc. Date: April 8, 1991

Report On: Analysis of Water & Soil Lab No.: 16854

IDENTIFICATION:
Samples Received on 04-03-91 Sampled 3-28-91
Project: 91008 Trans. Mountain

ANALYSIS:

Lab Sample No.	Client ID	*Total Petroleum Fuel Hydrocarbons, ppm
1	Control (water)	< 1.0
2	Dam 1 (water)	< 1.0
3	Dam 2 (water)	< 1.0
4	Dam 3 (water)	< 1.0
5	Guide (water)	< 1.0
6	Victor - TM (water)	< 1.0

*TPH by EPA SW-846 Modified Method 8015

Lab Sample No.	Client ID	Total Petroleum Hydrocarbons, ppm by EPA Method 418.1
7	Jar #42 (soil)	2,150
8	Jar #43 (soil)*	2,080
9	Jar #44 (soil)	182
10	Jar #45 (soil)	3,260

* Sample very inconsistant, full of grass and roots.

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

W D Purnell & Assoc.
Project: 91008

Lab No. 16854
April 8, 1991

Lab Sample No.	11	12
Client Identification	Dam 3	Victor - TM
Matrix/Units	Water ppm	Water ppm
Benzene	< 0.001	< 0.001
Toluene	< 0.001	< 0.001
Ethyl Benzene	< 0.001	< 0.001
Xylenes	< 0.001	< 0.001
BTEX by EPA SW-846 Method 8020		

Lab Sample No. 13 Client ID: Dam 3 (water)

Total Suspended Solids, ppm 6

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QUALITY CONTROL REPORT

DUPLICATES

Lab No: 16854 (12)
Date: April 8, 1991
Client: W D Purnell & Assoc.

Client ID: Victor - TM
Matrix: Water
Units: ppm

Compound	Sample(S)	Duplicate(D)	RPD*
Benzene	< 0.001	< 0.001	---
Toluene	< 0.001	< 0.001	---
Ethyl Benzene	< 0.001	< 0.001	---
Xylenes	< 0.001	< 0.001	---

Lab No: 16854 (1)
Date: April 8, 1991
Client: W D Purnell & Assoc.

Client ID: Control
Matrix: Water
Units: ppm

Compound	Sample(S)	Duplicate(D)	RPD*
Total Petroleum Hydrocarbons	< 1.0	< 1.0	---

Lab No: 16854 (8)
Date: April 8, 1991
Client: W D Purnell & Assoc.

Client ID: Jar # 43
Matrix: Water
Units: ppm

Compound	Sample(S)	Duplicate(D)	RPD*
Total Petroleum Hydrocarbons	2,080	1,870	10.6

*RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

910068 APR 18 1991

CHAIN OF CUSTODY RECORD

Page 1 of 2

CUSTOMER: W.D. Purnell and Associates

PROJECT: Trans Mountain P.O./JOB NO.: 91008

SAMPLER: BU & CE

Lab No.	Sample No.	Date	Time	Cont.	Analysis Required	
	Jar#47	4-8-91		Soil	TPH 8015	RUSH
	Jar#48	4-8-91		Soil	TPH 8015	RUSH
	Jar#49	4-8-91		Soil	TPH 8015	RUSH
	Jar#50	4-8-91		Soil	TPH 8015	RUSH
	Jar#51	4-8-91		Soil	TPH 8015	RUSH
	Jar#52	4-8-91		Soil	TPH 8015	RUSH
	Jar#53	4-8-91		Soil	TPH- 8015	RUSH
	SH-1, 4-6"	4-8-91		Soil	TPH 8015	RUSH
	SH-1, 16-18"	4-8-91		Soil	TPH 8015	RUSH
	SH-1, 28-30"	4-8-91		Soil	TPH 8015	RUSH
	SH-2, 4-6"	4-8-91		Soil	TPH 8015	RUSH
	SH-2, 10-12"	4-8-91		Soil	TPH 8015	RUSH
	SH-2, 16-18"	4-8-91		Soil	TPH 8015	RUSH
	SH-2, 22-24"	4-8-91		Soil	TPH 8015	RUSH
	SH-2, 28-30"	4-8-91		Soil	TPH 8015	RUSH

Relinquished by:	Date	Time	Received by:	Date	Time
Wanda Walden	4-9-91	9:37	John E. Logger	4-9-91	0937
Relinquished by:	Date	Time	Received by:	Date	Time

Dispatched by:	Date	Time	Received at lab by:	Date	Time
			Mary Coates	4/9/91	2:30

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CHAIN OF CUSTODY RECORD

Page 2 of 2

CUSTOMER: ~~Hart~~ W. D. Purnell and Associates

PROJECT: Trans Mountain P.O./JOB NO.: 91008

SAMPLER: BU & CE

Lab No.	Sample No.	Date	Time	Cont.	Analysis Required	
	SH-3, 4-6"	4-8-91		Soil	TPH 8015	RUSH
	SH-3, 10-12"	4-8-91		Soil	TPH 8015	RUSH
	SH-3, 16-18"	4-8-91		Soil	TPH 8015	RUSH
	SH-3, 22-24"	4-8-91		Soil	TPH 8015	RUSH
	SH-3, 28-30"	4-8-91		Soil	TPH 8015	RUSH
	SH-4, 4-6"	4-8-91		Soil	TPH 8015	RUSH
	SH-4, 18-20"	4-8-91		Soil	TPH 8015	RUSH
	SH-4, 28-30"	4-8-91		Soil	TPH 8015	RUSH
	Jar #54	4-8-91		Soil	TPH 8015	RUSH

Relinquished by:	Date	Time	Received by:	Date	Time
Warren Wilson	4-9-91	9:37	John E. Logger	4-9-91	0937
Relinquished by:	Date	Time	Received by:	Date	Time

Dispatched by:	Date	Time	Received at lab by:	Date	Time
			Mary Custer	4/9/91	2:30

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APR 18 1991

91008B

Report To: W D Purnell & Assoc. Date: April 10, 1991

Report On: Analysis of Soil Lab No.: 16941

IDENTIFICATION:
Samples Received on 04-09-91 Sampled 4-8-91
Project: 91008 Trans. Mountain

ANALYSIS:

Lab Sample No.	Client ID	*Total Petroleum Fuel Hydrocarbons, ppm
RUSH 1	Jar #47	1,395 Aged Gas - Diesel
RUSH 2	Jar #48	< 10
RUSH 3	Jar #49	< 10
RUSH 4	Jar #50	< 10
RUSH 5	Jar #51	< 10
RUSH 6	Jar #52	< 10
RUSH 7	Jar #53	38 Diesel
RUSH 8	SH-1, 4-6"	843 Aged Gas - Diesel
RUSH 9	SH-1, 16-18"	< 10
RUSH 10	SH-1, 28-30"	< 10

*TPH by EPA SW-846 Modified Method 8015

Note - Results reported on an as received basis.

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

W D Purnell & Assoc.
Project: 91008

Lab No. 16941
April 10, 1991

Lab Sample No.	Client ID	*Total Petroleum Fuel Hydrocarbons, ppm
RUSH 11	SH-2, 4-6"	2,053 Aged Gas - Diesel
RUSH 12	SH-2, 10-12"	4,907 Aged Gas - Diesel
RUSH 13	SH-2, 16-18"	1,667 Aged Gas - Diesel
RUSH 14	SH-2, 22-24"	< 10
RUSH 15	SH-2, 28-30"	< 10
RUSH 16	SH-3, 4-6"	< 10
RUSH 17	SH-3, 10-12"	< 10
RUSH 18	SH-3, 16-18"	< 10
RUSH 19	SH-3, 22-24"	< 10
RUSH 20	SH-3, 28-30"	< 10
RUSH 21	SH-4, 4-6"	< 10

*TPH by EPA SW-846 Modified Method 8015

Note - Results reported on an as received basis.

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

W D Purnell & Assoc.
Project: 91008

Lab No. 16941
April 10, 1991

Lab Sample No.	Client ID	*Total Petroleum Fuel Hydrocarbons, ppm
RUSH 22	SH-4, 18-20"	< 10
RUSH 23	SH-4, 28-30"	< 10
RUSH 24	Jar #54< 10	< 10

*TPH by EPA SW-846 Modified Method 8015

Note - Results reported on an as received basis.

SOUND ANALYTICAL SERVICES

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QUALITY CONTROL REPORT

DUPLICATES

Lab No: 16941 (1)
Date: April 10, 1991
Client: W D Purnell & Assoc.

Client ID: Jar # 47
Matrix: Soil
Units: ppm

Compound	Sample(S)	Duplicate(D)	RPD*
Total Petroleum Fuel Hydrocarbons	1,395	1,517	8.3

Lab No: 16941 (10)
Date: April 10, 1991
Client: W D Purnell & Assoc.

Client ID: SH-1, 28-30"
Matrix: Soil
Units: ppm

Compound	Sample(S)	Duplicate(D)	RPD*
Total Petroleum Fuel Hydrocarbons	< 10	< 10	---

Lab No: 16941 (20)
Date: April 10, 1991
Client: W D Purnell & Assoc.

Client ID: SH-3, 4-6"
Matrix: Soil
Units: ppm

Compound	Sample(S)	Duplicate(D)	RPD*
Total Petroleum Fuel Hydrocarbons	< 10	< 10	---

*RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

Samples TAK 4/8/91

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APR 19 1991

Report To: W D Purnell & Assoc. Date: April 16, 1991

Report On: Analysis of Soil Lab No.: 17001-1
Page 1 of 2

IDENTIFICATION:
Original samples received on 04-09-91, reference lab report number 17001, lab number 1. Request for additional testing received on 04-11-91.
Sampled 4-8-91
Project: 91008 Trans Mountain
Client ID: Jar #47

ANALYSIS:

Sample was analyzed for polynuclear aromatic hydrocarbons in accordance with EPA SW 846 Method 8270.

CAS No.	Compound	Concentration ug/kg	PQL
91-20-3	Naphthalene	* (810)	1,000
208-96-8	Acenaphthylene	ND	1,000
83-32-9	Acenaphthene	ND	1,000
86-73-7	Fluorene	* (400)	1,000
85-01-8	Phenanthrene	* (250)	1,000
120-12-7	Anthracene	ND	1,000
206-44-0	Fluoranthene	ND	1,000
129-00-0	Pyrene	ND	1,000
56-55-3	Benzo(a)anthracene	ND	1,000
218-01-9	Chrysene	ND	1,000
205-99-2	Benzo(b)fluoranthene	ND	1,000
207-08-9	Benzo(k)fluoranthene	ND	1,000
50-32-8	Benzo(a)pyrene	ND	1,000
193-39-5	Indeno(1,2,3-cd)pyrene	ND	1,000
53-70-3	Dibenz(a,h)anthracene	ND	1,000
191-24-2	Benzo(g,h,i)perylene	ND	1,000

Continued . . . . . .

SOUND ANALYTICAL SERVICES, INC.

W D Purnell & Assoc.
Page 2 of 2
Lab No. 17001-1
April 17, 1991

Client ID: Jar #47

ND = Not Detected

PQL - Practical Quantitation Limit - These are the quantitation limits for this sample. This number is based on sample size, matrix and dilution required.

* = Compound was detected but below PQL.

() = value shown is estimated concentration.

Note: All soil samples are reported on a dry weight basis.

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	46	35 - 114	23 - 120
2-Fluorobiphenyl	52	43 - 116	30 - 115
p-Terphenyl-d_{14}	56	33 - 141	18 - 137
Phenol-d_6	28	10 - 94	24 - 113
2-Fluorophenol	41	21 - 100	25 - 121
2,4,6-Tribromophenol	51	10 - 123	19 - 122

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APR 19 1991

Report To: W D Purnell & Assoc. Date: April 17, 1991

Report On: Analysis of Soil Lab No.: 17001-2

IDENTIFICATION:
Original samples received on 04-09-91, reference lab report number 17001, lab number 7. Request for additional testing received on 04-11-91.
Project: 91008 Trans Mountain
Client ID: Jar #53

ANALYSIS:

Sample was analyzed for polynuclear aromatic hydrocarbons in accordance with EPA SW 846 Method 8270.

CAS No.	Compound	Concentration ug/kg	PQL
91-20-3	Naphthalene	ND	1,000
208-96-8	Acenaphthylene	ND	1,000
83-32-9	Acenaphthene	ND	1,000
86-73-7	Fluorene	ND	1,000
85-01-8	Phenanthrene	ND	1,000
120-12-7	Anthracene	ND	1,000
206-44-0	Fluoranthene	ND	1,000
129-00-0	Pyrene	ND	1,000
56-55-3	Benzo(a)anthracene	ND	1,000
218-01-9	Chrysene	ND	1,000
205-99-2	Benzo(b)fluoranthene	ND	1,000
207-08-9	Benzo(k)fluoranthene	ND	1,000
50-32-8	Benzo(a)pyrene	ND	1,000
193-39-5	Indeno(1,2,3-cd)pyrene	ND	1,000
53-70-3	Dibenz(a,h)anthracene	ND	1,000
191-24-2	Benzo(g,h,i)perylene	ND	1,000

Continued . . . . . .

SOUND ANALYTICAL SERVICES, INC.

W D Purnell & Assoc.
Page 2 of 2
Lab No. 17001-2
April 17, 1991

Client ID: Jar #53

ND = Not Detected

PQL - Practical Quantitation Limit - These are the quantitation limits for this sample. This number is based on sample size, matrix and dilution required.

* = Compound was detected but below PQL.

() = value shown is estimated concentration.

Note: All soil samples are reported on a dry weight basis.

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	46	35 - 114	23 - 120
2-Fluorobiphenyl	49	43 - 116	30 - 115
p-Terphenyl-d_{14}	48	33 - 141	18 - 137
Phenol-d_6	24	10 - 94	24 - 113
2-Fluorophenol	36	21 - 100	25 - 121
2,4,6-Tribromophenol	41	10 - 123	19 - 122

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W D Purnell & Assoc.

Lab No. 17001-3
April 17, 1991

Client ID: SH-1, 4-6"

ND = Not Detected

PQL - Practical Quantitation Limit - These are the quantitation limits for this sample. This number is based on sample size, matrix and dilution required.

* = Compound was detected but below PQL.

() = value shown is estimated concentration.

Note: All soil samples are reported on a dry weight basis.

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	57	35 - 114	23 - 120
2-Fluorobiphenyl	65	43 - 116	30 - 115
p-Terphenyl-d_{14}	59	33 - 141	18 - 137
Phenol-d_6	60	10 - 94	24 - 113
2-Fluorophenol	52	21 - 100	25 - 121
2,4,6-Tribromophenol	57	10 - 123	19 - 122

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APR 19 19

Report To: W D Purnell & Assoc. Date: April 17, 1991

Report On: Analysis of Soil Lab No.: 17001-4

IDENTIFICATION:

Original samples received on 04-09-91, reference lab report number 17001, lab number 11. Request for additional testing received on 04-11-91.
Project: 91008 Trans Mountain
Client ID: SH-2, 4-6"

ANALYSIS:

Sample was analyzed for polynuclear aromatic hydrocarbons in accordance with EPA SW 846 Method 8270.

CAS No.	Compound	Concentration ug/kg	PQL
91-20-3	Naphthalene	* (500)	900
208-96-8	Acenaphthylene	ND	900
83-32-9	Acenaphthene	ND	900
86-73-7	Fluorene	* (500)	900
85-01-8	Phenanthrene	* (400)	900
120-12-7	Anthracene	ND	900
206-44-0	Fluoranthene	ND	900
129-00-0	Pyrene	ND	900
56-55-3	Benzo(a)anthracene	ND	900
218-01-9	Chrysene	ND	900
205-99-2	Benzo(b)fluoranthene	ND	900
207-08-9	Benzo(k)fluoranthene	ND	900
50-32-8	Benzo(a)pyrene	ND	900
193-39-5	Indeno(1,2,3-cd)pyrene	ND	900
53-70-3	Dibenz(a,h)anthracene	ND	900
191-24-2	Benzo(g,h,i)perylene	ND	900

Continued . . . . . .

SOUND ANALYTICAL SERVICES, INC.

W D Purnell & Assoc.

Lab No. 17001-4
April 17, 1991

Client ID: SH-2, 4-6"

ND = Not Detected

PQL - Practical Quantitation Limit - These are the quantitation limits for this sample. This number is based on sample size, matrix and dilution required.

* = Compound was detected but below PQL.

() = value shown is estimated concentration.

Note: All soil samples are reported on a dry weight basis.

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	45	35 - 114	23 - 120
2-Fluorobiphenyl	49	43 - 116	30 - 115
p-Terphenyl-d_{14}	47	33 - 141	18 - 137
Phenol-d_6	27	10 - 94	24 - 113
2-Fluorophenol	39	21 - 100	25 - 121
2,4,6-Tribromophenol	48	10 - 123	19 - 122

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SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

APR 19 1991

Report To: W D Purnell & Assoc. Date: April 17, 1991

Report On: Analysis of Soil Lab No.: 17001-5

IDENTIFICATION:
Original samples received on 04-09-91, reference lab report number 17001, lab number 12. Request for additional testing received on 04-11-91.
Project: 91008 Trans Mountain
Client ID: SH-2, 10-12"

ANALYSIS:

Sample was analyzed for polynuclear aromatic hydrocarbons in accordance with EPA SW 846 Method 8270.

CAS No.	Compound	Concentration ug/kg	PQL
91-20-3	Naphthalene	3,700	900
208-96-8	Acenaphthylene	ND	900
83-32-9	Acenaphthene	ND	900
86-73-7	Fluorene	1,100	900
85-01-8	Phenanthrene	* (600)	900
120-12-7	Anthracene	ND	900
206-44-0	Fluoranthene	ND	900
129-00-0	Pyrene	ND	900
56-55-3	Benzo(a)anthracene	ND	900
218-01-9	Chrysene	ND	900
205-99-2	Benzo(b)fluoranthene	ND	900
207-08-9	Benzo(k)fluoranthene	ND	900
50-32-8	Benzo(a)pyrene	ND	900
193-39-5	Indeno(1,2,3-cd)pyrene	ND	900
53-70-3	Dibenz(a,h)anthracene	ND	900
191-24-2	Benzo(g,h,i)perylene	ND	900

Continued . . . . . .

SOUND ANALYTICAL SERVICES, INC.

W D Purnell & Assoc.

Lab No. 17001-5
April 17, 1991

Client ID: SH-2, 10-12"

ND = Not Detected

PQL - Practical Quantitation Limit - These are the quantitation limits for this sample. This number is based on sample size, matrix and dilution required.

* = Compound was detected but below PQL.

() = value shown is estimated concentration.

Note: All soil samples are reported on a dry weight basis.

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	67	35 - 114	23 - 120
2-Fluorobiphenyl	69	43 - 116	30 - 115
p-Terphenyl-d_{14}	65	33 - 141	18 - 137
Phenol-d_6	62	10 - 94	24 - 113
2-Fluorophenol	62	21 - 100	25 - 121
2,4,6-Tribromophenol	66	10 - 123	19 - 122

SOUND ANALYTICAL SERVICES

DENNIS BEAN

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

APR 19 1991

Report To: W D Purnell & Assoc. Date: April 17, 1991

Report On: Analysis of Soil Lab No.: 17001-6

IDENTIFICATION:
Original samples received on 04-09-91, reference lab report number 17001, lab number 13. Request for additional testing received on 04-11-91.
Project: 91008 Trans Mountain
Client ID: SH-2, 16-18"

ANALYSIS:

Sample was analyzed for polynuclear aromatic hydrocarbons in accordance with EPA SW 846 Method 8270.

CAS No.	Compound	Concentration ug/kg	PQL
91-20-3	Naphthalene	3,000	800
208-96-8	Acenaphthylene	ND	800
83-32-9	Acenaphthene	ND	800
86-73-7	Fluorene	* (500)	800
85-01-8	Phenanthrene	* (300)	800
120-12-7	Anthracene	ND	800
206-44-0	Fluoranthene	ND	800
129-00-0	Pyrene	ND	800
56-55-3	Benzo(a)anthracene	ND	800
218-01-9	Chrysene	ND	800
205-99-2	Benzo(b)fluoranthene	ND	800
207-08-9	Benzo(k)fluoranthene	ND	800
50-32-8	Benzo(a)pyrene	ND	800
193-39-5	Indeno(1,2,3-cd)pyrene	ND	800
53-70-3	Dibenz(a,h)anthracene	ND	800
191-24-2	Benzo(g,h,i)perylene	ND	800

Continued . . . . . .

SOUND ANALYTICAL SERVICES, INC.

W D Purnell & Assoc.

Lab No. 17001-6
April 17, 1991

Client ID: SH-2, 16-18"

ND = Not Detected

PQL - Practical Quantitation Limit - These are the quantitation limits for this sample. This number is based on sample size, matrix and dilution required.

* = Compound was detected but below PQL.

() = value shown is estimated concentration.

Note: All soil samples are reported on a dry weight basis.

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	49	35 - 114	23 - 120
2-Fluorobiphenyl	61	43 - 116	30 - 115
p-Terphenyl-d_{14}	60	33 - 141	18 - 137
Phenol-d_6	35	10 - 94	24 - 113
2-Fluorophenol	44	21 - 100	25 - 121
2,4,6-Tribromophenol	64	10 - 123	19 - 122

SOUND ANALYTICAL SERVICES

DENNIS BEAN

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

APR 19 1991

Report To: W D Purnell & Assoc. Date: April 17, 1991

Report On: Analysis of Soil Lab No.: 17001-6D

IDENTIFICATION:
Original samples received on 04-09-91, reference lab report number 17001, lab number 13. Request for additional testing received on 04-11-91.
Project: 91008 Trans Mountain
Client ID: SH-1, 16-18" **(DUPLICATE)**

ANALYSIS:

Sample was analyzed for polynuclear aromatic hydrocarbons in accordance with EPA SW 846 Method 8270.

CAS No.	Compound	Concentration ug/kg	PQL
91-20-3	Naphthalene	2,800	800
208-96-8	Acenaphthylene	ND	800
83-32-9	Acenaphthene	ND	800
86-73-7	Fluorene	* (400)	800
85-01-8	Phenanthrene	* (300)	800
120-12-7	Anthracene	ND	800
206-44-0	Fluoranthene	ND	800
129-00-0	Pyrene	ND	800
56-55-3	Benzo(a)anthracene	ND	800
218-01-9	Chrysene	ND	800
205-99-2	Benzo(b)fluoranthene	ND	800
207-08-9	Benzo(k)fluoranthene	ND	800
50-32-8	Benzo(a)pyrene	ND	800
193-39-5	Indeno(1,2,3-cd)pyrene	ND	800
53-70-3	Dibenz(a,h)anthracene	ND	800
191-24-2	Benzo(g,h,i)perylene	ND	800

Continued . . . . . .

SOUND ANALYTICAL SERVICES, INC.

W D Purnell & Assoc.

Lab No. 17001-6D
April 17, 1991

Client ID: SH-1, 16-18" **(DUPLICATE)**

ND = Not Detected

PQL - Practical Quantitation Limit - These are the quantitation limits for this sample. This number is based on sample size, matrix and dilution required.

* = Compound was detected but below PQL.

() = value shown is estimated concentration.

Note: All soil samples are reported on a dry weight basis.

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	52	35 - 114	23 - 120
2-Fluorobiphenyl	61	43 - 116	30 - 115
p-Terphenyl-d_{14}	60	33 - 141	18 - 137
Phenol-d_6	40	10 - 94	24 - 113
2-Fluorophenol	50	21 - 100	25 - 121
2,4,6-Tribromophenol	59	10 - 123	19 - 122

SOUND ANALYTICAL SERVICES

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SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

APR 19 1991

Report To: W D Purnell & Assoc. Date: April 17, 1991

Report On: **Method Blank** for Soil Lab No.: 17001-**MB**

IDENTIFICATION:
Original samples received on 04-09-91, reference lab report number 17001, lab number 7. Request for additional testing received on 04-11-91.
Project: 91008 Trans Mountain
Client ID: **METHOD BLANK**

ANALYSIS:

Sample was analyzed for polynuclear aromatic hydrocarbons in accordance with EPA SW 846 Method 8270.

CAS No.	Compound	Concentration ug/kg	PQL
91-20-3	Naphthalene	ND	660
208-96-8	Acenaphthylene	ND	660
83-32-9	Acenaphthene	ND	660
86-73-7	Fluorene	ND	660
85-01-8	Phenanthrene	ND	660
120-12-7	Anthracene	ND	660
206-44-0	Fluoranthene	ND	660
129-00-0	Pyrene	ND	660
56-55-3	Benzo(a)anthracene	ND	660
218-01-9	Chrysene	ND	660
205-99-2	Benzo(b)fluoranthene	ND	660
207-08-9	Benzo(k)fluoranthene	ND	660
50-32-8	Benzo(a)pyrene	ND	660
193-39-5	Indeno(1,2,3-cd)pyrene	ND	660
53-70-3	Dibenz(a,h)anthracene	ND	660
191-24-2	Benzo(g,h,i)perylene	ND	660

Continued . . . . . .

SOUND ANALYTICAL SERVICES, INC.

W D Purnell & Assoc.

Lab No. 17001-**MB**
April 17, 1991

Client ID: **METHOD BLANK**

ND = Not Detected

PQL - Practical Quantitation Limit - These are the quantitation limits for this sample. This number is based on sample size, matrix and dilution required.

* = Compound was detected but below PQL.

() = value shown is estimated concentration.

Note: All soil samples are reported on a dry weight basis.

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	61	35 - 114	23 - 120
2-Fluorobiphenyl	59	43 - 116	30 - 115
p-Terphenyl-d_{14}	56	33 - 141	18 - 137
Phenol-d_6	71	10 - 94	24 - 113
2-Fluorophenol	26	21 - 100	25 - 121
2,4,6-Tribromopheno	55	10 - 123	19 - 122

9008A

CHAIN OF CUSTODY RECORD

APR 19 1991

Page ___ of ___

CUSTOMER: Trans Mountain

PROJECT: Laurel Pump Station P.O./JOB NO.: 91048

SAMPLER: Banks Upshaw & Cory Erdman

Lab No.	Sample No.	Date	Time	Cont.	Analysis Required
	Control	4-12-91	8:30	Water	TPH 8015 modified
	Culvert 1	4-12-91	8:45	"	TPH 8015 Modified
	Dam 2	"	9:00	"	"
	Dam 3	"	9:20	"	"
	Culvert 1	"	8:45	"	BETX
	Dam 2	"	9:00	"	BETX
	Dam 3	"	9:20	"	BETX
	Dam 3	"	"	"	Total ~~Dissolved~~ Suspended solids
					Per Banks Upshaw telephone conv. 4-17-91 2:53pm

Relinquished by:	Date	Time	Received by:	Date	Time
Banks Upshaw	4-12-91		John E. Coggin	4-12-91	1005
Relinquished by:	Date	Time	Received by:	Date	Time

Dispatched by:	Date	Time	Received at lab by:	Date	Time
			[signature]	4-12-91	1:55 pm

SOUND ANALYTICAL SERVICES, INC.
4630 Pacific Hwy East Suite B-14
Tacoma, WA 98424 (206) 922-2310

SOUND ANALYTICAL SERVICES, INC.

9100SA
APR 19 1991

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS
4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Samples Taken 4/24/91

Report To: W D Purnell & Assoc. Date: April 18, 1991

Report On: Analysis of Water Lab No.: 17025

IDENTIFICATION:
Samples Received on 04-12-91 Sampled 4-12-91
Project: 91048 Trans. Mountain, Laurel Pump Station

ANALYSIS:

Lab Sample No.	Client ID	*Total Petroleum Fuel Hydrocarbons, ppm
1	Control	< 1.0
2	Culvert 1	< 1.0
3	Dam 2	< 1.0
4	Dam 3	< 1.0

*TPH by EPA SW-846 Modified Method 8015

Lab Sample No.	Client ID	Total Suspended Solids, mg/l
5	Dam 3	< 2

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

W D Purnell & Assoc.
Project: 91048

Lab No. 17025
April 18, 1991

Lab Sample No.	6	7	8
Client Identification	Culvert 1	Dam 2	Dam 3
Units	mg/l	mg/l	mg/l
Benzene	< 0.001	< 0.001	< 0.001
Toluene	< 0.001	< 0.001	< 0.001
Ethyl Benzene	< 0.001	< 0.001	< 0.001
Xylenes	< 0.001	< 0.001	< 0.001
BTEX by EPA SW-846 Method 8020			

SOUND ANALYTICAL SERVICES

C. LARRY ZURAW

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

QUALITY CONTROL REPORT

DUPLICATES

Lab No: 17025 (1)
Date: April 18, 1991
Client: W D Purnell & Assoc.

Client ID: Control
Matrix: Water
Units: mg/l

Compound	Sample(S)	Duplicate(D)	RPD*
Total Petroleum Fuel Hydrocarbons	< 1.0	< 1.0	---

Lab No: 17025 (6)
Date: April 18, 1991
Client: W D Purnell & Assoc.

Client ID: Culvert 1
Matrix: Water
Units: mg/l

Compound	Sample(S)	Duplicate(D)	RPD*
Benzene	< 0.001	< 0.001	---
Toluene	< 0.001	< 0.001	---
Ethyl Benzene	< 0.001	< 0.001	---
Xylenes	< 0.001	< 0.001	---

*RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: W D Purnell & Assoc. Date: April 26, 1991

Report On: Analysis of Water Lab No.: 17151-1

IDENTIFICATION:
Samples Received on 04-18-91
Project: 91008 Trans Mountain (sampled on 04-17-91)
Client ID: Culvert 1

ANALYSIS:

Sample was analyzed for polynuclear aromatic hydrocarbons in accordance with EPA SW 846 Method 8270.

CAS No.	Compound	Concentration ug/l	PQL
91-20-3	Naphthalene	ND	13
208-96-8	Acenaphthylene	ND	13
83-32-9	Acenaphthene	ND	13
86-73-7	Fluorene	ND	13
85-01-8	Phenanthrene	ND	13
120-12-7	Anthracene	ND	13
206-44-0	Fluoranthene	ND	13
129-00-0	Pyrene	ND	13
56-55-3	Benzo(a)anthracene	ND	13
218-01-9	Chrysene	ND	13
205-99-2	Benzo(b)fluoranthene	ND	13
207-08-9	Benzo(k)fluoranthene	ND	13
50-32-8	Benzo(a)pyrene	ND	13
193-39-5	Indeno(1,2,3-cd)pyrene	ND	13
53-70-3	Dibenz(a,h)anthracene	ND	13
191-24-2	Benzo(g,h,i)perylene	ND	13

Continued . . . . . .

SOUND ANALYTICAL SERVICES, INC.

W D Purnell & Assoc.

Lab No. 17151-1
April 26, 1991

Client ID: Culvert 1

ND = Not Detected

PQL - Practical Quantitation Limit - These are the quantitation limits for this sample. This number is based on sample size, matrix and dilution required.

* = Compound was detected but below PQL.

() = value shown is estimated concentration.

Note: All soil samples are reported on a dry weight basis.

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	71	35 - 114	23 - 120
2-Fluorobiphenyl	65	43 - 116	30 - 115
p-Terphenyl-d_{14}	91	33 - 141	18 - 137
Phenol-d_6	25	10 - 94	24 - 113
2-Fluorophenol	47	21 - 100	25 - 121
2,4,6-Tribromophenol	76	10 - 123	19 - 122

Total Petroleum Fuel Hydrocarbons, mg/kg < 1.0
by EPA SW-846 Modified Method 8015

SOUND ANALYTICAL SERVICES
David R. Bean
DENNIS BEAN

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

MAY 1 1991

Report To: W D Purnell & Assoc. Date: April 26, 1991

Report On: Analysis of Water Lab No.: 17151-2

IDENTIFICATION:
Samples Received on 04-18-91
Project: 91008 Trans Mountain (sampled on 04-17-91)
Client ID: Dam 2

ANALYSIS:

Sample was analyzed for polynuclear aromatic hydrocarbons in accordance with EPA SW 846 Method 8270.

CAS No.	Compound	Concentration ug/l	PQL
91-20-3	Naphthalene	ND	11
208-96-8	Acenaphthylene	ND	11
83-32-9	Acenaphthene	ND	11
86-73-7	Fluorene	ND	11
85-01-8	Phenanthrene	ND	11
120-12-7	Anthracene	ND	11
206-44-0	Fluoranthene	ND	11
129-00-0	Pyrene	ND	11
56-55-3	Benzo(a)anthracene	ND	11
218-01-9	Chrysene	ND	11
205-99-2	Benzo(b)fluoranthene	ND	11
207-08-9	Benzo(k)fluoranthene	ND	11
50-32-8	Benzo(a)pyrene	ND	11
193-39-5	Indeno(1,2,3-cd)pyrene	ND	11
53-70-3	Dibenz(a,h)anthracene	ND	11
191-24-2	Benzo(g,h,i)perylene	ND	11

Continued . . . . . .

SOUND ANALYTICAL SERVICES, INC.

W D Purnell & Assoc.
Page 2 of 2
Lab No. 17151-2
April 26, 1991

Client ID: Dam 2

ND = Not Detected

PQL - Practical Quantitation Limit - These are the quantitation limits for this sample. This number is based on sample size, matrix and dilution required.

* = Compound was detected but below PQL.

() = value shown is estimated concentration.

Note: All soil samples are reported on a dry weight basis.

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	75	35 - 114	23 - 120
2-Fluorobiphenyl	68	43 - 116	30 - 115
p-Terphenyl-d_{14}	89	33 - 141	18 - 137
Phenol-d_6	24	10 - 94	24 - 113
2-Fluorophenol	47	21 - 100	25 - 121
2,4,6-Tribromophenol	76	10 - 123	19 - 122

Total Petroleum Fuel Hydrocarbons, mg/kg < 1.0
by EPA SW-846 Modified Method 8015

SOUND ANALYTICAL SERVICES

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SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

MAY 1 1991

Report To: W D Purnell & Assoc. Date: April 26, 1991

Report On: Analysis of Water Lab No.: 17151-3

IDENTIFICATION:
Samples Received on 04-18-91
Project: 91008 Trans Mountain (sampled on 04-17-91)
Client ID: Dam 3

ANALYSIS:

Sample was analyzed for polynuclear aromatic hydrocarbons in accordance with EPA SW 846 Method 8270.

CAS No.	Compound	Concentration ug/l	PQL
91-20-3	Naphthalene	ND	11
208-96-8	Acenaphthylene	ND	11
83-32-9	Acenaphthene	ND	11
86-73-7	Fluorene	ND	11
85-01-8	Phenanthrene	ND	11
120-12-7	Anthracene	ND	11
206-44-0	Fluoranthene	ND	11
129-00-0	Pyrene	ND	11
56-55-3	Benzo(a)anthracene	ND	11
218-01-9	Chrysene	ND	11
205-99-2	Benzo(b)fluoranthene	ND	11
207-08-9	Benzo(k)fluoranthene	ND	11
50-32-8	Benzo(a)pyrene	ND	11
193-39-5	Indeno(1,2,3-cd)pyrene	ND	11
53-70-3	Dibenz(a,h)anthracene	ND	11
191-24-2	Benzo(g,h,i)perylene	ND	11

Continued . . . . . .

SOUND ANALYTICAL SERVICES, INC.

MAY 1 1991

W D Purnell & Assoc.
Page 2 of 2
Lab No. 17151-3
April 26, 1991

Client ID: Dam 3

ND = Not Detected

PQL - Practical Quantitation Limit - These are the quantitation limits for this sample. This number is based on sample size, matrix and dilution required.

* = Compound was detected but below PQL.

() = value shown is estimated concentration.

Note: All soil samples are reported on a dry weight basis.

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	79	35 - 114	23 - 120
2-Fluorobiphenyl	71	43 - 116	30 - 115
p-Terphenyl-d_{14}	90	33 - 141	18 - 137
Phenol-d_6	26	10 - 94	24 - 113
2-Fluorophenol	50	21 - 100	25 - 121
2,4,6-Tribromophenol	73	10 - 123	19 - 122

Total Petroleum Fuel Hydrocarbons, mg/kg < 1.0
by EPA SW-846 Modified Method 8015

SOUND ANALYTICAL SERVICES

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SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

MAY 1 1991

Report To: W D Purnell & Assoc. Date: April 26, 1991

Report On: Analysis of Water Lab No.: 17151-4

IDENTIFICATION:
Samples Received on 04-18-91
Project: 91008 Trans Mountain (sampled on 04-17-91)
Client ID: MW-2

ANALYSIS:

Sample was analyzed for polynuclear aromatic hydrocarbons in accordance with EPA SW 846 Method 8270.

CAS No.	Compound	Concentration ug/l	PQL
91-20-3	Naphthalene	120	12
208-96-8	Acenaphthylene	ND	12
83-32-9	Acenaphthene	ND	12
86-73-7	Fluorene	* (5.0)	12
85-01-8	Phenanthrene	* (2.0)	12
120-12-7	Anthracene	ND	12
206-44-0	Fluoranthene	ND	12
129-00-0	Pyrene	ND	12
56-55-3	Benzo(a)anthracene	ND	12
218-01-9	Chrysene	ND	12
205-99-2	Benzo(b)fluoranthene	ND	12
207-08-9	Benzo(k)fluoranthene	ND	12
50-32-8	Benzo(a)pyrene	ND	12
193-39-5	Indeno(1,2,3-cd)pyrene	ND	12
53-70-3	Dibenz(a,h)anthracene	ND	12
191-24-2	Benzo(g,h,i)perylene	ND	12

Continued . . . . . .

SOUND ANALYTICAL SERVICES, INC.

W D Purnell & Assoc.

Lab No. 17151-4
April 26, 1991

Client ID: MW-2

ND = Not Detected

PQL - Practical Quantitation Limit - These are the quantitation limits for this sample. This number is based on sample size, matrix and dilution required.

* = Compound was detected but below PQL.

() = value shown is estimated concentration.

Note: All soil samples are reported on a dry weight basis.

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	73	35 - 114	23 - 120
2-Fluorobiphenyl	66	43 - 116	30 - 115
p-Terphenyl-d_{14}	90	33 - 141	18 - 137
Phenol-d_6	30	10 - 94	24 - 113
2-Fluorophenol	50	21 - 100	25 - 121
2,4,6-Tribromophenol	86	10 - 123	19 - 122

Total Petroleum Fuel Hydrocarbons, mg/kg by EPA SW-846 Modified Method 8015	7.3
TPH as	Gas

SOUND ANALYTICAL SERVICES

DENNIS BEAN

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: W D Purnell & Assoc. Date: April 26, 1991

Report On: Analysis of Water Lab No.: 17151-5

IDENTIFICATION:
Samples Received on 04-18-91
Project: 91008 Trans. Mountain (sampled on 04-17-91)

ANALYSIS:

Lab Sample No.	Client ID	*Total Petroleum Fuel Hydrocarbons, mg/l
5	Control	< 1.0
6	MW-1	< 1.0
7	MW-3	< 1.0

*TPH by EPA SW-846 Modified Method 8015

Lab Sample No.	8	9	10	11	12
Client ID	Dam 2	Dam 3	MW-1	MW-2	MW-3
Units	mg/l	mg/l	mg/l	mg/l	mg/l
Benzene	<0.001	<0.001	0.057	0.290	0.021
Toluene	<0.001	<0.001	<0.001	0.066	0.015
Ethyl Benzene	<0.001	<0.001	<0.001	0.037	<0.001
Xylenes	<0.001	<0.001	0.021	0.632	0.010
BTEX by EPA SW-846 Method 8020					

Lab Sample No. 13 Client ID: Dam 3

Total Suspended Solids, mg/l 9

SOUND ANALYTICAL SERVICES

C. LARRY ZURAW

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

QUALITY CONTROL REPORT

DUPLICATES

Lab No: 17151-5
Date: April 26, 1991
Client: W D Purnell & Assoc.

Client ID: MW-3
Matrix: Water
Units: mg/l

Compound	Sample(S)	Duplicate(D)	RPD*
Benzene	0.021	0.022	4.7
Toluene	0.015	0.017	12.5
Ethyl Benzene	< 0.001	< 0.001	---
Xylenes	0.010	0.011	9.5

*RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

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SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

MAY 1 1991

Report To: W D Purnell & Assoc. Date: April 26, 1991

Report On: **METHOD BLANK** for Water Lab No.: 17151-**MB**

IDENTIFICATION:
Samples Received on 04-18-91
Project: 91008 Trans Mountain (sampled on 04-17-91)
Client ID: **METHOD BLANK**

ANALYSIS:

Sample was analyzed for polynuclear aromatic hydrocarbons in accordance with EPA SW 846 Method 8270.

CAS No.	Compound	Concentration ug/l	PQL
91-20-3	Naphthalene	ND	10
208-96-8	Acenaphthylene	ND	10
83-32-9	Acenaphthene	ND	10
86-73-7	Fluorene	ND	10
85-01-8	Phenanthrene	ND	10
120-12-7	Anthracene	ND	10
206-44-0	Fluoranthene	ND	10
129-00-0	Pyrene	ND	10
56-55-3	Benzo(a)anthracene	ND	10
218-01-9	Chrysene	ND	10
205-99-2	Benzo(b)fluoranthene	ND	10
207-08-9	Benzo(k)fluoranthene	ND	10
50-32-8	Benzo(a)pyrene	ND	10
193-39-5	Indeno(1,2,3-cd)pyrene	ND	10
53-70-3	Dibenz(a,h)anthracene	ND	10
191-24-2	Benzo(g,h,i)perylene	ND	10

Continued . . . . . .

SOUND ANALYTICAL SERVICES, INC.

W D Purnell & Assoc.

Lab No. 17151-**MB**
April 26, 1991

Client ID: **METHOD BLANK**

ND = Not Detected

PQL - Practical Quantitation Limit - These are the quantitation limits for this sample. This number is based on sample size, matrix and dilution required.

* = Compound was detected but below PQL.

() = value shown is estimated concentration.

Note: All soil samples are reported on a dry weight basis.

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	67	35 - 114	23 - 120
2-Fluorobiphenyl	60	43 - 116	30 - 115
p-Terphenyl-d_{14}	84	33 - 141	18 - 137
Phenol-d_6	22	10 - 94	24 - 113
2-Fluorophenol	43	21 - 100	25 - 121
2,4,6-Tribromophenol	67	10 - 123	19 - 122

Total Petroleum Fuel Hydrocarbons, mg/kg < 1.0
by EPA SW-846 Modified Method 8015

SOUND ANALYTICAL SERVICES, INC.
ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 Pacific Hwy. East
Tacoma, Washington 98424
(206) 922-2310 • FAX (206) 922-5047

CHAIN OF CUSTODY / REQUEST FOR LABORATORY ANALYSIS

MAY 2 1991

CLIENT: W.D. Purnell & Assoc.
PROJECT NAME: 91008A Trans Mountain
CONTACT: Banks Upshaw
PHONE NO: (206) - 676-9589

ANALYSIS REQUESTED: (Circle, check box or write preferred method in box) OTHER:

SAMPLE ID #	DATE	TIME	PRES.	MATRIX	BTEX	TPH 418.1	TPH Mod 8015	BTEX/8015 Combo Gasoline Only	Halogenated Volatiles EPA 601/8010	Aromatics EPA 602/8020	PAH EPA 625/8270	Purgeables (GC/MS) EPA 624/8240	BNA's EPA 625/8270	Organochlorine Pest., PCB's EPA 608/8080	Total Halogens EPA 9076	TCLP Extraction Metals	TCLP Extraction (ZHE) Volatile Organics	TCLP Extraction Semi-volatiles	TCLP Extraction Pesticides & Herbicides	Total Metals ICP GFAA	Total Suspended Solids
1. CONTROL	4/24	1:35	HCL	H_2O		X															
2. CULVERT 1	4/24	1:45	HCL	H_2O		X															
3. CULVERT 1	4/24	1:55	—	H_2O	8020																
4. ~~CULVERT 1~~																					
5. DAM 2	4/24	2:20	HCL	H_2O		X															
6. DAM 2	4/24	2:20	—	H_2O	8020	X															
7. DAM 3	4/24	2:40	HCL	H_2O		X															
8. DAM 3	4/24	2:40	—	H_2O	8020																
9. DAM 3	4/24	2:40	—	H_2O																X	
10.																					
11.																					
12.																					

RELINQUISHED BY:	RELINQUISHED BY:	RELINQUISHED BY:	SPECIAL INSTRUCTIONS / COMMENTS:
Signature: Wanda Walker	Signature:	Signature:	
Printed Name: Wanda Walker	Printed Name:	Printed Name:	
Firm: WDP Purnell	Firm:	Firm:	
Date/Time: 4-25-91 10:11	Date/Time:	Date/Time:	
RECEIVED BY:	**RECEIVED BY:**	**RECEIVED BY:**	
Signature: John E. Cogger	Signature: M. Curtiss	Signature:	
Printed Name: John E. Cogger	Printed Name: M. Curtiss	Printed Name:	
Firm: ACI	Firm: SAS	Firm:	
Date/Time: 4-25-91 1011	Date/Time: 4/25/91 3:25	Date/Time:	

Page _____ of _____

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

MAY 2 1991

Report To: WD Purnell Date: April 30, 1991

Report On: Analysis of Water Lab No.: 17277

IDENTIFICATION:
Samples Received on 04-25-91 sampled on 4-24-91
Project: 91008A Trans Mountain

ANALYSIS:

Lab Sample No.	1	2	3	4
Client Identification	Control	Culvert 1	Dam 2	Dam 3
Units	mg/l	mg/l	mg/l	mg/l
Benzene	NT	0.001	< 0.001	< 0.001
Toluene	NT	0.003	< 0.001	< 0.001
Ethyl Benzene	NT	< 0.001	< 0.001	< 0.001
Xylenes	NT	0.003	< 0.001	< 0.001
BTEX by EPA SW-846 Method 8020				
Total Petroleum Hydrocarbons by EPA Method 418.1	< 1.0	< 1.0	< 1.0	< 1.0
Total Suspended Solids	NT	NT	NT	17

NT = Not Tested.

SOUND ANALYTICAL SERVICES

for

C. LARRY ZURAW

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

QUALITY CONTROL REPORT

DUPLICATES

Lab No: 17277 (4)
Date: April 30, 1991
Client: WD Purnell

Client ID: Dam 3
Matrix: Water
Units: mg/l

Compound	Sample(S)	Duplicate(D)	RPD*
Benzene	< 0.001	< 0.001	---
Toluene	< 0.001	< 0.001	---
Ethyl Benzene	< 0.001	< 0.001	---
Xylenes	< 0.001	< 0.001	---
Total Petroleum Hydrocarbons	< 1.0	< 1.0	---
Total Suspended Solids	17	17	---

*RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

APPENDIX E
SUPPORTING DOCUMENTATION FOR ENFORCEMENT ORDER-RELATED ACTIVITIES

Appendix E contains the following:

- Ecology's July 26, 1995 letter to TMOPL which states that no further action is required by TMOPL at the former PCS Storage Cells.

- Figures 2, 5, 6, and 7 of W.D. Purnell and Associates, Inc.'s *Response to Enforcement Order DE 91-N192, Item I.I.1, Wetlands Delineation; Areas 1 – 3, Trans Mountain, Laurel Pump Station*, dated February 20, 1992.

- URS' January 11, 2010 letter regarding Wetlands Investigations at Laurel Station, Bellingham, WA.

- Aqua-Terr Systems, Inc.'s *Laurel Station Project Area, Terasen Pipeline, Wetland/Fish & Wildlife Study, Whatcom County, Washington*, dated March 2007.

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

Northwest Regional Office, 3190 - 160th Ave S.E. • Bellevue, Washington 98008-5452 • (206) 649-7000

January 26, 1995

Mr. Dan O'Rourke
Trans Mountain Oil Pipe Line Corporation
1333 West Broadway, Suite 900
Vancouver, B.C. V6H 4C2 Canada

Dear Dan:

Re: Trans Mountain - Laurel Station
Interim Action - Contaminated Soil Stockpiles
First Amended Enforcement Order No. DE91-N192
Exhibit A, Section III, Subsection I.

The Washington Department of Ecology (Ecology) has completed its review of Trans Mountain Oil Pipe Line Corporation's (Trans Mountain) November 14, 1994, *Petroleum Contaminated Soil Stockpile Interim Cleanup Action Report, Trans Mountain Oil Pipe Line Corporation, Laurel Pump Station Facility* (Report). The Report presents the results of the interim cleanup action conducted by Trans Mountain from June to October 1994 for the petroleum contaminated soil (PCS) storage cells.

The PCS was excavated from the storage cells located at the Laurel Station and transported to permitted treatment and disposal facilities. The Report indicates that the project was completed according to the Remedial Action Plan approved by Ecology with one exception. A portion of the oversized screened contaminated soil was sent to a PCS treatment facility rather than disposed at the Roosevelt Landfill as originally planned. Ecology verbally agreed to Trans Mountain's proposed modification for the oversized soil remediation.

According to the Report, the majority of the petroleum contaminated soil was remediated at the Holnam Inc. cement facility, Seattle, Washington; the remaining screened portion was transported to Roosevelt Landfill, Roosevelt, Washington or remediated at Associated Sand & Gravel in Everett, Washington.

Based on this information and the results presented in the Report, Ecology considers the interim cleanup action for the PCS Storage Cells completed. No further action is required by Trans Mountain at the former PCS Storage Cells.

Ecology has no additional comments on the Report. The November 14, 1994 Report is considered a final document.

If you have any questions, please contact me at (206) 649-7206.

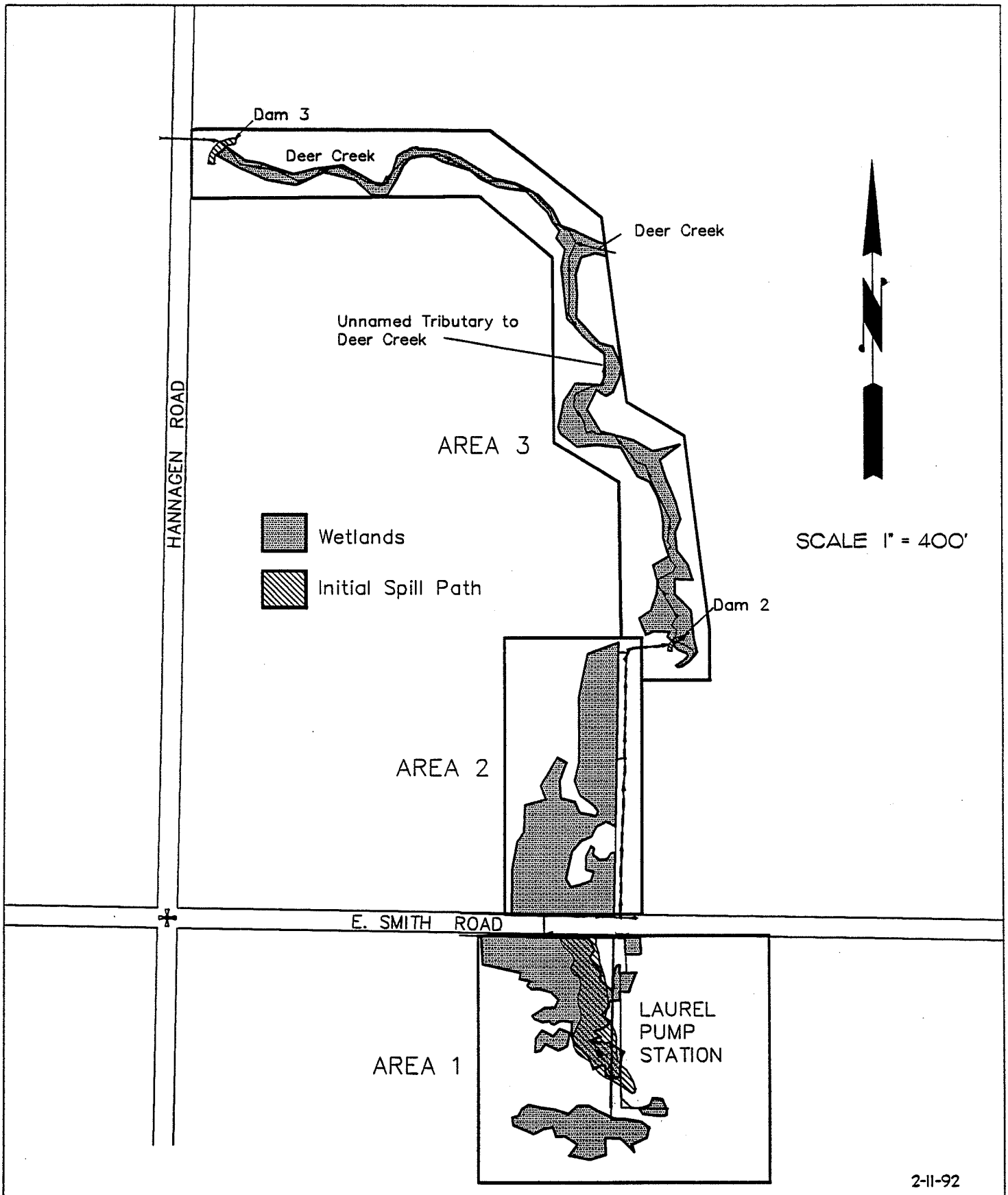
Sincerely,

Barbara J. Trejo

Barbara J. Trejo
Toxics Cleanup Program

BJT:bt

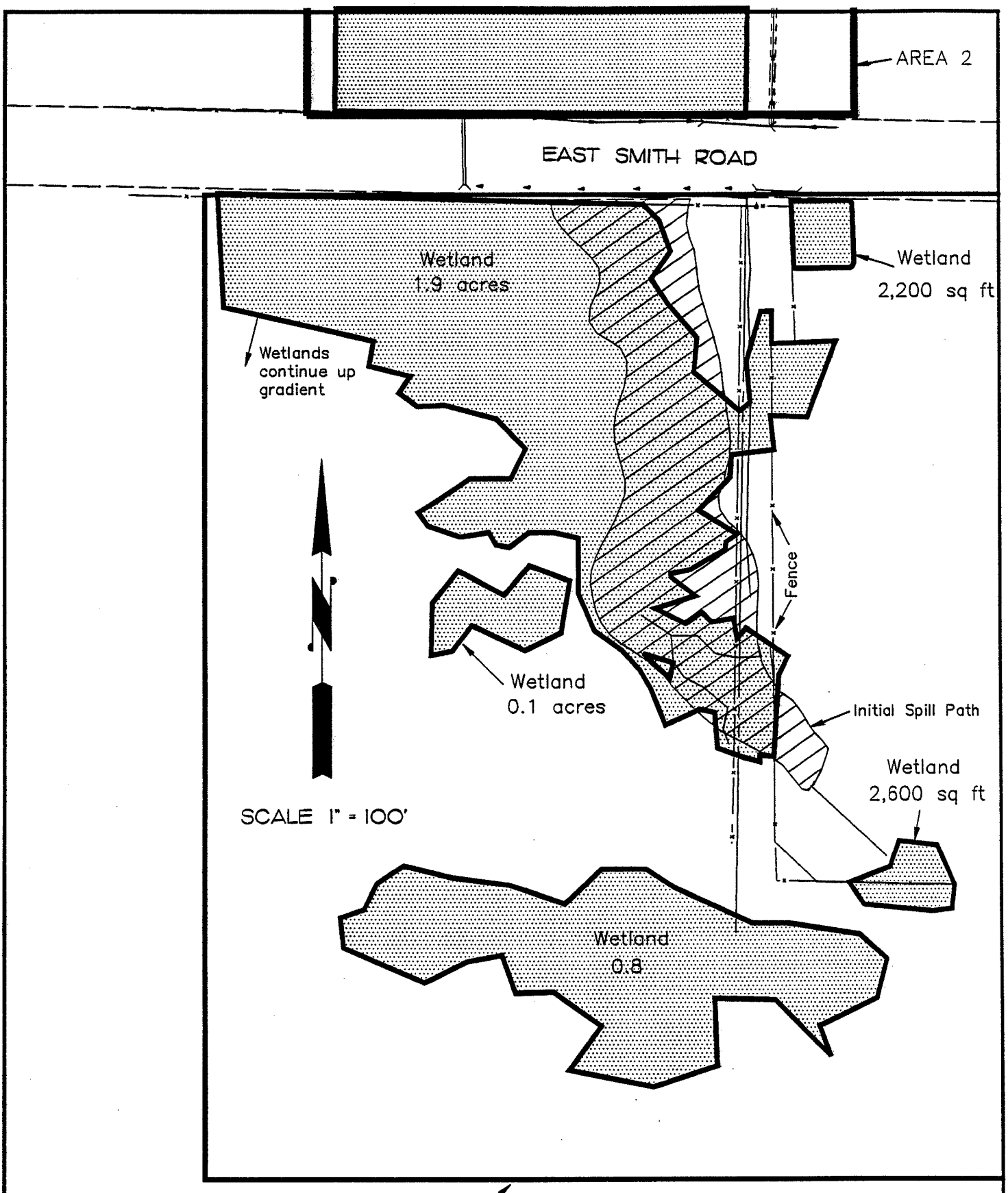
cc: David Raubvogel, Dames & Moore



Source: Department of Natural Resources
1986 Aerial Photo.

W.D. PURNELL & ASSOCIATES, INC.
CONSULTING ENGINEERS
LAUREL PUMP STATION

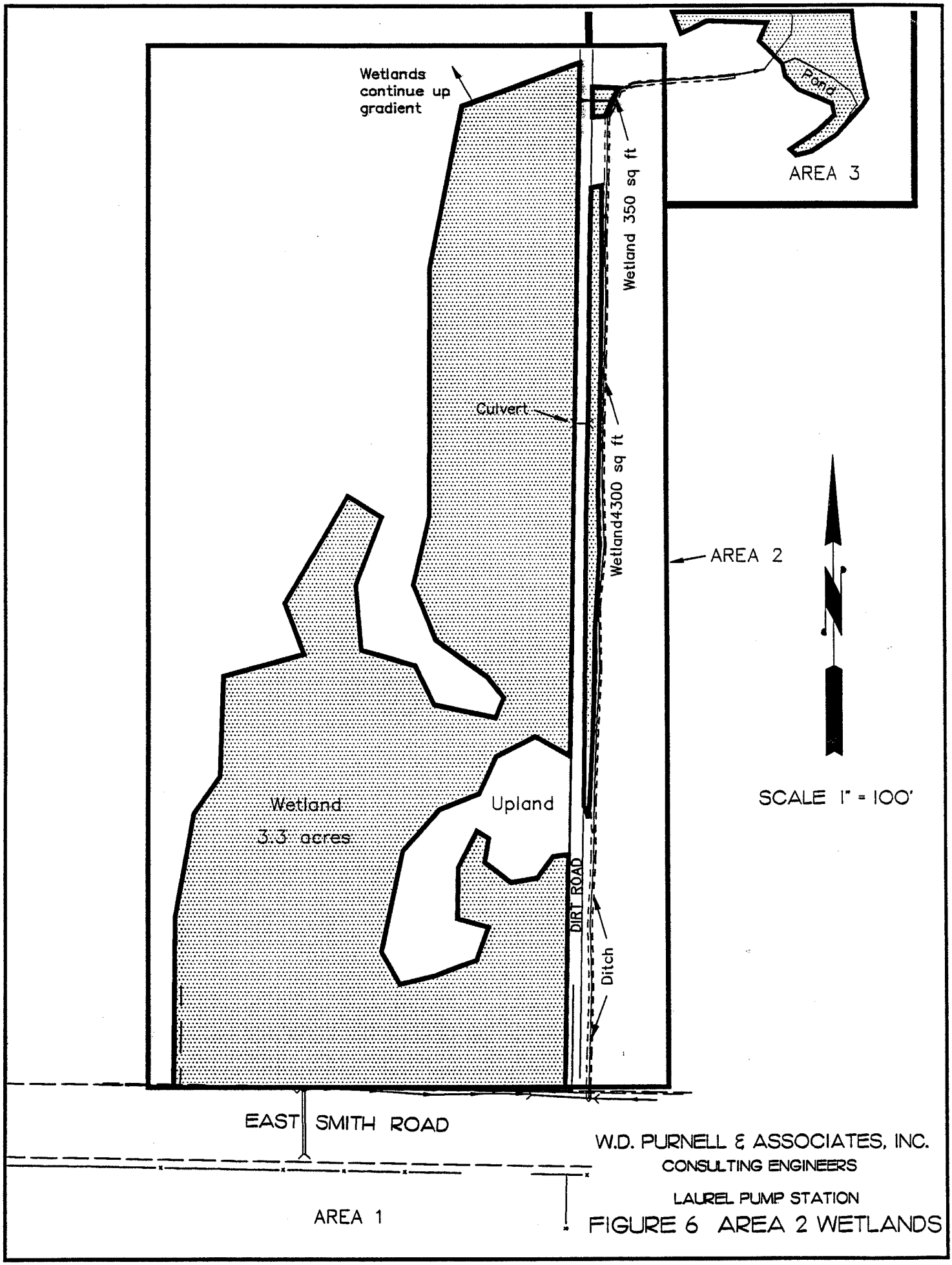
FIGURE 2 SITE PLAN

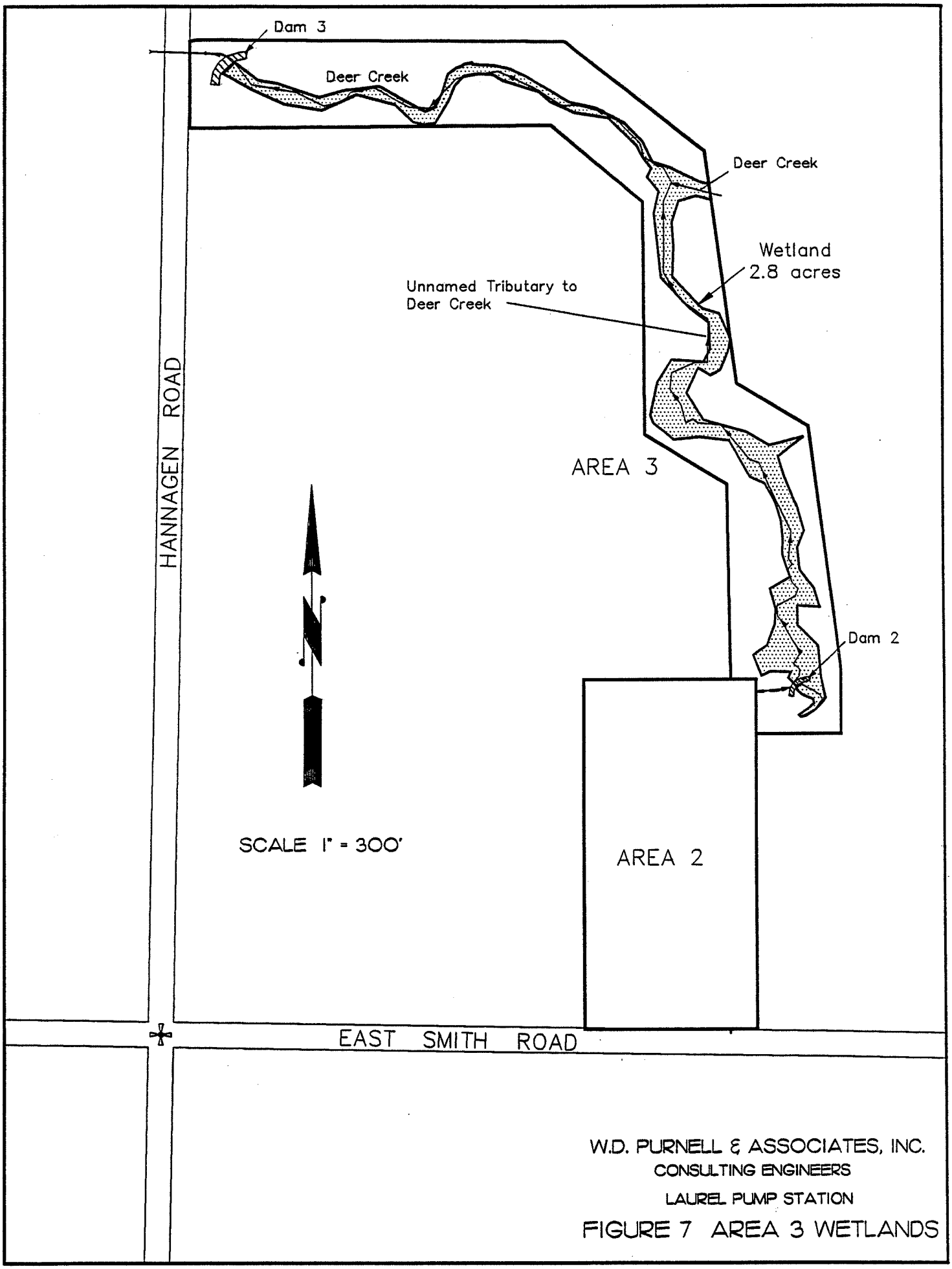


W.D. PURNELL & ASSOCIATES, INC.
CONSULTING ENGINEERS

LAUREL PUMP STATION

FIGURE 5 AREA I WETLANDS


Wetlands continue up gradient
Pond
AREA 3
Wetland 350 sq ft
Culvert
Wetland4300 sq ft
AREA 2
SCALE 1" = 100'
Wetland
3.3 acres
Upland
DIRT ROAD
Ditch
EAST SMITH ROAD
AREA 1
W.D. PURNELL & ASSOCIATES, INC.
CONSULTING ENGINEERS
LAUREL PUMP STATION
FIGURE 6 AREA 2 WETLANDS



W.D. PURNELL & ASSOCIATES, INC.
CONSULTING ENGINEERS

LAUREL PUMP STATION

FIGURE 7 AREA 3 WETLANDS

URS

January 11, 2010

Mr. Mike Droppo
Kinder Morgan
300 5th Avenue SW, Suite 2700
Calgary, Alberta
Canada, T2P5JZ

Re: Wetland Investigations at Laurel Station, Bellingham, WA

Dear Mr. Droppo:

URS reviewed existing documentation for the wetlands at the Laurel Station spill sites (1991 and 1992 spills). This included the Department of Ecology Enforcement Order, the Dames & Moore Remedial Investigation/Feasibility Study Work Plan (Dames & Moore 1992), and the Response to the Enforcement Order documents prepared by W.D. Purnell & Associates (1992), which included a wetland delineation for areas affected by the 1991 spill. URS also reviewed a description of the existing vegetation in field observations from Dames & Moore's March 1992 inspection of the 1992. In addition, current aerial photographs, National Wetland Inventory maps, and soil survey maps were reviewed.

Paul Hamidi and Bill Kidder of URS visited the Laurel Station spill sites on August 6, 2009. Mr. Patrick Davis, Kinder Morgan facility supervisor, met with them, briefly explained the history of the sites, and showed them the areas which had been impacted by the spills. The intent of the site visit was to document existing conditions (vegetation, soils and hydrology) of the wetlands in order to compare existing conditions with site conditions as they existed immediately after the spills. All of the wetland areas impacted by spills were traversed on foot. Detailed wetland data forms were completed at five sample plots (see Attachment 1 for sample plot locations, and Attachment 2 for wetland data sheets). The locations were recorded by GPS. Numerous check plots were also observed. Representative photographs were taken throughout the sites (see Attachment 3).

Based on the site visit, it appears that wetland conditions have persisted in the spill areas. Wetland hydrology indicators were observed in representative areas previously delineated as wetlands. Hydric soils were also confirmed in these areas. Native hydrophytic vegetation is dominant across most of the wetland areas, with the exception of a few patches of reed canary grass and Himalayan blackberry. Plant species were similar to those documented in the 1991 wetland delineation, and in the field observations from 1992.

Three check dams were installed after the spills. Dam #3 on Deer Creek next to Hannegan Road appears to have naturally degraded since installation in 1991. Dam #2 on the Deer Creek tributary is still in place and a small, unvegetated pond has formed behind the dam. Reed canarygrass and blackberries are growing around the pond. The

URS Corporation
1501 4th Avenue, Suite 1400
Seattle, WA 98101-1616
Tel: 206.438.2700
Fax: 206.438.2699

March 7, 1992 Spill Containment Dam is a plastic structure installed to contain the 1992 spill. There is also a small pond behind this dam. If these dams are no longer needed for containment purposes, they could be removed and the dam and pond areas restored to native wetland vegetation. If they are necessary for future containment, it is recommended that each location be inspected annually and maintained as needed. URS understands that Kinder Morgan is currently assessing upgrading Dam #2 to provide an ongoing physical containment barrier useful in the event of a future release from the site. Additionally, the relief tank where the March 7, 1992 release occurred is no longer used to contain product so the utility of continuing the March 7, 1992 containment dam is no longer apparent.

Since the wetlands affected by the spills appear to have recovered to be very similar to what was previously documented, no other wetland mitigation activities appear necessary at this time.

We trust this information meets your current requirements. If you have any questions, or if we can be of further assistance, please do not hesitate to contact this office.

Sincerely,
URS CORPORATION

David Every
Principal Ecologist

Karen L. Mixon
Project Manager

References

Dames & Moore, 1992a. *Remedial Investigation/Feasibility Study Work Plan, Trans Mountain Oil Pipe Line, Corp., Laurel Station, Bellingham, Washington*. September 30.

W.D. Purnell and Associates, Inc., 1992. *Response to Enforcement Order DE 91-N192, Item I.I.1, Wetlands Delineation; Areas 1 – 3, Trans Mountain, Laurel Pump Station*. April 9.

Attachments:
- Sample Point Locations Map
- Wetland Data Forms
- Wetland Photos

ATTACHMENT 1

SAMPLE POINT LOCATIONS

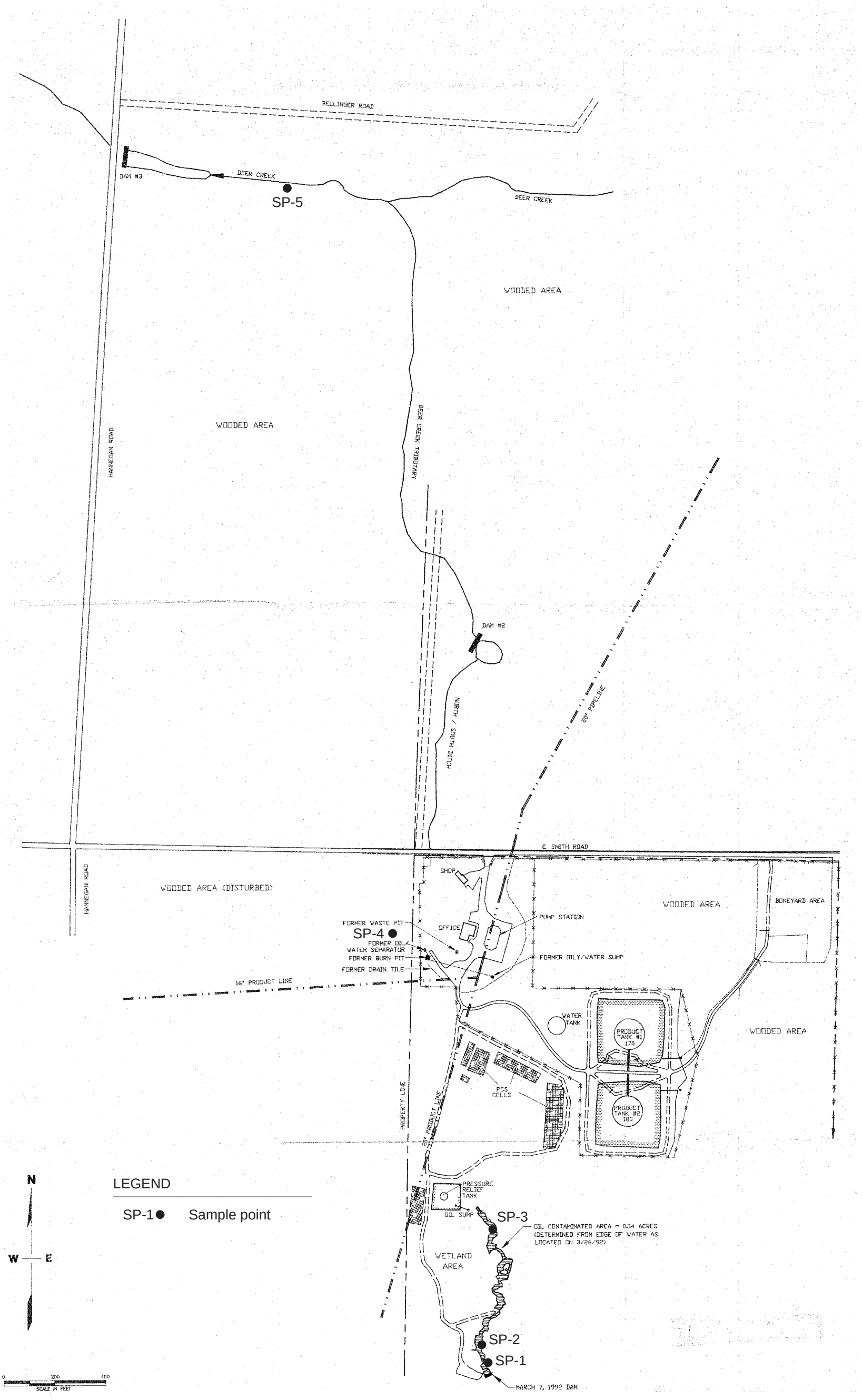


Figure 1

Wetland Data Points

Job No. 33761424

Laurel Station

URS

ATTACHMENT 2

WETLAND DELINEATION DATA FORMS

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Laurel Station, 1009 East Smith Road City/County: Bellingham Sampling Date: 8-6-09

Applicant/Owner: Kinder Morgan State: WA Sampling Point: SP-1

Investigator(s): Hamidi, Kidder Section, Township, Range: S. 33, T. 39N, R. 3E

Landform (hillslope, terrace, etc.): glaciomarine drift plain Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR): A Lat: Long: Datum:

Soil Map Unit Name: Whatcom-Labounty silt loam, 0-8% slopes NWI classification: PSSC/PEMC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation _____, Soil yes, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐ Hydric Soil Present? Yes ☒ No ☐ Wetland Hydrology Present? Yes ☒ No ☐	**Is the Sampled Area within a Wetland?** Yes ☒ No ☐

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 15' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15' radius)			
1. Rubus spectabilis	20	yes	FAC
2. Sambucus racemosa	5		FACU
3. Acer Circinatum	10	yes	FAC-
4. Rubus armeniacus	10	yes	FACU
5.			
	45 = Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. Polystichum munitum	5		FACU
2. Athyrium filix-femina	5		FAC
3. Equisetum telmateia	10	yes	FACW
4. Phalaris arundinacea	20	yes	FACW
5. Urtica dioica	5		FAC+
6. Tolmiea menziesii	5		FAC
7. Veronica americana	2		OBL
8. Oenanthe sarmentosa	2		OBL
9.			
10.			
11.			
	54 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 4	x 1 = 4
FACW species 30	x 2 = 60
FAC species 45	x 3 = 135
FACU species 20	x 4 = 80
UPL species 0	x 5 = 0
Column Totals: 99 (A)	279 (B)

Prevalence Index = B/A = 2.8

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☒ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Wetland Non-Vascular Plants[1]

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes ☒ No ☐**

Remarks: Thuja plicata, Alnus rubra and Populus balsamifera are rooted outside of plot.

SOIL

Sampling Point: SP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/1.5	100					SiCL	
8-12	10YR 4/3	90	10YR 4/6, 4/4	10	C	PL, M	GR-L	
12-16	10YR 4/3	90	10YR 4/6, 4/4	10	C	M	VGR-L	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☒ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: fine glaciomarine drift material

Depth (inches): within 24 inches

Hydric Soil Present? Yes ☒ No ☐

Remarks: Based on vegetation and hydrology indicators, landform, and the presence of redox concentrations within 10", it is assumed that this soil meets the definition of a hydric soil. It is assumed to meet the hydric soil criteria for long duration ponding (two weeks during the growing season).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☒ Geomorphic Position (D2)
- ☒ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Soils are moist; ponding and surface saturation are assumed for the early part of the growing season (i.e. March).

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Laurel Station, 1009 East Smith Road City/County: Bellingham Sampling Date: 8-6-09

Applicant/Owner: Kinder Morgan State: WA Sampling Point: SP-2

Investigator(s): Hamidi, Kidder Section, Township, Range: S. 33, T. 39N, R. 3E

Landform (hillslope, terrace, etc.): glaciomarine drift plain Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR): A Lat: Long: Datum:

Soil Map Unit Name: Whatcom-Labounty silt loam, 0-8% slopes NWI classification: PSSC/PEMC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐ Hydric Soil Present? Yes ☒ No ☐ Wetland Hydrology Present? Yes ☒ No ☐	**Is the Sampled Area within a Wetland?** Yes ☒ No ☐

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 15' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	25	yes	FAC
2.			
3.			
4.			
	25	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15' radius)			
1. Rubus spectabilis	25	yes	FAC
2. Sambucus racemosa	2		FACU
3. Oemleria cerasiformis	5		FACU
4. Lonicera involnucrata	2		FAC
5.			
	34	= Total Cover	
Herb Stratum (Plot size: 5' radius)			
1. Polystichum munitum	5		FACU
2. Athyrium filix-femina	15	yes	FAC
3. Equisetum telmateia	5		FACW
4. Stachys cooleyae	10	yes	FACW
5. Geum macrophylum	1		FACW-
6. Tolmiea menziesii	2		FAC
7.			
8.			
9.			
10.			
11.			
	38	= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 20

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 0	x 1 = 0
FACW species 16	x 2 = 32
FAC species 69	x 3 = 207
FACU species 12	x 4 = 48
UPL species 0	x 5 = 0
Column Totals: 97 (A)	287 (B)

Prevalence Index = B/A = 2.96

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes ☒ No ☐**

Remarks: Acer macrophylum rooted outside of plot.

SOIL

Sampling Point: SP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/1	90	10YR 3/3	10	C	M	SiCL	
8-12	2.5Y 4/2.5	90	10YR 4/4	10	C	M	L	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: fine glaciomarine drift material

Depth (inches): within 24 inches

Hydric Soil Present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☒ Geomorphic Position (D2)
- ☒ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Soils are moist; ponding and surface saturation are assumed for the early part of the growing season (i.e. March).

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Laurel Station, 1009 East Smith Road City/County: Bellingham Sampling Date: 8-6-09

Applicant/Owner: Kinder Morgan State: WA Sampling Point: SP-3

Investigator(s): Hamidi, Kidder Section, Township, Range: S. 33, T. 39N, R. 3E

Landform (hillslope, terrace, etc.): glaciomarine drift plain Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR): A Lat: Long: Datum:

Soil Map Unit Name: Whatcom-Labounty silt loam, 0-8% slopes NWI classification: PFOC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐ Hydric Soil Present? Yes ☒ No ☐ Wetland Hydrology Present? Yes ☒ No ☐	**Is the Sampled Area within a Wetland?** Yes ☒ No ☐

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 15' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	30	yes	FAC
2. Betula papyrifera	30	yes	FAC
3. Thuja plicata	10		FAC
4.			
	70	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15' radius)			
1. Rubus spectabilis	30	yes	FAC
2. Acer circinatum	2		FAC-
3. Oemleria cerasiformis	2		FACU
4.			
5.			
	34	= Total Cover	
Herb Stratum (Plot size: 5' radius)			
1. Lysichitun americanum	10	yes	OBL
2. Athyrium filix-femina	5		FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	15	= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 50

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 10	x 1 = 10
FACW species 0	x 2 = 0
FAC species 107	x 3 = 214
FACU species 2	x 4 = 8
UPL species 0	x 5 = 0
Column Totals: 119 (A)	232 (B)

Prevalence Index = B/A = 1.95

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☒ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Wetland Non-Vascular Plants[1]

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes ☒ No ☐**

Remarks:

SOIL

Sampling Point: SP-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	2.5Y 3/1	98	2.5Y 3/2	2	C	M	SiL	
8-16	2.5Y 5/1.5	85	10YR 4/6	15	C	M	CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: fine glaciomarine drift material

Depth (inches): within 24 inches

Hydric Soil Present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☒ Sparsely Vegetated Concave Surface (B8)
- ☒ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☒ Geomorphic Position (D2)
- ☒ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Soils are moist; ponding and surface saturation are assumed for the early part of the growing season (i.e. March).

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Laurel Station, 1009 East Smith Road City/County: Bellingham Sampling Date: 8-6-09

Applicant/Owner: Kinder Morgan State: WA Sampling Point: SP-4

Investigator(s): Hamidi, Kidder Section, Township, Range: S. 33, T. 39N, R. 3E

Landform (hillslope, terrace, etc.): glaciomarine drift plain Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR): A Lat: Long: Datum:

Soil Map Unit Name: Whatcom-Labounty silt loam, 0-8% slopes NWI classification: PFOC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐ Hydric Soil Present? Yes ☒ No ☐ Wetland Hydrology Present? Yes ☒ No ☐	**Is the Sampled Area within a Wetland?** Yes ☒ No ☐

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 15' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	80	yes	FAC
2. Acer macrophylum	5		FACU
3. Thuja plicata	5		FAC
4.			
	90	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15' radius)			
1. Rubus spectabilis	2		FAC
2. Lonicera involnucrata	20	yes	FAC
3. Oemleria cerasiformis	20	yes	FACU
4. Thuja plicata	5		FAC
5. Symphoricarpus albus	5		FACU
	52	= Total Cover	
Herb Stratum (Plot size: 5' radius)			
1. Ranunculus repens	75	yes	FACW
2. Athyrium filix-femina	25	yes	FAC
3. Tolmiea menziesii	2		FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	102	= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 0	x 1 = 0
FACW species 75	x 2 = 150
FAC species 139	x 3 = 417
FACU species 30	x 4 = 120
UPL species 0	x 5 = 0
Column Totals: 244 (A)	687 (B)

Prevalence Index = B/A = 2.82

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☒ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Wetland Non-Vascular Plants[1]

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes ☒ No ☐**

Remarks:

SOIL

Sampling Point: SP-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/2	95	10YR 3/3	5	C	M	SiL	
8-13	10YR 4/2	95	10YR 4/4	5	C	M	SiL	
13-16	2.5Y 5/2	80	10YR 5/6	20	C	M	L	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: fine glaciomarine drift material

Depth (inches): within 24 inches

Hydric Soil Present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☒ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☒ Geomorphic Position (D2)
- ☒ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Ponding and surface saturation are assumed for the early part of the growing season (i.e. March).

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Laurel Station, 1009 East Smith Road City/County: Bellingham Sampling Date: 8-6-09

Applicant/Owner: Kinder Morgan State: WA Sampling Point: SP-5

Investigator(s): Hamidi, Kidder Section, Township, Range: S. 33, T. 39N, R. 3E

Landform (hillslope, terrace, etc.): glaciomarine drift plain Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR): A Lat: Long: Datum:

Soil Map Unit Name: Whatcom silt loam, 30-60% slopes NWI classification: PFOC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐ Hydric Soil Present? Yes ☒ No ☐ Wetland Hydrology Present? Yes ☒ No ☐	**Is the Sampled Area within a Wetland?** Yes ☒ No ☐

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 15' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	50	yes	FAC
2. Populus balsamifera	20	yes	FAC
3.			
4.			
	70	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15' radius)			
1. Rubus spectabilis	25	yes	FAC
2. Lonicera involnucrata	5		FAC
3. Acer circinatum	30	yes	FAC-
4. Rubus armeniacus	5		FACU
5.			
	65	= Total Cover	
Herb Stratum (Plot size: 5' radius)			
1. Polystichum munitum	5		FACU
2. Glyceria elata	5		FACW+
3. Geum macrophylum	1		FACW-
4. Lysichitun americanum	10	yes	OBL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	21	= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 40

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	6	x 2 =	12
FAC species	130	x 3 =	390
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	156 (A)		452 (B)

Prevalence Index = B/A = 2.9

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☒ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Wetland Non-Vascular Plants[1]

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes ☒ No ☐**

Remarks:

SOIL

Sampling Point: SP-5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/2	90	10YR 4/4, 4/6	10	C	M	L	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☒ Water Marks (B1)
- ☒ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☒ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Flooding and surface saturation are assumed for the early part of the growing season (i.e. March).

ATTACHMENT 3

WETLAND PHOTOS

Dam 1 at south end of project site

Sample Point 1 near Dam 1

Sample Point 2

Near Sample Point 2

Dense blackberry north of Sample Point 2

Sample Point 3

South of Sample Point 3

Sample Point 4

Ditch north of E. Smith Road

Dam 2 and ponded area

Deer Creek tributary north of Dam 2

Sample Point 5 along Deer Creek, east of Hannegan Road

LAUREL STATION PROJECT AREA, TERASEN PIPELINE WETLAND/FISH & WILDLIFE STUDY
WHATCOM COUNTY, WASHIGTON

March 2007

Prepared for:

Pete Hellstrom
Anvil Corporation
1675 West Bakerview Road
Bellingham, WA 98226

Prepared by:

ATSI
21993 Grip Rd
Sedro-Woolley, WA 98284

ATSI
Aqua-Terr Systems, Inc.

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Figure 1. Vicinity map of the Laurel Station parcel project area.
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Figure 4. NRCS soils map of the Laurel Station parcel project area (Sheet 26; Goldin 1992); Location, size, and shape of project area as indicated on the map are approximate. 179-Whatcom silt loam, 3 to 8 percent slopes; 180-Whatcom silt loam, 8 to 15 percent slopes; 182-Whatcom-Labounty silt loams, 0 to 8 percent slopes.

EXECUTIVE SUMMARY

Anvil Corporation has contracted with ATSI to review a portion of the 29-acre Terasen Pipeline parcel for the proposed reconstruction (installation of new pumps, pipes, and an electrical line) project that extends from Smith Road, south/southeast approximately 850 feet to existing on-site storage tanks.

ATSI conducted a wetland reconnaissance level on-site review (3-parameter data collection) within the approximate 6-acre project area and a cursory review of the entire Terasen Pipeline parcel on 12 February 2007. ATSI staff made observations for wetlands and protected habitat within 300 feet of the project area. Wetlands were not observed within the project area nor within 300 feet of the project area on the parcel, however, there appears to be a forested wetland immediately north of Smith Road separate from the project area. ATSI staff did not observe local species of concern, or state and federally listed species in the project area.

INTRODUCTION

As requested, Aqua-Terr Systems, Inc. (ATSI) reviewed a portion of an approximate 29-acre Terasen Pipeline (Puget Sound) Corp, (Terasen Pipeline) Laurel Station parcel located near the southeast corner of Smith and Hannegan Roads, Whatcom County, Washington, within a portion of Section 33, Township 39 North, Range 3 East, W.M. (Figure 1). The project area is a narrow corridor extending from Smith Road south, and then southeast, to two existing oil tanks in an existing tank farm (Figure 2).

The purpose of our review is to provide an assessment of the presence, location, and extent of wetlands, streams, and other biological critical areas and their regulated buffers under the jurisdiction of Whatcom County, the Washington State Department of Ecology (Ecology), and the U.S. Army Corps of Engineers (Corps) that are within the project area or within 300 feet of said project area.

METHODS AND PROCEDURES

Regulations & Preliminary Analysis

The wetlands referred to in this report follow the Corps definition: "*...those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.*" (Environmental Laboratory 1987) and the State of Washington, *Washington State Wetlands Identification and Delineation Manual, March, 1997*. Through Section 404 of the Clean Water Act, the Corps has the authority to regulate the placement of fill materials in wetlands and other waters of the U.S., and requires permits for such activities. Whatcom County also regulates all activities in and around wetlands, streams, and other critical areas through the Whatcom County Critical Areas Ordinance, Chapter 16.16 (WCC).

Field Reconnaissance & Personnel

A two-step procedure is used to determine the presence and extent of wetlands and other critical areas on the subject parcel. This procedure includes preliminary data

review and an on-site reconnaissance. A qualitative analysis of biota and habitats is performed. We observe the general terrain and traverse the entire parcel to identify wetlands and other critical areas/habitats. Data are collected from the dominant plant communities and soils. In addition, aerial photographs, soil data, and topographic maps are used for orientation and to assist in locating wetlands, streams, and other unique or critical habitats.

The goal of this analysis and site review is to describe the biological aspects of the parcel in order to provide sufficient information for the client and regulating agency to make informed decisions regarding wetlands, streams, and other critical areas.

A preliminary review of public resource documents is used to provide initial information on soils, vegetation, hydrology, and critical areas of the site and surrounding area. These resources include but are not limited to:

- USDA, Natural Resource Conservation Service soil surveys.
- Natural Resource Conservation Service hydric soil list.
- National Wetland Inventory maps.
- Local jurisdiction inventory maps.

An on-site field reconnaissance was conducted on 12 February 2007 by Dr. Elizabeth Binney, Jim Wiggins, and Amy Dearborn. Both Mr. Wiggins and Dr. Binney are Professional Wetland Scientists (P.W.S.) certified through the Society of Wetland Scientist. Dr. Binney is provisionally certified through the Seattle District of the U.S. Army Corps of Engineers as a Wetland Delineator. Both Dr. Binney and Ms. Dearborn have completed the five-day training course for the Washington State Wetland Function Assessment Project Methods for Assessing Wetland Functions. All three have completed the two-day training for the Department of Ecology wetland rating system.

Wetland Identification & Assessment

All wetlands are identified based on the presence of hydrophytic vegetation, hydric soils, and wetland hydrology as described in the Corps of Engineers *Wetland Delineation Manual* (Environmental Laboratory 1987) and the State of Washington, *Washington State Wetlands Identification and Delineation Manual, March 1997*. All three parameters must be present for an area to be considered a jurisdictional wetland under normal circumstances. Atypical situations and problem areas are treated per the Corps and state manuals. Figure 2 depicts the approximate location of the project area and the approximate locations of the sample plots within the project area; Data Forms for individual sample plots are at the back of this report.

An area has hydrophytic vegetation if greater than 50 percent of the total composition of the dominant plant species from all strata have an indicator status of Facultative (FAC), Facultative Wetland (FACW), or Obligate Wetland (OBL) (Environmental Laboratory 1987) as defined in the *National List of Plant Species that Occur in Wetlands: 1988 Washington* (Reed 1988) and the *1993 Supplement to List of Plant Species that Occur*

in Wetlands: Northwest (Region 9) (Reed 1993). Additional indicator status of Facultative Upland (FACU) and Obligate Upland (UPL) are given to plants that usually occur in nonwetlands or nearly always occur in nonwetlands respectively (Reed 1988, 1993). No Indicator (NI) is given to species where sufficient information is lacking to give the species an indicator status (Reed 1988). The percent cover of the dominant plant species is estimated for each stratum (e.g. canopy, shrub layer, and herbaceous layer) within a thirty-foot radius plot and the indicator status of each species is determined.

Hydric soils, in general, are those soils that have high organic-matter, sulfidic material, reduced conditions, aquic or peraquic moisture regimes, soil colors with a chroma of 1, soil colors with a chroma of 2 with mottles, or the presence of iron or manganese concretions (Environmental Laboratory 1987). On-site soils are observed and described from a 20-inch (+/-) soil pit. Hydric characteristics and indicators such as redoxymorphic features (e.g. mottles) are examined within the profile and specifically just below the A-horizon or at 10 inches. Soil color, texture, and hydric indicators, if present, are recorded. Color is determined using a Munsell soil color chart (Kollmorgen 1998).

Wetland hydrology is present when direct or indirect indicators of seasonal or permanent soil saturation or inundation are observed. Indicators include: soil saturation; surface inundation; free water within the top 12 inches of the soil pit; oxidized rhizospheres, water-stained leaves; water marks; drift lines; sediment deposits; drainage patterns; or previously recorded data.

In order to categorize wetlands we use the local jurisdiction system or the revised *Washington State Wetland Rating System for Western Washington* (Hruby 2004) if the local jurisdiction lacks a categorization system. This system takes into account the hydrogeomorphic class of the wetland, sensitivity to disturbance, significance of the wetland, its degree of rarity, replacement potential, and functions the wetland provides.

We evaluate wetland functions with the *Methods for Assessing Wetland Functions Volume I: Riverine and Depressional Wetlands in the Lowlands of Western Washington* (Hruby et al. 1999).

When this method is not applicable, e.g., slope, lacustrine fringe, or flats wetlands, or wetlands outside of the lowlands, or wetlands too small for this method we use an evaluation method that we derived from a combination of best professional judgment, the wetland functions listed in the *Washington State Wetland Rating System for Western Washington* (Hruby 2004), and several other wetland functional assessment methods. This assessment provides information that aids in categorization of the wetlands and baseline information if mitigation is required. Below is a list of functions and attributes addressed (for detailed methods please contact ATSI personnel); a similar list of functions is used to assess other critical areas and habitats:

1. Age and classes of wetland communities or populations.
2. Buffer size and character.
3. Cultural, heritage, recreational, and local value.
4. Ecotone complexity and transition zone between dry land and watercourses (sinuosity).
5. Enhancement potential.
6. Flood and storm drainage protection.
7. Habitat for fish and/or wildlife.
8. Presence of sensitive, threatened, or endangered species.
9. Presence and number of habitat features.
10. Shoreline stabilization.
11. Size of wetland or habitat.
12. Support of baseflow and surface or groundwater recharge or discharge.
13. Uniqueness of habitat to area or in general.
14. Water quality functions.
15. Wetland/habitat classification diversity.
16. Wildlife corridors and linkage to other habitats.

SITE DESCRIPTION

General

The project area is located on the south side of Smith Road, in Whatcom County, Washington (Figure 1). Land use in the vicinity is low-density residential and open space. The project area is developed as an oil pump station that is fenced with a chain link fence. Facilities on the site include oil tanks with containment dikes, maintenance buildings, an equipment yard, an underground oil pipeline with above ground pump structures, parking areas, storage areas, and an office. Topography in the project area slopes to the north. The project area is maintained lawn, but there are patches of trees and shrubs adjacent to the project area. Much of the project area was recontoured in the past to facilitate stormwater drainage into a catch basin and buried pipelines. No wetlands or streams were identified on or within 300 feet of the project area. There appears to be a forested wetland immediately north of Smith Road.

Whatcom County CAO Map

The Whatcom County critical area maps indicate that there are wetland areas to the south and east of the project area. The mapped wetland areas are greater than 300 feet from the project area. We concur with this mapping. The maps do not indicate any fish or wildlife areas on or within 300 feet of the project area.

NWI

The National Wetlands Inventory (NWI) maps do not indicate any wetlands on or within 300 feet of the project area (Figure 3). We concur with this assessment; however, there appears to be a forested wetland immediately north of Smith Road.

Vegetation

The project area is predominantly maintained lawn and patches of trees and shrubs that contain a sparse herbaceous understory. The reconnaissance occurred in the winter therefore some herbaceous plant species may not be evident this time of year.

The patches of trees and shrubs consists of herbaceous plants such as sword fern (*Polystichum munitum*; FACU), bracken fern (*Pteridium aquilinum*; FACU), trailing blackberry (*Rubus ursinus*; FACU), and evergreen blackberry (*Rubus lacinatus*; FACU+) in the herbaceous layer. The shrub layer is dominated by salmonberry (*Rubus spectabilis*; FAC+), snowberry (*Symphoricarpos albus*; FACU), vine maple (*Acer circinatum*; FACU), osoberry (*Oemleria cerasiformis*; FACU), beaked hazelnut (*Corylus cornuta*; FACU), and Himalayan blackberry (*Rubus procerus*; FACU). The upland canopy is dominated by deciduous trees such as red alder (*Alnus rubra*; FAC), paper birch (*Betula papyrifera*; FAC), bigleaf maple (*Acer macrophyllum*; FACU), and black cottonwood (*Populus balsamifera*; FAC); and evergreen trees such as western hemlock (*Tsuga heterophylla*; FACU-), Douglas fir (*Pseudotsuga menziesii*, FACU), and western red cedar (*Thuja plicata*; FAC).

Soils

NRCS Soil Description

The Natural Resource Conservation Service (NRCS) maps three soil units on the subject parcel. These are: 179-Whatcom silt loam, 3 to 8 percent slopes; 180-Whatcom silt loam, 8 to 15 percent slopes; 182-Whatcom-Labounty silt loams, 0 to 8 percent slope (Goldin 1992) (Figure 4). The NRCS does not list Whatcom soil units as a hydric soil. Labounty is listed as a hydric soil. Whatcom soils may have inclusions of hydric soils.

Excerpts of the NRCS descriptions (Goldin 1992) for the soil units are listed below:

> **179-Whatcom silt loam, 3 to 8 percent slopes.** This very deep, moderately well drained soil is in the higher areas of glaciomarine drift plains. It formed in a mixture of loess and volcanic ash over glaciomarine drift. The native vegetation is mainly conifers and shrubs. Elevation is 50 to 600 feet. The average annual precipitation is about 45 inches, the average annual air temperature is about 50 degrees F, and the average frost-free period is about 170 days.
>
> Typically, the surface layer is dark brown silt loam 9 inches thick. The upper 7 inches of the subsoil is dark brown silt loam. The lower 10 inches is light olive brown, mottled loam. The upper 9 inches of the substratum is olive gray, mottled loam. The lower part of a depth of 60 inches is dark gray loam. In some areas the surface layer is loam or gravelly silt loam. In other areas the substratum has lenses of sandy material, is 10 to 18 percent clay, is 35 to 45 percent clay, or is 5 to 10 percent cobbles, stones, or boulders.
>
> Included in this unit are small areas of Skipopa, Labounty, Bellingham, Birchbay, Laxton, Shalcar, and Whitehorn soils, somewhat poorly drained soils that are mottled at a depth of 12 inches, and Whatcom soils that have slopes of more than 8 percent or less than 3 percent. Included areas make up about 20 percent of the total acreage.
>
> Permeability is moderate in the upper part of the Whatcom soil and slow in the lower part. Available water capacity is high. The effective rooting depth is limited

by a seasonal high water table, which is at a depth of 1.5 to 3.0 feet from December through April. Runoff is slow, and the hazard of water erosion is slight.

180-Whatcom silt loam, 8 to 15 percent slopes. This very deep, moderately well drained soil is in the higher areas of glaciomarine drift plains. It formed in a mixture of loess and volcanic ash over glaciomarine drift. The native vegetation is mainly conifers and shrubs. Elevation is 50 to 600 feet. The average annual precipitation is about 45 inches, the average annual air temperature is about 50 degrees F, and the average frost-free period is about 170 days.

Typically, the surface is covered with a mat of needles, leaves, and twigs 1 inch thick. The surface layer is dark brown silt loam 5 inches thick. The upper 14 inches of the subsoil is dark yellowish brown and yellowish brown silt loam. The lower 15 inches is yellowish brown and olive brown, mottled loam. The upper 9 inches of the substratum is light olive brown, mottled loam. The lower part to a depth of 60 inches is grayish brown, mottled loam. In some areas the surface layer is loam or gravelly silt loam. In other areas the substratum has lenses of sandy material, is 10 to 18 percent clay, or is 5 to 10 percent cobbles, stones, or boulders.

Included in this unit are small areas of Skipopa, Labounty, Bellingham, Birchbay, Laxton, Squalicum, Shalcar, and Whitehorn soils and small areas of Whatcom soils have slope more than 15 percent or less than 8 percent. Included areas make up about 15 percent of the total acreage.

Permeability is moderate in the upper part of the Whatcom soil and slow in the lower part. Available water capacity is high. The effective rooting depth is limited by a seasonal high water table, which is at a depth of 1.5 to 3.0 feet from December through April. Runoff is medium, and the hazard of water erosion is moderate.

182-Whatcom-Labounty silt loams, 0 to 8 percent slope. This map unit is on glaciomarine drift plains that are hummocky. The Whatcom soil is on 0 to 8 percent slopes, and the Labounty soil is on 0 to 2 percent slopes. The native vegetation is mainly trees and shrubs. Elevation is 50 to 600 feet. The average annual precipitation is about 45 inches, the average annual air temperature is about 50 degrees F, and the average frost-free period is about 170 days.

This unit is 55 percent Whatcom silt loam and 25 percent Labounty silt loam. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the selected scale of mapping.

Included in this unit are small areas of Skipopa, Bellingham, and Shalcar soils, somewhat poorly drained soils that are mottled at a depth of about 12 inches, Labounty soils that have been artificially drained, and Whatcom soils that have slopes more than 8 percent. Included areas make up about 20 percent of the total acreage.

The **Whatcom** soil is very deep and moderately well drained. It formed in a mixture of loess and volcanic ash over glaciomarine deposits. Typically, the surface layer is dark brown silt loam 9 inches thick. The upper 7 inches of the subsoil is dark brown silt loam. The lower 10 inches is light olive brown, mottled loam. The upper 9 inches of the substratum is light olive gray, mottled loam. The lower part to a depth of 60 inches is dark gray loam. In some areas the surface layer is loam or gravelly silt loam. In other areas the substratum has lenses of sandy material, is 10 to 18 percent clay, is 35 to 45 percent clay, or is 5 to 10 percent cobbles, stones, or boulders.

Permeability is moderate in the upper part of the Whatcom soil and slow in the lower part. Available water capacity is high. The effective rooting depth is limited by a seasonal high water table, which is at depth of 1.5 to 3.0 feet from December through April. Runoff is slow, and the hazard of water erosion is slight.

The **Labounty** soil is very deep and poorly drained. It formed in glaciomarine drift with an admixture of loess and volcanic ash. Typically, the surface layer is very dark grayish brown silt loam 10 inches thick. The upper 6 inches of the subsoil is grayish brown and light brownish gray, mottled loam. The lower 19 inches is grayish brown, olive gray, and light olive ray, mottled loam. The substratum to a depth of 60 inches is gray loam. In some areas the surface layer is loam. In other areas the soil has 10 to 18 percent or 35 to 45 percent clay in the subsoil and substratum, has lenses of sand in the substratum, or has 5 to 15 percent cobbles in the substratum.

Permeability is moderately slow in the Labounty soil. Available water capacity is high. The effective rooting depth is limited by a seasonal high water table, which is at or near the surface from November through May. Runoff generally is very slow, but the soil may be ponded during the winter. There is no hazard of erosion. Runoff from the higher areas of the micro-relief increases the poorly drained conditions in the depressions.

Field Observations

Most of the project area consisted of soils that were characteristic of the Whatcom soil unit. However, much of the soil surface layer in the project area was disturbed at some point in the past from site re-contouring. The soils in the tree and shrub patches were the least disturbed and provided reference for the re-contoured areas.

The soils were generally very dark grayish brown (10YR 3/2) loam from the surface down to six to 10 inches. From six to 10 inches and deeper the soils were very dark grayish brown (10YR 3/2) silt loam, with dark brown, grayish brown, and yellowish brown (7.5YR 3/4,10YR 5/2 and 5/6) mottles. In some areas the surface layer was very dark brown (10YR 2/2) loam from the surface to 7 to 12 inches in depth, with dark brown (10YR 3/3) silt loam to greater than 18 inches in depth.

Hydrology

The dominant source of hydrology in the project area is from precipitation. Water generally flows northwest through the project area. We observed saturation to the surface and free water at 11 inches at the north end of the project area within the drainage containment area that was developed in 1991-1992. We observed soil saturation from one to three inches in two locations; however, there was no saturation in these plots below three inches. This indicates that the saturation is a result of recent precipitation and the water is percolating through the soil.

Water from the project site flows north to the Deer Creek watershed.

WILDLIFE & PRIORITY SPECIES

We did not observe endangered, threatened, or sensitive plant or animal species regulated by Whatcom County, Washington State, or the federal government in the project area or within the immediate vicinity. Nor did we observe any Whatcom County Habitat Conservation Areas (WCC Article 7).

Habitats within the project area are grass lawn with a mixed deciduous and coniferous forest with a partially mowed understory, and parking area, pumps, outbuildings, and storage tanks. We observed black-tailed deer (*Odocoileus hemionus*) tracks on the project site and a red-tailed hawk (*Buteo jamaicensis*) fly over the site. Wildlife that may use habitats in or near the project area are typical of developed rural areas such as raptors, passerine birds, small mammals such as mice and voles, and large mammals such as coyote (*Canis latrans*). The forested area to the south increases wildlife habitat potential within the project area however the project area is fenced decreasing the opportunity for large mammals on the site.

DETERMINATION

We did not observe jurisdictional wetlands, streams, or other fish and wildlife habitat areas on or within 300 feet of the project area. The wetland north of Smith Road is functionally isolated from the project area by Smith Road.

LIMITATIONS

We have used the most current, established methods to make determinations as to the location, size, and types of wetlands on this parcel. All of the above statements are based on our best professional judgment. Although we follow the federal, state, and local criteria, we cannot guarantee that the U.S. Army Corps of Engineers or the local jurisdiction determination will correspond to ours. Please note that regulations pertaining to critical areas are subject to change over time.

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FIGURES

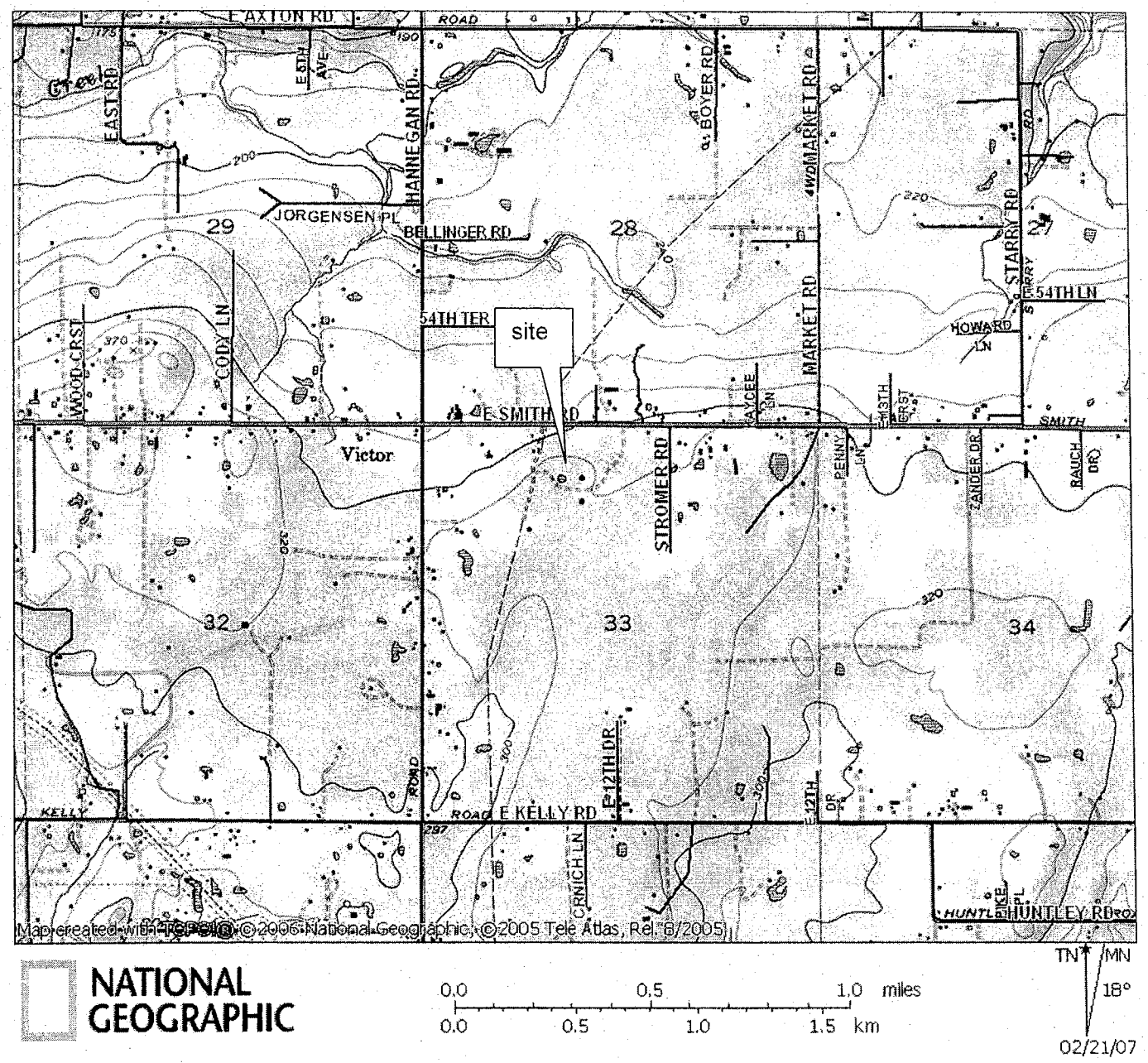

Figure 1. Vicinity map of the Laurel Station parcel project area.

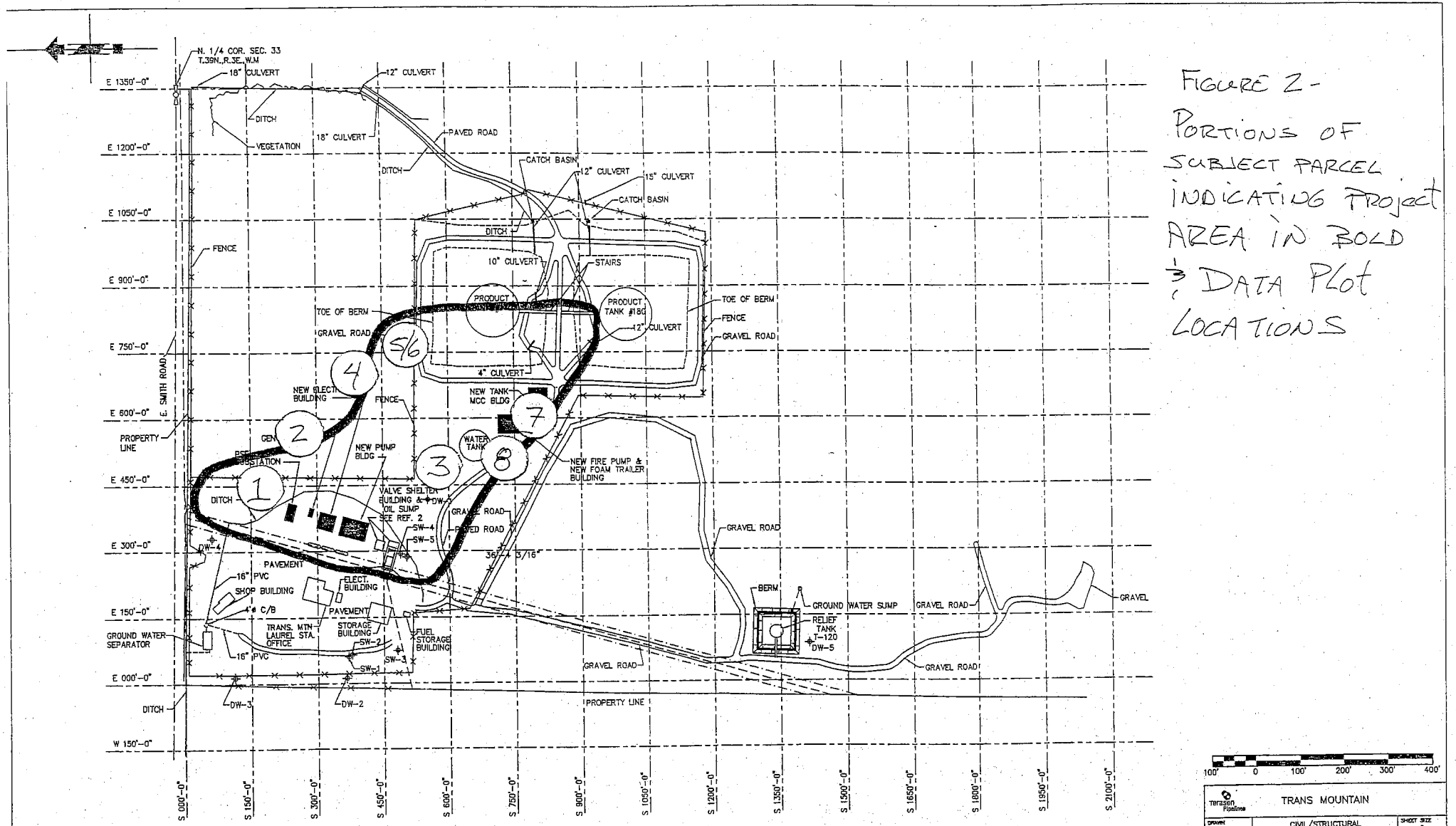

FIGURE 2 - PORTIONS OF SUBJECT PARCEL INDICATING PROJECT AREA IN BOLD & DATA PLOT LOCATIONS

NO.	REFERENCE DRAWINGS	DRAWING NO.
2	VALVE SHELTER	MP1009
1	AREA BREAKDOWN & GRID LAYOUT	GA1002

NO.	DATE	REVISION	DR.	CHK.	APPR.
5	04/10/08	CHANGE TO TERASEN BORDER	DS		
4	03/02/05	AS-BUILT ; ADDED FUEL STORAGE BLDG.	RF	DP	
3	02/04/29	UPDATED - VALVE SHELTER BLDG. ADDED & OIL SUMP (APE 0383)	DS		
2	96/12/03	STORAGE BUILDING ADDED - (APE 6230)	AJW		
1	96/05/01	AS-BUILT 4238, 4239, 4240 & 4241	ELM		
0	94/05/04	REDRAWN FROM GS1010, REV. 1	DF		

Terasen Pipelines

TRANS MOUNTAIN

DRAWN DF | CHECKED | APPROVED

CIVIL/STRUCTURAL PLOT PLAN

LAUREL FACILITY

SHEET SIZE D | SCALE 1"=100'-0" | DATE 02/22/07

DRAWING NUMBER

APE	WBS	FACILITY ID.	DOCUMENT No.	SHT.No.	REV.
ST010	C1A01	UL00	SK001		B

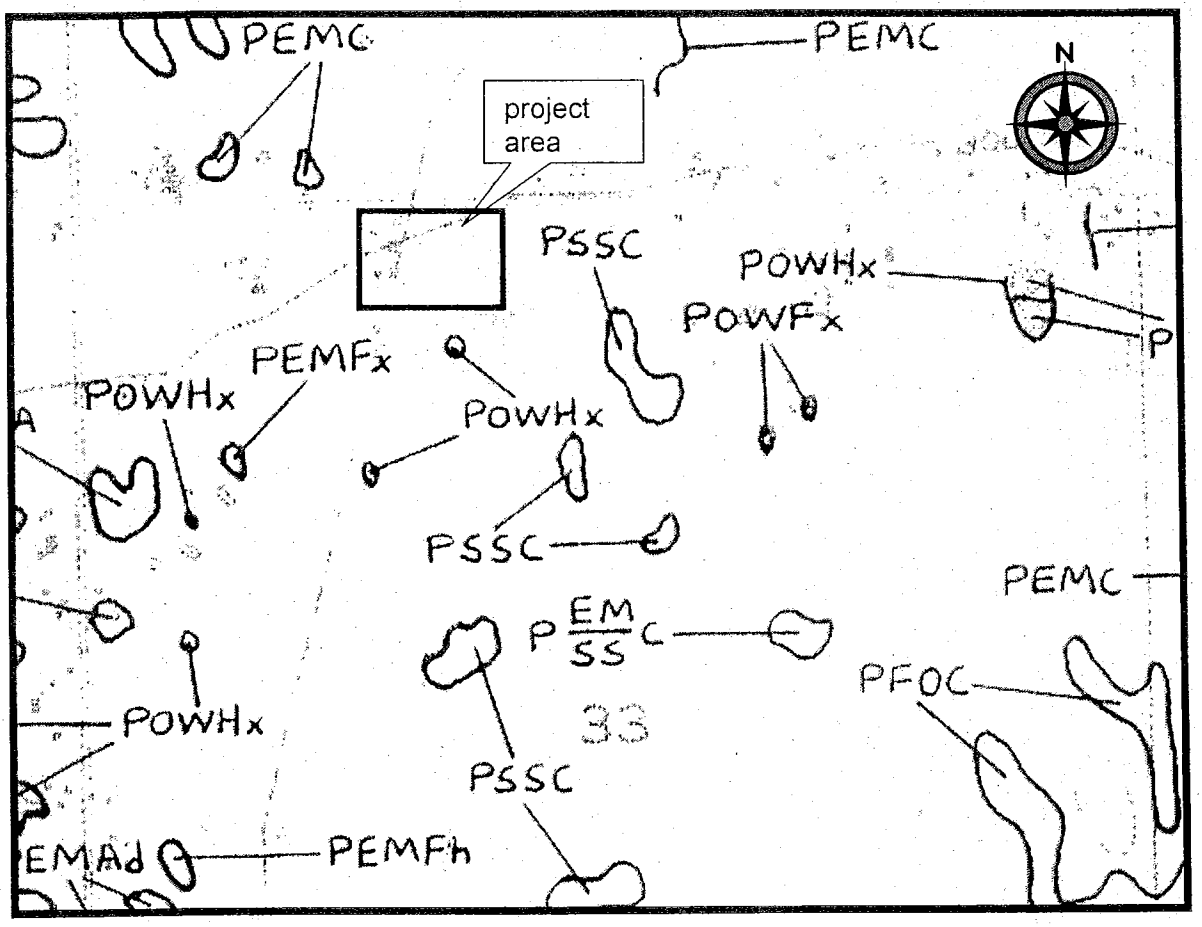

Figure 3. NWI map of the Laurel Station parcel project area (Bellingham North, Wash. 1987); location, size, and shape of project area as indicated on the map are approximate.

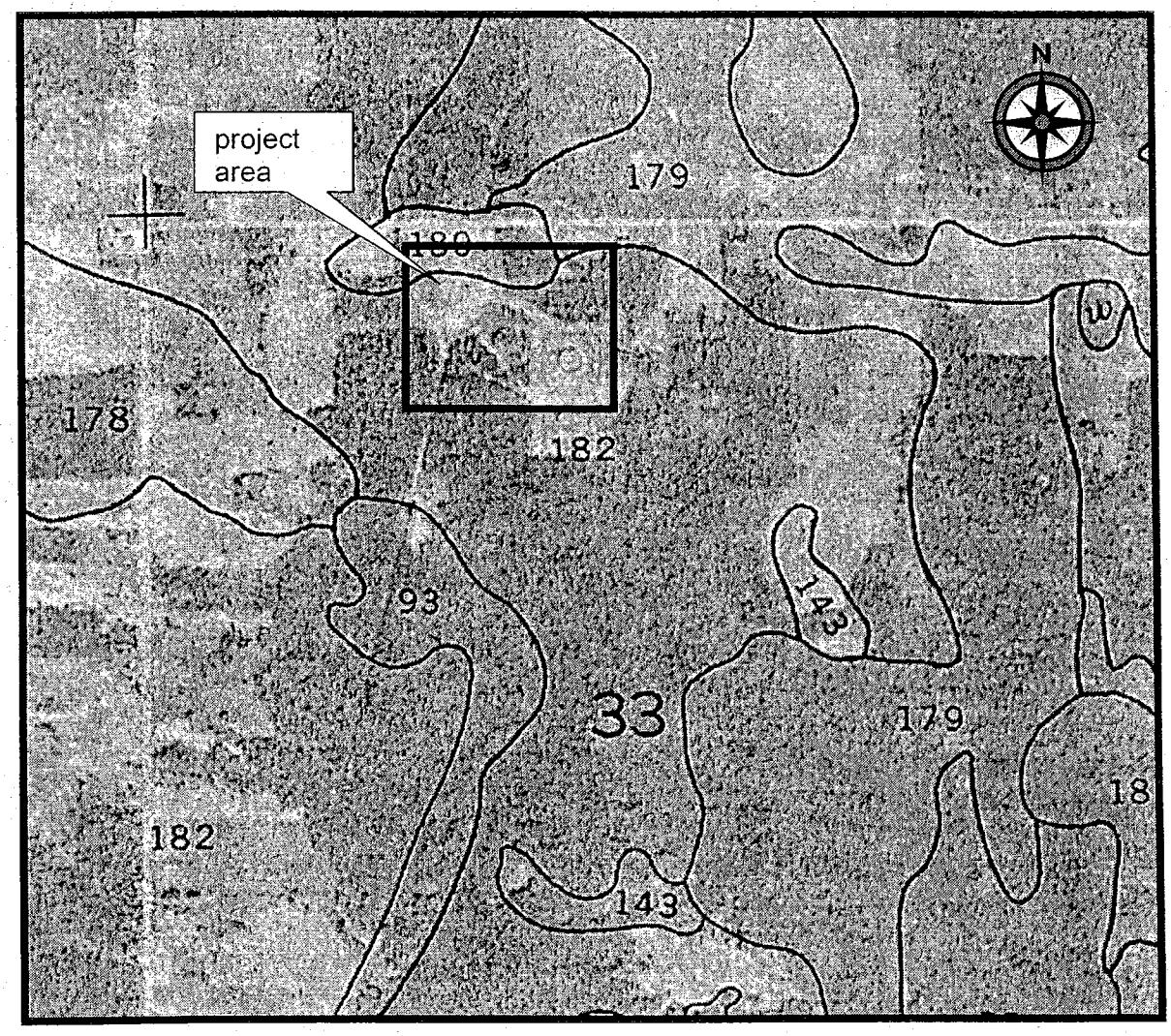

Figure 4. NRCS soils map of the Laurel Station parcel project area (Sheet 26; Goldin 1992); Location, size, and shape of project area as indicated on the map are approximate. 179-Whatcom silt loam, 3 to 8 percent slopes; 180-Whatcom silt loam, 8 to 15 percent slopes; 182-Whatcom-Labounty silt loams, 0 to 8 percent slopes.

DATA SHEETS

ROUTINE WETLAND DETERMINATION DATA FORM

(1987 COE Wetlands Delineation Manual)

Project Name: Terasen
Applicant/agent: Anvil
Field Investigator(s): Wiggins/Binney/Dearborn

Date: 12 Feb 07
County: Whatcom
State: WA
S-T-R: 33-39-3

Do Normal Circumstances exist on the site? yes
Is this site significantly disturbed (Atypical Situation)? no
Is the Area a potential Problem Area? no

Description: Project area extends south from Smith Road and then s.e. to existing tanks. The area is mowed lawn/field that was recontoured to facilitate stormwater drainage.

VEGETATION

Dominant Species	Stratum	%cover	Indicator		Dominant Species	Stratum	%cover	Indicator
1 *Poa pratensis*	Herb	40	fac	9				
2 *Agrostis capillaris*	H	40	fac	10				
3 *Ranunculus repens*	H	15	facw	11				
4 *Trifolium repens*	H	trace	fac	12				
5 *Hypocharis radiata*	H	trace	facu	13				
6 *Moss sp.*	H	trace	?	14				
7				15				
8				16				

Percent of Dominant Species that are OBL, FACW, or FAC: >50 Other hydrophytic indicators:
Remarks: weedy lawn species that qualify as hydric but are not indicative of wetlands

HYDROLOGY

Depth to Surface Water: Depth to saturated soil: see below Depth to free standing water in soil pit:

Recorded Data		Primary Indicators		Secondary Indicators (2 or more required)	
Stream, Lake, or Tide Gauge	☐	Inundated	☐	Oxidized Root Channels in upper 12 inches	☐
Aerial Photographs	☐	Saturated in Upper 12 Inches	☐	Water-Stained Leaves	☐
Other (Explain in Remarks)	☐	Water Marks	☐	Local Soil Survey data	☐
		Drift Lines	☐	FAC-Neutral Test	☐
No Recorded Data Available	☒	Sediment Deposits	☐	Other (Explain in Remarks)	☐
		Drainage Patterns in Wetlands	☐		

Remarks: This area is managed as a stormwater management area that is designed to convey all surface flow....It is a lawn that is a broad stormwater swale that conveys all precipitation into a stormwater drainage, then into an oil water separator. Water is present in lenses.

SOILS

Series/Phase-Mapped: Whatcom Silt Loam Field observation confirm mapped type? yes

Profile Description:

Depth (in.)	Color	Mottle	Mottle %	Texture
0-6	10YR 3/2 and 3/3			Loam with gravel
6-18	10YR 3/2 - 7.5 YR 3/4			Silt loam with gravel

Hydric Soil Indicators:

Histosol	☐	Concretions	☐
Histic Epipedon	☐	High Organic Content	☐
Sulfidic Odor	☐	Organic Streaking (sand)	☐
Aquic Moisture Regime	☐	On Hydric Soils List	☐
Reducing Conditions	☐	Gleyed or Low Chroma	☐

Remarks: soils have been recontoured and amended to promote drainage

WETLAND DETERMINATION

Hydrophytic Vegetation present? yes
Wetland Hydrology present? no
Hydric Soil present? no

Is this sample plot within a wetland? no

Remarks: not a wetland

ROUTINE WETLAND DETERMINATION DATA FORM

(1987 COE Wetlands Delineation Manual)

Project Name: Terasen
Applicant/agent: Anvil
Field Investigator(s): Wiggins/Binney/Dearborn

Date: 12 Feb 07
County: Whatcom
State: WA
S-T-R: 33-39-3

Do Normal Circumstances exist on the site? yes
Is this site significantly disturbed (Atypical Situation)? no
Is the Area a potential Problem Area? no

Description: Project area extends south from Smith Road and then s.e. to existing tanks. The area is mowed lawn/field that was recontoured to facilitate stormwater drainage.

VEGETATION

Dominant Species	Stratum	%cover	Indicator		Dominant Species	Stratum	%cover	Indicator
1 *Festuca arundinacea*	Herb	80	fac-	9				
2 *Agrostis stolonifera*	herb	70	fac	10				
3 *Ranunculus repens*	herb	20	facw	11				
4 *Agrostis capillaris*	herb	20	fac	12				
5 *Hypocharis radiata*	herb	trace	facu	13				
6				14				
7				15				
8				16				

Percent of Dominant Species that are OBL, FACW, or FAC: >50 Other hydrophytic indicators:
Remarks: weedy lawn species that qualify as hydric but are not indicative of wetlands

HYDROLOGY

Depth to Surface Water: Depth to saturated soil: see below Depth to free standing water in soil pit:

Recorded Data		Primary Indicators		Secondary Indicators (2 or more required)	
Stream, Lake, or Tide Gauge	☐	Inundated	☐	Oxidized Root Channels in upper 12 Inches	☐
Aerial Photographs	☐	Saturated in Upper 12 Inches	☐	Water-Stained Leaves	☐
Other (Explain in Remarks)	☐	Water Marks	☐	Local Soil Survey data	☐
		Drift Lines	☐	FAC-Neutral Test	☐
No Recorded Data Available	☒	Sediment Deposits	☐	Other (Explain in Remarks)	☐
		Drainage Patterns in Wetlands	☐		

Remarks: This area is managed as a stormwater management area that is designed to convey all surface flow....It is a lawn that is a broad stormwater swale that conveys all precipitation into a stormwater drainage, then into an oil water separator. Water is present in lenses.

SOILS

Series/Phase-Mapped: Whatcom Silt Loam Field observation confirm mapped type? yes

Profile Description:

Depth (in.)	Color	Mottle	Mottle %	Texture
0-6	10YR 3/2			loam
6-18	10 YR 3/2	10-YR 5/2 & 5/6	30	Silt loam

Hydric Soil Indicators:

Histosol	☐	Concretions	☐
Histic Epipedon	☐	High Organic Content	☐
Sulfidic Odor	☐	Organic Streaking (sand)	☐
Aquic Moisture Regime	☐	On Hydric Soils List	☐
Reducing Conditions	☐	Gleyed or Low Chroma	☐

Remarks: Soils are jumbled, mixed matrix and subsoils together....this area is a recontoured very broad drainage swale.

WETLAND DETERMINATION

Hydrophytic Vegetation present? yes Is this sample plot within a wetland? no
Wetland Hydrology present? No*
Hydric Soil present? No*

Remarks: Veg is indicative of weedy lawn species. Hydrology is recent precip in lenses, not entire column saturated. Soils are mixed and recontoured.

ROUTINE WETLAND DETERMINATION DATA FORM

(1987 COE Wetlands Delineation Manual)

Project Name: Terasen
Applicant/agent: Anvil
Field Investigator(s): Wiggins/Binney/Dearborn

Date: 12 Feb 07
County: Whatcom
State: WA
S-T-R: 33-39-3

Do Normal Circumstances exist on the site? yes
Is this site significantly disturbed (Atypical Situation)? no
Is the Area a potential Problem Area? no

Description: Project area extends south from Smith Road and then s.e. to existing tanks. The area is mowed lawn/field that was recontoured to facilitate stormwater drainage.

VEGETATION

Dominant Species	Stratum	%cover	Indicator		Dominant Species	Stratum	%cover	Indicator
1 *Festuca arundinacea*	Herb	40	fac-	9				
2 *Agrostis stolonifera*	herb	30	fac	10				
3 *Peritidium aquilinum*	herb	20	upl	11				
4 *Agrostis capillaris*	herb	15	fac	12				
5 *Mahonia nervosa*	shrub	20	facu	13				
6 *Thuja plicata*	canopy	60	fac	14				
7 *Acer macrophyllum*	canopy	40	facu	15				
8 *Betula papyrifera*	canopy	15	fac	16				

Percent of Dominant Species that are OBL, FACW, or FAC: barely 50

Other hydrophytic indicators:

Remarks:

HYDROLOGY

Depth to Surface Water: Depth to saturated soil: Depth to free standing water in soil pit:

Recorded Data		Primary Indicators		Secondary Indicators (2 or more required)	
Stream, Lake, or Tide Gauge	☐	Inundated	☐	Oxidized Root Channels in upper 12 inches	☐
Aerial Photographs	☐	Saturated in Upper 12 Inches	☐	Water-Stained Leaves	☐
Other (Explain in Remarks)	☐	Water Marks	☐	Local Soil Survey data	☐
		Drift Lines	☐	FAC-Neutral Test	☐
No Recorded Data Available	☒	Sediment Deposits	☐	Other (Explain in Remarks)	☐
		Drainage Patterns in Wetlands	☐		

Remarks: no evidence of water

SOILS

Series/Phase-Mapped: Whatcom Silt Loam

Field observation confirm mapped type? yes

Profile Description:

Depth (in.)	Color	Mottle	Mottle %	Texture
0-6	10YR 2/2			Loam with a thin layer of duff
6-18	10YR 3/3			silt loam

Hydric Soil Indicators:

Histosol	☐	Concretions	☐
Histic Epipedon	☐	High Organic Content	☐
Sulfidic Odor	☐	Organic Streaking (sand)	☐
Aquic Moisture Regime	☐	On Hydric Soils List	☐
Reducing Conditions	☐	Gleyed or Low Chroma	☐

Remarks: not hydric but a bit jumbled/mixed

WETLAND DETERMINATION

Hydrophytic Vegetation present? yes
Wetland Hydrology present? no
Hydric Soil present? no

Is this sample plot within a wetland? no

Remarks: not a wetland

ROUTINE WETLAND DETERMINATION DATA FORM

(1987 COE Wetlands Delineation Manual)

Project Name: Terasen
Applicant/agent: Anvil
Field Investigator(s): Wiggins/Binney/Dearborn

Date: 12 Feb 07
County: Whatcom
State: WA
S-T-R: 33-39-3

Do Normal Circumstances exist on the site? yes
Is this site significantly disturbed (Atypical Situation)? no
Is the Area a potential Problem Area? no

Description: Project area extends south from Smith Road and then s.e. to existing tanks. The area is mowed lawn/field that was recontoured to facilitate stormwater drainage.

VEGETATION

Dominant Species	Stratum	%cover	Indicator		Dominant Species	Stratum	%cover	Indicator
1 *Agrostis stolonifera*	Herb	60	fac	9				
2 *Agrostis capillaris*	herb	50	fac	10				
3 *Festuca arundinacea*	herb	30	fac	11				
4 *Ranunculus repens*	herb	20	facw	12				
5 *Rubus procerus*	shrub	40	facu	13				
6 *Alnus rubra*	canopy	60	fac	14				
7				15				
8				16				

Percent of Dominant Species that are OBL, FACW, or FAC: >50

Other hydrophytic indicators:

Remarks: weedy lawn species, edge of weedy forested area

HYDROLOGY

Depth to Surface Water: Depth to saturated soil: Depth to free standing water in soil pit:

Recorded Data		Primary Indicators		Secondary Indicators (2 or more required)	
Stream, Lake, or Tide Gauge	☐	Inundated	☐	Oxidized Root Channels in upper 12 inches	☐
Aerial Photographs	☐	Saturated in Upper 12 Inches	☐	Water-Stained Leaves	☐
Other (Explain in Remarks)	☐	Water Marks	☐	Local Soil Survey data	☐
		Drift Lines	☐	FAC-Neutral Test	☐
No Recorded Data Available	☒	Sediment Deposits	☐	Other (Explain in Remarks)	☐
		Drainage Patterns in Wetlands	☐		

Remarks: no evidence of water

SOILS

Series/Phase-Mapped: Whatcom Silt Loam

Field observation confirm mapped type? yes

Profile Description:

Depth (in.)	Color	Mottle	Mottle %	Texture
0-8.5	7.5YR 2.5/2			loam
8.5-16+	2.5Y 4/2			Gravelly sandy silt

Hydric Soil Indicators:

Histosol	☐	Concretions	☐
Histic Epipedon	☐	High Organic Content	☐
Sulfidic Odor	☐	Organic Streaking (sand)	☐
Aquic Moisture Regime	☐	On Hydric Soils List	☐
Reducing Conditions	☐	Gleyed or Low Chroma	☐

Remarks: no hydric

WETLAND DETERMINATION

Hydrophytic Vegetation present? Yes, barely
Wetland Hydrology present? no
Hydric Soil present? no

Is this sample plot within a wetland? no

Remarks: not wetland

ROUTINE WETLAND DETERMINATION DATA FORM

(1987 COE Wetlands Delineation Manual)

Project Name: Terasen
Applicant/agent: Anvil
Field Investigator(s): Wiggins/Binney/Dearborn

Date: 12 Feb 07
County: Whatcom
State: WA
S-T-R: 33-39-3

Do Normal Circumstances exist on the site? yes
Is this site significantly disturbed (Atypical Situation)? no
Is the Area a potential Problem Area? no

Description: Project area extends south from Smith Road and then s.e. to existing tanks. The area is mowed lawn/field that was recontoured to facilitate stormwater drainage.

VEGETATION

Dominant Species	Stratum	%cover	Indicator	Dominant Species	Stratum	%cover	Indicator
1 *Rubus ursinus*	Herb	15		9			
2 *Polystichum munitum*	herb/shrub	5		10			
3 *Oemleria ceraciformis*	shrub	20		11			
4 *Rubus procerus*	shrub	15		12			
5 *Thuja plicata*	canopy	90		13			
6				14			
7				15			
8				16			

Percent of Dominant Species that are OBL, FACW, or FAC: >50

Other hydrophytic indicators:

Remarks: barely hydrophytic, an aberation

HYDROLOGY

Depth to Surface Water: Depth to saturated soil: Depth to free standing water in soil pit:

Recorded Data	☐	**Primary Indicators**		**Secondary Indicators (2 or more required)**	
Stream, Lake, or Tide Gauge	☐	Inundated	☐	Oxidized Root Channels in upper 12 inches	☐
Aerial Photographs	☐	Saturated in Upper 12 Inches	☐	Water-Stained Leaves	☐
Other (Explain in Remarks)	☐	Water Marks	☐	Local Soil Survey data	☐
		Drift Lines	☐	FAC-Neutral Test	☐
No Recorded Data Available	☒	Sediment Deposits	☐	Other (Explain in Remarks)	☐
		Drainage Patterns in Wetlands	☐		

Remarks: no water present nor evidence of

SOILS

Series/Phase-Mapped: Whatcom Silt Loam

Field observation confirm mapped type? yes

Profile Description:

Depth (in.)	Color	Mottle	Mottle %	Texture
0-10	7.5 YR 2.5/2			loam
10-18	10YR 3/3			Sandy loam

Hydric Soil Indicators:

Histosol	☐	Concretions	☐
Histic Epipedon	☐	High Organic Content	☐
Sulfidic Odor	☐	Organic Streaking (sand)	☐
Aquic Moisture Regime	☐	On Hydric Soils List	☐
Reducing Conditions	☐	Gleyed or Low Chroma	☐

Remarks: not hydric

WETLAND DETERMINATION

Hydrophytic Vegetation present? yes, barely
Wetland Hydrology present? no
Hydric Soil present? no

Is this sample plot within a wetland? no

Remarks: not wetland

ROUTINE WETLAND DETERMINATION DATA FORM

Plot 6 of 8

(1987 COE Wetlands Delineation Manual)

Project Name: Terasen
Applicant/agent: Anvil
Field Investigator(s): Wiggins/Binney/Dearborn

Date: 12 Feb 07
County: Whatcom
State: WA
S-T-R: 33-39-3

Do Normal Circumstances exist on the site? yes
Is this site significantly disturbed (Atypical Situation)? no
Is the Area a potential Problem Area? no

Description: Project area extends south from Smith Road and then s.e. to existing tanks. The area is mowed lawn/field that was recontoured to facilitate stormwater drainage.

VEGETATION

Dominant Species	Stratum	%cover	Indicator		Dominant Species	Stratum	%cover	Indicator
1 *Agrostis stolonifera*	herb	90	fac	9				
2 *Festuca arundinacea*	herb	40	fac-	10				
3 *Taraxicum officinale*	herb	20	facu	11				
4 *Trifolium repens*	herb	15	fac	12				
5 *Juncus effusus*	herb	15	facw	13				
6 *Hypocharis radicata*	herb	5	facu	14				
7				15				
8				16				

Percent of Dominant Species that are OBL, FACW, or FAC: >50

Other hydrophytic indicators:

Remarks: compacted soils, weedy lawn species

HYDROLOGY

Depth to Surface Water: Depth to saturated soil: Depth to free standing water in soil pit:

Recorded Data		Primary Indicators		Secondary Indicators (2 or more required)	
Stream, Lake, or Tide Gauge	☐	Inundated	☐	Oxidized Root Channels in upper 12 inches	☐
Aerial Photographs	☐	Saturated in Upper 12 Inches	☐	Water-Stained Leaves	☐
Other (Explain in Remarks)	☐	Water Marks	☐	Local Soil Survey data	☐
		Drift Lines	☐	FAC-Neutral Test	☐
No Recorded Data Available	☒	Sediment Deposits	☐	Other (Explain in Remarks)	☐
		Drainage Patterns in Wetlands	☐		

Remarks: about two inches of water saturation on the soil surface layer...dry below...historically compacted area.

SOILS

Series/Phase-Mapped: Whatcom Silt Loam

Field observation confirm mapped type? yes

Profile Description:

Depth (in.)	Color	Mottle	Mottle %	Texture
0-15	2.5Y 5/2	10YR 4/3 & 4/4	50	Sandy silt loam

Hydric Soil Indicators:

Histosol	☐	Concretions	☐
Histic Epipedon	☐	High Organic Content	☐
Sulfidic Odor	☐	Organic Streaking (sand)	☐
Aquic Moisture Regime	☐	On Hydric Soils List	☐
Reducing Conditions	☐	Gleyed or Low Chroma	☐

Remarks: soils are mixed and compacted what appears to be subsoil, this area is an historic cut.

WETLAND DETERMINATION

Hydrophytic Vegetation present? Yes, barely
Wetland Hydrology present? No
Hydric Soil present? yes

Is this sample plot within a wetland? no

Remarks: historic cut into subsoil, water does not remain, has sheet flow

ROUTINE WETLAND DETERMINATION DATA FORM

(1987 COE Wetlands Delineation Manual)

Project Name: Terasen
Applicant/agent: Anvil
Field Investigator(s): Wiggins/Binney/Dearborn

Date: 12 Feb 07
County: Whatcom
State: WA
S-T-R: 33-39-3

Do Normal Circumstances exist on the site? yes
Is this site significantly disturbed (Atypical Situation)? no
Is the Area a potential Problem Area? no

Description: Project area extends south from Smith Road and then s.e. to existing tanks. The area is mowed lawn/field that was recontoured to facilitate stormwater drainage.

VEGETATION

Dominant Species	Stratum	%cover	Indicator		Dominant Species	Stratum	%cover	Indicator
1 *Phalaris arundinacea*	herb	100	facw	9				
2 *Festuca arundinacea*	herb	20	fac-	10				
3 *Agrostis stolonifera*	herb	trace	fac-	11				
4 *Agrostis capillaris*	herb	trace	fac	12				
5 *Rubus procerus*	shrub	40	facu	13				
6 *Betula papyrifera*	canopy	40	fac	14				
7 *Thuja plicata*	canopy	15	fac	15				
8				16				

Percent of Dominant Species that are OBL, FACW, or FAC: >50 Other hydrophytic indicators:

Remarks: Data plot is directly adjacent to a ditch, that is periodically cleaned and mowed, reed canarygrass is in the ditch, with facu and facu species directly adjacent to. Therefore the plot is not hydrophytic except for the reed canarygrass in the ditch.

HYDROLOGY

Depth to Surface Water: Depth to saturated soil: Depth to free standing water in soil pit:

Recorded Data		Primary Indicators		Secondary Indicators (2 or more required)	
Stream, Lake, or Tide Gauge	☐	Inundated	☐	Oxidized Root Channels in upper 12 inches	☐
Aerial Photographs	☐	Saturated in Upper 12 Inches	x	Water-Stained Leaves	☐
Other (Explain in Remarks)	☐	Water Marks	☐	Local Soil Survey data	☐
		Drift Lines	☐	FAC-Neutral Test	☐
No Recorded Data Available	☒	Sediment Deposits	☐	Other (Explain in Remarks)	☐
		Drainage Patterns in Wetlands	☐		

Remarks: saturated at 10 inches from ditch water

SOILS

Series/Phase-Mapped: Whatcom Silt Loam

Field observation confirm mapped type? yes

Profile Description:

Depth (in.)	Color	Mottle	Mottle %	Texture
0-18	7.5YR 3/2			

Hydric Soil Indicators:

Histosol	☐	Concretions	☐
Histic Epipedon	☐	High Organic Content	☐
Sulfidic Odor	☐	Organic Streaking (sand)	☐
Aquic Moisture Regime	☐	On Hydric Soils List	☐
Reducing Conditions	☐	Gleyed or Low Chroma	☐

Remarks: not hydric

WETLAND DETERMINATION

Hydrophytic Vegetation present? Yes, barely
Wetland Hydrology present? Yes, but from ditch
Hydric Soil present? no

Is this sample plot within a wetland? no

Remarks: area adjacent to a ditch with periodic flow within the ditch. Soils not hydric indicating that the area does not retain sufficient saturation to create hydric soil conditions.

ROUTINE WETLAND DETERMINATION DATA FORM

(1987 COE Wetlands Delineation Manual)

Project Name: Terasen
Applicant/agent: Anvil
Field Investigator(s): Wiggins/Binney/Dearborn

Date: 12 Feb 07
County: Whatcom
State: WA
S-T-R: 33-39-3

Do Normal Circumstances exist on the site? yes
Is this site significantly disturbed (Atypical Situation)? no
Is the Area a potential Problem Area? no

Description: Project area extends south from Smith Road and then s.e. to existing tanks. The area is mowed lawn/field that was recontoured to facilitate stormwater drainage.

VEGETATION

Dominant Species	Stratum	%cover	Indicator		Dominant Species	Stratum	%cover	Indicator
1 *Moss sp.*	herb	80		9				
2 *Festuca arundinacea*	herb	60	fac-	10				
3 *Agrostis stolonifera*	herb	30	fac	11				
4 *Agrostis capillaris*	herb	20	fac	12				
5				13				
6				14				
7				15				
8				16				

Percent of Dominant Species that are OBL, FACW, or FAC: <50

Other hydrophytic indicators:

Remarks: weedy species, in field/lawn, close but no cigar

HYDROLOGY

Depth to Surface Water: Depth to saturated soil: Depth to free standing water in soil pit:

Recorded Data		Primary Indicators		Secondary Indicators (2 or more required)	
Stream, Lake, or Tide Gauge	☐	Inundated	☐	Oxidized Root Channels in upper 12 inches	☐
Aerial Photographs	☐	Saturated in Upper 12 Inches	☐	Water-Stained Leaves	☐
Other (Explain in Remarks)	☐	Water Marks	☐	Local Soil Survey data	☐
		Drift Lines	☐	FAC-Neutral Test	☐
No Recorded Data Available	☒	Sediment Deposits	☐	Other (Explain in Remarks)	☐
		Drainage Patterns in Wetlands	☐		

Remarks: no water present nor evidence

SOILS

Series/Phase-Mapped: Whatcom Silt Loam

Field observation confirm mapped type? yes

Profile Description:

Depth (in.)	Color	Mottle	Mottle %	Texture
0-12	10YR 3/3			loam
12+	10YR 3/3			Silt loam

Hydric Soil Indicators:

Histosol	☐	Concretions	☐
Histic Epipedon	☐	High Organic Content	☐
Sulfidic Odor	☐	Organic Streaking (sand)	☐
Aquic Moisture Regime	☐	On Hydric Soils List	☐
Reducing Conditions	☐	Gleyed or Low Chroma	☐

Remarks: soils not hydric

WETLAND DETERMINATION

Hydrophytic Vegetation present? no
Wetland Hydrology present? no
Hydric Soil present? no

Is this sample plot within a wetland? no

Remarks: not wetland

APPENDIX F
KINDER MORGAN 2009 DISCHARGE MONITORING REPORTS

KINDER MORGAN
CANADA INC.

Kinder Morgan Canada Inc.
7815 Shellmont Street
Burnaby, BC V5A 4S9
Tel: (604) 268-3000
Fax: (604) 268-3001
Toll Free: 1 (800) 535-7219
www.kindermorgan.com

July 30, 2009

Joyce Smith
Industrial Stormwater Permit Coordinator
Washington State Dept. of Ecology
PO Box 47696
Olympia, WA 98504-7696

Dear Ms. Smith:

Re: Discharge Monitoring Report for Laurel Station
(Permit No. SO3-001522D)

Enclosed please find Terasen Pipelines (Puget Sound) Inc. discharge monitoring report for the 2nd quarter of 2009.

The name of our operating company has changed to Kinder Morgan Canada Inc., however this does not affect the name of the entity holding the permit. If you have any questions about this, please do not hesitate to contact me at (direct) 604-268-3008 or (toll free) 1-866-268-3001.

Sincerely,

Dan Chow, BSc, AScT
Environmental Coordinator

Enclosures

/DC

File: Stormwater Discharge Permit – Laurel Station (SO301522)
Word File: \\cgyfs03\home1\users\dan_chow\My Documents\Laurel\SWPPP\2009 Q2 DMR Submission.doc

SO3-001522D

INDUSTRIAL STORMWATER GENERAL PERMIT
DISCHARGE MONITORING REPORT

MONITORING PERIOD for (year/quarter): 2009 (Year) ☐ Jan/Feb/Mar ☒ Apr/May/Jun ☐ Jul/Aug/Sep ☐ Oct/Nov/Dec

Facility/Site Information

LAUREL STATION
Location: 1009 E SMITH ROAD
County: WHATCOM
Primary SIC Code: 5171

Mailing Information

KINDER MORGAN CANADA INC.
7815 SHELLMONT ST
BURNABY, BC V5A 4S9
CANADA
ATTEN: Dan Chow

You must send a Discharge Monitoring Report (DMR) to Ecology **every quarter.** If there was **no discharge** *or* you have **suspended sampling** because of consistent attainment of benchmark values, mark the appropriate boxes and send the DMR to Ecology. Please read the instructions before completing the DMR.

Discharge Point Outfall 001

☒ There was no qualifying storm event this quarter so no values are entered below (see explanation)

Quarterly Monitoring		AVERAGE	MAXIMUM	UNITS	Sample Type	Events Sampled
Turbidity	☐ Consistent Attainment		4.10	NTU		
PH	☐ Consistent Attainment		7.22	Standard Units		
Zinc (total)	☐ Consistent Attainment		10	µg/L		
Oil & Grease	☐ Consistent Attainment		< 6.0	mg/L		
Copper (total)	☐ Consistent Attainment		3	µg/L		
Lead (total)	☐ Consistent Attainment		< 20	µg/L		
Hardness	☐ Consistent Attainment		120	mg/L		

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS RESPONSIBLE FOR OBTAINING THE INFORMATION, I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFCANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT. SEE 18 USC § 1319. *(PENALALTIES UNDER THESE STATUES MAY INCLUDE FINES UP TO $10,000.00 AND OR MINIMUM IMPRISONMENT OF BETWEEN SIX MONTHS AND FIVE YEARS.)*

Dan Chow, Environmental Coordinator
NAME/TITLE PRINCIPAL EXECUTIVE OFFICER (TYPED OR PRINTED)

July 30, 2009
DATE: MO DAY YEAR

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

(604) 268-3008
TELEPHONE NUMBER

COMMENTS / EXPLANATIONS
Rain accumulation for the day was approximately 0.54 inches.

SO3-001522D

INDUSTRIAL STORMWATER GENERAL PERMIT
DISCHARGE MONITORING REPORT

MONITORING PERIOD for (year/quarter): 2009 (Year) ☐ Jan/Feb/Mar ☐ Apr/May/Jun ☑ Jul/Aug/Sep ☐ Oct/Nov/Dec

Facility/Site Information	Mailing Information
LAUREL STATION	KINDER MORGAN CANADA INC.
Location: 1009 E SMITH ROAD	7815 SHELLMONT ST
County: WHATCOM	BURNABY, BC V5A 4S9
Primary SIC Code: 5171	CANADA ATTEN: Dan Chow

You must send a Discharge Monitoring Report (DMR) to Ecology **every quarter.** If there was **no discharge** *or* you have **suspended sampling** because of consistent attainment of benchmark values, mark the appropriate boxes and send the DMR to Ecology. Please read the instructions before completing the DMR.

Discharge Point Outfall 002

☐ There was no qualifying storm event this quarter so no values are entered below (see explanation)

Quarterly Monitoring		AVERAGE	MAXIMUM	UNITS	Sample Type	Events Sampled
Turbidity	☐ Consistent Attainment			NTU	Grab	1
PH	☐ Consistent Attainment			Standard Units	Grab	1
Zinc (total)	☐ Consistent Attainment			µg/L	Grab	1
Oil & Grease	☐ Consistent Attainment			mg/L	Grab	1
Copper (total)	☐ Consistent Attainment			µg/L	Grab	1
Lead (total)	☐ Consistent Attainment			µg/L	Grab	1
Hardness	☐ Consistent Attainment			mg/L	Grab	1

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS RESPONSIBLE FOR OBTAINING THE INFORMATION, I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFCANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT. SEE 18 USC § 1319. *(PENALALTIES UNDER THESE STATUES MAY INCLUDE FINES UP TO $10,000.00 AND OR MINIMUM IMPRISONMENT OF BETWEEN SIX MONTHS AND FIVE YEARS.)*

DAN CHOW, ENVIRONMENTAL COORDINATOR
NAME/TITLE PRINCIPAL EXECUTIVE OFFICER (TYPED OR PRINTED)

DATE: 11 (MO) 04 (DAY) 2009 (YEAR)

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

604-268-3008
TELEPHONE NUMBER

COMMENTS / EXPLANATIONS

No discharge at Outfall 002 during qualifying storm.

whatcom
ENVIRONMENTAL

soil | water | air
compliance consulting

228 East Champion Street, Suite 101
Bellingham, WA 98225
tel 360.752.9571 | **fax** 360.752.9573
www.whatcomenvironmental.com

October 28, 2009

Department of Ecology
Water Quality Program – Industrial Stormwater
PO Box 47696
Olympia, WA 98504-7696

RE: Transmountain Oil Pipeline (Kinder Morgan) Laurel Site (Permit# SO3-001522D) – addition of sampling point – Outfall 002

To whom it may concern:

This correspondence is written on behalf of Trans Mountain Pipeline – Laurel Station. The site is located at 1009 East Smith Road, Bellingham WA, 98226-7415 (Whatcom County). Construction activities of the tank containment area have been completed. As a result, a new discharge point has been added (Outfall 002). It is located at the East Smith Road Ditch downstream of the tank containment area and oil/water separator. The SWPPP has been updated to reflect these changes.

Quarterly stormwater sampling will be performed at Outfall 001 and Outfall 002. Lab testing will be performed on the samples from both outfalls for the parameters listed on the DMR provided by Ecology.

Sincerely,

David Westerlund
Whatcom Environmental Services

Stormwater Compliance Inspection

Completed by: David Westerlund Whatcom Environmental Services

Title: Stormwater Inspector - CESCL certified

Facility: Trans Mountain Pipeline (Puget Sound) LLC

Location: Laurel Station 1009 East Smith Road, Bellingham WA

Inspection Date: 11/25/09

List observed pollutants in all discharges and carefully assess the pollutant sources and action steps needed to control the pollutants. Record pollutant sources/generating activities, BMP adequacy, site map accuracy, and other facility information.

Date	Quarter	Discharge ID	Floating materials?	Visible Sheen?	Discolored?	Turbidity?	Odor?	Add'l BMPs Required?	Observations	Recommended Corrective Actions	Follow-up Actions	Date CA Complete
11/25/09	Q4 2009	001[1]	NO	NO	very slight	NO	NO	NO	clear discharging water slight brownish tint	NONE	—	
11/25/09	Q4 2009	002[1]	NO	NO	NO	NO	NO	NO	clear discharging stormwater	NONE	—	
	Jan - Mar	003[2]										

Note 1: Conduct quarterly visual monitoring at time of stormwater sample collection.
Note 2: Outfall 003 must be inspected once per year in the winter quarter during a storm event.

Additional BMPs needed? If so, where and why? NO

Other Notes or Comments: cleared leaf buildup at Grate @ OUTFLOW pipe from Stormwater pond

Site is in Compliance? (Yes/No) YES Initials: DW

Certification by Responsible Company Official: 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 gathered and evaluated the information. Based on my inquiry of the person or persons who manage the systems 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 there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name DAN CRAIG Title ENV COORDINATOR Signature

Date Signed 09/12/2009

Stormwater Compliance Inspection

Completed by: Alicia Martinez

Title: CESL inspector

Facility: Trans Mountain Pipeline (Puget Sound) LLC

Location: Laurel Station 1009 East Smith Road, Bellingham WA

Inspection Date: 9-17-09

List observed pollutants in all discharges and carefully assess the pollutant sources and action steps needed to control the pollutants. Record pollutant sources/generating activities, BMP adequacy, site map accuracy, and other facility information.

Date	Quarter	Discharge ID	Floating materials?	Visible Sheen?	Discolored?	Turbidity?	Odor?	Add'l BMPs Required?	Observations	Recommended Corrective Actions	Follow-up Actions	Date CA Complete
9/17/09	3	001[1]	NO	NO	NO	Clear	NO	NO	N/A	N/A	N/A	N/A
9/17/09	3	002[1]							NO Discharge			
X	Jan - Mar	003[2]										

Note 1: Conduct quarterly visual monitoring at time of stormwater sample collection.
Note 2: Outfall 003 must be inspected once per year in the winter quarter during a storm event.

Additional BMPs needed? If so, where and why?	NO
Other Notes or Comments	

Site is in Compliance? (Yes/No) Initials: AM

Certification by Responsible Company Official: 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 gathered and evaluated the information. Based on my inquiry of the person or persons who manage the systems 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 there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name DAN CHOW Title ENV COORDINATOR Signature

Date Signed 09/12/2009

APPENDIX G
SAMPLING AND ANALYSIS PLAN

APPENDIX G

SAMPLING AND ANALYSIS PLAN
DATA GAP INVESTIGATION
LAUREL STATION

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SAMPLING AND ANALYSIS PLAN
DATA GAP INVESTIGATION
LAUREL STATION

G1.0 INTRODUCTION

This Sampling and Analysis Plan (SAP) presents the tasks, methods, and procedures that will be used during additional environmental data collection at Kinder Morgan Canada's (Kinder Morgan) Laurel Station facility located at 1009 East Smith Road in Bellingham, Washington (site). The data collection described herein is intended to address data gaps identified during the compilation and review of previous data collected at the site and reported in the Final Supplemental Remedial Investigation/Feasibility Study (RI/FS) Work Plan (hereafter referred to as Work Plan) to which this SAP is appended. The previous data collected and described in the Work Plan was obtained to complete requirements in the Amended Enforcement Order (No. DE 91-N192) issued for the site by Washington State Department of Ecology (Ecology) effective June 15, 1992 following multiple releases at the site. Kinder Morgan and URS Corporation (URS) met with Ecology on August 25, 2009 to discuss the activities necessary to close the Order. The presentation of the Work Plan with the historical data compilation and identification of pending data gaps is the first step toward closure on the Order. Ecology requested that the Work Plan include a SAP to address the data gaps. The data collection described in this SAP will be reported in a Draft RI/FS report.

The release history at the site, contents of the Order, and previous data are described in detail in the Work Plan in Sections 1 through 4. A discussion on Preliminary Cleanup Levels (PCLs) is presented in Section 5 of the Work Plan and the analytical program presented in this SAP is based on collecting data to directly compare to the PCLs. The discussion of the data collected thus far at the site is included in Section 6 of the Work Plan. Based on those data, the nature and extent of contamination was determined and data gaps were identified in Sections 7 and 8. The rationale for the data gaps investigation and basis for the data collection activities described in this SAP is included in Section 9 of the Work Plan and is not repeated in this SAP. Tables 24 and 25 and Figures 34 through 41 in the Work Plan summarize the rationale and present the sample locations selected for additional data collection. As the SAP is appended to the Work Plan, tables and figures from the Work Plan are identified for reference as appropriate but are not represented in the SAP.

G1.1 BACKGROUND

The site is located in Bellingham, Washington. The developed site is approximately 15 acres and is bounded by an additional 135 acres of Kinder Morgan-owned undeveloped or agricultural land on three sides. Current facility improvements include 20-inch and 16-inch pipelines, a pump station and associated valve manifolds, an oil drain system, and two 96,000 barrel aboveground (1 barrel equivalent to 42 gallons) break-out tanks. Auxiliary facilities which support the industrial activities include a fire fighting system, electrical building, Tank Motor Control Center (MCC) Building, Puget Sound Energy (PSE) Substation, an emergency generator, transformer, HVAC heat pump, the Trans Mountain administrative office and maintenance facilities. The Laurel Station facility supplies crude oil to refineries in Ferndale and Anacortes, Washington and has been in operation since 1956. A site plan showing current facility features is presented on Figure 2B in the Work Plan.

In October 1991, the initial Enforcement Order was issued by Ecology concerning assessment and cleanup of a natural gas condensate release at the site on January 15, 1991. Ecology issued an Amended Order on June 15, 1992 to address two additional releases (crude oil) on December 11, 1991 and March 7, 1992 and soil contamination unrelated to the three releases that was discovered during facility upgrades following the January 15, 1992 release. The Amended Order defines the facility or "site" as three areas of concern (Areas 1 through 3), as well as "all other properties in the vicinity of the pump station property which have been affected or are potentially affected by spills, leaks, or discharges of petroleum products or other hazardous substances from the pump station". Non-Order-defined areas of concern identified at the site were divided into seven individual "Study Units" (Study Units 1 through 7). These areas of concern as well as the Order defined areas are depicted on Figure 2A in the Work Plan. Areas 1 through 3 are situated on the adjacent properties to the west (Area 1) and north (Areas 2 and 3). With the exception of Study Unit 5, all of the other Study Units are located on the Laurel Station facility.

G1.2 PURPOSE AND OBJECTIVES

The primary purpose of this investigation is to further evaluate the present environmental conditions in areas where prior sampling efforts had not fully characterized the nature and extent of petroleum impacts to the soil, surface water and wetland sediment/soils both on site and at off-site locations. The results of this investigation will be used to determine whether or not cleanup actions are necessary at the site. The data will be presented to Ecology in a Draft RI/FS Report.

G2.0 PROJECT ORGANIZATION AND RESPONSIBILITY

The project team will consist of personnel from URS, their subcontractors, Analytical Resources, Inc. (ARI, Kinder Morgan's contract laboratory), and Kinder Morgan. URS and their subcontractors will conduct the field investigation including the following:

- Establish the field sampling locations depicted on Figures 34 through 41 of the Work Plan,
- Perform direct push-probe soil sampling, collect soil samples and log each boring according to USCS classification,
- Complete hand augers and collect soil samples if field conditions are not favorable to direct push-probe sampling methods. Several of the proposed deeper borings may need to be drilled using hollow stem auger methods.
- Collect surface water samples,
- Collect wetland sediment/soil samples,
- Label and submit samples to ARI under appropriate chain-of-custody protocols,
- Arrange for a container(s) for aqueous investigation-derived waste and storage of the container(s) pending analytical results,
- Coordinate with the Kinder Morgan Laurel Station operations manager (Patrick Davis) and project manager (Mike Droppo) for all field activities, as appropriate, and

- Ensure compliance with the provisions of the project Health and Safety Plan (HSP) and facility protocols. All field personnel will have the required Kinder Morgan safety training as well 40-hour Hazwoper health and safety training.

Samples collected during this investigation that are selected for chemical analysis will be analyzed for the chemical parameters specified in this plan. Chemical analyses of soil, surface water and sediment/soil samples will be performed by ARI, an Ecology-accredited laboratory, located in Tukwila, Washington. Quality assurance and quality control (QA/QC) measures as outlined in the SAP will be implemented to ensure that data obtained from the chemical analyses are representative of the field conditions, valid, and accurately reported.

URS will submit a Draft RI/FS Report to Kinder Morgan presenting the data collected under this SAP and recommendations appropriate based on the data. The report will be submitted to Ecology following Kinder Morgan's review.

G3.0 HEALTH AND SAFETY

A site specific HSP will be prepared to cover the proposed investigation activities associated with the scope of work described herein. URS' site safety officer will be responsible for assuring that field personnel are properly trained, fully aware of potential site hazards, have undergone any Kinder Morgan specific training required for work at Laurel Station, conduct all work in a safe manner, wear appropriate PPE and confirm that the provisions outlined in the site HSP are adhered to.

G4.0 SCHEDULE AND REPORTING

The analytical results and locations of each sampling location will be included in a Microsoft Access database for submittal to Ecology. The sample analytical results will be compared to the PCLs established in Tables 3 and 5 of the Work Plan.

The data gap investigation will be implemented within 60 days of receiving formal acceptance of the proposed investigation from Ecology. The Draft RI/FS Report will be submitted within 120 days of receiving the final analytical results from the laboratory.

G5.0 FIELD SAMPLING PLAN

The scope of work for this investigation includes the collection of soil samples from hand auger, hollow-stem auger, and/or direct push borings, the collection of surface water and wetland sediment/soil samples from Areas 1, 2 and 3 and Study Units 1, 2 and 3. The proposed boring and sampling locations are shown on Figures 34 through 41 of the Work Plan. The proposed sampling rationale, locations, sampling depths and analytical parameters are presented in Table G-1 included in this SAP but also in Table 25 of the Work Plan. The tasks to be completed include:

- complete twenty-five direct push probe borings (A1-B1 through A1-B25) within Area 1 to a depth of 5 feet below ground surface (bgs) and collect soil samples for analysis of gasoline, diesel, and motor oil-range petroleum hydrocarbons, BTEX, and PAHs
- collecting 3 surface water (A1-SW1 through A1-SW3) and 9 wetland sediment/soil samples from 3 locations (A1-SED1 through A1-SED3) within the wetland area in

Area 1 during a one-time sampling event and submitting the samples for gasoline, diesel, and motor oil-range petroleum hydrocarbons and BTEX analysis

- complete one direct push boring (A2-B1) within Area 2 to a depth of 3 feet bgs and collect soil samples for analysis of gasoline, diesel, and motor oil-range petroleum hydrocarbons, BTEX, and PAHs
- collecting one surface water (A2-SW1) and 3 wetland sediment/soil samples from one location (A2-SED1) within the wetland area in Area 2 during a one-time sampling event and submitting the samples for gasoline, diesel, and motor oil-range petroleum hydrocarbons and BTEX
- collecting 2 surface water (A3-Dam 2 and A3-Dam 3) and 9 sediment/soil samples from 3 locations (A3-SED1 through A3-SED3) within the wetland areas in Area 3 during a one-time sampling event and submitting the samples for gasoline, diesel, and motor oil-range petroleum hydrocarbons and BTEX
- complete 20 direct push probe borings (SU1-B1 through SU1-B20) within Study Unit 1 at depths from 5 to 30 feet bgs and collect soil samples for analysis for gasoline, diesel, and motor oil-range petroleum hydrocarbons, BTEX, and PAHs,
- complete 8 direct push probe borings (SU2-B1 through SU2-B8) within Study Unit 2 to a depth of 10 feet bgs and collect soil samples for analysis for gasoline, diesel, and motor oil-range petroleum hydrocarbons, BTEX, and PAHs,
- complete 7 direct push probe borings (SU3-B1 through SU3-B7) within Study Unit 3 to depths ranging between 4 and 7 feet bgs and collect soil samples for analysis for gasoline, diesel, and motor oil-range petroleum hydrocarbons, BTEX, and PAHs
- collecting 3 surface water (SU3-SW1 through SU3-SW3) and 9 wetland sediment/soil samples from 3 locations (SU3-SED1 through SU3-SED3) within the wetland areas in Study Unit 3 during a one-time sampling event and submitting the samples for gasoline, diesel, and motor oil-range petroleum hydrocarbons and BTEX analysis
- collecting GPS coordinates from the outer limit of the wetland area associated with the March 1992 release to complete delineation of this wetland.

G5.1 METHODS OF INVESTIGATION

This section describes the methodologies to be used during this investigation, including field and laboratory methods. General operating procedures (GOPs) will be implemented during this investigation such that information that is obtained is accurate and defensible and is of adequate technical quality to meet the data quality objectives of the investigation. GOPs include:

consistent field procedures throughout the program

- accurate documentation of field observations, sampling procedures, and decontamination procedures
- sample location selection and collection are representative of the site conditions
- proper calibration of field equipment to obtain accurate field measurements

- procedures that minimize potential for cross-contamination and introduction of artificial contaminants to samples

Field methods to be used in the investigation are generally described below.

G5.1.1 Planning and Reconnaissance

The following planning and reconnaissance tasks will be performed prior to initiation of the field program.

A site-specific HSP will be created and all URS field staff and subcontractors will review and acknowledge the contents.

URS will conduct field reconnaissance to locate and mark preferred sampling locations and assess access for sampling. The proposed drilling and sampling locations shown on Figures 34 through 41 in the Work Plan will be established in the field using a global positioning system (GPS) device.

A utility locate for underground utilities will be conducted using a public utility locating service and a private utility locator. Facility drawings will also be reviewed and Kinder Morgan personnel will be consulted to identify potential underground utilities in the proposed boring areas. If underground utilities are identified at the proposed boring locations, alternative boring locations will be selected.

Pre-coring of concrete at the direct push-probe sample locations prior to initiating the subsurface exploration will be conducted, if necessary.

G5.1.2 Direct Push-Probe Soil Sampling Procedures

A direct push drill rig will be used to advance borings in the areas shown on Figures 34 through 41 of the Work Plan. The drilling and push-probe sampling services will be provided by a Washington State licensed drilling subcontractor. The drilling subcontractor will be responsible for obtaining and submitting all drilling permits and boring logs as required by the State of Washington. The borings will be advanced to the depths indicated in Table G-1 (a maximum of 30 feet bgs) or refusal, whichever is encountered first.

Soil samples will be collected continuously to the total depth of each boring. Monitoring of drilling and soil sampling activities will be conducted by a qualified URS geologist or engineer. The field personnel will maintain a detailed log of the subsurface materials encountered and record photo-ionization detector (PID) screening data. Particular attention will be given to noting visible evidence of contamination, odors, or other relevant factors indicative of the presence of contaminants. Soils will be classified in general accordance with the Unified Soil Classification System (USCS) (ASTM D 2487-93). Soil samples will be selected for laboratory analysis based on the field screening results and the proposed sampling depths outlined in Table G-1.

All soil sampling equipment will either be steam cleaned or washed in dilute Liquinox® detergent solution, rinsed in tap water, and dried prior to initiating each boring and before collecting each soil sample. The Liquinox® solution will be mixed in the field to the manufacturer's specification (i.e., 100:1 dilution and pH approximately 8.5). The subsurface drilling equipment will be decontaminated prior to initiating each boring. Upon completion of

the field sampling, the boreholes will be filled with bentonite and patched with concrete, asphalt, or topsoil to match the existing surface conditions at each location.

G5.1.3 Hollow Stem Auger Soil Sampling Procedures

Hollow stem auger drilling methods may be necessary for the deeper proposed borings. If required, auger drilling will be performed by a licensed drilling subcontractor. The drilling subcontractor will be responsible for obtaining and submitting all drilling permits and boring logs as required by the State of Washington.

Samples from the auger borings will be collected using a standard penetration test (SPT) or other split spoon sampler. The sampler will be driven 18-inches (or until refusal which is defined as 50 blow counts for less than 6-inches) using a 30-inch drop of the appropriate hammer (140 lb or 300 lb). Sub-samples for laboratory analysis will be placed in laboratory prepared jars. Monitoring of drilling and soil sampling activities will be conducted by a qualified URS geologist or engineer. The field personnel will maintain a detailed log of the subsurface materials encountered and record photo-ionization detector (PID) screening data. Particular attention will be given to noting visible evidence of contamination, odors, or other relevant factors indicative of the presence of contaminants. Soils will be classified in general accordance with the Unified Soil Classification System (USCS) (ASTM D 2487-93).

All soil sampling equipment will either be steam cleaned or washed in dilute Liquinox® detergent solution, rinsed in tap water, and dried prior to initiating each boring and before collecting each soil sample. The Liquinox® solution will be mixed in the field to the manufacturer's specification (i.e., 100:1 dilution and pH approximately 8.5). The subsurface drilling equipment will be decontaminated prior to initiating each boring. Upon completion of the field sampling, the boreholes will be filled with bentonite and patched with concrete, asphalt, or topsoil to match the existing surface conditions at each location.

G5.1.4 Hand Auger Soil Sample Procedures

Hand auger borings will be performed in Areas 1 and 2 and Study Unit 3 if these areas will not allow access by a drill rig. Up to twenty-seven hand auger borings may be performed in these areas. The borings will be advanced to the depths indicated in Table G-1 (to a maximum of 5 feet bgs) or refusal, whichever is encountered first. The soil samples will be field screened and logged as described above in Section G5.1.2. Soil samples will be selected for chemical testing based on field screening results and the proposed sample depths outlined in Table G-1.

The hand auger head will be washed in dilute Liquinox® detergent solution, rinsed in tap water, and dried prior to initiating each hand auger boring and before collecting each soil sample. The Liquinox® solution will be mixed in the field to the manufacturer's specification (i.e., 100:1 dilution and pH approximately 8.5). In the event that hand auger tools prove inadequate, a power-driven manual auger tool, or equivalent, will be considered.

G5.1.5 Surface Water Sampling

Surface water samples will be collected prior to wetland sediment/soil sampling in channels to avoid disturbance of the areas and suspending solids into the water. Samples will be collected directly into the laboratory-provided containers at each location from mid-span of the water

channel. Each container will be placed such that the mouth of the container is facing upstream of the flow while sampling personnel are standing downstream of the location. Analyses that typically require preservation will be collected into non-preserved containers to avoid preservative being lost and entering the channel flow. The omission of a preservative will result in the need to reduce the hold times for both BTEX and petroleum hydrocarbons testing. Surface water sampling locations are shown on Figures 39 through 41 in the Work Plan.

G5.1.6 Wetland Sediment/Soil Sample Collection Procedures

Discrete sediment/soil samples will be collected within the wetland area located in Areas 1, 2 and 3 and Study Unit 3. The sediment/soil sample locations generally coincide with the proposed surface water sampling locations. Care will be taken to minimize disturbing the wetland areas sampled. The approximate sampling locations within Areas 1, 2, and 3 are shown on Figure 39 and within Study Unit 3 on Figure 40. A transect across the drainage will be made at each sample location and three discrete samples will be collected as follows: center of the channel/depression, right bank and left bank (based on looking downstream).

Surficial sediment/soil (approximately uppermost 12 inches) representative of depositional material will be collected using a hand-driven stainless steel sediment sampler, or equivalent. Sediment samples will be field screened consistent with the soil sampling procedures. The sample will be placed directly from the core/sampler into the sample jar. The resulting corehole will not require backfilling based on the non-cohesive nature of the sediment in within the submerged areas.

G5.1.7 Field Screening and Equipment Calibration

Soil and wetland sediment/soil samples will be visually examined for evidence of petroleum hydrocarbons (e.g., sheen or staining) contamination and classified in accordance with the USCS. The samples will be field screened for volatile organic vapors using a PID. To obtain reliable and accurate data from the use of field screening instruments, the PID will be calibrated in accordance with the manufacturer's instructions. Soil exhibiting field evidence of contamination will be preferentially retained for laboratory analysis.

Field parameters (e.g., temperature, pH, specific conductance and dissolved oxygen) will be measured during surface water sampling using a portable meter calibrated in accordance with the manufacturer's instructions.

G5.1.8 Field Documentation

Accurate documentation of field procedures will be guided by the procedure for field documentation. A daily field report will be prepared summarizing the daily activities, or equivalent notes will be maintained in a bound field notebook. A detailed log of the soil materials encountered, field screening data, and pertinent sampling and drilling details will be prepared in the field by the field personnel. Surface water and sediment field sampling forms will be used to record sampling information at each sample locations. In addition, sample collection data and requested analyses will be recorded on the laboratory chain-of-custody (COC) forms.

G5.1.9 Chemical Analytical Methods For Samples

The analytical testing of soil, surface water and wetland sediment/soil samples will be performed by ARI. Samples will be shipped within 48 hours of collection to ARI via commercial shipper for next day delivery or hand-delivered by URS personnel. The samples will be analyzed for the parameters outlined in Table G-1. Selected testing methods for each media are summarized in Table G-2. The analytical methods were selected to achieve the reporting limits necessary to directly compare data to the proposed PCLs presented in the Work Plan. TPH analyses will be conducted for gasoline-, diesel- and oil-range hydrocarbons to determine concentrations of TPH within each range. However, samples with the highest concentrations of TPH will be selected for NWTPH-HCID analysis to confirm the type of TPH to confirm chemical data are appropriately compared to PCLs. The laboratory reporting limits, method detection limits, and the PCLs are included in Table G-2.

Soil samples selected for BTEX and gasoline-range petroleum hydrocarbons (NWTPH-Gx) analysis will be collected using EPA SW-846 Method 5035A as outlined in Appendix A of Ecology's Toxics Cleanup Program Implementation Memorandum #5 (Ecology, 2004). However, very dense and/or gravelly soils may necessitate sample collection directly into the laboratory provided glassware if difficulties are encountered using the 5035A technique. If so, this will be documented in the field and the impact to data quality will be assessed during data review. All other soil samples for diesel and motor oil-range petroleum hydrocarbons (NWTPH-Dx) and PAHs will be transferred directly to laboratory-provided glassware as described in Table G-3.

As noted previously, surface water samples will be collected in non-preserved containers to avoid losing the preservative during sampling to the water channel. The laboratory will be notified prior to the sampling event that non-preserved containers will be used and holding times will be adjusted accordingly.

G5.1.10 Collection And Testing Of Investigation Derived Waste (IDW)

The proposed drilling methods will not generate soil cuttings, thus, soil cutting IDW is not anticipated. With the exception of cleaning of the direct-push probe equipment, all sampling equipment is dedicated so decontamination fluids generated during the field program will be minimal. If generated, the fluids will be contained onsite in labeled Department of Transportation (DOT) approved 55-gallon steel drums pending laboratory analysis. Samples will be collected directly from a representative number of the drums for BTEX, gasoline, diesel, and motor oil-range petroleum hydrocarbons. The drums will be temporarily stored at location on the facility designated by Kinder Morgan personnel pending laboratory analysis and off-site disposal/treatment, if necessary.

As discussed in Section G5.1.3, hollow stem auger drilling methods may be necessary for the deeper proposed borings. If required, IDW generated during auger drilling will be contained onsite in labeled DOT-approved 55-gallon steel drums pending laboratory analysis. Samples will be collected directly from a representative number of the drums for BTEX, gasoline, diesel, and motor oil-range petroleum hydrocarbons. The drums will be temporarily stored at location on the facility designated by Kinder Morgan personnel pending laboratory analysis and off-site disposal/treatment, if necessary.

G6.0 SAMPLE DESIGNATIONS

Samples will be labeled based on the location names presented in Table G-1 and on the proposed sampling location shown on Figures 34 through 41 of the Work Plan.

Push-probe, hand auger and wetland sediment/soil samples will be labeled as follows: Area of Concern (e.g., Study Unit 1 [SU1]), sample type, sample location name abbreviation and sample depth. For example, the 5-foot bgs sample collected from the first boring drilled in Study Unit 1 will be labeled SU1–B1–5.

Surface water samples will be labeled with the area of concern and sample location name. For example, the surface water sample collected from Area 1 at sample location number 2 will be labeled A1-SW2.

At each wetland sediment/soil sample location, three discrete samples will be collected across the drainage. The left and right banks of the drainages are distinguished by looking downstream. Thus, for a sediment/soil sample collected within Area 1 at location 2, the following sample designation would be used:

- Left bank sample would be labeled: A1-SED2-L
- Center of channel/depression sample would be labeled: A1-SED2-C; and
- Right bank sample would be labeled: A1-SED2-R.

G7.0 SAMPLE HANDLING, SHIPPING, AND LABORATORY RECEIPT

Sample custody and documentation procedures will include completion of COC forms, tracking transportation methodologies, and laboratory acceptance procedures. Sample integrity will be maintained through strict adherence to these procedures.

G7.1 CHAIN OF CUSTODY

COC forms will be maintained as samples are collected and shipped with corresponding samples. The requested turnaround will be communicated to ARI verbally and on the COC forms.

G7.2 TRANSPORTATION

The sample containers will be packed in coolers with ice. Shipping dates and method of shipment will be recorded on the field report form and on the COC forms and the samples transported to ARI.

G8.0 QUALITY ASSURANCE PLAN

This section describes QA/QC procedures developed to ensure that data quality objectives are met.

G8.1 SAMPLE COLLECTION AND HANDLING

Sampling procedures are described in Section G5.1, Methods of Investigation. When a permanent modification of an approved sampling protocol is necessary, the modification will be

included in this document. Temporary modifications caused by non-typical field conditions or equipment malfunction shall be recorded on the appropriate sample collection form and the URS project manager shall be notified. Modifications to Ecology-approved sampling protocols require prior Ecology approval. If non-typical field conditions or equipment malfunction results in a field modification to an Ecology-approved procedure, Ecology will be notified of this modification by phone and email within 24-hours of knowledge of this modification. Depending on the nature of the variation, Ecology will notify URS if resampling is necessary.

Sample containers, preservatives and holding times will be appropriate for the type of sample collected and the analytical method to be used. Maximum sample holding times will be strictly adhered to. Each sample will be documented, labeled and identified as noted in Section G6.0. Complete documentation of sample collection and handling will be maintained by URS.

G8.2 SAMPLE CUSTODY

A sample is under an individual's custody if one or more of the following criteria are met:

- it is in the sampler's possession
- it is in the sampler's view after being in possession
- it is in the sampler's possession and secured to prevent tampering
- it is in a designated secure area

In order to maximize sample integrity and accountability, strict COC procedures will be adhered to.

G8.2.1 Field Custody Procedures

A limited number of people will handle the samples. The sampler will be personally responsible for completion of the COC form and the care and custody of collected samples until they are transferred to another person.

G8.2.2 Transfer of Custody

When samples transfer possession, the individuals relinquishing and receiving the samples will sign the COC form and document the date and time of transfer. The sample collector will sign the form in the first signature space. The sample receiver will then sign the form in the second signature space.

G8.2.3 Laboratory Custody Procedures

A designated sample custodian in the laboratory will accept custody of the samples. The custodian will verify that the sample identification numbers match those on the chain-of-custody record. The laboratory will maintain sample security and custody as appropriate.

G8.3 INTERNAL QUALITY CONTROL

Quality Control (QC) checks will consist of measurements performed in the field and laboratory. QC checks include analysis of a number of field and laboratory QC samples as outlined below.

These samples will be evaluated to verify accuracy, comparability, completeness, and precision of analytical results for this sampling routine. The following QC samples will be obtained and analyzed.

G8.3.1 Field Rinsate Blank

A field rinsate blank will be collected and analyzed only if non-disposable equipment is used. Field rinsate blanks will consist of distilled, deionized water (supplied by the analytical laboratory) passed over and/or through decontaminated sampling equipment. Surfaces and materials exposed during actual sampling will be rinsed to evaluate the effectiveness of sampling equipment decontamination procedures and potential for equipment or field cross contamination. Rinsate blanks shall be collected at a rate of one per sampling event per media and analyzed for all parameters specified for the area. The sample will be labeled "rinsate blank" with the date in MM/DD/YY format.

G8.3.2 Trip Blanks

Trip blanks will accompany all volatile samples (BTEX and gasoline-range petroleum hydrocarbons) as they are transported to and from the sampling site and then to the laboratory. They will consist of 40-ml glass vials filled with distilled/carbon-free water provided by the laboratory. One trip blank will be included with each cooler of sample containers destined for volatiles analysis. Trip blanks will be prepared by the laboratory at the time sample containers are prepared for the site sampling.

G8.3.3 Blind Field Duplicates

One field duplicate soil sample will be collected for every 20 soil samples collected. One field duplicate for surface water and one for sediment/soil from the wetland areas will be collected during the single sampling event for these media. Samples will be coded such that the laboratory cannot identify which samples are duplicates from the information on the sample label. The soil field duplicates will be collected from a location where the widest range of parameters is included in the analytical suite. The samples will be analyzed for the same parameters as the primary sample. Field duplicates shall be noted on the sample collection form and the location recorded in the field sampling documentation.

G9.0 ANALYTICAL PROCEDURES

G9.1 LABORATORY ANALYSES

The analytical procedures that will be used during the field program are summarized in Table G-3. The URS project manager or their designee will be responsible for scheduling analyses and will serve as a primary contact for all laboratory issues and problem resolution. The laboratory will be requested to submit a fully validatable data package(s) to URS.

G9.1.1 Data Validation – Chemical Analyses

Data validation reviews will be performed for each laboratory report by a URS chemist. The review will be conducted based on the method criteria, the current laboratory control limits when

samples are received at the laboratory, and adherence to the reporting limit requirements for the project.

The components of all data validation reviews will include the following items:

- Holding Time
- Initial and Continuing Calibrations
- System Performance
- Method Blanks
- Matrix Spike/Matrix Spike Duplicates
- Field Duplicates
- Compound Identification
- Compound Quantification
- Reported RLs

Data will be reviewed and validated based on the QA/QC criteria specified in the methods and based on current laboratory control limits in use at the time samples are submitted to the laboratory. If required, data qualifiers will be assigned based on the definition and guidance of qualifiers used in the Functional Guidelines (USEPA, 2008).

A summary validation will be performed on all data generated by the laboratory. A "summary" data validation review refers to conducting reviews that involve evaluating only the data summary and QA/QC summary sheets provided with all data packages. The "summary" reviews do not involve spot-checking the raw data packages and calculations.

If "summary" reviews indicate potential problematic areas within a data set, a "standard" data validation review may be conducted. A "standard" data validation review refers to conducting a data validation review that requires spot-checking the laboratory's raw data package and calculations in accordance with the Functional Guidelines (USEPA, 2008). The URS chemist will contact the laboratory to discuss the problematic areas; however, if questions still exist, the URS chemist may elect to conduct a "standard" review of the data.

Data validation memoranda for all data validation reviews will be prepared for each analytical data package. Completed QA/QC memoranda will be submitted to the Project Manager and copies will be retained in the project file.

G9.1.2 Field QA/QC Sample Evaluation

Following the data validation reviews of each set of analytical data, field QA/QC sample results will be evaluated. Field QA/QC sample results will provide information regarding the potential for introducing artificial contaminants during the sample collection process, cross-contamination and field variability. If the introduction of contaminants is evident due to problems with sample containers, sample collection procedures and/or sampling equipment, the URS chemist will notify the URS project manager. The project manager will assess sampling procedural changes with Kinder Morgan and if significant, Ecology. Upon approval by URS, Kinder Morgan, and Ecology, procedural changes will be documented and followed from the effective date. The change and its effectiveness will be documented in the field record.

G10.0 DATA REDUCTION, VALIDATION, AND REPORTING

Data obtained in the field will be recorded daily in bound field notebooks or other formats as indicated in Section G5.0 and will be maintained by the URS field task lead. The field data package will be reviewed by the URS project manager or their designee to determine if the field records are complete and measurements specified in the SAP have been performed. If the field records are incomplete, corrective actions will be implemented to rectify the issue to the extent possible.

G10.1 CHEMICAL ANALYSES

Data validation and review of laboratory and field measurement analytical data collected during the investigation will be conducted as described in Section 9.0. Data validation memoranda and associated data summary sheets will be provided to the URS project manager upon completion. Field measurements will be tabulated.

Data collected during the investigation will be stored, compiled, and managed in an ACCESS database for the project. Chemical parameters, concentrations, and data qualifiers for each sample analysis will be entered into the project database. Regular backups of the database will be performed to avoid data loss due to equipment failure.

G11.0 REFERENCES

USEPA, 1998, Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW-846), 3rd Ed., September 1986: Final Update I, July 1992; Final Update IIA, August 1993; Final Update II, September 1994; Final Update IIB, January 1995, Final Update III, December 1996, Final Update IIIA, April 1998, Final Update IIIB, November 2004, Final Update IVA and IVB, January 2008.

USEPA, 2008. USEPA Contract Laboratory Program, National Functional Guidelines for Organic Data Review, June.

Washington State Department of Ecology. 2004. Collecting and preparing Soil Samples for VOC Analysis, Implementation Memorandum #5, Publication 04-09-087, June 2004.

Table G-1
Proposed Soil, Surface Water, and Wetland Sediment/Soil Sampling Locations and Rationale
Laurel Station
Bellingham, Washington

Area of Concern / Final RI/FS Report Figure No.	Proposed Sample Location/Sample ID	Media	Proposed Sampling Depth (feet bgs)	Analytical Testing	Rationale
Area 1 / Figure 34	A1-B1 through A1-B25	Soil	3 and 5	NWTPH-Gx, NWTPH-Dx[1], and BTEX. PAHs for A1-B1, A1-B9, A1-B12, A1-B16, A1-B17, and A1-B20	Characterization of the vertical and lateral extent of hydrocarbon impacts exceeding the PCL in Area 1. Characterization of the vertical extent of PAHs where TPH was previously elevated. Assessment of BTEX.
Area 1 / Figure 39	A1-SW1 through A1-SW3	Surface Water	NA	NWTPH-Gx, NWTPH-Dx, and BTEX	Establish current surface water quality within Area 1.
Area 1 / Figure 39	A1-SED1 through A1-SED3 [2]	Wetland Sediment/Soil	0-1	NWTPH-Gx, NWTPH-Dx[1], and BTEX	Establish current wetland sediment/soil quality within Area 1.
Area 2 / Figure 35	A2-B1	Soil	1, 2, and 3	NWTPH-Gx, NWTPH-Dx[1], BTEX, and PAHs [3]	Characterization of the vertical extent of hydrocarbon impacts exceeding the PCL in Area 2. Assessment of BTEX.
Area 2 / Figure 39	A2-SW1	Surface Water	NA	NWTPH-Gx, NWTPH-Dx, and BTEX	Establish current surface water quality within Area 2.
Area 2 / Figure 39	A2-SED1[2]	Wetland Sediment/Soil	0-1	NWTPH-Gx, NWTPH-Dx[1], and BTEX	Establish current wetland sediment/soil quality within Area 2.
Area 3 / Figure 39	A3-DAM 2 and A3-DAM 3	Surface Water	NA	NWTPH-Gx, NWTPH-Dx, and BTEX	Establish current surface water quality within Area 3.
Area 3 / Figure 39	A3-SED1 through A3-SED3 [2]	Wetland Sediment/Soil	0-1	NWTPH-Gx, NWTPH-Dx[1], and BTEX	Establish current wetland sediment/soil quality within Area 3.
Study Unit 1 / Figure 36	SU1-B1 through SU1-B4	Soil	5, 10 and 15	NWTPH-Gx, NWTPH-Dx, BTEX, and PAHs [3]	Characterization of the lateral extent of hydrocarbon impacts exceeding the PCL at historical test pits TP-6 and TP-7.
Study Unit 1 / Figure 36	SU1-B5	Soil	2 and 5	NWTPH-Gx, NWTPH-Dx, BTEX, and PAHs [3]	Characterization of the vertical extent of hydrocarbon impacts exceeding the PCL at sample location DTE-1.
Study Unit 1 / Figure 36	SU1-B6 through SU1-B9, SU1-B17 and SU1-B18	Soil	3, 5 and 10	NWTPH-Gx, NWTPH-Dx, BTEX, and PAHs [3]	Characterization of the vertical and lateral extent of hydrocarbon impacts exceeding the PCL at sample locations PEX-11-S-7, PEX-17-B-5, PEX-18-S-3, and PEX-34-S-1.
Study Unit 1 / Figure 36	SU1-B10 and SU1-B11	Soil	5, 10 and 15	NWTPH-Gx, NWTPH-Dx, BTEX, and PAHs [3]	Characterization of the vertical and lateral extent of hydrocarbon impacts exceeding the PCL at sample location PB-2.
Study Unit 1 / Figure 36	SU1-B12 through SU1-B16	Soil	5, 10, 15, 20 and 25	NWTPH-Gx, NWTPH-Dx, BTEX, and PAHs [3]	Characterization of the lateral extent of hydrocarbon impacts exceeding the PCL at soil borings TM-B4 and TM-B16.
Study Unit 1 / Figure 36	SU1-B19	Soil	6, 8 and 10	NWTPH-Gx, NWTPH-Dx, BTEX, and PAHs [3]	Confirmatory sampling at test pit PB-4.
Study Unit 1 / Figure 36	SU1-B20	Soil	29 and 30	NWTPH-Gx, NWTPH-Dx, BTEX, and PAHs [3]	Confirmatory sampling at boring TM-B15.
Study Unit 2 / Figure 37	SU2-B1 through SU2-B8	Soil	2, 5 and 10	NWTPH-Gx, NWTPH-Dx, BTEX, and PAHs [3]	Characterization of the vertical and lateral extent of hydrocarbon impacts exceeding the PCL within the bulk storage tank containment berms.
Study Unit 3 / Figure 38	SU3-B1 through SU3-B6	Soil	2 and 4	NWTPH-Gx, NWTPH-Dx, BTEX, and PAHs [3]	Characterization of the vertical and lateral extent of hydrocarbon impacts exceeding the PCL within the former relief tank containment berm.
Study Unit 3 / Figure 38	SU3-B7	Soil	5 and 7	NWTPH-Gx, NWTPH-Dx, BTEX, and PAHs [3]	Confirmatory sampling at test pit TP-3-2.
Study Unit 3 / Figure 40	SU3-SW1 through SU3-SW3	Surface Water	NA	NWTPH-Gx, NWTPH-Dx, and BTEX	Establish current surface water quality within Study Unit 3.
Study Unit 3 / Figure 40	SU3-SED1 through SU3-SED3 [2]	Wetland Sediment/Soil	0-1	NWTPH-Gx, NWTPH-Dx[1], and BTEX	Establish current wetland sediment/soil quality within Study Unit 3.

Notes:
PCL - Preliminary Cleanup Level
NWTPH-Gx - Northwest Total Petroleum Hydrocarbons Gasoline
NWTPH-Dx - Northwest Total Petorleum Hydrocarbons Diesel extended
BTEX - Benzene, toluene, ethylbenzene, and xylenes
PAHs - Polycyclic aromatic hydrocarbons
bgs - below ground surface
NA - not applicable
NWTPH-HCID analyses will be performed on select samples to evaluate the type of TPH for comparison to PCLs as described in Section G.5.19.
[1] Acid and/or silica gel cleanup
[2] Three samples per location: (a) right bank, (b) mid-drainage, and (c) left bank
[3] PAH analysis will be conducted when the NWTPH-Dx result exceeds the PCL of 460 milligrams per kilogram.

Table G-2
Parameters, Methods, and Reporting Limits
Laurel Station
Bellingham, Washington

Parameter	Method	MDL		RL		Preliminary Cleanup Levels [a]	
		Soil/Solids	Water	Soil/Solids	Water	Soil/Sediment	Surface Water
Total Petroleum Hydrocarbons	**Ecology June 1997**	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L
Gasoline Range	NWTPH-Gx	2.49	0.049	5.0	0.25	30/100 [b]	0.8/1.0 [b]
Diesel Range	NWTPH-Dx	0.50	0.012	5	0.25	460	0.5
Oil Range	NWTPH-Dx, Extended	1.91	0.049	10	0.50	2,000	NE
HCID	NWTPH-HCID	NA	NA	100	0.63	NA	NA
Volatile Organic Compounds	**USEPA 8021B**	ug/kg	ug/L	ug/kg	ug/L	ug/kg	ug/L
Benzene		4.70	0.094	25	1.0	30	1.2
Ethylbenzene		4.65	0.091	25	1.0	6,000	530
Toluene		3.15	0.057	25	1.0	7,000	1,300
m,p-Xylene		6.28	0.122	25	1.0	9,000 [c]	NE
o-Xylene		4.24	0.135	25	1.0	9,000 [c]	NE
Polycyclic Aromatic Hydrocarbons		ug/kg	ug/L	ug/kg	ug/L	ug/kg	ug/L
Acenaphthene	**USEPA 8270D-SIM**	1.29	0.00355	5.0	0.01	4,800	643
Acenaphthylene	**(soil)/low-level (water)**	1.74	0.00313	5.0	0.01	NE	NE
Anthracene		1.16	0.00216	5.0	0.01	24,000	8,300
Benzo (a) pyrene [d]		1.80	0.00501	5.0	0.01	See Note d	See Note d
Benzo(a)anthracene [d]		0.99	0.00270	5.0	0.01	See Note d	See Note d
Benzo(b)fluoranthene [d]		1.49	0.00395	5.0	0.01	See Note d	See Note d
Benzo(g,h,i)perylene		1.35	0.00283	5.0	0.01	NE	NE
Benzo(k)fluoranthene [d]		1.54	0.00608	5.0	0.01	See Note d	See Note d
Chrysene [d]		1.56	0.00562	5.0	0.01	See Note d	See Note d
Dibenz(a,h)anthracene [d]		1.55	0.00414	5.0	0.01	See Note d	See Note d
Dibenzofuran		1.90	0.00349	5.0	0.01	160	NE
Fluoranthene		3.80	0.00294	5.0	0.01	3,200	90
Fluorene		2.39	0.00338	5.0	0.01	3,200	1,100
Indeno(1,2,3-cd)pyrene [d]		1.62	0.00305	5.0	0.01	See Note d	See Note d
2-Methylnaphthalene		1.05	0.00314	5.0	0.01	320	NE
Naphthalene		1.93	0.00226	5.0	0.01	1,600	4938
Phenanthrene		1.41	0.00477	5.0	0.01	NE	NE
Pyrene		1.40	0.00246	5.0	0.01	2,400	830

Notes:

mg/kg - milligrams per kilogram
mg/L - milligrams per liter
ug/kg - micrograms per kilogram
ug/L - micrograms per liter
MDL - Method Detection Limit
NA - not applicable
NE - not established
RL - Reporting Limit

[a] Preliminary Cleanup Levels are found on Table 3 (soil) and Table 5 (surface water) of the Final Supplemental RI/FS Work Plan.

[b] gasoline mixtures with benzene/gasoline mixtures without benzene

[c] PCL for total xylenes

[d] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708(8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene.

Table G-3
Sample Collection, Preservation, and Holding Time Criteria
Laurel Station
Bellingham, Washington

			Water					Soil/Sediment Media				
Parameter	**Method Reference**	**Method**	**Minimum Sample Amount**	**Container Type**	**Preservation**	**Extraction Holding Time**	**Analysis Holding Time**	**Minimum Sample Amount**	**Container Type**	**Preservation**	**Extraction Holding Time**	**Analysis Holding Time**
Gasoline-Range Petroleum Hydrocarbons	WA Dept. of Ecology	NWTPH-Gx	5 ml	2-40 ml VOA glass vials with teflon septum (No Headspace)	HCl pH<2, cool to 4ºC [a]	N/A	14 days [a]	10 g	2-40 mL VOA vials w/MeOH (from Easy-Draw Syringe) and 2-oz glass jar with teflon-lined lid (minimize headspace)	Methanol (for VOA vial), No headspace (for 2-oz glass jar) Cool to 4ºC [5 gms of sample to 5 mls of preservative]	N/A	14 days
Diesel- and Motor Oil Range Petroleum Hydrocarbons (TPH)	WA Dept. of Ecology	NWTPH-Dx	500 ml	2-500 ml amber glass, Teflon lined cap	Cool to 4ºC	7 days	40 days [b]	30 g	8-oz glass jar with teflon-lined lid	Cool to 4ºC	14 days	40 days [b]
Hydrocarbon Identification	WA Dept. of Ecology	NWTPH-HCID	500 ml	2-500 ml amber glass, Teflon lined cap	Cool to 4ºC	7 days	40 days [b]	10 g	2-oz glass jar with teflon-lined lid	Cool to 4ºC	14 days	40 days [b]
Purgeable Aromatic Compounds (BTEX)	SW-846	EPA 8021B	5 ml	2-40 ml VOA glass vials with teflon septum (No Headspace)	HCl pH<2, cool to 4ºC [a]	N/A	14 days [a]	5 g	2-40 mL VOA vials w/MeOH (from Easy-Draw Syringe) and 2-oz glass jar with teflon-lined lid (minimize headspace)	Methanol (for VOA vial), No headspace (for 2-oz glass jar) Cool to 4ºC [5 gms of sample to 5 mls of preservative]	N/A	14 days
Polycyclic Aromatic Hydrocarbons (PAHs)	SW-846	8270D-SIM	Not Applicable					30 g	8-oz glass jar with teflon-lined lid	Cool to 4ºC	14 days	40 days [b]

Notes:
ml - milliliters
BTEX - Benzene, toluene, ethylbenzene, and xylenes
N/A - not applicable

[a] Surface water samples will be collected in non-preserved containers due to the sampling technique. The holding time will be shortened to 7 days due to no preservation.

[b] Days from extraction date

APPENDIX H
ECOLOGY-APPROVED SPCC PLAN LETTER

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DEPARTMENT OF
ECOLOGY
State of Washington

Oil Spill Contingency Plan Approval

Certificate

The Oil Spill Contingency Plan for

TRANSMOUNTAIN PIPELINE

has been APPROVED pursuant to
Chapter 173-182 Washington Administrative Code

August 27, 2009 — Date of Approval

August 27, 2014 — Plan Expiration Date

Linda Nunes-Lewis

Preparedness Section Manager
Washington State Department of Ecology
Department of Ecology - Spill Preparedness Section

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47600 • Olympia, WA 98504-7600 • 360-407-6000
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

August 27, 2009

Dan O'Rourke
Transmountain Pipeline, Kinder Morgan Canada
300 5th Ave SW Ste 2700
Calgary, Alberta
Canada T2P 512

Dear Mr. O'Rourke:

Congratulations, I am granting final approval to the Transmountain Pipeline oil spill contingency plan. The plan meets Washington's statutory and regulatory requirements and must be maintained in an accurate condition. Please add a copy of the enclosed certificate to the front of each plan as proof of compliance. This approval expires on August 27, 2014.

Your work to improve this plan is a significant milestone in the history of Washington's preparedness program. The new regulatory standards have improved plans and resulted in:

- Response equipment pre-staged in more than 45 locations around the state, effective in fast flowing rivers, shallow waters, estuaries, and open waters.
- Commitment to a variety of drills that will test all aspects of your plan over time.
- Participation in our program to verify maintenance of all spill response equipment including boats, trucks, boom, vacuum devices and skimmers.
- New standards for non-dedicated workboats, shoreline cleanup crews, and aerial surveillance.

Thank you for your cooperation and patience throughout the process. If you have questions, please contact your plan manager, Kelli Gustaf at (425) 649-7194 or at kgus@ecy.wa.gov.

Sincerely,

Linda Pilkey-Jarvis
Preparedness Section Manager
Spill Prevention, Preparedness, and Response

LP: bl

Enclosure: Certificate

cc: Patrick Davis, Transmountain
Niki Affleck, Transmountain
USCG Sector Seattle
Dale Jensen, Spills Program
Kelli Gustaf, Spills Program