



February 21, 2023  
Project No. M0615.20.008

Steve Teel  
Cleanup Project Manager/Hydrogeologist  
Washington State Department of Ecology  
Toxics Cleanup Program, Southwest  
P.O. Box 47775  
Olympia, WA 98504

Re: Supplemental Investigation Work Plan, Port Parcel 110 and Potter Property  
Taylor Way and Alexander Avenue Fill Area

Dear Steve Teel:

On behalf of the Port of Tacoma (the Port), Maul Foster & Alongi, Inc. (MFA), has prepared this work plan to describe the proposed field activities to support the ongoing data gaps investigation at the Taylor Way and Alexander Avenue Fill Area Site (TWAAFA site; facility/site ID no. 1403183; cleanup site ID no. 4692) on two properties currently owned by the Port:

- Parcel 110, located at 3401 Lincoln Avenue in Tacoma, Washington
- Potter Property, located at 1801 E Alexander Avenue in Tacoma, Washington

MFA prepared this work plan to address your comments dated November 9, 2022 (Ecology 2022c) and December 19, 2022 (Ecology 2022d). MFA is concurrently developing a separate sampling and analysis work plan to evaluate potential impacts to indoor air quality at the Potter Property as a follow-up to soil vapor sampling performed in July 2022 (MFA 2022a).

## **PROPERTY BACKGROUND**

### **Parcel 110**

Parcel 110 (Pierce County tax parcel number 321351051) is an approximately 9-acre lot within the TWAAFA site (see Figure 1). Parcel 110 is owned by the Port and is occupied by Article, a furniture manufacturer that uses the building for warehousing and shipping furniture. A wood-frame structure referred to as the Educator Building (Floyd Snider 2007) formerly existed on Parcel 110 and was demolished between 2018 and 2019.

Parcel 110 is generally flat and situated approximately 10 to 15 feet above mean sea level (Floyd Snider 2007). At nearby monitoring wells CCW-1A, CCW-1B, and CCW-8B of the TWAAFA

site groundwater elevation fluctuates seasonally with depth to groundwater often encountered at less than 5 feet below ground surface (bgs) in the winter and spring.

In 2007, Floyd Snider prepared a Phase I environmental site assessment (ESA) of Parcel 110 that identified recognized environmental conditions, including the potential for groundwater contamination originating from a landfill at the neighboring CleanCare property along the northeastern border of Parcel 110 (Floyd Snider 2007). In 2010, Environmental Partners, Inc. (EPI), prepared a site assessment and closure report documenting the cleanup of soil impacted by motor oil released from a railcar at the railroad spur to the east of Parcel 110 (EPI 2010). Soil analytical results confirmed volatile organic compounds (VOCs), fuel additives, and petroleum compounds below Model Toxics Control Act (MTCA) Method A screening levels (see Attachment A).

In 2018, Floyd Snider conducted a Phase II ESA of Parcel 110 (Floyd Snider 2018, also included in Attachment A). Floyd Snider collected soil, reconnaissance groundwater, and soil vapor samples from Parcel 110 prior to demolition of the Educator Building. Phase II ESA sample locations, including four soil borings, two temporary reconnaissance groundwater wells, and three soil vapor locations, are shown on Figure 1. VOCs were non-detect in soil and groundwater samples with method reporting limits below screening criteria, except for one detection of vinyl chloride in groundwater (0.21 micrograms per liter from location TW-12).

Soil vapor samples were collected at three locations around the perimeter of the Educator Building before it was demolished. Samples were positioned near planned office spaces to assess the potential for worker exposure, though at least one location was positioned over 100 feet from the current building footprint. The following VOCs were detected at concentrations exceeding sub-slab MTCA Method C non-cancer screening levels:

- SG-1: Acetaldehyde (550 micrograms per cubic meter [ $\text{ug}/\text{m}^3$ ]) and acrolein (21  $\text{ug}/\text{m}^3$ ) exceed the screening levels of 300 and 0.67  $\text{ug}/\text{m}^3$ , respectively.
- SG-2: Acrolein (5.7  $\text{ug}/\text{m}^3$ ) exceeds the screening level of 0.67  $\text{ug}/\text{m}^3$ .
- SG-3: Trichloroethene (TCE; 210  $\text{ug}/\text{m}^3$ ) exceeds the screening level of 67  $\text{ug}/\text{m}^3$ .

Floyd Snider noted that acetaldehyde is used in the production of polyester resins, as a fish preservative, and as a flavoring agent, all of which are associated with historical operations on Parcel 110 (Floyd Snider 2018). Further, acrolein is an active ingredient in rodenticides; a rodent abatement was performed at Parcel 110 sometime prior to demolition of the Educator Building. The sources of these chemicals were eliminated when former tenant operations ceased, and the building was demolished. No soil or groundwater samples were collected near SG-3 and the source of the TCE in soil vapor at this location was not identified.

During site redevelopment activities in 2018, a stormwater line originating from the neighboring CleanCare property was encountered on Parcel 110 to the south of the Educator Building (prior to its demolition). On July 16, 2018, Ecology approved capping of this stormwater line (Ecology 2018).

In fall 2018, two underground storage tanks (USTs), an 8,000-gallon heavy heating oil UST and a 400-gallon diesel heating oil UST, were encountered during demolition of the Educator Building and subsequently removed (ES 2018; see Attachment A). Approximate UST locations are shown on Figure 1. No releases were observed around the 8,000-gallon UST, though petroleum was observed beneath the 400-gallon UST and approximately 65 tons of diesel-impacted soil was excavated and transported off-property for disposal. Following tank removal and soil excavation, confirmation sampling around both former USTs indicated petroleum hydrocarbon concentrations below MTCA Method A screening levels, with a maximum diesel concentration remaining in soil of 470 milligrams per kilogram (mg/kg). A closure report was filed with Pollution Liability Insurance Agency.

In 2019, the current warehouse building was constructed on Parcel 110 and a new dedicated stormwater system was installed. A loading dock is present along the northern side of the warehouse. The building was constructed with a 6-inch-thick concrete slab-on-grade foundation, with a sub-slab vapor barrier beneath the office areas (see Figure 1).

## Potter Property

The Potter Property is owned by the Port and operated by tenant Handan, Inc., a trailer and shipping container repair company. Two buildings are present on the Potter Property: the shop building and the conjoined Quonset huts (Quonset Hut 1 and Quonset Hut 2) (see Figure 2).

Releases from historical unlined waste-oil storage and treatment ponds on the adjacent Burlington Environmental Tacoma property resulted in light nonaqueous-phase liquid in groundwater. Ecology required the Port to assess chemical concentrations in sub-slab soil vapor emanating from the light nonaqueous-phase liquid in soil and groundwater on the Potter Property (Ecology 2021).

## INVESTIGATION BACKGROUND

### Parcel 110

On November 9, 2022, Ecology provided comments on the results of quarterly groundwater monitoring events conducted at the TWAAFA site in first and second quarter 2022 (Ecology 2022c). In the comments, Ecology requested additional investigation of “soil vapor and/or groundwater” to the southeast of monitoring well CCW-1A (shown in Figure 1).

Monitoring well CCW-1A is located 60 feet north-northwest of the occupied warehouse on Parcel 110. Monitoring well CCW-1A was installed using a hollow stem auger drill rig to a total depth of 6 feet bgs, with a 2-inch-diameter polyvinyl chloride well casing and screen interval between 4 and 5.8 feet bgs (DOF 2022a). First and second quarter 2022 groundwater monitoring data at CCW-1A showed concentrations of TCE exceeding Ecology's MICA Method B groundwater vapor intrusion screening levels for commercial workers. Shallow groundwater generally exhibits a radial outflow from a central mound beneath the Burlington Environmental parcels. Parcel 110 is located southeast of CCW-1A in an inferred downgradient position relative to the observed TCE exceedance.

In response to Ecology's comments, the field investigation activities described in this work plan include investigation for chlorinated VOCs (including TCE) in soil and groundwater hydraulically downgradient of CCW-1A. Additionally, MFA proposes assessing chlorinated VOCs in soil, groundwater, and potentially soil vapor near the historical soil vapor sampling location SG-3. Floyd Snider previously collected soil vapor samples from Parcel 110 via post-run tubing (PRT) methodology at a depth shallower than 5 feet bgs, likely due to the shallow water table inhibiting deeper sample collection. The U.S. Environmental Protection Agency (EPA) recommends sampling at 5 feet bgs or deeper to avoid pulling ambient air into the soil gas sample (EPA 2015). Additionally, Floyd Snider did not use a leak-check compound to evaluate whether ambient air entered the soil gas sample due to the shallow collection depth or leaks in sample train. Given these considerations, additional investigation is proposed near SG-3 to characterize current subsurface conditions following the redevelopment of Parcel 110.

## Potter Property

On December 19, 2022, Ecology provided comments (Ecology 2022d) on MFA's *Indoor Air Sampling and Analysis Plan, Former Potter Property* (MFA 2022b).<sup>1</sup> Comment number 5 from Ecology pertains to potential residual contamination that may exist beneath the building slabs at the Potter Property. Specifically, Ecology denied the Port's request to waive soil testing for polychlorinated biphenyls (PCBs) and carcinogenic polycyclic aromatic hydrocarbons (cPAHs) and reiterated its request that soil samples be collected from the Potter Property based on historical data collected from the TWAAFA site near the Potter Property:

- Referencing Table 6 from the *Final Data Gaps Work Plan* prepared by Dalton, Olmsted & Fuglevand, Inc. (DOF 2020), Ecology notes that total PCBs were detected at a concentration of 14.4 mg/kg. That sample was collected in 1987 from boring location CTP-7<sup>2</sup> on the neighboring Burlington Environmental (formerly

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<sup>1</sup> Ecology comments pertaining to the proposed sub-slab soil vapor and indoor air sampling at the Potter Property will be addressed in a forthcoming amended version of the *Indoor Air Sampling and Analysis Plan, Former Potter Property*.

<sup>2</sup> The sample was collected from "Depth Zone 2," which corresponds to 2.2 to 3.5 feet bgs (Sweet-Edwards 1988).

referred to as Stericycle Parcel A) property as part of closure activities and is shown on a figure from a Phase II hydrogeological investigation prepared by Sweet-Edwards/EMCON, Inc. (Sweet-Edwards 1988).

- Referencing Table 13 from the *Final Data Gaps Work Plan*, Ecology cites a detection of benzo(a)pyrene (a cPAH constituent) of 9.6 mg/kg in soil collected from monitoring well MW-1 collected in 2001 on the Potter Property. Annotated versions of Table 6, Table 13, and the Sweet-Edwards figure are included in Attachment A.

PCBs and cPAHs have been previously investigated in soil at the Potter Property. Figures 29 and 30 from the *Final Data Gaps Work Plan* show total PCB and benzo(a)pyrene soil screening level exceedances across the TWAAFA site. Historical data shows at least six sample locations on the Potter Property have been analyzed for PCBs with no screening level exceedances (PCBs were non-detect at five of the six locations). Historical data also shows at least 11 sample locations on the Potter Property have been analyzed for benzo(a)pyrene. Other than the 9.6 mg/kg detection at MW-1 (referenced by Ecology), benzo(a)pyrene was non-detect at the other ten locations. Annotated copies of Figures 29 and 30 are included in Attachment A.

In response to Ecology's comments, the field investigation activities described in this work plan include scope for additional investigation in three areas of the Potter Property not previously evaluated. The proposed locations are within or immediately adjacent to the existing buildings where sub-slab petroleum hydrocarbon and VOC concentrations are above MTCA Method B soil vapor screening levels (MFA 2022a). Pursuant to Ecology's request, soil samples will be analyzed for petroleum hydrocarbons and full suite VOCs and semivolatile organic compounds. Because the potential source(s) of the petroleum hydrocarbons and VOCs may be collocated with other contaminants, soil samples will also be analyzed for PCBs, cPAHs, and metals.

## FIELD INVESTIGATION ACTIVITIES

Field investigation and sampling methods described in this section will be performed consistent with the *Final Data Gaps Sampling and Analysis Plan* and *Soil Vapor Sampling and Analysis Plan* (Appendices K and M of the *Final Data Gaps Work Plan*). Prior to commencement of field activities, MFA will coordinate public and private utility locates to identify the locations of subsurface utilities in the proposed investigation areas on Parcel 110 and the Potter Property. Sample locations may be altered in the field based on accessibility or information from the tenant, the Port, or Ecology.

Borings will be advanced using direct-push technology, by a driller licensed by the State of Washington, to a maximum depth of 10 feet bgs. Borings will not be advanced past the silt layer separating shallow and deep aquifers. Locations will be recorded using a handheld global

positioning system device with submeter accuracy. Continuous cores will be retrieved for soil logging and field screened for volatile compounds with a photoionization detector. Based on visual and olfactory observations and photoionization detector readings, MFA field staff will collect up to two soil samples of potentially impacted material from each boring location. If no field indications of contamination are observed, MFA will collect a soil sample from the capillary fringe (immediately above the water table). MFA staff will prepare a geologic boring log for each location under the supervision of a geologist licensed in the State of Washington. Drillers will decommission temporary borings in accordance with Washington Administrative Code 173-160-381 and the ground surface will be restored to match existing grade.

Investigation-derived waste, including soil cuttings and purge water, will be contained in Washington State Department of Transportation-approved drums pending characterization and off-site disposal. Specific details of each field investigation are described in the sections below.

## Parcel 110

One permanent monitoring well (TWA-11) will be installed adjacent to the northern edge of the Parcel 110 warehouse (southeast of permanent monitoring well CCW-1A and Floyd Snider boring/temporary well TP-12/TW-12). One boring/temporary monitoring well (TW-14) will be installed adjacent to historical sampling location SG-3. Well construction details are included in Table 1 and approximate well locations are shown on Figure 1. Permanent monitoring wells will be constructed from 2-inch diameter polyvinyl chloride pipe and temporary monitoring wells will be constructed with a ¾-inch diameter polyvinyl chloride pipe with well screens installed from approximately 5 to 10 feet bgs. In addition to primary soil samples and after development, one groundwater sample from each monitoring well will be collected using low-flow methods with a peristaltic pump and disposable polyethylene tubing. Duplicate soil and groundwater samples will also be collected from Parcel 110. Samples will be placed directly into laboratory-supplied containers and stored on ice.

If groundwater depth is sufficiently low to expose the vadose zone (greater than 5 feet bgs) in TW-14 and sampling can be scheduled to not immediately follow a significant rainfall event (Ecology 2022a), a soil vapor sample (TWSV-1) will be collected at a stepped-out location within approximately 5 feet of TW-14 to characterize current soil vapor conditions near historical sample location SG-3 (shown on Figure 1). The location will be advanced using direct-push drilling method and soil vapor sample will be collected in general accordance with guidance published by Ecology (Ecology 2022a) using PRT methodology.

A PRT point holder and expendable point will be attached to the leading end of a sampling screen, and the stainless steel drill rods will be advanced to the desired depth. The driller will ensure that the PRT tip threads are clean, and a new O-ring is used prior to pin installation. The PRT adapter attached to rigid-wall Teflon sample tubing will be threaded into a reverse

thread fitting in the top of the point holder. The rods will be retracted no more than 6 inches to release the expendable point, exposing the screen and creating an opening where vapor can enter the PRT. The upper end of the tubing will be connected to the purging/sampling system. A flow controller will be attached to the sample setup to regulate the flow of vapor into the sample container. Once sample setup is complete, a 60-minute equilibration period will be observed prior to purging, shut-in and leak testing, and sample collection. The 60-minute equilibration period will begin after the rods have been pulled back from the sample screen.

Once equilibrated, the line will be purged for at least one minute or a sufficient time to achieve a purge volume that equals at least three pore volumes. Helium will be contained in a small tent-like structure that is set up around the sampling apparatus and sampling location and will serve as a leak-check compound. A helium test will be conducted using a hand-held helium meter to verify the integrity of the sample system before a soil vapor sample is collected for laboratory analysis. Following purge and leak tests, the sample will be collected using a laboratory-supplied stainless steel Summa canister. The Summa canister will also be analyzed for helium by the analytical laboratory as a quality assurance measure.

MFA will record field data before and after sampling, including start and stop times, initial and final canister vacuum readings, and observation of conditions that may influence sampling results (e.g., significant industrial activities or chemical odors) (see field sampling data sheet in Attachment B).

### Potter Property

Three temporary borings (TWA-SB06 through TWA-SB08) will be advanced at the Potter Property for soil sample collection. Locations relative to sub-slab vapor pin locations and relative to historical sample locations on the Potter Property are shown in Figures 2 and 3, respectively. One boring will be advanced in Quonset Hut 2, one in the shop building, and one to the southwest of the shop building (see Table 2). Continuous core soil logging by MFA staff will include identification of auto fluff, if observed. Auto fluff consists of silty sand mixed with automobile waste, including glass, wire, metal, foam, or various automobile parts (DOF 2020). In addition to primary soil samples, a field duplicate soil sample will also be collected from the Potter Property.

## **ANALYTICAL METHODS AND REPORTING**

All samples will be submitted to Friedman & Bruya, Inc., a laboratory located in Seattle, Washington, and accredited nationally and by Washington State. Analytical results will be screened against the site-specific screening levels developed under MTCA for the TWAAFA site as reported in the *Final Data Gaps Work Plan*. Contaminants (if any) without site-specific screening levels will be screened against MTCA Method A or Method B criteria for reference.

Quality assurance and quality control protocols for this work will generally follow the *Quality Assurance Project Plan* for the TWAAFA site (DOF 2019). Following the completion of laboratory analysis, MFA will prepare and submit a report describing the work completed. MFA will provide documentation of fieldwork, data validation, and an evaluation of the analytical results for Parcel 110 and the Potter Property. Specific details regarding laboratory analysis for each field investigation are described below.

### Parcel 110

Soil samples from TWA-11 and TW-14 will be analyzed on a standard turnaround time (TAT) for chlorinated VOCs by EPA Method 8260C and screened against site-specific screening levels. Groundwater samples collected from TWA-11 and TW-14 will be analyzed on a standard TAT for chlorinated VOCs by EPA Method 8260C and screened against site-specific screening levels and MTCA Method B groundwater vapor intrusion screening levels.

If conditions permit sample collection, the soil vapor sample will be analyzed on a standard TAT for chlorinated VOCs by EPA Method 8260C and screened against site-specific screening levels.

Table 1 presents a sampling and analysis summary for Parcel 110.

### Potter Property

Soil samples will be analyzed on a standard TAT for the following:

- Diesel- and oil-range petroleum hydrocarbons by Northwest Total Petroleum Hydrocarbons (NWTPH)-Dx
- Gasoline-range petroleum hydrocarbons by NWTPH-Gx
- PCB Aroclors by EPA Method 8082A
- VOCs by EPA Method 8260C
- Semivolatile organic compounds by EPA Method 8270D
- Metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, and zinc, and manganese) by EPA Method 6020B

Table 2 presents a sampling and analysis summary for the Potter Property.

## **SCHEDULE**

MFA proposes to conduct the above-described boring and monitoring well installation activities at Parcel 110 and the Potter Property following the ongoing discussion and resolution

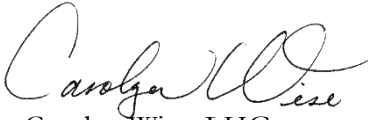


in cooperation with Ecology regarding other potential data gaps for the TWAAFA site that were identified in an email from Ecology to the Port and DOF on October 13, 2022 (Ecology 2022b). This will facilitate collection, validation, and reporting of meaningful data consistently and efficiently throughout the TWAAFA site. MFA proposes to conduct the above-described soil vapor sampling at Parcel 110 when the groundwater table is low (greater than or equal to 5 feet below ground surface). Sample collection activities described in this work plan will begin by July 10, 2023, and data collection activities will be completed before September 30, 2023 (Ecology 2023).

A report summarizing field activities and analytical data will be provided to Ecology within 60 days of receipt of all validated data. MFA will upload available site data to Ecology's Environmental Information Management database within 30 days of receipt of validated sample results.

Sincerely,

Maul Foster & Alongi, Inc.

  
Carolyn Wise, LHG  
Project Hydrogeologist

  
Audrey Hackett  
Senior Environmental Scientist

Attachments: Limitations  
References  
Tables  
Figures  
Attachment A—Key Documents from Previous Investigations  
Attachment B—Field Sampling Data Sheet

cc: Scott Hooton, Port of Tacoma  
Tasya Gray, DOF  
Kim Seely, Coastline Law Group PLLC  
Douglas Steding, Northwest Resource Law PLLC

## LIMITATIONS

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The services undertaken in completing this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this report.

## REFERENCES

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- DOF. 2019. *Quality Assurance Project Plan, Taylor Way and Alexander Avenue Fill Area Site, Tacoma, Washington*. Prepared by Dalton, Olmsted & Fuglevand, Inc.: Seattle, WA. January 29.
- DOF. 2020. *Final Data Gaps Work Plan, Taylor Way and Alexander Avenue Fill Area Site, Tacoma, Washington*. Prepared by Dalton, Olmsted & Fuglevand, Inc.: Seattle, WA. July.
- DOF. 2022a. *Revised Groundwater Monitoring Plan, Taylor Way and Alexander Avenue Fill Area Site, Tacoma, Washington*. Prepared by Dalton, Olmsted & Fuglevand, Inc.: Seattle, WA. April.
- DOF. 2022b. *Data Gaps Report, Taylor Way and Alexander Avenue Fill Area Site, Tacoma, Washington*. Prepared by Dalton, Olmsted & Fuglevand, Inc.: Seattle, WA. November.
- Ecology. 2018. Steve Teel, LHG, Washington State Department of Ecology. *Clean Care- Storm Line Sketch*. Email to Drew Zaborowski, Avenue 55; Caroline Cress, Washington State Attorney General; and Scott Hooton, Port of Tacoma. July 16.
- Ecology. 2021. Steve Teel, LHG, Washington State Department of Ecology. *Comments on the Aboveground Site Conditions Memorandum and Existing Groundwater Monitoring Network Evaluation and Recommendations Memorandum*. Letter to Tasya Gray, LG, Dalton, Olmsted & Fuglevand, Inc., and Scott Hooton, Port of Tacoma. May 5.
- Ecology. 2022a. *Guidance for Evaluating Vapor Intrusion in Washington State*. Washington State Department of Ecology, Toxics Cleanup Program: Olympia, WA. March.
- Ecology. 2022b. Steve Teel, LHG, Washington State Department of Ecology. *Comments on TWAAFA Reports and Request for Work Plan*. Email to Tasya Gray, LG, Dalton, Olmsted & Fuglevand, Inc. and Scott Hooton, Port of Tacoma. October 13.
- Ecology. 2022c. Steve Teel, LHG, Washington State Department of Ecology. *Comments on TWAAFA Reports and Request for Work Plan*. Email to Scott Hooton, Port of Tacoma. November 9.
- Ecology. 2022d. Steve Teel, LHG, Washington State Department of Ecology. *Comments on Indoor Air Sampling and Analysis Plan, Former Potter Property*. Letter to Tasya Gray, LG, Dalton, Olmsted & Fuglevand, Inc. and Scott Hooton, Port of Tacoma. December 19.
- Ecology. 2023. Steve Teel, LHG, Washington State Department of Ecology. *Comments on Port Parcel 110 and Former Potter Property Work Plan*. Letter to Tasya Gray, LG, Dalton, Olmsted & Fuglevand, Inc. and Scott Hooton, Port of Tacoma. February 6.
- EPA. 2015. *Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air*. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response. OSWER Publication 9200.2-154. June.

EPI. 2010. *Railcar Oil Release Site Assessment/Closure Report*. Prepared for Emerald Services, Inc. Environmental Partners, Inc.: Issaquah, WA. July 21.

ES. 2018. *Heating Oil Storage Tank Removals, Site Assessment, Remediation and Closure Report, Portside 55 Demolition Project*. Prepared by Environmental Specialties: Puyallup, Washington. November 15.

Floyd Snider. 2007. *Phase I Environmental Site Assessment, Educator Building, Tacoma, Washington*. Prepared for Port of Tacoma. Seattle, WA. October 5.

Floyd Snider. 2018. *Phase II Environmental Site Assessment, Educator Building*. Prepared for Avenue 55, LLC. Floyd Snider: Seattle, WA. September.

MFA. 2022a. *Vapor Intrusion Assessment Report, Taylor Way and Alexander Avenue Fill Area, Former Potter Property*. Prepared for Port of Tacoma. Maul Foster & Alongi, Inc.: Seattle, WA. October 6.

MFA. 2022b. *Indoor Air Sampling and Analysis Plan, Taylor Way and Alexander Avenue Fill Area, Former Potter Property*. Prepared for Port of Tacoma. Maul Foster & Alongi, Inc.: Seattle, WA. November 30.

Sweet-Edwards. 1988. *Phase II Hydrogeological Investigation, Parcel A*. Prepared for Chemical Processors, Inc. Sweet-Edwards/EMCON, Inc.: Redmond, WA. April.

# TABLES



**Table 1**  
**Parcel 110—Proposed Sampling and Analysis Summary**  
**TWAAFA Site**  
**Port of Tacoma**



Location ID	Location Type	Total Depth (feet bgs)	Screen Interval/ Sample Depth (feet bgs) <sup>(a)</sup>	Sample Matrix	Analytical Suite	
					Chlorinated VOCs <sup>(b)</sup>	Helium <sup>(c)</sup>
TWA-11	Monitoring Well	10	TBD	Soil	X	--
			TBD		X	--
			5-10	GW	X	--
TW-14	Temporary Monitoring Well	10	TBD	Soil	X	--
			TBD		X	--
			5-10	GW	X	--
TWSV-1 <sup>(d)</sup>	Soil Vapor Sample	5	5	SV	X	X

**Notes**

bgs = below ground surface.

EPA = U.S. Environmental Protection Agency.

GW = groundwater.

SV = soil vapor.

ID = identification.

TBD = to be determined.

TO = toxic organics.

TWAAFA = Taylor Way and Alexander Avenue Fill Area.

VOC = volatile organic compound.

X = analyze.

<sup>(a)</sup>Sample depths will be determined in the field based on soil core photoionization detector results and depth to groundwater at each location.

<sup>(b)</sup>Chlorinated VOCs analysis by EPA Method 8260C for soil and groundwater and EPA Method TO-15 for soil vapor.

<sup>(c)</sup>Helium analysis by ASTM D1946.

<sup>(d)</sup>A soil vapor sample from TWSV-1 will only be collected if groundwater observed at TW-14 is approximately 5 feet bgs or deeper.

**Table 2**  
**Potter Property—Proposed Sampling and Analysis Summary**  
**TWAAFA Site**  
**Port of Tacoma**



Location ID	Location Type	Total Depth (feet bgs)	Sample Depth (feet bgs) <sup>(a)</sup>	Sample Matrix	Analytical Suite					
					Petroleum Hydrocarbons		PCB Aroclors <sup>(d)</sup>	VOCs <sup>(e)</sup>	SVOCs <sup>(f)</sup>	Metals <sup>(g)</sup>
					DRO/ORO <sup>(b)</sup>	GRO <sup>(c)</sup>				
TWA-SB06	Boring	10	TBD	Soil	X	X	X	X	X	X
TWA-SB07			TBD		X	X	X	X	X	
TWA-SB08			TBD		X	X	X	X	X	X

**Notes**

bgs = below ground surface.  
DRO = diesel-range organics.  
EPA = U.S. Environmental Protection Agency.  
GRO = gasoline-range organics.  
NWTPH = Northwest Total Petroleum Hydrocarbons.  
ORO = oil-range organics.  
PCB = polychlorinated biphenyl.  
SVOC = semivolatfile organic compound.  
TBD = to be determined.  
TWAAFA = Taylor Way and Alexander Avenue Fill Area.  
VOC = volatile organic compound.  
X = analyze.

<sup>(a)</sup>Sample depths will be determined in the field based on photoionization detector results.  
<sup>(b)</sup>DRO/ORO analysis by NWTPH-Dx.  
<sup>(c)</sup>GRO analysis by NWTPH-Gx.  
<sup>(d)</sup>PCB Aroclors analysis by EPA Method 8082A.  
<sup>(e)</sup>VOCs analysis by EPA Method 8260C.  
<sup>(f)</sup>SVOCs analysis by EPA Method 8270D and 8270-SIM.  
<sup>(g)</sup>Metals (arsenic, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, and zinc) by EPA Method 6020B.

# FIGURES





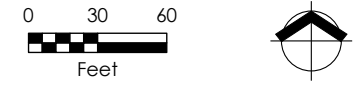
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 Reviewed by: illenhanstien  
 Print Date: 1/15/2023

**Figure 1**  
**Parcel 110 Property**  
**Features and Proposed**  
**Sample Locations**  
 Port of Tacoma  
 TWAFA Site  
 Tacoma, Washington



- Legend**
- Proposed Monitoring Well
  - Proposed Boring/Temporary Well
  - Existing Monitoring Well
- Phase II ESA (Floyd Snider 2018)**
- Soil Boring
  - Soil Gas Boring
  - Soil and Reconnaissance Groundwater Boring
  - Soil and Soil Gas Boring
  - Vapor Barrier/Office Area
  - Former UST
  - TWAFA Site Boundary
  - Parcel 110 Property Boundary
  - Tax Lot

**Notes**  
 Proposed locations are approximate and may be adjusted based on field conditions. Existing well locations were obtained from the *Final Data Gaps Report* (DOF 2022b). MFA approximated former UST locations from *Heating Oil Storage Tank Removals Site Assessment, Remediation and Closure Report* (ES 2018).  
 DOF = Dalton, Olmsted & Fuglevand, Inc.  
 ES = Environmental Specialties.  
 TWAFA = Taylor Way and Alexander Avenue Fill Area.  
 ESA = environmental site assessment.  
 UST = underground storage tank.



**Data Sources**  
 Aerial photographs obtained from Esri; parcels obtained from Pierce County Assessor; previous sample locations obtained from Figure 3.1 of the 2018 Floyd Snider Phase II Environmental Site Assessment Report; vapor barrier locations obtained from June 2018 Avenue 55 site plan.



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Project: M061520.008 - Produced By: rjaberis - Reviewed By: llenahansen - Print Date: 7/16/2023 - Path: X:\061520.008\Fig2\_Potter\_Property\_Features\_and\_Proposed\_Sample\_Locations.mxd



**Figure 2**  
**Potter Property Features and**  
**Proposed Sample Locations**

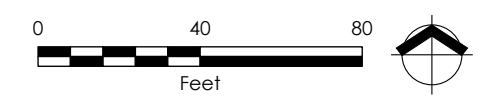
Port of Tacoma  
 TWAFA Site  
 Tacoma, Washington

**Legend**

- Proposed Soil Boring Location
- Existing Sub-Slab Vapor Pin
- Sub-Slab Soil Gas CUL Exceedance
- Building
- TWAFA site Boundary
- Potter Property Boundary

**Notes**

Sample locations are approximate. Proposed sample locations may be adjusted based on field conditions.  
 Sub-slab soil gas CUL exceedances are based on MTCA Method B or Method C CULs.  
 CUL = cleanup level.  
 MTCA = Model Toxics Control Act.  
 TWAFA = Taylor Way and Alexander Avenue Fill Area.



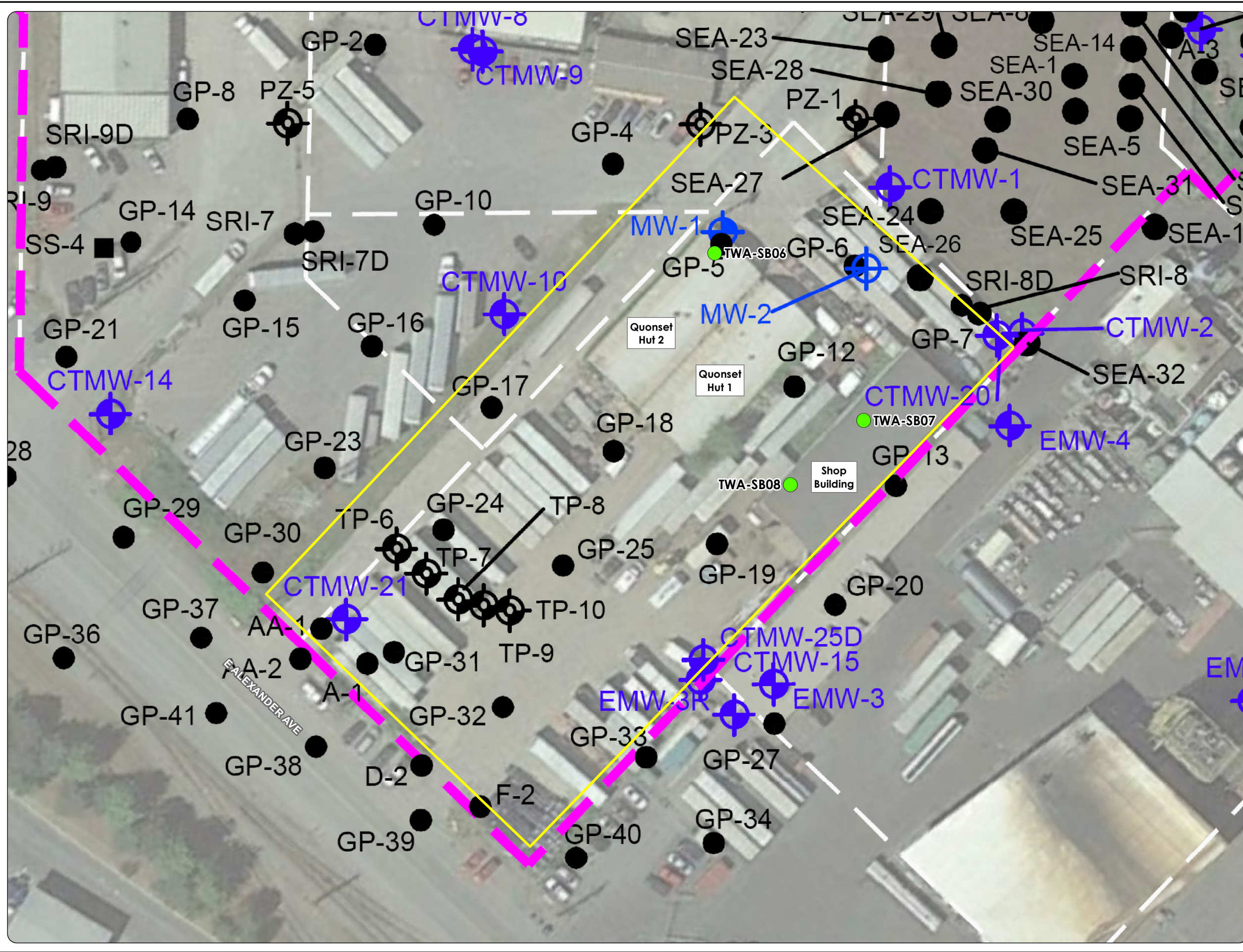
**Data Sources**

Aerial photograph obtained from Mapbox;  
 parcels obtained from Pierce County Assessor.

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Project: M061520.008 Produced By: jrobbers Reviewed By: jlenahansen Print Date: 2/16/2023 Path: X:\061520.008\Fig3\_Potter\_Property\_Previous\_and\_Proposed\_Sample\_Locations.mxd

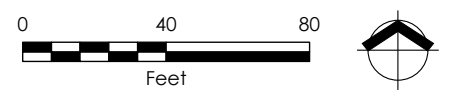


**Figure 3**  
**Potter Property Previous and Proposed Sample Locations**

Port of Tacoma  
TWAFA Site  
Tacoma, Washington

- Legend**
- Yellow outline: Potter Property Boundary
  - Pink dashed outline: TWAFA site Boundary
  - Green dot: Proposed Soil Boring Location
- Existing Features (DOF 2020)**
- Circle with crosshair: Monitoring Well
  - Black dot: Boring
  - Black square: Test Pit

**Notes**  
Sample locations are approximate. Proposed sample locations may be adjusted based on field conditions.  
DOF = Dalton, Olmsted & Fuglevand, Inc.  
TWAFA = Taylor Way and Alexander Avenue Fill Area.  
DOF. 2020. *Final Data Gaps Work Plan, Taylor Way and Alexander Avenue Fill Area Site*. Dalton Olmsted & Fuglevand, Inc. Seattle, Washington. July.



**Data Sources**  
Parcels obtained from Pierce County Assessor; basemap reproduced from Figure 3 Historical Sampling Locations from *Final Data Gaps Work Plan* (DOF 2020).

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# ATTACHMENT A

KEY DOCUMENTS FROM PREVIOUS  
INVESTIGATIONS



**Educator Building  
Tacoma, Washington**

**Phase I  
Environmental Site Assessment**

**Prepared for**  
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P.O. Box 1837  
Tacoma, WA 98401-1837

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**October 5, 2007**

**Table of Contents**

**Executive Summary.....vi**

**1.0 Introduction .....1-1**

1.1 INTRODUCTION ..... 1-1

1.2 PURPOSE ..... 1-1

1.3 REASON FOR PERFORMING THIS ESA ..... 1-1

1.4 DETAILED SCOPE OF SERVICES ..... 1-2

1.5 EXCLUSIONS ..... 1-2

1.6 LIMITATIONS ..... 1-3

    1.6.1 Uncertainty Not Eliminated ..... 1-4

    1.6.2 Reliance on Information Provided by Others ..... 1-4

1.7 USER RELIANCE ..... 1-4

**2.0 Site Description and Physical Setting .....2-1**

2.1 LOCATION, ZONING, AND LEGAL DESCRIPTION ..... 2-1

2.2 SITE AND VICINITY GENERAL CHARACTERISTICS ..... 2-1

    2.2.1 Current Use of the Property ..... 2-1

    2.2.2 Current Use of Adjoining Properties ..... 2-1

    2.2.3 Historic and Cultural Resources ..... 2-1

2.3 PHYSICAL SETTING ..... 2-2

    2.3.1 Regional Physiographic Conditions ..... 2-2

    2.3.2 Regional and Site Geology ..... 2-2

    2.3.3 Regional and Site Surface Water ..... 2-3

    2.3.4 Floodplain Zoning ..... 2-3

**3.0 User-provided Information .....3-1**

3.1 TITLE RECORDS ..... 3-1

3.2 ENVIRONMENTAL LIENS OR ACTIVITY AND USE LIMITATIONS ..... 3-1

3.3 SPECIALIZED KNOWLEDGE ..... 3-1

3.4 COMMONLY KNOWN OR REASONABLY ASCERTAINABLE INFORMATION ..... 3-1

3.5 VALUATION REDUCTION FOR ENVIRONMENTAL ISSUES ..... 3-1

3.6 REASON FOR PERFORMING PHASE I ENVIRONMENTAL SITE ASSESSMENT ..... 3-2

**4.0 Records Review ..... 4-1**

4.1 STANDARD ENVIRONMENTAL RECORD SOURCES ..... 4-1

4.1.1 Federal Agency Records Review ..... 4-1

4.1.1.1 *National Priorities List* ..... 4-1

4.1.1.2 *USEPA Comprehensive Environmental Response, Compensation, and Liability Information System Inventory* 4-1

4.1.1.3 *RCRA Treatment, Storage and Disposal Facilities and the Corrective Action Site List* ..... 4-2

4.1.1.4 *RCRA Large Quantity Hazardous Waste Generators* ..... 4-4

4.1.1.5 *RCRA Small Quantity Hazardous Waste Generators* ..... 4-4

4.1.1.6 *Emergency Response Notification System* ..... 4-5

4.1.1.7 *Hazardous Materials Incident Report System* ..... 4-5

4.1.1.8 *Additional Federal Database Search Results* ..... 4-6

4.1.2 Washington State Regulatory Records Review ..... 4-6

4.1.2.1 *Washington State Hazardous Sites List* ..... 4-7

4.1.2.2 *Underground Storage Tank Records* ..... 4-10

4.1.2.3 *Leaking Underground Storage Tank Records* ..... 4-11

4.1.2.4 *Solid Waste Facilities* ..... 4-11

4.1.2.5 *Institutional Controls Records* ..... 4-12

4.1.2.6 *Voluntary Cleanup Program Facilities* ..... 4-12

4.1.2.7 *Brownfields Sites* ..... 4-13

4.1.2.8 *Additional Washington State Records Search Results* .... 4-13

4.1.3 Additional Environmental Records Sources ..... 4-14

4.1.3.1 *Tacoma/Pierce County Health Department* ..... 4-14

4.1.3.2 *Local Fire Department* ..... 4-14

4.1.3.3 *City of Tacoma Building Department* ..... 4-14

4.1.3.4 *Washington Department of Ecology* ..... 4-15

4.1.3.5 *Previous Environmental Studies and Reports* ..... 4-16

4.1.3.6 *Area-wide Environmental History and Current Conditions Summary* ..... 4-17

4.2 HISTORICAL USE INFORMATION ON THE PROPERTY ..... 4-21

4.2.1 Ownership Record Review ..... 4-22

4.2.2 Historical Aerial Photograph Review..... 4-23

4.2.3 Historical Topographical Map Review..... 4-25

4.2.4 Sanborn Fire Insurance Map Review..... 4-26

4.2.5 City Directory Review ..... 4-27

4.2.6 Summary of Subject Property Historical Uses ..... 4-28

**5.0 Site Reconnaissance and Site Owner Interview..... 5-1**

5.1 TIMING, PARTICIPANTS, AND METHODOLOGY ..... 5-1

5.1.1 Date and Time of Site Reconnaissance and Interview..... 5-1

5.1.2 Individuals Conducting Site Reconnaissance and Interview ..... 5-1

5.1.3 Site Representatives Present During the Inspection ..... 5-1

5.1.4 Description of the Site Reconnaissance and Interview Process..... 5-1

5.2 SITE RECONNAISSANCE OBSERVATIONS ..... 5-1

5.2.1 Site Inspection Conclusions ..... 5-4

5.3 OWNER INTERVIEW ..... 5-4

5.4 LIMITATIONS ..... 5-5

5.4 ADDITIONAL INTERVIEWS ..... 5-5

5.4.1 Interviews with Local Government Officials ..... 5-5

5.4.2 Interview with Emerald Services ..... 5-5

**6.0 Findings, Opinion, and Conclusion ..... 6-1**

6.1 FINDINGS ..... 6-1

6.2 OPINION ..... 6-1

6.3 CONCLUSION..... 6-2

**7.0 Deviations ..... 7-1**

**8.0 Environmental Professional Statement ..... 8-1**

**9.0 References..... 9-1**

**List of Figures**

- Figure 1.1 Site Vicinity Map
- Figure 4.1 Surrounding Properties of Interest



## List of Appendices

- Appendix A Figures from Other Reports
- Appendix B Environmental Data Resources, Inc. Report (CD-ROM)
- Appendix C Phase I Environmental Site Assessment by AGRA (CD-ROM)
- Appendix D Aerial Photographs (CD-ROM)
- Appendix E Interview Documentation

## List of Abbreviations and Acronyms

Acronym/Abbreviation	Definition
ACT	Abandoned Commercial Tank
AST	Aboveground storage tank
ASTM	American Society for Testing and Materials
AUL	Activity and use limitations
bgs	Below ground surface
CBN/T	Commencement Bay Nearshore/Tideflats
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CORRACTS	Corrective Action Site
CSCSL	Confirmed and Suspected Contaminated Sites List
DAHP	Washington State Department of Archaeology and Historic Preservation
ECL	Office of Environmental Cleanup
ESA	Environmental Site Assessment
FINDS	Facility Index System
LQG	Large quantity generator
LUST	Leaking underground storage tank
MLLW	Mean Low Low Water
MTCA	Washington Model Toxics Control Act
NFA	No Further Action
NPL	National Priorities List

<b>Acronym/Abbreviation</b>	<b>Definition</b>
NRHP	National Register of Historic Places
OAWT	Office of Air, Waste, and Toxics
OCE	Office of Compliance and Enforcement
OWW	Office of Water and Watersheds
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
Ppm	Parts per million
RAATS	Resource Conservation and Recovery Act Administrative Tracking System
RA	Remedial action
RCRA	Resource Conservation and Recovery Act
RCRIS	Resource Conservation and Recovery Information System
RDF	Refuse-defined fuel
SVOCs	Semivolatile organic compounds
SQG	Small quantity generator
SWF	Solid waste facility
TCLP	Toxic characterization leaching procedure
TPCHD	Tacoma/Pierce County Health Department
TPU	Tacoma Public Utilities
TSD	Treatment, storage or disposal
TSDF	Treatment, storage or disposal facilities
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
UST	Underground storage tank
VCP	Voluntary Cleanup Program

## Executive Summary

This report represents the results of a Phase I Environmental Site Assessment (ESA) for the Educator Building (subject property) located at 3401 Lincoln Avenue in Tacoma, Washington (Figure 1.1). Floyd|Snider performed the ESA on the subject property on behalf of the Port of Tacoma (Port).

This ESA was conducted in accordance with the ASTM International (ASTM) E 1527-05 Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (ASTM Standard 2005), and also in general accordance with the Port requirements for Phase I ESAs.

The purpose of the ESA is to compile and review available information about the subject property and immediate vicinity to determine if recognized environmental conditions (RECs) exist on the subject property to the extent feasible pursuant to ASTM E 1527-05. Significant findings from this ESA are discussed below.

The land on which the Educator Building is located was first developed in the late 1950s after being filled as part of the development of the Tideflats industrial area beginning in the 1920s.

The Educator Building is the only significant building constructed on the property. It was originally built to fabricate laminated cabinetry for schools. It was later converted to a multi-tenant building used for general warehousing and light manufacturing.

Current tenants use the building for a wide variety of uses, including: waxing of cardboard boxes, wood product storage and assembly, storage and repackaging of recycled industrial fluids, general storage, light maintenance of machinery, and beverage container destruction and recycling.

The western boundary of the property is adjacent to a known contaminated site, the former CleanCare Corporation hazardous waste treatment facility. The CleanCare Corporation facility was constructed on top of a portion of the Don Oline Landfill—a 1960s to 1970s era landfill that accepted hazardous materials and deposited them across the general area.

Two active hazardous waste treatment, storage and disposal facilities (TSDs), Phillip Services Corporation (PSC) and Emerald Services (Emerald) are located close to and adjacent to the subject property, respectively.

A review of regulatory records indicates that one tenant, Trendwest, is a RCRA small quantity generator of hazardous waste with six records of violation and another tenant, Belco Forest Products, was cited once for non-compliance for lack of proper identification on waste containers. No other regulatory records concerning underground tanks, spills, or cleanups at the subject property were encountered.

No building plans were obtained and the site visit was limited to brief walkthroughs of tenant spaces. No tenant interviews were conducted and so a full understanding of all tenant activities was not developed, nor was in the scope of this ESA.

According to a prior Phase I conducted at the subject property, an underground heating oil tank is present along the northern edge of the property, but according to the owner, is no longer in use.

The possibility of contamination, primarily along the western boundary with CleanCare from either landfilled wastes deposited during the Don Oline Landfill era and/or migration of contaminated groundwater originating from those wastes, or from hazardous substances released from activities at CleanCare, constitutes a recognized environmental condition.

## 1.0 Introduction

### 1.1 INTRODUCTION

This report presents the results of a Phase I Environmental Site Assessment (ESA) for the Educator Building (subject property) located at 3401 Lincoln Avenue in Tacoma, Washington (subject property; Figure 1.1). Floyd|Snider performed the ESA on the subject property on behalf of the Port of Tacoma (Port). The subject property is currently owned by Educator Building LLC and the Port is considering purchasing the property.

This ESA was conducted in accordance with the ASTM International (ASTM) E 1527-05 Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (ASTM Standard 2005) and also in general accordance with the Port's requirements for Phase I ESAs. ASTM E 1527-05 complies with U.S. Environmental Protection Agency (USEPA) All Appropriate Inquiries (AAI) Final Rule (40 CFR 312), which was promulgated November 1, 2005 and took effect November 1, 2006.

### 1.2 PURPOSE

The purpose of the ESA is to compile and review available information about the subject property and immediate vicinity to identify recognized environmental conditions (RECs) to the extent feasible pursuant to ASTM E 1527-05. According to the ASTM Standard, a REC is defined as:

"the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, ground water, or surface water of the property. The term includes hazardous substances or petroleum products even under conditions in compliance with laws. The term is not intended to include *de minimis* conditions that generally do not present a threat to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate government agencies."

### 1.3 REASON FOR PERFORMING THIS ESA

As stated above, the Port is considering purchasing the subject property. The Port has commissioned this ESA to better understand the environmental condition of the subject property and to satisfy one of the requirements to qualify for the innocent landowner, contiguous property owner, or bona fide prospective purchaser liability protections as defined in the federal Brownfields Revitalization Act of 2001.

#### 1.4 DETAILED SCOPE OF SERVICES

The scope of services for this ESA is described in the Floyd|Snider proposal to the Port, dated August 9, 2007. This ESA included the following tasks:

- Review of relevant state and local governmental or regulatory agency files and/or databases for indications of potential sources of contamination on the subject property and adjacent properties.
- Review of relevant historical information for the subject property and adjacent properties for evidence of environmental concerns and identification of past land use.
- Review of the use and improvements to the subject property.
- Review of general information concerning regional and area-wide geology, water quality and hydrogeological conditions.
- Identification of jurisdictional wetlands on the subject property and adjacent properties via review of publicly-available databases.
- Review of publicly-available database records concerning historic and cultural resources on the subject property and on adjacent properties.
- Evaluation of available environmental data, including previous site assessments and investigation reports.
- Interviewing the property owner or the Port's designated site contact.
- Performing a reconnaissance of the subject property and adjacent properties.
- Reviewing selected agency or owner files to obtain current status of environmental assessments and/or remediation at the subject property and nearby properties.
- Reviewing documents related to the subject property provided by the Port.
- Preparing this report documenting these activities and identifying RECs.

#### 1.5 EXCLUSIONS

This ESA did not include collection and chemical analysis of samples of soil, sediment, water, or air. In addition, according to the ASTM Standard and the August 9, 2007 proposal from Floyd|Snider, the following issues are not part of the scope of a Phase I ESA:

- Asbestos-containing materials or other hazardous materials in building including lead based paint, polychlorinated biphenyls (PCBs) in lighting ballasts/transformers and ureaformaldehyde insulation
- Lead in drinking water
- Ecological resources
- Biological agents
- Radon
- Industrial hygiene

- Endangered species
- Mold
- Facility environmental compliance
- Health and safety
- Indoor air quality
- Geotechnical/seismic conditions

## 1.6 LIMITATIONS

The conclusions presented in this report are professional opinions based on data described in this report. These opinions have been arrived at in accordance with currently accepted environmental consulting work standards and practices applicable to this location. The opinions and conclusions in this report are subject to the following inherent limitations:

1. Floyd|Snider obtained the information in this report primarily from visual inspections, examination of records in the public domain, interviews with individuals having information about the subject property, and review of environmental reports associated with the subject property. The passage of time, manifestation of latent conditions, or occurrence of future events may require further exploration at the subject property, analysis of the data, and re-evaluation of the findings, observations, and conclusions in the report.
2. The data reported and the findings, observations, and conclusions expressed in the report are derived from the scope of services.
3. Phase I ESA report presents professional opinions and findings of a scientific and technical nature. While attempts were made to relate the data and findings to applicable environmental laws and regulations, the report shall not be construed to offer legal opinion or representations as to the requirements of, nor compliance with, environmental laws, rules, regulations, or policies of federal, state, or local government agencies. Floyd|Snider's liability extends only to its client, and its client's lenders, attorneys, investors, affiliates, and each of their assigns.
4. The conclusions presented in this report are professional opinions based on data described in this report. They are intended only for the purpose, subject property location, and project indicated. This report is not a definitive study of contamination at the subject property and should not be interpreted as such.
5. Visual observations are limited to accessible portions of the subject property and observations made from public access areas for surrounding property.
6. Interviews were limited to the key site personnel identified by the Port.
7. This report is based, in part, on unverified information supplied to Floyd|Snider by third-party sources. While efforts have been made to substantiate third-party information, Floyd|Snider cannot guarantee its completeness or accuracy.
8. Floyd|Snider reviewed information provided on publicly-available databases to identify whether wetlands or historical and cultural resources are present on the subject property and adjacent properties. A wetlands delineation was not performed

as it was not within the scope of this Phase I ESA. Therefore, Floyd|Snider does not warrant the presence or determination of wetlands, either jurisdictional or non-jurisdictional, on the subject property or adjacent properties.

#### **1.6.1 Uncertainty Not Eliminated**

Per the ASTM Standard, no ESA can wholly eliminate uncertainty regarding the potential for RECs in connection with a property. The use of the ASTM Standard is intended to reduce, but not eliminate, this uncertainty.

Within the limitations of the agreed-upon scope of work and the ASTM Standard, Floyd|Snider has conducted this ESA in a professional manner in accordance with generally accepted practices, using the degree of skill and care ordinarily exercised by environmental consultants under similar circumstances. Due to physical limitations inherent to this or any environmental assessment, Floyd|Snider does not warrant that the subject property is free of pollutants or that all pollutants have been identified. As such, no absolute determination of environmental risks can be made. No other warranties, expressed or implied, are made.

#### **1.6.2 Reliance on Information Provided by Others**

Floyd|Snider has relied upon information provided by others in the evaluation of environmental subject property conditions reported herein. Floyd|Snider did not attempt to independently verify the accuracy or completeness of that information. To the extent that the opinion and conclusions in this report are based in whole or in part on such information, those conclusions are contingent on its accuracy and validity. Floyd|Snider assumes no responsibility for any consequence arising from any information or condition that was concealed, withheld, misrepresented, or otherwise not fully disclosed or available to Floyd|Snider.

### **1.7 USER RELIANCE**

This ESA report has been prepared by Floyd|Snider for the express use by the Port of Tacoma. No other parties shall rely on this report without the written consent from Floyd|Snider and the Port. The Port may release this report to third parties; however, any third party in using this report agrees that it shall have no legal recourse against Floyd|Snider.



## 2.0 Site Description and Physical Setting

### 2.1 LOCATION, ZONING, AND LEGAL DESCRIPTION

The subject property comprises approximately 9 acres located at 3401 Lincoln Avenue, currently owned by Educator Building LLC (tax parcel number 0321351051). The subject property is located in an industrial area of Tacoma, Washington (Figure 1.1) and is zoned Port Maritime and Industrial.

### 2.2 SITE AND VICINITY GENERAL CHARACTERISTICS

The subject property is located on the Blair Peninsula within the Tacoma Tideflats, a maritime industrial area that was created by the filling in of the tidelands of the Puyallup River beginning in the early 1920s. The elevation of the property and surrounding area is approximately 10 to 15 feet above mean sea level and is generally flat.

#### 2.2.1 Current Use of the Property

The property is entirely developed and mostly covered by a large, wood frame building with outside parking and storage. The building is currently leased out to a variety of tenants who perform the following activities: warehousing, light manufacturing, assembly, fluid repackaging, food product destruction and recycling, storage, minor maintenance, and storage outside the building. Activities of current tenants are described in more detail in Section 5.2.

#### 2.2.2 Current Use of Adjoining Properties

The following is a summary of the adjoining properties and/or property features:

- **North:** An undeveloped parcel of land owned by the Port of Tacoma (former ProLogis property) and the Rangar Building, a large warehouse.
- **East:** Lincoln Avenue and across Lincoln Avenue, the former Reichhold Chemical Facility.
- **South:** The Pacific Paper warehouse, Western Metals, and the Emerald Services hazardous waste treatment facility.
- **West:** The former CleanCare Corporation facility and Philip Services Corporation (PSC), an active hazardous waste treatment and storage facility.

#### 2.2.3 Historic and Cultural Resources

A review of records maintained by the National Register of Historic Places (NRHP) and Washington State Department of Archaeology and Historic Preservation (DAHP) did not identify historical or cultural resources on or adjacent to the subject property (DAHP 2007).

## 2.3 PHYSICAL SETTING

This section briefly describes the physical setting of the subject property, including physiographic conditions, regional and site geology and hydrogeology, and regional and site surface water features.

### 2.3.1 Regional Physiographic Conditions

The subject property is located on the Tacoma Tidelands, a deltaic area of unconsolidated sediment deposited by the Puyallup River. Sediment deposited at the mouth of the Puyallup River built a large estuarine delta into Commencement Bay. The delta consisted of a large tidal flat that merged landward with tidal marshes and sinuous tidal channels.

Upon development of the Tacoma Tidelands Industrial District, the Blair and Hylebos Waterways were dredged, with dredge spoils deposited on the land to build up and stabilize the former marsh lands over time beginning in the early 1900s and ending in the mid-1950s. This dredged material generally consists of 5 to 15 feet of fine to medium sand and silty sand laid directly upon to former tidal marshes and tidelands.

### 2.3.2 Regional and Site Geology

Based on review of Remedial Investigation reports for the adjacent PSC and ProLogis properties, the geology in the general vicinity of the subject property is consistent with the tidelands in general, which is typically 5 to 15 feet of dredge sands and/or a variety of anthropogenic fill materials that overlie native marsh soils consisting of peat and silt (PSC 2005, Floyd|Snider 2006). Groundwater occurs within this upper fill and is commonly referred to as the "fill aquifer" or "shallow aquifer." Underneath the marsh deposits are a thick sequence of saturated deltaic sands and silts and interbedded peats referred to as the "upper sand aquifer," "intermediate," or "deep aquifer."

Groundwater flow direction in the general area surrounding the subject property was determined as part of environmental investigations at the PSC and ProLogis properties. Appendix A contains figures from the PSC RI that illustrate area-wide groundwater flow directions in both aquifers in March 2006.

Examination of these figures implies that there is a prominent groundwater high on the center of the PSC property that diverts flow radially away from this high in the shallow aquifer.

This is expected to push shallow groundwater west to east near the western boundary of the subject property. That is, shallow groundwater apparently flows onto the subject property from both the adjacent CleanCare Corporation facility and Parcel A of the PSC site.

Shallow groundwater is eventually expected to flow towards the Hylebos Waterway, with the direction seasonally variable and heavily influenced by slight variations in local topography, interception by sewer or storm drain, localized recharge areas, and other factors.

The flow direction in the deep aquifer appears to flow towards to the south across the general area with less variability, as compared to the upper aquifer, but the deeper aquifer is subject to tidal influences that may mask actual flow directions.

### **2.3.3 Regional and Site Surface Water**

The Hylebos and Blair Waterways are the nearest regional surface water bodies. The subject property contains no natural surface water features.

Paving exists along the perimeter of the building to the south and west, with the far western, northern, and eastern boundaries unpaved. Stormwater from pavement along the southern perimeter of the building enters one storm drain. No surface water bodies were noted on-site, but a stormwater detention pond exists adjacent to the northwestern boundary of the subject property. This pond lies on the ProLogis property and is used to detain stormwater from the adjacent Rangar Building.

### **2.3.4 Floodplain Zoning**

According the City of Tacoma's govMe website, the limits of the 100 year floodplain are confined to land adjacent to the Blair and Hylebos Waterways and the floodplain boundary does not cross either Taylor or Alexander Avenues and so does not extend onto the subject property (City of Tacoma 2007).

### **2.3.5 Wetlands**

The City of Tacoma govMe website was reviewed to evaluate the presence of wetlands on the subject property and adjacent properties. The govMe website did not identify wetlands on the subject property. According to the goveME website, the nearest known wetlands to the subject property is the Hylebos Marsh, which is located west of the PSC property.

### **3.0 User-provided Information**

The user of this Phase I ESA, the Port, is obligated to provide certain information identified below to Floyd|Snider about their knowledge of the subject property. According to the ASTM Standard, research into the subjects below are not generally performed by the environmental professional, but if such information is provided to the environmental professional, it may be material to identifying RECs.

#### **3.1 TITLE RECORDS**

The purpose of the title record review is to better identify past site use and determine if environmental liens or activity and use limitations (AULs) are recorded against the subject property. Title records have been provided for the subject property and past use findings from that review are described within Section 4.2.

#### **3.2 ENVIRONMENTAL LIENS OR ACTIVITY AND USE LIMITATIONS**

Port staff were not aware of any environmental liens or AULs of the subject property. The title reports provided did not indicate otherwise.

#### **3.3 SPECIALIZED KNOWLEDGE**

The Port has indicated that they have no specialized knowledge or experience concerning the environmental conditions of the subject property, other than general knowledge that this part of the Tacoma Tidelands has a history of contamination due to the Don Oline Landfill, CleanCare Corporation, and PSC sites.

#### **3.4 COMMONLY KNOWN OR REASONABLY ASCERTAINABLE INFORMATION**

The Port has indicated that they have no commonly known or reasonably ascertainable information that is material to the environmental conditions of the subject property.

#### **3.5 VALUATION REDUCTION FOR ENVIRONMENTAL ISSUES**

ASTM Standard E1527-05 requires that the purchase price of the subject property be evaluated with respect to what its fair market value would be if the property were unaffected by petroleum products or hazardous substances. A significant valuation difference may indicate that environmental conditions exist that are negatively affecting the value of the property.

According to the Port, the subject property is being purchased by the Port at a price reflecting fair market value.

**3.6 REASON FOR PERFORMING PHASE I ENVIRONMENTAL SITE ASSESSMENT**

The performance of the Phase I ESA fulfills Port requirements for due diligence, and enables the Port to better understand the history of the subject property and the environmental conditions in the general area prior to purchase.

## 4.0 Records Review

### 4.1 STANDARD ENVIRONMENTAL RECORD SOURCES

A review of regulatory databases maintained by various federal and state environmental agencies was performed. Basic database information was provided by Environmental Data Resources, Inc. (EDR). A copy of the complete database listings obtained from EDR and a map showing the locations of certain listed sites relative to the subject property are presented on CD-ROM in PDF format as Appendix B. According to EDR, the information from various federal and state agencies is obtained and updated regularly per ASTM standards<sup>1</sup>. Dates of the individual databases and lists utilized by EDR are included in that report. Surrounding properties of interest identified from the EDR report that are located between the Hylebos and Blair Waterways are presented in Figure 4.1. This figure includes sites undergoing or having completed cleanup actions under CERCLA, the Resource Conservation and Recovery Act (RCRA), or the Washington Model Toxics Control Act (MTCA), as well as locations of nearby leaking underground storage tank (LUST) sites.

#### 4.1.1 Federal Agency Records Review

##### 4.1.1.1 National Priorities List

The National Priorities List (NPL) was reviewed for sites within a 1-mile radius of the subject property. The only NPL site within a 1-mile radius of the subject property is the USEPA Commencement Bay Nearshore/Tideflats (CBN/T) Superfund site. The CBN/T Superfund site is located in Tacoma, Washington at the southern end of the main basin of Puget Sound and includes 10 to 12 square miles of shallow water, shoreline, and adjacent land, most of which is highly developed and industrialized. The subject property is included within the general area of the CBN/T. Construction is completed at most of the main CBN/T project areas, which include the Asarco Tacoma Smelter, the Ruston/North Tacoma Study Area, and the Thea Foss and Hylebos Waterway segments of the CBN/T.

##### 4.1.1.2 USEPA Comprehensive Environmental Response, Compensation, and Liability Information System Inventory

The USEPA Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) inventory of potential and confirmed hazardous waste sites under investigation was reviewed. This list includes sites that are, or have previously been, evaluated for possible inclusion on the NPL. Review of the CERCLIS inventory identified 10 sites within the area of interest to this Phase I ESA between the Blair and Hylebos Waterways (Figure 4.1). These sites of interest and their addresses are identified in the following table.

<sup>1</sup> However, the findings from the EDR database review may contain older, less relevant, and/or out-of-date information.

CERCLIS Site	Address
USEPA Commencement Bay Nearshore Tidelands Industrial SE (CBNT Superfund Site)	
Don Oline Landfill <sup>1</sup>	1801 Alexander Avenue
Port of Tacoma <sup>1</sup>	2301 Taylor Way
Atofina Chemicals*	2901 Taylor Way
Petroleum Reclaiming Service <sup>1</sup>	3003 Taylor Way
CleanCare Corporation	1510 Taylor Way
Port of Tacoma <sup>1</sup>	3502 Lincoln Avenue
PRi Northwest <sup>1</sup>	709 Alexander Avenue
Pioneer Americas LLC <sup>1</sup>	605 Alexander Avenue
USARMY NG Watercraft Support	321 E Alexander Avenue

Note:

- 1 Part of the CBN/T Superfund site.

As indicated in the above table, all sites except CleanCare Corporation and USARMY NG Watercraft Support are part of the CBN/T Superfund site. The potential impacts of the Don Oline Landfill and CleanCare sites are of particular concern to the subject property and are discussed further in Section 4.1.3.6.

The USARMY NG Watercraft Support site was listed on the CERCLIS list in 1995 with a site inspection and preliminary assessment. The site was reassessed in 2000 and is designated as a low priority site.

The CERCLIS database includes a subset of sites that have been assigned No Further Remedial Action Planned (CERC-NFRAP) status. Following an initial investigation, these sites were removed from the CERCLIS inventory and archived because no contamination was found, contamination was removed quickly, or the contamination was not serious enough to require NPL consideration. Review of this database identified two CERC-NFRAP sites within the area of interest: Burlington Environmental Inc. (aka Phillip Services Corporation) at 1701 E Alexander Avenue, and Reichhold Chemicals, Inc. (aka SSA Containers) at 3320 Lincoln Avenue. Both of these sites have current corrective actions being administered by the Washington State Department of Ecology (Ecology; refer to Section 4.1.2.1).

#### **4.1.1.3 RCRA Treatment, Storage and Disposal Facilities and the Corrective Action Site List**

The Resource Conservation and Recovery Information System (RCRIS) lists facilities that are permitted for treatment, storage, or disposal (TSD) of USEPA-regulated hazardous waste. It also contains information pertaining to the status of facilities tracked by the RCRA Administrative Action Tracking System (RAATS). RAATS lists RCRA violations under administrative review or sanction by the USEPA. In addition, the USEPA maintains the

Corrective Action Site (CORRACTS) list, which is a database of RCRA-permitted facilities that are undergoing a corrective action to cleanup releases of hazardous waste.

The CORRACTS list was searched for RCRA treatment, storage or disposal facilities (TSD) within a 1-mile radius of the subject property. The RCRIS database was reviewed for other listed TSD and RAATS-listed facilities within a half-mile radius of the subject property. The following sites were identified within the area of interest between the Blair and Hylebos Waterways (Figure 4.1).

CORRACTS or RCRIS-Listed Site	Address	Database(s)
Burlington Environmental Inc. (aka PSC)	1701 E Alexander Avenue	CORRACTS, TSD
Sol Pro Inc (aka Emerald Services)	1825 Alexander Avenue	CORRACTS, TSD
Reichhold Chemical, Inc. (aka SSA Containers)	3320 Lincoln Avenue	CORRACTS, TSD, and RAATS
Petroleum Reclaiming Service	3003 Taylor Way	CORRACTS, TSD
CleanCare Corporation	1510 Taylor Way	CORRACTS, RAATS
Pioneer Americas LLC (aka Occidental Chemical)	605 Alexander Avenue	CORRACTS

**Burlington Environmental Inc.** The site (now operating as PSC) is designated with current human exposures under control for current and reasonably expected conditions. There are 82 TSD violation records reported for this site. An RFI was approved for the site in April 2005. The site is currently under Ecology oversight for cleanup activities (refer to Section 4.1.2.1).

**Sol Pro Inc.** The site (now operating as Emerald Services) is designated with current human exposures and migration of contaminated groundwater under control for current and reasonably expected conditions. The known TSD activity for the site is as a used oil transfer facility. There are 80 TSD violation records reported for this site.

**Reichhold, Inc.** The site (now operating as SSA Containers) is designated with migration of contaminated groundwater under control and all human exposures under control for current and reasonably expected conditions. There are 17 TSD violation records reported for this site. The site is currently under Ecology oversight for cleanup activities (refer to Section 4.1.2.1).

**Petroleum Reclaiming Service.** The site is designated with all human exposures under control for current and reasonably expected conditions. The known TSD activities identified for the site include: used oil transporter, used oil transfer facility, used oil processor, used oil burner, used oil market burner, and used oil spec marketer. There are 16 TSD violation records reported for this site. The site is currently under Ecology oversight for cleanup activities (refer to Section 4.1.2.1).

**CleanCare Corporation.** The CleanCare Corporation (CleanCare) site was used for temporary treatment, storage, disposal, and recycling of hazardous and non-hazardous waste from other locations. The CleanCare facility had four separate tank farms, two hazardous/dangerous waste



container storage pads, and a processing area where solvents, oil, and antifreeze were distilled. CleanCare abandoned its facility in 1999 and the USEPA performed a removal action that disposed of over 2,000 drums and emptied hazardous waste liquids from facility storage tanks at a cost of over \$4,000,000. The aboveground part of the CleanCare Corporation site no longer poses an immediate threat to human health or the environment (USEPA 2000; refer to the EDR report in Appendix B for more information). This site is now an Ecology-lead site and Ecology is negotiating with the potentially liable parties in order to perform a remedial investigation/feasibility study to conduct a cleanup of subsurface soil and groundwater.

**Pioneer Americas LLC.** According to a summary of conditions at this facility by Ecology, while migration of contaminated groundwater is observed at the site, current human exposures are under control. This is because the impact of the contaminated groundwater is to the marine organism of the Hylebos Waterway, and not humans working at the facility. As of March 2005, CMS and RFI Work Plans have been approved for the site. The site is currently under joint EPA and Ecology RCRA Corrective Action oversight for cleanup activities (refer to Section 4.1.2.1).

In summary, several hazardous waste TSDs are located near or adjacent to the subject property. The three closest are the PSC, Emerald Services, and CleanCare facilities. The remaining sites are unlikely to adversely impact the subject property due to distance from the subject site, or a cleanup is in progress that limits migration of contaminants (i.e., Reichhold Chemical, Inc.). The potential impacts of the PSC, Emerald Services and CleanCare facilities on the subject property are discussed in further detail in Section 4.1.3.6.

#### **4.1.1.4 RCRA Large Quantity Hazardous Waste Generators**

Generators of hazardous waste that have obtained identification numbers and either generate more than 1,000 kg of hazardous waste per month or meet other RCRA requirements are listed in the RCRIS database as large quantity generators (LQGs). Belco Forest Products is located on the subject property at the address 3401 Lincoln Avenue, and is listed as a LQG site, but there are no LQG violations listed. The following LQG sites were identified within the area of interest.:

<b>LQG Site</b>	<b>Address</b>	<b>Violations</b>
Burlington Environmental Inc (aka PSC).	1701 E Alexander Avenue	82
Sol Pro Inc (aka Emerald Services).	1825 Alexander Avenue	80
Belco Forest Products	3401 Lincoln Avenue	0
CleanCare Corporation	1510 Taylor Way	77
PRI Northwest Inc.	709 Alexander Avenue	1

#### **4.1.1.5 RCRA Small Quantity Hazardous Waste Generators**

Generators of hazardous waste that have obtained identification numbers and either generate between 100 and 1,000 kg of hazardous waste per month or meet other applicable

requirements of RCRA are listed in the RCRIS database as small quantity generators (SQGs). A total of 34 sites were identified on the RCRA-SQG list within the area of interest. The following table lists those SQH sites that have recorded violations (Trendwest Inc., a tenant of the subject property, is listed as having SQG violations):

SQH Site	Address	Violations
CleanCare Corporation	1510 Taylor Way	1
Don Oline Landfill	1801 Taylor Way	4
Trendwest Inc.	3403 Lincoln Avenue, Suite H	6
Port of Tacoma	2301 Taylor Way	2
Nordlund Boat Co	1621 Taylor Way	1
Jesse Yard II	1110 Alexander Avenue	9
Pioneer Americas LLC	605 Alexander Avenue	11

#### **4.1.1.6 Emergency Response Notification System**

The Emergency Response Notification System (ERNS) database, maintained by the USEPA, records and stores information on reported releases of oil and hazardous substances. A review of the ERNS database revealed the following nine addresses within the area of interest (Appendix B):

1701 E. Alexander Avenue  
 1825 Alexander Avenue  
 2204 Taylor Way  
 2102 Alexander Avenue  
 1510 Taylor Way  
 1221 Alexander Avenue  
 2000 Taylor Way  
 1240 Alexander Avenue  
 901 Alexander Avenue

The CleanCare facility is located at 1510 Taylor Way, adjacent to the subject property. And PSC is located at 1701 E. Alexander Avenue, located near the western boundary of the subject property.

#### **4.1.1.7 Hazardous Materials Incident Report System**

The Hazardous Materials Incident Report System (HMIRS), maintained by the USEPA, contains hazardous material spill incidents reported to the Department of Transportation. A review of the HMIRS database revealed two sites within the area of interest with hazardous materials spills:

1620 E. Alexander Avenue, and 1701 E. Alexander Avenue, both of which correspond to the PSC site.

#### **4.1.1.8 Additional Federal Database Search Results**

In addition to the database searches discussed above, EDR conducted reviews of numerous additional federal listings and databases for properties within the area of interest. The following federal information sources were reviewed:

- US ENG CONTROLS list, identifying sites with Engineering Controls in place.
- US INST CONTROL list, identifying sites with institutional controls in place, including water use restrictions, property and construction use restrictions.
- FUDS list, locations of Formerly Used Defense Sites where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.
- CONSENT list, maintained by the US District Court, identifying sites where legal settlements have established responsibility and standards for NPL sites.
- RODs, Record of Decision documents containing technical and health information regarding Superfund cleanup actions.
- TRIS, the Toxic Chemical Release Inventory System identifies facilities that release toxic chemicals to the air, water, and land in reportable quantities under SARA Title III, Section 313.
- FTTS, tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA, and EPCRA (Emergency Planning and Community Right-to-Know Act) over the previous 5 years.
- ICIS, the Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.
- HIST FTTS, a complete administrative case listing from the FTTS for all 10 USEPA regions. Includes records that may not be included in the newer FTTS database updates. This database is no longer updated.
- PADS, the PCB Activity Database, maintained by USEPA, identifies generators, transporters, commercial storers and/or brokers and dispensers of PCBs who are required to notify the USEPA of such activities.
- FINDS, the Facility Index System, which contains facility information for numerous database and information systems.

Review of these listings did not identify new sites or records of interest that were not already discussed in the previous sections.

#### **4.1.2 Washington State Regulatory Records Review**

The EDR records review searched Ecology databases and records. A brief discussion of each relevant database and its findings is included in the following subsections.

#### 4.1.2.1 Washington State Hazardous Sites List

Ecology maintains the Confirmed and Suspected Contaminated Sites List (CSCSL), which is the state equivalent to the federal CERCLIS listings. The inventory is a comprehensive state listing of those facilities that will undergo state-funded cleanup and properties that are undergoing voluntary cleanup actions. In addition, federal NPL sites are also listed. A review of the CSCSL revealed 16 sites located between the Hylebos and Blair Waterways are shown on Figure 4.1 and discussed below; refer to the EDR report in Appendix B for more information.

Site	CSCSL Report Findings
Burlington Environmental Inc. (aka PSC) 1701 E. Alexander Avenue	Confirmed contamination of soil and groundwater by petroleum products, corrosive wastes, non-halogenated solvents, metals, and cyanide at levels greater than MTCA cleanup levels. A dangerous waste corrective action is in progress.
SSA Containers (aka Reichhold Chemicals, Inc.) 3320 Lincoln Avenue	Confirmed contamination of soil and groundwater by phenolic compounds and PCBs at levels greater than MTCA cleanup levels. A remedial action (RA) is in progress.
Port of Tacoma Property 2301 Taylor Way	Suspected sediment contamination by metals and confirmed contamination of surface water, groundwater, and soil by metals. A RA is in progress.
Reichhold Chemicals Inc 2340 Taylor Way	Confirmed contamination of groundwater by phenolic compounds and non-halogenated solvents at levels greater than MTCA cleanup levels. Confirmed contamination of soil by phenolic compounds and metals and cyanide at levels greater than MTCA cleanup levels. Suspected contamination of soil by dioxin. Suspected presence of phenolic compounds in drinking water. A RA is in progress.
Atofina Chemicals, Inc 2901 Taylor Way	Confirmed contamination of soil, groundwater, and sediment by corrosive wastes, metals and cyanide, and inorganic conventionals at levels greater than MTCA cleanup levels. Ecology status shows the construction is complete for the site for these media with operation and maintenance underway. There is also confirmed contamination of surface water by these same contaminants; however, Ecology has determined that contamination of surface water has been remediated to cleanup levels established for the site.
Petroleum Reclaiming Service 3003 Taylor Way	Suspected contamination of groundwater and surface water by metals and cyanide. Confirmed contamination of soil by petroleum products, metals, and cyanide at levels greater than MTCA cleanup levels. Suspected contamination of soil by polycyclic aromatic hydrocarbons (PAHs).

Site	CSCSL Report Findings
CleanCare Corporation 1510 Taylor Way	Confirmed contamination of soil and groundwater by pesticides, petroleum products, PCBs, volatile organics, metals and cyanide at levels greater than MTCA cleanup levels. The site has been cleaned (USEPA 2000), is ranked, and awaiting further RA under Ecology oversight.
GP Gypsum Corporation 1240 Alexander Avenue	Suspected contamination of soil by petroleum products and confirmed contamination of groundwater by petroleum products at levels greater than MTCA cleanup levels. The site is ranked and awaiting RA.
Graymont Western US Inc. 1220 Alexander Avenue	Confirmed contamination of groundwater by petroleum products at levels greater than MTCA cleanup levels. An Ecology Voluntary Cleanup Program (VCP) independent RA is in progress. Soil is reported as remediated at the site. There is a Restrictive Covenant in place as of April 9, 2001 due to residual concentrations of total petroleum hydrocarbons that remain in soil and groundwater at levels greater than cleanup standards.
AOL Express Inc. 2000 Taylor Way	Suspected contamination of soil and groundwater by petroleum products, semivolatile organic compounds (SVOCs), PAHs, metals, and cyanide. A RA is in progress.
Tacoma Port Parcel 4 3533 E. 11 <sup>th</sup> Street	Confirmed contamination of soil and sediment with metals and cyanide at levels greater than MTCA cleanup levels. Suspected contamination of surface water by metals and cyanide. An independent RA is in progress.
Port of Tacoma 721 Alexander 721 Alexander Avenue	Confirmed contamination of soil and groundwater by petroleum products at levels greater than MTCA cleanup levels. The site is ranked and awaiting RA.
PRI Northwest Inc. 709 Alexander Avenue	Confirmed contamination of soil, groundwater, and sediment by corrosive waste, metals and cyanide. PAHs discovered at levels greater than MTCA cleanup levels. Suspected contamination of sediment by petroleum products. A RA is in progress.
Pioneer Americas LLC 605 Alexander Avenue	Confirmed contamination of surface water for non-halogenated solvents greater than MTCA cleanup levels. Confirmed contamination of sediment for non-halogenated solvents, metals and cyanide, and PCBs at levels greater than MTCA cleanup levels. Suspected groundwater contamination for corrosive wastes, non-halogenated solvents. Soil contamination by non-halogenated solvents at levels greater than MTCA cleanup levels is confirmed at the site, with suspected contamination by corrosive wastes. A RA is in progress.

Site	CSCSL Report Findings
US Army WSMC Pier 23 401 Alexander Avenue	Confirmed soil contamination by petroleum products, metals, cyanide, and PAHs at levels greater than MTCA cleanup levels. Confirmed contamination of soil by non-priority metal pollutants at levels less than MTCA cleanup levels. Suspected soil contamination by arsenic. Confirmed sediment contamination by metals and cyanide, PCBs, and PAHs at levels greater than MTCA cleanup levels. Confirmed groundwater contamination by SVOCs, metals, and cyanide. The site is awaiting a site hazard assessment.
Tacoma Port Earley Business Center 401 Alexander Avenue	Confirmed soil contamination by petroleum products, asbestos, non-halogenated solvents, metals, and cyanide at levels greater than MTCA cleanup levels. Confirmed groundwater contamination by petroleum products and non-halogenated solvents at levels greater than MTCA cleanup levels. Suspected soil and groundwater contamination by other non-priority pollutant metals. The site is ranked and awaiting RA.

A subset of the CSCSL report is the Hazardous Sites List (HSL), which includes sites that have been assessed and ranked using the Washington Ranking Method. There is one HSL site within the area of interest: Burlington Environmental, Inc. (aka PSC).

The CSCSL also identifies sites that have received a No Further Action (NFA) determination. The CSCSL NFA list identified 10 sites within the area of interest, which are presented below. (Refer to Appendix B.)

Site	Address	NFA Status
Don Oline Landfill (aka Handan Containers)	1801 Alexander Avenue	January 1999: awaiting site hazard assessment; referred to another Ecology program.
RW Investments (aka Visador Co.)	3376 Lincoln Avenue	March 1998: final independent RA report received; NFA after assessment (IRAP or VCP).
Visador Co.	2150 Taylor Way	March 1998: final independent RA report received; NFA after assessment (IRAP or VCP).
Fields Corp	2240 Taylor Way	December 1999: final independent RA report received; NFA after assessment (IRAP or VCP).
Simon & Sons	1601 Taylor Way	January 2004: RA complete, confirmational monitoring underway, removed from HSL.

Site	Address	NFA Status
Taylor Way Properties Inc.	1501 Taylor Way	January 2001: RA and all activities completed, no monitoring, removed from HSL.
Buffelen Woodworking Co	1901 Taylor Way	April 1995: final independent RA report received; NFA after assessment (IRAP or VCP).
AOL Express Inc	2000 Taylor Way	January 2001: UST removal and RA and all activities completed, no monitoring, not on HSL.
Port of Tacoma (aka Murray Pacific Log Yard 1)	3502 Lincoln Avenue	August 1997: RA complete, confirmation monitoring underway, removed from HSL.
Naval Reserve Center Tacoma	1100 Alexander Avenue	August 1999: final independent RA report received; NFA after assessment (IRAP or VCP).

In summary, none of the Ecology sites listed above, with the exception of the Don Oline Landfill, CleanCare, and the PSC sites, are expected to impact soil and groundwater conditions at the subject property due to distance from the subject property, a cleanup action in progress that limits contaminant migration, or a NFA determination has been received.

#### 4.1.2.2 *Underground Storage Tank Records*

A review of Ecology's Statewide Underground Storage Tank (UST) Site/Tank Report (listing registered USTs) revealed 13 registered locations within the area of interest where the UST(s) has been removed or closed in place. The UST sites and their current status are presented below: None are on the subject property.

UST Site	Address	Number of USTs	Status
Reichhold Chemical Inc.	3320 Lincoln Avenue	4	Closed in place
Superion Plastics Co Inc.	2116 Taylor Way	1	Removed
Reichhold Chemical	2340 Taylor Way	1	Removed
Cenex AG, Inc.	1801 Taylor Way	7	Removed
Buffelen Woodworking Co	1901 Taylor Way	2	1 Removed 1 Closed in place
AOL Express Inc.	2000 Taylor Way	1	Removed
The PQ Corporation	1202 Taylor Way	1	Closed in place
Domtar Gypsum America Inc.	1240 Alexander Avenue	1	Removed

UST Site	Address	Number of USTs	Status
Continental Lime Inc.	1220 Alexander Avenue	1	Removed
City of Tacoma	3510 E. 11 <sup>th</sup> Street	1	Removed
Port of Tacoma BP	3140 E. 11 <sup>th</sup> Street	5	Removed
Dick Dawsons ARCO	3130 E. 11 <sup>th</sup> Street	4	Removed
Tacoma Marine Terminal	709 Alexander Avenue	1	Closed in place

#### 4.1.2.3 Leaking Underground Storage Tank Records

Ecology maintains a summary of information pertaining to all reported leaking UST sites (LUST) within Washington State. A review of this list identified seven LUST sites within the area of interest. All had releases in the 1990s and have reportedly been cleaned up.

LUST Site	Address
Reichhold Chemical, Inc.	3320 Lincoln Avenue
Thermal Fiber LLC/USG Interiors	2301 Taylor Avenue
Cenex AG, Inc.	1801 Taylor Way
Domtar Gypsum America Inc.	1240 Alexander Avenue
Yard 1	3502 Lincoln Avenue
Dick Dawson's Arco	3130 E. 11 <sup>th</sup> Street
Puget Sound Chip Center	2340 Alexander Avenue

#### 4.1.2.4 Solid Waste Facilities

Ecology maintains information pertaining to all active and permitted disposal and recycling facilities operating within Washington State. A review of the Ecology Solid Waste Facility Handbook revealed three Solid Waste Facility/Landfill sites within the area of interest, presented by type below.

Solid Waste Facility / Landfill Site	Address	Type
Emerald Services MRW Facility	1825 Alexander Avenue E	Moderate Risk Waste Facility
PRS Group	3003 Taylor Way East	Pile of Inert Waste
Tacoma RDF Steam Plant 2	1171 Taylor Way	Energy Recovery Facility



#### 4.1.2.5 Institutional Controls Records

The Washington State institutional control (INST CONTROL) list maintains information regarding sites with institutional controls including deed restrictions, construction and land use restrictions, and groundwater access controls. A review of this list identified three institutional control sites within the area of interest (none of which are on the subject property.):

- Port of Tacoma, 2301 Taylor Way
- Graymont Western US Inc., 1220 Alexander Way
- Glenn Springs Holdings Inc., 709 Alexander Avenue

#### 4.1.2.6 Voluntary Cleanup Program Facilities

The VCP list identifies all sites that have entered the Voluntary Cleanup Program. Review of the VCP list identified four sites within the area of interest (none of which are on the subject property.):

VCP Participant	Address	VCP Actions
RW Investments	3376 Lincoln Avenue	Conducted an Independent RA under the VCP and received a "No Further Action" determination in 1998.
Fields Corp	2240 Taylor Way	Conducted an Independent RA under the VCP and received a "No Further Action" determination in 1999.
Graymont Western US Inc.	1220 Alexander Avenue	Conducted an Independent RA under the VCP and obtained a restrictive covenant in 2001 for residual concentrations of total petroleum hydrocarbons remaining in soil and groundwater at levels greater than cleanup standards.
US Naval Reserve Center	1100 Alexander Avenue	Conducted an Independent RA under the VCP and received a "No Further Action" determination in 1999. (This site is also on the FUDS list.)

#### 4.1.2.7 *Brownfields Sites*

Brownfields are abandoned, idle or underused commercial and industrial property where development or expansion is restricted by the presence or the perceived presence of environmental contamination. Brownfields listing of a property is not controlled by size, location, history, or age. Brownfield sites are located throughout the state. Review of the Washington State Brownfields list identified four sites within the area of interest. (All of these sites have been discussed in previous sections.)

- CleanCare Corporation, 1510 Taylor Way
- GP Gypsum Corporation, 1240 Alexander Avenue
- Port of Tacoma, 721 Alexander Avenue
- Tacoma Port Earley Business Center, 401 Alexander Avenue

#### 4.1.2.8 *Additional Washington State Records Search Results*

In addition to the Ecology records listed above, the EDR records search investigated properties within the area of interest between the Blair and Hylebos Waterways on the following lists and records sources:

- AIRS (EMI), emissions inventory data from the Washington Emissions Data System.
- CDL list, identifying the location of illegal methamphetamine laboratories.
- DRYCLEANERS, listing of drycleaners that registered with Ecology as hazardous waste generators.
- ICR list, identifying properties for which Independent Cleanup Action Reports have been submitted to Ecology for sites not under department order or decree.
- Inactive Drycleaners, identifying the location of inactive drycleaner facilities.
- NPDES, identifying properties with permitted wastewater facilities.
- SPILLS, list identifying the location of sites where release of a hazardous material has occurred, or facilities that failed to meet the RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.
- SWTIRE, identifying solid waste tire facilities state-wide with unauthorized accumulations of scrap tires.
- WA MANIFEST list, identifying sites with hazardous waste manifest information on record with Ecology.

Information from these additional listings was used to identify possible off-site sources of potential impacts to the subject property. No additional sites of concern were identified by these listings.

### 4.1.3 Additional Environmental Records Sources

In addition to the standard environmental records search described above, additional local, state, and federal records were searched through Freedom of Information Act (FOIA) queries. The findings are discussed below.

#### 4.1.3.1 Tacoma/Pierce County Health Department

In 2003, with grants from Ecology, the Tacoma/Pierce County Health Department developed a program to research locations of historical gasoline service stations throughout Pierce County. This site inventory program is called the Abandoned Commercial Tank Project (Project ACT). Project ACT identified 347 historical UST sites throughout the county with no record of tank removal activities. A copy of the database was obtained and reviewed. The Project ACT database did not include sites in the tidelands area near the subject property.

#### 4.1.3.2 Local Fire Department

On September 6, 2007, Floyd|Snider reviewed files at the Tacoma Fire Department regarding information pertaining to USTs, spills, or releases filed at the address of the subject property. The following information was discovered within the area of interest:

- **3401-3405 Lincoln Ave (subject property):** No documents on file with the Tacoma Fire Department.
- **1701 Alexander Ave:** On May 22, 2003 203 gallons of acid neutralization sludge was spilled onto asphalt at the facility (1629 E. Alexander). The release was cleaned up right away and laboratory analysis of the residual spill/asphalt detected silver (0.75 ppm), cadmium (0.20 ppm), lead (0.22 ppm), and selenium (0.18 ppm). The spill was reported to Ecology (Incident 03-1025) and the National Response Center (Incident 645770). Nothing else of interest was found for this address.
- **1801 Alexander Ave:** No records of a UST or spill release.
- **2000 Taylor Way:** One permit record for a 950-gallon liquid propane aboveground tank installed at the southwest corner of the former AOL Express warehouse building adjacent to the rail spur in 1983. Two hazardous material incidents (#042810015 on 10/7/04 and #040130025 on 1/13/04) and one Hazardous Conditions incident (#993360026 on 12/2/99) were reported on a 8/27/07 Tacoma Fire Department Primary Inspection Report under the Incident History header. No other information on these incidents was available in the files.

#### 4.1.3.3 City of Tacoma Building Department

In a search of the issued building permits on the City's govMe website, Floyd|Snider found no permits filed for the subject property.

#### 4.1.3.4 Washington Department of Ecology

On July 2 and August 30, 2007 Floyd|Snider staff reviewed documents at Ecology pertaining to the subject property as well as relevant off-site properties in the area of interest identified through a review of the EDR Report.

The files examined on July 2, 2007, pertained to the Steam Plant property, CleanCare Corporation, and Burlington Environmental Inc. (aka PSC). These files contained information about past and/or ongoing cleanups associated with all sites. No information was found in the files regarding potential migration of contamination from these sites onto or towards the subject property.

The files examined August 30, 2007, for the following properties primarily contained information about past and/or ongoing cleanups. Material in the files confirmed the information in the EDR Report (Appendix B). No information was found in the files that provided information regarding potential migration of contamination from these sites onto or towards the subject property. The following information was obtained:

- **Belco Forest Products (subject property).** A March 2006 inspection revealed 38 55-gallon drums of waste that were not properly identified in the waste stream. Analysis of the contents revealed they contained naphthalene, ethylbenzene, toluene, and xylene. The responsible parties contracted with PSC for proper disposal.
- **Graymont Western US Inc. (aka Continental Lime).** Petroleum hydrocarbons were detected in soil and groundwater samples. Remedial activities were conducted in 1993 for petroleum contamination. In 2007, new construction for a stormwater sump discovered additional contamination. A proposed RA is currently on file with Ecology.
- **GP Gypsum Corporation (aka Domtar Gypsum America, Inc.).** In 2002, excavation for a new building found approximately 200 tons of paint waste material. This was reported and removed. Water quality was tested and found within acceptable range.
- **Simon & Sons.** Previous contamination from sandblasting grit resulted in elevated PCBs, copper, arsenic, lead, and zinc, as well as petroleum products. Remediation activities included excavating and disposing of contaminated soil, backfilling, grading, subsequent monitoring, and placing deed restrictions on the property. In 2003, Ecology recommended removal of this site from the hazardous sites list.
- **Cenex AG Inc. (aka Land-o-Lakes).** Petroleum was detected in groundwater, cleanup was conducted in 1991 that involved removing seven USTs. Follow-up monitoring was conducted.
- **Murray Pacific Yard 1.** In 1992, a UST containing diesel was closed in place. In 1995 to 1996 this property excavated slag and woodwaste material containing unacceptable levels of arsenic and lead. The excavated area was backfilled and a stormwater detention facility was constructed.
- **Buffelen Woodworking Company.** In 1987, a UST was removed and another UST was cleaned, filled, capped, and appears to have been abandoned in place. From 1994 to 1998 there was pentachlorophenol contamination at this property. The area

of contamination was excavated, capped, and now has a restrictive covenant on land use. In 1998, a complaint was filed with Ecology regarding unapproved discharges; this was investigated and found without merit.

- **Visador Co. (aka RW Investments).** In 1997 one well was discovered with elevated levels of total petroleum hydrocarbons. A RA was performed with no further action determined necessary.
- **Hylebos Marsh (aka City of Tacoma).** A Phase II ESA was conducted in 1991. Soil and groundwater samples were collected for analysis of volatile organic compounds, SVOCs, pesticides, PCBs, cyanides, phenols and metals. All results were either non-detects or less than MTCA Method A cleanup levels, except for groundwater levels of arsenic and lead, which were greater than MTCA Method A cleanup levels. In 2003 a complaint was filed with Ecology that fill deposited in the area contained asbestos, lead, and copper. Samples were collected and only one sample contained a small piece of pipe with asbestos, indicating that this was not a major problem for this site. No further action was determined necessary.

#### **4.1.3.5 Previous Environmental Studies and Reports**

As part of the records review, a Phase I ESA concerning the subject property was provided to Floyd|Snider for review by the site owner (AGRA 2000). A copy of that report is included in Appendix C and a summary of key findings are presented below:

- A structure was present on the subject property as early as 1919, based on the review of tax assessor records for the property. By 1946, the report states that three small buildings were present on the subject property, based on review of an aerial photograph.
- Construction of the current on-site warehouse began in 1956. Building permit records indicate that the warehouse building was expanded multiple times between 1956 and 1972.
- Building permit records showed two permits for heating oil tanks, one in 1958 and the other in 1959. A building permit was also issued to Sol Pro in 1992 for the construction of a "pole building" to be used for drum storage.
- A sanitation permit was issued in 1969 at the subject property for a new septic drain field, which was apparently converted to a sanitary sewer connection in 1976.
- During the site reconnaissance conducted for the 2000 Phase I ESA, the warehouse was reportedly being used for offices, storage of wood and paper products, and furniture manufacturing. Businesses operating in the warehouse at that time included Sol Pro, Defiance Forest Products/Pacific Paper, Norstar, Trendwest, Inc., Glacier Manufacturing, and Mapletex.
- AGRA noted fill and vent pipes for a UST on the subject property during the site reconnaissance. Mr. Granum (the current property owner) told AGRA that the UST was emptied and a tightness testing had been recently performed.

- Also noted during AGRA's site reconnaissance were numerous paint and solvent containers in Trendwest's furniture manufacturing area. Paint containers in the paint room were noted to have leaked down the counter and sink.
- AGRA observed one groundwater monitoring well located on the southwestern side of the subject property, close to Lincoln Avenue. The AGRA report stated that past reports had listed two additional wells on the subject property. These two additional wells were not observed by AGRA, but were reportedly located in the northwest and northeast corners of the subject property.
- An environmental database search for the subject property done in 2000 by AGRA showed the subject property as a registered UST site. The UST was registered at 3401 Lincoln Ave under Accurate Packaging Company, a predecessor to Glacier Packaging. A phone call was made to Ecology's Southwest Regional office to understand why the current EDR report did not list this UST. Ecology reviewed their database and determined that the listing under Accurate Packaging at 3401 Lincoln was determined in 2002 to be an "exempted tank", and so was moved off the active database to an "historical" table.
- A 1991 soil and groundwater investigation was apparently performed on the subject property by Enviro Applied Technologies. Floyd|Snider was not able to obtain a copy of this soil study for review. However, based upon AGRA's summary of this investigation, elevated levels of total petroleum hydrocarbons (TPH) were identified in small, localized areas around the warehouse. These areas were located near utility line and the building foundations, posing difficulties for excavation. Groundwater was found to flow to the north and contained "elevated levels of formaldehyde, total arsenic, chromium, and lead in on-site, upgradient monitoring wells", but were assumed to be related to migration of contaminants from Reichhold Chemical, Inc. Elevated levels of metals were found in one other well and assumed to be related to migration of contaminants from the Don Oline Landfill, or high suspended solids content in the samples.
- An asbestos survey was reportedly conducted on the warehouse by Saltbush Environmental Services, Inc. in July 1994. Four asbestos-containing materials were identified, including boiler room pipe insulation, 9-inch by 9-inch floor tile, ceiling texture, and aircell pipe insulation, some of which was reported to be damaged. A copy of that report was requested from the site owner but they were not able to locate the report.

#### **4.1.3.6 Area-wide Environmental History and Current Conditions Summary**

A summary of the history of hazardous waste contamination in the general vicinity of the subject property is presented based upon review of the RI of the PSC facility (PSC 2005) and the ProLogis Site (Floyd|Snider 2006), which is located close to the subject property. These reports represent comprehensive studies of both site history and soil and groundwater conditions. The area discussed in these two reports is primarily impacted by the land disposal and treatment of hazardous wastes and petroleum products from Don Oline Landfill and/or the CleanCare site. The following paragraphs summarize the history of this area and identify some of the more significant environmental conditions documented to exist within the area and the potential impact of these environmental conditions upon the subject property.

*Don Oline Landfill*

Prior to the 1960s, the Don Oline Landfill area was marsh land intermittently filled in with dredge spoils, wood waste, and sawdust. Don Oline acquired the southern part of the current PSC facility between 1965 and 1969 from the Educators Manufacturing Company, which purchased it from private individuals and the Port of Tacoma in 1961. Don Oline allowed the dumping of various industrial wastes and fill material on the low areas of his property and by 1974, the area was mostly filled in. Wastes reportedly dumped in this area include dredge spoils, ground automotive interiors (auto fluff), demolition debris, lime solvent sludge (which may contain chlorinated solvents from the former Hooker Chemical, now Pioneers America) and high pH waste lime sludge (from Domtar Industries).

In 1970, a subsection of the PSC property, Parcel A, was leased to an oil storage and waste oil recycling company called Aero Oil. This facility operated an unlined waste oil pond that was later expanded upon by Puget Sound Industrial Petroleum by the addition of 2, 10,000-gallon barrels placed on the site to store waste oil. The pond operated until 1975 when it was pumped out, filled with inert materials, and covered with 2 feet of fill under order from Ecology. However, Don Oline, who still owned the property, reportedly continued to allow dumping of wastes oils and sludges in the marsh area north and west of Parcel A.

In 1975, Chemical Processors, Inc. (Chempro) assumed operation of the oil-recycling facility, added a chemical treatment facility for neutralization of liquid inorganic wastes, and added tanks to store and treat these wastes and generated wastewaters.

Don Oline subdivided and sold his property in the early 1980s and Chempro continued to recycle waste oil on Parcel A until the mid 1980s when their lease expired. In 1987, remedial activities occurred after the dismantling of the tanks. Approximately 1,300 cubic yards of oil-impacted soil was excavated to a depth of approximately 4 feet, followed by placement of a 40 mil HPDE membrane and soil cap. Contaminated soil underneath the former chemical treatment facility tanks was also excavated. Burlington Environmental Inc. (Burlington) purchased Parcel A in 1992 from the Solidus Corporation and that parcel has remained unoccupied except for storage of inert materials. Burlington is a wholly-owned subsidiary of PSC.

Parcel B is located directly west of Parcel A and was the location of a pond in 1974, possibly used for oil dumping. Chempro operated a "letter tank" system there in the mid-1970s. The letter tanks were used for the storage and treatment of oily sludges, caustics from plating, and chemical milling. The letter tank operation ceased in the late 1980s and the tanks were all decommissioned and removed. Burlington purchased Parcel B as part of its acquisition of Chempro in 1992. Since that time, Parcel B has been used primarily for container storage.

Parcel C is PSC's treatment and storage area, which processes acids, caustics, and metal-containing wastes. Chempro began operations on Parcel C in 1987, and the processed wastes may have contained chlorinated solvents, acids, phenolics, and heavy metals. Waste oil is also blended on this parcel.

There is little evidence for documented hazardous wastes operations outside of these areas.

The past history of the resource recovery area of PSC (a transportation subsidiary) was primarily used as a log sorting yard in the 1970s, as was the "leased area," which was leased by Freeway Containers from Chempro from 1986 through 1991.

#### *CleanCare Corporation*

This site was once marshland that was sold by the Port of Tacoma in 1961 to Educators Manufacturing Company. Don Oline purchased the property in 1969 when a pond existed on it and began filling it in with sand, gravel, dredge spoils, lime solvent sludge, waste, auto fluff, demolition debris, and possibly slag. The site was mostly filled in by the early 1970s and hazardous waste operations begin in 1974 when the western half of the site was leased to Poligen, who used it to support the solvent recycling operations at Lilyblad Petroleum facility elsewhere in the tideflats. Poligen purchased the property in 1981, along with the parcel to the south leased to Chempro. In the mid-1980s, Poligen bought the parcels to the east, expanded operations, and changed its name to Northwest Processing. Northwest Processing submitted for a RCRA Part B permit in 1988, which was followed by a RCRA Corrective Action Order signed by Northwest Processing, Sol Pro, and Chempro.

Northwest Processing recycled solvent for CleanCare until they merged into one company under the name of CleanCare in March 1992. In 1998, CleanCare was purchased by Bromley-Marr. Waste solvents, petroleum, and antifreeze were accepted for recycling, storage, and transfer to another TSD facility or blending into hazardous waste fuel. In July 1999, Ecology issued an administrative order requiring CleanCare to, (1) revise its operating plans and procedures, (2) add or upgrade containment, and (3) stop several processes until adequate containment was achieved. CleanCare stopped accepting wastes from customers and threatened to walk away from the site unless other financial arrangements were made. Ecology issued an administrative order requiring CleanCare to provide Ecology with plans for security, spill management, and closure of the facility in August 1999. CleanCare ceased and abandoned operations in November 1999.

A number of documented and potential chemical releases to the environment have occurred at the CleanCare facility. In 1994, CleanCare installed eight groundwater monitoring wells and samples were collected regularly from these wells during 1994 and 1995. Analytical results from these samples showed benzene, tetrachloroethene (PCE), trichloroethene (TCE), vinyl chloride, lead, and arsenic concentrations consistently greater than applicable groundwater action levels. Following CleanCare's abandonment of the site, USEPA performed an emergency removal action that removed all aboveground wastes, including emptying the contents of the aboveground tanks and removing more than 2,000 drums from the CleanCare facility. These actions were completed by 2000. USEPA also sampled soil beneath chemical storage areas to determine the nature and extent of contamination. Surface soil was found to be contaminated and USEPA installed an asphalt cap over the soil (USEPA 2000).

In 2002, the Tacoma/Pierce County Health Department performed a site hazard assessment of the CleanCare facility that involved installing additional monitoring wells and collecting soil and groundwater samples. In 2005, as part of the RI for the ProLogis site, ProLogis sampled selected wells on the CleanCare facility. Results of both investigations are discussed below.



*Summary of Current Environmental Conditions in the Area of Interest*

As a result of these past activities, hazardous wastes have been deposited in various areas and releases of hazardous substances have occurred to soil and groundwater area-wide. Intensive investigations of soil and groundwater conditions by CleanCare, PSC, and ProLogis have identified the approximate limits of soil and groundwater in this area. Contamination is primarily characterized by three types of hazardous substances in both soil and groundwater: petroleum hydrocarbons, heavy metals, and solvents. Petroleum hydrocarbons, in the gasoline to heavy oil range, are primarily attributable to waste oil dumping and petroleum recycling activities. Heavy metals are primarily attributable to auto fluff and lime solvent sludge. Chlorinated solvents are generally confined to areas with occurrences of lime solvent sludge. Other contaminants were detected in limited occurrences, such as PAHs, PCBs, and pesticides. PCBs were associated with either waste oils or auto fluff. In nearly all cases, the soil contamination is limited to the areas of fill where hazardous materials or petroleum products were placed.

Groundwater is also impacted by petroleum hydrocarbons and benzene, and to a limited extent by heavy metals and chlorinated solvents. With the exception of the light non-aqueous phase liquid (LNAPL) release found primarily on the Potter Property (aka Handan Containers), groundwater does not appear to be impacted by a plumes of groundwater contaminants that can be mapped area-wide. Chlorinated solvents appear to be undergoing biodegradation, which limits their mobility. Groundwater contamination is limited mostly to specific wells in areas associated with impacted fill and is also found mostly in the shallow aquifer. The highest concentrations of contaminants appear to be present in wells located on or close to the CleanCare facility.

Appendix A contains a series of selected figures reproduced from both the PSC and ProLogis RI reports that best identify the extent of fill types and the extent of soil and groundwater contamination near the subject property.

The following table summarizes known environmental conditions at properties within and near the Don Oline Landfill and CleanCare facility.

<b>Property</b>	<b>Waste Types Deposited or Spilled at Site</b>	<b>Soil Contaminants Identified</b>	<b>Groundwater Contaminants Identified</b>	<b>Comments</b>
Parcel A on PSC	Waste oil, lime solvent, sludge	Heavy metals, benzene, TPH	TPH, benzene	Location of former waste oil pond in 1970s.
Parcel B and C on PSC	Waste oil, auto fluff	Heavy metals, benzene, PCE, TCE, TPH (diesel to oil range)	Heavy metals, TPH, benzene, phthalates, lindane	Location of former waste oil pond and treatment of oil and caustics.
Resource Recovery Parcel of PSC	Wood debris, gypsum lime waste	None identified	TPH (diesel to oil range) in limited areas	

Property	Waste Types Deposited or Spilled at Site	Soil Contaminants Identified	Groundwater Contaminants Identified	Comments
Freeway Containers Parcel of PSC	Wood debris, auto fluff, gypsum lime sludge, waste oil	Heavy oil TPH, PCB, heavy metals	TPH diesel to oil range	PCB and heavy metals in western area and associated with auto fluff. TPH is more widespread in other areas of site due to past waste oil disposal.
ProLogis Site	Wood debris, lime sludge	Heavy metals, TPH, PCP	Benzene, lead, PCP	Lime sludge free of solvents and groundwater contamination limited and low level.
Potter Property (aka Handan Containers)	Waste oil, auto fluff, gypsum lime sludge	TPH (as LNAPL and in soil)	TPH (gasoline to oil range and as LNAPL, benzene)	LNAPL migration from off-site Parcel A.
Hylebos Marsh	Demolition and wood Debris	TPH	TPH (diesel)	Very limited detection of TPH in samples.
Emerald Services (aka Sol Pro Inc.)	None identified	No significant soil contamination identified	Low levels of benzene, toluene, TPH in certain upgradient wells	Limited groundwater contamination thought attributable to off-site migration from Parcel A.
CleanCare	Gypsum lime sludge, lime solvent sludge, waste oil, auto fluff, slag, solvent spillage, process sludge spillage	Heavy metals, PAH, PCE, TCE, benzene, TPH (gasoline to oil range)	Lead, benzene, TPH (gasoline, to diesel range, PCE, TCE	Contamination due to both Don Oline fill activities and releases from CleanCare operations.

**4.2 HISTORICAL USE INFORMATION ON THE PROPERTY**

The following sources of information were used to compile historical use information for the subject property and adjacent properties:

- Pierce County Assessor/Treasurer Records
- Land title records
- Aerial photographs from 1930s to 2005
- Topographic maps from 1900 to 1994
- Sanborn Fire Insurance Maps from 1950 and 1965
- City directory abstracts for the period from 1963 to 2006

Aerial photographs are presented in Appendix D, including an oblique aerial taken in 1958; the Sanborn maps and city directories are included in the EDR Report (Appendix B).

A detailed review of historical use information was performed for the subject property to evaluate possible past property use. A detailed listing of the observations from review of the historical use information is provided below as the basis for identifying past uses.

#### 4.2.1 Ownership Record Review

According to the Pierce County Assessor/Treasurer property records for the subject property, the current property owner is Educator Building, L.L.C. Active personal property parcels listed as being present at the subject property include: Mapletex, Inc. (located at 3401 Lincoln Avenue); Full Container Recovery (located at 3403 Lincoln Avenue); and Glacier Packaging, Inc. (located at 3405 Lincoln Avenue).

A land title records report prepared by Chicago Title Insurance Company for the subject property was provided for review by the Port. Ownership information provided in the land title report is summarized below:

- The first available record for the subject property is from 1946, where Buffelen Lumber and Manufacturing Company granted the City of Tacoma, on behalf of the Department of Public Utilities, Belt Line Division, an easement for constructing, operating, and maintaining a railroad spur track on a portion of the subject property. The spur track was stated to serve the Buffelen Planing Mill and the Mutual Fir Column Company. These facilities were located directly to the northwest of the subject property.
- In 1950, an easement agreement was recorded between Buffelen Manufacturing Company and the City of Tacoma regarding a Municipal Belt Line railroad.
- In 1956, an easement was granted to the City of Tacoma to install an eye bolt and equipment in the southerly wall of a building located on the subject property. The easement agreement was signed by J. Philip Simpson and Hazel M. Simpson, who were listed as the recorded owners of the premises.
- In 1958, an easement agreement was signed by J. P. Simpson with the Port regarding the conveyance of excess water from the subject property.
- In 1981, a real estate contract states Tacoma-Pacific, Inc. as the seller and the purchasers as Ronald L. Moore and Alice Jean Moore, Donald J. Foote and Pat D. Foote, and Michael H. McCallum and Diane M. McCallum. A property lease was listed in this contract between the seller and Hauserman, Inc. This lease was dated November 1, 1980.
- By 1991, the subject property was owned by the Simpson Family Trust, as indicated by an easement signed between the Trustees and the Washington Natural Gas Company. The easement was for a gas pipeline on the subject property.
- In May 1992, a statutory warranty deed was signed by the Trustees on behalf of the Simpson Family Trust, conveying the subject property to Douglas C. Granum and Katherine T. Granum.

- In September 1994, a deed of trust was signed by the Granums. Tenants listed on the subject property at this time included: American Tar Company (entered into a lease with Granums in August 1993); City Delivery, Inc. (entered into a lease with the Granums in December 1992); Mapletex, Inc. (entered into a lease with Granums in January 1994); Norstar Cargo Systems, Inc. (entered into a lease with Granums in April 1994); and Sol Pro, Inc. (entered into a lease with Granums in December 1993).
- In August 1998, Douglas C. Granum and Katherine T. Granum formed the Educator Building, L.L.C. and the subject property title was assumed by this corporation.
- In 2000, records on the subject property show that the following companies leased a portion of the subject property from Educator Building, L.L.C.: American Tar Company (lease amended in August 1995); Sol Pro, Inc. (entered into lease in October 1997); Glacier Packaging, Inc. (entered into lease in December 1997); Pacific Paper (entered into lease in July 1998); and Mapletex, Inc. (lease amended in January 1997). Edwin Enterprises, Inc., doing business as Defiance Forest Products, was also listed as having a lease with Educator Building, L.L.C. in 2000.

#### 4.2.2 Historical Aerial Photograph Review

Aerial photos encompassing the subject property and adjacent properties were obtained from the City of Tacoma, EDR, and Aero-Metric (formerly Walker & Associates) for review (Appendix D). Observations from review of the aerial photographs are summarized in the following paragraphs.

**1931.** The 1931 aerial photograph shows that the subject property is an undeveloped marsh. There are no structures present on the subject property. A roadway is present southeast of the subject property, which is in the current location of Lincoln Avenue.

A large industrial building, likely the Buffelen/Mutual Fir Column Company facility, is present on the property north of the subject property. This large building is connected to other industrial buildings located across Taylor Way to the northeast. Two smaller industrial buildings are located immediately east of the subject property and Lincoln Avenue. The remaining properties surrounding the subject property also appear to be undeveloped marsh lands.

**1946.** The 1946 aerial photograph shows that the subject property is generally similar to the conditions observed in the 1931 photograph, remaining primarily an undeveloped marsh. However, there does appear to be some filling or grading in the northwestern portion of the subject property. This grading activity is associated with the property located to the north of the subject property. Several small buildings may be present along the southeastern edge of the subject property. The adjacent property to the north shows increasing site development, with expansion of the industrial building observed in the 1931 aerial photograph and a large graded area to the east of this industrial building and to the northwest of the subject property.

With the exception of the adjacent properties to the north and east of the subject properties, the remaining adjacent properties surrounding the subject property appear to be covered by marshes.

**1950.** Additional grading or filling appears to have occurred on the northwestern portion of the subject property. Again this grading is associated with the adjacent property to the north. The remainder of the property still appears to be an undeveloped marsh. The southeastern edge of the subject property, along Lincoln Avenue, appears to be used as parking area and several small buildings also still appear to be present, possibly linked to the industrial facility located directly across Lincoln Avenue to the east.

It appears that a rail spur has been added to the industrial facility located on the property north of the subject property, leading from Taylor Way to the southern part of the facility. To the east of the facility, the large graded area previously observed in the 1946 aerial photograph is now being used as a large parking and storage area, possibly for railcars or truck trailers and stacked wood. As mentioned above, this graded parking and storage area extends onto the subject property. The industrial facility to the east of the subject property does not appear to have changed and the remaining properties around the subject property still are undeveloped marsh lands.

**1958.** An oblique aerial obtained from the Tacoma Public Library's Photography Archive shows the newly constructed Educator Building. Stacks of lumber or finished wood products are visible on the adjacent lot to the north now occupied by the current day Rangar Building. According to the photo description, "Educators Mfg. made school furniture in a one million dollar facility on ten acres in the Tideflats for mass production of quality controlled classroom equipment. They apparently shared the same address with Buffelen Woodworking & Buffelen Sales Co". The photo shows a view of the large plant constructed of three connected buildings. The buildings for the Reichhold Chemical plant are visible directly across Lincoln Avenue.

**1961 and 1965.** Significant changes were made to the subject property and adjacent parcels by 1961 as the large manufacturing building is visibly covering a majority of the property. This warehouse was expanded slightly westward on the subject property by 1965. Most of the remaining portion of the subject property appears to have been paved.

To the north of the subject property, several more buildings have been added to the industrial facility. The area to the east of this industrial facility remains a storage and parking area. To the northwest of the subject property, the tidal marsh observed in the 1950 aerial photograph has been replaced with large ponded areas that extend westward. Filling has occurred on the properties to the southwest of the subject property. With the exception of a couple of smaller industrial buildings constructed on these properties, these properties generally remain undeveloped. The former marshy area to the south of the subject property has been filled in and a large industrial complex, possibly with a large holding pond, has been constructed, near the intersection of Lincoln Avenue and Alexander Avenue.

**1969.** The 1969 aerial photograph shows the subject property in the same configuration as seen in the 1965 aerial photograph. The paved areas on the western and southern sides of the building appear to be used for employee parking. Adjacent properties are also generally the same. Further to the west of the subject property, there is evidence of significant filling occurring in one of the large ponded area that was observed in the 1965 aerial photography. This material is light colored, considerably lighter than any surrounding soil.

**1973/74.** The subject property and structures appear similar to the 1965 aerial photograph. By 1973, the large ponds to the northwest of the subject property and further west have been

completely filled in. There are two new industrial facilities located near the subject property. One new industrial building is located directly south of the subject property and is likely the current day Pacific Paper warehouse. The other facility is located west of the subject property, but does not appear to be directly adjacent to the property boundary. This facility to the west appears to contain two large holding tanks, a large pond, and several smaller buildings. Evidence of filling originating at the adjacent site to the east (the Don Oline Landfill) is visible as a series of dump truck piles that may extend close to or onto what may be the northwestern border of the subject property. This filling apparently eliminated the former large ponded area occupying mostly the ProLogis/Clean Care sites visible in the 1969 photograph.

**1989.** There appear to be no significant changes on the subject property when compared to the 1973/74 aerial photographs. A stormwater detention pond is observed adjacent to the northern border of the subject property. There are also several new industrial facilities located adjacent to the subject property and industrial facilities that have been expanded and removed. Bordering the subject property to the east and to the southwest are three new industrial facilities. The other facility to the west of the subject property, which contained the two large holding tanks and a large pond, is no longer present and the pond appears to have been filled in. The industrial facility located directly south of the subject property has undergone expansion.

**1996.** The subject property and structures appear similar to the 1989 aerial photograph. Truck trailers are being stored on the western edge of the subject property. Many truck trailers are visible in the parking area located northeast of the subject property. The stormwater detention pond located along the northern border of the subject property is still present, but the western portion of the pond has been filled in and is being used for truck trailer parking. Other industrial facilities surrounding the subject property generally have remained the same in comparison to the 1989 aerial photograph.

**2000.** The large industrial facility located immediately north of the subject property (present since at least 1930) has been demolished and replaced with a large warehouse. A small stormwater retention area still remains on the border of this northern property and the subject property. No other significant changes are visible on the subject property.

#### **4.2.3 Historical Topographical Map Review**

Historical topographic maps encompassing the subject property and adjacent properties were obtained from EDR for review. Observations from review of the topographic maps are summarized in the following sections.

**1900.** The subject property and surrounding area was not developed at that time. The area of the subject property appears to be a submerged marsh. A channelized water feature is present in the approximate location of the current mouth of the Hylebos Waterway.

**1961.** The large warehouse building on the subject property visible on the 1961 aerial photograph is present on the 1961 topographical map. Two rail lines appear adjacent to the property, running along both sides of Lincoln Avenue. The large ponded area directly northwest of the subject property, observed in the 1965 aerial photography, is present on this map, as well as the connected larger ponded area observed further westward.

**1968.** In this map, the large warehouse building on the subject property has been expanded westward and has a similar outline compared to the building visible in the 1965 aerial photograph. The large ponded area to the northwest of the subject property is still present on the map, but has been significantly filled in. The other large ponded area further to the west of the subject property is no longer present on the 1968 topographic map (referring back to the 1969 aerial photograph, the large pond is in the process of being filled.)

**1973 and 1981.** The rail line that was present in the 1968 topographic map in the 1973 and 1981 topographic map is no longer present. (It was located on the western side of Lincoln Avenue adjacent to the subject property )

**1994.** The topographic map from 1994 appears similar to the topographic maps from 1973 and 1981 and does not provide additional information concerning site use at or in the vicinity of the subject property.

#### **4.2.4 Sanborn Fire Insurance Map Review**

Sanborn Fire Insurance Maps encompassing the subject property and adjacent properties to the north, west, and east were obtained from EDR for review. There is no coverage for the properties located south of the subject property on the Sanborn Fire Insurance Maps. The Sanborn Fire Insurance Maps are included in Appendix B. Observations from review of the Sanborn Maps are summarized in the following sections.

**1950.** There is nothing present on the subject property on the 1950 Sanborn Fire Insurance Map. Lincoln Avenue is adjacent to the west of the subject property as well as the Tacoma Municipal Belt Line Railroad. The rail line appears to run down the center of Lincoln Avenue on the map.

Directly north of the subject property is an industrial complex with at least four buildings present. The companies identified at this industrial complex include the Buffelen Lumber and Manufacturing Company and the Mutual Fir Column Company. There is also a rail line on this property extending from Taylor Way to the southern portion of the industrial facility. Northeast of the subject property and to the east of the industrial complex is a large area apparently used by Buffelen Lumber and Manufacturing Company and/or the Mutual Fir Column Company for storing lumber in transit.

**1965.** On the 1965 Sanborn Fire Insurance Map, a large manufacturing building is present on the subject property identified as Educators Manufacturing Company. This company appears to be a furniture manufacturing company, based on the areas identified within the building, which include the following:

- Planing and plywood warehouse
- Woodworking machine area
- Staging area
- Veneer cutting and gluing area
- Assembling and finishing area

- Crating and shipping area
- Warehouse and shipping area

There is also reference on the map to an area of irregular lumber piles located directly north of the large manufacturing building. The Sanborn Map makes reference to the building being heated by hot air with blowers and shows a boiler room along the northwest side with the words "oil" and "vent," indicating a possible UST in this area.

The Educators Manufacturing Company also appears at the industrial facility directly north of the subject property, which was formerly occupied by Buffelen Lumber and Manufacturing Company on the 1950 Sanborn Fire Insurance Map. The Mutual Fir Column Company is still present at this industrial facility, located in the buildings on the west side of the complex. The 1965 Sanborn Fire Insurance Map shows that this industrial complex in the same configuration as the 1950 Sanborn Fire Insurance Map.

#### 4.2.5 City Directory Review

A historical city directory abstract for the subject property and surrounding area was obtained from EDR for review. A summary of the listings for the time period from 1963 to 2006, in approximately 5-year intervals, was provided in the abstract. The city directory abstract is included as Appendix B. The listings provided in the abstract for the subject property (3401 Lincoln Avenue) are the following:

- 1963: Address listed as Buffelen Sales Company and Educators Manufacturing Company.
- 1969: Address listed as Educators Manufacturing Company and Tacoma Pacific, Inc.
- 1975: Address listed as Educators Manufacturing Company (Div Hauserman) and Tacoma Pacific, Inc.
- 1982: Address listed as Hauserman, Inc.
- 1988: Address listed as Mapletex, Inc.
- 1996: Address listed as Sol-Pro, Mapletex, Inc., and Defiance Forest Products.
- 2002: Address listed as Emerald Services, Trendwest, Inc., and Defiance Forest Products.
- 2006: Address listed as BLC Trucking, Sol-Pro/Lilyblad Hazardous Waste, and Defiance Forest Products.

The listings provided in the abstract for the adjacent properties include the following:

##### 2000 Taylor Way (located north of the subject property)

- 1963 and 1969: Address listed as Mutual Fir Column Company.
- 1975 and 1982: Address listed as Lindal Cedar Homes (Plant).
- 1988: Address listed as AOL Express Inc., APR Forwarders, and J B Gottstein & Company.



- 1996: Address listed as AOL Express Inc. and Carr Gottstein & Company.
- 2002: No address listed.
- 2006: APR Forwarders, Inc.

3319 Lincoln Avenue (located south of the subject property)

- 1963: No address listed.
- 1969, 1975, 1982, and 1988: Address listed as Pacific Paper Products.
- 1996: Address listed as Pacific Paper Warehouse.
- 2002: No address listed.
- 2006: Address listed as Pacific Paper.

1851 Alexander Avenue (located south of the subject property)

- 1963, 1969, 1975, and 1982: No address listed.
- 1988: Address listed as Standard Mechanical (Warehouse).
- 1996: Address listed as B J West and Transchem.
- 2002 and 2006: Address listed as Western Metal Lath, Inc.

1825 Alexander Avenue (located south of the subject property)

- 1963, 1969, 1975, and 1982: No address listed.
- 1988: Address listed as Sol-Pro (Recycling Plant).
- 1996, 2002, and 2006: No address listed.

1510-1540 Taylor Way (located west of the subject property)

- No addresses listed between 1963 and 2006.

No city directory listings were provided by EDR for the adjacent property to the east of the subject property.

#### **4.2.6 Summary of Subject Property Historical Uses**

The detailed review of historical use information identified the following predominant uses for the subject property:

- The subject property was primarily undeveloped marshlands from the 1930s to the 1950s. During the 1940s and 1950s some grading or filling occurred on the north end of the subject property.
- A large manufacturing plant was constructed on the subject property in 1958. The remainder of the subject property also appears to have been paved by this time.

- Educators Manufacturing Company operated at this facility during the 1960s and 1970s constructing school furniture. Tacoma Pacific, Inc. also operated at this facility during part of this time.
- Based on the review of the city directories and the title report, many tenants have operated within the large warehouse on the subject property over the past several decades (1980s to 2006). These companies include: American Tar Company; City Delivery, Inc; Mapletex, Inc.; Norstar Cargo Systems, Inc.; Sol Pro, Inc.; Glacier Packaging, Inc.; Pacific Paper; Defiance Forest Products; and others.



## 5.0 Site Reconnaissance and Site Owner Interview

### 5.1 TIMING, PARTICIPANTS, AND METHODOLOGY

#### 5.1.1 Date and Time of Site Reconnaissance and Interview

A site reconnaissance of the subject property and adjacent properties was performed on August, 23, 2007, between the hours of 9:00 am and 11:00 am. A telephone interview<sup>2</sup> with Ms. Kit Granum, the owner of the subject property was performed on September 13, 2007. Additional questions were asked of Mr. Doug Granum on September 17 and 19, 2007.

#### 5.1.2 Individuals Conducting Site Reconnaissance and Interview

The site reconnaissance was performed by Tom Colligan and Jill Thomas of Floyd|Snider. The owner interviews were performed by Tom Colligan.

#### 5.1.3 Site Representatives Present During the Inspection

Todd Clarke of GVA Kidder Matthews, broker representing the property owners, was present during the site reconnaissance.

#### 5.1.4 Description of the Site Reconnaissance and Interview Process

The site reconnaissance was performed on foot beginning along the Lincoln Avenue (southeastern) portion of the subject property and then generally proceeded to the south, west, north, and northeastern portions of the property. An interview of Mr. Clarke was performed during the course of the reconnaissance. Following the reconnaissance, supplemental questions were submitted to Mr. Clarke that were in turn transmitted to the property owners. Their response to the supplemental questions asked during a telephone interview is included as Appendix E. Information learned during that interview is described in Section 5.3 below.

### 5.2 SITE RECONNAISSANCE OBSERVATIONS

A site reconnaissance was performed to obtain information regarding potential RECs at the subject property. The following discussion summarizes observations made during the site reconnaissance and the information provided during the owner interviews.

The Educator Property is bounded by Lincoln Avenue, the Rangar Building, the ProLogis property, the CleanCare facility, Pacific Paper, Western Metals and Emerald Services (aka Sol Pro, Inc.). These properties were observed from the subject property during the site reconnaissance.

<sup>2</sup> A request was made by the attorney for the Granum's to have the Granum's provide verbal but not written responses to interview questions. A copy of that letter is provided in Appendix D.

The Educator Building is an older wood frame building. It was originally used, according to Mr. Clarke, by a cabinet manufacturer. The current owners acquired the building 12 to 15 years ago. They have made no major improvements to the property apart from conducting routine maintenance, such as roofing maintenance.

There are two access points to the property from Lincoln Avenue, one at either end of the building. The Lincoln Avenue (southeast) side of the building has an active railroad spur operating parallel to the roadway. The area along that side of the building is roughly graded dirt and gravel. The access road on the southwest side of the building is paved. This area provides truck/trailer access to the tenants along this side of the building; the majority of this area is paved and appears to have only one stormwater drain, located mid-building. A larger truck/trailer access and storage area is located along the northwest side of the building and is primarily unpaved and roughly graded dirt and gravel, apart from a small paved section immediately adjacent to the building. There are areas of grasses and blackberry vines along the fence line between the subject property and the CleanCare and ProLogis properties. The access road along the northeast side of the building is a narrow, unpaved road with an inactive railroad spur located between the access road and the building.

The Educator Building and property has a number of businesses operating on the premises. Some of the tenant areas inside the building overlap or are commingled, making determination of which business is operating in a specific location difficult. No interviews were conducted with tenants at the time of inspection due to the sensitivity of the transaction. The following businesses are current tenants and involved in the following activities<sup>3</sup>:

1. **BLC Trucking**—this business appears to do minor mechanical repairs on truck parts and has a small storage area for parts.
2. **Glacier Packaging**—this manufacturing business applies wax to corrugated containerboard, providing waxed containers for shipment of fruit, etc. There is a large storage area with pallets of waxed and unwaxed containerboard, as well as an area with equipment that applies the wax to the containerboard. The wax used by Glacier Packaging is brought in by railcar along the active spur. There were two railcars located on the spur next to the Glacier Packaging business during the site reconnaissance.
3. **Defiance Forest Products**—this business is a warehouse for lumber products produced at a nearby sawmill and is only used for dry storage (information provided by a Defiance Forest Products employee). However part of the inside space used by Defiance co-mingles with space used by Emerald Services, discussed below.
4. **Emerald Services**—this business leases both office space on the second floor (not inspected) and warehouse space in the Educator Building. This business is affiliated with the Emerald Services TSD facility located to the west of the property line with the subject property. They apparently repackage recycled fluids such as antifreeze, cleaning, and possibly solvent chemicals from large totes into smaller containers (information provided by an Emerald Services employee). There are many large totes of windshield wash fluid, xylene, and other chemicals, and pallets of smaller containers (5-gallon buckets) also containing similar chemicals. This area also

<sup>3</sup> Information on tenant activities was provided by Mr. Clark and supplemented with visual observations.

appears to be used for storage of miscellaneous mechanical equipment and janitorial cleaning supplies.

5. **One Reel**—this business is an entertainment event producer. This area appears to be used primarily for storage of a variety of items such as ticket booths and clown figures. The area was formerly occupied by Trendwest, a cabinet maker; there is unused ventilation piping along the ceiling in two areas and an abandoned tanker car located on the inactive rail line outside this part of the building, which may have received wood dust from the cabinet building process. There were no employees on-site during the site reconnaissance.
6. **Mapletex**—this manufacturing business produces wood-based products such as food preparation cutting surfaces and skate ramps. They have pallets of pressed board and equipment for cutting and shaping the board.
7. **Full Container Recovery**—this business destroys off-spec beverages. The liquid waste appeared to be piped to a tanker truck located along the east side of the building. Containerboard and glass are separated and packaged for recycling.
8. **City Delivery**—this business uses the unpaved outside area along the northwest side of the property for trailer truck storage.

In addition to the above-noted conditions, the following observations were noted during the inspection of the inside and outside of the facility:

- Chemical odors were noticed in the Emerald Services area.
- A sump was noted inside the Emerald Services area. Other areas of the warehouse had observed cuts in the pavement from unknown past uses that had been asphalted over.
- An aboveground storage tank was noted outside the building between the Defiance Forest Products and the Emerald Services areas. It appeared to be unused and had secondary containment consisting of a galvanized metal container. A storage container was noted inside the building in the co-mingled area between Defiance Forest Products and Emerald Services; it was unclear if it was currently in use.
- Housekeeping appears poor at some of the facilities, particularly in the Emerald Services area and in some commingled areas, where it was not possible to determine which business was responsible.
- Dumpsters were noted to be located outside the Glacier Packaging, Defiance Forest Products, and Emerald Services facilities.

The following features were *not* present during the inspection of the inside and outside of the facility:

- Water bodies, surface impoundments, or holding ponds
- Floor drains or septic systems
- PCB transformers or suspect equipment
- Spills or stains on the concrete or paving material

- Leachate or seeps
- Distressed, discolored or stained vegetation
- Other known or suspect conditions
- Discharges from off-site sources
- High voltage power lines

### 5.2.1 Site Inspection Conclusions

Housekeeping appears to be poor in some of the tenant areas. Insufficient information was obtained concerning the nature of the activities conducted in the Emerald Services leased space. (Emerald Services was interviewed on a subsequent date to fill this data gap as described in Section 5.4.2 )

### 5.3 OWNER INTERVIEW

Telephone interviews of Mr. and Mrs. Granum revealed the following<sup>4</sup>:

- The Granums have owned the Educator Building since 1992.
- They purchased the building from the Simpson Family Trust and have not made any significant building modifications.
- The building was originally built by the Educator Company to construct plastic-laminated furniture for schools and hospitals.
- By the time the building was purchased by the Granums it had already been converted over to the current multi-tenant use.
- A UST exists at the building and was formerly used by Glacier Packaging to heat wax for cardboard containers. It is currently not in use. The Granums know of no other USTs on-site.
- A Phase I report was prepared for the subject property in 2000 as part of a loan refinancing. Findings from that report are discussed in Section 4.1.3.5.
- The American Tar Company and the Fields Corporation were once tenants but their activities were limited to office usage and storage of roofing materials.
- A part-time site manager/maintenance man is employed by the Granums but he was out of town on vacation and was not available for interview.
- The asbestos report apparently done by Saltbush Environmental in 1994 was not able to be located.
- The Granums are unaware of the existence of any monitoring wells or any prior environmental studies being performed at the property.

<sup>4</sup> According to a letter provided by the attorney for the Granums (see Appendix E), they wished to provide verbal answers to an environmental questionnaire, rather than written.

- The Granums are not aware of any environmental violations, spills, or other adverse conditions at the subject property since their ownership.
- The Granums do not possess any building plans.

#### 5.4 LIMITATIONS

The following is a list of limitations that are associated with the site reconnaissance and owner interview of the Educator Building property:

- Mr. Clarke was not fully cognizant as to current tenant activities.
- Tenant personnel were not available to interview at most businesses.
- According to Mr. Clark, some tenants were not amenable to allowing access inside the building space they occupied; therefore not all areas inside the buildings were visually inspected.

#### 5.4 ADDITIONAL INTERVIEWS

##### 5.4.1 Interviews with Local Government Officials

Ms. Kaia Peterson, an Ecology employee who is managing the corrective action at the PSC facility, was interviewed by telephone on August 30, 2007 concerning her opinion of environmental conditions at the subject property. She stated that she had no particular knowledge of environmental conditions at the subject property, but did acknowledge that the extent of the Don Oline Landfill in the western boundary of the subject property was not fully defined. She also stated that she believed Emerald Services repackages fluids generated from the recycling of wastes received and processed at the adjacent Emerald Services TSD but has not inspected their operations at the subject property as it operates outside of the footprint of the TSD.

##### 5.4.2 Interview with Emerald Services

On September 17, 2007, Mr. Steve Banchemo, owner of Emerald Services, was interviewed concerning the activities that occur within their leased space. According to Mr. Banchemo, Emerald Services does not occupy the office portion of the warehouse anymore, as those sales operations have been transferred to their Seattle facility. Emerald Services has leased space at the Educator Building since 2001. They primarily store and repackage recycled fluids for distribution to their customers. The fluids (primarily antifreeze, windshield washer fluid and mineral spirits-type parts washer fluids) are all recycled and purified by distillation at their adjacent TSD and then transported over the warehouse where they are stored in totes and barrels and other containers. They also store adsorbents, empty drums, and other supplies used by their company fleet operations. Occasionally, they utilize the loading docks as a temporary transload facility for their TSD operations to offload containers that otherwise cannot be dropped off at their adjacent TSD.



## 6.0 Findings, Opinion, and Conclusion

### 6.1 FINDINGS

The following is a summary of the key findings from the Phase I ESA for the subject property:

- The site was first developed on former marsh land beginning in the 1950s with the current large wooden structure that occupies most of the subject property developed in 1958. Its original use was to manufacture laminated wooden school and hospital cabinetry.
- A UST is present on the site and used at one time to store heating oil. It is classified as exempt from the UST regulations by Ecology. Historic building permits suggest the existence of a second tank but this could not be verified.
- The building was subsequently used to manufacture wood cabinetry and by the 1980s was used by multiple tenants for a variety of purposes, included warehousing, light manufacturing, storage and packing of industrial fluids (antifreeze, cleaning fluids), and truck/trailer storage and related maintenance.
- No records of environmental spills or cleanups or other significant environmental concerns were found in a search of regulatory databases; however it is possible that unreported spills have occurred in the past both inside the building and outside the perimeter of the building, as housekeeping for some current and past tenants appears to have been poor.
- A floor sump was noted in the Emerald Services area of the building. Where the floor sump discharges was not identified.
- The building was once connected to a septic system.
- The western border of the site lies adjacent to the Don Oline Landfill. Review of aerial photographs suggest that filling activities at the Don Oline Landfill may have extended to include a portion of the northwestern boundary of the subject property.
- Groundwater may flow eastward from the CleanCare facility towards the subject property and may be carrying contamination onto the subject property that originated at the CleanCare facility.
- A former soil and groundwater study indicated minor areas of TPH contamination as well as possible contamination from heavy metals in site groundwater.

### 6.2 OPINION

The impact of the above findings upon the subject property are discussed in this section, along with the logic and reasoning and rationale as to whether or not any of the above findings represent RECs.

Housekeeping in some tenant areas of the property appears to be poor, and these or past tenants with such practices may have historically spilled hazardous substances within the subject property. This may have resulted in past releases to the building floor, or sumps which

may in turn drain to the stormwater or for historic spills, possibly the former septic drainfield. However, without documentation of a known release this is considered a speculative condition and is not considered a REC.

The existence of a heating oil tank installed in 1956 but not currently in use and considered exempt by Ecology is not considered a REC. However, as with all older USTs, it is possible that given the age of the tank, some heating oil may have been released in this area. The exempt status precludes the necessity of this tank as having to undergo a "change in service" notification to Ecology which includes an assessment as to whether the tank had leaked. This "change in service" is required for non-exempted tanks out of service for over one year.

The possibility that a portion of the wastes accepted at the Don Oline Landfill may exist along the northwestern border of the subject property is considered a REC.

The possibility of groundwater contamination due to migration of contamination from the adjacent Don Oline Landfill and CleanCare facilities is considered a REC, as these sites may lie upgradient to the subject property and have known groundwater contamination.

### 6.3 CONCLUSION

Floyd|Snider has performed a Phase I ESA in general conformance with the scope and limitations of ASTM Practice E 1527 at the subject property being considered for purchase by the Port. Any exceptions to or deletions from, this practice are described in Section 7.0 of this report. This assessment has revealed several RECs in connection with the subject property as discussed above.

## 7.0 Deviations

The performance of this ESA was done in general accordance with the ASTM Standard Practice E1527-05, entitled *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*. No deviations of significance from that practice are noted for this Phase I ESA for the subject property.

## 8.0 Environmental Professional Statement

We declare that to the best of our professional knowledge and belief, that we meet the definition of Environmental Professional as defined in Chapter 312.10 of 40 CFR 312 and we have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. We have developed and performed all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

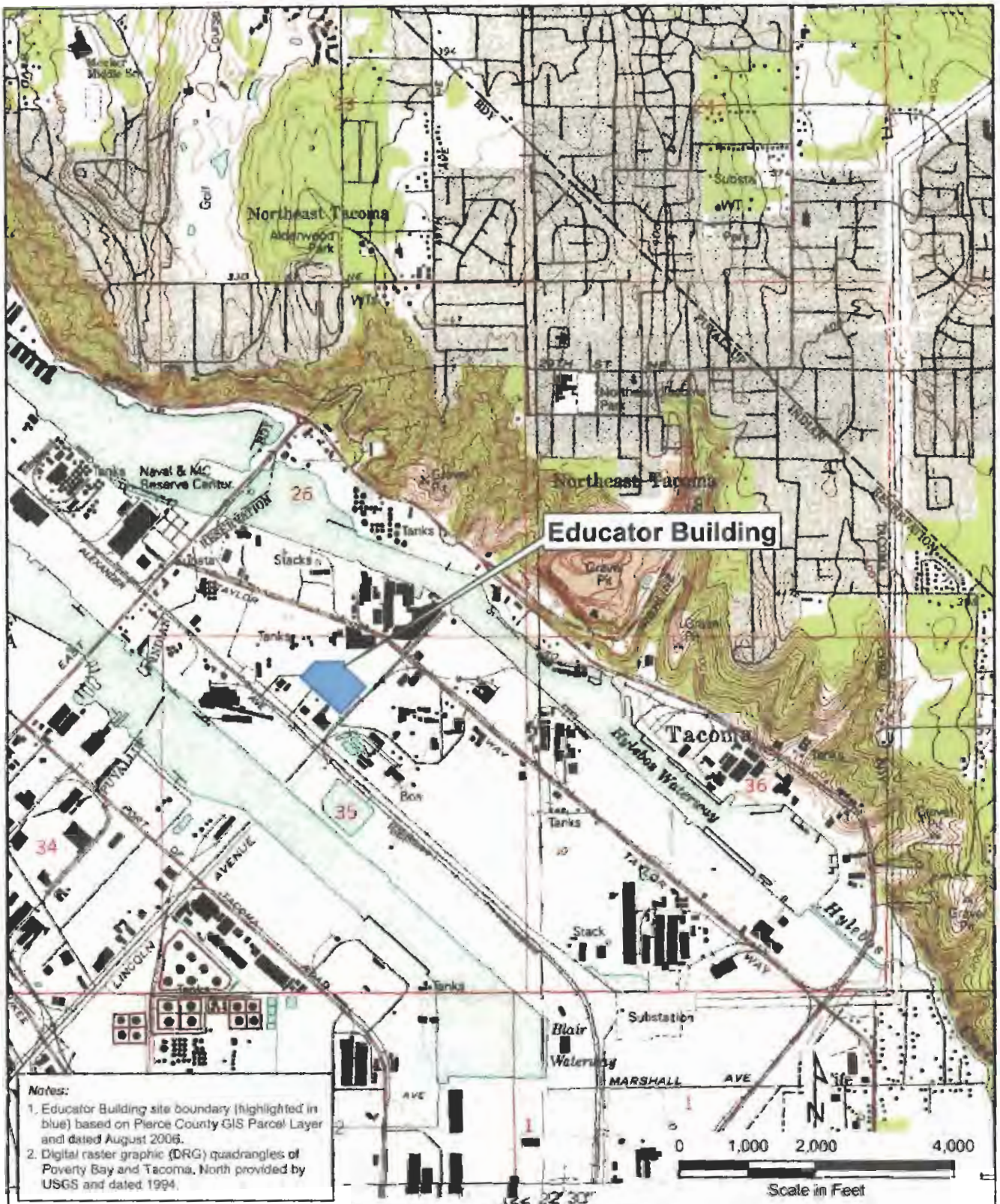
## 9.0 References

- American Society for Testing and Materials (ASTM). 2007. "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process." *Annual Book of ASTM Standards, Volume 11.05, Water and Environmental Technology*. West Conshohocken, Pennsylvania.
- City of Tacoma. 2007. City of Tacoma's Government Made Easy. <http://www.govME.com>.
- Dalton, Olmsted & Fuglevand, Inc. (DOF). 1995. *Interim Remedial Action Report, Taylor Way Properties Site, Port of Tacoma, Washington*. August.
- Department of Archaeology and Historic Preservation (DAHP). 2007. Washington Information System for Architectural and Archaeological Records Data. [http:// www.dahp.wa.gov/](http://www.dahp.wa.gov/).
- Floyd|Snider. 2006. *ProLogis Taylor Way Property Remedial Investigation*. October.
- National Register of Historic Places. 2007. <http://nationalregisterofhistoricalplaces.com>.
- National Wetlands Inventory. 2007. <http://www.fws.gov/nwi/>.
- Phillip Services Corporation. 2005. *Final Comprehensive RI Report, Tacoma Facility, Tacoma, Washington*. January.
- U.S. Environmental Protection Agency (USEPA). 2000. Superfund Fact Sheet, CleanCare, Tacoma, Washington.  
[http://yosemite.epa.gov/R10/CLEANUP.NSF9f3c21896330b4898825687b007a0f33/41acf49d06cb975a88256856005e40f2/\\$FILE/1100cleancare+Final.pdf](http://yosemite.epa.gov/R10/CLEANUP.NSF9f3c21896330b4898825687b007a0f33/41acf49d06cb975a88256856005e40f2/$FILE/1100cleancare+Final.pdf). December.

**Educator Building  
Tacoma, Washington**

**Phase I  
Environmental Site Assessment**

**Figures**



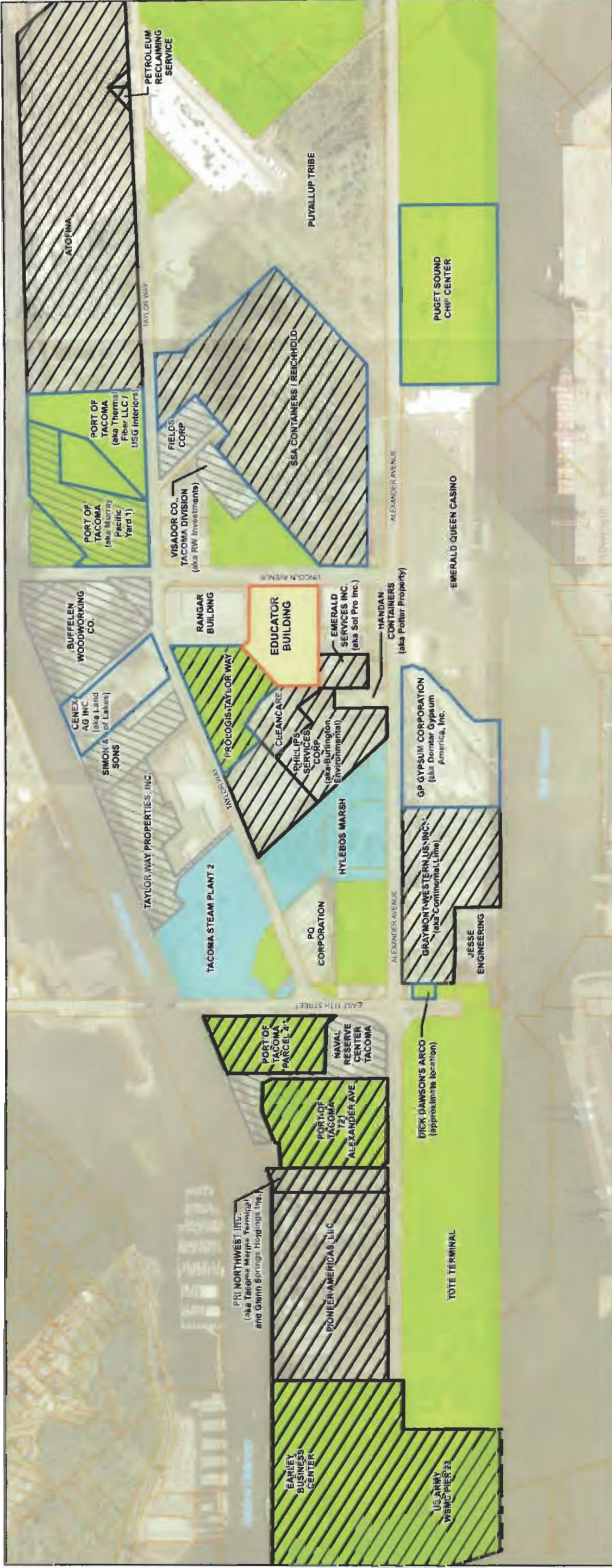
Notes:

1. Educator Building site boundary (highlighted in blue) based on Pierce County GIS Parcel Layer and dated August 2006.
2. Digital raster graphic (DRG) quadrangles of Poverty Bay and Tacoma, North provided by USGS and dated 1994.

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**Phase I ESA  
 Educator Building  
 Tacoma, Washington**

**Figure 1.1  
 Site Vicinity Map**



**Legend**

- Property of Interest
- Port of Tacoma Owned
- City of Tacoma Owned
- Former LUST Site
- MTCA, CERCLA, or RCRA Corrective Action Sites
- No Further Action (NFA) Sites
- Tax Parcels



**Notes:**

- High-resolution orthoimagery provided by USGS and City of Tacoma and dated 2002 and 2005, respectively.
- Parcel data provided by Pierce County and dated 2005.
- Property information obtained through multiple sources including City of Tacoma's govME website, EDR, and Floyd|Snider independent research.
- Cleanup action reported to Ecology.

Figure 4.1  
Surrounding Sites of Interest



**Educator Building  
Tacoma, Washington**

**Phase I  
Environmental Site Assessment**

**Appendix A  
Figures from Other Reports**

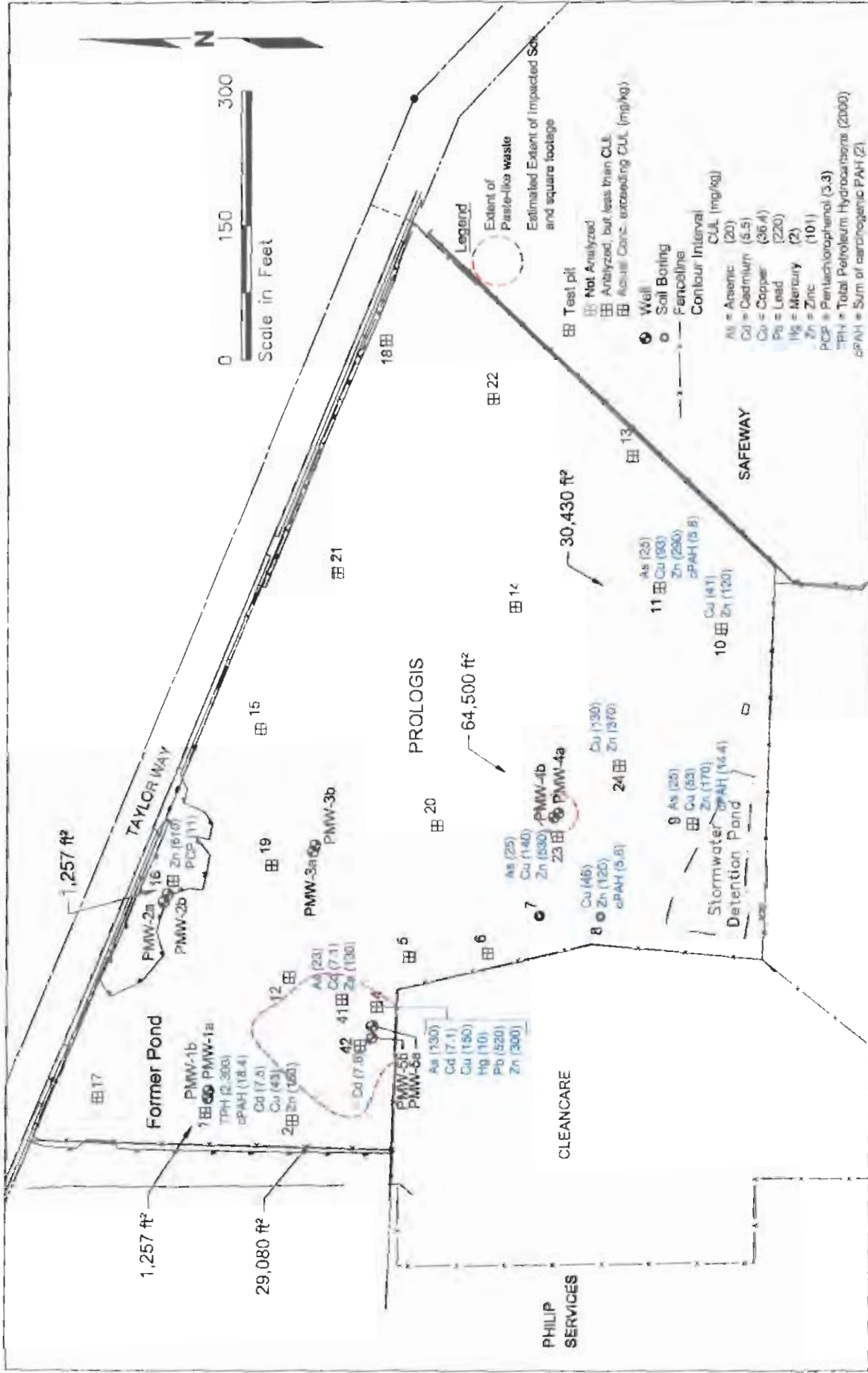


Figure 1.2  
Location and Concentration of  
Samples Exceeding Soil Cleanup Levels

ProLogis Taylor Way Property  
Feasibility Study  
Tacoma, Washington

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DATE: 1/13/2011  
 FILE NAME: 11/10/2010\_Visit and Solid Waste/VIS/010201.mxd

**Notes:**  
 1. Basemap taken from 2005 Site Survey by Dowt Engineers.  
 2. On this ProLogis Site, "g" denotes a shallow aquifer well or piezometer and "i" denotes an intermediate aquifer well or piezometer. On the Clean Care Site, "B" denotes a shallow aquifer well and "C" denotes an intermediate aquifer well.  
 3. Concentrations in **Red** are those that exceed Philip Services RI Groundwater Screening Levels, PSC RI Table 8.12.  
 4. NS: Not sampled or analyzed during sampling event.  
 5. All ND: VOC not detected at each of the sampling events.  
 6. VOC results not presented if VOC was not detected at any of the sampling events.

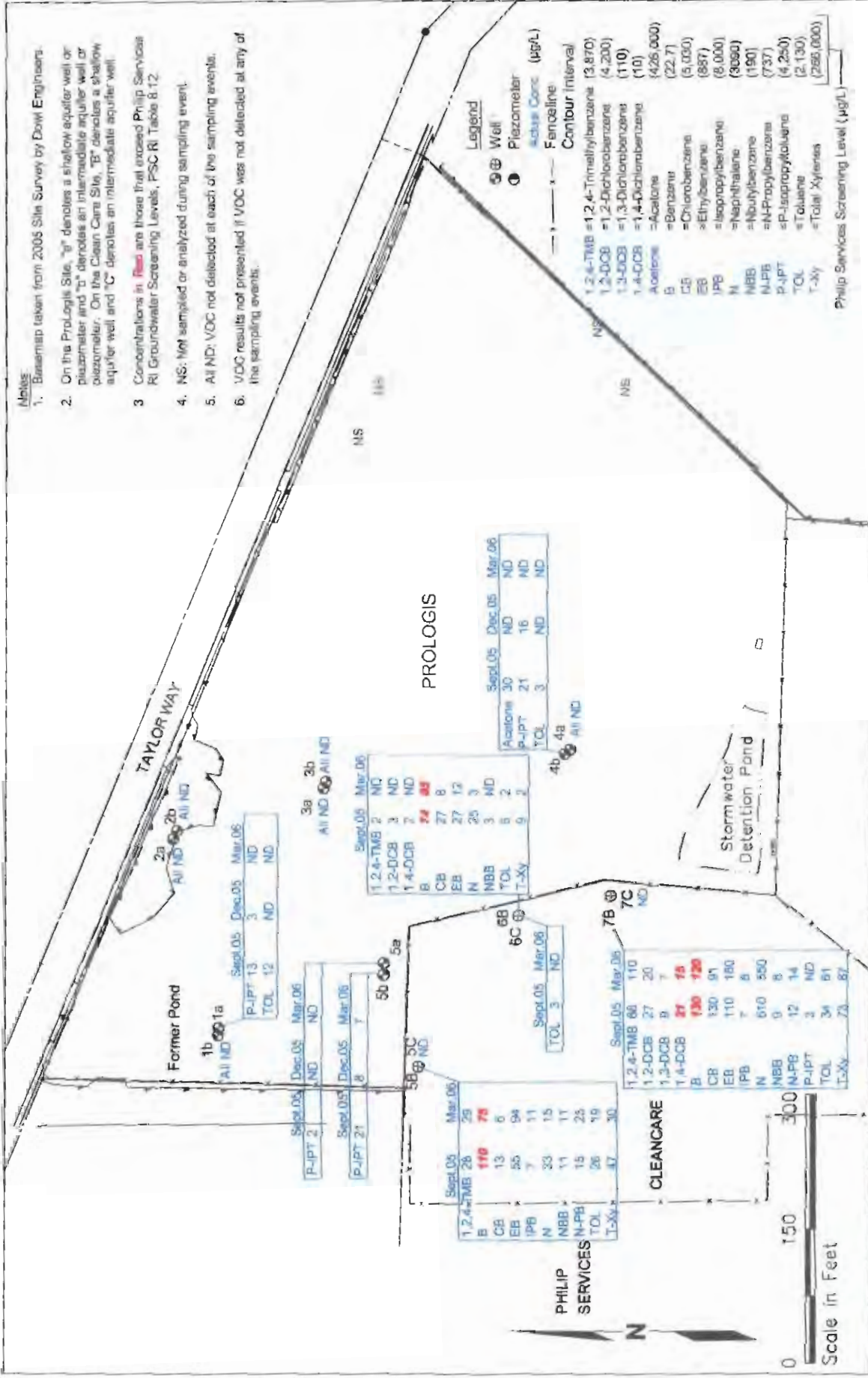
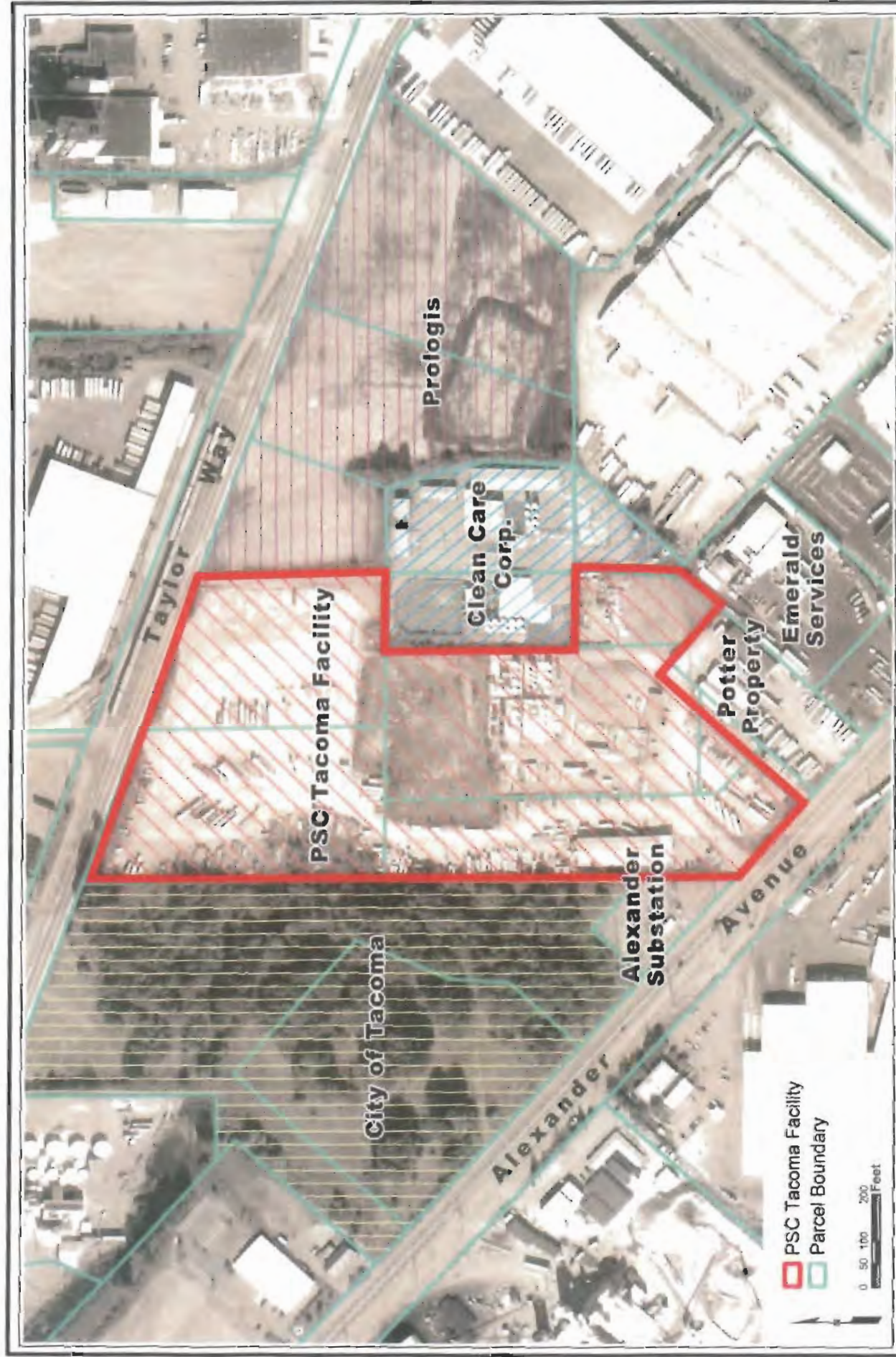


Figure 3.14  
 VOC Results for Groundwater

ProLogis Taylor Way Property  
 Remedial Investigation  
 Tacoma, Washington

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DATE: 06/16/06  
 DWT NAME: 10-2006  
 © Veriject/Chem/Veri and Site/Property/Remedial Investigation/Report/016 (Fig. 3.14) Rev.






Project No. **10048**  
 Figure **2-3**

**ADJACENT PROPERTIES**  
 PSC Tacoma Facility  
 1701 East Alexander Avenue  
 Tacoma, WA




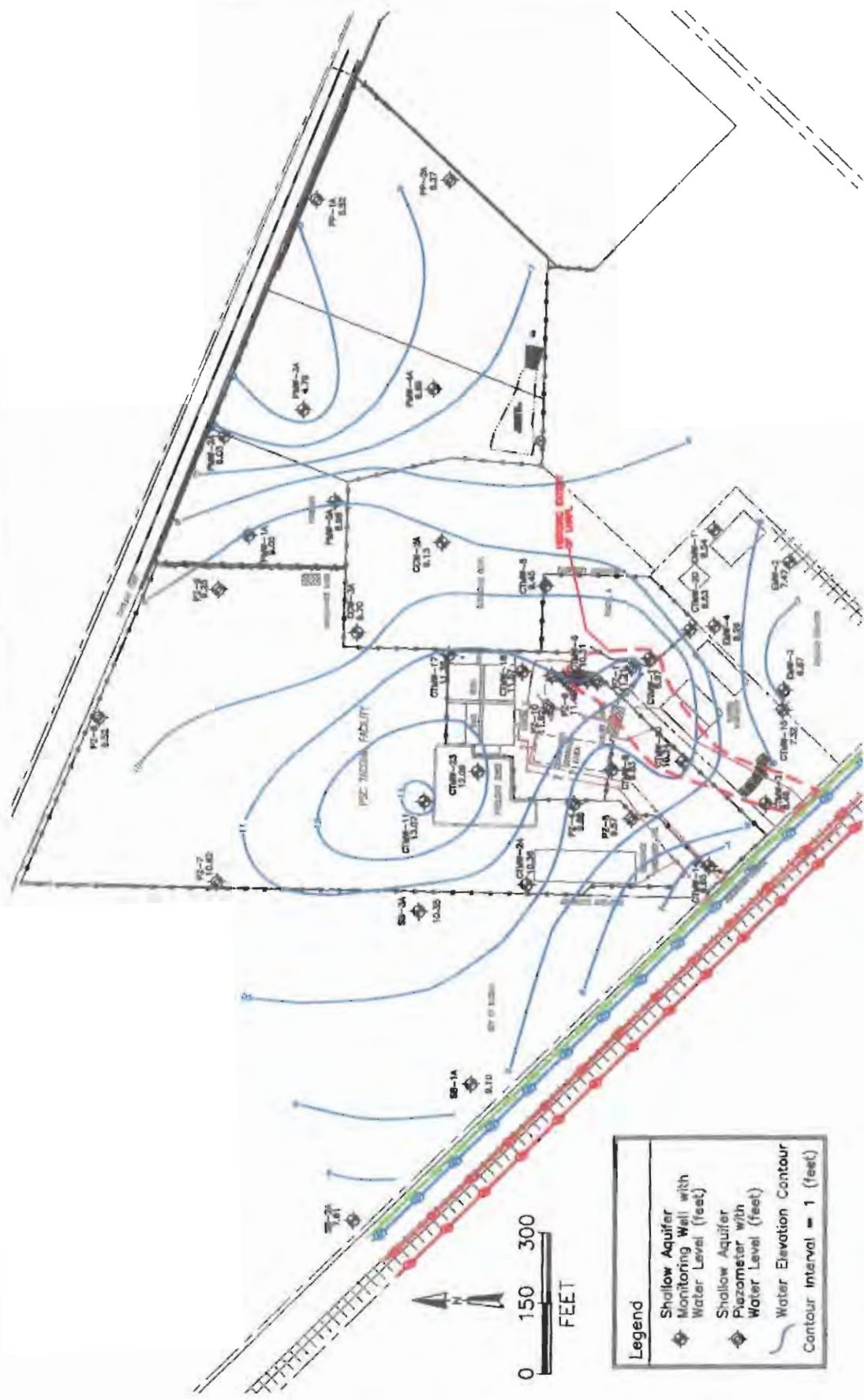


**Explanation**

-  Former Oline Property
-  Parcel Boundary
-  PSC Tacoma Facility



<p>FORMER OLINE PROPERTY          PSC Tacoma Facility          1701 East Alexander Avenue          Tacoma, Washington</p>		
	<p>Project No 10048</p>	<p>Figure 3-1</p>



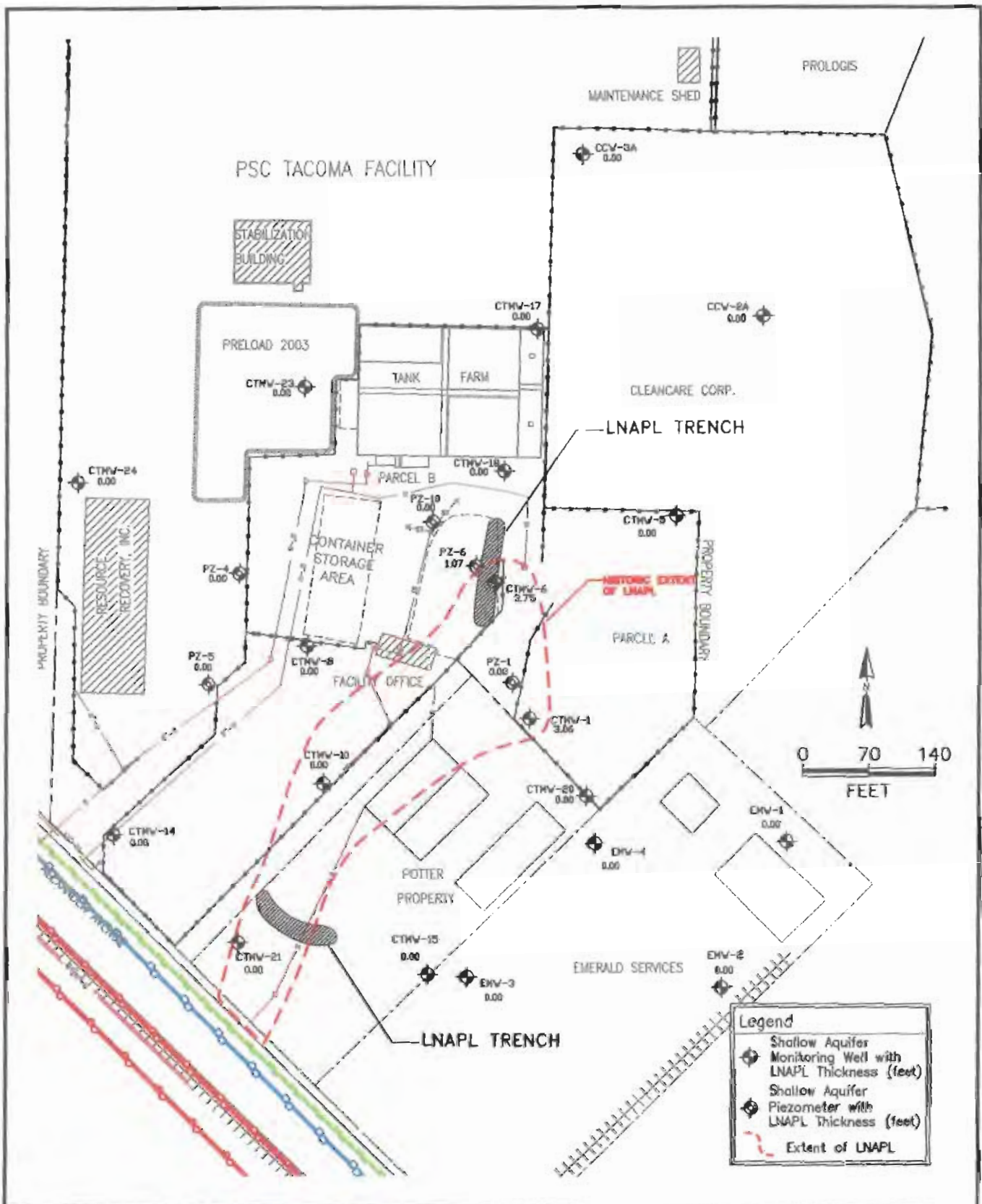
DESIGNER:	dtb	DESIGN NO.:	Annual 2006
CHKD:		APPD:	
DATE:	3/26/07	REV:	1

TITLE: Groundwater Elevations  
 Shallow Aquifer, March 20, 2006  
 PSC Tacoma Facility



- Legend
- ◆ Shallow Aquifer Monitoring Well with Water Level (feet)
  - ◆ Shallow Aquifer Piezometer with Water Level (feet)
  - Water Elevation Contour
  - Contour Interval = 1 (feet)






	TITLE:	DWN:	DES.:	PROJECT NO.:
	Calculated LNAPL Thickness	dtb		1007
	March 14, 2007	CHKD:	APPD:	FIGURE NO.:
PSC Tacoma Facility	DATE:	REV.:	3	
	6/21/07			





Figure 1.1  
Vicinity Map

ProLogis Taylor Way Property  
Feasibility Study  
Tacoma, Washington

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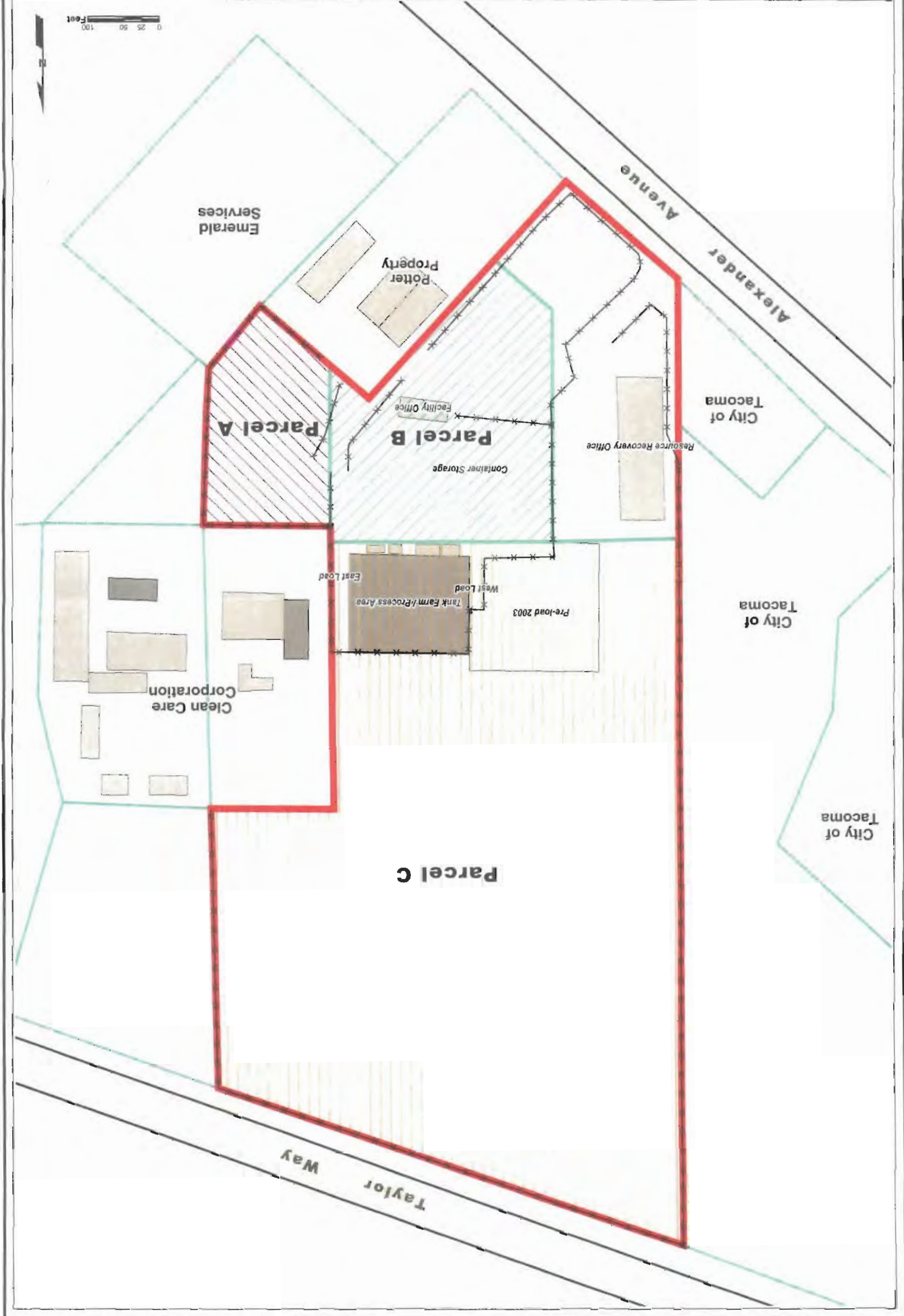


Project No. 10048

Figure 2-2

SITE LAYOUT  
PSC Tacoma Facility  
1701 East Alexander Avenue  
Tacoma, Washington

- Explanation**
- Neighboring Parcel
  - Parcel C
  - Parcel B
  - Parcel A
  - PSC Tacoma Facility
  - Fence
  - Tank Farm
  - Building



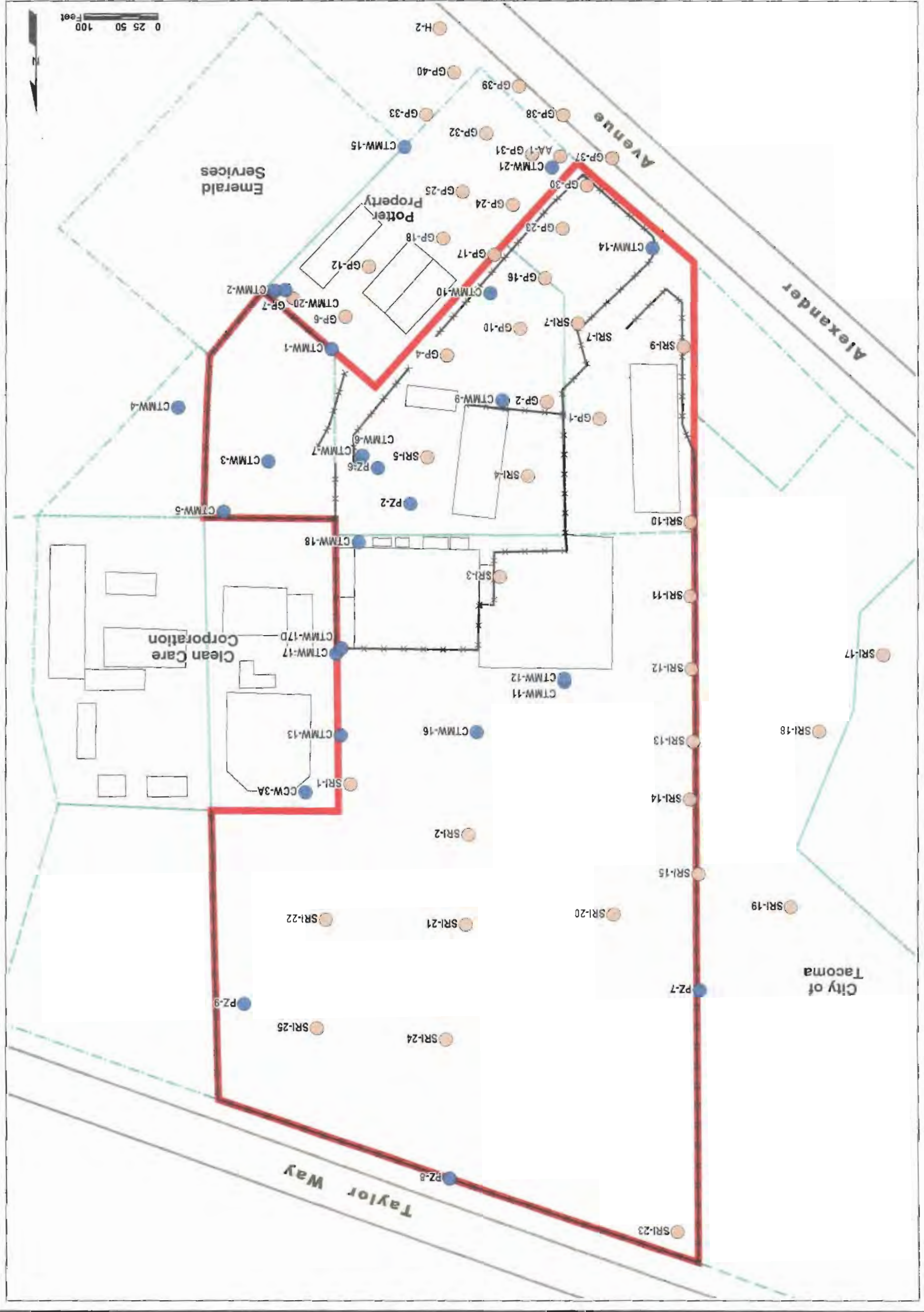


Project No  
10048

Figure  
2-5

SOIL SAMPLE LOCATIONS  
1701 East Alexander Avenue  
PSC Tacoma Facility  
Tacoma, Washington

- Explanation**
- PSC Tacoma Facility
  - Fence
  - Structure
  - Parcel Boundary
  - Soil Boring
  - Monitoring Well or Piezometer



**GEOMATRIX**

Project No. 10048

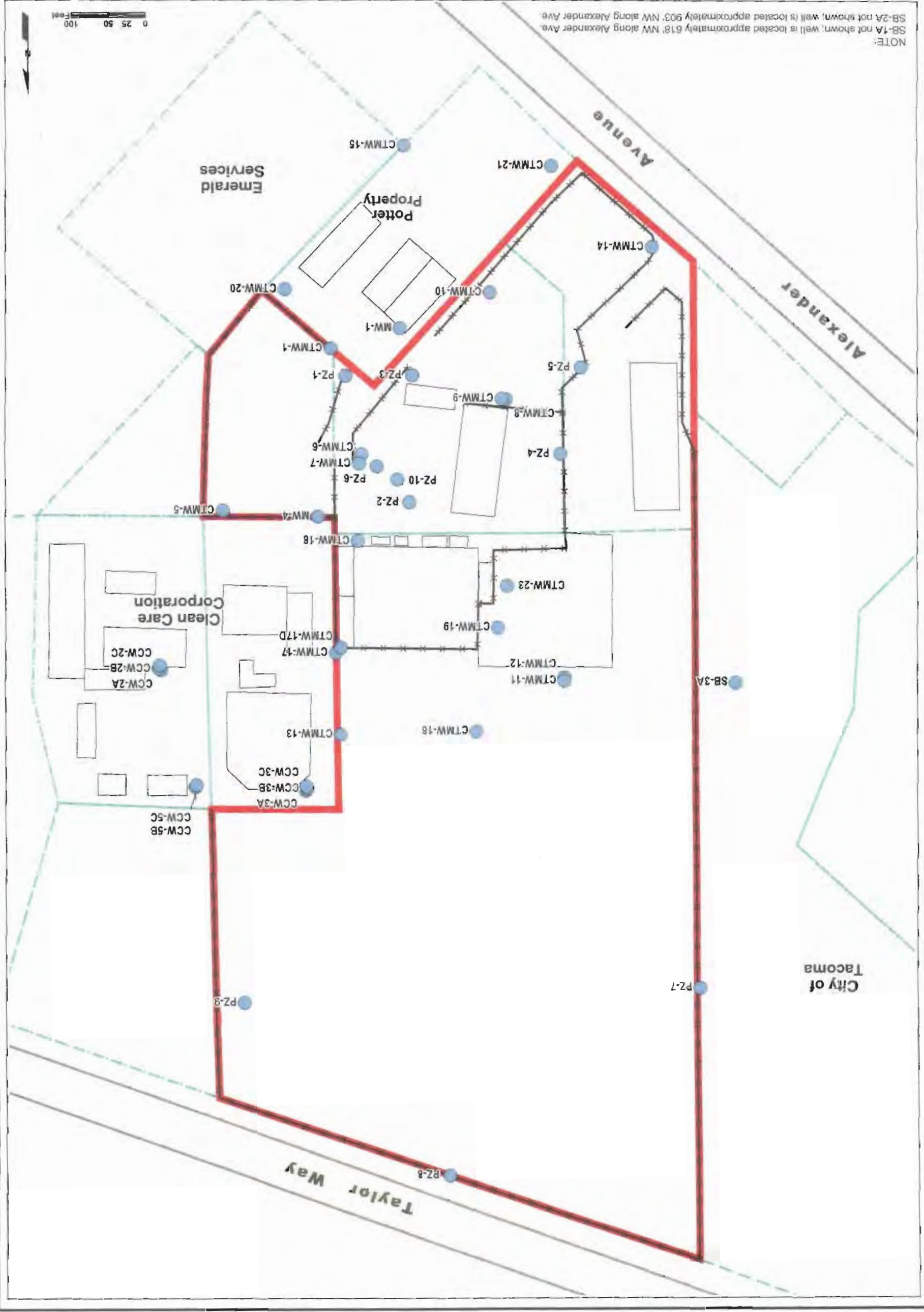
Figure 2-6

1701 East Alexander Avenue  
PSC Tacoma Facility  
Tacoma, Washington

GROUNDWATER LEVEL MONITORING PROGRAM  
WELL & PIEZOMETER LOCATIONS

**Explanation**

- Groundwater Monitoring Well or Piezometer
- Parcel Boundary
- Structure
- Fence
- PSC Tacoma Facility



City of Tacoma

SB-3A

PZ-7

PZ-8

PZ-9

CCW-5B

CCW-5C

CCW-3A

CCW-3B

CCW-3C

CTMW-13

CCW-2A

CCW-2B

CCW-2C

CTMW-17D

CTMW-17C

CTMW-17B

CTMW-17A

CTMW-18

MM-4

CTMW-5

CTMW-6

CTMW-7

PZ-6

CTMW-9

PZ-3

PZ-1

CTMW-1

CTMW-20

MM-1

CTMW-10

CTMW-9

PZ-4

PZ-5

CTMW-8

CTMW-14

CTMW-21

CTMW-15

CTMW-11

CTMW-12

CTMW-19

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CTMW-16

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CTMW-19

CTMW-19

CTMW-19

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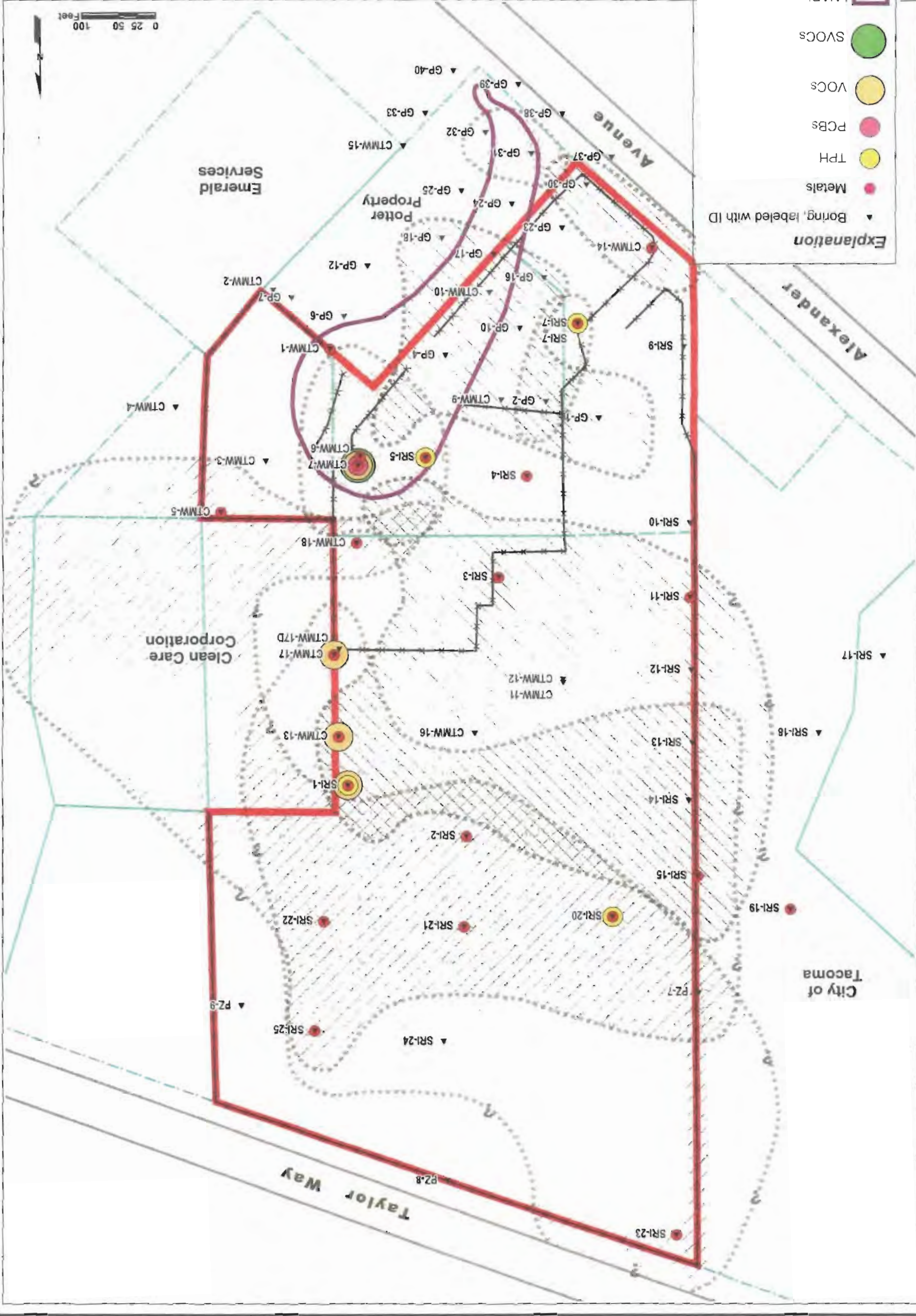


Project No. 10048

Figure 3-2

SOIL CONCENTRATIONS ABOVE  
PSC TACOMA CLEANUP LEVELS  
1701 East Alexander Avenue  
PSC Tacoma Facility  
Tacoma, Washington

- Explanation**
- ▼ Boring, labeled with ID
  - Metals (pink circle)
  - TPH (yellow circle)
  - PCBs (red circle)
  - VOCs (yellow circle)
  - SVOCs (green circle)
  - LNAPL (purple outline)
  - Lime Waste Fill (diagonal lines)
  - Wood Waste Fill (cross-hatch)
  - Auto-Fill (dotted)
  - Parcel Boundary (dashed line)
  - Fence (line with cross-ticks)
  - PSC Tacoma Facility (thick red outline)



**Explanation**

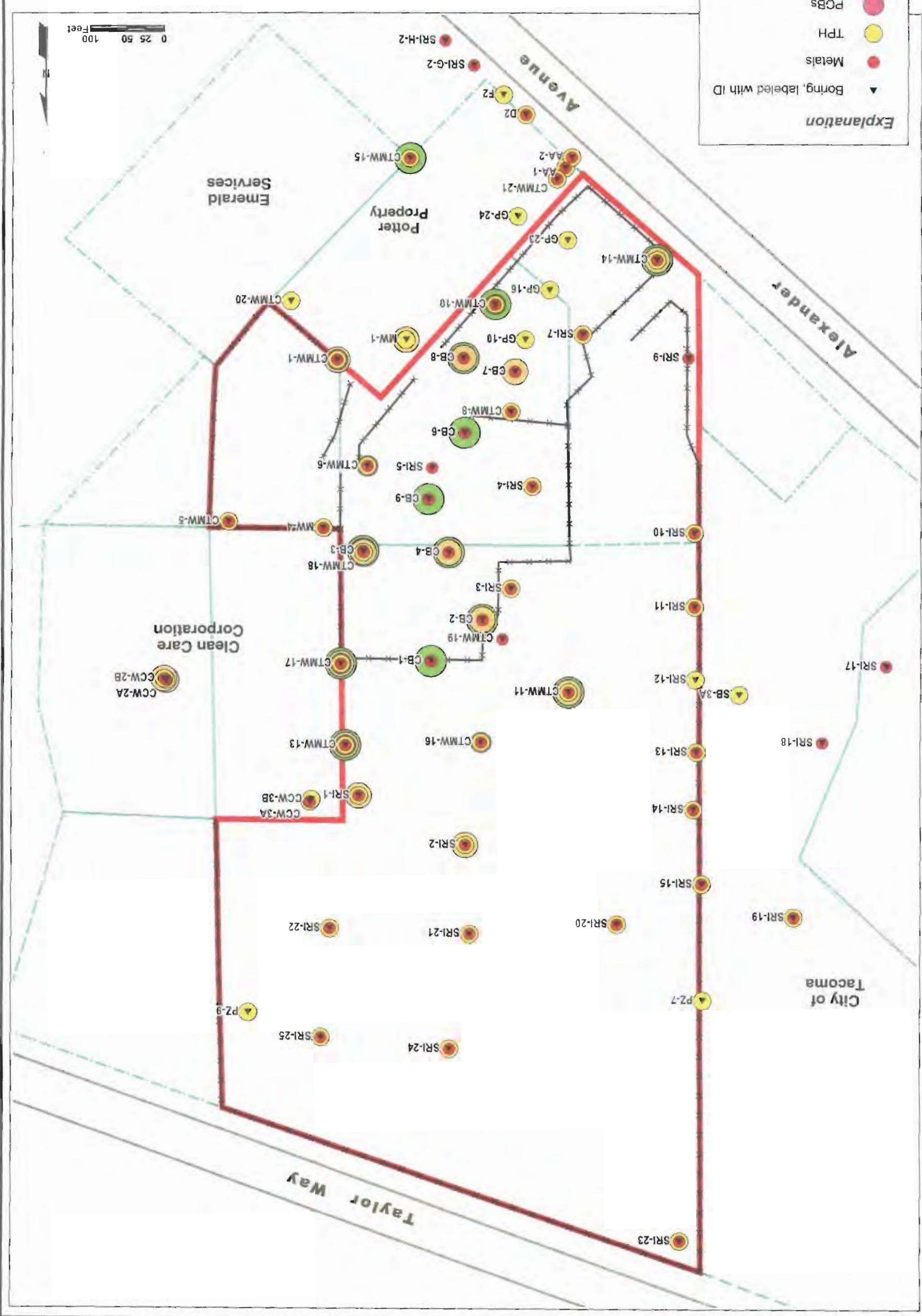
- ▼ Boring, labeled with ID
- Metals
- TPH
- PCBs
- VOCs
- SVOCs
- ▭ Parcel Boundary
- Fence
- ▭ PSC Tacoma Facility

**GEOMATRIX**

Project No. 10048

Figure 3-3

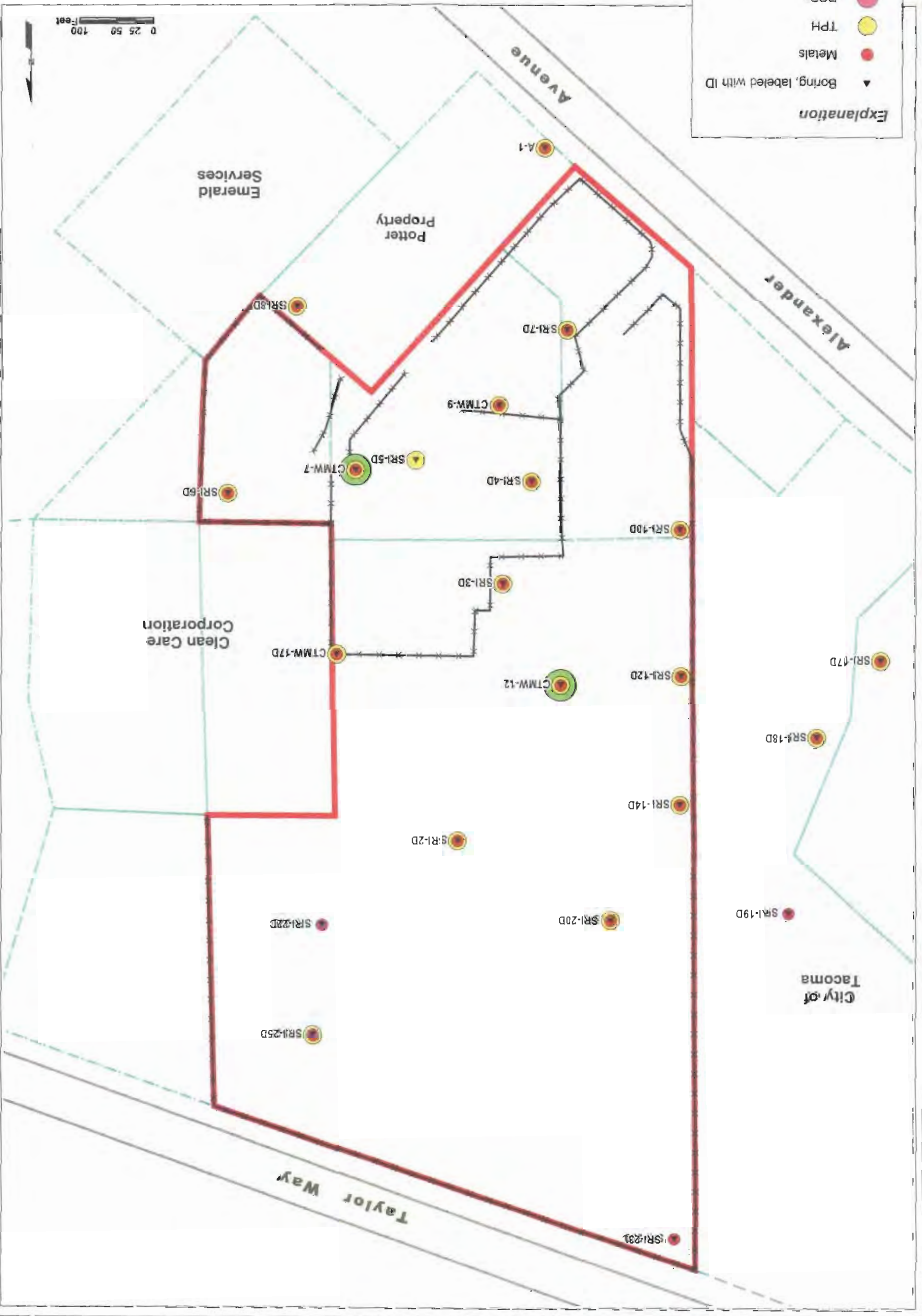
SHALLOW AQUIFER GROUNDWATER  
CONCENTRATIONS ABOVE  
PSC TACOMA CLEANUP LEVELS  
1701 East Alexander Avenue  
PSC Tacoma Facility  
Tacoma, Washington



DEEP AQUIFER GROUNDWATER  
CONCENTRATIONS ABOVE  
PSC TACOMA CLEANUP LEVELS  
1701 East Alexander Avenue  
PSC Tacoma Facility  
Tacoma, Washington

**Explanation**

- ▲ Boring, labeled with ID
- Metals
- TPH
- PCBs
- VOCs
- SVOCs
- ▭ Parcel Boundary
- ▭ PSC Property Boundary

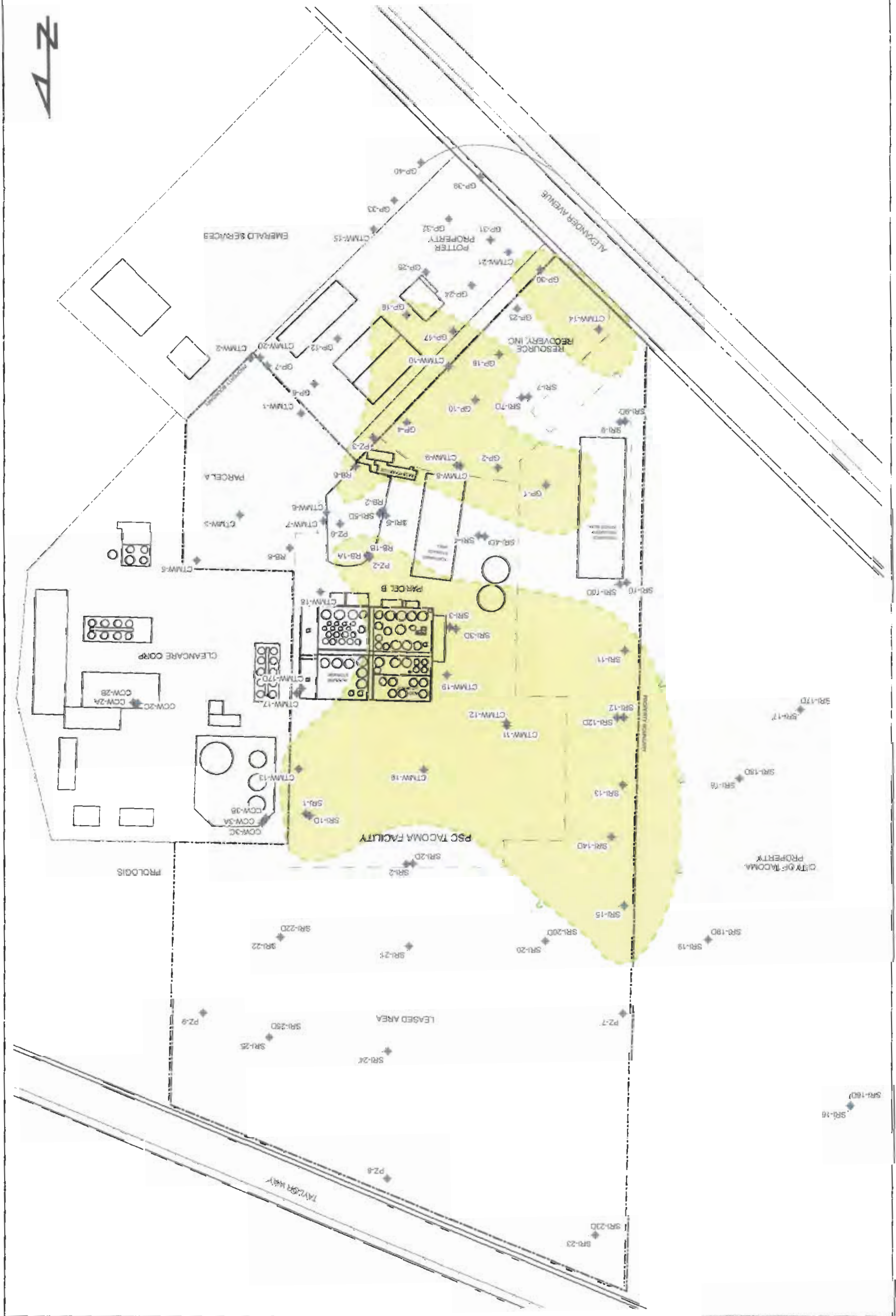




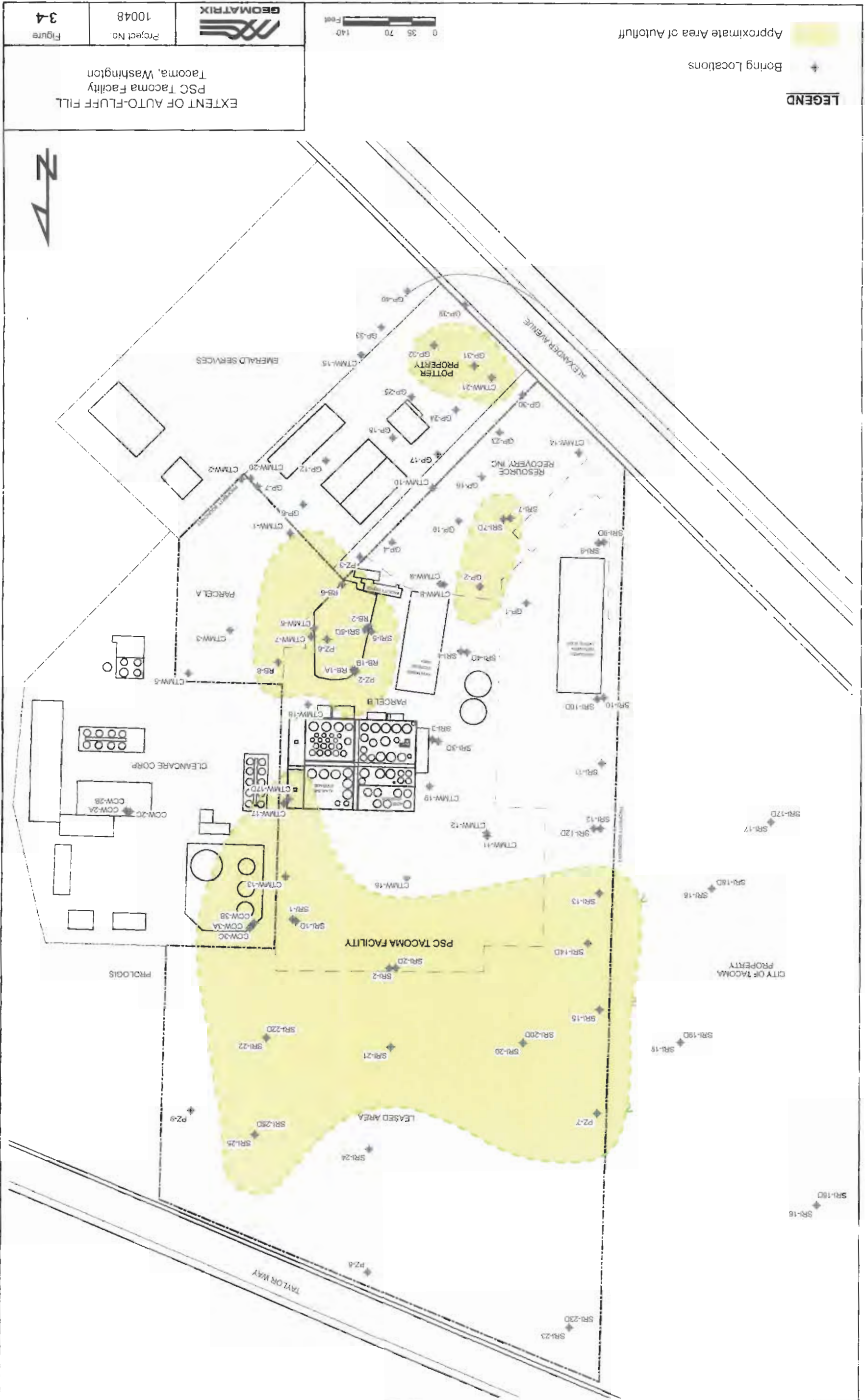
Approximate Area of Lime Waste

Boring Locations

**LEGEND**







**LEGEND**

✦ Boring Locations

Approximate Area of AutoLuff

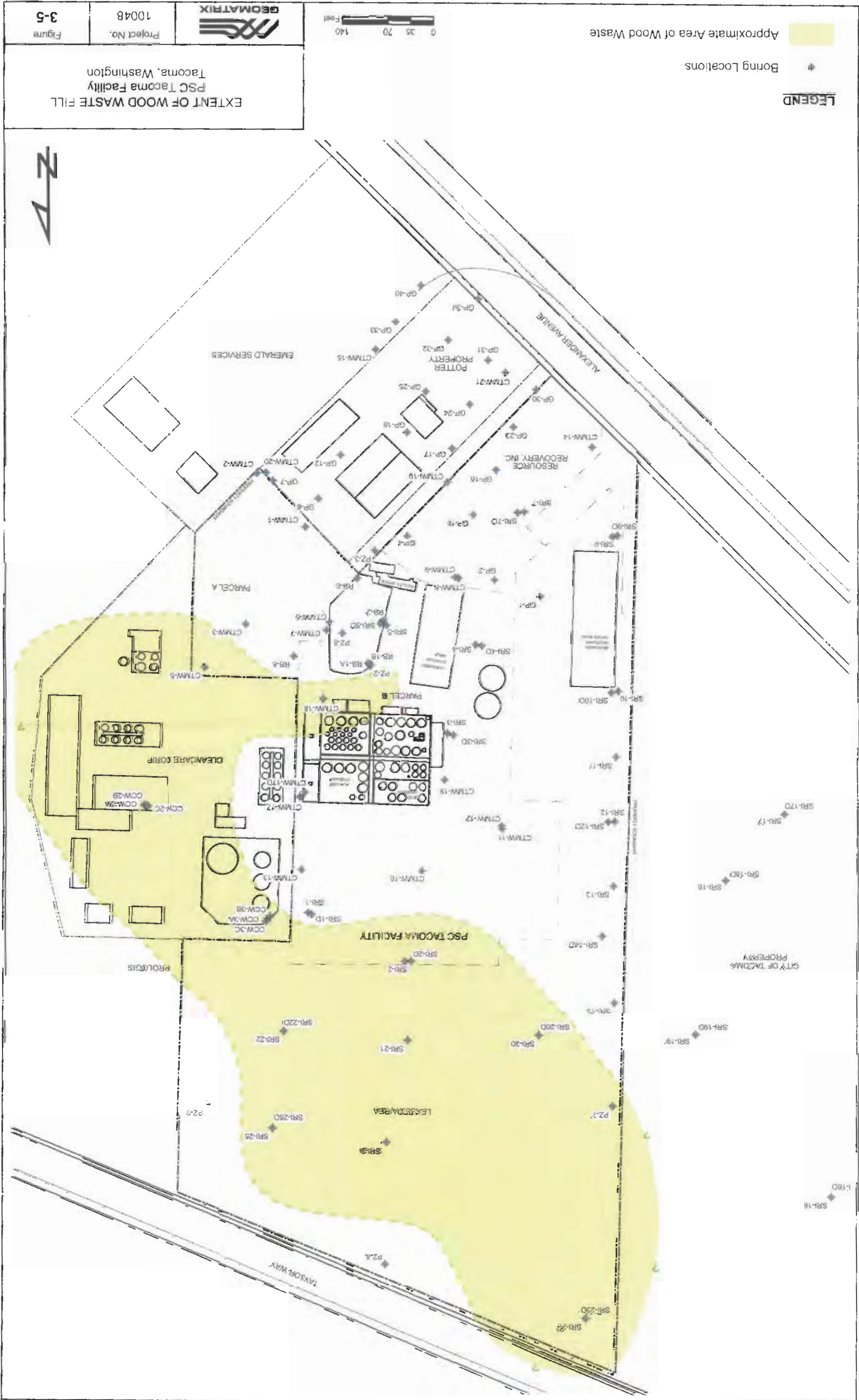


Project No. 10048

Figure 3-4

EXTENT OF AUTO-FLUFF FILL  
 PSC Tacoma Facility  
 Tacoma, Washington





**LEGEND**

◆ Boring Locations

Approximate Area of Wood Waste



Project No. 10048

Figure 3-5

**EXTENT OF WOOD WASTE FILL**  
PSC Tacoma Facility  
Tacoma, Washington



**Educator Building  
Tacoma, Washington**

**Phase I  
Environmental Site Assessment**

**Appendix B**

**Environmental Data Resources Inc.  
Radius Search  
(CD-ROM)**

**Educator Building  
Tacoma, Washington**

**Phase I  
Environmental Site Assessment**

**Appendix C**

**Phase I Environmental Site Assessment  
by AGRA (CD-ROM)**

**Educator Building  
Tacoma, Washington**

**Phase I  
Environmental Site Assessment**

**Appendix D**

**Aerial Photographs  
(CD-ROM)**

**Educator Building  
Tacoma, Washington**

**Phase I  
Environmental Site Assessment**

**Appendix E  
Interview Documentation**

LAW OFFICES

GORDON, THOMAS, HONEYWELL, MALANCA, PETERSON & DAHEIM LLP

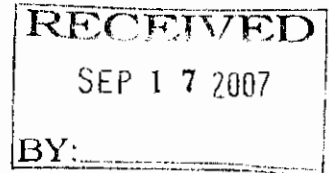
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September 14, 2007

Tom Colligan  
Floyd Snider  
Two Union Square  
601 Union Street, Suite 600  
Seattle WA 98101

Re: **Douglas and Katherine (Kit) Granum - Educator Building, Phase I**

Dear Tom:

I represent Doug and Kit Granum, owners of the Educator Building currently under contract for acquisition by the Port of Tacoma. I am in receipt of a questionnaire from you that you have requested my clients complete.

As you know, the Educator Building is in an area of well-documented environmental conditions. In connection with your work for ProLogis, the Port, and others, you have fairly detailed knowledge about the history of the area and the industrial activities that have resulted in soil and groundwater contamination. You have previously accessed, and have continuing access to Ecology and EPA files related to many of the surrounding properties. The Purchase and Sale Agreement concerning the Educator Building does not require the Granums to complete any written questionnaire. However, Kit Granum would be more than happy to talk with you by phone to assist you in compiling information for your Phase I report to the Port. You may contact her directly at (253) 906-3178.

Should you have any other questions, please do not hesitate to contact me.

Sincerely,

A handwritten signature in black ink that reads "Bradley B. Jones". The signature is written in a cursive style with a large, stylized "B" and "J".

Bradley B. Jones

BBJ:sit

cc: Kit Granum  
Todd Clarke

[1392255 v1.doc]

## EDUCATOR BUILDING Phase 1 ENVIRONMENTAL QUESTIONNAIRE

The following questionnaire will help in conducting a more thorough investigation during our Phase One Environmental Site Assessment. Please answer the following questions to the best of your ability, and return via mail or FAX if possible. Where appropriate, please include copies of citations, permits, maps, etc. If necessary, please use additional pages to further explain "Yes" responses or include additional information needed to clarify answers (please reference question number).

1. **Property Ownership;** Are you the legal owner of the subject property ("property")?

- Yes    Approximate Years owned? 17    Previous Owners Name? Simpson Family Trust  
 No     Legal Owner \_\_\_\_\_    Owner contact phone \_\_\_\_\_

Please provide a description of the past and current use of the property to the best of your knowledge.

Built by 10 foot kitchen cabinetry -  
for Hospitals and schools - converted to  
various multi-tenant use - light industry, warehouse,  
and office)    used previously by [unclear]  
and continued use by current owner

2. **Present or Past Industrial Use;** Is the property or adjoining properties in industrial use? Any known past uses?

- No     Yes     Property (specify) \_\_\_\_\_     Adjoining property (specify) \_\_\_\_\_

3. **Other Property Uses;** Is the property or adjoining properties in gasoline station, automotive repair, commercial printing, dry cleaners, photo developing laboratory, junkyard, landfill or waste treatment, storage, disposal, processing or recycling facility use? Any known past uses?

- No     Yes     Property (specify) \_\_\_\_\_     Adjoining property (specify) Emerald Services

4. **Hazardous Material Storage;** Is the property or adjoining properties presently being used to store damaged or discarded automotive or industrial batteries, pesticides, paints, or other hazardous chemicals in industrial drums (e.g. 55-gallon or 208 liter capacity) or sacks? Any known past storage of these materials?

- No     Yes     Property (specify) Need to ask Emerald Services     Adjoining property (specify) N/A

5. **Fill Dirt;** To the best of your knowledge, has fill dirt been brought onto the property that originated from a known contaminated site or from an unknown location/origin?

- No     Yes     Property (specify) \_\_\_\_\_     Adjoining property (specify) N/A

Occasionally found debris in the lot  
but also that as found by trees



6. **Pits, Ponds, Lagoons or Depressions;** Are there currently, or have there been previously, any pits, ponds, lagoons or depressions located on the property and used with any kind of waste treatment or waste disposal?

No  Yes  Property (specify) \_\_\_\_\_  Adjoining property (specify) \_\_\_\_\_

7. **Stained Soil(s);** Are there currently, or have there been previously, any stained soils on the property or adjoining properties (other than typical automotive engine oil residue)?

No  Yes  Property (specify) \_\_\_\_\_  Adjoining property (specify) \_\_\_\_\_

8. **Storage Tanks;** Are there currently any registered or unregistered storage tanks (above or underground) located on the property or adjoining properties? Any past storage tank use on the site to the best of your knowledge?

No  Yes  Property (specify) UST for heating - see phase 1 done in 2000  Adjoining property (specify) \_\_\_\_\_

9. **Vent/Fill Pipes and Access Ways;** Are there presently any vent pipes, fill pipes or access ways protruding from the ground on the property or adjacent to any structure located on the property? Any removed vent or fill pipes?

No  Yes  Property (specify) \_\_\_\_\_  Adjoining property (specify) \_\_\_\_\_

10. **Stained Flooring, Drains, Walls or Foul Odors;** Are there any flooring, floor drains, catch basins or walls located on the property or within the facilities that are stained by substances other than water? Any emitting foul odors? Do you recall any past staining of these structures or associated foul odors?

No  Yes  Property (specify) \_\_\_\_\_  Adjoining property (specify) \_\_\_\_\_

11. **Wastewater;** Is wastewater (other than storm water) presently discharged on, or adjacent to the property, or is the property served by an on-site septic system (e.g. septic tank or cesspool)?

No  Yes  Property (specify) \_\_\_\_\_  Adjoining property (specify) \_\_\_\_\_

12. **Spills or Dumping of Waste;** Are you aware of any spills or dumping of hazardous substances or petroleum products, batteries or any other waste materials either above grade, buried and/or burned on the property?

No  Yes  Property (specify) \_\_\_\_\_  Adjoining property (specify) \_\_\_\_\_

13. **PCB Containing Equipment;** Are there electrical transformers, capacitors or any other oil-filled equipment known to contain PCBs on the property? Any past uses of PCB-containing oil on the site or adjoining sites?

No  Yes  Property (specify) \_\_\_\_\_  Adjoining property (specify) \_\_\_\_\_

14. **Use of Petroleum Products;** Are there any hazardous substances or petroleum products on the property or associated with any facility located on the property? Any past uses? If yes, please clarify

No  Yes  Specify VST used for heating - see Phase 1  
NAK by GRACOR Packaging

15. **Water Well Use;** Is the property served by a private well or non-public water system? If so, have contaminants been identified in the well or system that exceed state or federal guidelines or has the well been designated as 'contaminated' by any government environmental/health agency?

No  Yes  Specify \_\_\_\_\_

16. **Liens and/or Property Use Restrictions;** Do you have any knowledge of environmental liens or activity/use limitations, such as deed restrictions, associated with the property?

No  Yes  Specify \_\_\_\_\_

17. **Devaluing of the Property;** Has the property value or purchase price been devalued (lowered), relative to comparable properties, as a result of environmental conditions at the property or surrounding properties?

No  Yes  Property (specify) \_\_\_\_\_  Surrounding property (specify) \_\_\_\_\_

18. **Environmental Violations;** Do you have any knowledge of past or recurrent violations of environmental laws with respect to the property or any facility located on the property resulting in governmental notification?

No  Yes  Specify \_\_\_\_\_

19. **Past Environmental Assessments;** Have any past environmental site assessments of the property/facility indicated the presence of hazardous substances or petroleum products or subsurface contamination? If so, was further environmental assessment of the property performed and/or recommended?

No  Yes  Specify Phase I done in 2000 by ALPA for reference

20. **Proceedings Related to Release of Hazardous Substances;** Do you have any knowledge of any past, threatened, or pending lawsuits or administrative proceedings concerning a release or threatened release of any hazardous substances or petroleum products on the property?

No  Yes  Specify \_\_\_\_\_

21. Please indicate below if you can provide, or are aware of any of the following pertaining to the property:

- Prior environmental site assessment reports, including asbestos survey or abatement reports
- Environmental audit reports
- Environmental permits (e.g. solid waste disposal, hazardous waste or wastewater permits, NPDES permits)
- State or federal registrations for above or underground storage tanks
- Community right-to-know plan
- Safety plans, preparedness and prevention plans, spill prevention plans, etc.
- Hydrogeologic reports
- Notices/correspondence from governmental agencies (past or current violations of environmental laws)
- Hazardous waste generator reports
- Geotechnical studies
- Building plans (either historical or current)

Additional comments relating to #21 (above) here:

*no asbestos reports or audits or permits,  
no registration for UST  
no site specific studies or mitigation plans*

For any questions that were answered "Yes", or which otherwise require additional explanation, please provide question number(s) and details here:

The undersigned represents that to the best of his/her knowledge the responses, statements and facts given in this questionnaire are true and correct and no material facts have been suppressed or misstated.

Name (Please Print)

Company (Representing)

Signature

Date

Relationship with the Property

*Answers based on  
Telephone interview conducted by Tom COLLIGAN  
with Kit Brown on 9/13/07 -*



# Railcar Oil Release Site Assessment / Closure Report

Prepared For:

**Emerald Services, Inc.  
7343 East Marginal Way South  
Seattle, Washington**

July 21, 2010

Prepared By:

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Doug Kunkel, LG, LHG  
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QR

TR

## TABLE OF CONTENTS

<b>1.0</b>	<b>INTRODUCTION.....</b>	<b>1</b>
1.1	Background .....	1
1.2	Site Description .....	2
1.3	Potential Contaminants of Concern.....	2
<b>2.0</b>	<b>SAMPLING METHODS AND LABORATORY ANALYSIS .....</b>	<b>4</b>
2.1	Product Sampling .....	4
2.2	Performance Sampling.....	5
2.2.1	Sampling Locations .....	5
2.2.2	Sample Collection Methods.....	5
2.2.3	Laboratory Analyses.....	6
2.3	Confirmation Sampling .....	7
<b>3.0</b>	<b>DATA QUALITY.....</b>	<b>8</b>
3.1	Sample Identification and Handling.....	8
3.2	Duplicates, Blanks, Lab Control Samples and Matrix Spike .....	8
3.3	Laboratory Contact Information .....	9
<b>4.0</b>	<b>ANALYTICAL RESULTS AND COMPARISONS TO CRITERIA.....</b>	<b>10</b>
4.1	Performance Sampling .....	10
4.2	Confirmation Sampling .....	11
<b>5.0</b>	<b>CONCLUSIONS AND RECOMMENDATIONS .....</b>	<b>12</b>

### Table

Table 1 – Railcar Oil Release Soil Sampling Analytical Results

### Figures

Figure 1 – General Vicinity Map

Figure 2 – Site Representation and Sampling Locations

### Attachments

Attachment A – Spill Report, ERTS #617057 – Rail Spur at 3401 Lincoln Ave., Tacoma, WA,  
December 15, 2009

Attachment B – Product Sample PCB Analytical Results

Attachment C – Field Notes

Attachment D – Soil Performance/Confirmation Sample Analytical Results

## **1.0 INTRODUCTION**

Environmental Partners, Inc. (EPI) is pleased to present this Site Assessment / Closure Report presenting the results of recently completed soil sampling performed on property owned by the Port of Tacoma (Port). This sampling was conducted to confirm and document successful cleanup of soil potentially impacted by an accidental release of used motor oil from a railcar owned by Vortex Recycling. The used motor oil release was discovered on December 15, 2009 and the cleanup response is documented in a Spill Report prepared by Emerald Services (Emerald) dated December 29, 2009 and included as Attachment A.

The soil sampling work was performed at the railroad spur adjacent to the east side of the Educator Building at 3401 Lincoln Avenue, Tacoma, WA (the Site). The release Site tax parcel number is 0321351051. The general location of the Site is shown on Figure 1. An aerial photo based figure of the Site showing site features and soil sampling locations is presented in Figure 2.

The cleanup action and subsequent soil sampling were conducted as independent remedial actions under the Washington State Department of Ecology (Ecology) Model Toxics Control Act (MTCA). Soil sampling was performed under a Sampling and Analysis Plan (SAP) prepared by EPI dated June 25, 2010 (EPI, 2010<sup>1</sup>). The SAP was prepared in accordance with Ecology requirements in MTCA, specifically Washington Administrative Code (WAC) 173-340-820 and Revised Code of Washington (RCW) chapter. 70.105D and was approved by the Tacoma Pierce County Health District.

The objectives of this Site Assessment / Closure Report are to:

- Document the cleanup actions performed following an accidental release of used motor oil from the Vortex Recycling railcar.
- Provide a general description of the release site and provide performance and confirmation soil sampling results.
- Compare soil sampling analytical data to applicable MTCA Method A Soil Cleanup Levels for Industrial Properties to demonstrate and document the effectiveness of the already-performed cleanup action.

### **1.1 Background**

On October 9, 2009 and again on October 14, 2009, Emerald loaded used automotive oil filters onto a railcar owned by Vortex Recycling for later transport. On December 15, 2009 Emerald staff were notified of used motor oil leaking from a broken valve on the railcar. At that time the Vortex Recycling railcar was located on the railroad spur immediately adjacent to

and approximately at the center of the southeast wall of the Educator Building at the location shown in Figure 2.

Emerald immediately implemented emergency response actions, and worked to perform clean-up on December 15, 2009. Due to heavy rainfall that began shortly after notification of the spill, which continued throughout the night, the ground surface contained areas of ponded water, which spread the released oil away from the railcar northeast and southwest along the railroad spur during ongoing clean-up efforts. Emerald therefore enlisted additional clean-up support from NRC Environmental Services (NRC) on December 16, 2009. NRC and Emerald used vacuum trucks and other equipment to recover most of the released oil and visibly contaminated soil, rock, and gravel. Emerald's Spill Report to Ecology, which contains additional information regarding the spill response, is presented in Attachment A.

## **1.2 Site Description**

The Site is located in an industrial area and consists of a length of railroad spur in a parking lot and loading dock area that is covered with compacted gravel. The rail spur runs in a northeast to southwest direction adjacent to the Educator building as shown in Figure 2.

Site topography in the parking area adjacent to the rail spur is generally flat; however, the rail spur next to the Educator Building, where the oil release occurred, is depressed approximately 6 to 8 inches below the surrounding grade. Raised surface grades at the south and east corners of the Educator Building and the rail spur served to contain the released oil and rain water within the depressed rail spur next to the building. The combination of containment within the depressed rail spur and the rapid clean-up response by Emerald and NRC, likely limited the area of potential soil impacts to the approximately 10-foot by 360-foot area along the southeast wall of the Educator Building as shown in Figure 2.

Groundwater was likely not impacted due to the rapid emergency cleanup response and the high viscosity of the motor oil, which limits its penetration into the soil. Therefore, groundwater was not sampled or analyzed during this investigation. Based on depth to groundwater measurements from an adjacent property, groundwater at the site is generally 4 to 8 feet below ground surface (bgs), which is below the deeper target soil sampling depth of 1.5 feet bgs.

## **1.3 Potential Contaminants of Concern**

Potential contaminants of concern (pCOCs) for used motor oil are based on MTCA Table 830-1, "Required Testing for Petroleum Releases". These pCOCs include:

- Volatile Petroleum Compounds: benzene, toluene, ethylbenzene, and xylenes (BTEX);
- Fuel Additives and Blending Compounds: 1,2-dibromoethane (EDB), 1,2-dichloroethane (EDC), methyl tertiary-butyl ether (MTBE), and total lead;

- Other Petroleum Components: carcinogenic polycyclic aromatic hydrocarbons (cPAHs) (benzo(a)anthracene, chrysene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, dibenz(a,h)anthracene and total benzofluoranthenes), and naphthalenes (naphthalene, 2-methylnaphthalene, 1-methylnaphthalene);
- Other Compounds: halogenated volatile organic compounds (HVOCs) (1,1,1-trichloroethane, trichloroethene, and tetrachloroethene), and cadmium (cadmium analysis requested by Tacoma Pierce County Health District);
- Petroleum Hydrocarbons: gasoline-range petroleum hydrocarbons (GRPH), and diesel-range petroleum hydrocarbons (DRPH), which includes analysis for motor oil-range petroleum hydrocarbons.

Polychlorinated biphenyls (PCBs) were not considered a pCOC because the released product was known to be used motor oil and did not contain oil from unknown sources or from oil related to use in transformers. As noted in Section 2.1, PCBs were analyzed for in a product sample collected from the Vortex Recycling railcar and were not detected. Based on the non-detection for PCBs in the product sample PCBs were not included in the analytical suite for soil samples.



## **2.0 SAMPLING METHODS AND LABORATORY ANALYSIS**

Sampling and analysis was conducted in order to identify the product released, measure performance of the emergency response actions, and confirm that the soil meets clean-up levels. The sampling methods and laboratory analysis performed are summarized in the following sections:

- Product sampling;
- Soil performance sampling; and,
- Soil confirmation sampling.

### **2.1 Product Sampling**

PCBs were not expected to be present in the used motor oil; however, as a precaution, Emerald performed PCB analysis on a product sample collected from the Vortex Recycling railcar that was the source of the used motor oil release. Emerald's in-house analytical laboratory, which is accredited for PCB analyses by the Washington State Department of Ecology, performed PCB screening on the product sample using EPA Method 8082 with 3580A extraction.

The product sample was analyzed for the PCB Aroclors 1016, 1232, 1242, 1248, 1254 and 1260. None of the PCB Aroclors were detected in the product sample. Based on the non-detect results in the product sample soil samples collected during this investigation were not analyzed for PCBs. The laboratory analysis report form for the product sample PCB analysis is included as Attachment B.

An aliquot of the product sample was sent to Friedman & Bruya, Inc. and was archived pending an evaluation of petroleum hydrocarbon analytical results from the soil performance sampling. This sample was held for possible hydrocarbon fuel scan (Method 8015 modified) to "fingerprint" the used motor oil associated with December 2009 release in order to distinguish the product sample from petroleum hydrocarbons likely existing in the soil at the Site prior to that release. This evaluation would have been considered if petroleum hydrocarbon impacts were detected at concentrations greater than applicable MTCA Soil Cleanup Levels for Industrial Properties.

Emerald has retained an additional aliquot of the product sample, which can be sent to Torkelson Geochemistry, Inc. (Torkelson) for potential future analysis at the direction and expense of the Port. Emerald will retain this sample for 30 days beyond the delivery date of this Site Assessment / Closure Report.

Contact information for ARI, Friedman & Bruya, Inc, and Torkelson analytical laboratories is provided in Section 3.3.

## **2.2 Performance Sampling**

On June 30, 2010 EPI collected performance samples from surface and deeper soils at locations within the 360 x 10 foot area delineating the approximate extent of observed sheen. Sampling locations, methods, and laboratory analyses performed are described in the following sections.

### **2.2.1 Sampling Locations**

Surface (0.0 to 0.5 ft. bgs) and deeper (1.0 to 1.5 ft. bgs) soil samples were planned for seven locations at a 50-foot spacing along the rail spur. For the purposes of this investigation the 0.0 ft. bgs surface was considered to start at the top of the soil beneath the overlying railroad ballast (if present).

At the time of sampling, a railcar, which was unrelated to the oil release, was present at the far northeast end of the rail spur at the location shown in Figure 2. The railcar was positioned over the planned ES-07 sampling point making that location inaccessible to the direct-push probe rig and to EPI field staff. EPI field staff consulted with Emerald and the EPI project manager to implement a field modification that would provide equivalent data for evaluation of the effectiveness of the already-performed Site remediation. As a result, sample location ES-07 was moved to the location immediately southwest of the railcar, approximately 30 feet southwest of the original ES-07 sampling point. An additional sampling point, ES-09, was added immediately northeast of the railcar, approximately 20 feet northeast of the original ES-07 sampling point. These locations were as close to the original ES-07 sampling point as access allowed.

Sample locations are shown in Figure 2 and are described as follows:

- ES-01-S and ES-01-D: 150 feet southwest of the railcar release location;
- ES-02-S and ES-02-D: 100 feet southwest of the railcar release location;
- ES-03-S and ES-03-D: 50 feet southwest of the railcar release location;
- ES-04-S and ES-04-D: At the railcar release location;
- ES-05-S and ES-05-D: 50 feet northeast of the railcar release location;
- ES-06-S and ES-06-D: 100 feet northeast of the railcar release location;
- ES-07-S and ES-07-D: Immediately southwest of the unrelated railcar;
- ES-08-S: Duplicate of ES-04-S; and,
- ES-09-S: Immediately northeast of the unrelated railcar at the northeast end of the rail spur.

### **2.2.2 Sample Collection Methods**

Soil samples were collected by hand digging or direct-push probing, as appropriate for the site-specific access conditions. Sample ES-09-S was collected by hand digging because there was not sufficient access for the direct-push probe rig to collect a sample from that

location at the northeast end of the railcar. The 15 remaining soil samples were collected using a direct-push probe rig equipped with a 4-foot long, 3.5-inch diameter sample barrel containing single-use acetate sample liners. All soil samples were discrete samples and no composite samples were collected for performance or compliance sampling purposes.

Soil samples were placed in pre-cleaned, laboratory-supplied glass jars. EPA method 5035 was used to collect soil samples intended for BTEX, HVOC, and GRPH analysis. Filled sample containers were then placed into a cooler with sufficient ice to maintain an internal temperature of 4°C or less throughout the remaining sampling and transport to the analytical laboratory.

Sheen testing to field-screen for the presence of separate-phase hydrocarbons within the soil matrix was performed. At each sample interval a small amount of the soil sample was disaggregated and placed into a decontaminated pan with distilled water. The visual observation and subjective measure of intensity of the resulting hydrocarbon sheen served as a field indication of the presence and relative degree of hydrocarbon contamination in the soil sample. Hydrocarbon sheen was not noted in any of the samples.

A photoionization detector (PID) was used to field screen soil cores for the presence of volatile organic compounds (VOCs). Immediately after opening the acetate sample liners EPI field staff used the PID to screen the full length of each soil core for VOCs. VOCs were not detected during field screening, which is consistent with the analytical results for VOCs.

Field activities including times, dates, identification numbers, and sampling locations were recorded in a field notebook. This field notebook contains notations of pertinent observations, field screening, health and safety monitoring measurements, and other observations deemed important by the field personnel. Copies of field notes are presented in Attachment C.

### **2.2.3 Laboratory Analyses**

All 16 soil samples described in Section 2.2.2 were analyzed by Analytical Resources, Incorporated (ARI) in Tukwila, WA for GRPH and DRPH, using Methods NWTPH-G and NWTPH-Dx, respectively.

Per footnote (8) in MTCA Table 830-1, "Required Testing for Petroleum Releases," additional constituents must be analyzed in a sufficient number of samples to determine whether the chemical is present at concentrations of concern. Samples from all 16 soil sampling locations were collected in sufficient quantity to perform all of the analyses listed in MTCA Table 830-1 and Table 1 of the SAP. Only surface samples ES-03-S, ES-04-S, and ES-05-S, from locations in the center of the release location (ES-04-S) and 50 feet to either side were analyzed by ARI for BTEX, EDB, EDC, MTBE, cPAHs, HVOCs, cadmium, and lead with a five-day turn around time. The remaining samples were archived at the analytical laboratory and held pending evaluation of results from the three locations. If any potential COCs were

detected at concentrations greater than MTCA Method A Soil Cleanup Levels for Industrial Properties the archived samples would be analyzed for the additional analyses.

Total cadmium and total lead analysis were analyzed using Method 6010B. cPAHs were analyzed by Method SW8270D using gas chromatography and mass spectrometry (GC/MS). BTEX, EDB, EDC, MTBE and HVOCs were analyzed by Method 8260C using a Purge and Trap GC/MS.

An additional sample volume was collected from each sampling location and depth, for possible later hydrocarbon fuel scan analysis based on the initial sample results. Samples collected for hydrocarbon fuel scan analysis were retained and archived at Friedman & Bruya. Per the SAP, the hydrocarbon fuel scan analysis would be performed if the GRPH and DRPH concentrations exceeded MTCA Method A Soil Cleanup Levels for Industrial Properties. None of the GRPH or DRPH concentrations exceeded applicable cleanup levels; therefore, the hydrocarbon fuel scan analysis was not performed.

### **2.3 Confirmation Sampling**

Confirmation sampling is intended to confirm the effectiveness of the cleanup action performed at the Site by Emerald and NRC.

Per the data evaluation process described in the SAP, if analytical results from the performance sampling meet MTCA Method A Soil Cleanup Levels for Industrial Properties the performance sample data will also serve as confirmation sampling data. All analytical results for the performance samples are non-detect or at concentrations less than MTCA Method A Soil Cleanup Levels for Industrial Properties, therefore the performance sampling data also serve as confirmation sampling data.

### 3.0 DATA QUALITY

#### 3.1 Sample Identification and Handling

Soil samples were given unique alphanumeric identifiers (sample names) to distinguish individual samples. The following sample identification scheme was used:

ES-##-X

Where:

- ES = Emerald Services
- ## = Sample location number
- X = "S" for surface sample (0 to 0.5 ft. bgs), "D" for deeper sample (1.0 to 1.5 ft. bgs)

Sample packaging, handling, and chain-of-custody procedures described in the SAP were followed during this Site Assessment.

#### 3.2 Duplicates, Blanks, Lab Control Samples and Matrix Spike

EPI submitted samples to ARI, a Washington State-certified analytical laboratory, for the analyses summarized in Table 1. Reporting limits (RLs) for the ARI analyses are listed in Table 1 for every non-detect result.

One field duplicate sample, labeled as ES-08-S, was collected at location ES-04-S and was analyzed for DRPH and GRPH. The location of the duplicate sample was recorded in the field notes but was not known to the laboratory.

Laboratory Method Blanks and Control Samples were analyzed for DRPH GRPH, metals, cPAHs, naphthalenes and VOCs. A trip blank was also submitted with the samples and analyzed for VOCs with no detections in the trip blank sample.

Additional volumes of soil were collected to allow for Matrix Spike and Matrix Spike Duplicate (MS/MSD) analysis. Soil from ES-05-D was used for DRPH MS/MSD analysis. Soil from ES-09-S was used for GRPH MS/MSD analysis. Soil from ES-03-S was used for metals MS/MSD analysis. Soil from ES-04-S was used for cPAH and naphthalene MS/MSD analysis. No matrix interference issues were noted in the MS/MSD results.

Laboratory data sheets containing quality control analysis results are presented in Attachment D.

### **3.3 Laboratory Contact Information**

EPI submitted 16 soil samples to ARI, for the analyses summarized in Table 1.

ARI's contact for this project is:

Susan Dunahoo  
Analytical Resources, Inc.  
4611 South 134<sup>th</sup> Place  
Tukwila, WA 98168  
(206) 695-6207

Emerald has retained an aliquot of the product sample, which can be sent to Torkelson for potential future analysis at the direction and expense of the Port. Torkelson's contact for this project is:

Bruce Torkelson  
Torkelson Geochemistry, Inc.  
2528 South Columbia Place  
Tulsa, OK 74114-3233  
(918) 749-8441

A product sample and soil samples from all sample locations were sent to Friedman & Bruya and were archived and held for analysis. The samples were held for potential hydrocarbon fuel scan analysis depending upon the results of ARI's GRPH and DRPH analyses. The Friedman & Bruya contact for this project is:

Eric Young  
Friedman & Bruya, Inc.  
3012 16th Avenue, West  
Seattle, WA 98119  
(206) 285-8282

## **4.0 ANALYTICAL RESULTS AND COMPARISONS TO CRITERIA**

A summary of analytical results for the Performance Sampling performed at the Site is presented in Table 1. Laboratory data sheets containing all analytical results, TPH chromatograms, and laboratory quality control sample results are presented in Attachment D.

### **4.1 Performance Sampling**

Performance Sampling analytical data are summarized by constituent groups and compared to MTCA Method A Soil Cleanup Levels for Industrial Properties in the following bullets.

#### **Volatile Petroleum Compounds (BTEX)**

- Samples ES-03-S, ES-04-S, and ES-05-S were analyzed for BTEX compounds with detections of m,p-xylene at a concentration of 0.0023 mg/kg and o-xylene at a concentration of 0.0024 mg/kg, both in the sample from ES-04-S. The total xylene concentration is 0.0047 mg/kg, which is less than the MTCA Method A Soil Cleanup Level for Industrial Properties of 9.0 mg/kg.

#### **Petroleum Hydrocarbons**

- Petroleum hydrocarbons were analyzed in all 16 soil samples. Three of the 16 soil samples analyzed for petroleum hydrocarbons had detectable concentrations of petroleum hydrocarbons and none of the three detections were at concentrations greater than applicable MTCA Method A Soil Cleanup Levels for Industrial Properties.
- GRPH was detected in samples ES-03-D and ES-06-D at concentrations of 9.9 mg/kg and 12 mg/kg, respectively. Both GRPH detections are at concentrations less than the MTCA Method A Soil Cleanup Level for Industrial Properties of 100 mg/kg.
- DRPH was detected in sample ES-09-S at a concentration of 38 mg/kg, which is less than the MTCA Method A Soil Cleanup Level for Industrial Properties of 2,000 mg/kg.
- Motor oil range petroleum hydrocarbons were detected in sample ES-09-S at a concentration of 320 mg/kg, which is less than the MTCA Method A Soil Cleanup Level for Industrial Properties of 2,000 mg/kg.
- Soil samples were collected and archived and held for hydrocarbon fuel scan analysis. The hydrocarbon fuel scan analysis was to be performed if the GRPH or DRPH concentrations exceeded MTCA Method A Soil Cleanup Levels for Industrial Soils. All analytical results are non-detect or at concentrations less than MTCA Method A Soil

Cleanup Levels for Industrial Properties, therefore the hydrocarbon fuel scan analysis was not performed.

### **Fuel Additives**

- Analyses for fuel additives were performed on samples ES-03-S, ES-04-S, and ES-05-S. Analytical results for the fuel additives, EDB, EDC, MTBE, and total lead are all non-detect.

### **Other Petroleum Components**

- Analyses for carcinogenic PAHs and naphthalenes (non-carcinogenic) was performed on samples ES-03-S, ES-04-S, and ES-05-S. Carcinogenic PAHs were not detected in these samples.
- Naphthalene and 1-methylnaphthalene were detected in the sample ES-05-at concentrations of 0.32 mg/kg and 0.012 mg/kg, respectively. The sum of these concentrations is 0.45, which is less than the MTCA Method A Soil Cleanup Level for Industrial Properties of 5.0 mg/kg.

### **Other Compounds**

- Other compounds, HVOCs and total cadmium, were analyzed in samples ES-03-S, ES-04-S, and ES-05-S with no detections of any constituents.

The concentrations of additional constituents were non-detect or detected at levels well below the applicable MTCA Method A Cleanup Levels for Industrial Properties the archived samples were not analyzed for the full constituent list found in Table 1 of the SAP.

At the request of the Port of Tacoma, analytical data are also compared to Category 2 criteria from Guidelines for Reuse of Petroleum Contaminated Soil, as listed in Table 1. The Category 2 criteria are not regulatory levels and any concentrations exceeding the Category 2 criteria will be managed directly by the Port. The only soil sample that did not meet Category 2 criteria was the motor oil range petroleum hydrocarbon detection of 320 mg/kg in the ES-09-S sample.

## **4.2 Confirmation Sampling**

Analytical results from the performance sampling meet MTCA Method A Soil Cleanup Levels for Industrial Properties. Therefore, the performance sample data also serve as confirmation sampling data and demonstrate that the emergency response cleanup activities were successful and clean closure has been attained at the Site.



## **5.0 CONCLUSIONS AND RECOMMENDATIONS**

Analytical results from Site Assessment sampling meet MTCA Method A Soil Cleanup Levels for Industrial Properties. These data demonstrate that the emergency response cleanup activities were successful and clean closure has been attained at the Site.

Based on the analytical data demonstrating successful cleanup no further cleanup action, remediation, or sampling is warranted at the Site.

---

<sup>i</sup> Environmental Partners, Inc. 2010. Railcar Oil Release Sampling and Analysis Plan. June 25, 2010.

## TABLE

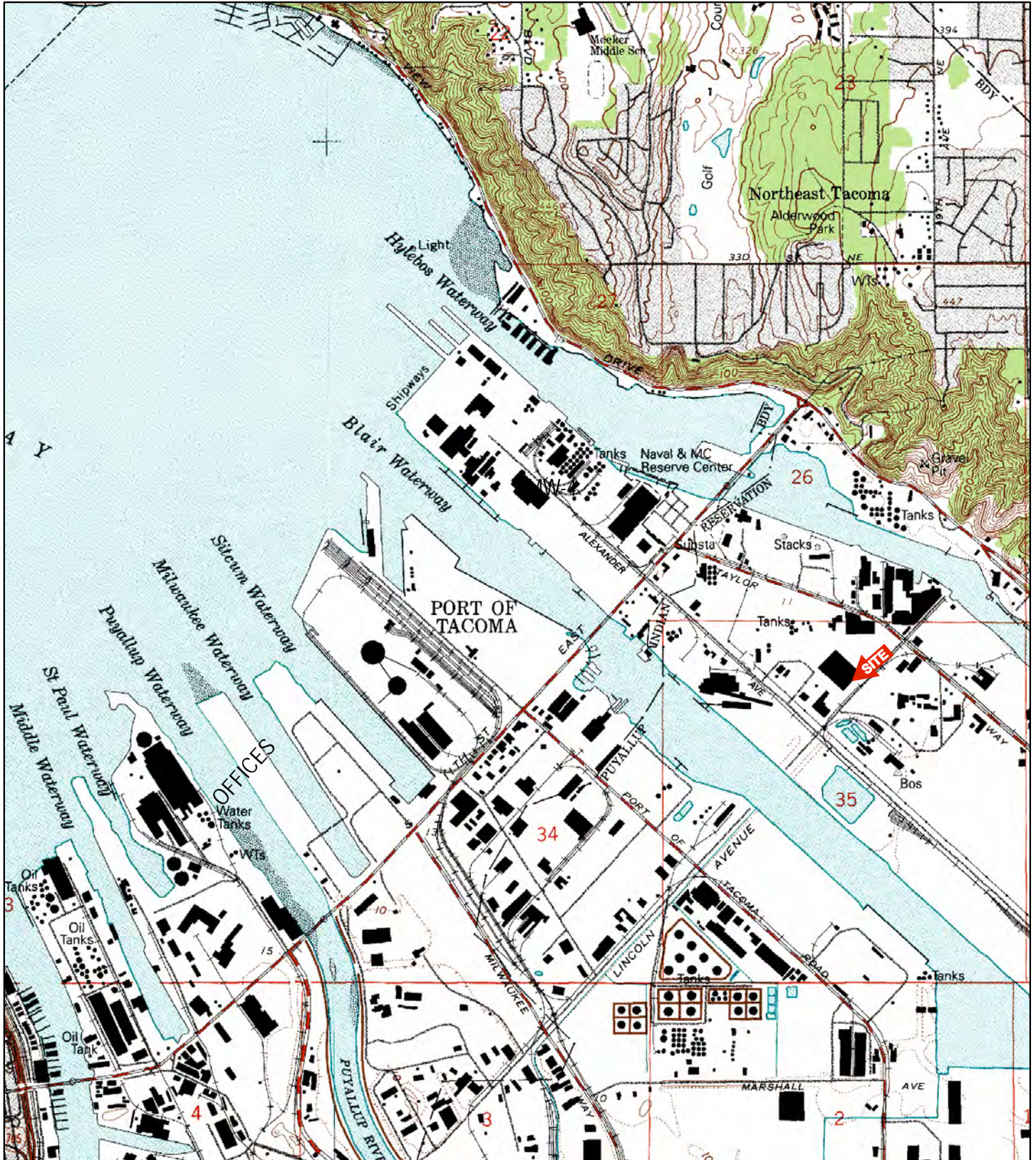
**Table 1: Railcar Oil Release Soil Sampling Analytical Results**

Sampling Location	Volatile Petroleum Compounds (BTEX)				Fuel Additives			Other Petroleum Components			Other Compounds		Petroleum Hydrocarbons			
	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylene (mg/kg)	1,2-Dibromoethane (EDB) (mg/kg)	1,2-Dichloroethane (EDC) (mg/kg)	Methyl tertiary-Butyl Ether (MTBE) (mg/kg)	Total Lead (mg/kg-dry)	Carcinogenic PAHs (mg/kg)	Naphthalenes (mg/kg)	Halogenated VOCs (mg/kg)	Total Cadmium (mg/kg-dry)	Gasoline-Range Petroleum Hydrocarbons (mg/kg)	Diesel-Range Petroleum Hydrocarbons (mg/kg)	Motor Oil Range Petroleum Hydrocarbons (mg/kg)	Hydrocarbon fuel scan
ES-01-S	-	-	-	-	-	-	-	-	-	-	-	-	< 8.8 U	< 6.2 U	<12 U	-
ES-01-D	-	-	-	-	-	-	-	-	-	-	-	-	< 7.1 U	< 6.0 U	<12 U	-
ES-02-S	-	-	-	-	-	-	-	-	-	-	-	-	< 6.2 U	< 5.4 U	<11 U	-
ES-02-D	-	-	-	-	-	-	-	-	-	-	-	-	< 7.0 U	< 5.9 U	<12 U	-
ES-03-S	< 0.002 U	< 0.002 U	< 0.002 U	< 0.002 U	< 0.002 U	< 0.002 U	< 0.002 U	< 3.0 U	< 0.066 U	< 0.066 U	< 0.002 U	< 0.3 U	< 13 U	< 8.3 U	<16 U	-
ES-03-D	-	-	-	-	-	-	-	-	-	-	-	-	<b>9.9</b>	< 5.7 U	<11 U	-
ES-04-S	<0.0012 U	<0.0012 U	<0.0012 U	<b>0.0047</b>	<0.0012 U	<0.0012 U	<0.0012 U	< 2.0 U	< 0.058 U	< 0.058 U	< 0.0012 U	< 0.2 U	< 7.5 U	< 5.8 U	<12 U	-
ES-04-D	-	-	-	-	-	-	-	-	-	-	-	-	< 6.6 U	< 5.4 U	<11 U	-
ES-05-S	<0.0013 U	<0.0013 U	<0.0013 U	<0.0013 U	<0.0013 U	<0.0013 U	<0.0013 U	< 2.0 U	< 0.064 U	<b>0.45</b>	<0.0013 U	< 0.2 U	< 6.7 U	< 5.9 U	<12 U	-
ES-05-D	-	-	-	-	-	-	-	-	-	-	-	-	< 7.2 U	< 5.6 U	<11 U	-
ES-06-S	-	-	-	-	-	-	-	-	-	-	-	-	< 5.8 U	< 5.5 U	<11 U	-
ES-06-D	-	-	-	-	-	-	-	-	-	-	-	-	<b>12</b>	< 5.6 U	<11 U	-
ES-07-S	-	-	-	-	-	-	-	-	-	-	-	-	< 7.3 U	< 5.6 U	<11 U	-
ES-07-D	-	-	-	-	-	-	-	-	-	-	-	-	< 6.2 U	< 5.1 U	<10 U	-
ES-08-S (Duplicate of ES-04-S)	-	-	-	-	-	-	-	-	-	-	-	-	< 6.2 U	< 5.5 U	<11 U	-
ES-09-S	-	-	-	-	-	-	-	-	-	-	-	-	< 5.8 U	<b>38</b>	<b>320</b>	-
MTCA Method A Soil CULs for Industrial Properties (mg/kg)	0.03	7	6	9	0.005	11 <sup>a</sup>	0.1	1,000	2 <sup>b</sup>	5	PCE = 0.05 TCE = 0.03 1,1,1-TCA = 2	2	100 / 30 <sup>d</sup>	2,000	2,000	not applicable
Category 2 Reuse of PCS (mg/kg)	0.005-0.03	0.005-7	0.005-6	0.015-9	NA	NA	0.005-0.1	17-45	0.05-0.1	0.05-5	NA	NA	5-30	25-200	100-200	not applicable

**Notes:**  
 Detections in bold  
 -- = Sample collected and archived  
 NA = Not Applicable  
 PCS = Petroleum Contaminated Soil  
 PAHs - polycyclic aromatic hydrocarbons  
 VOCs - volatile organic compounds  
 CULs - cleanup levels  
 mg/kg = milligrams per kilogram  
<sup>a</sup> = MTCA Method B (carcinogenic) soil cleanup level  
<sup>b</sup> = based on benzo(a)pyrene, total for all PAHs detected  
<sup>c</sup> = based on naphthalene CAS number 91-20-3  
<sup>d</sup> = 100 for gasoline mixtures without benzene and TEX totaling less than 1 percent / 30 for all others.

Carcinogenic PAHs: Benzo(a)anthracene, Chrysene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene and Total Benzofluoranthenes.  
 VOCs: 1,1,1-TCA, TCE, PCE.  
 Naphthalenes: Naphthalene, 2-Methylnaphthalene, 1-Methylnaphthalene.

## FIGURES



KEY:

SOURCE: USGS 7.5 MINUTE QUADRANGLE (TOPOGRAPHIC)  
 TACOMA NORTH, WASHINGTON  
 1961 (REVISED 1994)



SCALE = 1:24,000

**epi ENVIRONMENTAL PARTNERS INC**  
 295 NE Gilman Boulevard, Suite 201  
 Issaquah, Washington 98027

FIGURE 1

GENERAL VICINITY MAP

<b>PROJECT</b>	43507.4		
<b>PREPARED FOR</b>	EMERALD SERVICES, INC.		
<b>LOCATION</b>	EDUCATOR BUILDING 3401 LINCOLN AVENUE TACOMA, WASHINGTON		
<b>SHEET</b> 1 of 1	<b>DRAWN BY</b> ARM	<b>REVIEWED BY</b> DCK	<b>DATE</b> 12/21/09



KEY:

- APPROXIMATE SOIL SAMPLING LOCATION
- APPROXIMATE EXTENT OF OBSERVED SHEEN
- RAILROAD TRACKS

SCALE: 1" = 50'

**epi ENVIRONMENTAL PARTNERS INC**  
 295 NE Gilman Boulevard, Suite 201  
 Issaquah, Washington 98027

FIGURE 2

SITE REPRESENTATION AND SAMPLING LOCATIONS

<b>PROJECT</b>	43507.6		
<b>PREPARED FOR</b>	EMERALD SERVICES		
<b>LOCATION</b>	EDUCATOR BUILDING 3401 LINCOLN AVENUE TACOMA, WASHINGTON		
<b>SHEET</b> 1 of 1	<b>DRAWN BY</b> MMH/KLA	<b>REVIEWED BY</b> DCK	<b>DATE</b> 07/16/10

## **Attachment A**



www.emeraldnw.com

December 29, 2009

- Recycling & Recovery
- Marine & Industrial Cleaning
- Recycled Products
- Waste Treatment & Disposal
- Automotive Fluids Management
- Construction Services
- Transportation Services
- Vacuum Truck Services
- Portable Storage

Washington State Department of Ecology  
 Southwest Regional Office  
 P.O. Box 47775  
 Olympia WA 98504-7775  
 Attn: John Hanson

RE: Spill Report, ERTS #617057  
 Rail Spur at 3401 Lincoln Ave., Tacoma WA, December 15, 2009

Dear Mr. Hanson:

This report provides information regarding a recent oil spill that occurred at the rail spur (the "rail spur") located at 3401 Lincoln Ave., Tacoma, Washington.

Name, mailing address, and telephone number of reporter:

Sheila Smith, Environmental Coordinator  
 Emerald Services, Inc.  
 7343 East Marginal Way S.  
 Seattle WA 98108  
 206-832-3204

Name, address, and telephone number of facility:

Emerald Services, Inc.  
 3401 Lincoln Ave.  
 Tacoma WA 98421  
 (206) 832-3200 (Emerald Services, Inc. Tacoma facility phone number)

Date, time, and type of incident:

Emerald learned at 12:30 p.m on December 15, 2009 that used oil was leaking from a rail car hopper owned by Vortex Recycling ("Vortex") to a Port of Tacoma rail spur. After arriving at the site, Emerald began a clean-up response at approximately 1:30 p.m.. Once response support was mobilized from other divisions within the company, Emerald reported the incident to Ecology and the Port of Tacoma that afternoon.

{00215528.DOC /1}

Emerald Services, Inc. 7343 E. Marginal Way S. Seattle, WA 98108



Name and quantity of material involved:

Approximately 40 gallons of used oil was released from the Vortex Recycling rail car to the rail spur area.

Extent of injuries:

None

Actual or potential hazards to human health or the environment:

The release did not present any actual hazards to human health or the environment. Potential hazards to human health were de minimis due to the low health hazard rating of used oil. The risk to the environment was low, as the oil volume was relatively low, was released in a heavily developed industrial area, and did not reach any water body. Oil was spilled to an unpaved area, and the nearest storm drain was over 200 feet from the initial spill area. There were periods of heavy rain during the clean-up process, creating a potential risk of oil reaching the storm drain. Emerald eliminated this risk, however, by adequately protecting the storm drain throughout the clean-up process. No oil was released to water. Emerald has removed the majority of the contamination from the soil and is continuing to monitor the area with the assistance of NRC Environmental and under the supervision of the Tacoma Pierce County Health District and Port of Tacoma. Emerald is prepared to take any additional steps necessary to fully remediate Vortex's release.

Estimated quantity and disposition of recovered material that resulted from the incident:

To date, Emerald has removed approximately 5,200 gallons of oily water, 24.44 tons of contaminated soil and rock, and five drums of absorbents from the site. All of the above, along with any additional contaminated media generated at the site due to the clean-up efforts, have been, or will be transported to the Emerald facility located at 1500 Airport Way S., Seattle WA 98134 for proper disposal, including wastewater treatment and oil recovery, or consolidation and solidification prior to landfill.

Cause of incident:

A failed valve on Vortex's rail car hopper caused the incident. The valve failure allowed residual oil from the filters to leak to the rail line. The rail car hopper was staged on the rail spur awaiting off-site shipment. No loading, unloading, or movement of the car was occurring at the time of the spill.

Corrective action:

In addition to the clean-up activities described above, Emerald will cease its business relationship with Vortex Recycling once the subject Vortex rail car hopper and another remaining Vortex rail car hopper are shipped to Pennsylvania. On December 24, 2009, Emerald informed Vortex of its decision to cease doing business with Vortex. On the same date, Emerald also notified Vortex Recycling that, prior to shipping the remaining containers, Vortex Recycling must arrange to have a certified inspection performed on the rail car hoppers and have all necessary repairs completed by an appropriate

contractor. Emerald plans to hold the rail car hoppers until the inspections are complete and satisfactory repairs performed.

From December 17, 2009 until today, Emerald has continued with passive spill clean-up efforts, including monitoring the site and maintaining absorbent pads and visqueen over the main spill area to continue to remove residual used oil from the spill. The absorbent pads were checked regularly and changed out as necessary. As of this writing, the rail lines are being cleaned under the supervision of NRC Environmental, using Emerald personnel and equipment. The absorbents and visqueen have been removed and will be shipped to Emerald's facility in Seattle for proper disposal. Contaminated water, including wash water and puddles with visible contamination, are being collected, and fresh booms will be placed at each end of the immediate spill area prior to NRC's departure from the site in anticipation of rain forecast to begin late December 29, 2009.

Emerald will check the site conditions on Wednesday morning, December 30, 2009. If no additional sheen is observed, then Emerald will coordinate with the Port of Tacoma to place the rail line back in service. Emerald has contracted with Environmental Partners, Inc. ("EPI") to prepare a sampling plan to confirm that the cleanup was effective. Emerald will provide the sampling plan to the Port and Tacoma Pierce County Health District (contracted by Ecology) for review before EPI implements it.

Emerald and the Port of Tacoma have yet to determine whether to put the rail line back in service prior to confirming effective site clean-up. Ultimately, both parties understand that results of sampling will need to show effective cleanup, and early use of the rail line may result in additional maintenance costs for the rail line later. Effective cleanup will be determined by Tacoma Pierce County Health District.

If you need any additional information regarding this incident, please feel free to contact me.

Sincerely,



Sheila Smith, Environmental Coordinator  
Emerald Services, Inc.  
(206) 832-3204 (Office)  
(253) 370-7912 (Cell)  
(206) 832-3304 (fax)  
sheilas@emeraldinc.com

cc: Lisa Rozmyn, Port of Tacoma  
Sharon Bell, Tacoma Pierce County Health District  
Kerry Graber, Washington State Department of Ecology  
Vida Piera, City of Tacoma Environmental Services

## **Attachment B**



# Analysis Report Form

Sample Identification: Emerald Services -Tacoma.  
 Contact Person: Peter McLean/ Tina Beebe  
 Seattle Lab ID#:100202.00

NOTE: All units are in mg/kg (ppm) unless otherwise specified

Project Description: Railcar Oil sample

Parameter: PCB's in oil

By Method SW 846 8082, with 3580A Extraction

Samples are run on a Hewlett Packard 6890n Gas Chromatograph with an Agilent HP-5 capillary column

PCB Aroclors screened:

- Aroclor 1016
- Aroclor 1232
- Aroclor 1242
- Aroclor 1248
- Aroclor 1254
- Aroclor 1260

Any Aroclors detected will be listed below by individual concentration found.

Sample	Results	MDL	Surrogate recovery (decachlorobiphenol):
100202.00	< 1.0	1.0 mg/kg	83%

Analyst: L. Embrey

Date:2-3-10

## Quality Control Data:

Sample type:	Results	Percent Recovery	MDL	Surrogate recovery (decachlorobiphenol):
Blank	< 1.0	na	< 1.0 mg/kg	106%
Blank- spike @ 1.0 ppm	1.39	139%	< 1.0 mg/kg	104%
Matrix spike @ 1.50 ppm	1.29	86%	< 1.0 mg/kg	107%

Analyst: L. Embrey

Date:2-3-10

## **Attachment C**

6/30/10 43507.6

0515 - Leave for SITE. Pick up ice and arrive on-site @ 0610.

0615 - Mark locations according to "Railcar Oil Release Sampling and Analysis Plan."

0645 - Tanker railcar is on the tracks blocking access to location ES-07-S,D.

0655 - Locating Inc. on-site clearing locations which have been marking.

0700 - Call Doug Kunkel to inform him of the location of the railcar.

0730 - Clear locations of the entire length of railcar

JP

6/30/10 43507.6

to provide flexibility  
- for additional sampling.

0745 - Sheila Smith with Emerald Services on-site.

0800 - Rob with Pacific Northwest Probe + Drilling on-site.

0815 - Health and Safety Plan Meeting

0830 - Discussions with Shida and Doug have begun to attempt and get rail car moved.

0845 - Begin Sampling @ ES-02-S,D  
All samples collected according to "Railcar Oil Release Sampling and Analysis Plan" See pages 6-7 for sampling details. Analysis

JP

6/30/10 43507.6

information can be found on the  
COC and the Sampling and Analysis  
Plan.

0845 - Move to ES-02-S, D

See SAP for locations and  
analysis. See pages 6-7 for  
Samples collected

0915 - Move to ES-03-S, D

1000 - Move to ES-04-S, D

ES-08-S is a duplicate sample  
for ES-04-S

1045 - Move to ES-05-S, D

1130 - Move to ES-06-S, D

1200 - Move to ES-07-S, D

ES-07-S, D was approximately 20'  
south of location marked in the

16

6/30/10 43507.6<sup>5</sup>

SAP

1230 - PNW Probe off-site

1245 - Talked to Doug Kunkel and  
we will take a sample North  
of the rail car.

1300 - OFF-site to get shovel.

1330 - ON-site. Dig approximately  
2 feet to native soil below  
rail gravel. collect sample.

1350 - ES-09-S collected

1450 - OFF-SITE.

1530 - Sample drop off @ lab

1630 - Demobilize

1700 - Arrive @ OFFICE.

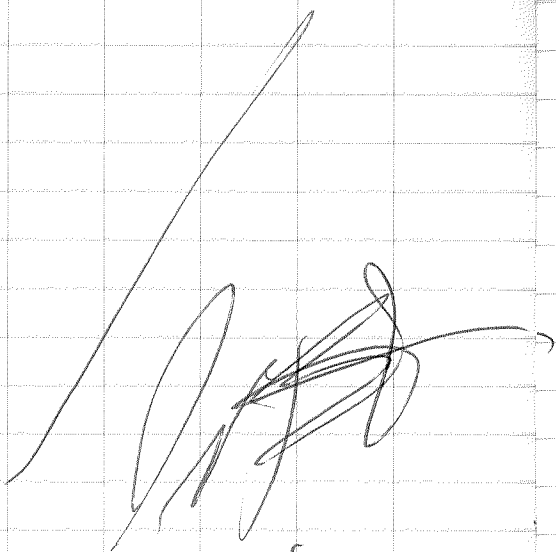
18

	TIME	Date	PID (ppm)	sheen testing	Notes
ES-01-S	0850	6/30/10	0.0	No visible sheen	
ES-01-D	0900	6/30/10	0.0	No visible sheen	
ES-02-S	0820	6/30/10	0.0	No visible sheen	
ES-02-D	0830	6/30/10	0.0	No visible sheen	
ES-03-S	0930	6/30/10	0.0	No visible sheen	
ES-03-D	0945	6/30/10	0.0	No visible sheen	
ES-04-S	1015	6/30/10	0.3	No visible sheen	
ES-04-D	1030	6/30/10	0.2	No visible sheen	
ES-05-S	1100	6/30/10	1.6	No visible sheen	
ES-05-D	1130	6/30/10	0.5	No visible sheen	
ES-06-S	1140	6/30/10	0.1	No visible sheen	
ES-06-D	1150	6/30/10	0.3	No visible sheen	
ES-07-S	1210	6/30/10	0.0	No visible sheen	
ES-07-D	1230	6/30/10	0.0	No visible sheen	
ES-08-S	1110	6/30/10	0.6	No visible sheen	Dupe for ES08S
ES-09-S	1350	6/30/10	0.0	No visible sheen	Hard Dog

16

10



A handwritten signature in dark ink, consisting of several overlapping loops and a long horizontal stroke extending to the right.

6/30/10

## **Attachment D**



**Analytical Resources, Incorporated**  
Analytical Chemists and Consultants

July 8, 2010

Doug Kunkel  
Environmental Partners, Inc.  
295 NE Gilman Blvd, Suite 201  
Issaquah, WA 98027

**RE: Project: Emerald Services, Inc., 43507.6**  
**ARI Job No: RC51**

Dear Doug:

Please find enclosed the original Chain-of-Custody (COC), sample receipt documentation, and the final report for the project referenced above. Analytical Resources, Inc. (ARI) accepted sixteen soil samples and one trip blank in good condition on June 30, 2010. For details regarding sample receipt, please refer to the enclosed Cooler Receipt Form.

The samples were analyzed for VOAs, PAHs, NWTPH-Dx, NWTPH-G, and total metals, as requested on the COC.

There were no anomalies associated with the analyses of these samples.

Please note that to comply with method requirements, we will now be reporting "Total Benzofluoranthenes" instead of benzo(b)fluoranthene and benzo(k)fluoranthene.

An electronic copy of this package will be kept on file with ARI. Should you have any questions regarding these results, please feel free to contact me at any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

A handwritten signature in blue ink, appearing to read "Susan D. Dunnihoo".

Susan D. Dunnihoo  
Director, Client Services  
206- 695-6207  
[sue@arilabs.com](mailto:sue@arilabs.com)

cc: eFile RC51

Enclosures

# Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated  
 Analytical Chemists and Consultants  
 4611 South 134th Place, Suite 100  
 Tukwila, WA 98168  
 206-695-6200 206-695-6201 (fax)



Page: 1 of 2  
 Date: 6/30/10  
 No. of Coolers: 2  
 Ice Present?   
 Cooler Temps: 21.3, 23.1

ARI Assigned Number: **RC51**  
 Turn-around Requested: **6-4y**  
 ARI Client Company: **ENVIRONMENTAL PARBERS, INC** Phone: **425-385-0010**  
 Client Contact: **BOB KUEHL**  
 Client Project Name: **HERALD Services, INC**  
 Client Project #: **43507.6**

Analysis Requested: **TPH, TPH, CMT, NAPH, Metals**  
 Notes/Comments: **\* Archive all others**

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested				Notes/Comments	
					TPH	TPH	CMT	NAPH		Metals
ES-01-S	6/30/10	0650	Soil	7	X	X	X	X		
ES-01-D	6/30/10	0900	Soil	7	X	X	X	X		
ES-02-S	6/30/10	0830	Soil	7	X	X	X	X		
ES-02-D	6/30/10	0830	Soil	7	X	X	X	X		
ES-03-S	6/30/10	0930	Soil	7	X	X	X	X		
ES-03-D	6/30/10	0945	Soil	7	X	X	X	X		
ES-04-S	6/30/10	1015	Soil	7	X	X	X	X		
ES-04-D	6/30/10	1030	Soil	7	X	X	X	X		
ES-05-S	6/30/10	1100	Soil	7	X	X	X	X		
ES-05-D	6/30/10	1130	Soil	7	X	X	X	X		

Comments/Special Instructions: **Relinquished by: [Signature] Received by: [Signature]**  
 Relinquished by: [Signature] Received by: [Signature]  
 Printed Name: **Estl Bernals** Printed Name: **A. Volgerdson**  
 Company: **EPC** Company: **ARI**  
 Date & Time: **6/30/10 1530** Date & Time: **6/30/10 1530**

**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 releases ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the 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.

RC51 0002

# Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated  
 Analytical Chemists and Consultants  
 4611 South 134th Place, Suite 100  
 Tukwila, WA 98168  
 206-695-6200 206-695-6201 (fax)



Page: 2 of 2  
 Date: 6/30/10  
 No. of Coolers: 2  
 Ice Present?   
 Cooler Temps: 21.3, 23.1

ARI Assigned Number: \_\_\_\_\_ Turn-around Requested: 5 days  
 ARI Client Company: ENVIRONMENTAL PARTNERS, LLC Phone: 425-241-5400  
 Client Contact: Doug Kunkel  
 Client Project Name: Emerald Services, Inc  
 Client Project #: 43501.6  
 Samplers: Josh Beinhill

Analysis Requested: 8260, TPH, TPH+, CPAT, NAPHT, Metals  
 Notes/Comments

Sample ID	Date	Time	Matrix	No. Containers					
ES-06-5	6/30/10	1140	Soil	7	X	X			
ES-06-0	6/30/10	1150	Soil	7	X	X			
ES-07-5	6/30/10	1210	Soil	7	X	X			
ES-07-0	6/30/10	1230	Soil	7	X	X			
ES-08-5	6/30/10	1110	Soil	7	X	X			
ES-09-5	6/30/10	1350	Soil	7	X	X			
TR10 BLANK	6/23/10		H <sub>2</sub> O	2	X				

Relinquished by: [Signature] Received by: [Signature]  
 Printed Name: [Name] Printed Name: [Name]  
 Company: [Company] Company: [Company]  
 Date & Time: 6/30/10 15:30 Date & Time: 6/30/10 15:30

Comments/Special Instructions

**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.

RCS1:0000



# Cooler Receipt Form

ARI Client: EPI

Project Name: Emerald Services

COC No(s): \_\_\_\_\_ NA

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: \_\_\_\_\_

Assigned ARI Job No: RC51

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

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 21.3 23.1

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 90877952

Cooler Accepted by: AV Date: 6/30/10 Time: 1530

**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? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: \_\_\_\_\_

Was sufficient ice used (if appropriate)? NA YES NO

Were all bottles sealed in individual plastic bags? YES NO

Did all bottles arrive in good condition (unbroken)? YES NO

Were all bottle labels complete and legible? YES NO

Did the number of containers listed on COC match with the number of containers received? 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 sheet, excluding VOCs)... NA YES NO

Were all VOC vials free of air bubbles? NA YES NO

Was sufficient amount of sample sent in each bottle? YES NO

Date VOC Trip Blank was made at ARI: \_\_\_\_\_ NA Split by: 6/23/10

Was Sample Split by ARI: NA YES Date/Time: \_\_\_\_\_ Equipment: \_\_\_\_\_ Split by: \_\_\_\_\_

Samples Logged by: MM Date: 7/1/10 Time: 0730

**\*\* Notify Project Manager of discrepancies or concerns \*\***

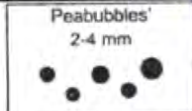
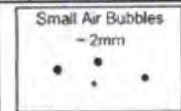
Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

**Additional Notes, Discrepancies, & Resolutions:**

2 of 2 TB = PB

By: MM

Date: 7/1/10



Small → "sm"

Peabubbles → "pb"

Large → "lg"

Headspace → "hs"





## Data Reporting Qualifiers

Effective 7/10/2009

### 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  $\geq$  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  $\leq 5$  times the Reporting Limit and the replicate control limit defaults to  $\pm 1$  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
- 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.
- Q Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria ( $< 20\%$  RSD,  $< 20\%$  Drift or minimum RRF).
- 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
- NR Spiked compound recovery is not reported due to chromatographic interference
- 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
- M2 The sample contains PCB congeners that do not match any standard Aroclor pattern. The PCBs are identified and quantified as the Aroclor whose pattern most closely matches that of the sample. The reported value is an estimate.
- N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"
- Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting 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  $\geq 40\%$  RPD with no obvious chromatographic interference

### Geotechnical Data

- A The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.
- F Samples were frozen prior to particle size determination
- SM Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations
- SS Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis
- W Weight of sample in some pipette aliquots was below the level required for accurate weighting

VOA SURROGATE RECOVERY SUMMARY



Matrix: Soil

QC Report No: RC51-Environmental Partners  
 Project: Emerald Services, Inc  
 43507.6

ARI ID	Client ID	Level	DCE	TOL	BFB	DCB	TOT OUT
RC51E	ES-03-S	Low	125%	104%	98.8%	101%	0
RC51G	ES-04-S	Low	123%	103%	100%	102%	0
MB-070110	Method Blank	Low	98.3%	100%	95.1%	99.0%	0
LCS-070110	Lab Control	Low	89.1%	101%	98.9%	99.4%	0
LCSD-070110	Lab Control Dup	Low	102%	101%	99.8%	101%	0
RC51I	ES-05-S	Low	118%	101%	96.3%	102%	0

SW8260C	LCS/MB LIMITS		QC LIMITS	
	Low	Med	Low	Med
(DCE) = d4-1,2-Dichloroethane	79-121	76-120	75-152	69-120
(TOL) = d8-Toluene	80-120	80-120	82-115	80-120
(BFB) = Bromofluorobenzene	80-120	80-120	64-120	76-128
(DCB) = d4-1,2-Dichlorobenzene	80-120	80-120	80-120	80-120

Log Number Range: 10-15627 to 10-15631

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C

Sample ID: ES-03-S

Page 1 of 1

SAMPLE

Lab Sample ID: RC51E


QC Report No: RC51-Environmental Partners

LIMS ID: 10-15627

Project: Emerald Services, Inc

Matrix: Soil

43507.6

Data Release Authorized: 

Date Sampled: 06/30/10

Reported: 07/02/10

Date Received: 06/30/10

Instrument/Analyst: FINN5/PAB

Sample Amount: 2.45 g-dry-wt

Date Analyzed: 07/01/10 18:13

Purge Volume: 5.0 mL

Moisture: 41.7%

CAS Number	Analyte	RL	Result	Q
107-06-2	1,2-Dichloroethane	2.0	< 2.0	U
71-55-6	1,1,1-Trichloroethane	2.0	< 2.0	U
79-01-6	Trichloroethene	2.0	< 2.0	U
71-43-2	Benzene	2.0	< 2.0	U
127-18-4	Tetrachloroethene	2.0	< 2.0	U
108-88-3	Toluene	2.0	< 2.0	U
100-41-4	Ethylbenzene	2.0	< 2.0	U
179601-23-1	m,p-Xylene	2.0	< 2.0	U
95-47-6	o-Xylene	2.0	< 2.0	U
106-93-4	Ethylene Dibromide	2.0	< 2.0	U
1634-04-4	Methyl tert-Butyl Ether	2.0	< 2.0	U

Reported in µg/kg (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	125%
d8-Toluene	104%
Bromofluorobenzene	98.8%
d4-1,2-Dichlorobenzene	101%

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C  
Page 1 of 1

Sample ID: ES-04-S  
SAMPLE

Lab Sample ID: RC51G  
LIMS ID: 10-15629  
Matrix: Soil  
Data Release Authorized: *AB*  
Reported: 07/02/10

QC Report No: RC51-Environmental Partners  
Project: Emerald Services, Inc  
43507.6  
Date Sampled: 06/30/10  
Date Received: 06/30/10

Instrument/Analyst: FINN5/PAB  
Date Analyzed: 07/01/10 18:39

Sample Amount: 4.16 g-dry-wt  
Purge Volume: 5.0 mL  
Moisture: 16.7%

CAS Number	Analyte	RL	Result	Q
107-06-2	1,2-Dichloroethane	1.2	< 1.2	U
71-55-6	1,1,1-Trichloroethane	1.2	< 1.2	U
79-01-6	Trichloroethene	1.2	< 1.2	U
71-43-2	Benzene	1.2	< 1.2	U
127-18-4	Tetrachloroethene	1.2	< 1.2	U
108-88-3	Toluene	1.2	< 1.2	U
100-41-4	Ethylbenzene	1.2	< 1.2	U
179601-23-1	<b>m,p-Xylene</b>	<b>1.2</b>	<b>2.3</b>	
95-47-6	<b>o-Xylene</b>	<b>1.2</b>	<b>2.4</b>	
106-93-4	Ethylene Dibromide	1.2	< 1.2	U
1634-04-4	Methyl tert-Butyl Ether	1.2	< 1.2	U

Reported in µg/kg (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	123%
d8-Toluene	103%
Bromofluorobenzene	100%
d4-1,2-Dichlorobenzene	102%

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C

Sample ID: ES-05-S

Page 1 of 1

SAMPLE

Lab Sample ID: RC51I

QC Report No: RC51-Environmental Partners

LIMS ID: 10-15631

Project: Emerald Services, Inc

Matrix: Soil

43507.6

Data Release Authorized: *[Signature]*

Date Sampled: 06/30/10

Reported: 07/02/10

Date Received: 06/30/10

Instrument/Analyst: FINN5/PAB

Sample Amount: 3.91 g-dry-wt

Date Analyzed: 07/01/10 19:06

Purge Volume: 5.0 mL

Moisture: 21.5%

CAS Number	Analyte	RL	Result	Q
107-06-2	1,2-Dichloroethane	1.3	< 1.3	U
71-55-6	1,1,1-Trichloroethane	1.3	< 1.3	U
79-01-6	Trichloroethene	1.3	< 1.3	U
71-43-2	Benzene	1.3	< 1.3	U
127-18-4	Tetrachloroethene	1.3	< 1.3	U
108-88-3	Toluene	1.3	< 1.3	U
100-41-4	Ethylbenzene	1.3	< 1.3	U
179601-23-1	m,p-Xylene	1.3	< 1.3	U
95-47-6	o-Xylene	1.3	< 1.3	U
106-93-4	Ethylene Dibromide	1.3	< 1.3	U
1634-04-4	Methyl tert-Butyl Ether	1.3	< 1.3	U

Reported in µg/kg (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	118%
d8-Toluene	101%
Bromofluorobenzene	96.3%
d4-1,2-Dichlorobenzene	102%

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C  
Page 1 of 1

Sample ID: MB-070110  
METHOD BLANK

Lab Sample ID: MB-070110  
LIMS ID: 10-15631  
Matrix: Soil  
Data Release Authorized:  
Reported: 07/02/10

QC Report No: RC51-Environmental Partners  
Project: Emerald Services, Inc  
43507.6  
Date Sampled: NA  
Date Received: NA

Instrument/Analyst: FINN5/PAB  
Date Analyzed: 07/01/10 13:16

Sample Amount: 5.00 g-dry-wt  
Purge Volume: 5.0 mL  
Moisture: NA

CAS Number	Analyte	RL	Result	Q
107-06-2	1,2-Dichloroethane	1.0	< 1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	< 1.0	U
79-01-6	Trichloroethene	1.0	< 1.0	U
71-43-2	Benzene	1.0	< 1.0	U
127-18-4	Tetrachloroethene	1.0	< 1.0	U
108-88-3	Toluene	1.0	< 1.0	U
100-41-4	Ethylbenzene	1.0	< 1.0	U
179601-23-1	m,p-Xylene	1.0	< 1.0	U
95-47-6	o-Xylene	1.0	< 1.0	U
106-93-4	Ethylene Dibromide	1.0	< 1.0	U
1634-04-4	Methyl tert-Butyl Ether	1.0	< 1.0	U

Reported in µg/kg (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	98.3%
d8-Toluene	100%
Bromofluorobenzene	95.1%
d4-1,2-Dichlorobenzene	99.0%

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C

Sample ID: LCS-070110

Page 1 of 1

LAB CONTROL SAMPLE

Lab Sample ID: LCS-070110


QC Report No: RC51-Environmental Partners

LIMS ID: 10-15631

Project: Emerald Services, Inc

Matrix: Soil

43507.6

Data Release Authorized: 

Date Sampled: NA

Reported: 07/02/10

Date Received: NA

Instrument/Analyst LCS: FINN5/PAB

Sample Amount LCS: 5.00 g-dry-wt

LCS: FINN5/PAB

LCS: 5.00 g-dry-wt

Date Analyzed LCS: 07/01/10 11:33

Purge Volume LCS: 5.0 mL

LCS: 07/01/10 12:07

LCS: 5.0 mL

Moisture: NA

Analyte	LCS	Spike	LCS	LCS	LCS	Spike	LCS	RPD
		Added-LCS	Recovery			Added-LCS	Recovery	
1,2-Dichloroethane	48.1	50.0	96.2%	50.3	50.0	101%	4.5%	
1,1,1-Trichloroethane	44.6	50.0	89.2%	50.4	50.0	101%	12.2%	
Trichloroethene	45.4	50.0	90.8%	48.8	50.0	97.6%	7.2%	
Benzene	47.1	50.0	94.2%	51.1	50.0	102%	8.1%	
Tetrachloroethene	44.6	50.0	89.2%	46.9	50.0	93.8%	5.0%	
Toluene	45.8	50.0	91.6%	50.2	50.0	100%	9.2%	
Ethylbenzene	49.6	50.0	99.2%	52.5	50.0	105%	5.7%	
m,p-Xylene	103	100	103%	109	100	109%	5.7%	
o-Xylene	48.8	50.0	97.6%	50.9	50.0	102%	4.2%	
Ethylene Dibromide	46.6	50.0	93.2%	47.6	50.0	95.2%	2.1%	
Methyl tert-Butyl Ether	49.3	50.0	98.6%	51.2	50.0	102%	3.8%	

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

**Volatile Surrogate Recovery**

	LCS	LCS
d4-1,2-Dichloroethane	89.1%	102%
d8-Toluene	101%	101%
Bromofluorobenzene	98.9%	99.8%
d4-1,2-Dichlorobenzene	99.4%	101%

VOA SURROGATE RECOVERY SUMMARY



Matrix: Water

QC Report No: RC51-Environmental Partners  
 Project: Emerald Services, Inc  
 43507.6

ARI ID	Client ID	PV	DCE	TOL	BFB	DCB	TOT OUT
RC51Q	TRIP BLANK	5	113%	102%	97.7%	102%	0

LCS/MB LIMITS

QC LIMITS

SW8260C

(DCE) = d4-1,2-Dichloroethane	83-122	80-125
(TOL) = d8-Toluene	80-120	80-120
(BFB) = Bromofluorobenzene	80-120	80-120
(DCB) = d4-1,2-Dichlorobenzene	80-120	80-120

Prep Method: SW5030B  
 Log Number Range: 10-15639 to 10-15639



**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C

Sample ID: TRIP BLANK  
SAMPLE

Page 1 of 1

Lab Sample ID: RC51Q


QC Report No: RC51-Environmental Partners

LIMS ID: 10-15639

Project: Emerald Services, Inc

Matrix: Water

43507.6

Data Release Authorized: 

Date Sampled: 06/30/10

Reported: 07/02/10

Date Received: 06/30/10

Instrument/Analyst: FINN5/PAB

Sample Amount: 5.00 mL

Date Analyzed: 07/01/10 19:32

Purge Volume: 5.0 mL

CAS Number	Analyte	RL	Result	Q
107-06-2	1,2-Dichloroethane	1.0	< 1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	< 1.0	U
79-01-6	Trichloroethene	1.0	< 1.0	U
71-43-2	Benzene	1.0	< 1.0	U
127-18-4	Tetrachloroethene	1.0	< 1.0	U
108-88-3	Toluene	1.0	< 1.0	U
100-41-4	Ethylbenzene	1.0	< 1.0	U
179601-23-1	m,p-Xylene	2.0	< 2.0	U
95-47-6	o-Xylene	1.0	< 1.0	U
106-93-4	Ethylene Dibromide	1.0	< 1.0	U
1634-04-4	Methyl tert-Butyl Ether	1.0	< 1.0	U

Reported in µg/L (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	113%
d8-Toluene	102%
Bromofluorobenzene	97.7%
d4-1,2-Dichlorobenzene	102%

**TPHG SOIL SURROGATE RECOVERY SUMMARY**

ARI Job: RC51  
Matrix: Soil

QC Report No: RC51-Environmental Partners  
Project: Emerald Services, Inc  
Event: 43507.6

<u>Client ID</u>	<u>BFB</u>	<u>TFT</u>	<u>BBZ</u>	<u>TOT OUT</u>
MB-070110	NA	94.0%	94.6%	0
LCS-070110	NA	99.7%	96.5%	0
LCSD-070110	NA	98.9%	96.7%	0
ES-01-S	NA	101%	100%	0
ES-01-D	NA	106%	102%	0
ES-02-S	NA	104%	99.8%	0
ES-02-D	NA	97.9%	98.2%	0
ES-03-S	NA	98.0%	96.9%	0
ES-03-D	NA	102%	99.2%	0
ES-04-S	NA	99.3%	98.7%	0
ES-04-D	NA	99.9%	98.4%	0
ES-05-S	NA	96.6%	98.4%	0
ES-05-D	NA	96.4%	98.0%	0
ES-06-S	NA	95.2%	95.3%	0
ES-06-D	NA	97.6%	96.3%	0
ES-07-S	NA	99.2%	100%	0
ES-07-D	NA	98.2%	99.4%	0
ES-08-S	NA	94.6%	97.2%	0
ES-09-S	NA	100%	99.8%	0
ES-09-S MS	NA	101%	102%	0
ES-09-S MSD	NA	96.9%	96.9%	0

	<b>LCS/MB LIMITS</b>	<b>QC LIMITS</b>
(BFB) = Bromofluorobenzene	(70-130)	(70-130)
(TFT) = Trifluorotoluene	(80-120)	(66-123)
(BBZ) = Bromobenzene	(80-120)	(62-130)

Log Number Range: 10-15622 to 10-15638

**ORGANICS ANALYSIS DATA SHEET**

TPHG by Method NWTPHG

Matrix: Soil


QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc

Event: 43507.6

Date Sampled: 06/30/10

Date Received: 06/30/10

Data Release Authorized: 

Reported: 07/02/10

ARI ID	Client ID	Analysis Date	Basis	Range	Result
MB-070110 10-15622	Method Blank	07/01/10 PID3	Dry	Gasoline HC ID Trifluorotoluene Bromobenzene	< 5.0 U --- 94.0% 94.6%
RC51A 10-15622	ES-01-S	07/01/10 PID3	Dry	Gasoline HC ID Trifluorotoluene Bromobenzene	< 8.8 U --- 101% 100%
RC51B 10-15623	ES-01-D	07/01/10 PID3	Dry	Gasoline HC ID Trifluorotoluene Bromobenzene	< 7.1 U --- 106% 102%
RC51C 10-15624	ES-02-S	07/01/10 PID3	Dry	Gasoline HC ID Trifluorotoluene Bromobenzene	< 6.2 U --- 104% 99.8%
RC51D 10-15626	ES-02-D	07/01/10 PID3	Dry	Gasoline HC ID Trifluorotoluene Bromobenzene	< 7.0 U --- 97.9% 98.2%
RC51E 10-15627	ES-03-S	07/01/10 PID3	Dry	Gasoline HC ID Trifluorotoluene Bromobenzene	< 13 U --- 98.0% 96.9%
RC51F 10-15628	ES-03-D	07/01/10 PID3	Dry	<b>Gasoline</b> HC ID Trifluorotoluene Bromobenzene	<b>9.9</b> GRO 102% 99.2%
RC51G 10-15629	ES-04-S	07/01/10 PID3	Dry	Gasoline HC ID Trifluorotoluene Bromobenzene	< 7.5 U --- 99.3% 98.7%
RC51H 10-15630	ES-04-D	07/01/10 PID3	Dry	Gasoline HC ID Trifluorotoluene Bromobenzene	< 6.6 U --- 99.9% 98.4%
RC51I 10-15631	ES-05-S	07/01/10 PID3	Dry	Gasoline HC ID Trifluorotoluene Bromobenzene	< 6.7 U --- 96.6% 98.4%

**ORGANICS ANALYSIS DATA SHEET**

TPHG by Method NWTPHG

Matrix: Soil


QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc

Event: 43507.6

Date Sampled: 06/30/10

Date Received: 06/30/10

Data Release Authorized: 

Reported: 07/02/10

ARI ID	Client ID	Analysis Date	Basis	Range	Result
RC51J 10-15632	ES-05-D	07/01/10 PID3	Dry	Gasoline HC ID Trifluorotoluene Bromobenzene	< 7.2 U --- 96.4% 98.0%
RC51K 10-15633	ES-06-S	07/01/10 PID3	Dry	Gasoline HC ID Trifluorotoluene Bromobenzene	< 5.8 U --- 95.2% 95.3%
RC51L 10-15634	ES-06-D	07/01/10 PID3	Dry	<b>Gasoline</b> HC ID Trifluorotoluene Bromobenzene	<b>12</b> GRO 97.6% 96.3%
RC51M 10-15635	ES-07-S	07/01/10 PID3	Dry	Gasoline HC ID Trifluorotoluene Bromobenzene	< 7.3 U --- 99.2% 100%
RC51N 10-15636	ES-07-D	07/01/10 PID3	Dry	Gasoline HC ID Trifluorotoluene Bromobenzene	< 6.2 U --- 98.2% 99.4%
RC51O 10-15637	ES-08-S	07/01/10 PID3	Dry	Gasoline HC ID Trifluorotoluene Bromobenzene	< 6.2 U --- 94.6% 97.2%
RC51P 10-15638	ES-09-S	07/01/10 PID3	Dry	Gasoline HC ID Trifluorotoluene Bromobenzene	< 5.8 U --- 100% 99.8%

Gasoline values reported in mg/kg (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.

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

**ORGANICS ANALYSIS DATA SHEET**

TPHG by Method NWTPHG

Page 1 of 1


Sample ID: ES-09-S

MATRIX SPIKE

Lab Sample ID: RC51P

LIMS ID: 10-15638

Matrix: Soil

Data Release Authorized: 

Reported: 07/02/10

QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc

Event: 43507.6

Date Sampled: 06/30/10

Date Received: 06/30/10

Date Analyzed MS: 07/01/10 20:19

MSD: 07/01/10 20:43

Instrument/Analyst MS: PID3/MH

MSD: PID3/MH

Purge Volume: 5.0 mL

Sample Amount MS: 85.8 mg-dry-wt

MSD: 85.8 mg-dry-wt

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Gasoline Range Hydrocarbons <	5.83 U	58.6	58.3	101%	60.2	58.3	103%	2.7%

Reported in mg/kg (ppm)

RPD calculated using sample concentrations per SW846.

**TPHG Surrogate Recovery**

	MS	MSD
Trifluorotoluene	101%	96.9%
Bromobenzene	102%	96.9%

**ORGANICS ANALYSIS DATA SHEET**

TPHG by Method NWTPHG

Page 1 of 1

Sample ID: LCS-070110

LAB CONTROL SAMPLE

Lab Sample ID: LCS-070110

LIMS ID: 10-15622

Matrix: Soil

Data Release Authorized: *B*

Reported: 07/02/10

QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc

Event: 43507.6

Date Sampled: NA

Date Received: NA

Date Analyzed LCS: 07/01/10 09:25

LCSD: 07/01/10 09:50

Instrument/Analyst LCS: PID3/MH

LCSD: PID3/MH

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	54.0	50.0	108%	50.6	50.0	101%	6.5%

Reported in mg/kg (ppm)

RPD calculated using sample concentrations per SW846.

**TPHG Surrogate Recovery**

	LCS	LCSD
Trifluorotoluene	99.7%	98.9%
Bromobenzene	96.5%	96.7%

**ORGANICS ANALYSIS DATA SHEET  
TOTAL DIESEL RANGE HYDROCARBONS**

NWTPHD by GC/FID-Silica and Acid Cleaned  
Page 1 of 2  
Matrix: Soil

QC Report No: RC51-Environmental Partners  
Project: Emerald Services, Inc  
43507.6

Data Release Authorized: *VBS*  
Reported: 07/03/10

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range	RL	Result
RC51A 10-15622	ES-01-S HC ID: ---	07/01/10	07/02/10 FID9	1.00 1.0	Diesel Motor Oil o-Terphenyl	6.2 12	< 6.2 U < 12 U 98.7%
RC51B 10-15623	ES-01-D HC ID: ---	07/01/10	07/02/10 FID9	1.00 1.0	Diesel Motor Oil o-Terphenyl	6.0 12	< 6.0 U < 12 U 102%
RC51C 10-15624	ES-02-S HC ID: ---	07/01/10	07/02/10 FID9	1.00 1.0	Diesel Motor Oil o-Terphenyl	5.4 11	< 5.4 U < 11 U 107%
RC51D 10-15626	ES-02-D HC ID: ---	07/01/10	07/02/10 FID9	1.00 1.0	Diesel Motor Oil o-Terphenyl	5.9 12	< 5.9 U < 12 U 92.9%
RC51E 10-15627	ES-03-S HC ID: ---	07/01/10	07/02/10 FID9	1.00 1.0	Diesel Motor Oil o-Terphenyl	8.3 16	< 8.3 U < 16 U 104%
RC51F 10-15628	ES-03-D HC ID: ---	07/01/10	07/02/10 FID9	1.00 1.0	Diesel Motor Oil o-Terphenyl	5.7 11	< 5.7 U < 11 U 82.7%
RC51G 10-15629	ES-04-S HC ID: ---	07/01/10	07/02/10 FID9	1.00 1.0	Diesel Motor Oil o-Terphenyl	5.8 12	< 5.8 U < 12 U 90.7%
RC51H 10-15630	ES-04-D HC ID: ---	07/01/10	07/02/10 FID9	1.00 1.0	Diesel Motor Oil o-Terphenyl	5.4 11	< 5.4 U < 11 U 99.5%
RC51I 10-15631	ES-05-S HC ID: ---	07/01/10	07/02/10 FID9	1.00 1.0	Diesel Motor Oil o-Terphenyl	5.9 12	< 5.9 U < 12 U 99.4%
MB-070110 10-15632	Method Blank HC ID: ---	07/01/10	07/02/10 FID9	1.00 1.0	Diesel Motor Oil o-Terphenyl	5.0 10	< 5.0 U < 10 U 110%
RC51J 10-15632	ES-05-D HC ID: ---	07/01/10	07/02/10 FID9	1.00 1.0	Diesel Motor Oil o-Terphenyl	5.6 11	< 5.6 U < 11 U 102%

**ORGANICS ANALYSIS DATA SHEET**

**TOTAL DIESEL RANGE HYDROCARBONS**

NWTPHD by GC/FID-Silica and Acid Cleaned

Page 2 of 2

Matrix: Soil

QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc

43507.6

Data Release Authorized: *VBS*  
Reported: 07/03/10

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range	RL	Result
RC51K 10-15633	ES-06-S HC ID: ---	07/01/10	07/02/10 FID9	1.00 1.0	Diesel Motor Oil o-Terphenyl	5.5 11	< 5.5 U < 11 U 106%
RC51L 10-15634	ES-06-D HC ID: ---	07/01/10	07/02/10 FID9	1.00 1.0	Diesel Motor Oil o-Terphenyl	5.6 11	< 5.6 U < 11 U 97.6%
RC51M 10-15635	ES-07-S HC ID: ---	07/01/10	07/02/10 FID9	1.00 1.0	Diesel Motor Oil o-Terphenyl	5.6 11	< 5.6 U < 11 U 104%
RC51N 10-15636	ES-07-D HC ID: ---	07/01/10	07/02/10 FID9	1.00 1.0	Diesel Motor Oil o-Terphenyl	5.1 10	< 5.1 U < 10 U 108%
RC51O 10-15637	ES-08-S HC ID: ---	07/01/10	07/02/10 FID9	1.00 1.0	Diesel Motor Oil o-Terphenyl	5.5 11	< 5.5 U < 11 U 93.3%
RC51P 10-15638	ES-09-S HC ID: DRO/MOTOR OIL	07/01/10	07/02/10 FID9	1.00 1.0	Diesel Motor Oil o-Terphenyl	5.0 10	38 320 96.2%

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 indicate results of organics or additional hydrocarbons in ranges are not identifiable.



Analytical Resources Inc.  
 NWTPH Quantitation Report

Data file: /chem2/fid9.i/20100702.b/0702A017.D  
 Method: /chem2/fid9.i/20100702.b/ftphfid9a.m  
 Instrument: fid9.i  
 Operator: MS  
 Report Date: 07/03/2010

ARI ID: RC51MBS1  
 Client ID: RC51MBS1  
 Injection: 02-JUL-2010 19:47  
 Dilution Factor: 1  
 Macro: 15-JUN-2010

FID:9 RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	2.063	0.009	5791	9132	GAS (Tol-C12)	185097	9
C8	2.181	-0.003	4089	7775	DIESEL (C12-C24)	72414	3
C10	2.856	0.000	2304	2420	M.OIL (C24-C38)	258747	19
C12	3.435	-0.010	625	880	AK-102 (C10-C25)	122227	5
C14	3.969	0.000	313	211	AK-103 (C25-C36)	185294	20
C16	4.438	0.004	782	449			
C18	4.897	-0.001	187	117			
C20	5.426	-0.005	529	358			
C22	5.900	-0.002	265	65			
C24	6.323	0.017	638	1344			
C25	6.485	-0.006	408	102			
C26	6.663	0.001	889	769			
C28	6.979	0.001	1785	3327			
C32	7.566	-0.004	2398	807	JP-4 (Tol-C14)	199489	12
C34	7.905	-0.005	2269	1171	BUNKERC (C10-C38)	378123	43
Filter Peak	7.680	-0.003	2362	841			
C36	8.328	-0.005	2544	4683			
C38	8.882	0.004	2269	1534			
C40	9.599	-0.005	2307	1058			
o-terph	5.125	-0.003	1097593	1073810	JET-A (C10-C18)	92235	7
Triacon Surr	7.278	-0.001	1138262	880882			

Range Times: NW Diesel(3.445 - 6.306) AK102(2.86 - 6.49) Jet A(2.86 - 4.90)  
 NW M.Oil(6.31 - 8.88) AK103(6.49 - 8.33) OR Diesel(2.86 - 6.98)

Surrogate	Area	Amount	%Rec
o-Terphenyl	1073810	49.5	110.0
Triacontane	880882	48.6	107.9

*MS 7/3/10*

Analyte	RF	Curve Date
o-Terph Surr	21702.3	14-MAY-2010
Triacon Surr	18136.2	14-MAY-2010
Gas	21009.8	15-JUN-2010
Diesel	22931.0	14-MAY-2010
Motor Oil	13981.0	14-MAY-2010
AK102	25407.0	14-MAY-2010
AK103	9457.0	10-DEC-2009
JP4	16396.5	09-JUN-2010
JetA	13819.1	11-JUN-2010
Bunker C	8770.6	05-JAN-2010

Data File: /chem2/fid9.i/20100702.b/07020017.D

Date: 02-JUL-2010 19:47

Client ID: RCS1HBS1

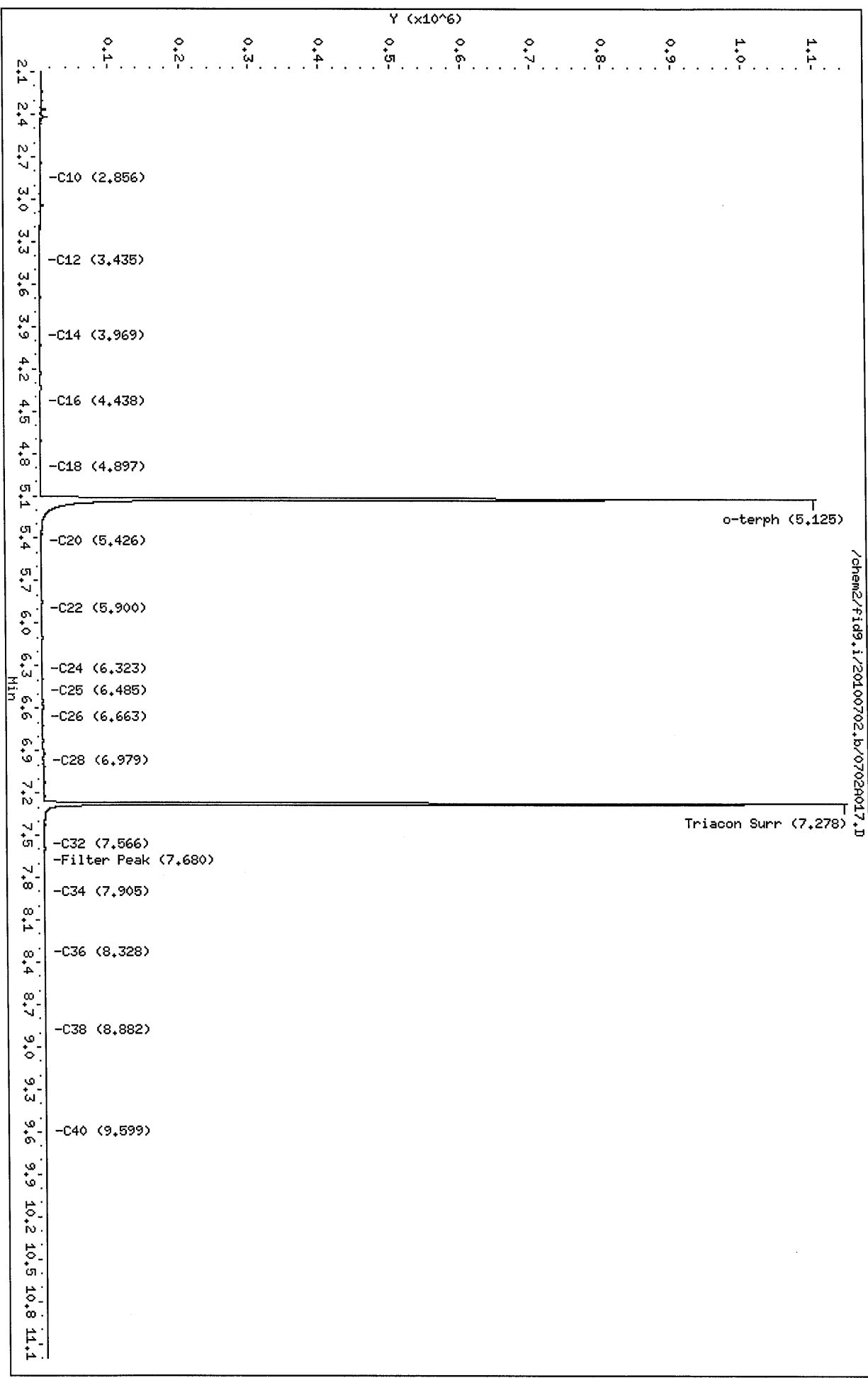
Sample Info: RCS1HBS1

Column phase: RTX-1

Instrument: fid9.i

Operator: HS

Column diameter: 0.25



Analytical Resources Inc.  
 NWTPH Quantitation Report

Data file: /chem2/fid9.i/20100702.b/0702A006.D  
 Method: /chem2/fid9.i/20100702.b/ftphfid9a.m  
 Instrument: fid9.i  
 Operator: MS  
 Report Date: 07/03/2010

ARI ID: RC51P  
 Client ID: ES-09-S  
 Injection: 02-JUL-2010 15:54  
 Dilution Factor: 1  
 Macro: 15-JUN-2010

FID:9 RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	2.064	0.010	5297	7466	GAS (Tol-C12)	201484	10
C8	2.183	-0.001	3324	3945	DIESEL (C12-C24)	8773114	383
C10	2.856	0.001	2950	2087	M.OIL (C24-C38)	44689327	3196
C12	3.451	0.007	2361	1572	AK-102 (C10-C25)	10314971	406
C14	3.973	0.004	4024	9171	AK-103 (C25-C36)	41468352	4385
C16	4.430	-0.003	13584	13474			
C18	4.893	-0.004	22173	30669			
C20	5.429	-0.002	37841	56489			
C22	5.903	0.001	116942	78509			
C24	6.307	0.001	275735	98204			
C25	6.478	-0.013	370228	440954			
C26	6.664	0.002	452032	213415			
C28	6.970	-0.008	565321	935140			
C32	7.575	0.005	309201	332847	JP-4 (Tol-C14)	257173	16
C34	7.909	-0.001	163651	64326	BUNKERC (C10-C38)	53529959	6103
Filter Peak	7.681	-0.002	243663	62788			
C36	8.335	0.002	78935	59193			
C38	8.880	0.002	40203	23304			
C40	9.612	0.008	19554	9635			
o-terph	5.125	-0.003	1191374	939425	JET-A (C10-C18)	858498	62
Triacon Surr	----						

Range Times: NW Diesel(3.445 - 6.306) AK102(2.86 - 6.49) Jet A(2.86 - 4.90)  
 NW M.Oil(6.31 - 8.88) AK103(6.49 - 8.33) OR Diesel(2.86 - 6.98)

Surrogate	Area	Amount	%Rec
o-Terphenyl	939425	43.3	96.2
Triacontane	0	0.0	0.0

MANUAL ADJUSTMENTS

1. Peak not found
2. Poor Chromatography
3. Baseline Correction
4. Totals Calculation
5. Other

Analyst Mr Date 7/3/10

Analyte	RF	Curve Date
o-Terph Surr	21702.3	14-MAY-2010
Triacon Surr	18136.2	14-MAY-2010
Gas	21009.8	15-JUN-2010
Diesel	22931.0	14-MAY-2010
Motor Oil	13981.0	14-MAY-2010
AK102	25407.0	14-MAY-2010
AK103	9457.0	10-DEC-2009
JP4	16396.5	09-JUN-2010
JetA	13819.1	11-JUN-2010
Bunker C	8770.6	05-JAN-2010

Data File: /chem2/fid9.i/20100702.b/0702A006.D

Date : 02-JUL-2010 15:54

Client ID: ES-09-S

Sample Info: RC51P

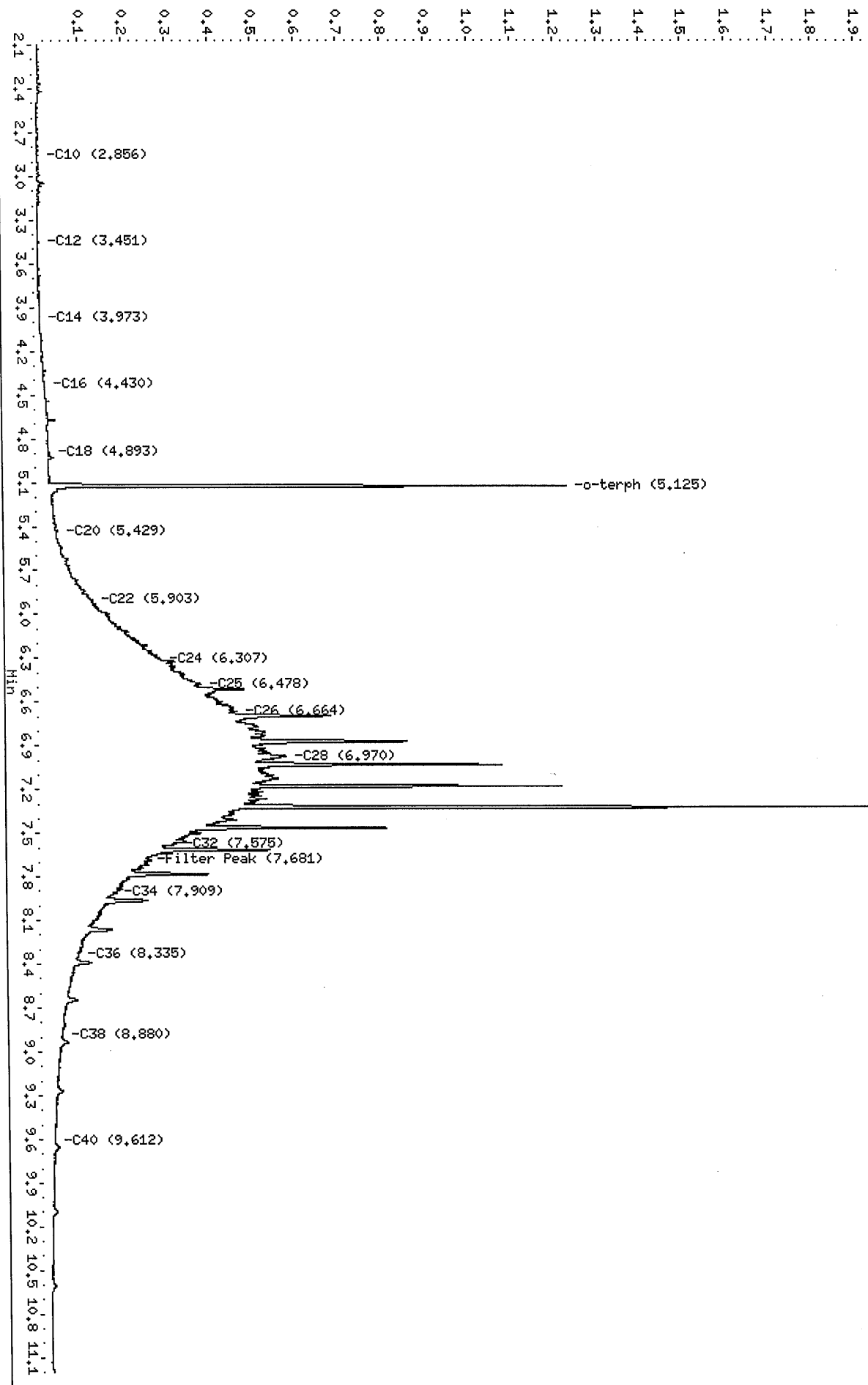
Column phase: RTX-1

Instrument: fid9.i

Operator: HS

Column diameter: 0.25

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**CLEANED TPHD SURROGATE RECOVERY SUMMARY**

Matrix: Soil

QC Report No: RC51-Environmental Partners  
Project: Emerald Services, Inc  
43507.6

<u>Client ID</u>	<u>OTER</u>	<u>TOT OUT</u>
ES-01-S	98.7%	0
ES-01-D	102%	0
ES-02-S	107%	0
ES-02-D	92.9%	0
ES-03-S	104%	0
ES-03-D	82.7%	0
ES-04-S	90.7%	0
ES-04-D	99.5%	0
ES-05-S	99.4%	0
MB-070110	110%	0
LCS-070110	114%	0
ES-05-D	102%	0
ES-05-D MS	106%	0
ES-05-D MSD	104%	0
ES-06-S	106%	0
ES-06-D	97.6%	0
ES-07-S	104%	0
ES-07-D	108%	0
ES-08-S	93.3%	0
ES-09-S	96.2%	0

**LCS/MB LIMITS      QC LIMITS**

(OTER) = o-Terphenyl

(63-115)

(49-120)

Prep Method: SW3546  
Log Number Range: 10-15622 to 10-15638

**ORGANICS ANALYSIS DATA SHEET**

NWTPHD by GC/FID-Silica and Acid Cleaned

Page 1 of 1

Sample ID: ES-05-D

MS/MSD

Lab Sample ID: RC51J

LIMS ID: 10-15632

Matrix: Soil

Data Release Authorized: *VAS*

Reported: 07/03/10

QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc

43507.6

Date Sampled: 06/30/10

Date Received: 06/30/10

Date Extracted MS/MSD: 07/01/10

Sample Amount MS: 9.03 g-dry-wt

MSD: 8.94 g-dry-wt

Date Analyzed MS: 07/02/10 21:33

Final Extract Volume MS: 1.0 mL

MSD: 07/02/10 21:55

MSD: 1.0 mL

Instrument/Analyst MS: FID/MS

Dilution Factor MS: 1.0

MSD: FID/MS

MSD: 1.0

Percent Moisture: 13.3%

Range	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Diesel	< 5.6	135	166	81.3%	132	168	78.6%	2.2%

**TPHD Surrogate Recovery**

	MS	MSD
o-Terphenyl	106%	104%

Results reported in mg/kg

RPD calculated using sample concentrations per SW846.

Analytical Resources Inc.  
NWTPH Quantitation Report

Data file: /chem2/fid9.i/20100702.b/0702A022.D  
Method: /chem2/fid9.i/20100702.b/ftphfid9a.m  
Instrument: fid9.i  
Operator: MS  
Report Date: 07/03/2010

ARI ID: RC51JMS  
Client ID: ES-05-D MS  
Injection: 02-JUL-2010 21:33  
Dilution Factor: 1  
Macro: 15-JUN-2010

FID:9 RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	2.059	0.005	18070	15535	GAS (Tol-C12)	3463426	165
C8	2.188	0.004	9204	9005	DIESEL (C12-C24)	27905051	1217
C10	2.855	-0.001	107618	69556	M.OIL (C24-C38)	385931	28
C12	3.443	-0.001	312151	238979	AK-102 (C10-C25)	30737309	1210
C14	3.975	0.006	169730	102795	AK-103 (C25-C36)	287957	30
C16	4.431	-0.002	1249459	815621			
C18	4.906	0.009	883666	829804			
C20	5.423	-0.008	108520	23572			
C22	5.907	0.006	334693	270909			
C24	6.305	-0.001	114913	108895			
C25	6.487	-0.003	47326	69181			
C26	6.660	-0.002	19930	28153			
C28	6.978	0.000	5248	5462			
C32	7.567	-0.002	936	387	JP-4 (Tol-C14)	7612127	464
C34	7.905	-0.005	376	313	BUNKERC (C10-C38)	31029550	3538
Filter Peak	7.692	0.009	625	658			
C36	8.328	-0.005	388	592			
C38	8.877	-0.001	103	17			
C40	9.606	0.002	122	48			
o-terph	5.133	0.006	1275356	1034742	JET-A (C10-C18)	21261202	1539
Triacon Surr	7.276	-0.003	1171542	828630			

Range Times: NW Diesel (3.445 - 6.306) AK102 (2.86 - 6.49) Jet A (2.86 - 4.90)  
NW M.Oil (6.31 - 8.88) AK103 (6.49 - 8.33) OR Diesel (2.86 - 6.98)

Surrogate	Area	Amount	%Rec
o-Terphenyl	1034742	47.7	106.0
Triacontane	828630	45.7	101.5

Analyte	RF	Curve Date
o-Terph Surr	21702.3	14-MAY-2010
Triacon Surr	18136.2	14-MAY-2010
Gas	21009.8	15-JUN-2010
Diesel	22931.0	14-MAY-2010
Motor Oil	13981.0	14-MAY-2010
AK102	25407.0	14-MAY-2010
AK103	9457.0	10-DEC-2009
JP4	16396.5	09-JUN-2010
JetA	13819.1	11-JUN-2010
Bunker C	8770.6	05-JAN-2010

MANUAL ADJUSTMENTS

1. Peak not found
2. Poor Chromatography
3. Baseline Correction
4. Totals Calculation
5. Other

Analyst: MS Date: 7/3/10

Data File: /chem2/fid9.i/20100702.b/0702A022.D

Date : 02-JUL-2010 21:33

Client ID: ES-05-D HS

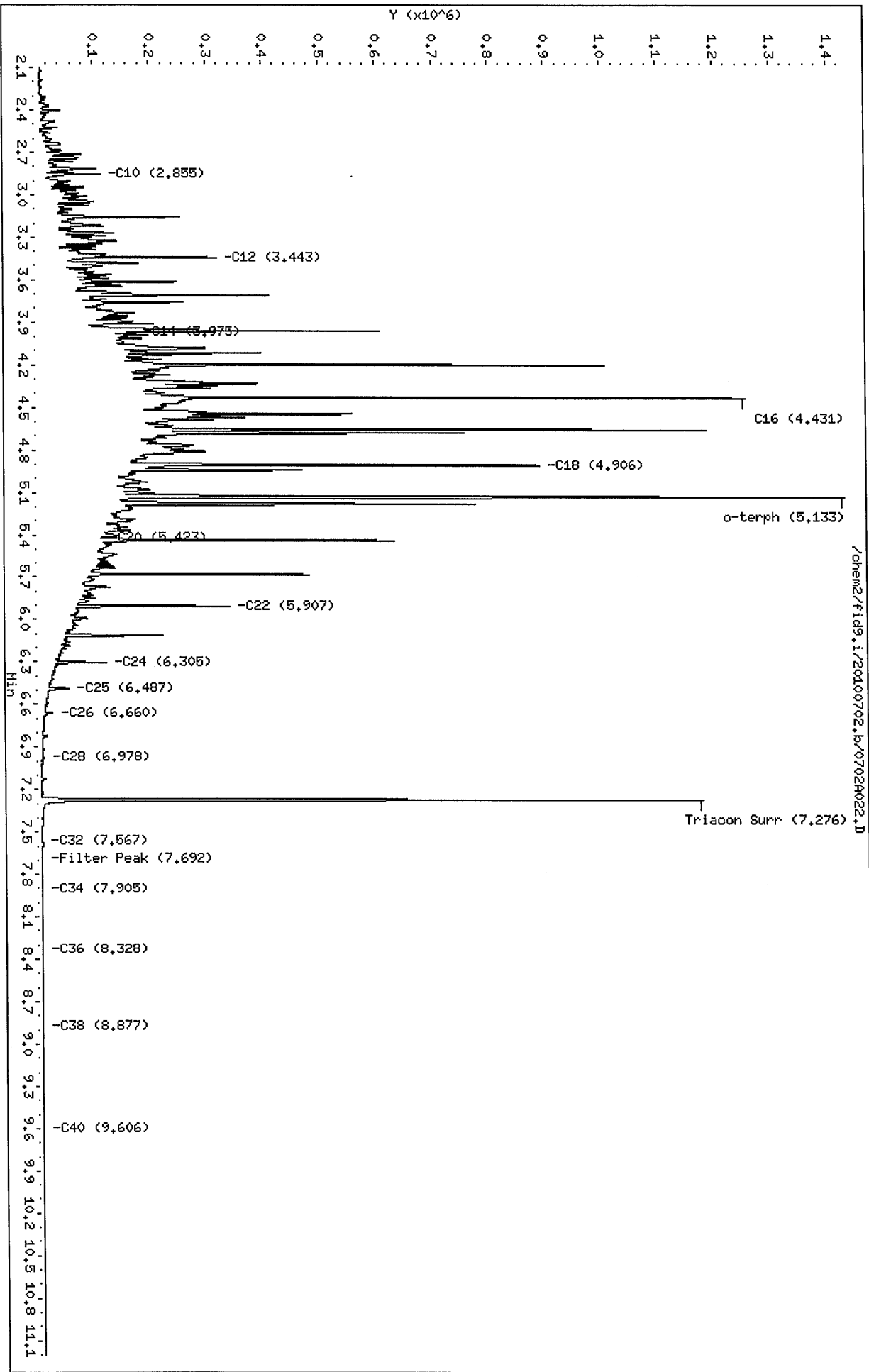
Sample Info: RC51JMS

Column phase: RTX-1

Instrument: fid9.i

Operator: MS

Column diameter: 0.25





Analytical Resources Inc.  
NWTPH Quantitation Report

Data file: /chem2/fid9.i/20100702.b/0702A023.D  
Method: /chem2/fid9.i/20100702.b/ftphfid9a.m  
Instrument: fid9.i  
Operator: MS  
Report Date: 07/03/2010

ARI ID: RC51JMSD  
Client ID: ES-05-D MSD  
Injection: 02-JUL-2010 21:55  
Dilution Factor: 1  
Macro: 15-JUN-2010

FID:9 RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	2.058	0.004	26646	20532	GAS (Tol-C12)	3432121	163
C8	2.188	0.004	9839	9852	DIESEL (C12-C24)	27027909	1179
C10	2.855	-0.001	110696	70452	M.OIL (C24-C38)	417807	30
C12	3.444	-0.001	313025	240052	AK-102 (C10-C25)	29873668	1176
C14	3.962	-0.007	607716	376143	AK-103 (C25-C36)	317107	34
C16	4.433	-0.001	1219520	941771			
C18	4.908	0.011	883343	810734			
C20	5.441	0.010	600716	534781			
C22	5.908	0.007	325938	265170			
C24	6.307	0.001	111060	81881			
C25	6.490	-0.001	47486	67302			
C26	6.662	0.000	19482	27989			
C28	6.979	0.001	5782	6314			
C32	7.566	-0.004	849	182	JP-4 (Tol-C14)	7412253	452
C34	7.906	-0.003	393	211	BUNKERC (C10-C38)	30196086	3443
Filter Peak	7.689	0.006	638	486			
C36	8.328	-0.005	505	765			
C38	8.884	0.005	131	45			
C40	9.604	0.000	136	30			
o-terph	5.136	0.008	1258204	1014990	JET-A (C10-C18)	20666759	1496
Triacon Surr	7.276	-0.003	1084548	807489			

Range Times: NW Diesel(3.445 - 6.306) AK102(2.86 - 6.49) Jet A(2.86 - 4.90)  
NW M.Oil(6.31 - 8.88) AK103(6.49 - 8.33) OR Diesel(2.86 - 6.98)

Surrogate	Area	Amount	%Rec
o-Terphenyl	1014990	46.8	103.9
Triacontane	807489	44.5	98.9

Analyte	RF	Curve Date
o-Terph Surr	21702.3	14-MAY-2010
Triacon Surr	18136.2	14-MAY-2010
Gas	21009.8	15-JUN-2010
Diesel	22931.0	14-MAY-2010
Motor Oil	13981.0	14-MAY-2010
AK102	25407.0	14-MAY-2010
AK103	9457.0	10-DEC-2009
JP4	16396.5	09-JUN-2010
JetA	13819.1	11-JUN-2010
Bunker C	8770.6	05-JAN-2010

MANUAL ADJUSTMENTS

1. Peak not found
2. Poor Chromatography
3. Baseline Correction
4. Totals Calculation
5. Other

Analyst *[Signature]* Date *7/2/10*

Data File: /chem2/fid9.i/20100702.b/07020023.D

Date: 02-JUL-2010 21:55

Client ID: ES-05-D MSD

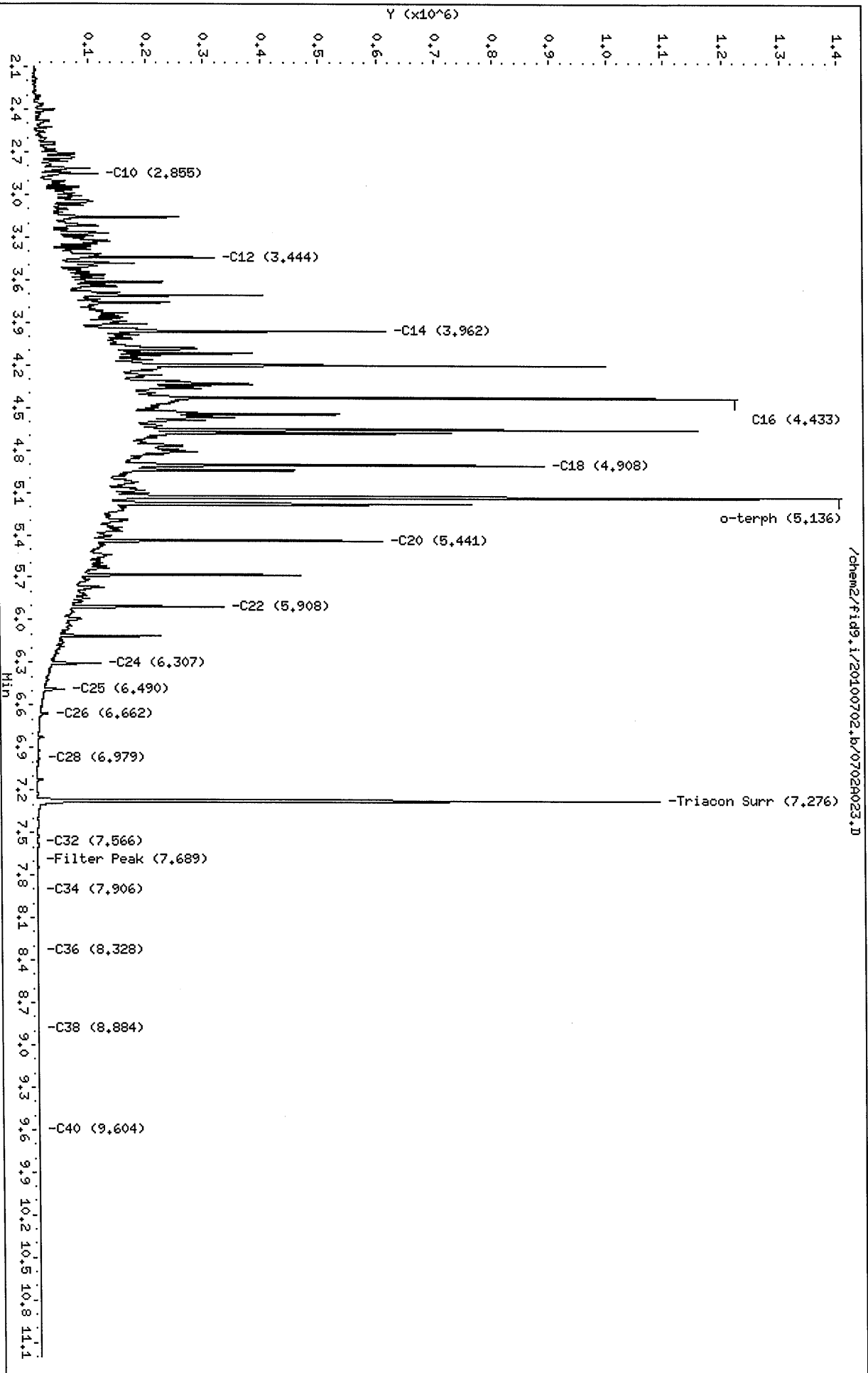
Sample Info: RC51JMSD

Instrument: fid9.i

Page 1

Column phase: RTX-1

Operator: MS  
Column diameter: 0.25



**ORGANICS ANALYSIS DATA SHEET**

NWTPHD by GC/FID-Silica and Acid Cleaned

Page 1 of 1

Sample ID: LCS-070110

LAB CONTROL

Lab Sample ID: LCS-070110

LIMS ID: 10-15632

Matrix: Soil

Data Release Authorized: *VDS*  
Reported: 07/03/10

QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc

43507.6

Date Sampled: 06/30/10

Date Received: 06/30/10

Date Extracted: 07/01/10

Date Analyzed: 07/02/10 19:26

Instrument/Analyst: FID/MS

Sample Amount: 10.0 g

Final Extract Volume: 1.0 mL

Dilution Factor: 1.0

Range	Lab Control	Spike Added	Recovery
Diesel	138	150	92.0%

**TPHD Surrogate Recovery**

o-Terphenyl	114%
-------------	------

Results reported in mg/kg

Analytical Resources Inc.  
NWTPH Quantitation Report

Data file: /chem2/fid9.i/20100702.b/0702A016.D  
Method: /chem2/fid9.i/20100702.b/ftphfid9a.m  
Instrument: fid9.i  
Operator: MS  
Report Date: 07/03/2010

ARI ID: RC51LCSS1  
Client ID: RC51LCSS1  
Injection: 02-JUL-2010 19:26  
Dilution Factor: 1  
Macro: 15-JUN-2010

FID:9 RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	2.060	0.006	20379	16395	GAS (Tol-C12)	3908144	186
C8	2.189	0.005	9918	9606	DIESEL (C12-C24)	31527825	1375
C10	2.855	-0.001	118360	75797	M.OIL (C24-C38)	454418	33
C12	3.444	0.000	342808	257989	AK-102 (C10-C25)	34778896	1369
C14	3.963	-0.006	657054	421323	AK-103 (C25-C36)	325309	34
C16	4.434	0.001	1351930	906538			
C18	4.911	0.013	962422	925372			
C20	5.426	-0.005	123525	32004			
C22	5.910	0.008	360943	299568			
C24	6.308	0.002	124591	91216			
C25	6.490	-0.001	52982	71197			
C26	6.661	-0.001	20530	33562			
C28	6.980	0.002	4019	5151			
C32	7.566	-0.004	748	204	JP-4 (Tol-C14)	8614616	525
C34	7.911	0.002	290	45	BUNKERC (C10-C38)	35107774	4003
Filter Peak	7.683	0.000	513	227			
C36	8.329	-0.004	517	833			
C38	8.872	-0.006	96	57			
C40	9.605	0.001	122	53			
o-terph	5.138	0.010	1316215	1109197	JET-A (C10-C18)	23971365	1735
Triacon Surr	7.279	-0.001	1190663	893412			

Range Times: NW Diesel (3.445 - 6.306) AK102 (2.86 - 6.49) Jet A (2.86 - 4.90)  
NW M.Oil (6.31 - 8.88) AK103 (6.49 - 8.33) OR Diesel (2.86 - 6.98)

Surrogate	Area	Amount	%Rec
o-Terphenyl	1109197	51.1	113.6
Triacotane	893412	49.3	109.5

Analyte	RF	Curve Date
o-Terph Surr	21702.3	14-MAY-2010
Triacon Surr	18136.2	14-MAY-2010
Gas	21009.8	15-JUN-2010
Diesel	22931.0	14-MAY-2010
Motor Oil	13981.0	14-MAY-2010
AK102	25407.0	14-MAY-2010
AK103	9457.0	10-DEC-2009
JP4	16396.5	09-JUN-2010
JetA	13819.1	11-JUN-2010
Bunker C	8770.6	05-JAN-2010

MANUAL ADJUSTMENTS

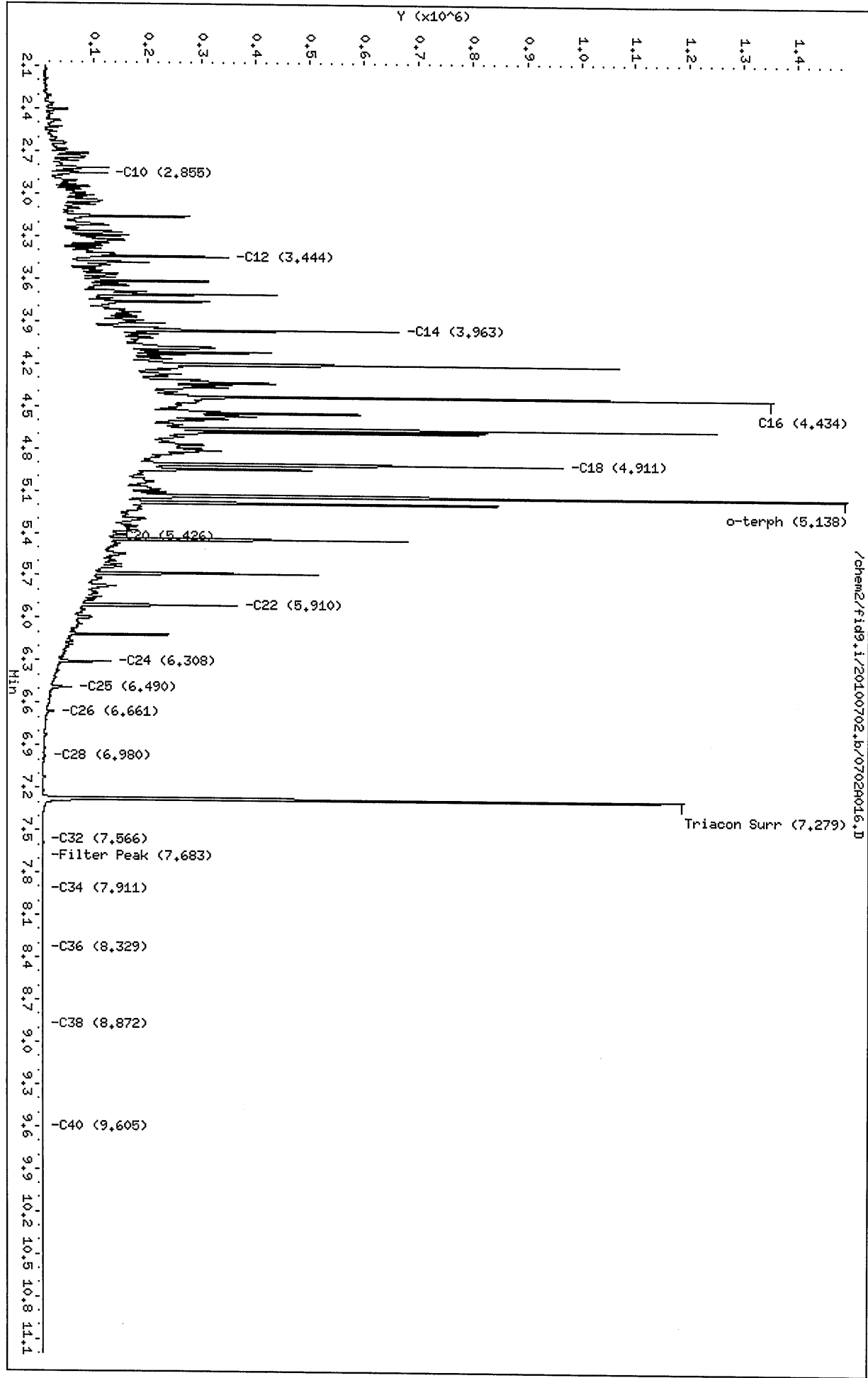
1. Peak not found
2. Poor Chromatography
3. Baseline Correction
4. Totals Calculation
5. Other

Analyst MS Date 7/3/10

Data File: /chem2/fid9.i/20100702.b/0702A016.D  
Date: 02-JUL-2010 19:26  
Client ID: RC51LCSS1  
Sample Info: RC51LCSS1

Column phase: RTX-1

Instrument: fid9.i  
Operator: HS  
Column diameter: 0.25



TOTAL DIESEL RANGE HYDROCARBONS-EXTRACTION REPORT

Matrix: Soil  
Date Received: 06/30/10

ARI Job: RC51  
Project: Emerald Services, Inc  
43507.6

ARI ID	Client ID	Client Amt	Final Vol	Basis	Prep Date
10-15622-RC51A	ES-01-S	8.01 g	1.00 mL	D	07/01/10
10-15623-RC51B	ES-01-D	8.26 g	1.00 mL	D	07/01/10
10-15624-RC51C	ES-02-S	9.23 g	1.00 mL	D	07/01/10
10-15626-RC51D	ES-02-D	8.43 g	1.00 mL	D	07/01/10
10-15627-RC51E	ES-03-S	6.05 g	1.00 mL	D	07/01/10
10-15628-RC51F	ES-03-D	8.76 g	1.00 mL	D	07/01/10
10-15629-RC51G	ES-04-S	8.58 g	1.00 mL	D	07/01/10
10-15630-RC51H	ES-04-D	9.22 g	1.00 mL	D	07/01/10
10-15631-RC51I	ES-05-S	8.46 g	1.00 mL	D	07/01/10
10-15632-070110MB1	Method Blank	10.0 g	1.00 mL	-	07/01/10
10-15632-070110LCS1	Lab Control	10.0 g	1.00 mL	-	07/01/10
10-15632-RC51J	ES-05-D	9.01 g	1.00 mL	D	07/01/10
10-15632-RC51JMS	ES-05-D	9.03 g	1.00 mL	D	07/01/10
10-15632-RC51JMSD	ES-05-D	8.94 g	1.00 mL	D	07/01/10
10-15633-RC51K	ES-06-S	9.05 g	1.00 mL	D	07/01/10
10-15634-RC51L	ES-06-D	8.85 g	1.00 mL	D	07/01/10
10-15635-RC51M	ES-07-S	8.97 g	1.00 mL	D	07/01/10
10-15636-RC51N	ES-07-D	9.87 g	1.00 mL	D	07/01/10
10-15637-RC51O	ES-08-S	9.12 g	1.00 mL	D	07/01/10
10-15638-RC51P	ES-09-S	10.1 g	1.00 mL	D	07/01/10

Basis: D=Dry Weight W=As Received  
Diesel Extraction Report

**ORGANICS ANALYSIS DATA SHEET**

PNA's by SW8270D GC/MS

Page 1 of 1

Sample ID: ES-03-S

SAMPLE

Lab Sample ID: RC51E

LIMS ID: 10-15627

Matrix: Soil

Data Release Authorized: *VJB*

Reported: 07/07/10

QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc

43507.6

Date Sampled: 06/30/10

Date Received: 06/30/10

Date Extracted: 07/02/10

Date Analyzed: 07/02/10 15:22

Instrument/Analyst: NT6/JZ

GPC Cleanup: No

Alumina: No

Silica Gel: No

Sample Amount: 7.59 g-dry-wt

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

Percent Moisture: 41.7%

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	66	< 66 U
91-57-6	2-Methylnaphthalene	66	< 66 U
90-12-0	1-Methylnaphthalene	66	< 66 U
56-55-3	Benzo(a)anthracene	66	< 66 U
218-01-9	Chrysene	66	< 66 U
50-32-8	Benzo(a)pyrene	66	< 66 U
193-39-5	Indeno(1,2,3-cd)pyrene	66	< 66 U
53-70-3	Dibenz(a,h)anthracene	66	< 66 U
TOTBFA	Total Benzofluoranthenes	66	< 66 U

Reported in µg/kg (ppb)

**Semivolatile Surrogate Recovery**

d14-p-Terphenyl	69.6%
2-Fluorobiphenyl	66.8%

**ORGANICS ANALYSIS DATA SHEET**

**PNAs by SW8270D GC/MS**

Page 1 of 1

**Sample ID: MB-070210**

**METHOD BLANK**

Lab Sample ID: MB-070210

LIMS ID: 10-15629

Matrix: Soil

Data Release Authorized: *VJS*

Reported: 07/07/10

QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc  
43507.6

Date Sampled: NA

Date Received: NA

Date Extracted: 07/02/10

Date Analyzed: 07/02/10 14:16

Instrument/Analyst: NT6/JZ

GPC Cleanup: No

Alumina: No

Silica Gel: No

Sample Amount: 7.50 g

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

Percent Moisture: NA

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	67	< 67 U
91-57-6	2-Methylnaphthalene	67	< 67 U
90-12-0	1-Methylnaphthalene	67	< 67 U
56-55-3	Benzo(a)anthracene	67	< 67 U
218-01-9	Chrysene	67	< 67 U
50-32-8	Benzo(a)pyrene	67	< 67 U
193-39-5	Indeno(1,2,3-cd)pyrene	67	< 67 U
53-70-3	Dibenz(a,h)anthracene	67	< 67 U
TOTBFA	Total Benzofluoranthenes	67	< 67 U

Reported in µg/kg (ppb)

**Semivolatle Surrogate Recovery**

d14-p-Terphenyl	83.6%
2-Fluorobiphenyl	78.4%



**ORGANICS ANALYSIS DATA SHEET**

PNA's by SW8270D GC/MS

Page 1 of 1

Sample ID: ES-04-S

SAMPLE

Lab Sample ID: RC51G

LIMS ID: 10-15629

Matrix: Soil

Data Release Authorized: *VJ*

Reported: 07/07/10

QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc

43507.6

Date Sampled: 06/30/10

Date Received: 06/30/10

Date Extracted: 07/02/10

Date Analyzed: 07/02/10 15:55

Instrument/Analyst: NT6/JZ

GPC Cleanup: No

Alumina: No

Silica Gel: No

Sample Amount: 8.61 g-dry-wt

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

Percent Moisture: 16.7%

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	58	< 58 U
91-57-6	2-Methylnaphthalene	58	< 58 U
90-12-0	1-Methylnaphthalene	58	< 58 U
56-55-3	Benzo(a)anthracene	58	< 58 U
218-01-9	Chrysene	58	< 58 U
50-32-8	Benzo(a)pyrene	58	< 58 U
193-39-5	Indeno(1,2,3-cd)pyrene	58	< 58 U
53-70-3	Dibenz(a,h)anthracene	58	< 58 U
TOTBFA	Total Benzofluoranthenes	58	< 58 U

Reported in µg/kg (ppb)

**Semivolatile Surrogate Recovery**

d14-p-Terphenyl	69.6%
2-Fluorobiphenyl	64.8%

**ORGANICS ANALYSIS DATA SHEET**

**PNA's by SW8270D GC/MS**

Page 1 of 1

**Sample ID: ES-04-S**

**MATRIX SPIKE**

Lab Sample ID: RC51G

LIMS ID: 10-15629

Matrix: Soil

Data Release Authorized: *VTS*

Reported: 07/07/10

QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc

43507.6

Date Sampled: 06/30/10

Date Received: 06/30/10

Date Extracted: 07/02/10

Date Analyzed: 07/02/10 16:27

Instrument/Analyst: NT6/JZ

GPC Cleanup: No

Alumina: No

Silica Gel: No

Sample Amount: 8.58 g-dry-wt

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

Percent Moisture: 16.7%

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	58	---
91-57-6	2-Methylnaphthalene	58	---
90-12-0	1-Methylnaphthalene	58	---
56-55-3	Benzo(a)anthracene	58	---
218-01-9	Chrysene	58	---
50-32-8	Benzo(a)pyrene	58	---
193-39-5	Indeno(1,2,3-cd)pyrene	58	---
53-70-3	Dibenz(a,h)anthracene	58	---
TOTBFA	Total Benzofluoranthenes	58	---

Reported in µg/kg (ppb)

**Semivolatile Surrogate Recovery**

d14-p-Terphenyl	69.6%
2-Fluorobiphenyl	64.8%

**ORGANICS ANALYSIS DATA SHEET**

**PNA's by SW8270D GC/MS**

Page 1 of 1

**Sample ID: ES-04-S**

**MATRIX SPIKE DUPLICATE**

Lab Sample ID: RC51G

LIMS ID: 10-15629

Matrix: Soil

Data Release Authorized: *VIT*

Reported: 07/07/10

QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc

43507.6

Date Sampled: 06/30/10

Date Received: 06/30/10

Date Extracted: 07/02/10

Date Analyzed: 07/02/10 17:00

Instrument/Analyst: NT6/JZ

GPC Cleanup: No

Alumina: No

Silica Gel: No

Sample Amount: 8.61 g-dry-wt

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

Percent Moisture: 16.7%

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	58	---
91-57-6	2-Methylnaphthalene	58	---
90-12-0	1-Methylnaphthalene	58	---
56-55-3	Benzo(a)anthracene	58	---
218-01-9	Chrysene	58	---
50-32-8	Benzo(a)pyrene	58	---
193-39-5	Indeno(1,2,3-cd)pyrene	58	---
53-70-3	Dibenz(a,h)anthracene	58	---
TOTBFA	Total Benzofluoranthenes	58	---

Reported in µg/kg (ppb)

**Semivolatile Surrogate Recovery**

d14-p-Terphenyl	75.2%
2-Fluorobiphenyl	70.4%

**ORGANICS ANALYSIS DATA SHEET**

PNA's by SW8270D GC/MS

Page 1 of 1

Sample ID: ES-05-S  
SAMPLE

Lab Sample ID: RC51I

LIMS ID: 10-15631

Matrix: Soil

Data Release Authorized: *VTS*

Reported: 07/07/10

QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc  
43507.6

Date Sampled: 06/30/10

Date Received: 06/30/10

Date Extracted: 07/02/10

Date Analyzed: 07/02/10 17:33

Instrument/Analyst: NT6/JZ

GPC Cleanup: No

Alumina: No

Silica Gel: No

Sample Amount: 7.88 g-dry-wt

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

Percent Moisture: 21.5%

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	64	330
91-57-6	2-Methylnaphthalene	64	< 64 U
90-12-0	1-Methylnaphthalene	64	120
56-55-3	Benzo(a)anthracene	64	< 64 U
218-01-9	Chrysene	64	< 64 U
50-32-8	Benzo(a)pyrene	64	< 64 U
193-39-5	Indeno(1,2,3-cd)pyrene	64	< 64 U
53-70-3	Dibenz(a,h)anthracene	64	< 64 U
TOTBFA	Total Benzofluoranthenes	64	< 64 U

Reported in µg/kg (ppb)

**Semivolatile Surrogate Recovery**

d14-p-Terphenyl	70.4%
2-Fluorobiphenyl	66.0%

SW8270 PNA SURROGATE RECOVERY SUMMARY



Matrix: Soil

QC Report No: RC51-Environmental Partners  
 Project: Emerald Services, Inc  
 43507.6

Client ID	TER	FBP	TOT OUT
ES-03-S	69.6%	66.8%	0
MB-070210	83.6%	78.4%	0
LCS-070210	84.0%	76.0%	0
ES-04-S	69.6%	64.8%	0
ES-04-S MS	69.6%	64.8%	0
ES-04-S MSD	75.2%	70.4%	0
ES-05-S	70.4%	66.0%	0

	LCS/MB LIMITS	QC LIMITS
(TER) = d14-p-Terphenyl	(30-160)	(30-160)
(FBP) = 2-Fluorobiphenyl	(30-160)	(30-160)

Prep Method: SW3546  
 Log Number Range: 10-15627 to 10-15631

**ORGANICS ANALYSIS DATA SHEET**

**PNA's by SW8270D GC/MS**

Page 1 of 1

**Sample ID: ES-04-S  
MS/MSD**

Lab Sample ID: RC51G  
LIMS ID: 10-15629  
Matrix: Soil  
Data Release Authorized: *VJB*  
Reported: 07/07/10

QC Report No: RC51-Environmental Partners  
Project: Emerald Services, Inc  
43507.6  
Date Sampled: 06/30/10  
Date Received: 06/30/10

Date Extracted MS/MSD: 07/02/10  
Date Analyzed MS: 07/02/10 16:27  
MSD: 07/02/10 17:00  
Instrument/Analyst MS: NT6/JZ  
MSD: NT6/JZ  
GPC Cleanup: No  
Silica Gel Cleanup: No

Sample Amount MS: 8.58 g-dry-wt  
MSD: 8.61 g-dry-wt  
Final Extract Volume MS: 0.5 mL  
MSD: 0.5 mL  
Dilution Factor MS: 1.00  
MSD: 1.00  
Alumina Cleanup: No

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Naphthalene	< 58.1	882	1460	60.4%	922	1450	63.6%	4.4%
2-Methylnaphthalene	< 58.1	938	1460	64.2%	998	1450	68.8%	6.2%
1-Methylnaphthalene	< 58.1	927	1460	63.5%	993	1450	68.5%	6.9%
Benzo(a)anthracene	< 58.1	1040	1460	71.2%	1220	1450	84.1%	15.9%
Chrysene	< 58.1	980	1460	67.1%	1170	1450	80.7%	17.7%
Benzo(a)pyrene	< 58.1	979	1460	67.1%	1120	1450	77.2%	13.4%
Indeno(1,2,3-cd)pyrene	< 58.1	996	1460	68.2%	1150	1450	79.3%	14.4%
Dibenz(a,h)anthracene	< 58.1	988	1460	67.7%	1110	1450	76.6%	11.6%
Total Benzofluoranthenes	< 58.1	2030	2910	69.8%	2300	2900	79.3%	12.5%

Results reported in µg/kg  
RPD calculated using sample concentrations per SW846.

**ORGANICS ANALYSIS DATA SHEET**

**PNA's by SW8270D GC/MS**

Page 1 of 1

**Sample ID: LCS-070210**

**LAB CONTROL**

Lab Sample ID: LCS-070210

LIMS ID: 10-15629

Matrix: Soil

Data Release Authorized: *VDS*

Reported: 07/07/10

QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc

43507.6

Date Sampled: NA

Date Received: 06/30/10

Date Extracted: 07/02/10

Date Analyzed: 07/02/10 14:49

Instrument/Analyst: NT6/JZ

GPC Cleanup: No

Silica Gel Cleanup: No

Sample Amount: 7.50 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Alumina Cleanup: No

Analyte	Lab Control	Spike Added	Recovery
Naphthalene	1170	1670	70.1%
2-Methylnaphthalene	1230	1670	73.7%
1-Methylnaphthalene	1220	1670	73.1%
Benzo(a)anthracene	1420	1670	85.0%
Chrysene	1350	1670	80.8%
Benzo(a)pyrene	1370	1670	82.0%
Indeno(1,2,3-cd)pyrene	1420	1670	85.0%
Dibenz(a,h)anthracene	1400	1670	83.8%
Total Benzofluoranthenes	2880	3330	86.5%

**Semivolatile Surrogate Recovery**

d14-p-Terphenyl	84.0%
2-Fluorobiphenyl	76.0%

Results reported in µg/kg

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1


Sample ID: ES-03-S

SAMPLE

Lab Sample ID: RC51E

LIMS ID: 10-15627

Matrix: Soil

Data Release Authorized: 

Reported: 07/06/10

QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc

43507.6

Date Sampled: 06/30/10

Date Received: 06/30/10

Percent Total Solids: 72.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	07/01/10	6010B	07/06/10	7440-43-9	Cadmium	0.3	0.3	U
3050B	07/01/10	6010B	07/06/10	7439-92-1	Lead	3	3	U

U-Analyte undetected at given RL

RL-Reporting Limit



**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1

Sample ID: ES-04-S

SAMPLE

Lab Sample ID: RC51G

LIMS ID: 10-15629

Matrix: Soil

Data Release Authorized: *[Signature]*

Reported: 07/06/10

QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc

43507.6

Date Sampled: 06/30/10

Date Received: 06/30/10

Percent Total Solids: 86.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	07/01/10	6010B	07/06/10	7440-43-9	Cadmium	0.2	0.2	U
3050B	07/01/10	6010B	07/06/10	7439-92-1	Lead	2	2	U

U-Analyte undetected at given RL

RL-Reporting Limit

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1

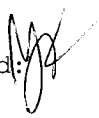
Sample ID: ES-05-S

SAMPLE

Lab Sample ID: RC51I

LIMS ID: 10-15631

Matrix: Soil

Data Release Authorized: 

Reported: 07/06/10

QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc

43507.6

Date Sampled: 06/30/10

Date Received: 06/30/10

Percent Total Solids: 90.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	07/01/10	6010B	07/06/10	7440-43-9	Cadmium	0.2	0.2	U
3050B	07/01/10	6010B	07/06/10	7439-92-1	Lead	2	2	U

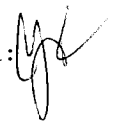
U-Analyte undetected at given RL

RL-Reporting Limit

**INORGANICS ANALYSIS DATA SHEET**  
**TOTAL METALS**  
 Page 1 of 1

Sample ID: **ES-03-S**  
**DUPLICATE**

Lab Sample ID: RC51E  
 LIMS ID: 10-15627  
 Matrix: Soil  
 Data Release Authorized:  
 Reported: 07/06/10



QC Report No: RC51-Environmental Partners  
 Project: Emerald Services, Inc  
 43507.6  
 Date Sampled: 06/30/10  
 Date Received: 06/30/10

**MATRIX DUPLICATE QUALITY CONTROL REPORT**


Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Cadmium	6010B	0.3 U	0.3 U	0.0%	+/- 0.3	L
Lead	6010B	3 U	3 U	0.0%	+/- 3	L

Reported in mg/kg-dry

\*-Control Limit Not Met  
 L-RPD Invalid, Limit = Detection Limit

**INORGANICS ANALYSIS DATA SHEET**  
**TOTAL METALS**  
 Page 1 of 1

Sample ID: ES-03-S  
**MATRIX SPIKE**

Lab Sample ID: RC51E  
 LIMS ID: 10-15627  
 Matrix: Soil  
 Data Release Authorized:   
 Reported: 07/06/10

QC Report No: RC51-Environmental Partners  
 Project: Emerald Services, Inc  
 43507.6  
 Date Sampled: 06/30/10  
 Date Received: 06/30/10

**MATRIX SPIKE QUALITY CONTROL REPORT**

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Cadmium	6010B	0.3 U	62.4	65.9	94.7%	
Lead	6010B	3 U	247	264	93.6%	

Reported in mg/kg-dry

N-Control Limit Not Met  
 H-% Recovery Not Applicable, Sample Concentration Too High  
 NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

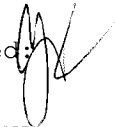
Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: RC51MB

LIMS ID: 10-15629

Matrix: Soil

Data Release Authorized: 

Reported: 07/06/10

QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc

43507.6

Date Sampled: NA

Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	07/01/10	6010B	07/06/10	7440-43-9	Cadmium	0.2	0.2	U
3050B	07/01/10	6010B	07/06/10	7439-92-1	Lead	2	2	U

U-Analyte undetected at given RL

RL-Reporting Limit

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**


Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: RC51LCS

LIMS ID: 10-15629

Matrix: Soil

Data Release Authorized: 

Reported: 07/06/10

QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc

43507.6

Date Sampled: NA

Date Received: NA

**BLANK SPIKE QUALITY CONTROL REPORT**

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Cadmium	6010B	48.1	50.0	96.2%	
Lead	6010B	192	200	96.0%	

Reported in mg/kg-dry

N-Control limit not met

NA-Not Applicable, Analyte Not Spiked

Control Limits: 80-120%

# Educator Building

## Phase II Environmental Site Assessment

### Prepared for

Avenue 55, LLC  
600 University Street, Suite 2305  
Seattle, WA 98101

September 2018

Certified



Corporation



100% Recycled  
Paper

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### **LIMITATIONS**

This report has been prepared for the exclusive use of Avenue 55, their authorized agents, and regulatory agencies. It has been prepared following the described methods and information available at the time of the work. No other party should use this report for any purpose other than that originally intended, unless Floyd|Snider agrees in advance to such reliance in writing. The information contained herein should not be utilized for any purpose or project except the one originally intended. Under no circumstances shall this document be altered, updated, or revised without written authorization of Floyd|Snider.

The interpretations and conclusions contained in this report are based in part on site characterization data collected by others. Floyd|Snider cannot assure the accuracy of this information.



**Table of Contents**

**1.0 Introduction ..... 1-1**

**2.0 Site Description ..... 2-1**

    2.1 SITE DESCRIPTION AND CURRENT USES ..... 2-1

    2.2 SUMMARY OF PREVIOUS REPORTS AND RECOGNIZED ENVIRONMENTAL  
        CONDITIONS..... 2-1

**3.0 Field Investigation and Results ..... 3-1**

    3.1 PROPERTY RECONNAISSANCE AND GROUND-PENETRATING RADAR ..... 3-1

    3.2 SUBSURFACE INVESTIGATION..... 3-1

        3.2.1 Test Pits and Ground-Penetrating Radar Survey ..... 3-1

        3.2.2 Soil Borings..... 3-2

        3.2.3 Groundwater..... 3-2

        3.2.4 Soil-Gas ..... 3-2

    3.3 ANALYTICAL RESULTS..... 3-2

        3.3.1 Soil..... 3-3

        3.3.2 Groundwater..... 3-3

        3.3.3 Soil-Gas ..... 3-3

**4.0 Findings and Recommendations..... 4-1**

    4.1 UNDERGROUND STORAGE TANK REMOVAL BUDGET ..... 4-1

**5.0 Limitations ..... 5-1**

**6.0 References ..... 6-1**

**List of Tables**

Table 3.1 Summary of Recognized Environmental Conditions

Table 3.2 Soil Analytical Results

Table 3.3 Groundwater Analytical Results

Table 3.4 Soil-Gas-Detected Analytical Results

**List of Figures**

Figure 1.1 Site Vicinity Map

Figure 3.1 Phase II Sample Locations

## List of Appendices

Appendix A	Documentation of Prior Spill Cleanups
Appendix B	Documentation of Asbestos Removal
Appendix C	Laboratory Reports
Appendix D	Johnson & Ettinger Model Outputs

## List of Acronyms and Abbreviations

<b>Acronym/ Abbreviation</b>	<b>Definition</b>
AGRA	AGRA Earth & Environmental, Inc.
ESA	Environmental Site Assessment
GPR	Ground-penetrating radar
J&E Model	Johnson and Ettinger Model
µg/L	Micrograms per liter
µg/m <sup>3</sup>	Micrograms per cubic meter
MTCA	Model Toxics Control Act
PLIA	Pollution Liability Insurance Agency
Port	Port of Tacoma
PRT	Post-run tubing
REC	Recognized environmental condition
TPH	Total petroleum hydrocarbons
UST	Underground storage tank
VOC	Volatile organic compound

## 1.0 Introduction

This Phase II Environmental Site Assessment (ESA) was prepared by Floyd|Snider at the request of Avenue 55 for the property located at 3401 Lincoln Avenue in Tacoma, Washington (refer to Figure 1.1). The property was originally developed with a large, wood frame building known as the Educator Building. The Educator Building is currently being demolished in preparation for site redevelopment as a warehouse. The Educator Building was built in 1956 and expanded several times until the 1970s. The Educator Building was originally used for school furniture manufacturing and after that ceased, it was sub-leased to various tenants for commercial or limited industrial use such as cardboard coating, furniture assembly, lumber processing, fluid storage, and beverage recycling. The Educator Building was the first development on this property, which was created by filling tidal marsh with up to 10 feet of native sand generated by the dredging of the nearby Blair and Hylebos Waterways in the early 20<sup>th</sup> century.

The purpose of this Phase II ESA is to investigate several recognized environmental conditions (RECs) at the subject property as identified in Phase I ESA reports, and more recently, possible additional RECs identified by lending institutions. A summary of RECs that were investigated by this Phase II study are summarized below followed by discussion of the field activities, analytical results, and recommendations.

## 2.0 Site Description

### 2.1 SITE DESCRIPTION AND CURRENT USES

The subject property, formerly referred to as the Educator Building, is located at 3401 Lincoln Avenue in an industrial area of Tacoma, Washington. As mentioned in Section 1.0, the property is undergoing redevelopment. The property will be redeveloped with a 200,000-square-foot warehouse.

### 2.2 SUMMARY OF PREVIOUS REPORTS AND RECOGNIZED ENVIRONMENTAL CONDITIONS

This section summarizes the key findings of prior environmental reports that were reviewed in order to identify potential RECs to be investigated during Phase II field activities.

#### **AGRA Phase I ESA (2000)**

In 2000, AGRA Earth & Environmental, Inc. (AGRA) completed a Phase I ESA of the subject property. During their site reconnaissance, they noted an underground storage tank (UST) to the east of the Educator Building, four unlabeled 55-gallon drums at the northwest corner of the building, and two labeled 55-gallon drums and paint and solvent cans in the paint booth area of one tenant. In addition, they located a monitoring well at the southwest corner of the property. Previous reports indicated two additional wells, near the northwest and northeast corners of the property, but AGRA was unable to locate them.

The property owner at that time confirmed the presence of a UST and stated that it had recently been emptied and tightness tests were performed. A variety of tenants leased space in the building including a paper and lumber company, furniture manufacturer, cardboard box manufacturer, and packaging material manufacturer. In addition to the UST, one other on-property REC was identified including four unlabeled drums in the northwest corner of the building. Several off-property RECs were identified as well, including an oil/antifreeze recycling company along the west adjacent property line and a chemical plant located to the south of Lincoln Avenue.

#### **Floyd|Snider Phase I ESA (2007)**

In 2007, Floyd|Snider completed an updated Phase I ESA prior to the subject property's purchase by the Port of Tacoma (Port). The Floyd|Snider report expanded on the findings of the previous AGRA Phase I report. In addition to the RECs mentioned in the AGRA report, Floyd|Snider reported finding a sump inside the building near the operational area of Emerald Services, the nearby oil/antifreeze recycler that had leased space in the building for container storage. This report also discussed the site history of nearby properties and compiled a list of potential contaminants of concern at these nearby sites. This list identifies auto fluff, lime solvent, gypsum lime sludge, slag, waste oil, and wood debris either spilled or intermingled with shallow fill on nearby properties due to a past industrial landfill called the "Don Oline Landfill." Contaminants associated with these waste types include total petroleum hydrocarbons (TPH), heavy metals,

and volatile organic compounds (VOCs). This list was used to establish the analytical scope of the current Phase II investigation.

Floyd|Snider identified the nearby Don Oline Landfill as a possible REC due to possible landfilling along the northern portion of the subject property along with migration of hazardous substances onto the property via groundwater. Poor housekeeping was also noted in some of the tenant spaces.

### **Floyd|Snider Phase I ESA Updates (2016, 2018)**

In 2016 and again in 2018, Floyd|Snider updated the previous 2007 Phase I ESA due to a land lease agreement between the Port and Avenue 55. These updates determined that most site conditions and RECs had not changed since the previous report. However, three small petroleum spills had occurred on or near the subject property since 2007. Each spill was well documented and cleaned up, removing them from the list of RECs. Documentation of the cleanup of each spill is provided in Appendix A.

### **Terra Associates, Inc., Geotechnical Report (2017)**

In 2017, Terra Associates, Inc., completed a series of test pits and borings on the subject property and adjacent industrial properties in the Taylor Way and Lincoln Avenue area. The geotechnical report identified fairly consistent subsurface conditions in the area with no evidence of landfilled material. The top 5 to 7 feet of soil below ground surface (bgs) consists of sandy fill with trace wood debris and construction rubble. The groundwater table sits at about 7 feet bgs. Under the fill layer there is a sand and silt layer that continues down to about 10 to 12 feet bgs, where it gradually becomes siltier before transitioning to a clayey silt layer. Below the clayey silt layer, the amount of fines gradually decreases as the soil transitions back to a sand by 25 feet bgs.

### **Lending Institution Concerns (2018)**

In addition to the RECs identified above, concerns were raised by the lending institution to the development in regard to possible additional site-specific areas, including the following:

- Overall quality of fill sand at the subject property and presence of landfill debris
- Risk of vapor intrusion from former manufacturing operations
- Contamination associated with possible waste disposal to former septic system
- Soil contamination near former paint storage areas (used by former tenant Trendwest, Inc.)

### 3.0 Field Investigation and Results

The RECs noted in the previous reports and by the lending institution were used to define the scope of work for the Phase II ESA, which included collection of soil, groundwater, and soil-gas samples at the subject property prior to building demolition. The field investigation occurred on August 27 and 28, 2018. Building demolition started the following day, on August 29. Table 3.1 contains a listing of the individual RECs discussed in Section 2.0 and the field efforts taken to address the RECs. Sample locations are shown on Figure 3.1.

#### 3.1 PROPERTY RECONNAISSANCE AND GROUND-PENETRATING RADAR

On August 21, 2018, Pamela Osterhout of Floyd|Snider visited the subject property to determine locations for the Phase II investigation. During this site walk, active asbestos and rodent abatement was being performed in preparation for building demolition. Documentation of removal of building asbestos is included in Appendix B. A large surcharge soil pile was noted on the north side of the building, which limited the accessibility for subsurface investigations in this area. The sampling scheme identified in Table 3.1 was adjusted to account for physical limitations while retaining the original objectives of the subsurface investigation in this vicinity.

#### 3.2 SUBSURFACE INVESTIGATION

##### 3.2.1 Test Pits and Ground-Penetrating Radar Survey

On August 27, 2018, a ground-penetrating radar (GPR) survey was completed across the perimeter of the property to search for the historical septic drain field, fill debris, unidentified USTs, and buried monitoring wells. The GPR survey was unable to locate the monitoring wells or a septic drain field. An unidentifiable anomaly was noted along the western property line; however, these areas were inaccessible due to surficial construction debris and subsurface utilities. A test pit was dug in the vicinity adjacent to this anomaly, but no field indication of a drain field was observed. A representative soil sample was collected from this test pit and analyzed per Table 3.1.

Additionally, the UST located adjacent to the former boiler room on the east side of the Educator Building was surveyed to estimate the size of the tank. The existing UST dimensions are approximately 8 feet by 20 feet oriented north to south with the fill port on the northern side of the tank. The tank contained about 6 inches of product visually identified as Bunker C oil, which equates to approximately 200 gallons of product. Historically, boilers were connected to two USTs, one with Bunker C and a second, smaller tank with diesel fuel. GPR was unable to locate a second UST, but observation of the boiler room indicated that it had been converted to natural gas. When this conversion took place, it is possible that the diesel tank was removed. Several asphalt and concrete patches were observed in the vicinity of the UST, which is another indication that a tank was removed during the conversion. A test pit was dug on the east side of the existing UST to a depth of about 8 feet bgs. No indication of contamination was observed in the test pit. A soil sample was collected near the sidewall of the UST for analysis per Table 3.1.

Several additional test pits were dug in on the north half of the property in the vicinity of the Don Oline Landfill. These test pits were dug to characterize the fill soils in this area. All of the test pits were dug to an approximate depth of 6 to 7 feet bgs, at which point groundwater seepage and sloughing of sandy material made it difficult to dig deeper. The geology was generally clean sands with scattered pockets of shell fragments and silty clay inclusions, consistent with placed dredged material during the creation of the property from a former tidal marsh. No auto fluff, lime waste, or wood debris associated with historical filling of the adjacent landfill was observed in any test pits. Representative soil samples were collected from each test pit, just above the water table, and analyzed per Table 3.1.

### **3.2.2 Soil Borings**

Four soil borings were advanced by direct push to assess subsurface conditions related to specific RECs in the former Educator Building. One boring was advanced on the northwest property corner, where unlabeled 55-gallon drums were previously stored. Three additional borings were advanced within the warehouse; two near sumps and a third near what was believed to be an old paint or storage room with a floor drain. Borings were advanced to 10 feet bgs. About 3 to 5 feet of common borrow fill was observed beneath the building followed by fine to medium-grained poorly graded sands, which is consistent with hydraulic dredge material observed in test pits across the subject property. There were no odors or staining observed in soil samples collected under the building. Additionally, no indications of petroleum contamination or landfill debris were encountered. Soil samples were collected from the borings at the interval above the water table and analyzed per Table 3.1.

### **3.2.3 Groundwater**

Two temporary groundwater wells were installed in the shallow aquifer along the northern property boundary between the subject property and the Clean Care facility where historical exceedances of VOCs have been observed in groundwater on that facility. Wells were screened from 3 to 13 feet bgs and purged until turbidity cleared. Groundwater samples were collected and each sample analyzed per Table 3.1.

### **3.2.4 Soil-Gas**

Three soil-gas samples were collected via the post-run tubing (PRT) methodology at the northwest, southwest, and southeast corners of the current Educator Building. These locations roughly correspond to the vicinity of proposed office spaces in the new warehouse. The tubing was set above the water table at about 3.25 feet bgs and then leak tested and purged for 15 to 20 minutes prior to sample collection. Soil-gas samples were analyzed for a full scan of VOCs per Table 3.1.

## **3.3 ANALYTICAL RESULTS**

Soil, groundwater, and soil-gas samples were submitted to Friedman & Bruya, Inc., in Seattle, Washington, under chain-of-custody procedures. The laboratory reports are included in

Appendix C. Results for soil, groundwater, and soil-gas samples are presented in Tables 3.2, 3.3, and 3.4 respectively.

### 3.3.1 Soil

Soil samples were analyzed for metals, petroleum hydrocarbons (gasoline- or diesel-range), and VOCs. The only detected analytes were arsenic, chromium, and lead, which reflect natural background concentrations well below Model Toxics Control Act (MTCA) Method A cleanup levels.

No VOCs or petroleum hydrocarbons were detected in any of the soil samples.

### 3.3.2 Groundwater

Groundwater samples were analyzed for dissolved metals, VOCs, and TPH. Diesel was detected in both samples at low levels of 190 micrograms per liter ( $\mu\text{g/L}$ ) and 390  $\mu\text{g/L}$ , well below the 500  $\mu\text{g/L}$  MTCA Method A cleanup level. Dissolved metals and VOCs were not detected, except for one detection of vinyl chloride, which was detected at TW-12 just at the reporting limit with a concentration of 0.21  $\mu\text{g/L}$ .

### 3.3.3 Soil-Gas

Soil-gas samples were analyzed for the full scan of VOCs. A number of VOCs were detected, but except for three compounds, all detections were at concentrations below the MTCA Method C industrial screening criteria for sub-slab soil-gas. The three VOCs detected at concentrations greater than the MTCA Method C criteria are acetaldehyde, acrolein, and trichloroethene.

Acetaldehyde was detected at 550 micrograms per cubic meter ( $\mu\text{g/m}^3$ ) in sample SG-1 near the northwest corner of the warehouse, which is greater than the MTCA C non-cancer screening criterion of 300  $\mu\text{g/m}^3$ .

Acrolein was detected at 21  $\mu\text{g/m}^3$  and 5.7  $\mu\text{g/m}^3$  at SG-1 and SG-2, respectively, which are greater than the MTCA C non-cancer screening criterion of 0.67  $\mu\text{g/m}^3$ .

Trichloroethene was detected at 210  $\mu\text{g/m}^3$  at SG-3 near the southeast corner of the Educator Building, which is greater than the MTCA C non-cancer criterion of 67  $\mu\text{g/m}^3$  and equivalent to the MTCA C cancer criteria of 210  $\mu\text{g/m}^3$ .

When VOCs are detected in soil-gas samples at concentrations greater than screening values, then additional evaluation is required to assess whether the soil gas concentrations present an indoor air risk. To quantify indoor air risk, VOC results for the three chemicals of concern were input in the Johnson and Ettinger Model (J&E Model; USEPA 2018). Building settings were based on construction specifications for the future warehouse, which contain office spaces ranging between 3,600 and 6,000 square feet. The building parameters, soil-gas concentrations, and soil quality information were input in the model with conservative estimates regarding indoor air exchange rate. Based on these inputs, the J&E Model predicted indoor air concentrations of



1.7  $\mu\text{g}/\text{m}^3$  for acetaldehyde, 0.063  $\mu\text{g}/\text{m}^3$  for acrolein, and 0.63  $\mu\text{g}/\text{m}^3$  for trichloroethene, which are all below the respective MTCA criteria for indoor air. The spreadsheet results for the J&E Model are included in Appendix D.

## 4.0 Findings and Recommendations

Soil and groundwater on subject property appear to be of excellent quality and do not present any liability for site development. This is consistent with the finding of no evidence of Don Oline Landfill material being placed on the property. Also, the sidewall sample collected adjacent to the existing UST did not indicate evidence of a release of heavy oil.

Soil-gas at the subject property did have a variety of VOC detections. Three compounds were detected at concentrations greater than applicable screening levels. Acetaldehyde is used in the production of polyester resins, as a fish preservative, and as a flavoring agent, which are all processes historically associated with tenants at the Educator Building. Because all tenant operations have ceased and the building is being demolished, the source of acetaldehyde has been eliminated and is not considered a concern for future land use.

Acrolein is an active ingredient in rodenticides. Prior to this Phase II ESA, a rodent abatement was completed at the subject property, so these results may be associated with this activity and are not considered a concern for future land use.

Trichloroethene was not detected in soil or groundwater and was only detected at one soil-gas sample location (SG-3), so this detection is likely a limited area of concern. A J&E Model was run to assess the risk for future indoor air quality from this concentration in soil-gas. The single detection of trichloroethene in soil-gas is too low to present an indoor air risk according to the J&E Model.

### 4.1 UNDERGROUND STORAGE TANK REMOVAL BUDGET

Following building demolition, the UST should be removed. This requires obtaining a permit from the local fire department, emptying the tank of product, cleaning the tank, carbon dioxide inertion, and physical removal of the tank. Per the minimum soil sampling requirements for UST tank closures defined by the Washington State Department of Ecology, three soil samples must be collected from the pit following removal; two sidewalls samples and one sample from the base of the tank (Ecology 2003). Additionally, at least three samples must be analyzed from any soil that is stockpiled and reused as backfill. One sample analyzed during this Phase II investigation was collected from soils adjacent to the UST and may be used to fulfill one of the sidewall samples required for tank closure. At least two additional soil samples will need to be collected and analyzed to fulfill the sample requirements for tank removal. Based on test pit observations and soil results, the tank does not appear to have leaked; therefore, analysis by NWTPH-HCID should be sufficient for confirmation sampling. Reporting following UST removal will be necessary to both Tacoma-Pierce County Health Department and the Pollution Liability Insurance Agency (PLIA). PLIA is the state agency now responsible for leaking UST reporting and cleanup. The cost for this work is approximately \$12,800, including tank removal and confirmation sampling and reporting. Should a limited amount of contamination be found, an additional \$5,000 should be budgeted for contaminated soil disposal.

## 5.0 Limitations

This Phase II investigation characterized current site conditions related to previously identified RECs. Samples collected may not be fully representative of all site conditions. It is recommended that following building demolition, a site survey be conducted to look for evidence of possible contamination or additional buried tanks under the building footprint in areas that were not accessible during the Phase II work described in this report.

## 6.0 References

- AGRA Earth & Environmental, Inc. (AGRA). 2000. *Phase I Environmental Site Assessment, Educator Building, 3401 Lincoln Avenue, Tacoma Washington*. Prepared for Mr. Douglas Granum. 12 April.
- Floyd|Snider. 2007. *Phase I Environmental Site Assessment, Educator Building, Tacoma, Washington*. Prepared for the Port of Tacoma. 1 November.
- \_\_\_\_\_. 2016. *Phase I Environmental Site Assessment Update for the Educator Building Property, 3401 Lincoln Avenue, Tacoma, Washington*. Memorandum from Tom Colligan and Pamela Osterhout, Floyd|Snider, to Drew Zaborowski, Avenue 55, LLC. 30 December.
- \_\_\_\_\_. 2018. *Phase I Environmental Site Assessment Update for the Educator Building Property, 3401 Lincoln Avenue, Tacoma, Washington*. Memorandum from Tom Colligan and Pamela Osterhout, Floyd|Snider, to Drew Zaborowski, Avenue 55, LLC. 13 July.
- Terra Associates, Inc. 2017. *Geotechnical Report, Taylor Way and Lincoln Avenue Industrial Sites, Tacoma, Washington*. Prepared for Avenue 55, LLC. 10 April.
- U.S. Environmental Protection Agency (USEPA). 2018. "Johnson and Ettinger Model Spreadsheet Tool, Version 6.0." EPA Spreadsheet for Modeling Subsurface Vapor Intrusion. <<https://www.epa.gov/vaporintrusion/epa-spreadsheet-modeling-subsurface-vapor-intrusion#model>>. Last accessed September 12, 2018.
- Washington State Department of Ecology (Ecology). 2003. *Guidance for Site Checks and Site Assessment for Underground Storage Tanks*. Publication No. 90-52. Underground Storage Tank Program. Olympia, Washington. April.

**Educator Building**

**Phase II Environmental Site Assessment**

**Tables**

**Table 3.1**  
**Summary of Recognized Environmental Conditions**

<b>Recognized Environmental Conditions</b>	<b>Investigation Methodology</b>	<b>Samples Collected</b>	<b>Sample Interval (ft bgs)</b>	<b>Analytical Scheme<sup>1</sup></b>
UST	GPR, Test Pit	1 soil	7.5	HCID, Metals
Unlabeled drums	Geoprobe Boring	1 soil	4 to 4.5	HCID
Sump	Geoprobe Boring	2 soil	8 <sup>2</sup>	HCID, VOCs
Landfill material	GPR, Test Pit	5 soil	5 to 6	HCID, Metals
Groundwater quality	Temporary well screened in shallow aquifer	2 groundwater	3 to 13	TPH (Gas & Diesel), Dissolved Metals, VOCs
Vapor intrusion	Post-Run Tubing	3 soil-gas	3.25	VOCs
Septic field	GPR, Test Pit	1 soil	3	HCID, Metals, VOCs
Paint/storage room	Geoprobe Boring	1 soil	8 <sup>2</sup>	HCID, VOCs

Notes:

- 1 HCID identifies detectable concentrations of gas-, diesel- and heavy oil-range petroleum. Metal analyses included arsenic, cadmium, chromium, mercury, and lead. VOCs included a full scan for all media types.
- 2 Depth is from floor of building, which was approximately 3.5 feet above ground level.

Abbreviations:

- ft bgs Feet below ground surface
- GPR Ground-penetrating radar
- HCID Hydrocarbon Identification
- TPH Total petroleum hydrocarbons
- UST Underground storage tank
- VOC Volatile organic compound

**Table 3.2**  
**Soil Analytical Results**

				Location	TP-10	TP-11	TP-12	TP-13	TP-14	TP-15	TP-UST Sidewall	SB-1	SB-2	SB-3	SB-4
				Sample ID	TP-10-5.5ft	TP-11-5ft	TP-12-5.5ft	TP-13-5.5ft	TP-14-5ft	TP-15-3.0ft	UST-7.5ft	SB-1-4-4.5	SB-2-8-8.5	SB-3-7.5-8.0	SB-4-7.5-8.0
				Sample Date	8/27/2018	8/27/2018	8/27/2018	8/27/2018	8/27/2018	8/27/2018	8/27/2018	8/28/2018	8/28/2018	8/28/2018	8/28/2018
Analyte	CAS No.	Units	Screening Criteria <sup>1</sup>												
<b>Metals, Total</b>															
Arsenic	7440-38-2	mg/kg	20	1 U	1.2	3.49	1.28	1.74	1 U	1.34 U	--	--	--	--	--
Cadmium	7440-43-9	mg/kg	2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	--	--	--	--	--
Chromium	7440-47-3	mg/kg	2,000	8.86	9.39	11.3	11.9	9.28	9.53	22.1	--	--	--	--	--
Lead	7439-92-1	mg/kg	1,000	1.06	1.29	11.6	3.51	3.69	1.12	2.07 U	--	--	--	--	--
Mercury	7439-97-6	mg/kg	2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	--	--	--	--	--
<b>Volatile Organic Compounds</b>															
1,1,1,2-Tetrachloroethane	630-20-6	mg/kg	5,050	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U	0.05 U
1,1,1-Trichloroethane	71-55-6	mg/kg	2	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U	0.05 U
1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	660	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U	0.05 U
1,1,2-Trichloroethane	79-00-5	mg/kg	2,300	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U	0.05 U
1,1-Dichloroethane	75-34-3	mg/kg	23,000	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U	0.05 U
1,1-Dichloroethene	75-35-4	mg/kg	180,000	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U	0.05 U
1,1-Dichloropropene	563-58-6	mg/kg	--	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U	0.05 U
1,2,3-Trichlorobenzene	87-61-6	mg/kg	--	--	--	--	--	--	0.25 U	--	--	0.25 U	0.25 U	0.25 U	0.25 U
1,2,3-Trichloropropane	96-18-4	mg/kg	4.4	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U	0.05 U
1,2,4-Trichlorobenzene	120-82-1	mg/kg	4,500	--	--	--	--	--	0.25 U	--	--	0.25 U	0.25 U	0.25 U	0.25 U
1,2,4-Trimethylbenzene	95-63-6	mg/kg	--	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U	0.05 U
1,2-Dibromo-3-chloropropane	96-12-8	mg/kg	160	--	--	--	--	--	0.5 U	--	--	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromoethane	106-93-4	mg/kg	66	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U	0.05 U
1,2-Dichlorobenzene	95-50-1	mg/kg	320,000	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U	0.05 U
1,2-Dichloroethane	107-06-2	mg/kg	1,400	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U	0.05 U
1,2-Dichloropropane	78-87-5	mg/kg	3,600	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U	0.05 U
1,3,5-Trimethylbenzene	108-67-8	mg/kg	35,000	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U	0.05 U
1,3-Dichlorobenzene	541-73-1	mg/kg	--	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U	0.05 U
1,3-Dichloropropane	142-28-9	mg/kg	--	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U	0.05 U
1,4-Dichlorobenzene	106-46-7	mg/kg	24,000	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U	0.05 U
2,2-Dichloropropane	594-20-7	mg/kg	--	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U	0.05 U
2-Butanone	78-93-3	mg/kg	2,100,000	--	--	--	--	--	0.5 U	--	--	0.5 U	0.5 U	0.5 U	0.5 U
2-Chlorotoluene	95-49-8	mg/kg	70,000	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U	0.05 U
2-Hexanone	591-78-6	mg/kg	--	--	--	--	--	--	0.5 U	--	--	0.5 U	0.5 U	0.5 U	0.5 U
4-Chlorotoluene	106-43-4	mg/kg	--	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U	0.05 U
4-Methyl-2-pentanone	108-10-1	mg/kg	280,000	--	--	--	--	--	0.5 U	--	--	0.5 U	0.5 U	0.5 U	0.5 U
Acetone	67-64-1	mg/kg	3,200,000	--	--	--	--	--	0.5 U	--	--	0.5 U	0.5 U	0.5 U	0.5 U
Benzene	71-43-2	mg/kg	0.03	--	--	--	--	--	0.03 U	--	--	0.03 U	0.03 U	0.03 U	0.03 U
Bromobenzene	108-86-1	mg/kg	--	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U	0.05 U

**Table 3.2**  
**Soil Analytical Results**

				Location	TP-10	TP-11	TP-12	TP-13	TP-14	TP-15	TP-UST Sidewall	SB-1	SB-2	SB-3	SB-4
				Sample ID	TP-10-5.5ft	TP-11-5ft	TP-12-5.5ft	TP-13-5.5ft	TP-14-5ft	TP-15-3.0ft	UST-7.5ft	SB-1-4-4.5	SB-2-8-8.5	SB-3-7.5-8.0	SB-4-7.5-8.0
				Sample Date	8/27/2018	8/27/2018	8/27/2018	8/27/2018	8/27/2018	8/27/2018	8/27/2018	8/28/2018	8/28/2018	8/28/2018	8/28/2018
Analyte	CAS No.	Units	Screening Criteria <sup>1</sup>												
<b>Volatile Organic Compounds (cont.)</b>															
Bromodichloromethane	75-27-4	mg/kg	2,100	--	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U
Bromoform	75-25-2	mg/kg	17,000	--	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U
Bromomethane	74-83-9	mg/kg	4,900	--	--	--	--	--	--	0.5 U	--	--	0.5 U	0.5 U	0.5 U
Carbon tetrachloride	56-23-5	mg/kg	1,900	--	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U
Chlorobenzene	108-90-7	mg/kg	70,000	--	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U
Chloroethane	75-00-3	mg/kg	--	--	--	--	--	--	--	0.5 U	--	--	0.5 U	0.5 U	0.5 U
Chloroform	67-66-3	mg/kg	4,200	--	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U
Chloromethane	74-87-3	mg/kg	--	--	--	--	--	--	--	0.5 U	--	--	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	156-59-2	mg/kg	7,000	--	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U
cis-1,3-Dichloropropene	10061-01-5	mg/kg	--	--	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U
Dibromochloromethane	124-48-1	mg/kg	1,600	--	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U
Dibromomethane	74-95-3	mg/kg	35,000	--	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U
Dichlorodifluoromethane	75-71-8	mg/kg	700,000	--	--	--	--	--	--	0.5 U	--	--	0.5 U	0.5 U	0.5 U
Ethylbenzene	100-41-4	mg/kg	6	--	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U
Hexachlorobutadiene	87-68-3	mg/kg	1,700	--	--	--	--	--	--	0.25 U	--	--	0.25 U	0.25 U	0.25 U
Hexane	110-54-3	mg/kg	210,000	--	--	--	--	--	--	0.25 U	--	--	0.25 U	0.25 U	0.25 U
Isopropylbenzene	98-82-8	mg/kg	350,000	--	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U
m,p-Xylene	179601-23-1	mg/kg	700,000	--	--	--	--	--	--	0.1 U	--	--	0.1 U	0.1 U	0.1 U
Methyl t-butyl ether	1634-04-4	mg/kg	0.1	--	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U
Methylene chloride	75-09-2	mg/kg	0.02	--	--	--	--	--	--	0.5 U	--	--	0.5 U	0.5 U	0.5 U
Naphthalene	91-20-3	mg/kg	5	--	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U
n-Propylbenzene	103-65-1	mg/kg	350,000	--	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U
o-Xylene	95-47-6	mg/kg	700,000	--	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U
p-Isopropyltoluene	99-87-6	mg/kg	--	--	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U
sec-Butylbenzene	135-98-8	mg/kg	350,000	--	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U
Styrene	100-42-5	mg/kg	700,000	--	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U
tert-Butylbenzene	98-06-6	mg/kg	350,000	--	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U
Tetrachloroethene	127-18-4	mg/kg	0.05	--	--	--	--	--	--	0.025 U	--	--	0.025 U	0.025 U	0.025 U
Toluene	108-88-3	mg/kg	7	--	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U
trans-1,2-Dichloroethene	156-60-5	mg/kg	7,000	--	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U
trans-1,3-Dichloropropene	10061-02-6	mg/kg	--	--	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U
Trichloroethene	79-01-6	mg/kg	1,800	--	--	--	--	--	--	0.02 U	--	--	0.02 U	0.02 U	0.02 U
Trichlorofluoromethane	75-69-4	mg/kg	1,050,000	--	--	--	--	--	--	0.5 U	--	--	0.5 U	0.5 U	0.5 U
Vinyl chloride	75-01-4	mg/kg	10,500	--	--	--	--	--	--	0.05 U	--	--	0.05 U	0.05 U	0.05 U



**Table 3.2**  
**Soil Analytical Results**

				TP-10	TP-11	TP-12	TP-13	TP-14	TP-15	TP-UST Sidewall	SB-1	SB-2	SB-3	SB-4		
Location																
Sample ID				TP-10-5.5ft	TP-11-5ft	TP-12-5.5ft	TP-13-5.5ft	TP-14-5ft	TP-15-3.0ft	UST-7.5ft	SB-1-4-4.5	SB-2-8-8.5	SB-3-7.5-8.0	SB-4-7.5-8.0		
Sample Date				8/27/2018	8/27/2018	8/27/2018	8/27/2018	8/27/2018	8/27/2018	8/27/2018	8/28/2018	8/28/2018	8/28/2018	8/28/2018	8/28/2018	
Analyte	CAS No.	Units	Screening Criteria <sup>1</sup>													
<b>Total Petroleum Hydrocarbons (TPH)</b>																
Gasoline-range TPH	--	mg/kg	100	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	
Diesel-range TPH	--	mg/kg	2,000	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	
Oil-range TPH	--	mg/kg	2,000	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	

Notes:

-- Not applicable or not analyzed.

<sup>1</sup> Screening criteria based on MTCA Method C Industrial Criteria or MTCA Method A Industrial when established.

Abbreviations:

CAS Chemical Abstracts Service

mg/kg Milligrams per kilogram

MTCA Model Toxics Control Act

Qualifier:

U Analyte was not detected at the given reporting limit.

**Table 3.3**  
**Groundwater Analytical Results**

Analyte	CAS No.	Units	Screening Criteria <sup>1</sup>	Location	TW-12	TW-13
				Sample ID	TW-12-3-13	TW-13-3-13
				Sample Date	8/28/2018	8/28/2018
<b>Metals, Dissolved</b>						
Arsenic	7440-38-2	µg/L	5		1 U	1 U
Cadmium	7440-43-9	µg/L	5		1 U	1 U
Chromium	7440-47-3	µg/L	50		1 U	1 U
Lead	7439-92-1	µg/L	15		1 U	1 U
Mercury	7439-97-6	µg/L	2		1 U	1 U
<b>Volatile Organic Compounds</b>						
1,1,1,2-Tetrachloroethane	630-20-6	µg/L	17		1 U	1 U
1,1,1-Trichloroethane	71-55-6	µg/L	35,000		1 U	1 U
1,1,2,2-Tetrachloroethane	79-34-5	µg/L	2.2		1 U	1 U
1,1,2-Trichloroethane	79-00-5	µg/L	7.7		1 U	1 U
1,1-Dichloroethane	75-34-3	µg/L	77		1 U	1 U
1,1-Dichloroethene	75-35-4	µg/L	880		1 U	1 U
1,1-Dichloropropene	563-58-6	µg/L	--		1 U	1 U
1,2,3-Trichlorobenzene	87-61-6	µg/L	--		1 U	1 U
1,2,3-Trichloropropane	96-18-4	µg/L	70		1 U	1 U
1,2,4-Trichlorobenzene	120-82-1	µg/L	15		1 U	1 U
1,2,4-Trimethylbenzene	95-63-6	µg/L	--		1 U	1 U
1,2-Dibromo-3-chloropropan	96-12-8	µg/L	0.55		10 U	10 U
1,2-Dibromoethane	106-93-4	µg/L	0.22		1 U	1 U
1,2-Dichlorobenzene	95-50-1	µg/L	1,600		1 U	1 U
1,2-Dichloroethane	107-06-2	µg/L	4.8		1 U	1 U
1,2-Dichloropropane	78-87-5	µg/L	12		1 U	1 U
1,3,5-Trimethylbenzene	108-67-8	µg/L	175		1 U	1 U
1,3-Dichlorobenzene	541-73-1	µg/L	--		1 U	1 U
1,3-Dichloropropane	142-28-9	µg/L	--		1 U	1 U
1,4-Dichlorobenzene	106-46-7	µg/L	81		1 U	1 U
2,2-Dichloropropane	594-20-7	µg/L	--		1 U	1 U
2-Butanone	78-93-3	µg/L	10,500		10 U	10 U
2-Chlorotoluene	95-49-8	µg/L	350		1 U	1 U
2-Hexanone	591-78-6	µg/L	--		10 U	10 U
4-Chlorotoluene	106-43-4	µg/L	--		1 U	1 U
4-Methyl-2-pentanone	108-10-1	µg/L	1,400		10 U	10 U
Acetone	67-64-1	µg/L	16,000		50 U	50 U
Benzene	71-43-2	µg/L	8		0.35 U	0.35 U
Bromobenzene	108-86-1	µg/L	--		1 U	1 U
Bromodichloromethane	75-27-4	µg/L	7.1		1 U	1 U
Bromoform	75-25-2	µg/L	55		1 U	1 U
Bromomethane	74-83-9	µg/L	25		1 U	1 U
Carbon tetrachloride	56-23-5	µg/L	6.3		1 U	1 U
Chlorobenzene	108-90-7	µg/L	350		1 U	1 U
Chloroethane	75-00-3	µg/L	--		1 U	1 U
Chloroform	67-66-3	µg/L	14		1 U	1 U
Chloromethane	74-87-3	µg/L	--		10 U	10 U
cis-1,2-Dichloroethene	156-59-2	µg/L	35		1 U	1 U
cis-1,3-Dichloropropene	10061-01-5	µg/L	--		1 U	1 U
Dibromochloromethane	124-48-1	µg/L	5.2		1 U	1 U
Dibromomethane	74-95-3	µg/L	180		1 U	1 U
Dichlorodifluoromethane	75-71-8	µg/L	3,500		1 U	1 U
Ethylbenzene	100-41-4	µg/L	1,800		1 U	1 U
Hexachlorobutadiene	87-68-3	µg/L	5.6		1 U	1 U
Hexane	110-54-3	µg/L	1,100		1 U	1 U
Isopropylbenzene	98-82-8	µg/L	1,800		1 U	1 U
m,p-Xylene	179601-23-1	µg/L	3,500		2 U	2 U
Methyl t-butyl ether	1634-04-4	µg/L	240		1 U	1 U
Methylene chloride	75-09-2	µg/L	220		5 U	5 U
Naphthalene	91-20-3	µg/L	350		1 U	1 U
n-Propylbenzene	103-65-1	µg/L	1,800		1 U	1 U
o-Xylene	95-47-6	µg/L	3,500		1 U	1 U
p-Isopropyltoluene	99-87-6	µg/L	--		1 U	1 U
sec-Butylbenzene	135-98-8	µg/L	1,800		1 U	1 U
Styrene	100-42-5	µg/L	3,500		1 U	1 U
tert-Butylbenzene	98-06-6	µg/L	1,800		1 U	1 U
Tetrachloroethene	127-18-4	µg/L	210		1 U	1 U
Toluene	108-88-3	µg/L	1,400		1 U	1 U

**Table 3.3  
Groundwater Analytical Results**

				Location	TW-12	TW-13
				Sample ID	TW-12-3-13	TW-13-3-13
				Sample Date	8/28/2018	8/28/2018
Analyte	CAS No.	Units	Screening Criteria <sup>1</sup>			
<b>Volatile Organic Compounds (cont.)</b>						
trans-1,2-Dichloroethene	156-60-5	µg/L	35		1 U	1 U
trans-1,3-Dichloropropene	10061-02-6	µg/L	--		1 U	1 U
Trichloroethene	79-01-6	µg/L	8.75		1 U	1 U
Trichlorofluoromethane	75-69-4	µg/L	5,300		1 U	1 U
Vinyl chloride	75-01-4	µg/L	52.5		0.21	0.2 U
<b>Total Petroleum Hydrocarbons (TPH)</b>						
Gasoline-range TPH	--	µg/L	800		100 U	100 U
Diesel-range TPH	--	µg/L	500		190	390
Oil-range TPH	--	µg/L	500		390 U	250 U

Notes:

-- Not applicable.

*Italics* Non-detect; reporting limit exceeds criteria.

<sup>1</sup> Screening criteria based on MTCA Method C Industrial Criteria or MTCA Method A Industrial when established.

Abbreviations:

CAS Chemical Abstracts Service

µg/L Micrograms per liter

Qualifier:

U Analyte was not detected at the given reporting limit.

**Table 3.4  
Soil-Gas-Detected Analytical Results**

Analyte	CAS No.	Units	Sub Slab Method C Non-Cancer	Sub Slab Method C Cancer	Sample ID	SG-1	SG-2	SG-3
					Sample Location	NW building corner	SW building corner	SE building corner
					Sample Date	8/28/2018	8/28/2018	8/28/2018
<b>Volatiles by TO-15</b>								
1,1,1-Trichloroethane	71-55-6	µg/m <sup>3</sup>	170,000	--		1.8 U	1.8 U	69
1,1-Dichloroethane	75-34-3	µg/m <sup>3</sup>	--	520		1.3 U	1.3 U	15
1,1-Dichloroethene	--	µg/m <sup>3</sup>	--	--		1.3 U	1.3 U	48
1,2-Dichloroethane (EDC)	107-06-2	µg/m <sup>3</sup>	230	32		0.13 U	0.13 U	0.28 fb
1,2-Dichloropropane	78-87-5	µg/m <sup>3</sup>	130	83		0.76 U	0.76 U	1.7
1,3-Butadiene	106-99-0	µg/m <sup>3</sup>	67	28		14	15	25
1,3-Dichlorobenzene	541-73-1	µg/m <sup>3</sup>	--	--		2 U	2.2	5.8
1-Butanol	71-36-3	µg/m <sup>3</sup>	--	--		20 U	35	36
2-Butanone (MEK)	--	µg/m <sup>3</sup>	--	--		26	28	35
Acetaldehyde	75-07-0	µg/m <sup>3</sup>	300	380		<b>550 ve</b>	250	45 U
Acetone	67-64-1	µg/m <sup>3</sup>	--	--		160	170	180
Acrolein	107-02-8	µg/m <sup>3</sup>	0.67	--		<b>21</b>	<b>5.7</b>	<i>4.6 U</i>
Acrylonitrile	107-13-1	µg/m <sup>3</sup>	67	12		0.73 U	0.73 U	12
Benzene	71-43-2	µg/m <sup>3</sup>	1,000	110		6.3	6	18
Butanal	--	µg/m <sup>3</sup>	--	--		88	26	23
CFC-113	76-13-1	µg/m <sup>3</sup>	1,000,000	--		6.1 fb	4.8 fb	77
Chloroform	67-66-3	µg/m <sup>3</sup>	3,300	36		1.2	1.9	2.5
Chloromethane	74-87-3	µg/m <sup>3</sup>	3,000	--		12	6.2	3.2
Cyclopentane	287-92-3	µg/m <sup>3</sup>	--	--		2.2	0.95 U	1.4 U
Dichlorodifluoromethane	75-71-8	µg/m <sup>3</sup>	3,300	--		3.1	3.2	3.2
Ethanol	--	µg/m <sup>3</sup>	--	--		25 UJ	30 fb, J	38 UJ
Ethylbenzene	100-41-4	µg/m <sup>3</sup>	33,000	--		4.3	3.5	20
Hexanal	--	µg/m <sup>3</sup>	--	--		250	54	54
Hexane	110-54-3	µg/m <sup>3</sup>	23,000	--		18	13	31
Isobutene	115-11-7	µg/m <sup>3</sup>	--	--		100	110	220
Isoprene	78-79-5	µg/m <sup>3</sup>	--	--		4.2	4.8	11
m,p-Xylene	--	µg/m <sup>3</sup>	--	--		16	13	47
Naphthalene	91-20-3	µg/m <sup>3</sup>	100	25		1.1 fb	2 fb	2.6 fb
o-Xylene	95-47-6	µg/m <sup>3</sup>	3,300	--		5.1	6	21
Pentanal	495-85-2	µg/m <sup>3</sup>	--	--		220	36	31
Pentane	109-66-0	µg/m <sup>3</sup>	--	--		30	27	67
Propene	115-07-1	µg/m <sup>3</sup>	--	--		160	180	390
Tetrachloroethene	127-18-4	µg/m <sup>3</sup>	1,333	3,205		2.2 U	3.2	63
Toluene	108-88-3	µg/m <sup>3</sup>	170,000	--		33	10	210.0
Trichloroethene	79-01-6	µg/m <sup>3</sup>	67	210		1.6 fb	1.6 fb	<b>210</b>
Trichlorofluoromethane	75-69-4	µg/m <sup>3</sup>	23,000	--		3.5 fb	2.8 fb	19

Notes:

- Not applicable.
- RED** Detected concentration exceeds criterion.
- Italics* Reporting limit exceeds criteria.

Abbreviations:

- CAS Chemical Abstracts Service
- µg/m<sup>3</sup> Micrograms per cubic meter

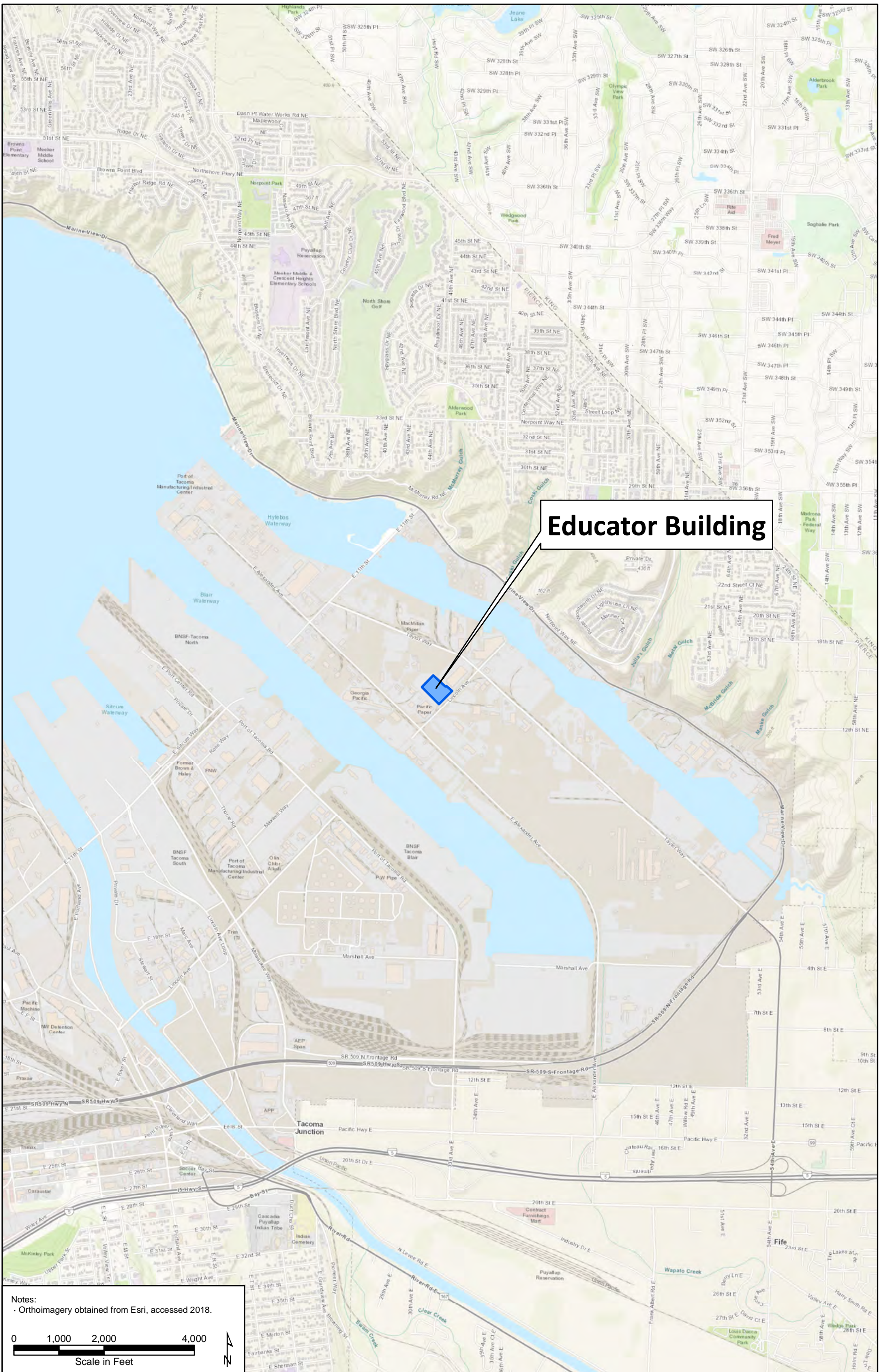
Qualifiers:

- fb The analyte was detected in the method blank.
- J The analyte value reported is considered an estimate.
- U The analyte was not detected at the given reporting limit.
- UJ The analyte was not detected at the given reporting limit. The value reported is an estimate.
- ve The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

**Educator Building**

**Phase II Environmental Site Assessment**

**Figures**



**Educator Building**

Notes:  
 • Orthoimagery obtained from Esri, accessed 2018.

0 1,000 2,000 4,000  
 Scale in Feet

**FLOYD | SNIDER**  
 strategy • science • engineering

**Phase II Environmental Site Assessment  
 Educator Building  
 Tacoma, Washington**

**Figure 1.1  
 Site Vicinity Map**



**Legend**

**Sample Type**

- Soil
- Groundwater
- ⊗ Soil-gas
- Property Boundary

**Notes:**

- See Table 3.1 for sampling location rationale.
- Samples were collected in August, 2018.
- Property boundaries obtained from Pierce County, 2015.
- Orthoimagery obtained from Esri, accessed 2018.

0 50 100 200  
Scale in Feet

H:\GIS\Projects\Ave-55 Educator\MXD\2018 Phase II ESA\Figure 3.1 Phase II Sample Locations.mxd  
9/12/2018

**Educator Building**

**Phase II Environmental Site Assessment**

**Appendix A**

**Documentation of Prior Spill Cleanups**



# Department of Ecology - Environmental Report Tracking System

**ERTS # 554489**

## Initial Report

External Reference #

### Caller Information

First Name: KERRY  
 Last Name: GRABER  
 Business Name:  
 Street Address:  
 Other Address:  
 City: State: WA Zip:  
 E-mail: Confidential\_FL   
 Phone: Ext: Type:

### Where did it happen

Berth: Anchorage:  
 Location Name: BELCO FOREST PRODUCTS  
 Street Address: 3401 LINCOLN AVE  
 Other Address:  
 City/Place: TACOMA State: WA Zip: 98421-  
 County - Region: PIERCE SWRO FS ID:  
 WIRA #:  
 Waterway: Type:  
 Latitude: Longitude:  
 Topo Quad 1:24:000: TACOMA  
 Direction/Landmark (mile post, cross roads, township/range):

### What happened

Spills Program Oil Spill? N

Incident Date: 3/6/2006 Received Date: 4/14/2006 0:00  
 Medium: ROADWAY-PAVED  
 Material: UNKNOWN  
 Quantity: Unit:

### Primary Potentially Responsible Party Information

Source: COMMERCIAL  
 Cause: OTHER  
 Activity: STORING  
 Impact: POTENTIAL POLLUTION/RELEASE  
 Vessel Name:  
 Hull Number:

First Name: DENNIS Last Name: REDFORD  
 Business Name:  
 Street Address:  
 Other Address:  
 City: State: Zip:  
 Phone: Ext: Type:  
 E-mail:

### Additional Contact Information

Name: Phone: Ext: Type:

### More Information

Hello Barb,

I received a complaint from Kerry Graber by word of mouth about a facility called Belco Forest Products located at 3401 Lincoln Ave, Tacoma, WA 98421. The manager working there is Dennis Redford. I couldn't find the ERTS complaint, so I fear she did not report this to you or meant for me to conduct a CEI. I treated the inspection as a complaint inspection, so I humbly request that you enter the complaint into ERTS for me. I believe I was told about this facility early March, so the complaint probably came in around March 6, 2006. Stacks of drums could be seen from the Clean Care facility. They explained the drums belonged to Belco and had been there for a long time. There were no labels, so Kerry became suspicious and felt they needed to be inspected to find out what was in them. That's about all I had to go off of for the original complaint.

I will enter the follow up information once the complaint is in. Thank you for your time and have a great weekend.

Arianne Fernandez  
 WA Department of Ecology  
 Hazardous Waste and Toxics Reduction Program  
 360.407.6346  
 fax: 360.407.6305

Entry Person TOPE, BARB

Entry Date 4/14/2006

ERTS # 554489

Referral

<b>Referral Method</b>		<b>Person Referred to</b> FERNANDEZ (SWRO), ARIANNE	<b>Referral #</b> 89021
<input type="radio"/> E-mail ERTS number		<b>Phone</b> (360) 407-6346 <b>Fax</b> (360) 407-6305	<b>Primary</b> <input type="checkbox"/>
<input type="radio"/> E-mail attachment		<b>E-mail</b> afer461@ecy.wa.gov	
<input type="radio"/> Print		<b>Program/Organization</b> HAZARDOUS WASTE AND TOXICS REDUCTION	
<input checked="" type="radio"/> Telephone		<b>Address</b> 300 DESMOND DR	
		<b>City</b> LACEY      WA      98503-	
		<b>Region/Location</b> SWRO	
		<b>Referral Date</b> 4/14/2006	

ERTS # 554489

Followup

<u>Inspector Information</u>		<u>Where did it happen</u>		Followup #1
Referral #	89021	Berth	Anchorage	
<input checked="" type="checkbox"/> Lead Inspector	FERNANDEZ (SWRO), ARIANNE	Location Name	BELCO FOREST PRODUCTS	
Program/Organization	HAZARDOUS WASTE AND TOXICS REDUCTION	Street Address	3401 LINCOLN AVE	
		Other Address		
* Region/Location	SWRO	City/Place	TACOMA	State WA Zip 98421-
# of Ecology Staff	2	Overtime	<input type="checkbox"/>	County PIERCE Region SWRO FS ID
<u>Action</u>	FIELD RESPONSE - INVESTIGATION	Start Date	4/10/2006	End Date 4/10/2006
		Waterway		Type
		WRIA #		
<u>What happened</u>	Incident Date 3/6/2006	Spills Program Oil Spill?	N	Latitude Longitude
<u>Medium</u>	ROADWAY-PAVED	Topo Quad	1:24,000 TACOMA	Direction/Landmark (mile post, cross roads, township/range)
<u>Material</u>	UNKNOWN			
Quantity	Unit	Est.		
		<input type="checkbox"/>		
<u>Source</u>	Regulated? <input type="checkbox"/>	<u>Potentially Responsible Party Information</u>	Check if the primary PRP provided notice to Ecology <input type="checkbox"/>	
COMMERCIAL		Primary <input checked="" type="checkbox"/>	First	Last
<u>Cause</u>	OTHER	Name	DENNIS	REDFORD
		Business Name		
<u>Activity</u>	STORING	Street Address		
<u>Impact</u>	POTENTIAL POLLUTION/RELEASE	Other Address		
<u>Vessel</u>		City	State	Zip
		Phone	Ext	Type
		E-mail		

Narrative

Arianne Fernandez conducted a site inspection at this site on 3/6/2006 and wrote the following letter in response:

Dear Mr. Redford:

The Hazardous Waste and Toxics Reduction Program of the Washington State Department of Ecology received a complaint on 3/6/2006 about your site (complaint # 554489). The complaint expressed concern about management of wastes on your property. Specifically, the allegation claimed your facility has stored drums of potential hazardous waste outside for an extended period of time. Ecology observed numerous containers of paint waste, and has concerns regarding their management.

The Washington State Department of Ecology Hazardous Waste and Toxic Reduction Program (HWTRP) conducted a site investigation on April 10, 2006. The purpose of this correspondence is to provide guidance on how to come into compliance.

1. According to WAC 173-303-170(1)(a), generators are responsible for designating their waste as either dangerous waste or extremely hazardous waste. We observed numerous 55 gallon drums and numerous smaller containers, of what appeared to be waste. Ecology requires generators to designate all waste before disposal to determine whether the waste is hazardous. Within 90 calendar days from receipt of this letter, designate all waste streams including:

- Cloverdale's Fargo II primer sludge.
- Belco Armor Coat from Canada sludge.
- Wil-Pro 5251 sludge.
- Cloverdale's Fargo II primer wash water.
- Wil-Pro 5251 wash water.

There are two ways you can designate your waste:

A.Book Designate using the MSDS and determine the materials toxicity. (Attachment 1 State-Only Designation).

B.Test the material. Tests may include but are not limited to:

## Department of Ecology - Environmental Report Tracking System

ERTS # 554489

- Flammability (EPA Method 1311 and Method 1010, 1020, or 1030).
- Volatiles (EPA Method 8260).
- Zinc oxide concentrations (EPA Method 6010).

The analytical costs may exceed the cost of disposal, and you may also declare them hazardous waste and ship them offsite to a permitted treatment, storage, or disposal facility.

If the waste book designates as a state only toxic waste, your facility may have an accredited laboratory perform a fish test to confirm your waste stream matches the book designation. For example, we reviewed the MSDS for Wil-Pro 5251 during the inspection and found the paint designates as a state only hazardous waste due to the zinc oxide concentration. Belco has the option to test a representative sample of Wil-Pro 5251 sludge using a fish bioassay or simply testing to see if the concentration of zinc oxide is below 1%.

If designating using a fish bioassay, I will consider one representative sample per like waste stream adequate. For example, Belco may collect one sample of Cloverdale's Fargo II primer sludge, one sample of Belco Armor Coat from Canada sludge, one sample of Wil-Pro 5251 sludge, one sample of Cloverdale's Fargo II primer wash water, and one sample of Wil-Pro 5251 wash water for testing.

Although we did not discuss what happens to the wash water after cleaning paint contaminated equipment, the local sewer authority must grant permission to dispose of excess wash water into the sanitary sewer.

If the waste designates as hazardous, your facility will need to reapply for a RCRA ID Number using Form 2 which is enclosed. Belco will need to manage containers of hazardous waste differently from the current practice. Information on container management is enclosed.

Per our conversation during the inspection, I attempted to contact Mr. Jody Sanders who used to manage the hazardous waste for that site to find out the soap product's name, but I received no response. I attempted to contact Mr. Sanders concerning the MSDS for the Cloverdale's Fargo II primer paint waste but received no response. Because you expressed concern about your relationship with Cloverdale, I did not contact them about the MSDS.

Belco can try to sell or give the soap to someone else as a reusable product instead of disposing of the waste. Publications such as IMEX allow a business to advertise their leftover products that are still useable. Otherwise, Belco will need to designate the discarded soap product before disposal.

### 2. Determine Generator Status

How much waste you generate will determine the regulations you need to comply with. In general, the less waste you generate, the fewer regulations you need to comply with.

The amount of HW generated per month and stored on-site will determine your generator status. Determining generator status will establish what regulations your facility must follow in order to comply with the Hazardous Waste Regulations WAC 173-303. The amount of waste accumulated per month or batch and the amount stored on-site at any one time will determine generator status. Further information on how to determine generator status is enclosed.

If testing shows all waste streams as non-hazardous, I will refer this complaint to your local solid waste authority concerning storing non-dangerous waste for an extended period of time.

While waiting for designation results, Ecology recommends placing a highly visible sign around the waste saying "Waste Pending Designation" as described during the visit.

Please complete and submit all designation and disposal documentation to Arianne Fernandez at PO Box 47775 Olympia, WA 98504-7775 by August 21, 2006 so that our records properly reflect your compliance status. Please do not hesitate to call me at 360-407-6346 or email me at [afer461@ecy.wa.gov](mailto:afer461@ecy.wa.gov) should you have questions about hazardous waste management or environmental concerns in general. You may also visit the Hazardous Waste and Toxics Reduction Program website at [www.ecy.wa.gov/programs/hwtr](http://www.ecy.wa.gov/programs/hwtr) to access the Dangerous Waste Regulations as well as a variety of information to assist you in hazardous waste management. Ecology may visit you to evaluate these compliance issues.

Sincerely,

Arianne Fernandez  
Hazardous Waste Compliance Specialist  
Hazardous Waste and Toxics Reduction Program

Belco returned to compliance following this letter.

NFA

Vessel Emergency

Entry Person: BROOKS, NANNETTE

Entry Date 4/27/2006

# Department of Ecology - Environmental Report Tracking System

ERTS # 605580

## Initial Report

External Reference #

### Caller Information

First Name RAND  
Last Name LYMANGROVER  
Business Name TOTEM OCEAN TRAILER EXPRESS  
Street Address  
Other Address  
City TACOMA State WA Zip  
E-mail Confidential\_FL   
Phone (253) 405-7355 Ext Type Mobile

### Where did it happen

Berth Anchorage  
Location Name TOTEM OCEAN TRAILER EXPRESS  
Street Address 3401 LINCOLN AVE  
Other Address  
City/Place TACOMA State WA Zip  
County - Region PIERCE SWRO FS ID  
WIRA #  
Waterway Type  
Latitude Longitude  
Topo Quad 1:24:00 TACOMA  
Direction/Landmark (mile post, cross roads, township/range)

### What happened

Spills Program Oil Spill? Y

Incident Date 5/8/2008 Received Date 5/8/2008 9:06

Medium Impermeable surface

Material Diesel Oil  
Sheen Only  Quantity 80 To Water

Source Type Other Primary

Cause

Incident Type Oil Spill  
Activity Other  
Impact CONTAMINATED ROADWAY/PARKING LOT

Vessel Name  
Hull Number

### Primary Potentially Responsible Party Information

First Name Last Name  
Business Name TOTEM OCEAN TRAILER EXPRESS  
Street Address SAME AS ABOVE  
Other Address  
City TACOMA State WA Zip  
Phone Ext Type  
E-mail

### Additional Contact Information

Name Phone Ext Type

### More Information

CALLER REPORTING THAT A REFRIGERATED TRAILER WAS PARKED IN PARKING LOT, THE LANDING GEAR ON THE TRAILER FAILED CAME DOWN AND SPLIT THE DIESEL TANK. SOME OF THE DIESEL HAS MADE IT TO A GRAVEL AREA.

SPILL OCCURRED AT 3:00

NRC ENVIRONMENTAL HAS BEEN ON SCEN SINCE 4:30

Entry Person SMITHERMAN, OPAL

Entry Date 5/8/2008

ERTS # 605580

Referral

<b>Referral Method</b>		<b>Person Referred to</b> PIESCH, CURT	<b>Referral #</b> 112015
<input type="radio"/> E-mail ERTS number		<b>Phone</b> 360-750-6976	<b>Primary</b> <input type="checkbox"/>
<input type="radio"/> E-mail attachment		<b>Fax</b> 360-690-7166	
<input type="radio"/> Print		<b>E-mail</b> cupi461@ecy.wa.gov	
<input checked="" type="radio"/> Telephone		<b>Program/Organization</b> SPILLS, PREVENTION, PREPAREDNESS AND RESPONSE	
		<b>Address</b>	
		<b>City</b>	
		<b>Region/Location</b> VFO	
		<b>Referral Date</b> 5/8/2008	

# Department of Ecology - Environmental Report Tracking System

**ERTS # 605580**

## Followup

<p><b><u>Inspector Information</u></b></p> <p>Referral # 112015</p> <p><input checked="" type="checkbox"/> <b>Lead Inspector</b> PIESCH, CURT</p> <p><b>Program/Organization</b> SPILLS, PREVENTION, PREPAREDNESS AND RESPONSE</p> <p>* <b>Region/Location</b> VFO</p> <p><b># of Ecology Staff</b> _____ <b>Overtime</b> <input type="checkbox"/></p> <p><b>Action</b></p> <p>TELEPHONE _____ <b>Start Date</b> 5/8/2008 <b>End Date</b> 5/8/2008</p> <p><b>What happened</b></p> <p><b>Incident Date</b> 5/8/2008</p> <p><b>Medium</b></p> <p>Impermeable surface</p> <p><b>Material</b></p> <p>Diesel Oil <input type="checkbox"/> Sheen Only</p> <table border="0" style="width: 100%;"> <tr> <td><b>Quantity</b></td> <td><b>To Water</b></td> <td><b>To Imperm</b></td> <td><b>Recover</b></td> <td><b>NRDA</b></td> <td><b>Est.</b></td> </tr> <tr> <td>80</td> <td>0</td> <td>75</td> <td>80</td> <td></td> <td><input type="checkbox"/></td> </tr> </table> <p><b>Source</b> Regulated? <input type="checkbox"/></p> <p>Commercial Truck</p> <p><b>Type</b> Vehicle <b>Primary</b> <input checked="" type="checkbox"/></p> <p><b>Cause</b></p> <p>Mechanical Failure</p> <p><b>Type</b> Equipment Failure <b>Primary</b> <input checked="" type="checkbox"/></p> <p><b>Incident Type</b></p> <p>Oil Spill</p> <p><b>Activity</b></p> <p>Other</p> <p><b>Impact</b></p> <p>CONTAMINATED ROADWAY/PARKING LOT</p> <p><b>Vessel</b></p>	<b>Quantity</b>	<b>To Water</b>	<b>To Imperm</b>	<b>Recover</b>	<b>NRDA</b>	<b>Est.</b>	80	0	75	80		<input type="checkbox"/>	<p><b><u>Where did it happen</u></b></p> <p><b>Berth</b> _____ <b>Anchorage</b> _____</p> <p><b>Location Name</b> Port of Tacoma</p> <p><b>Street Address</b> 3401 LINCOLN AVE</p> <p><b>Other Address</b> P.O. Box 1837</p> <p><b>City/Place</b> TACOMA <b>State</b> WA <b>Zip</b> 98401-</p> <p><b>County</b> PIERCE <b>Region</b> SWRO <b>FS ID</b> _____</p> <p><b>Waterway</b> _____ <b>Type</b> _____</p> <p><b>WRIA #</b> _____</p> <p><b>Latitude</b> 47.27045 <b>Longitude</b> 122.38791</p> <p><b>Topo Quad</b> 1:24,000 TACOMA</p> <p><b>Direction/Landmark</b> (mile post, cross roads, township/range)</p>	<p><b>Followup #1</b></p>
<b>Quantity</b>	<b>To Water</b>	<b>To Imperm</b>	<b>Recover</b>	<b>NRDA</b>	<b>Est.</b>									
80	0	75	80		<input type="checkbox"/>									
<p><b><u>Narrative</u></b></p> <p>05/08/2008.</p> <p>Spill Site GPS Readings based upon the address: N47.27045, W122.38791</p> <p>I (Curt Piesch) worked this case by phone.</p> <p>No waters of the state was impacted by this incident.</p> <p>Spill Volume: 80-gallons of red-dye diesel. Volume to impermeable surface: 75-gallons. Volume to gravel: 5-gallons. Volume cleaned up: 80-gallons.</p> <p>The spill occurred at 3:00 am. Apparently, there was an emergency at one of the terminals. They had to have the semi truck driver leave the refrigeration box trailer in this parking lot. The trailer was to be shipped out by vessel. During the time the trailer was left in the parking lot, the landing gear failed causing the trailer to fall onto the 100-gallon capacity fuel tank. The tank contained 80-gallons of red-dye diesel at the time of the incident and it all spilled.</p> <p>The diesel spilled to pavement and some to a 10-square-foot area on gravel. There were two catch basins in the area. They did not believe any got to either of the catch basins however they still boomed them. They then put spill pads into the catch basins. They did not pick-up any diesel and being the diesel was red-dye diesel, they would have seen it on the white pad. They also vactored out the two catch basins as a precaution. This property was later determined to be Port of Tacoma property.</p> <p>No waters of the state impacted by this spill.</p>														

## Department of Ecology - Environmental Report Tracking System

**ERTS # 605580**

They used spill cleanup kits from one of there terminals located 1/2-miles away from this site. They also used spill cleanup sorbent materials provided by NRCES. The Project Manager from NRCES is Ron Broadway who works for Jason Potts.

I confirmed that they will conduct confirmation sampling that represents the spill area.

I required the following from Rand by June 30, 2008 (except I requested the property owner information ASAP):

- 1) A copy of a Spill Cleanup Report to include: disposal receipts of the sorbent materials, soil, and vactor truck liquids.
- 2) Sampling analytical to include a sample diagram and sample results.
- 3) Land owner (already provided @ 1010 hours today on 05/08/2008).
- 4) A statement that the spill cleanup kits have been re-stocked and replaced at their terminal.

@ 1010 hours, Rand called me back and provided the name and contact person for the land owner, Port of Tacoma.

@ 1031 hours, I called the Port of Tacoma, Anita and left a message for some information.

@ 1223 hours, I had a message from Anita.

@ 1250 hours, I called Anita back. She should keep an eye on the pavement. However the pavement is going to be part of a demolition area due development. She confirmed that the catch basins were higher than the spill area. She said that he did not initially get contacted and neither did the Port of Tacoma through their normal policy notification system. She did get notified by phone but not by their proper system so she is also going to look into this.

Responsible Party information:  
Totem Ocean Trailer Express  
Contact Person: Rand Lymangrover  
3401 Lincoln Avenue  
Tacoma, WA  
(253) 405-7355

Property Owner Information:  
Port of Tacoma  
Contact Person: Anita Fichthorn  
(253) 830-5379

Site Location:  
Port of Tacoma  
3401 Lincoln Avenue  
Tacoma, WA 98421

Port of Tacoma Mailing Address:  
Port of Tacoma  
Attn. Anita Fichthorn  
P.O. Box 1837  
Tacoma, WA 98401  
(253) 830-5379

05/23/2008.

@ 1540 hours, (Jason Blair had left me a message earlier) I called Jason at (206) 772-1097. The spill was diesel. Sample indicated that the background sample for diesel was 540 PPM for motor oil, and 41 PPM for diesel.

After cleanup: Motor oil was at 2,100 PPM and diesel was at 200 PPM. The other two samples, after cleanup came back at 2,000 and another at 2,000 PPM for motor oil. Diesel was 200, 160 & 170 PPM after cleanup. Jason was told that the Port of Tacoma owns the property and they lease to Emerald Services. He was hired by Totem Ocean Trailer Express. He wanted to let me know ahead of time before they close out this case for Totem Ocean Trailer Express due to historical. We both suspect that the Port of Tacoma does not know about this data, the historical spill data.

I will need to find out how to do a closure letter as there is still contamination on site however it is not related to this incident. It is historical oil spilled.

09/02/2008.  
Received the Spill Cleanup Report.

12/30/2008.

Determined that the diesel was cleaned up to state standards however at the site there is a historical oil spill (see above). Since that was NOT the target, the oil was not cleaned up. What is confusing on this case is that there were three spills in the area that NRCES was contracted with. Two on Birch St. on the same day. It appears that NRCES sent to me the wrong TestAmerica analytical for this spill. I called Michelle at (253-518-1109). She will verify the sample analytical for this case and get back to me by tomorrow, 12/31/2008.

@ 1212 hours I called Cris Matthews at (360) 407-6388. Cris requested that I re-refer this case to Sharon Bell, Piece County Health Dept. (253) 798-2891.



Department of Ecology - Environmental Report Tracking System

**ERTS # 605580**

@ 1455 hours, I called Sharon Bell. I left a message.

Referred to TCP.

Case Pending.

Vessel Emergency

Entry Person: PIESCH, CURT

Entry Date 5/8/2008

Department of Ecology - Environmental Report Tracking System

ERTS # 615788

Initial Report

External Reference #

Caller Information

Where did it happen

First Name SHIRLEY, Last Name SMITH, Business Name EMERALD SERVICES, Street Address, Other Address, City TACOMA, State WA, Zip, E-mail, Phone (253) 370-7912, Ext, Type Business, Confidential\_FL checkbox

Berth, Anchorage, Location Name, Street Address 3401 LINCOLN AVENUE, Other Address, City/Place TACOMA, State WA, Zip, County - Region PIERCE, SWRO, FS ID, WIRA #, Waterway, Type, Latitude, Longitude, Topo Quad 1:24:000 TACOMA

What happened

Spills Program Oil Spill? Y

Direction/Landmark (mile post, cross roads, township/range) 3401 LINCOLN AVENUE

Incident Date 10/9/2009, Received Date 10/9/2009 11:10

Medium Land

Material Lube Oil/Motor Oil

Sheen Only checkbox, Quantity 1, To Water

Primary Potentially Responsible Party Information

First Name, Last Name UNKNWON

Business Name, Street Address

Source, Type Unknown, Primary checkbox

Cause

Incident Type Oil Spill

Activity Other

Impact SOIL CONTAMINATION

Vessel Name

Hull Number

Other Address

City, State WA, Zip, Phone, Ext, Type, E-mail

Additional Contact Information

Name, Phone, Ext, Type

More Information

APPROX. 1/2 GALLON OF USED MOTOR OIL LEAKED TO SOIL, NO WATER OR STORM DRAINS INVOLVED. THIS WAS A PORTABLE STORAGE FOR USED OIL FILTERS AND THE BOTTOM HAS AN OPENING THAT WAS NOT COMPLETELY SEALED.

Entry Person GADWA, LORNA

Entry Date 10/9/2009

ERTS # 615788

Referral

<b>Referral Method</b>		<b>Person Referred to</b> OSWEILER, MIKE	<b>Referral #</b> 127046
<input type="radio"/> E-mail ERTS number		<b>Phone</b> (360) 407-6372	<b>Primary</b> <input type="checkbox"/>
<input type="radio"/> E-mail attachment		<b>Fax</b>	
<input type="radio"/> Print		<b>E-mail</b> mosw461@ecy.wa.gov	
<input checked="" type="radio"/> Telephone		<b>Program/Organization</b> SPILLS, PREVENTION, PREPAREDNESS AND RESPONSE	
		<b>Address</b> 300	
		<b>City</b> LACEY WA 98504-	
		<b>Region/Location</b> SWRO	
		<b>Referral Date</b> 10/9/2009	

Department of Ecology - Environmental Report Tracking System

ERTS # 615788

Followup

<u>Inspector Information</u>		<u>Where did it happen</u>		Followup #1
Referral #	127046	Berth	Anchorage	
<input checked="" type="checkbox"/> Lead Inspector	OSWEILER, MIKE	Location Name		
Program/Organization	SPILLS, PREVENTION, PREPAREDNESS AND RESPONSE	Street Address	3401 LINCOLN AVENUE	
* Region/Location	SWRO	Other Address		
# of Ecology Staff	1	Overtime	<input type="checkbox"/>	
<u>Action</u>	TELEPHONE	Start Date	10/9/2009	End Date 10/9/2009
		City/Place	TACOMA	State WA Zip
		County	PIERCE	Region SWRO FS ID
		Waterway		Type
		WRIA #		
<u>What happened</u>	Incident Date 10/9/2009	Spills Program Oil Spill?	Y	
		Latitude	47.270116	Longitude 122.38837
		Topo Quad 1:24,000	TACOMA	
<u>Medium</u>	Land	Direction/Landmark (mile post, cross roads, township/range)		
<u>Material</u>	Lube Oil/Motor Oil	<input type="checkbox"/> Sheen Only		
Quantity	To Water	To Imperm	Recover	NRDA
1	0	0	1	0
				Est. <input type="checkbox"/>
<u>Source</u>	Regulated?	<input type="checkbox"/>	<u>Potentially Responsible Party Information</u>	
			Check if the primary PRP provided notice to Ecology <input type="checkbox"/>	
Type	Unknown	Primary	<input type="checkbox"/>	
<u>Cause</u>	Mechanical Failure	Type	Equipment Failure	Primary <input checked="" type="checkbox"/>
<u>Incident Type</u>	Oil Spill			
<u>Activity</u>	Other			
<u>Impact</u>	SOIL CONTAMINATION			
<u>Vessel</u>				
<u>Narrative</u>				
SHEILA SMITH @ 1229/09OCT09: No answer. I (Mike Osweiler) left a voice mail requesting callback.				
SHEILA SMITH/EMERALD SERVICES @ 1420 09OCT09: There was a small oil spill to gravel in the tracks around 1000 today. The spill resulted from a sheared valve on a railroad hopper car owned by Vortex--oil exited from this sheared valve onto the tracks. Spilled oil was cleaned up.				
No further action required in this matter.				
Vessel Emergency	<input type="checkbox"/>	Entry Person:	OSWEILER, MIKE	Entry Date 10/12/2009

ERTS # 617057

**Initial Report**

External Reference #

Caller Information

Where did it happen

First Name: Sheila  
 Last Name: Smith  
 Business Name: Emerald Services  
 Street Address:  
 Other Address:  
 City: State WA Zip: Confidential\_FL   
 E-mail:  
 Phone: (253) 370-7912 Ext: Type: Business

Berth: Anchorage  
 Location Name:  
 Street Address: 3401 Lincoln Ave  
 Other Address:  
 City/Place: TACOMA State: WA Zip:  
 County - Region: PIERCE SWRO FS ID:  
 WIRA #:  
 Waterway: Type:  
 Latitude: Longitude:  
 Topo Quad 1:24:000: TACOMA  
 Direction/Landmark (mile post, cross roads, township/range):

What happened

Spills Program Oil Spill? Y

Incident Date: 12/15/2009 Received Date: 12/15/2009 14:15

Medium: Land

Material: Lube Oil/Motor Oil

Sheen Only:  Quantity: 40 To Water:

Primary Potentially Responsible Party Information

First Last

Name

Business Name

Street Address

Source

Type Other

Primary

Cause

Other Address

Incident Type: Oil Spill

Activity: Other

Impact: SOIL CONTAMINATION

City

State

Zip

Phone

Ext

Type

Vessel Name

E-mail

Hull Number

Additional Contact Information

Name Phone Ext Type

More Information

Caller reporting a spill of 40 gallons of lube oil from a rail car at a rail yard near the Port of Tacoma. A frozen valve thawed then broke. No water affected and cleanup is underway.

Entry Person: Baxter, Susan

Entry Date: 12/15/2009

ERTS # 617057

Referral

<b>Referral Method</b>		<b>Person Referred to</b> HANSON, JOHN	<b>Referral #</b> 128844
<input type="radio"/> E-mail ERTS number		<b>Phone</b> 407-6378 <b>Fax</b>	<b>Primary</b> <input type="checkbox"/>
<input type="radio"/> E-mail attachment		<b>E-mail</b> joha461@ecy.wa.gov	
<input type="radio"/> Print		<b>Program/Organization</b> SPILLS, PREVENTION, PREPAREDNESS AND RESPONSE	
<input checked="" type="radio"/> Telephone		<b>Address</b>	
		<b>City</b>	
		<b>Region/Location</b> SWRO	
		<b>Referral Date</b> 12/15/2009	
<b>Referral Method</b>		<b>Person Referred to</b> BELL, SHARON	<b>Referral #</b> 129061
<input type="radio"/> E-mail ERTS number		<b>Phone</b> (253) 798-2891 <b>Fax</b>	<b>Primary</b> <input type="checkbox"/>
<input checked="" type="radio"/> E-mail attachment		<b>E-mail</b> erts@tpchd.org	
<input type="radio"/> Print		<b>Program/Organization</b> TOXICS CLEANUP	
<input type="radio"/> Telephone		<b>Address</b> TPCHD	
		<b>City</b> TACOMA <b>WA</b>	
		<b>Region/Location</b> swro	
		<b>Referral Date</b> 12/23/2009	

# Department of Ecology - Environmental Report Tracking System

**ERTS # 617057**

## Followup

<u>Inspector Information</u>		<u>Where did it happen</u>		<u>Followup #1</u>
Referral # 128844		Berth	Anchorage	
<input checked="" type="checkbox"/> Lead Inspector HANSON, JOHN		Location Name		
Program/Organization SPILLS, PREVENTION, PREPAREDNESS AND RESPONSE		Street Address 3401 Lincoln Ave		
* Region/Location SWRO		Other Address		
# of Ecology Staff 2	Overtime <input type="checkbox"/>	City/Place TACOMA	State WA	Zip
		County PIERCE	Region SWRO	FS ID
<u>Action</u>	Start Date	End Date	Waterway	Type
FIELD RESPONSE - INVESTIGATION	12/15/2009	12/16/2009	WRIA #	
<u>What happened</u>	Spills Program Oil Spill? Y	Latitude 47.2695	Longitude	122.3872
Incident Date 12/15/2009		Topo Quad 1:24,000 TACOMA		
<u>Medium</u>		Direction/Landmark (mile post, cross roads, township/range)		
Land				
<u>Material</u>				
Lube Oil/Motor Oil	<input type="checkbox"/> Sheen Only			
Quantity To Water To Imperm Recover NRDA Est.				
40 20 40 30	<input type="checkbox"/>			
<u>Source</u>	Regulated? <input type="checkbox"/>	<u>Potentially Responsible Party Information</u>		
		Check if the primary PRP provided notice to Ecology <input type="checkbox"/>		
Type Other	Primary <input type="checkbox"/>			
<u>Cause</u>				
Other - Equipment Failure				
Type Equipment Failure	Primary <input checked="" type="checkbox"/>			
<u>Incident Type</u>				
Oil Spill				
<u>Activity</u>				
Other				
<u>Impact</u>				
SOIL CONTAMINATION				
<u>Vessel</u>				
<u>Narrative</u>				
<p>Contacts onsite:</p> <ul style="list-style-type: none"> <li>* Lisa Rozmyn, Port of Tacoma</li> <li>* Mark Rettmann, Port of Tacoma</li> <li>* Sheila Smith, Emerald Services Environmental Coordinator</li> <li>* Clue Westmoreland, Emerald Services Chief Operating Officer</li> <li>* Frank Flanagan, Emerald Services General Manager</li> <li>* Gary Coil, Emerald Services onsite clean-up supervisor</li> <li>* Ron Holcomb, Ecology</li> </ul> <p>At 14:15 on 12/15/09 a call from Sheila Smith (Emerald) reporting a spill of 40 to 60 gallons of used motor oil spilled to the rail bed. Emerald Services recycles used oil filters. They dump the filters into a rail car. The railcar full of used oil filters was located at 3401 Lincoln Ave Tacoma. Sheila told me that cold weather, that we have been experiencing, had froze the valve located at the bottom of the rail car and when it un-froze it broke spilling the oil. Sheila told me that the onsite clean-up supervisor Gary Coil could answer more of my questions. I contacted Gary. Gary told me that the spill was contained to the track area no water has been involved and nothing was leaving the site and they have a vac-truck removing the oil at this time.</p> <p>At approximately 15:30 Gary Coil (Emerald) called back and informed me that the clean-up was going well and they had found a utility vault at the north end of the spill site that has been collecting rain water and ground water. Gary observed a small amount of oil on the water in the utility vault. Gary told me that they would remove all of the water and thoroughly clean the vault. At this time I felt confident that both Sheila and Gary were capable of a spill clean-up. I had planned to take a look at the spill area the next day when I was in the area, nothing reported from Emerald the rest of the day.</p> <p>On 12/16/09 at 11:00 I was contacted by Vida Piera (City of Tacoma). Vida told me that Emerald Services is one of her permit holders and</p>				

# Department of Ecology - Environmental Report Tracking System

**ERTS # 617057**

she thought she would take a look at the spill area. Vida told me that there was still oil every where, I told Vida I'm in Tacoma and will respond.

I arrived at 11:30. Onsite I observed a considerable amount of recoverable oil in soil and both surface water run off and ground water in the utility vault and both are considered waters of the state. Both samples and photo's were taken showing oil in the vault. The impacted area was approximately 600' by 60' and oil was flowing off site through a small stream 2' wide to a low area just south of the spill area. Emerald had 3 personnel and 1 vac-truck onsite working. Based on both Ron Holcomb's and my experience, I told Sheila and Gary that their clean-up efforts are not adequate and they would have to get more personnel and assets onsite immediately. The spill occurred at approximately 14:00 hours on 12/15/09 and still at 11:30 on 12/16/09 oil was still leaving the spill area and a very limited clean-up effort was under way at this time. I insisted that Emerald step up there clean-up efforts.

12:30 Frank Flanagan, Emerald Services General Manager onsite. Frank hired National Response Corporation (NRCES) and Environmental Cleanup Contractor who arrived on site with more clean personnel and equipment. I felt the clean-up was being handled properly after NRCES arrived.

Photo's and samples take.

Formal Enforcement action's both Spills and Hazardous Waste under way.

This case has been referred to Sharon Bell TPCH.

Vessel Emergency

Entry Person: HANSON, JOHN

Entry Date 12/23/2009

**Inspector Information**

Referral # 129061

Lead Inspector BELL, SHARON

Program/Organization TOXICS CLEANUP

\* Region/Location swro

# of Ecology Staff

Overtime

**Action**

	Start Date	End Date
FIELD RESPONSE - INVESTIGATION	6/30/2010	8/18/2010
TCP - SIS	6/30/2010	8/18/2010

**Where did it happen**

Followup #2

Berth Anchorage

Location Name Tacoma Rail Spur

Street Address 3401 Lincoln Ave

Other Address

City/Place TACOMA State WA Zip 98421-

County PIERCE Region SWRO FS ID 23504

Waterway Type

WRIA #

**What happened**

Spills Program Oil Spill? N

Latitude 47.2695 Longitude 122.3872

Incident Date 12/15/2009

Topo Quad 1:24,000 TACOMA

Direction/Landmark (mile post, cross roads, township/range)

Medium

SOIL

Material

PETROLEUM - MOTOR OIL

Quantity	Unit	Est.
40	GALLON	<input type="checkbox"/>

**Potentially Responsible Party Information**

Check if the primary PRP provided notice to Ecology

Primary  Name First Last

Business Name Port of Tacoma

Street Address PO Box 1837

Other Address

City TACOMA State WA Zip 98401-

Phone (253) 383-9428 Ext Type Business

E-mail

Source Regulated?

Cause

Activity

Impact

SOIL CONTAMINATION

Vessel

**Narrative**

COMPLAINT (Brief Summary of ERTS):  
Used motor oil spill from rail car transporting bulked oil filters.

SITE STATUS (Brief Summary of site condition(s) after investigation):  
Spill remediation has been successfully completed.



ERTS # 617057

Investigator: S. Bell Date Submitted: 08.18.10

OBSERVATIONS

Description:

On 12.15.09, Emerald Services, Inc. (Emerald) discovered used oil leaking from a rail car owned by Vortex Recycling. Emerald had contracted the services of the rail car from Vortex Recycling to transport used oil filters. The release resulted from a valve failure on the bottom of the rail car. An estimated 40 gallons of used motor oil was released to the soil and railroad ballast under the rail car. At the time of the release, the rail car was temporarily stored on a Tacoma Rail spur adjacent to the southeast side of the Educator Building at 3401 Lincoln Avenue in the Tacoma Tideflats. The Port of Tacoma (Port) owns the subject site.

Cleanup efforts were initiated by Emerald the same day as the discovery of the release but were complicated by periods of heavy precipitation. Storm drains were protected from impact, but storm water facilitated the horizontal spread of the oil release along the railroad tracks. Initial cleanup efforts resulted in the removal of 5200 gallons of oily water, and 24+ tons of contaminated soil and rock. Contaminated materials were transported to an Emerald Services facility in Seattle for proper disposal. A product sample was obtained and analyzed for the presence of PCB Aroclors; none were detected.

Heavy and persistent precipitation over the next two weeks resulted in standing water accumulating along this railroad spur, which is located in a slight depression. Oil continued to appear on the surface of the standing water, so absorbent materials and visqueen were used to absorb the oil and protect the area from further weather impacts, respectively.

Emerald put together a sampling and analysis plan (SAP) in January 2010 to determine if cleanup was sufficient at the subject site, but negotiations with the Port about the details of the SAP caused a significant delay and some modifications in its implementation. Soil sampling was finally conducted on 06.30.10, with surface samples collected from 8 locations along the 360' length of the impact area. Deeper samples were also collected from 1 to 1.5' bgs at 7 of those locations. All samples were submitted for NWTPH-gx and NWTPH-dx laboratory analyses. A subset of three samples, collected from the surface in the immediate vicinity of the release, was also submitted for additional analyses of VOCs, cP AHs, and total lead and cadmium. All results were either non-detect or below the relevant MTCA CUL.

The impact to soil from the used oil release appears to have been limited to surface areas and has been satisfactorily remediated. There is no indication that the contamination travelled significantly enough to impact groundwater. The TPCHD recommends no further action.

INITIAL INVESTIGATION COMPLETE SEE COMPLETE REPORT IN CENTRAL FILES - 04/29/11

Vessel Emergency

Entry Person: GADWA, LORNA

Entry Date 4/29/2011

## Emerald Timeline

<u>Date</u>	<u>Description</u>
12/15/09	Emerald staff notified of used oil release from railcar
12/16/09	NRC spill response & recovery effort begins
12/29/09	Emerald letter to Ecology describing spill & response efforts
1/6/10	Emerald (Shelia Smith) provides draft Sampling and Analysis Plan (SAP) to Port of Tacoma (Lisa Rozmyn) and Tacoma-Pierce County Health Department (TPCHD)(Sharon Bell).

### [6 January.msg](#)

1/12/10	Emerald (Shelia Smith) forwards redacted email from TPCHD (Sharon Bell) requiring cleanup to Method A Criteria to support TPCHD recommendation for NFA to Ecology.
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### [12 January.msg](#)

1/13/10	Port of Tacoma (Scott Hooton) provides SAP comments to Emerald (Shelia Smith).
---------	--

### [13 January a.msg](#)

### [13 January b.msg](#)

2/10/10	Emerald (Shelia Smith) forwards revised “final” workplan to Port of Tacoma (Lisa Rozmyn) partially addressing comments, but rebuffing Port request to collect & analyze deeper samples requested by Port to identify extent of remnant soil contamination exceeding Ecology guidelines for reuse of petroleum-contaminated soils.
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### [10 February.msg](#)

3/1/10	Meeting at Port of Tacoma offices between Port (Scott Hooton, Jason Jordan, Lisa Rozmyn) and Emerald (Shelia Smith - Environmental Coordinator, Jerry Bartlett – Chief Environmental and Sustainability Officer, Clue Westmoreland – Chief Operating Officer). Port expectations for cleanup: (1) MTCA compliance; (2) no encumbrance of any nature due to remnant contamination from Emerald release. Emerald agrees to collect additional samples requested previously by Port of Tacoma. Port emails to Emerald summarizing agreements made.
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### [1 March a.msg](#)

### [1 March b.msg](#)

3/9/10	Emerald (Shelia Smith) forwards revised SAP and proposed release agreement to Port of Tacoma (Scott Hooton).
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### [9 March.msg](#)

- 3/15/10 Telephone call between Port (Hooton) and Emerald (Smith). Port will return SAP comments. Release agreement inappropriate and not acceptable to Port.  
[15 March.pdf](#)
- 3/23/10 Port (Hooton) provides SAP comments to Emerald (Smith)  
[23 March.msg](#)
- 3/24/10 Emerald (Smith) responds to Port's SAP comments. Emerald no longer agrees to collect samples requested by Port of Tacoma, again citing TPCHD prior approval of SAP.  
[24 March.msg](#)
- 3/31/10 Telephone call between Port (Hooton) and Emerald (Steve Banchero). Steve Banchero will talk with Sheila Smith about adding the samples to the SAP previously requested by Port.  
[31 March.pdf](#)
- 4/6/10 Port provides requested changes to SAP  
[6 April.msg](#)
- 4/9/10 Emerald (Smith) not comfortable agreeing to the changes as a whole, suggests that the matter be referred to counsel.  
[9 April.msg](#)
- 5/19/10 Emerald recently contacted by TPCHD, will list Educator property on Ecology's contaminated site list unless SAP implemented soon.  
[19 May.msg](#)
- 5/20/10 Internal email expressing safety concerns (tripping hazards) associated with holes left after Emerald spill response in December.  
[20 May.msg](#)
- 5/20/10 Demand letter to Emerald  
[Emerald Letter \(2\).pdf](#)

A man can succeed at almost anything for which he has unlimited enthusiasm.  
—Charles Schwab

15  
Monday  
March 2010

Daily Notes

74th Day 291 Left Week 11

① Dave, Perry, Matt

Arkema started chemical injections prior to Perry involvement. looked like data showed that accumulation mass of extracted As had reached asymptote. High maintenance costs. Very little if any hydraulic control.

Vick Anderson, general mechanical employee hired w/ Arkema Contract Employee.

During May-June 2007 hired to remove all haz mats from system (chemicals in low piping points, Tanks, pumps, cavities), but VAD hired to render system inoperable.

System last operated during January 2004 by Shaw Environmental.

When Dave Cooper examined system during April 2008 accumulated water, con. H<sub>2</sub>O indicated to him that nothing was done to maintain the system so minimum ~~detention~~ detention while it was running

Window in aquitard: Appendix A, Addendum #1, Fig A-5.

② Shells

part will respond to SAP and return parts standard hold number agreement. Release agreement drafted by Jessica Fwall effectively release Emerald from soil... doesn't sit well w/ part... please inform Jerry Barklett / Glen Westmealand



To be faithful to your instincts and the impulses that carry you in the direction of the excellence you most desire and value . . . surely that is to lead the noble life.  
—George E. Woodberry

**31**  
Wednesday  
March 2010

Daily Notes

90th Day 275 Left Week 13

① "Ester A" Need New project Request form if scope changes - if name change only, explain that name was changed to more accurately describe the current scope of work.

② Sten Beachero 206.948.6009 (cell)  
left VM -

③ Tony Oberde 253.798.6566

left VM to: Cecco  
don't see value in going through VCP  
when it has been recommended to Schilcher  
of the work group

④ Sten Beachero Will talk to Sheila about modifying the sampling plan to obtain at least two excessively deep samples at each location that do not exceed Cat 2. unrestricted & industrial handling.



## SETTLEMENT AGREEMENT & RELEASE

THIS SETTLEMENT AGREEMENT & RELEASE (“Agreement”) is by and between Emerald Services, Inc. (“Emerald”), a Washington corporation, and the Port of Tacoma (the “Port”), a Washington municipal corporation. Emerald and the Port at places herein shall be referred to collectively as the “Parties.”

### RECITALS

A. The Port owns certain property, including a rail spur and premises known as the “Educator Building,” located at and around 3401 Lincoln Avenue in Tacoma, Pierce County, Washington, on Pierce County Tax Parcel Number 0321351051 (collectively, the “Property”). The legal description for the Property is described on Exhibit A, attached hereto. The Port purchased the Property on January 23, 2008.

B. Emerald leased portions of the Property under various leases, including one dated January 1, 2003. Emerald terminated its leasehold tenancy of the Property as of April 30, 2010.

C. In 2009, Emerald conducted business under a contract with the Donald R. Kleine Living Trust (d/b/a Vortex Recycling) (“Vortex”), which involved loading used oil filters onto railcars owned by Vortex.

D. On December 15, 2009, as a result of a mechanical failure, a Vortex railcar released between 40 and 50 gallons of used motor oil to the Property (the “December 2009 release” or “release”).

E. From December 15-17, 2009, Emerald remediated the majority of the release as directed by the Tacoma Pierce County Health Department (“TPCHD”) and the Washington State Department of Ecology (“Ecology”). Since the release, Emerald has worked in coordination

with its contractors, the TPCHD, Ecology, and the Port to fully remediate the portion of the Property that was impacted by the December 2009 release.

F. By letter dated May 20, 2010, the Port notified Emerald that the release allegedly gave rise to claims by the Port against Emerald of breach of contract and cost recovery under Washington's Model Toxics Control Act, RCW 70.105D *et seq.* ("MTCA"). The Port made certain demands of Emerald on that basis, alleging that it suffered and will continue to suffer damages as a result of the release.

G. Emerald denies liability to the Port.

H. Subject to certain mutual reservations of rights described below, the Parties now desire to resolve their dispute.

I. For purposes of this Agreement, the Port and Emerald are defined to include their past and present respective officers, commissioners, members, directors, shareholders, employees, agents, insurers, independent contractors, tenants, representatives, parent corporations, subsidiaries, affiliates, predecessors, successors, transferees, and assigns.

## **AGREEMENT**

NOW, THEREFORE, in consideration of the promises, releases, and covenants contained herein, and for other good and valuable consideration, the receipt and legal sufficiency of which are hereby acknowledged by the Parties, the Port and Emerald agree as follows:

1. Performance of sampling and analysis activities. By July 16, 2010, Emerald shall, through its contractor, Environmental Partners, Inc. ("EPI"), conduct the sampling and analysis activities described in the document attached hereto as Exhibit B, entitled "Railcar Oil Release Sampling and Analysis Plan" ("SAP"), prepared for Emerald by EPI, dated June 25, 2010. Emerald shall pay EPI's costs of conducting the SAP.

2. Settlement Payment. Emerald shall pay, and the Port shall accept, the sum of Twenty-Five Thousand Dollars (\$25,000.00), with respect to the Port's Released Claims against Emerald, as defined in Paragraph 4 below. Payment shall be made within thirty (30) days of the Effective Date of this Agreement by check or wire transfer payable to the Port of Tacoma. Payment shall be deemed made when the funds have been collected by the Port.

3. Potential Further Remediation. If, as a result of the investigation described in Paragraph 1 above, Emerald discovers that soil contamination within the approximate extent of observed sheen as delineated in Figure 2 of the SAP is at concentrations above MTCA Method A industrial cleanup levels for constituents related to the December 2009 release, then Emerald will, at Emerald's sole cost, further remediate that portion of the Property identified by the investigation at which those levels are exceeded to the standard appropriate for industrial property under MTCA Method A, as approved by Ecology. Emerald shall obtain a written determination from Ecology and/or TPCHD, in a form reasonably acceptable to the Port, that Emerald's remedial response to the December 2009 spill meets applicable laws and MTCA standards, that Emerald has satisfactorily completed the remediation of the December 2009 release, and that no further remedial or corrective action is required. Emerald shall diligently pursue and complete all work to be performed by Emerald pursuant to this Agreement.

4. Liability Release from the Port to Emerald. Except as expressly reserved below, upon Emerald's receipt of a written determination from Ecology and/or TPCHD, and the Port's receipt of a copy of said determination, in accordance with Section 3 above, the Port hereby releases, acquits, and forever discharges Emerald from any and all claims, cross-claims, demands, suits, actions, damages, costs, interest, attorneys' fees and costs, and causes of action of any kind or nature, past, present, or future, that arise out of or are in any way connected with



or related to their contracts, agreements, or other relationships with Emerald associated with any activities that allegedly resulted in the December 2009 release, including, but not limited to, claims related to: i) any contamination at or adjacent to the Property below MTCA Method A industrial cleanup levels; and ii) any contamination on the Property that Emerald discovers and remediates to the Washington Department of Ecology's satisfaction, per Paragraph 3 (the "Port's Released Claims"). The Port's Released Claims also expressly include claims related to amounts that Emerald may allegedly owe the Port in rent for the Educator Building. Notwithstanding anything to the contrary, the Port does not waive, and expressly reserves, all claims and causes of action against Emerald for other releases or contamination that may have been caused by or otherwise result from Emerald's tenancy.

5. Acknowledgment. The parties to this Agreement specifically acknowledge that the Agreement only resolves the Port's Released Claims as defined in Paragraph 4 above.

6. Compromise. The Parties hereto agree that this Agreement is a settlement of claims that are denied by the Parties and that the consideration given for this Agreement is in no way to be construed as an admission of liability and is, in fact, not an admission of liability.

7. No Assignment of Claims. Each Party hereto represents and warrants that it has not assigned, transferred or granted, or purported to assign, transfer, or grant, any of the claims, cross-claims, demands, suits, actions, damages, costs, or causes of action disposed of by this Agreement.

8. Venue. This Agreement may be enforced only in federal or state courts having competent jurisdiction in Pierce County, Washington.

9. Non-Waiver. A waiver of any term or condition of this Agreement shall not be deemed to be a waiver of any other term or condition hereof.

10. No Third-Party Beneficiaries. Each Party to this Agreement represents that there are no actual or intended third-party beneficiaries to this Agreement.

11. Opportunity to Confer with Counsel. Each Party represents that their respective attorneys have fully advised them concerning their rights with respect to the execution of the Agreement and releases contained herein and that each Party fully understands the same.

12. Releases as Defense. This Agreement, and release contained herein, may be pleaded as a full and complete defense to any action, suit, or other proceeding that may be instituted, prosecuted, or attempted by any Party in breach of the Agreement or the releases contained herein.

13. Entire Agreement; Modification. The Agreement represents the full and complete agreement of the Parties hereto with respect to resolution of their claims or potential claims against each other, superseding all previous communications, representations, or agreements, whether written or oral, and may not be modified without the written agreement of all Parties hereto.

14. Warranty of Authority. Each person signing this Agreement represents and warrants that he or she has been duly authorized to enter into this Agreement by the Party on whose behalf it is indicated that the person is signing.

15. Severance. If any provision in this Agreement is adjudicated to be unenforceable or voided for any reason, that part will be severed from the balance of this Agreement, and the validity and enforceability of the remainder of the Agreement shall in no way be affected or impaired unless the severed portion was essential to the intended purpose of the Agreement. The release provisions contained herein are each deemed essential to the intended purpose of the Agreement, although nothing in this paragraph shall preclude a finding that other provisions are

essential to the intended purpose of the Agreement. If the severed portion was essential to the intended purpose of this Agreement, then the Party who was to receive the benefit of the severed portion has the option to void the Agreement.

16. Voluntary Execution. The Parties represent that they understand and agree that the Agreement is made and entered into as their free and voluntary act.

17. Governing Law. The Agreement shall be interpreted, construed, and enforced in accordance with Washington law.

18. Counterparts. The Agreement may be executed in counterparts by the Parties named herein, and all such counterparts once so executed shall together be deemed to constitute one final Agreement, as if one document has been signed by all Parties hereto; and each such counterpart, upon execution and delivery, shall be deemed a complete original, binding on the Parties to the Agreement.

19. Binding Effect. Unless otherwise provided, the Agreement and the terms, covenants, conditions, provisions, obligations, undertakings, rights, and benefits hereto shall be binding upon and shall inure to the benefit of the Parties, and their representatives, successors, and assigns.

20. Headings. The headings contained in the paragraphs of the Agreement are for convenience of reference only and do not in any way limit, expand, or modify the terms or provisions of the Agreement.

21. Notices. Any notices required to be made under this Agreement shall be made in writing to the address of the appropriate Party as set forth below. All such notices shall be deemed to have been duly given upon receipt after mailing, email transmission, or delivery by courier or personal service. If a Party delivers a notice by means of email transmission, it must

also send a copy of that notice by one of the other means specified above. Parties may alter or modify their notice address by delivery of written notice pursuant to the terms of the Agreement.

**The Port:** Kimberly A. Seely, Attorney  
Coastline Law Group PLLC  
740 N Stadium Way  
Tacoma, WA 98403  
Telephone: 253.779.4933  
E-mail: kseely@coastlinelaw.com

**Emerald:** Jeff B. Kray  
Marten Law Group PLLC  
1191 Second Avenue, Suite 2200  
Seattle, WA 98101  
Telephone: 206.292.2600  
Facsimile: 206.292.2601  
E-mail: jkray@martenlaw.com

22. Attorneys' Fees and Costs. Except as otherwise stated herein, the Parties shall bear their own attorneys' fees and independent consultants' costs incurred in connection with the negotiation and performance of this Agreement. Notwithstanding the foregoing, in any action brought to enforce the terms of this Agreement, the prevailing Party shall be entitled to recover its reasonable attorneys' fees and consultants' costs incurred therein.

23. Dispute Resolution. Any dispute that may arise under this Agreement shall be resolved according to this Paragraph. If a Party alleges a breach or violation of any provision of this Agreement, it shall provide written notice of the alleged violation to the other Party. The Parties and/or their attorneys shall meet in person as soon as reasonably possible to attempt to resolve the dispute. If the Parties cannot resolve the dispute within thirty (30) days of such meeting, the Parties shall seek to agree on a mediator to mediate the dispute. The mediation shall be nonbinding on the Parties. In the event the mediation is unsuccessful and the Parties are

not able to resolve the dispute, each Party reserves all rights and defenses available to it under applicable laws.

24. Effective Date. This Agreement shall become effective as of the latest date of execution below.

WHEREFORE, the Parties have executed and entered into this Agreement as of the dates indicated below.

Emerald Services, Inc.

By *Joseph Bonales*

Its *President*

Date: *7/14/10*

Port of Tacoma

By *[Signature]*

Its *Dunbar - Real Estate*

Date: *7/14/2010*



STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

July 14, 2010

<b>Notice of Penalty Docket #</b>	7865
<b>Site Location</b>	3401 Lincoln Avenue, Building D Tacoma, Washington
<b>EPA/State ID #</b>	RCRA ID Number WAH000033206
<b>Penalty Amount</b>	\$14,000
<b>Due Date</b>	Within 30 days after receiving this Notice of Penalty.

Mr. Jerry Bartlett, Vice President  
Emerald Services, Inc.  
7343 E. Marginal Way South  
Seattle, WA 98108

Re: Notice of Penalty

Dear Mr. Bartlett:

The Department of Ecology (Ecology) has issued the enclosed Notice of Penalty to Emerald Services Inc. for violating provisions of:

1. Chapter 70.105 Revised Code of Washington (RCW), Hazardous Waste Management Act
2. Chapter 173-303 Washington Administrative Code (WAC), Dangerous Waste Regulations
3. Chapter 90.48 RCW, Water Pollution Control Act.

Please read the enclosed Notice of Penalty describing the violation(s) and options for responding to the penalty.

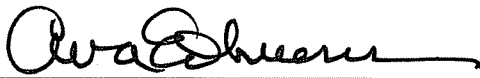
Ecology issues news releases for all major penalties and enforcement actions, including this one. A courtesy copy of the draft news release is enclosed. If you have a comment or question,

Ava Edmonson  
July 14, 2010  
Page 3

contact Ecology communication manager Kim Schmanke at 360-407-6239 or kisc461@ecy.wa.gov within one business day of when you first receive the draft news release.

If you have questions please contact Kerry Graber at 360-407-0241 or kgra461@ecy.wa.gov.

Sincerely,



---

Ava Edmonson, Section Manager  
Hazardous Waste and Toxics Reduction Program  
Southwest Regional Office

Enclosures: Notice of Penalty  
Draft News Release

By certified mail:  
7008 2810 0001 3940 8917

cc: Penalty Desk – Fiscal Office, Ecology  
Issuing Region Section Secretary  
Program Manager’s Secretary

STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

IN THE MATTER OF PENALTY  
ASSESSMENT AGAINST  
Emerald Services Inc.

)  
)  
)

NOTICE OF PENALTY  
INCURRED AND DUE  
DOCKET # 7865

To: Jerry Bartlett, Vice President  
Emerald Services, Inc.  
7343 E. Marginal Way South  
Seattle, WA 98108

<b>Notice of Penalty Docket #</b>	7865
<b>Site Location</b>	3401 Lincoln Avenue, Building D Tacoma, Washington
<b>EPA/State ID #</b>	RCRA ID Number WAH000033206
<b>Penalty Amount</b>	\$14,000
<b>Due Date</b>	Within 30 days after receiving this Notice of Penalty.

The Department of Ecology (Ecology) has assessed a penalty against Emerald Services Inc. in the amount of \$14,000 for violating provisions of:

1. Chapter 70.105 Revised Code of Washington (RCW), Hazardous Waste Management Act
2. Chapter 173-303 Washington Administrative Code (WAC), Dangerous Waste Regulations
3. Chapter 90.48 RCW, Water Pollution Control Act.

Ecology has authority to issue this penalty under RCW 70.105.080 and RCW 90.48.144, and is basing the penalties on the findings listed in this Notice of Penalty.

**DESCRIPTION OF VIOLATION(S)**

The penalty is based on the following Ecology findings:

On December 15, 2009 Emerald Services Inc. reported a spill from a cone-bottomed rail car filled with used oil filters and liquid oil when the valve on the undercarriage failed. Emerald Services Inc. ceased cleanup efforts before they were complete on the evening of December 15, and only resumed cleanup the following day. Used oil from the spill entered the waters



of the state and contaminated underlying soil because the company did not take action to contain the spill and complete the cleanup in a timely manner.

**Violation 1:**

RCW 90.48.080 - RCW 90.48.080 provides the prohibition against discharges to any waters of the state: "It shall be unlawful for any person to throw, drain, run, or otherwise discharge into any of the waters of this state, or to cause, permit or suffer to be thrown, run, drained, allowed to seep or otherwise discharged into such waters any organic or inorganic matter that shall cause or tend to cause pollution of such waters according to the determination of the department, as provided for in this chapter."

Oil entered waters of the state, the stormdrain, from the discharge from the broken railcar valve on December 15, 2010.

**Violation 2:**

WAC 173-303-145(3) – Mitigation and Control. The person responsible for a spill or non-permitted discharge must take appropriate immediate action to protect human health and the environment (e.g., diking to prevent contamination of state waters, shutting of open valves).

- (a) In addition, the person responsible for a spill or discharge must:
  - (i) Clean up all released dangerous wastes or hazardous substances, or take such actions as may be required or approved by the federal, state, or local officials acting within the scope of their official responsibilities. This may include complete or partial removal of released dangerous wastes or hazardous substances as may be justified by the nature of the released dangerous wastes or hazardous substances, the human and environmental circumstances of the incident, and protection required by the Water Pollution Control Act, chapter 90.48 RCW;

Emerald Services Inc. failed to fully control and mitigate the spill.

**ELIGIBILITY FOR PAPERWORK VIOLATION WAIVER AND OPPORTUNITY TO CORRECT**

Under RCW 34.05.110, small businesses are eligible for a waiver of a first-time paperwork violation and an opportunity to correct other violations.

Ecology has determined the requirements of RCW 34.05.110 do not apply to the violation(s) described in this Notice of Penalty because you are not a small business as defined in RCW 34.05.110 (9).

**OPTIONS FOR RESPONDING TO A NOTICE OF PENALTY**

**Option 1: Pay the penalty within 30 days after receiving the Notice of Penalty.**

Make your payment payable to the *Department of Ecology*. Please include the penalty docket number on your payment.

**Mail payment to:**

Department of Ecology  
Cashiering Unit  
PO Box 47611  
Olympia, WA 98504-7611

Note: Ecology may take legal action to collect the penalty if you have not paid 30 days after receiving the Notice of Penalty, and have not appealed.

**Option 2: Appeal to the PCHB within 30 days after the date of receipt of the Notice of Penalty.**

The appeal process is governed by Chapter 43.21B RCW and Chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal you must do the following within 30 days after the date of receipt of this Notice of Penalty:

- File your appeal and a copy of this Notice of Penalty with the Pollution Control Hearings Board (PCHB) during regular business hours.
- Serve a copy of your appeal and this Notice of Penalty on Ecology in paper form, by mail or in person. E-mail is not accepted.

You must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC.

**ADDRESS AND LOCATION INFORMATION**

Street Addresses	Mailing Addresses
<p><b>Department of Ecology</b> Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503</p> <p><b>Pollution Control Hearings Board</b> 4224 – 6<sup>th</sup> Avenue SE Rowe Six, Building 2 Lacey, WA 98503</p>	<p><b>Department of Ecology</b> Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608</p> <p><b>Pollution Control Hearings Board</b> PO Box 40903 Olympia, WA 98504-0903</p>

**CONTACT INFORMATION**

Please direct all questions about this Notice of Penalty to:

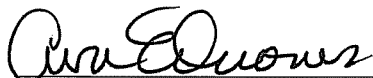
Kerry Graber  
Department of Ecology  
Southwest Regional Office

360-407-0241  
Kgra461@ecy.wa.gov

**MORE INFORMATION**

- Pollution Control Hearings Board Website  
[www.eho.wa.gov/Boards\\_PCHB.aspx](http://www.eho.wa.gov/Boards_PCHB.aspx)
- **Chapter 43.21B RCW – Environmental Hearings Office – Pollution Control Hearings Board**  
<http://apps.leg.wa.gov/RCW/default.aspx?cite=43.21B>
- **Chapter 371-08 WAC – Practice And Procedure**  
<http://apps.leg.wa.gov/WAC/default.aspx?cite=371-08>
- **Chapter 34.05 RCW – Administrative Procedure Act**  
<http://apps.leg.wa.gov/RCW/default.aspx?cite=34.05>
- **Chapter 70.105 RCW – Hazardous Waste Management**  
<http://apps.leg.wa.gov/RCW/default.aspx?cite=70.105>
- Chapter 173-303 WAC – Dangerous Waste Regulations  
<http://www.ecy.wa.gov/biblio/wac173303.html>

**SIGNATURE**



Ava Edmonson  
Hazardous Waste and Toxics Reduction Program  
Southwest Regional Office

7-14-10

Date



# News Release

FOR IMMEDIATE RELEASE – July XX, 2010  
10-XXX

## *Environmental company fined for inadequate spill cleanup*

**OLYMPIA** – The Washington Department of Ecology (Ecology) has issued a \$14,000 penalty to Emerald Services Inc. for failing to promptly and completely cleanup a December 2009 oil spill at its Lincoln Avenue facility in Tacoma.

Ecology says Emerald Services misrepresented its ability to respond to and clean up the spill. When Ecology spill responders checked on the site the following day, oil continued to flow from the spill area and spread in the rainfall. Oil was also found in a storm drain system that connects to the Blair Waterway. Ecology had to require Emerald Services to order additional resources to complete the cleanup.

“Considering this company markets services and equipment as a cleanup contractor, it should have been better prepared to handle this spill,” said Ecology spill responder John Hanson. “At minimum, Emerald’s staff could have put plastic sheeting over the spill area when the rain started to limit how much oil got into the soil. If they had, cleanup would have been easier and less expensive.”

Oil and petroleum products are toxic to people, wildlife and plants.

Emerald Services operates facilities in Washington, Oregon, Idaho, Montana and Utah. It provides a variety of industrial services, including recycling and recovering solvents and automotive fluids such as oil and antifreeze; transporting hazardous and non-hazardous wastes; and cleanup operations involving vacuum trucks.

On Dec. 15, 2009, Emerald Services reported an oil spill from a rail car that had been loaded with used oil filters and oil for transport to a recycling center in California. A valve at the bottom of the rail car failed, allowing 40 to 60 gallons of used oil to leak to the ground.

Emerald Services notified Ecology, but characterized it as a small, contained spill that the company could quickly clean up. The company assured Ecology later in the day that cleanup efforts were going well.

Emerald Services halted the cleanup overnight, which allowed the oil to spread farther, impact a larger area of the ground and make its way into city of Tacoma storm drains. The rainfall and passing traffic helped spread the oil, too.

After arriving the next morning to check on the cleanup, Ecology staff directed Emerald Services to step up its efforts. The company didn’t have a trained supervisor on site who could

## **Emerald Services penalty**

order the additional resources and staff needed, so Ecology stayed on scene until an outside cleanup contractor arrived.

Ava Edmondson, section manager of Ecology's Hazardous Waste and Toxics Reduction program, said, "This penalty is a clear reminder that preventing and responding to oil spills is very important. All companies who deal with hazardous materials on a daily basis must train their staff and have adequate resources on hand to respond to spill emergencies."

Ecology estimates that the company's failure to act promptly cost the company over \$73,000 in additional cleanup costs once the used oil spread to the underlying soil.

Emerald Services has 30 days to ask Ecology to file a formal appeal with the Pollution Control Hearings Board or pay the penalty.

###

**Media Contact:** Kim Schmanke, 360-407-6239 (desk)

**How to report a spill:** <http://www.ecy.wa.gov/programs/spills/other/reportaspill.htm>

### **Broadcast version**

State Ecology penalized a Tacoma company that handles hazardous waste 14 thousand dollars for poor response to an oil spill at the facility in December 2009.

A valve on a rail car loaded with used oil filters and liquid oil from Emerald Services failed, allowing 40 to 60 gallons of oil leak to the tracks. The company told Ecology the spill was easily managed, yet rainfall was carrying small streams of oil into stormdrains the next day.

Ecology says Emerald Services's cleanup efforts were inadequate and the company needs to improve its spill response readiness.

###



# Railcar Oil Release Site Assessment / Closure Report

Prepared For:

**Emerald Services, Inc.  
7343 East Marginal Way South  
Seattle, Washington**

July 21, 2010

Prepared By:

Environmental Partners, Inc.  
295 NE Gilman Blvd., Suite 201  
Issaquah, Washington 98027  
(425) 395-0010

Doug Kunkel, LG, LHG  
Principal Hydrogeologist

Josh Bernthal, PE  
Senior Engineer

Project Number: 43507.6

QR

TR

## TABLE OF CONTENTS

<b>1.0</b>	<b>INTRODUCTION.....</b>	<b>1</b>
1.1	Background .....	1
1.2	Site Description .....	2
1.3	Potential Contaminants of Concern.....	2
<b>2.0</b>	<b>SAMPLING METHODS AND LABORATORY ANALYSIS .....</b>	<b>4</b>
2.1	Product Sampling .....	4
2.2	Performance Sampling.....	5
2.2.1	Sampling Locations .....	5
2.2.2	Sample Collection Methods.....	5
2.2.3	Laboratory Analyses.....	6
2.3	Confirmation Sampling .....	7
<b>3.0</b>	<b>DATA QUALITY.....</b>	<b>8</b>
3.1	Sample Identification and Handling.....	8
3.2	Duplicates, Blanks, Lab Control Samples and Matrix Spike .....	8
3.3	Laboratory Contact Information .....	9
<b>4.0</b>	<b>ANALYTICAL RESULTS AND COMPARISONS TO CRITERIA.....</b>	<b>10</b>
4.1	Performance Sampling .....	10
4.2	Confirmation Sampling .....	11
<b>5.0</b>	<b>CONCLUSIONS AND RECOMMENDATIONS .....</b>	<b>12</b>

### Table

Table 1 – Railcar Oil Release Soil Sampling Analytical Results

### Figures

Figure 1 – General Vicinity Map

Figure 2 – Site Representation and Sampling Locations

### Attachments

Attachment A – Spill Report, ERTS #617057 – Rail Spur at 3401 Lincoln Ave., Tacoma, WA,  
December 15, 2009

Attachment B – Product Sample PCB Analytical Results

Attachment C – Field Notes

Attachment D – Soil Performance/Confirmation Sample Analytical Results

## **1.0 INTRODUCTION**

Environmental Partners, Inc. (EPI) is pleased to present this Site Assessment / Closure Report presenting the results of recently completed soil sampling performed on property owned by the Port of Tacoma (Port). This sampling was conducted to confirm and document successful cleanup of soil potentially impacted by an accidental release of used motor oil from a railcar owned by Vortex Recycling. The used motor oil release was discovered on December 15, 2009 and the cleanup response is documented in a Spill Report prepared by Emerald Services (Emerald) dated December 29, 2009 and included as Attachment A.

The soil sampling work was performed at the railroad spur adjacent to the east side of the Educator Building at 3401 Lincoln Avenue, Tacoma, WA (the Site). The release Site tax parcel number is 0321351051. The general location of the Site is shown on Figure 1. An aerial photo based figure of the Site showing site features and soil sampling locations is presented in Figure 2.

The cleanup action and subsequent soil sampling were conducted as independent remedial actions under the Washington State Department of Ecology (Ecology) Model Toxics Control Act (MTCA). Soil sampling was performed under a Sampling and Analysis Plan (SAP) prepared by EPI dated June 25, 2010 (EPI, 2010<sup>1</sup>). The SAP was prepared in accordance with Ecology requirements in MTCA, specifically Washington Administrative Code (WAC) 173-340-820 and Revised Code of Washington (RCW) chapter. 70.105D and was approved by the Tacoma Pierce County Health District.

The objectives of this Site Assessment / Closure Report are to:

- Document the cleanup actions performed following an accidental release of used motor oil from the Vortex Recycling railcar.
- Provide a general description of the release site and provide performance and confirmation soil sampling results.
- Compare soil sampling analytical data to applicable MTCA Method A Soil Cleanup Levels for Industrial Properties to demonstrate and document the effectiveness of the already-performed cleanup action.

### **1.1 Background**

On October 9, 2009 and again on October 14, 2009, Emerald loaded used automotive oil filters onto a railcar owned by Vortex Recycling for later transport. On December 15, 2009 Emerald staff were notified of used motor oil leaking from a broken valve on the railcar. At that time the Vortex Recycling railcar was located on the railroad spur immediately adjacent to



and approximately at the center of the southeast wall of the Educator Building at the location shown in Figure 2.

Emerald immediately implemented emergency response actions, and worked to perform clean-up on December 15, 2009. Due to heavy rainfall that began shortly after notification of the spill, which continued throughout the night, the ground surface contained areas of ponded water, which spread the released oil away from the railcar northeast and southwest along the railroad spur during ongoing clean-up efforts. Emerald therefore enlisted additional clean-up support from NRC Environmental Services (NRC) on December 16, 2009. NRC and Emerald used vacuum trucks and other equipment to recover most of the released oil and visibly contaminated soil, rock, and gravel. Emerald's Spill Report to Ecology, which contains additional information regarding the spill response, is presented in Attachment A.

## **1.2 Site Description**

The Site is located in an industrial area and consists of a length of railroad spur in a parking lot and loading dock area that is covered with compacted gravel. The rail spur runs in a northeast to southwest direction adjacent to the Educator building as shown in Figure 2.

Site topography in the parking area adjacent to the rail spur is generally flat; however, the rail spur next to the Educator Building, where the oil release occurred, is depressed approximately 6 to 8 inches below the surrounding grade. Raised surface grades at the south and east corners of the Educator Building and the rail spur served to contain the released oil and rain water within the depressed rail spur next to the building. The combination of containment within the depressed rail spur and the rapid clean-up response by Emerald and NRC, likely limited the area of potential soil impacts to the approximately 10-foot by 360-foot area along the southeast wall of the Educator Building as shown in Figure 2.

Groundwater was likely not impacted due to the rapid emergency cleanup response and the high viscosity of the motor oil, which limits its penetration into the soil. Therefore, groundwater was not sampled or analyzed during this investigation. Based on depth to groundwater measurements from an adjacent property, groundwater at the site is generally 4 to 8 feet below ground surface (bgs), which is below the deeper target soil sampling depth of 1.5 feet bgs.

## **1.3 Potential Contaminants of Concern**

Potential contaminants of concern (pCOCs) for used motor oil are based on MTCA Table 830-1, "Required Testing for Petroleum Releases". These pCOCs include:

- Volatile Petroleum Compounds: benzene, toluene, ethylbenzene, and xylenes (BTEX);
- Fuel Additives and Blending Compounds: 1,2-dibromoethane (EDB), 1,2-dichloroethane (EDC), methyl tertiary-butyl ether (MTBE), and total lead;

- Other Petroleum Components: carcinogenic polycyclic aromatic hydrocarbons (cPAHs) (benzo(a)anthracene, chrysene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, dibenz(a,h)anthracene and total benzofluoranthenes), and naphthalenes (naphthalene, 2-methylnaphthalene, 1-methylnaphthalene);
- Other Compounds: halogenated volatile organic compounds (HVOCs) (1,1,1-trichloroethane, trichloroethene, and tetrachloroethene), and cadmium (cadmium analysis requested by Tacoma Pierce County Health District);
- Petroleum Hydrocarbons: gasoline-range petroleum hydrocarbons (GRPH), and diesel-range petroleum hydrocarbons (DRPH), which includes analysis for motor oil-range petroleum hydrocarbons.

Polychlorinated biphenyls (PCBs) were not considered a pCOC because the released product was known to be used motor oil and did not contain oil from unknown sources or from oil related to use in transformers. As noted in Section 2.1, PCBs were analyzed for in a product sample collected from the Vortex Recycling railcar and were not detected. Based on the non-detection for PCBs in the product sample PCBs were not included in the analytical suite for soil samples.

## **2.0 SAMPLING METHODS AND LABORATORY ANALYSIS**

Sampling and analysis was conducted in order to identify the product released, measure performance of the emergency response actions, and confirm that the soil meets clean-up levels. The sampling methods and laboratory analysis performed are summarized in the following sections:

- Product sampling;
- Soil performance sampling; and,
- Soil confirmation sampling.

### **2.1 Product Sampling**

PCBs were not expected to be present in the used motor oil; however, as a precaution, Emerald performed PCB analysis on a product sample collected from the Vortex Recycling railcar that was the source of the used motor oil release. Emerald's in-house analytical laboratory, which is accredited for PCB analyses by the Washington State Department of Ecology, performed PCB screening on the product sample using EPA Method 8082 with 3580A extraction.

The product sample was analyzed for the PCB Aroclors 1016, 1232, 1242, 1248, 1254 and 1260. None of the PCB Aroclors were detected in the product sample. Based on the non-detect results in the product sample soil samples collected during this investigation were not analyzed for PCBs. The laboratory analysis report form for the product sample PCB analysis is included as Attachment B.

An aliquot of the product sample was sent to Friedman & Bruya, Inc. and was archived pending an evaluation of petroleum hydrocarbon analytical results from the soil performance sampling. This sample was held for possible hydrocarbon fuel scan (Method 8015 modified) to "fingerprint" the used motor oil associated with December 2009 release in order to distinguish the product sample from petroleum hydrocarbons likely existing in the soil at the Site prior to that release. This evaluation would have been considered if petroleum hydrocarbon impacts were detected at concentrations greater than applicable MTCA Soil Cleanup Levels for Industrial Properties.

Emerald has retained an additional aliquot of the product sample, which can be sent to Torkelson Geochemistry, Inc. (Torkelson) for potential future analysis at the direction and expense of the Port. Emerald will retain this sample for 30 days beyond the delivery date of this Site Assessment / Closure Report.

Contact information for ARI, Friedman & Bruya, Inc, and Torkelson analytical laboratories is provided in Section 3.3.

## **2.2 Performance Sampling**

On June 30, 2010 EPI collected performance samples from surface and deeper soils at locations within the 360 x 10 foot area delineating the approximate extent of observed sheen. Sampling locations, methods, and laboratory analyses performed are described in the following sections.

### **2.2.1 Sampling Locations**

Surface (0.0 to 0.5 ft. bgs) and deeper (1.0 to 1.5 ft. bgs) soil samples were planned for seven locations at a 50-foot spacing along the rail spur. For the purposes of this investigation the 0.0 ft. bgs surface was considered to start at the top of the soil beneath the overlying railroad ballast (if present).

At the time of sampling, a railcar, which was unrelated to the oil release, was present at the far northeast end of the rail spur at the location shown in Figure 2. The railcar was positioned over the planned ES-07 sampling point making that location inaccessible to the direct-push probe rig and to EPI field staff. EPI field staff consulted with Emerald and the EPI project manager to implement a field modification that would provide equivalent data for evaluation of the effectiveness of the already-performed Site remediation. As a result, sample location ES-07 was moved to the location immediately southwest of the railcar, approximately 30 feet southwest of the original ES-07 sampling point. An additional sampling point, ES-09, was added immediately northeast of the railcar, approximately 20 feet northeast of the original ES-07 sampling point. These locations were as close to the original ES-07 sampling point as access allowed.

Sample locations are shown in Figure 2 and are described as follows:

- ES-01-S and ES-01-D: 150 feet southwest of the railcar release location;
- ES-02-S and ES-02-D: 100 feet southwest of the railcar release location;
- ES-03-S and ES-03-D: 50 feet southwest of the railcar release location;
- ES-04-S and ES-04-D: At the railcar release location;
- ES-05-S and ES-05-D: 50 feet northeast of the railcar release location;
- ES-06-S and ES-06-D: 100 feet northeast of the railcar release location;
- ES-07-S and ES-07-D: Immediately southwest of the unrelated railcar;
- ES-08-S: Duplicate of ES-04-S; and,
- ES-09-S: Immediately northeast of the unrelated railcar at the northeast end of the rail spur.

### **2.2.2 Sample Collection Methods**

Soil samples were collected by hand digging or direct-push probing, as appropriate for the site-specific access conditions. Sample ES-09-S was collected by hand digging because there was not sufficient access for the direct-push probe rig to collect a sample from that

location at the northeast end of the railcar. The 15 remaining soil samples were collected using a direct-push probe rig equipped with a 4-foot long, 3.5-inch diameter sample barrel containing single-use acetate sample liners. All soil samples were discrete samples and no composite samples were collected for performance or compliance sampling purposes.

Soil samples were placed in pre-cleaned, laboratory-supplied glass jars. EPA method 5035 was used to collect soil samples intended for BTEX, HVOC, and GRPH analysis. Filled sample containers were then placed into a cooler with sufficient ice to maintain an internal temperature of 4°C or less throughout the remaining sampling and transport to the analytical laboratory.

Sheen testing to field-screen for the presence of separate-phase hydrocarbons within the soil matrix was performed. At each sample interval a small amount of the soil sample was disaggregated and placed into a decontaminated pan with distilled water. The visual observation and subjective measure of intensity of the resulting hydrocarbon sheen served as a field indication of the presence and relative degree of hydrocarbon contamination in the soil sample. Hydrocarbon sheen was not noted in any of the samples.

A photoionization detector (PID) was used to field screen soil cores for the presence of volatile organic compounds (VOCs). Immediately after opening the acetate sample liners EPI field staff used the PID to screen the full length of each soil core for VOCs. VOCs were not detected during field screening, which is consistent with the analytical results for VOCs.

Field activities including times, dates, identification numbers, and sampling locations were recorded in a field notebook. This field notebook contains notations of pertinent observations, field screening, health and safety monitoring measurements, and other observations deemed important by the field personnel. Copies of field notes are presented in Attachment C.

### **2.2.3 Laboratory Analyses**

All 16 soil samples described in Section 2.2.2 were analyzed by Analytical Resources, Incorporated (ARI) in Tukwila, WA for GRPH and DRPH, using Methods NWTPH-G and NWTPH-Dx, respectively.

Per footnote (8) in MTCA Table 830-1, "Required Testing for Petroleum Releases," additional constituents must be analyzed in a sufficient number of samples to determine whether the chemical is present at concentrations of concern. Samples from all 16 soil sampling locations were collected in sufficient quantity to perform all of the analyses listed in MTCA Table 830-1 and Table 1 of the SAP. Only surface samples ES-03-S, ES-04-S, and ES-05-S, from locations in the center of the release location (ES-04-S) and 50 feet to either side were analyzed by ARI for BTEX, EDB, EDC, MTBE, cPAHs, HVOCs, cadmium, and lead with a five-day turn around time. The remaining samples were archived at the analytical laboratory and held pending evaluation of results from the three locations. If any potential COCs were

detected at concentrations greater than MTCA Method A Soil Cleanup Levels for Industrial Properties the archived samples would be analyzed for the additional analyses.

Total cadmium and total lead analysis were analyzed using Method 6010B. cPAHs were analyzed by Method SW8270D using gas chromatography and mass spectrometry (GC/MS). BTEX, EDB, EDC, MTBE and HVOCs were analyzed by Method 8260C using a Purge and Trap GC/MS.

An additional sample volume was collected from each sampling location and depth, for possible later hydrocarbon fuel scan analysis based on the initial sample results. Samples collected for hydrocarbon fuel scan analysis were retained and archived at Friedman & Bruya. Per the SAP, the hydrocarbon fuel scan analysis would be performed if the GRPH and DRPH concentrations exceeded MTCA Method A Soil Cleanup Levels for Industrial Properties. None of the GRPH or DRPH concentrations exceeded applicable cleanup levels; therefore, the hydrocarbon fuel scan analysis was not performed.

### **2.3 Confirmation Sampling**

Confirmation sampling is intended to confirm the effectiveness of the cleanup action performed at the Site by Emerald and NRC.

Per the data evaluation process described in the SAP, if analytical results from the performance sampling meet MTCA Method A Soil Cleanup Levels for Industrial Properties the performance sample data will also serve as confirmation sampling data. All analytical results for the performance samples are non-detect or at concentrations less than MTCA Method A Soil Cleanup Levels for Industrial Properties, therefore the performance sampling data also serve as confirmation sampling data.

### 3.0 DATA QUALITY

#### 3.1 Sample Identification and Handling

Soil samples were given unique alphanumeric identifiers (sample names) to distinguish individual samples. The following sample identification scheme was used:

ES-##-X

Where:

- ES = Emerald Services
- ## = Sample location number
- X = "S" for surface sample (0 to 0.5 ft. bgs), "D" for deeper sample (1.0 to 1.5 ft. bgs)

Sample packaging, handling, and chain-of-custody procedures described in the SAP were followed during this Site Assessment.

#### 3.2 Duplicates, Blanks, Lab Control Samples and Matrix Spike

EPI submitted samples to ARI, a Washington State-certified analytical laboratory, for the analyses summarized in Table 1. Reporting limits (RLs) for the ARI analyses are listed in Table 1 for every non-detect result.

One field duplicate sample, labeled as ES-08-S, was collected at location ES-04-S and was analyzed for DRPH and GRPH. The location of the duplicate sample was recorded in the field notes but was not known to the laboratory.

Laboratory Method Blanks and Control Samples were analyzed for DRPH GRPH, metals, cPAHs, naphthalenes and VOCs. A trip blank was also submitted with the samples and analyzed for VOCs with no detections in the trip blank sample.

Additional volumes of soil were collected to allow for Matrix Spike and Matrix Spike Duplicate (MS/MSD) analysis. Soil from ES-05-D was used for DRPH MS/MSD analysis. Soil from ES-09-S was used for GRPH MS/MSD analysis. Soil from ES-03-S was used for metals MS/MSD analysis. Soil from ES-04-S was used for cPAH and naphthalene MS/MSD analysis. No matrix interference issues were noted in the MS/MSD results.

Laboratory data sheets containing quality control analysis results are presented in Attachment D.

### **3.3 Laboratory Contact Information**

EPI submitted 16 soil samples to ARI, for the analyses summarized in Table 1.

ARI's contact for this project is:

Susan Dunahoo  
Analytical Resources, Inc.  
4611 South 134<sup>th</sup> Place  
Tukwila, WA 98168  
(206) 695-6207

Emerald has retained an aliquot of the product sample, which can be sent to Torkelson for potential future analysis at the direction and expense of the Port. Torkelson's contact for this project is:

Bruce Torkelson  
Torkelson Geochemistry, Inc.  
2528 South Columbia Place  
Tulsa, OK 74114-3233  
(918) 749-8441

A product sample and soil samples from all sample locations were sent to Friedman & Bruya and were archived and held for analysis. The samples were held for potential hydrocarbon fuel scan analysis depending upon the results of ARI's GRPH and DRPH analyses. The Friedman & Bruya contact for this project is:

Eric Young  
Friedman & Bruya, Inc.  
3012 16th Avenue, West  
Seattle, WA 98119  
(206) 285-8282



## **4.0 ANALYTICAL RESULTS AND COMPARISONS TO CRITERIA**

A summary of analytical results for the Performance Sampling performed at the Site is presented in Table 1. Laboratory data sheets containing all analytical results, TPH chromatograms, and laboratory quality control sample results are presented in Attachment D.

### **4.1 Performance Sampling**

Performance Sampling analytical data are summarized by constituent groups and compared to MTCA Method A Soil Cleanup Levels for Industrial Properties in the following bullets.

#### **Volatile Petroleum Compounds (BTEX)**

- Samples ES-03-S, ES-04-S, and ES-05-S were analyzed for BTEX compounds with detections of m,p-xylene at a concentration of 0.0023 mg/kg and o-xylene at a concentration of 0.0024 mg/kg, both in the sample from ES-04-S. The total xylene concentration is 0.0047 mg/kg, which is less than the MTCA Method A Soil Cleanup Level for Industrial Properties of 9.0 mg/kg.

#### **Petroleum Hydrocarbons**

- Petroleum hydrocarbons were analyzed in all 16 soil samples. Three of the 16 soil samples analyzed for petroleum hydrocarbons had detectable concentrations of petroleum hydrocarbons and none of the three detections were at concentrations greater than applicable MTCA Method A Soil Cleanup Levels for Industrial Properties.
- GRPH was detected in samples ES-03-D and ES-06-D at concentrations of 9.9 mg/kg and 12 mg/kg, respectively. Both GRPH detections are at concentrations less than the MTCA Method A Soil Cleanup Level for Industrial Properties of 100 mg/kg.
- DRPH was detected in sample ES-09-S at a concentration of 38 mg/kg, which is less than the MTCA Method A Soil Cleanup Level for Industrial Properties of 2,000 mg/kg.
- Motor oil range petroleum hydrocarbons were detected in sample ES-09-S at a concentration of 320 mg/kg, which is less than the MTCA Method A Soil Cleanup Level for Industrial Properties of 2,000 mg/kg.
- Soil samples were collected and archived and held for hydrocarbon fuel scan analysis. The hydrocarbon fuel scan analysis was to be performed if the GRPH or DRPH concentrations exceeded MTCA Method A Soil Cleanup Levels for Industrial Soils. All analytical results are non-detect or at concentrations less than MTCA Method A Soil

Cleanup Levels for Industrial Properties, therefore the hydrocarbon fuel scan analysis was not performed.

### **Fuel Additives**

- Analyses for fuel additives were performed on samples ES-03-S, ES-04-S, and ES-05-S. Analytical results for the fuel additives, EDB, EDC, MTBE, and total lead are all non-detect.

### **Other Petroleum Components**

- Analyses for carcinogenic PAHs and naphthalenes (non-carcinogenic) was performed on samples ES-03-S, ES-04-S, and ES-05-S. Carcinogenic PAHs were not detected in these samples.
- Naphthalene and 1-methylnaphthalene were detected in the sample ES-05-at concentrations of 0.32 mg/kg and 0.012 mg/kg, respectively. The sum of these concentrations is 0.45, which is less than the MTCA Method A Soil Cleanup Level for Industrial Properties of 5.0 mg/kg.

### **Other Compounds**

- Other compounds, HVOCs and total cadmium, were analyzed in samples ES-03-S, ES-04-S, and ES-05-S with no detections of any constituents.

The concentrations of additional constituents were non-detect or detected at levels well below the applicable MTCA Method A Cleanup Levels for Industrial Properties the archived samples were not analyzed for the full constituent list found in Table 1 of the SAP.

At the request of the Port of Tacoma, analytical data are also compared to Category 2 criteria from Guidelines for Reuse of Petroleum Contaminated Soil, as listed in Table 1. The Category 2 criteria are not regulatory levels and any concentrations exceeding the Category 2 criteria will be managed directly by the Port. The only soil sample that did not meet Category 2 criteria was the motor oil range petroleum hydrocarbon detection of 320 mg/kg in the ES-09-S sample.

## **4.2 Confirmation Sampling**

Analytical results from the performance sampling meet MTCA Method A Soil Cleanup Levels for Industrial Properties. Therefore, the performance sample data also serve as confirmation sampling data and demonstrate that the emergency response cleanup activities were successful and clean closure has been attained at the Site.

## **5.0 CONCLUSIONS AND RECOMMENDATIONS**

Analytical results from Site Assessment sampling meet MTCA Method A Soil Cleanup Levels for Industrial Properties. These data demonstrate that the emergency response cleanup activities were successful and clean closure has been attained at the Site.

Based on the analytical data demonstrating successful cleanup no further cleanup action, remediation, or sampling is warranted at the Site.

---

<sup>i</sup> Environmental Partners, Inc. 2010. Railcar Oil Release Sampling and Analysis Plan. June 25, 2010.

## TABLE

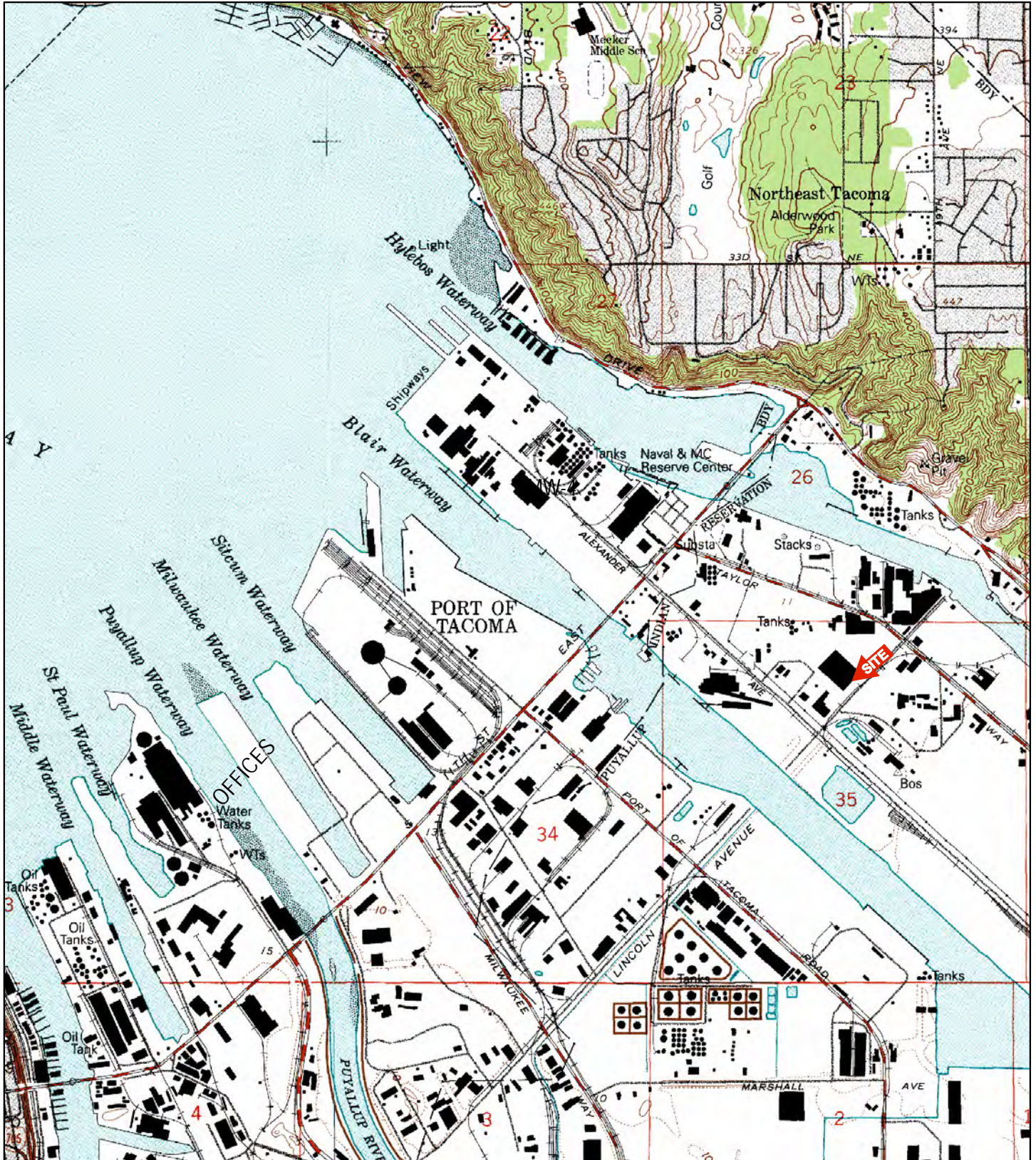
**Table 1: Railcar Oil Release Soil Sampling Analytical Results**

Sampling Location	Volatile Petroleum Compounds (BTEX)				Fuel Additives			Other Petroleum Components			Other Compounds		Petroleum Hydrocarbons			
	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylene (mg/kg)	1,2-Dibromoethane (EDB) (mg/kg)	1,2-Dichloroethane (EDC) (mg/kg)	Methyl tertiary-Butyl Ether (MTBE) (mg/kg)	Total Lead (mg/kg-dry)	Carcinogenic PAHs (mg/kg)	Naphthalenes (mg/kg)	Halogenated VOCs (mg/kg)	Total Cadmium (mg/kg-dry)	Gasoline-Range Petroleum Hydrocarbons (mg/kg)	Diesel-Range Petroleum Hydrocarbons (mg/kg)	Motor Oil Range Petroleum Hydrocarbons (mg/kg)	Hydrocarbon fuel scan
ES-01-S	-	-	-	-	-	-	-	-	-	-	-	-	< 8.8 U	< 6.2 U	<12 U	-
ES-01-D	-	-	-	-	-	-	-	-	-	-	-	-	< 7.1 U	< 6.0 U	<12 U	-
ES-02-S	-	-	-	-	-	-	-	-	-	-	-	-	< 6.2 U	< 5.4 U	<11 U	-
ES-02-D	-	-	-	-	-	-	-	-	-	-	-	-	< 7.0 U	< 5.9 U	<12 U	-
ES-03-S	< 0.002 U	< 0.002 U	< 0.002 U	< 0.002 U	< 0.002 U	< 0.002 U	< 0.002 U	< 3.0 U	< 0.066 U	< 0.066 U	< 0.002 U	< 0.3 U	< 13 U	< 8.3 U	<16 U	-
ES-03-D	-	-	-	-	-	-	-	-	-	-	-	-	<b>9.9</b>	< 5.7 U	<11 U	-
ES-04-S	<0.0012 U	<0.0012 U	<0.0012 U	<b>0.0047</b>	<0.0012 U	<0.0012 U	<0.0012 U	< 2.0 U	< 0.058 U	< 0.058 U	< 0.0012 U	< 0.2 U	< 7.5 U	< 5.8 U	<12 U	-
ES-04-D	-	-	-	-	-	-	-	-	-	-	-	-	< 6.6 U	< 5.4 U	<11 U	-
ES-05-S	<0.0013 U	<0.0013 U	<0.0013 U	<0.0013 U	<0.0013 U	<0.0013 U	<0.0013 U	< 2.0 U	< 0.064 U	<b>0.45</b>	<0.0013 U	< 0.2 U	< 6.7 U	< 5.9 U	<12 U	-
ES-05-D	-	-	-	-	-	-	-	-	-	-	-	-	< 7.2 U	< 5.6 U	<11 U	-
ES-06-S	-	-	-	-	-	-	-	-	-	-	-	-	< 5.8 U	< 5.5 U	<11 U	-
ES-06-D	-	-	-	-	-	-	-	-	-	-	-	-	<b>12</b>	< 5.6 U	<11 U	-
ES-07-S	-	-	-	-	-	-	-	-	-	-	-	-	< 7.3 U	< 5.6 U	<11 U	-
ES-07-D	-	-	-	-	-	-	-	-	-	-	-	-	< 6.2 U	< 5.1 U	<10 U	-
ES-08-S (Duplicate of ES-04-S)	-	-	-	-	-	-	-	-	-	-	-	-	< 6.2 U	< 5.5 U	<11 U	-
ES-09-S	-	-	-	-	-	-	-	-	-	-	-	-	< 5.8 U	<b>38</b>	<b>320</b>	-
MTCA Method A Soil CULs for Industrial Properties (mg/kg)	0.03	7	6	9	0.005	11 <sup>a</sup>	0.1	1,000	2 <sup>b</sup>	5	PCE = 0.05 TCE = 0.03 1,1,1-TCA = 2	2	100 / 30 <sup>d</sup>	2,000	2,000	not applicable
Category 2 Reuse of PCS (mg/kg)	0.005-0.03	0.005-7	0.005-6	0.015-9	NA	NA	0.005-0.1	17-45	0.05-0.1	0.05-5	NA	NA	5-30	25-200	100-200	not applicable

**Notes:**  
 Detections in bold  
 -- = Sample collected and archived  
 NA = Not Applicable  
 PCS = Petroleum Contaminated Soil  
 PAHs - polycyclic aromatic hydrocarbons  
 VOCs - volatile organic compounds  
 CULs - cleanup levels  
 mg/kg = milligrams per kilogram  
<sup>a</sup> = MTCA Method B (carcinogenic) soil cleanup level  
<sup>b</sup> = based on benzo(a)pyrene, total for all PAHs detected  
<sup>c</sup> = based on naphthalene CAS number 91-20-3  
<sup>d</sup> = 100 for gasoline mixtures without benzene and TEX totaling less than 1 percent / 30 for all others.

Carcinogenic PAHs: Benzo(a)anthracene, Chrysene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene and Total Benzofluoranthenes.  
 VOCs: 1,1,1-TCA, TCE, PCE.  
 Naphthalenes: Naphthalene, 2-Methylnaphthalene, 1-Methylnaphthalene.

## FIGURES



KEY:

SOURCE: USGS 7.5 MINUTE QUADRANGLE (TOPOGRAPHIC)  
 TACOMA NORTH, WASHINGTON  
 1961 (REVISED 1994)



SCALE = 1:24,000

**epi ENVIRONMENTAL PARTNERS INC**  
 295 NE Gilman Boulevard, Suite 201  
 Issaquah, Washington 98027

FIGURE 1

GENERAL VICINITY MAP

<b>PROJECT</b>	43507.4		
<b>PREPARED FOR</b>	EMERALD SERVICES, INC.		
<b>LOCATION</b>	EDUCATOR BUILDING 3401 LINCOLN AVENUE TACOMA, WASHINGTON		
<b>SHEET</b> 1 of 1	<b>DRAWN BY</b> ARM	<b>REVIEWED BY</b> DCK	<b>DATE</b> 12/21/09



KEY:

- APPROXIMATE SOIL SAMPLING LOCATION
- APPROXIMATE EXTENT OF OBSERVED SHEEN
- ⋯ RAILROAD TRACKS

SCALE: 1" = 50'

**epi ENVIRONMENTAL PARTNERS INC**  
 295 NE Gilman Boulevard, Suite 201  
 Issaquah, Washington 98027

FIGURE 2

SITE REPRESENTATION AND SAMPLING LOCATIONS

<b>PROJECT</b>	43507.6		
<b>PREPARED FOR</b>	EMERALD SERVICES		
<b>LOCATION</b>	EDUCATOR BUILDING 3401 LINCOLN AVENUE TACOMA, WASHINGTON		
<b>SHEET</b> 1 of 1	<b>DRAWN BY</b> MMH/KLA	<b>REVIEWED BY</b> DCK	<b>DATE</b> 07/16/10



## **Attachment A**



December 29, 2009

- Recycling & Recovery
- Marine & Industrial Cleaning
- Recycled Products
- Waste Treatment & Disposal
- Automotive Fluids Management
- Construction Services
- Transportation Services
- Vacuum Truck Services
- Portable Storage

Washington State Department of Ecology  
Southwest Regional Office  
P.O. Box 47775  
Olympia WA 98504-7775  
Attn: John Hanson

RE: Spill Report, ERTS #617057  
Rail Spur at 3401 Lincoln Ave., Tacoma WA, December 15, 2009

Dear Mr. Hanson:

This report provides information regarding a recent oil spill that occurred at the rail spur (the "rail spur") located at 3401 Lincoln Ave., Tacoma, Washington.

Name, mailing address, and telephone number of reporter:

Sheila Smith, Environmental Coordinator  
Emerald Services, Inc.  
7343 East Marginal Way S.  
Seattle WA 98108  
206-832-3204

Name, address, and telephone number of facility:

Emerald Services, Inc.  
3401 Lincoln Ave.  
Tacoma WA 98421  
(206) 832-3200 (Emerald Services, Inc. Tacoma facility phone number)

Date, time, and type of incident:

Emerald learned at 12:30 p.m on December 15, 2009 that used oil was leaking from a rail car hopper owned by Vortex Recycling ("Vortex") to a Port of Tacoma rail spur. After arriving at the site, Emerald began a clean-up response at approximately 1:30 p.m.. Once response support was mobilized from other divisions within the company, Emerald reported the incident to Ecology and the Port of Tacoma that afternoon.

{00215528.DOC /1}

Emerald Services, Inc. 7343 E. Marginal Way S. Seattle, WA 98108

**Name and quantity of material involved:**

Approximately 40 gallons of used oil was released from the Vortex Recycling rail car to the rail spur area.

**Extent of injuries:**

None

**Actual or potential hazards to human health or the environment:**

The release did not present any actual hazards to human health or the environment. Potential hazards to human health were de minimis due to the low health hazard rating of used oil. The risk to the environment was low, as the oil volume was relatively low, was released in a heavily developed industrial area, and did not reach any water body. Oil was spilled to an unpaved area, and the nearest storm drain was over 200 feet from the initial spill area. There were periods of heavy rain during the clean-up process, creating a potential risk of oil reaching the storm drain. Emerald eliminated this risk, however, by adequately protecting the storm drain throughout the clean-up process. No oil was released to water. Emerald has removed the majority of the contamination from the soil and is continuing to monitor the area with the assistance of NRC Environmental and under the supervision of the Tacoma Pierce County Health District and Port of Tacoma. Emerald is prepared to take any additional steps necessary to fully remediate Vortex's release.

**Estimated quantity and disposition of recovered material that resulted from the incident:**

To date, Emerald has removed approximately 5,200 gallons of oily water, 24.44 tons of contaminated soil and rock, and five drums of absorbents from the site. All of the above, along with any additional contaminated media generated at the site due to the clean-up efforts, have been, or will be transported to the Emerald facility located at 1500 Airport Way S., Seattle WA 98134 for proper disposal, including wastewater treatment and oil recovery, or consolidation and solidification prior to landfill.

**Cause of incident:**

A failed valve on Vortex's rail car hopper caused the incident. The valve failure allowed residual oil from the filters to leak to the rail line. The rail car hopper was staged on the rail spur awaiting off-site shipment. No loading, unloading, or movement of the car was occurring at the time of the spill.

**Corrective action:**

In addition to the clean-up activities described above, Emerald will cease its business relationship with Vortex Recycling once the subject Vortex rail car hopper and another remaining Vortex rail car hopper are shipped to Pennsylvania. On December 24, 2009, Emerald informed Vortex of its decision to cease doing business with Vortex. On the same date, Emerald also notified Vortex Recycling that, prior to shipping the remaining containers, Vortex Recycling must arrange to have a certified inspection performed on the rail car hoppers and have all necessary repairs completed by an appropriate

contractor. Emerald plans to hold the rail car hoppers until the inspections are complete and satisfactory repairs performed.

From December 17, 2009 until today, Emerald has continued with passive spill clean-up efforts, including monitoring the site and maintaining absorbent pads and visqueen over the main spill area to continue to remove residual used oil from the spill. The absorbent pads were checked regularly and changed out as necessary. As of this writing, the rail lines are being cleaned under the supervision of NRC Environmental, using Emerald personnel and equipment. The absorbents and visqueen have been removed and will be shipped to Emerald's facility in Seattle for proper disposal. Contaminated water, including wash water and puddles with visible contamination, are being collected, and fresh booms will be placed at each end of the immediate spill area prior to NRC's departure from the site in anticipation of rain forecast to begin late December 29, 2009.

Emerald will check the site conditions on Wednesday morning, December 30, 2009. If no additional sheen is observed, then Emerald will coordinate with the Port of Tacoma to place the rail line back in service. Emerald has contracted with Environmental Partners, Inc. ("EPI") to prepare a sampling plan to confirm that the cleanup was effective. Emerald will provide the sampling plan to the Port and Tacoma Pierce County Health District (contracted by Ecology) for review before EPI implements it.

Emerald and the Port of Tacoma have yet to determine whether to put the rail line back in service prior to confirming effective site clean-up. Ultimately, both parties understand that results of sampling will need to show effective cleanup, and early use of the rail line may result in additional maintenance costs for the rail line later. Effective cleanup will be determined by Tacoma Pierce County Health District.

If you need any additional information regarding this incident, please feel free to contact me.

Sincerely,



Sheila Smith, Environmental Coordinator  
Emerald Services, Inc.  
(206) 832-3204 (Office)  
(253) 370-7912 (Cell)  
(206) 832-3304 (fax)  
sheilas@emeraldinc.com

cc: Lisa Rozmyn, Port of Tacoma  
Sharon Bell, Tacoma Pierce County Health District  
Kerry Graber, Washington State Department of Ecology  
Vida Piera, City of Tacoma Environmental Services

## **Attachment B**



# Analysis Report Form

Sample Identification: Emerald Services -Tacoma.  
 Contact Person: Peter McLean/ Tina Beebe  
 Seattle Lab ID#:100202.00

NOTE: All units are in mg/kg (ppm) unless otherwise specified

Project Description: Railcar Oil sample

Parameter: PCB's in oil

By Method SW 846 8082, with 3580A Extraction

Samples are run on a Hewlett Packard 6890n Gas Chromatograph with an Agilent HP-5 capillary column

PCB Aroclors screened:

- Aroclor 1016
- Aroclor 1232
- Aroclor 1242
- Aroclor 1248
- Aroclor 1254
- Aroclor 1260

Any Aroclors detected will be listed below by individual concentration found.

Sample	Results	MDL	Surrogate recovery (decachlorobiphenol):
100202.00	< 1.0	1.0 mg/kg	83%

Analyst: L. Embrey

Date:2-3-10

## Quality Control Data:

Sample type:	Results	Percent Recovery	MDL	Surrogate recovery (decachlorobiphenol):
Blank	< 1.0	na	< 1.0 mg/kg	106%
Blank- spike @ 1.0 ppm	1.39	139%	< 1.0 mg/kg	104%
Matrix spike @ 1.50 ppm	1.29	86%	< 1.0 mg/kg	107%

Analyst: L. Embrey

Date:2-3-10

## **Attachment C**

6/30/10 43507.6

0515 - Leave for SITE. Pick up ice and arrive on-site @ 0610.

0615 - Mark locations according to "Railcar Oil Release Sampling and Analysis Plan."

0645 - Tanker railcar is on the tracks blocking access to location ES-07-S,D.

0655 - Locating Inc. on-site clearing locations which have been marking.

0700 - Call Doug Kunkel to inform him of the location of the railcar.

0730 - Clear locations of the entire length of railcar

JP

6/30/10 43507.6

to provide flexibility  
- for additional sampling.

0745 - Sheila Smith with Emerald Services on-site.

0800 - Rob with Pacific Northwest Probe + Drilling on-site.

0815 - Health and Safety Plan Meeting

0830 - Discussions with Shida and Doug have begun to attempt and get rail car moved.

0845 - Begin Sampling @ ES-02-S,D  
All samples collected according to "Railcar Oil Release Sampling and Analysis Plan" See pages 6-7 for sampling details. Analysis

JP



6/30/10 43507.6

information can be found on the  
COC and the Sampling and Analysis  
Plan.

0845 - Move to ES-02-S, D

See SAP for locations and  
analysis. See pages 6-7 for  
Samples collected

0915 - Move to ES-03-S, D

1000 - Move to ES-04-S, D

ES-08-S is a duplicate sample  
for ES-04-S

1045 - Move to ES-05-S, D

1130 - Move to ES-06-S, D

1200 - Move to ES-07-S, D

ES-07-S, D was approximately 20'  
south of location marked in the

16

6/30/10 43507.6<sup>5</sup>

SAP

1230 - PNW Probe off-site

1245 - Talked to Doug Kunkel and  
we will take a sample North  
of the rail car.

1300 - OFF site to get shovel.

1330 - ON-site. Dig approximately  
2 feet to native soil below  
rail gravel. collect sample.

1350 - ES-09-S collected

1450 - OFF-SITE.

1530 - Sample drop off @ lab

1630 - Demobilize

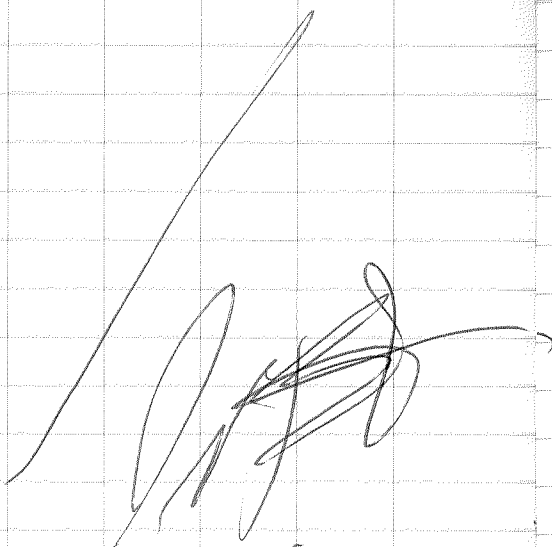
1700 - Arrive @ OFFICE.

18

	TIME	Date	PID (ppm)	sheen testing	Notes
ES-01-S	0850	6/30/10	0.0	No visible sheen	
ES-01-D	0900	6/30/10	0.0	No visible sheen	
ES-02-S	0820	6/30/10	0.0	No visible sheen	
ES-02-D	0830	6/30/10	0.0	No visible sheen	
ES-03-S	0930	6/30/10	0.0	No visible sheen	
ES-03-D	0945	6/30/10	0.0	No visible sheen	
ES-04-S	1015	6/30/10	0.3	No visible sheen	
ES-04-D	1030	6/30/10	0.2	No visible sheen	
ES-05-S	1100	6/30/10	1.6	No visible sheen	
ES-05-D	1130	6/30/10	0.5	No visible sheen	
ES-06-S	1140	6/30/10	0.1	No visible sheen	
ES-06-D	1150	6/30/10	0.3	No visible sheen	
ES-07-S	1210	6/30/10	0.0	No visible sheen	
ES-07-D	1230	6/30/10	0.0	No visible sheen	
ES-08-S	1110	6/30/10	0.6	No visible sheen	Dupe for ES08S
ES-09-S	1350	6/30/10	0.0	No visible sheen	Hard Dog

16

16

A handwritten signature in dark ink, consisting of several overlapping loops and a long horizontal stroke extending to the right.

6/30/10

## **Attachment D**



**Analytical Resources, Incorporated**  
Analytical Chemists and Consultants

July 8, 2010

Doug Kunkel  
Environmental Partners, Inc.  
295 NE Gilman Blvd, Suite 201  
Issaquah, WA 98027

**RE: Project: Emerald Services, Inc., 43507.6**  
**ARI Job No: RC51**

Dear Doug:

Please find enclosed the original Chain-of-Custody (COC), sample receipt documentation, and the final report for the project referenced above. Analytical Resources, Inc. (ARI) accepted sixteen soil samples and one trip blank in good condition on June 30, 2010. For details regarding sample receipt, please refer to the enclosed Cooler Receipt Form.

The samples were analyzed for VOAs, PAHs, NWTPH-Dx, NWTPH-G, and total metals, as requested on the COC.

There were no anomalies associated with the analyses of these samples.

Please note that to comply with method requirements, we will now be reporting "Total Benzofluoranthenes" instead of benzo(b)fluoranthene and benzo(k)fluoranthene.

An electronic copy of this package will be kept on file with ARI. Should you have any questions regarding these results, please feel free to contact me at any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

A handwritten signature in blue ink, appearing to read "Susan D. Dunnihoo".

Susan D. Dunnihoo  
Director, Client Services  
206- 695-6207  
[sue@arilabs.com](mailto:sue@arilabs.com)

cc: eFile RC51

Enclosures

# Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated  
 Analytical Chemists and Consultants  
 4611 South 134th Place, Suite 100  
 Tukwila, WA 98168  
 206-695-6200 206-695-6201 (fax)



Page: 1 of 2  
 Date: 6/30/10  
 No. of Coolers: 2  
 Ice Present?   
 Cooler Temps: 21.3, 23.1

ARI Assigned Number: **RC51**  
 Turn-around Requested: **6-4y**  
 ARI Client Company: **ENVIRONMENTAL PARBERS, INC** Phone: **425-385-0010**  
 Client Contact: **BOB KUEHL**  
 Client Project Name: **HERALD Services, INC**  
 Client Project #: **43507.6**

Analysis Requested: **TPH, TPH, CMT, NPH, Metals**  
 Notes/Comments: **Archives all others**

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested					Notes/Comments
					TPH	TPH	CMT	NPH	Metals	
ES-01-S	6/30/10	0650	Soil	7	X	X	X	X	X	
ES-01-D	6/30/10	0900	Soil	7	X	X	X	X	X	
ES-02-S	6/30/10	0830	Soil	7	X	X	X	X	X	
ES-02-D	6/30/10	0830	Soil	7	X	X	X	X	X	
ES-03-S	6/30/10	0930	Soil	7	X	X	X	X	X	
ES-03-D	6/30/10	0945	Soil	7	X	X	X	X	X	
ES-04-S	6/30/10	1015	Soil	7	X	X	X	X	X	
ES-04-D	6/30/10	1030	Soil	7	X	X	X	X	X	
ES-05-S	6/30/10	1100	Soil	7	X	X	X	X	X	
ES-05-D	6/30/10	1130	Soil	7	X	X	X	X	X	

Comments/Special Instructions: **Relinquished by: [Signature] Received by: [Signature]**  
 Relinquished by: **[Signature]** Received by: **[Signature]**  
 Printed Name: **Est. BEARDS** Printed Name: **A. Volgerdson**  
 Company: **EPC** Company: **ARI**  
 Date & Time: **6/30/10 1530** Date & Time: **6/30/10 1530**

**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 releases ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the 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.

RC51 0002

# Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated  
 Analytical Chemists and Consultants  
 4611 South 134th Place, Suite 100  
 Tukwila, WA 98168  
 206-695-6200 206-695-6201 (fax)



Page: 2 of 2  
 Date: 6/30/10  
 No. of Coolers: 2  
 Ice Present?   
 Cooler Temps: 21.3, 23.1

ARI Assigned Number: \_\_\_\_\_ Turn-around Requested: 5 days  
 ARI Client Company: ENVIRONMENTAL PARTNERS, LLC Phone: 425-241-5400  
 Client Contact: BOB KUNKEL  
 Client Project Name: Everald Services, Inc  
 Client Project #: 43501.6 Samplers: Josh Beinhill

Analysis Requested: 8260 TPH, TPH+, CPAT, NAPIT, Metals  
 Notes/Comments: \_\_\_\_\_

Sample ID	Date	Time	Matrix	No. Containers						
ES-06-S	6/30/10	1140	Soil	7		X	X			
ES-06-D	6/30/10	1150	Soil	7		X	X			
ES-07-S	6/30/10	1210	Soil	7		X	X			
ES-07-D	6/30/10	1230	Soil	7		X	X			
ES-08-S	6/30/10	1110	Soil	7		X	X			
ES-08-D	6/30/10	1350	Soil	7		X	X			
ES-09-S	6/30/10			2	X					
TR10 BLANK	6/23/10		H <sub>2</sub> O	2	X					

Relinquished by: \_\_\_\_\_ Received by: \_\_\_\_\_  
 (Signature) (Signature)  
 Printed Name: Josh Beinhill Printed Name: A. V. Jorgensen  
 Company: EPI Company: ARIP  
 Date & Time: 6/30/10 15:30 Date & Time: 6/30/10 15:30

**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.

RCS1:0000



# Cooler Receipt Form

ARI Client: EPI

Project Name: Emerald Services

COC No(s): \_\_\_\_\_ NA

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: \_\_\_\_\_

Assigned ARI Job No: RC51

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

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)..... 21.3 23.1

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 90877952

Cooler Accepted by: AV Date: 6/30/10 Time: 1530

**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? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: \_\_\_\_\_

Was sufficient ice used (if appropriate)? ..... NA YES NO

Were all bottles sealed in individual plastic bags? ..... YES NO

Did all bottles arrive in good condition (unbroken)? ..... YES NO

Were all bottle labels complete and legible? ..... YES NO

Did the number of containers listed on COC match with the number of containers received? ..... 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 sheet, excluding VOCs)... NA YES NO

Were all VOC vials free of air bubbles? ..... NA YES NO

Was sufficient amount of sample sent in each bottle? ..... YES NO

Date VOC Trip Blank was made at ARI..... NA 6/23/10

Was Sample Split by ARI : NA YES Date/Time: \_\_\_\_\_ Equipment: \_\_\_\_\_ Split by: \_\_\_\_\_

Samples Logged by: AM Date: 7/1/10 Time: 0730

**\*\* Notify Project Manager of discrepancies or concerns \*\***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

**Additional Notes, Discrepancies, & Resolutions:**

2 of 2 TB = PB

By: mm Date: 7/1/10

<p>Small Air Bubbles ~ 2mm</p>	<p>Peabubbles' 2-4 mm</p>	<p>LARGE Air Bubbles &gt; 4 mm</p>	Small → "sm"
			Peabubbles → "pb"
			Large → "lg"
			Headspace → "hs"







## Data Reporting Qualifiers

Effective 7/10/2009

### 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  $\geq$  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  $\leq 5$  times the Reporting Limit and the replicate control limit defaults to  $\pm 1$  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
- 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.
- Q Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria ( $< 20\%$  RSD,  $< 20\%$  Drift or minimum RRF).
- 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
- NR Spiked compound recovery is not reported due to chromatographic interference
- 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
- M2 The sample contains PCB congeners that do not match any standard Aroclor pattern. The PCBs are identified and quantified as the Aroclor whose pattern most closely matches that of the sample. The reported value is an estimate.
- N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"
- Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting 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  $\geq 40\%$  RPD with no obvious chromatographic interference

### Geotechnical Data

- A The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.
- F Samples were frozen prior to particle size determination
- SM Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations
- SS Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis
- W Weight of sample in some pipette aliquots was below the level required for accurate weighting

VOA SURROGATE RECOVERY SUMMARY



Matrix: Soil

QC Report No: RC51-Environmental Partners  
 Project: Emerald Services, Inc  
 43507.6

ARI ID	Client ID	Level	DCE	TOL	BFB	DCB	TOT OUT
RC51E	ES-03-S	Low	125%	104%	98.8%	101%	0
RC51G	ES-04-S	Low	123%	103%	100%	102%	0
MB-070110	Method Blank	Low	98.3%	100%	95.1%	99.0%	0
LCS-070110	Lab Control	Low	89.1%	101%	98.9%	99.4%	0
LCSD-070110	Lab Control Dup	Low	102%	101%	99.8%	101%	0
RC51I	ES-05-S	Low	118%	101%	96.3%	102%	0

SW8260C	LCS/MB LIMITS		QC LIMITS	
	Low	Med	Low	Med
(DCE) = d4-1,2-Dichloroethane	79-121	76-120	75-152	69-120
(TOL) = d8-Toluene	80-120	80-120	82-115	80-120
(BFB) = Bromofluorobenzene	80-120	80-120	64-120	76-128
(DCB) = d4-1,2-Dichlorobenzene	80-120	80-120	80-120	80-120

Log Number Range: 10-15627 to 10-15631

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C

Sample ID: ES-03-S

Page 1 of 1

SAMPLE

Lab Sample ID: RC51E


QC Report No: RC51-Environmental Partners

LIMS ID: 10-15627

Project: Emerald Services, Inc

Matrix: Soil

43507.6

Data Release Authorized: 

Date Sampled: 06/30/10

Reported: 07/02/10

Date Received: 06/30/10

Instrument/Analyst: FINN5/PAB

Sample Amount: 2.45 g-dry-wt

Date Analyzed: 07/01/10 18:13

Purge Volume: 5.0 mL

Moisture: 41.7%

CAS Number	Analyte	RL	Result	Q
107-06-2	1,2-Dichloroethane	2.0	< 2.0	U
71-55-6	1,1,1-Trichloroethane	2.0	< 2.0	U
79-01-6	Trichloroethene	2.0	< 2.0	U
71-43-2	Benzene	2.0	< 2.0	U
127-18-4	Tetrachloroethene	2.0	< 2.0	U
108-88-3	Toluene	2.0	< 2.0	U
100-41-4	Ethylbenzene	2.0	< 2.0	U
179601-23-1	m,p-Xylene	2.0	< 2.0	U
95-47-6	o-Xylene	2.0	< 2.0	U
106-93-4	Ethylene Dibromide	2.0	< 2.0	U
1634-04-4	Methyl tert-Butyl Ether	2.0	< 2.0	U

Reported in µg/kg (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	125%
d8-Toluene	104%
Bromofluorobenzene	98.8%
d4-1,2-Dichlorobenzene	101%

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C  
Page 1 of 1

Sample ID: ES-04-S  
SAMPLE

Lab Sample ID: RC51G  
LIMS ID: 10-15629  
Matrix: Soil  
Data Release Authorized: *AB*  
Reported: 07/02/10

QC Report No: RC51-Environmental Partners  
Project: Emerald Services, Inc  
43507.6  
Date Sampled: 06/30/10  
Date Received: 06/30/10

Instrument/Analyst: FINN5/PAB  
Date Analyzed: 07/01/10 18:39

Sample Amount: 4.16 g-dry-wt  
Purge Volume: 5.0 mL  
Moisture: 16.7%

CAS Number	Analyte	RL	Result	Q
107-06-2	1,2-Dichloroethane	1.2	< 1.2	U
71-55-6	1,1,1-Trichloroethane	1.2	< 1.2	U
79-01-6	Trichloroethene	1.2	< 1.2	U
71-43-2	Benzene	1.2	< 1.2	U
127-18-4	Tetrachloroethene	1.2	< 1.2	U
108-88-3	Toluene	1.2	< 1.2	U
100-41-4	Ethylbenzene	1.2	< 1.2	U
179601-23-1	<b>m,p-Xylene</b>	<b>1.2</b>	<b>2.3</b>	
95-47-6	<b>o-Xylene</b>	<b>1.2</b>	<b>2.4</b>	
106-93-4	Ethylene Dibromide	1.2	< 1.2	U
1634-04-4	Methyl tert-Butyl Ether	1.2	< 1.2	U

Reported in µg/kg (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	123%
d8-Toluene	103%
Bromofluorobenzene	100%
d4-1,2-Dichlorobenzene	102%

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C

Sample ID: ES-05-S

Page 1 of 1

SAMPLE

Lab Sample ID: RC51I


QC Report No: RC51-Environmental Partners

LIMS ID: 10-15631

Project: Emerald Services, Inc

Matrix: Soil

43507.6

Data Release Authorized: 

Date Sampled: 06/30/10

Reported: 07/02/10

Date Received: 06/30/10

Instrument/Analyst: FINN5/PAB

Sample Amount: 3.91 g-dry-wt

Date Analyzed: 07/01/10 19:06

Purge Volume: 5.0 mL

Moisture: 21.5%

CAS Number	Analyte	RL	Result	Q
107-06-2	1,2-Dichloroethane	1.3	< 1.3	U
71-55-6	1,1,1-Trichloroethane	1.3	< 1.3	U
79-01-6	Trichloroethene	1.3	< 1.3	U
71-43-2	Benzene	1.3	< 1.3	U
127-18-4	Tetrachloroethene	1.3	< 1.3	U
108-88-3	Toluene	1.3	< 1.3	U
100-41-4	Ethylbenzene	1.3	< 1.3	U
179601-23-1	m,p-Xylene	1.3	< 1.3	U
95-47-6	o-Xylene	1.3	< 1.3	U
106-93-4	Ethylene Dibromide	1.3	< 1.3	U
1634-04-4	Methyl tert-Butyl Ether	1.3	< 1.3	U

Reported in µg/kg (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	118%
d8-Toluene	101%
Bromofluorobenzene	96.3%
d4-1,2-Dichlorobenzene	102%

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C  
Page 1 of 1

Sample ID: MB-070110  
METHOD BLANK

Lab Sample ID: MB-070110  
LIMS ID: 10-15631  
Matrix: Soil  
Data Release Authorized:  
Reported: 07/02/10

QC Report No: RC51-Environmental Partners  
Project: Emerald Services, Inc  
43507.6  
Date Sampled: NA  
Date Received: NA

Instrument/Analyst: FINN5/PAB  
Date Analyzed: 07/01/10 13:16

Sample Amount: 5.00 g-dry-wt  
Purge Volume: 5.0 mL  
Moisture: NA

CAS Number	Analyte	RL	Result	Q
107-06-2	1,2-Dichloroethane	1.0	< 1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	< 1.0	U
79-01-6	Trichloroethene	1.0	< 1.0	U
71-43-2	Benzene	1.0	< 1.0	U
127-18-4	Tetrachloroethene	1.0	< 1.0	U
108-88-3	Toluene	1.0	< 1.0	U
100-41-4	Ethylbenzene	1.0	< 1.0	U
179601-23-1	m,p-Xylene	1.0	< 1.0	U
95-47-6	o-Xylene	1.0	< 1.0	U
106-93-4	Ethylene Dibromide	1.0	< 1.0	U
1634-04-4	Methyl tert-Butyl Ether	1.0	< 1.0	U

Reported in µg/kg (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	98.3%
d8-Toluene	100%
Bromofluorobenzene	95.1%
d4-1,2-Dichlorobenzene	99.0%



**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C

Sample ID: LCS-070110

Page 1 of 1

LAB CONTROL SAMPLE

Lab Sample ID: LCS-070110


QC Report No: RC51-Environmental Partners

LIMS ID: 10-15631

Project: Emerald Services, Inc

Matrix: Soil

43507.6

Data Release Authorized: 

Date Sampled: NA

Reported: 07/02/10

Date Received: NA

Instrument/Analyst LCS: FINN5/PAB

Sample Amount LCS: 5.00 g-dry-wt

LCS: FINN5/PAB

LCS: 5.00 g-dry-wt

Date Analyzed LCS: 07/01/10 11:33

Purge Volume LCS: 5.0 mL

LCS: 07/01/10 12:07

LCS: 5.0 mL

Moisture: NA

Analyte	LCS	Spike	LCS	LCS	LCS	Spike	LCS	RPD
		Added-LCS	Recovery			Added-LCS	Recovery	
1,2-Dichloroethane	48.1	50.0	96.2%	50.3	50.0	101%	4.5%	
1,1,1-Trichloroethane	44.6	50.0	89.2%	50.4	50.0	101%	12.2%	
Trichloroethene	45.4	50.0	90.8%	48.8	50.0	97.6%	7.2%	
Benzene	47.1	50.0	94.2%	51.1	50.0	102%	8.1%	
Tetrachloroethene	44.6	50.0	89.2%	46.9	50.0	93.8%	5.0%	
Toluene	45.8	50.0	91.6%	50.2	50.0	100%	9.2%	
Ethylbenzene	49.6	50.0	99.2%	52.5	50.0	105%	5.7%	
m,p-Xylene	103	100	103%	109	100	109%	5.7%	
o-Xylene	48.8	50.0	97.6%	50.9	50.0	102%	4.2%	
Ethylene Dibromide	46.6	50.0	93.2%	47.6	50.0	95.2%	2.1%	
Methyl tert-Butyl Ether	49.3	50.0	98.6%	51.2	50.0	102%	3.8%	

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

**Volatile Surrogate Recovery**

	LCS	LCS
d4-1,2-Dichloroethane	89.1%	102%
d8-Toluene	101%	101%
Bromofluorobenzene	98.9%	99.8%
d4-1,2-Dichlorobenzene	99.4%	101%

VOA SURROGATE RECOVERY SUMMARY



Matrix: Water

QC Report No: RC51-Environmental Partners  
 Project: Emerald Services, Inc  
 43507.6

ARI ID	Client ID	PV	DCE	TOL	BFB	DCB	TOT OUT
RC51Q	TRIP BLANK	5	113%	102%	97.7%	102%	0

LCS/MB LIMITS

QC LIMITS

SW8260C

(DCE) = d4-1,2-Dichloroethane	83-122	80-125
(TOL) = d8-Toluene	80-120	80-120
(BFB) = Bromofluorobenzene	80-120	80-120
(DCB) = d4-1,2-Dichlorobenzene	80-120	80-120

Prep Method: SW5030B  
 Log Number Range: 10-15639 to 10-15639

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C

Sample ID: TRIP BLANK  
SAMPLE

Page 1 of 1

Lab Sample ID: RC51Q


QC Report No: RC51-Environmental Partners

LIMS ID: 10-15639

Project: Emerald Services, Inc

Matrix: Water

43507.6

Data Release Authorized: 

Date Sampled: 06/30/10

Reported: 07/02/10

Date Received: 06/30/10

Instrument/Analyst: FINN5/PAB

Sample Amount: 5.00 mL

Date Analyzed: 07/01/10 19:32

Purge Volume: 5.0 mL

CAS Number	Analyte	RL	Result	Q
107-06-2	1,2-Dichloroethane	1.0	< 1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	< 1.0	U
79-01-6	Trichloroethene	1.0	< 1.0	U
71-43-2	Benzene	1.0	< 1.0	U
127-18-4	Tetrachloroethene	1.0	< 1.0	U
108-88-3	Toluene	1.0	< 1.0	U
100-41-4	Ethylbenzene	1.0	< 1.0	U
179601-23-1	m,p-Xylene	2.0	< 2.0	U
95-47-6	o-Xylene	1.0	< 1.0	U
106-93-4	Ethylene Dibromide	1.0	< 1.0	U
1634-04-4	Methyl tert-Butyl Ether	1.0	< 1.0	U

Reported in µg/L (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	113%
d8-Toluene	102%
Bromofluorobenzene	97.7%
d4-1,2-Dichlorobenzene	102%

**TPHG SOIL SURROGATE RECOVERY SUMMARY**

ARI Job: RC51  
Matrix: Soil

QC Report No: RC51-Environmental Partners  
Project: Emerald Services, Inc  
Event: 43507.6

<u>Client ID</u>	<u>BFB</u>	<u>TFT</u>	<u>BBZ</u>	<u>TOT OUT</u>
MB-070110	NA	94.0%	94.6%	0
LCS-070110	NA	99.7%	96.5%	0
LCSD-070110	NA	98.9%	96.7%	0
ES-01-S	NA	101%	100%	0
ES-01-D	NA	106%	102%	0
ES-02-S	NA	104%	99.8%	0
ES-02-D	NA	97.9%	98.2%	0
ES-03-S	NA	98.0%	96.9%	0
ES-03-D	NA	102%	99.2%	0
ES-04-S	NA	99.3%	98.7%	0
ES-04-D	NA	99.9%	98.4%	0
ES-05-S	NA	96.6%	98.4%	0
ES-05-D	NA	96.4%	98.0%	0
ES-06-S	NA	95.2%	95.3%	0
ES-06-D	NA	97.6%	96.3%	0
ES-07-S	NA	99.2%	100%	0
ES-07-D	NA	98.2%	99.4%	0
ES-08-S	NA	94.6%	97.2%	0
ES-09-S	NA	100%	99.8%	0
ES-09-S MS	NA	101%	102%	0
ES-09-S MSD	NA	96.9%	96.9%	0

	<b>LCS/MB LIMITS</b>	<b>QC LIMITS</b>
(BFB) = Bromofluorobenzene	(70-130)	(70-130)
(TFT) = Trifluorotoluene	(80-120)	(66-123)
(BBZ) = Bromobenzene	(80-120)	(62-130)

Log Number Range: 10-15622 to 10-15638

**ORGANICS ANALYSIS DATA SHEET**

TPHG by Method NWTPHG

Matrix: Soil

QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc

Event: 43507.6

Date Sampled: 06/30/10

Date Received: 06/30/10

Data Release Authorized: 

Reported: 07/02/10

ARI ID	Client ID	Analysis Date	Basis	Range	Result
MB-070110 10-15622	Method Blank	07/01/10 PID3	Dry	Gasoline HC ID Trifluorotoluene Bromobenzene	< 5.0 U --- 94.0% 94.6%
RC51A 10-15622	ES-01-S	07/01/10 PID3	Dry	Gasoline HC ID Trifluorotoluene Bromobenzene	< 8.8 U --- 101% 100%
RC51B 10-15623	ES-01-D	07/01/10 PID3	Dry	Gasoline HC ID Trifluorotoluene Bromobenzene	< 7.1 U --- 106% 102%
RC51C 10-15624	ES-02-S	07/01/10 PID3	Dry	Gasoline HC ID Trifluorotoluene Bromobenzene	< 6.2 U --- 104% 99.8%
RC51D 10-15626	ES-02-D	07/01/10 PID3	Dry	Gasoline HC ID Trifluorotoluene Bromobenzene	< 7.0 U --- 97.9% 98.2%
RC51E 10-15627	ES-03-S	07/01/10 PID3	Dry	Gasoline HC ID Trifluorotoluene Bromobenzene	< 13 U --- 98.0% 96.9%
RC51F 10-15628	ES-03-D	07/01/10 PID3	Dry	<b>Gasoline</b> HC ID Trifluorotoluene Bromobenzene	<b>9.9</b> GRO 102% 99.2%
RC51G 10-15629	ES-04-S	07/01/10 PID3	Dry	Gasoline HC ID Trifluorotoluene Bromobenzene	< 7.5 U --- 99.3% 98.7%
RC51H 10-15630	ES-04-D	07/01/10 PID3	Dry	Gasoline HC ID Trifluorotoluene Bromobenzene	< 6.6 U --- 99.9% 98.4%
RC51I 10-15631	ES-05-S	07/01/10 PID3	Dry	Gasoline HC ID Trifluorotoluene Bromobenzene	< 6.7 U --- 96.6% 98.4%

**ORGANICS ANALYSIS DATA SHEET**

TPHG by Method NWTPHG

Matrix: Soil


QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc

Event: 43507.6

Date Sampled: 06/30/10

Date Received: 06/30/10

Data Release Authorized: 

Reported: 07/02/10

ARI ID	Client ID	Analysis Date	Basis	Range	Result
RC51J 10-15632	ES-05-D	07/01/10 PID3	Dry	Gasoline HC ID Trifluorotoluene Bromobenzene	< 7.2 U --- 96.4% 98.0%
RC51K 10-15633	ES-06-S	07/01/10 PID3	Dry	Gasoline HC ID Trifluorotoluene Bromobenzene	< 5.8 U --- 95.2% 95.3%
RC51L 10-15634	ES-06-D	07/01/10 PID3	Dry	<b>Gasoline</b> HC ID Trifluorotoluene Bromobenzene	<b>12</b> GRO 97.6% 96.3%
RC51M 10-15635	ES-07-S	07/01/10 PID3	Dry	Gasoline HC ID Trifluorotoluene Bromobenzene	< 7.3 U --- 99.2% 100%
RC51N 10-15636	ES-07-D	07/01/10 PID3	Dry	Gasoline HC ID Trifluorotoluene Bromobenzene	< 6.2 U --- 98.2% 99.4%
RC51O 10-15637	ES-08-S	07/01/10 PID3	Dry	Gasoline HC ID Trifluorotoluene Bromobenzene	< 6.2 U --- 94.6% 97.2%
RC51P 10-15638	ES-09-S	07/01/10 PID3	Dry	Gasoline HC ID Trifluorotoluene Bromobenzene	< 5.8 U --- 100% 99.8%

Gasoline values reported in mg/kg (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.

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

**ORGANICS ANALYSIS DATA SHEET**

TPHG by Method NWTPHG

Page 1 of 1


Sample ID: ES-09-S

MATRIX SPIKE

Lab Sample ID: RC51P

LIMS ID: 10-15638

Matrix: Soil

Data Release Authorized: 

Reported: 07/02/10

QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc

Event: 43507.6

Date Sampled: 06/30/10

Date Received: 06/30/10

Date Analyzed MS: 07/01/10 20:19

MSD: 07/01/10 20:43

Instrument/Analyst MS: PID3/MH

MSD: PID3/MH

Purge Volume: 5.0 mL

Sample Amount MS: 85.8 mg-dry-wt

MSD: 85.8 mg-dry-wt

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Gasoline Range Hydrocarbons <	5.83 U	58.6	58.3	101%	60.2	58.3	103%	2.7%

Reported in mg/kg (ppm)

RPD calculated using sample concentrations per SW846.

**TPHG Surrogate Recovery**

	MS	MSD
Trifluorotoluene	101%	96.9%
Bromobenzene	102%	96.9%

**ORGANICS ANALYSIS DATA SHEET**

TPHG by Method NWTPHG

Page 1 of 1

Sample ID: LCS-070110

LAB CONTROL SAMPLE

Lab Sample ID: LCS-070110

LIMS ID: 10-15622

Matrix: Soil

Data Release Authorized: *B*

Reported: 07/02/10

QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc

Event: 43507.6

Date Sampled: NA

Date Received: NA

Date Analyzed LCS: 07/01/10 09:25

LCSD: 07/01/10 09:50

Instrument/Analyst LCS: PID3/MH

LCSD: PID3/MH

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	54.0	50.0	108%	50.6	50.0	101%	6.5%

Reported in mg/kg (ppm)

RPD calculated using sample concentrations per SW846.

**TPHG Surrogate Recovery**

	LCS	LCSD
Trifluorotoluene	99.7%	98.9%
Bromobenzene	96.5%	96.7%



**ORGANICS ANALYSIS DATA SHEET  
TOTAL DIESEL RANGE HYDROCARBONS**

NWTPHD by GC/FID-Silica and Acid Cleaned  
Page 1 of 2  
Matrix: Soil

QC Report No: RC51-Environmental Partners  
Project: Emerald Services, Inc  
43507.6

Data Release Authorized: *VBS*  
Reported: 07/03/10

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range	RL	Result
RC51A 10-15622	ES-01-S HC ID: ---	07/01/10	07/02/10 FID9	1.00 1.0	Diesel Motor Oil o-Terphenyl	6.2 12	< 6.2 U < 12 U 98.7%
RC51B 10-15623	ES-01-D HC ID: ---	07/01/10	07/02/10 FID9	1.00 1.0	Diesel Motor Oil o-Terphenyl	6.0 12	< 6.0 U < 12 U 102%
RC51C 10-15624	ES-02-S HC ID: ---	07/01/10	07/02/10 FID9	1.00 1.0	Diesel Motor Oil o-Terphenyl	5.4 11	< 5.4 U < 11 U 107%
RC51D 10-15626	ES-02-D HC ID: ---	07/01/10	07/02/10 FID9	1.00 1.0	Diesel Motor Oil o-Terphenyl	5.9 12	< 5.9 U < 12 U 92.9%
RC51E 10-15627	ES-03-S HC ID: ---	07/01/10	07/02/10 FID9	1.00 1.0	Diesel Motor Oil o-Terphenyl	8.3 16	< 8.3 U < 16 U 104%
RC51F 10-15628	ES-03-D HC ID: ---	07/01/10	07/02/10 FID9	1.00 1.0	Diesel Motor Oil o-Terphenyl	5.7 11	< 5.7 U < 11 U 82.7%
RC51G 10-15629	ES-04-S HC ID: ---	07/01/10	07/02/10 FID9	1.00 1.0	Diesel Motor Oil o-Terphenyl	5.8 12	< 5.8 U < 12 U 90.7%
RC51H 10-15630	ES-04-D HC ID: ---	07/01/10	07/02/10 FID9	1.00 1.0	Diesel Motor Oil o-Terphenyl	5.4 11	< 5.4 U < 11 U 99.5%
RC51I 10-15631	ES-05-S HC ID: ---	07/01/10	07/02/10 FID9	1.00 1.0	Diesel Motor Oil o-Terphenyl	5.9 12	< 5.9 U < 12 U 99.4%
MB-070110 10-15632	Method Blank HC ID: ---	07/01/10	07/02/10 FID9	1.00 1.0	Diesel Motor Oil o-Terphenyl	5.0 10	< 5.0 U < 10 U 110%
RC51J 10-15632	ES-05-D HC ID: ---	07/01/10	07/02/10 FID9	1.00 1.0	Diesel Motor Oil o-Terphenyl	5.6 11	< 5.6 U < 11 U 102%

**ORGANICS ANALYSIS DATA SHEET**

**TOTAL DIESEL RANGE HYDROCARBONS**

NWTPHD by GC/FID-Silica and Acid Cleaned

Page 2 of 2

Matrix: Soil

QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc

43507.6

Data Release Authorized: *VBS*  
Reported: 07/03/10

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range	RL	Result
RC51K 10-15633	ES-06-S HC ID: ---	07/01/10	07/02/10 FID9	1.00 1.0	Diesel Motor Oil o-Terphenyl	5.5 11	< 5.5 U < 11 U 106%
RC51L 10-15634	ES-06-D HC ID: ---	07/01/10	07/02/10 FID9	1.00 1.0	Diesel Motor Oil o-Terphenyl	5.6 11	< 5.6 U < 11 U 97.6%
RC51M 10-15635	ES-07-S HC ID: ---	07/01/10	07/02/10 FID9	1.00 1.0	Diesel Motor Oil o-Terphenyl	5.6 11	< 5.6 U < 11 U 104%
RC51N 10-15636	ES-07-D HC ID: ---	07/01/10	07/02/10 FID9	1.00 1.0	Diesel Motor Oil o-Terphenyl	5.1 10	< 5.1 U < 10 U 108%
RC51O 10-15637	ES-08-S HC ID: ---	07/01/10	07/02/10 FID9	1.00 1.0	Diesel Motor Oil o-Terphenyl	5.5 11	< 5.5 U < 11 U 93.3%
RC51P 10-15638	ES-09-S HC ID: DRO/MOTOR OIL	07/01/10	07/02/10 FID9	1.00 1.0	<b>Diesel</b> <b>Motor Oil</b> o-Terphenyl	<b>5.0</b> <b>10</b>	<b>38</b> <b>320</b> 96.2%

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 indicate results of organics or additional hydrocarbons in ranges are not identifiable.

Analytical Resources Inc.  
 NWTPH Quantitation Report

Data file: /chem2/fid9.i/20100702.b/0702A017.D  
 Method: /chem2/fid9.i/20100702.b/ftphfid9a.m  
 Instrument: fid9.i  
 Operator: MS  
 Report Date: 07/03/2010

ARI ID: RC51MBS1  
 Client ID: RC51MBS1  
 Injection: 02-JUL-2010 19:47  
 Dilution Factor: 1  
 Macro: 15-JUN-2010

FID:9 RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	2.063	0.009	5791	9132	GAS (Tol-C12)	185097	9
C8	2.181	-0.003	4089	7775	DIESEL (C12-C24)	72414	3
C10	2.856	0.000	2304	2420	M.OIL (C24-C38)	258747	19
C12	3.435	-0.010	625	880	AK-102 (C10-C25)	122227	5
C14	3.969	0.000	313	211	AK-103 (C25-C36)	185294	20
C16	4.438	0.004	782	449			
C18	4.897	-0.001	187	117			
C20	5.426	-0.005	529	358			
C22	5.900	-0.002	265	65			
C24	6.323	0.017	638	1344			
C25	6.485	-0.006	408	102			
C26	6.663	0.001	889	769			
C28	6.979	0.001	1785	3327			
C32	7.566	-0.004	2398	807	JP-4 (Tol-C14)	199489	12
C34	7.905	-0.005	2269	1171	BUNKERC (C10-C38)	378123	43
Filter Peak	7.680	-0.003	2362	841			
C36	8.328	-0.005	2544	4683			
C38	8.882	0.004	2269	1534			
C40	9.599	-0.005	2307	1058			
o-terph	5.125	-0.003	1097593	1073810	JET-A (C10-C18)	92235	7
Triacon Surr	7.278	-0.001	1138262	880882			

Range Times: NW Diesel(3.445 - 6.306) AK102(2.86 - 6.49) Jet A(2.86 - 4.90)  
 NW M.Oil(6.31 - 8.88) AK103(6.49 - 8.33) OR Diesel(2.86 - 6.98)

Surrogate	Area	Amount	%Rec
o-Terphenyl	1073810	49.5	110.0
Triacontane	880882	48.6	107.9

*MS 7/3/10*

Analyte	RF	Curve Date
o-Terph Surr	21702.3	14-MAY-2010
Triacon Surr	18136.2	14-MAY-2010
Gas	21009.8	15-JUN-2010
Diesel	22931.0	14-MAY-2010
Motor Oil	13981.0	14-MAY-2010
AK102	25407.0	14-MAY-2010
AK103	9457.0	10-DEC-2009
JP4	16396.5	09-JUN-2010
JetA	13819.1	11-JUN-2010
Bunker C	8770.6	05-JAN-2010

Data File: /chem2/fid9.i/20100702.b/07020017.D

Date: 02-JUL-2010 19:47

Client ID: RCS1HBS1

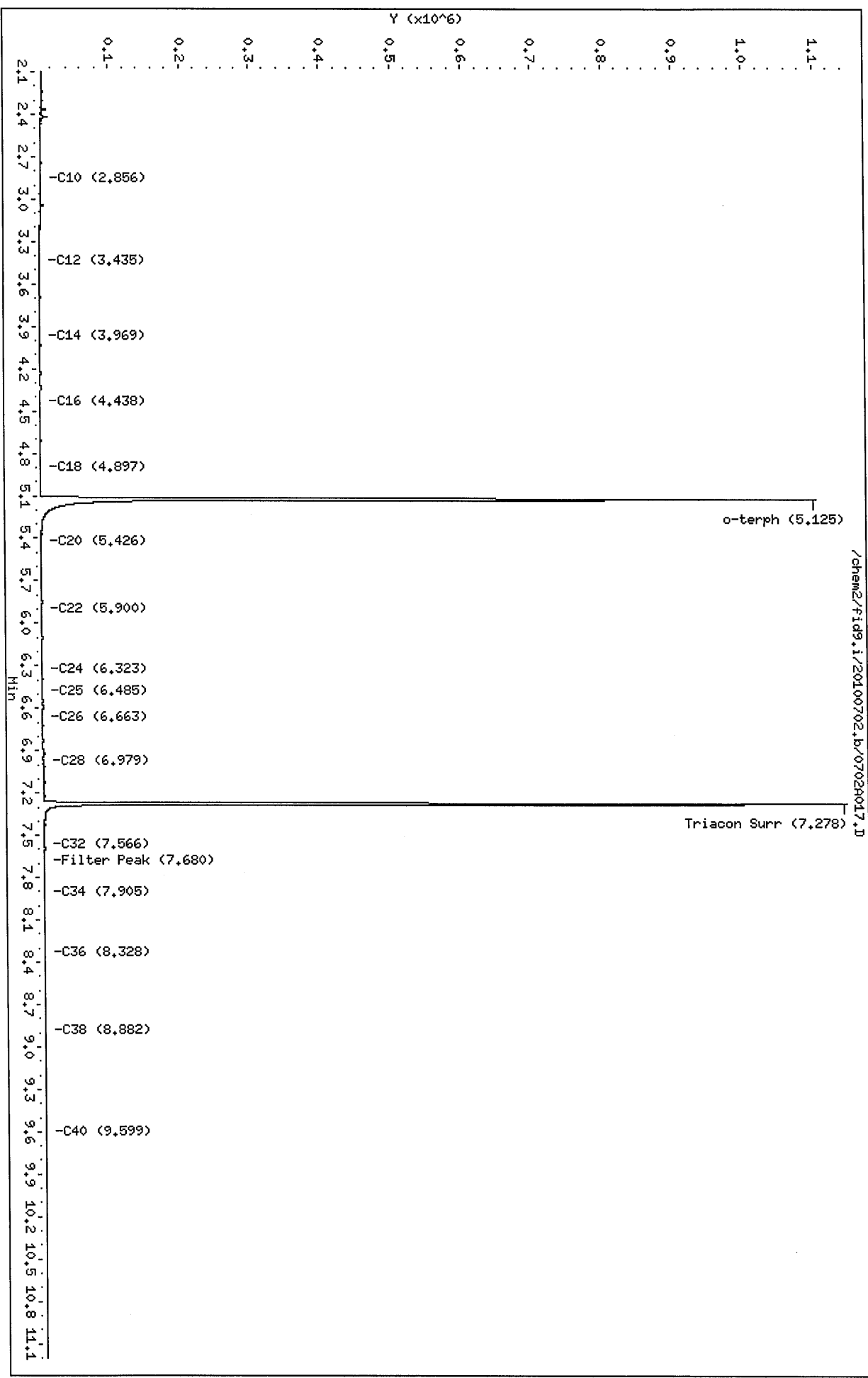
Sample Info: RCS1HBS1

Column phase: RTX-1

Instrument: fid9.i

Operator: HS

Column diameter: 0.25



Analytical Resources Inc.  
 NWTPH Quantitation Report

Data file: /chem2/fid9.i/20100702.b/0702A006.D  
 Method: /chem2/fid9.i/20100702.b/ftphfid9a.m  
 Instrument: fid9.i  
 Operator: MS  
 Report Date: 07/03/2010

ARI ID: RC51P  
 Client ID: ES-09-S  
 Injection: 02-JUL-2010 15:54  
 Dilution Factor: 1  
 Macro: 15-JUN-2010

FID:9 RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	2.064	0.010	5297	7466	GAS (Tol-C12)	201484	10
C8	2.183	-0.001	3324	3945	DIESEL (C12-C24)	8773114	383
C10	2.856	0.001	2950	2087	M.OIL (C24-C38)	44689327	3196
C12	3.451	0.007	2361	1572	AK-102 (C10-C25)	10314971	406
C14	3.973	0.004	4024	9171	AK-103 (C25-C36)	41468352	4385
C16	4.430	-0.003	13584	13474			
C18	4.893	-0.004	22173	30669			
C20	5.429	-0.002	37841	56489			
C22	5.903	0.001	116942	78509			
C24	6.307	0.001	275735	98204			
C25	6.478	-0.013	370228	440954			
C26	6.664	0.002	452032	213415			
C28	6.970	-0.008	565321	935140			
C32	7.575	0.005	309201	332847	JP-4 (Tol-C14)	257173	16
C34	7.909	-0.001	163651	64326	BUNKERC (C10-C38)	53529959	6103
Filter Peak	7.681	-0.002	243663	62788			
C36	8.335	0.002	78935	59193			
C38	8.880	0.002	40203	23304			
C40	9.612	0.008	19554	9635			
o-terph	5.125	-0.003	1191374	939425	JET-A (C10-C18)	858498	62
Triacon Surr	----						

Range Times: NW Diesel(3.445 - 6.306) AK102(2.86 - 6.49) Jet A(2.86 - 4.90)  
 NW M.Oil(6.31 - 8.88) AK103(6.49 - 8.33) OR Diesel(2.86 - 6.98)

Surrogate	Area	Amount	%Rec
o-Terphenyl	939425	43.3	96.2
Triacontane	0	0.0	0.0

Analyte	RF	Curve Date
o-Terph Surr	21702.3	14-MAY-2010
Triacon Surr	18136.2	14-MAY-2010
Gas	21009.8	15-JUN-2010
Diesel	22931.0	14-MAY-2010
Motor Oil	13981.0	14-MAY-2010
AK102	25407.0	14-MAY-2010
AK103	9457.0	10-DEC-2009
JP4	16396.5	09-JUN-2010
JetA	13819.1	11-JUN-2010
Bunker C	8770.6	05-JAN-2010

MANUAL ADJUSTMENTS

1. Peak not found
2. Poor Chromatography
3. Baseline Correction
4. Totals Calculation
5. Other

Analyst Mr Date 7/3/10

Data File: /chem2/fid9.i/20100702.b/0702A006.D

Date : 02-JUL-2010 15:54

Client ID: ES-09-S

Sample Info: RC51P

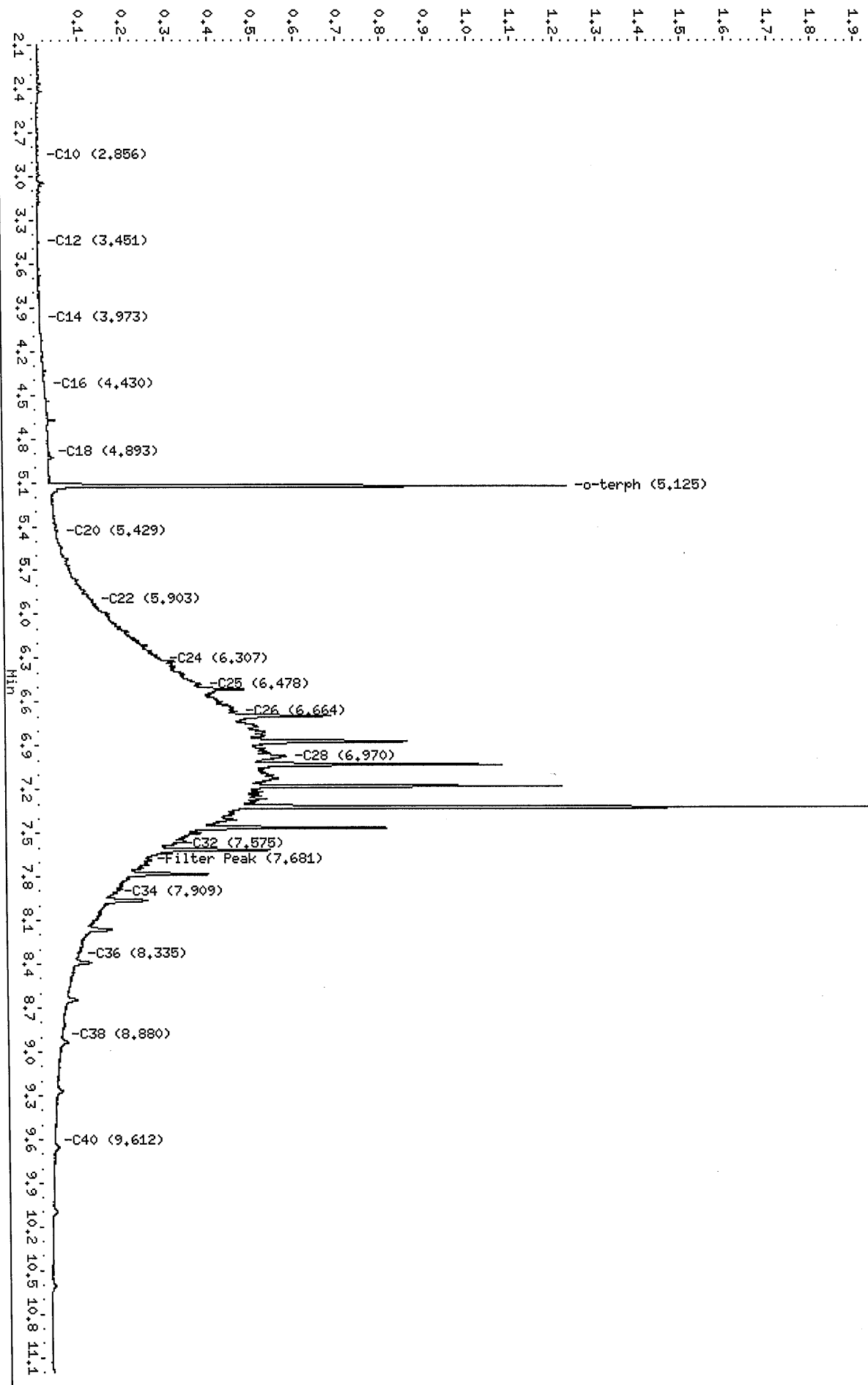
Column phase: RTX-1

Instrument: fid9.i

Operator: HS

Column diameter: 0.25

/chem2/fid9.i/20100702.b/0702A006.D



**CLEANED TPHD SURROGATE RECOVERY SUMMARY**

Matrix: Soil

QC Report No: RC51-Environmental Partners  
Project: Emerald Services, Inc  
43507.6

<u>Client ID</u>	<u>OTER</u>	<u>TOT OUT</u>
ES-01-S	98.7%	0
ES-01-D	102%	0
ES-02-S	107%	0
ES-02-D	92.9%	0
ES-03-S	104%	0
ES-03-D	82.7%	0
ES-04-S	90.7%	0
ES-04-D	99.5%	0
ES-05-S	99.4%	0
MB-070110	110%	0
LCS-070110	114%	0
ES-05-D	102%	0
ES-05-D MS	106%	0
ES-05-D MSD	104%	0
ES-06-S	106%	0
ES-06-D	97.6%	0
ES-07-S	104%	0
ES-07-D	108%	0
ES-08-S	93.3%	0
ES-09-S	96.2%	0

**LCS/MB LIMITS      QC LIMITS**

(OTER) = o-Terphenyl

(63-115)

(49-120)

Prep Method: SW3546  
Log Number Range: 10-15622 to 10-15638

**ORGANICS ANALYSIS DATA SHEET**

NWTPHD by GC/FID-Silica and Acid Cleaned

Sample ID: ES-05-D

Page 1 of 1

MS/MSD

Lab Sample ID: RC51J

QC Report No: RC51-Environmental Partners

LIMS ID: 10-15632

Project: Emerald Services, Inc

Matrix: Soil

43507.6

Data Release Authorized: *VAS*

Date Sampled: 06/30/10

Reported: 07/03/10

Date Received: 06/30/10

Date Extracted MS/MSD: 07/01/10

Sample Amount MS: 9.03 g-dry-wt

MSD: 8.94 g-dry-wt

Date Analyzed MS: 07/02/10 21:33

Final Extract Volume MS: 1.0 mL

MSD: 07/02/10 21:55

MSD: 1.0 mL

Instrument/Analyst MS: FID/MS

Dilution Factor MS: 1.0

MSD: FID/MS

MSD: 1.0

Percent Moisture: 13.3%

Range	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Diesel	< 5.6	135	166	81.3%	132	168	78.6%	2.2%

**TPHD Surrogate Recovery**

	MS	MSD
o-Terphenyl	106%	104%

Results reported in mg/kg

RPD calculated using sample concentrations per SW846.



Analytical Resources Inc.  
NWTPH Quantitation Report

Data file: /chem2/fid9.i/20100702.b/0702A022.D  
Method: /chem2/fid9.i/20100702.b/ftphfid9a.m  
Instrument: fid9.i  
Operator: MS  
Report Date: 07/03/2010

ARI ID: RC51JMS  
Client ID: ES-05-D MS  
Injection: 02-JUL-2010 21:33  
Dilution Factor: 1  
Macro: 15-JUN-2010

FID:9 RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	2.059	0.005	18070	15535	GAS (Tol-C12)	3463426	165
C8	2.188	0.004	9204	9005	DIESEL (C12-C24)	27905051	1217
C10	2.855	-0.001	107618	69556	M.OIL (C24-C38)	385931	28
C12	3.443	-0.001	312151	238979	AK-102 (C10-C25)	30737309	1210
C14	3.975	0.006	169730	102795	AK-103 (C25-C36)	287957	30
C16	4.431	-0.002	1249459	815621			
C18	4.906	0.009	883666	829804			
C20	5.423	-0.008	108520	23572			
C22	5.907	0.006	334693	270909			
C24	6.305	-0.001	114913	108895			
C25	6.487	-0.003	47326	69181			
C26	6.660	-0.002	19930	28153			
C28	6.978	0.000	5248	5462			
C32	7.567	-0.002	936	387	JP-4 (Tol-C14)	7612127	464
C34	7.905	-0.005	376	313	BUNKERC (C10-C38)	31029550	3538
Filter Peak	7.692	0.009	625	658			
C36	8.328	-0.005	388	592			
C38	8.877	-0.001	103	17			
C40	9.606	0.002	122	48			
o-terph	5.133	0.006	1275356	1034742	JET-A (C10-C18)	21261202	1539
Triacon Surr	7.276	-0.003	1171542	828630			

Range Times: NW Diesel (3.445 - 6.306) AK102 (2.86 - 6.49) Jet A (2.86 - 4.90)  
NW M.Oil (6.31 - 8.88) AK103 (6.49 - 8.33) OR Diesel (2.86 - 6.98)

Surrogate	Area	Amount	%Rec
o-Terphenyl	1034742	47.7	106.0
Triacontane	828630	45.7	101.5

Analyte	RF	Curve Date
o-Terph Surr	21702.3	14-MAY-2010
Triacon Surr	18136.2	14-MAY-2010
Gas	21009.8	15-JUN-2010
Diesel	22931.0	14-MAY-2010
Motor Oil	13981.0	14-MAY-2010
AK102	25407.0	14-MAY-2010
AK103	9457.0	10-DEC-2009
JP4	16396.5	09-JUN-2010
JetA	13819.1	11-JUN-2010
Bunker C	8770.6	05-JAN-2010

MANUAL ADJUSTMENTS

1. Peak not found
2. Poor Chromatography
3. Baseline Correction
4. Totals Calculation
5. Other

Analyst: MS Date: 7/3/10

Data File: /chem2/fid9.i/20100702.b/0702A022.D

Date : 02-JUL-2010 21:33

Client ID: ES-05-D HS

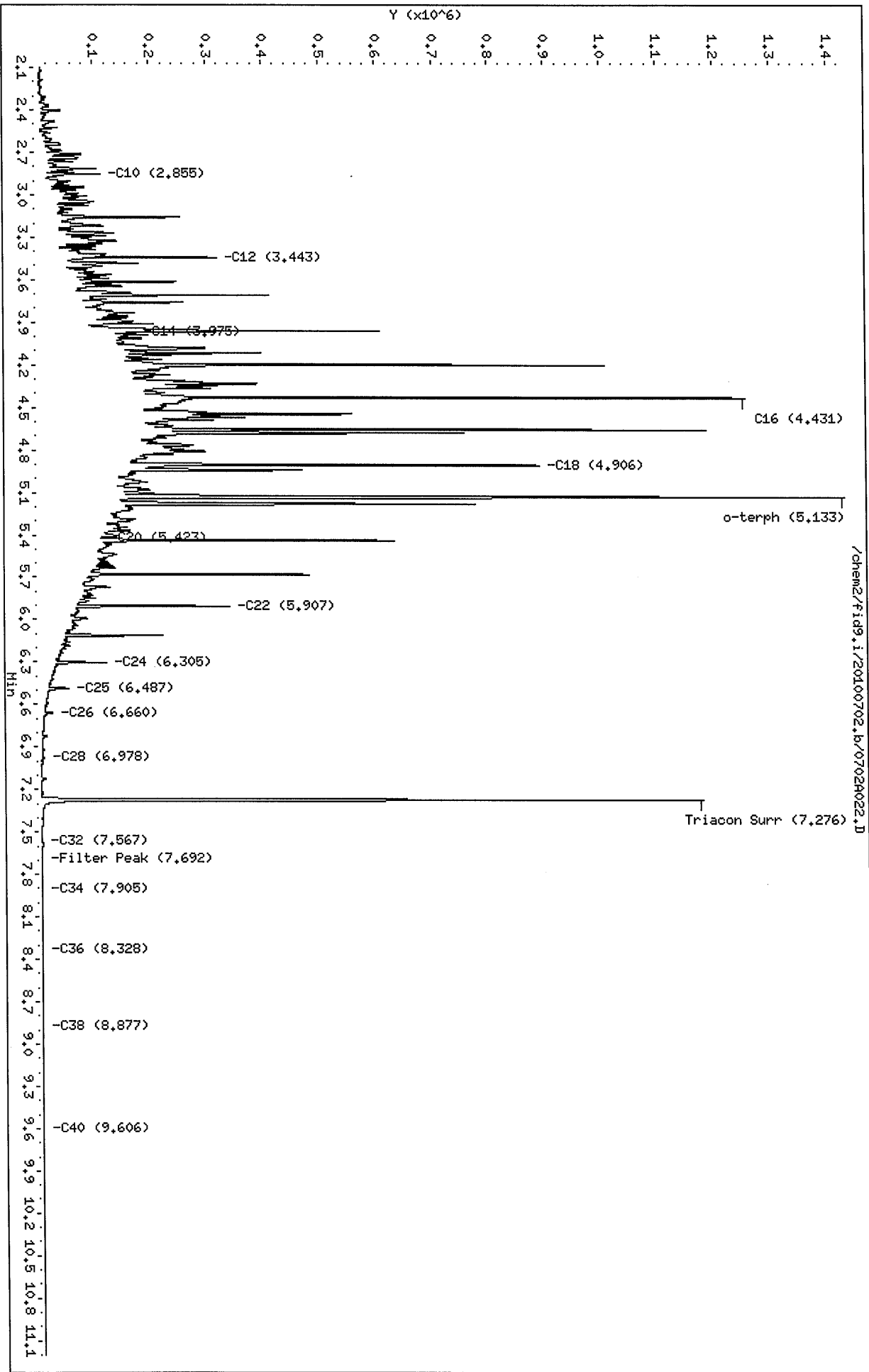
Sample Info: RC51JMS

Column phase: RTX-1

Instrument: fid9.i

Operator: MS

Column diameter: 0.25



Analytical Resources Inc.  
NWTPH Quantitation Report

Data file: /chem2/fid9.i/20100702.b/0702A023.D  
Method: /chem2/fid9.i/20100702.b/ftphfid9a.m  
Instrument: fid9.i  
Operator: MS  
Report Date: 07/03/2010

ARI ID: RC51JMSD  
Client ID: ES-05-D MSD  
Injection: 02-JUL-2010 21:55  
Dilution Factor: 1  
Macro: 15-JUN-2010

FID:9 RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	2.058	0.004	26646	20532	GAS (Tol-C12)	3432121	163
C8	2.188	0.004	9839	9852	DIESEL (C12-C24)	27027909	1179
C10	2.855	-0.001	110696	70452	M.OIL (C24-C38)	417807	30
C12	3.444	-0.001	313025	240052	AK-102 (C10-C25)	29873668	1176
C14	3.962	-0.007	607716	376143	AK-103 (C25-C36)	317107	34
C16	4.433	-0.001	1219520	941771			
C18	4.908	0.011	883343	810734			
C20	5.441	0.010	600716	534781			
C22	5.908	0.007	325938	265170			
C24	6.307	0.001	111060	81881			
C25	6.490	-0.001	47486	67302			
C26	6.662	0.000	19482	27989			
C28	6.979	0.001	5782	6314			
C32	7.566	-0.004	849	182	JP-4 (Tol-C14)	7412253	452
C34	7.906	-0.003	393	211	BUNKERC (C10-C38)	30196086	3443
Filter Peak	7.689	0.006	638	486			
C36	8.328	-0.005	505	765			
C38	8.884	0.005	131	45			
C40	9.604	0.000	136	30			
o-terph	5.136	0.008	1258204	1014990	JET-A (C10-C18)	20666759	1496
Triacon Surr	7.276	-0.003	1084548	807489			

Range Times: NW Diesel(3.445 - 6.306) AK102(2.86 - 6.49) Jet A(2.86 - 4.90)  
NW M.Oil(6.31 - 8.88) AK103(6.49 - 8.33) OR Diesel(2.86 - 6.98)

Surrogate	Area	Amount	%Rec
o-Terphenyl	1014990	46.8	103.9
Triacontane	807489	44.5	98.9

Analyte	RF	Curve Date
o-Terph Surr	21702.3	14-MAY-2010
Triacon Surr	18136.2	14-MAY-2010
Gas	21009.8	15-JUN-2010
Diesel	22931.0	14-MAY-2010
Motor Oil	13981.0	14-MAY-2010
AK102	25407.0	14-MAY-2010
AK103	9457.0	10-DEC-2009
JP4	16396.5	09-JUN-2010
JetA	13819.1	11-JUN-2010
Bunker C	8770.6	05-JAN-2010

MANUAL ADJUSTMENTS

1. Peak not found
2. Poor Chromatography
3. Baseline Correction
4. Totals Calculation
5. Other

Analyst *[Signature]* Date *7/2/10*

Data File: /chem2/fid9.i/20100702.b/07020023.D

Date: 02-JUL-2010 21:55

Client ID: ES-05-D MSD

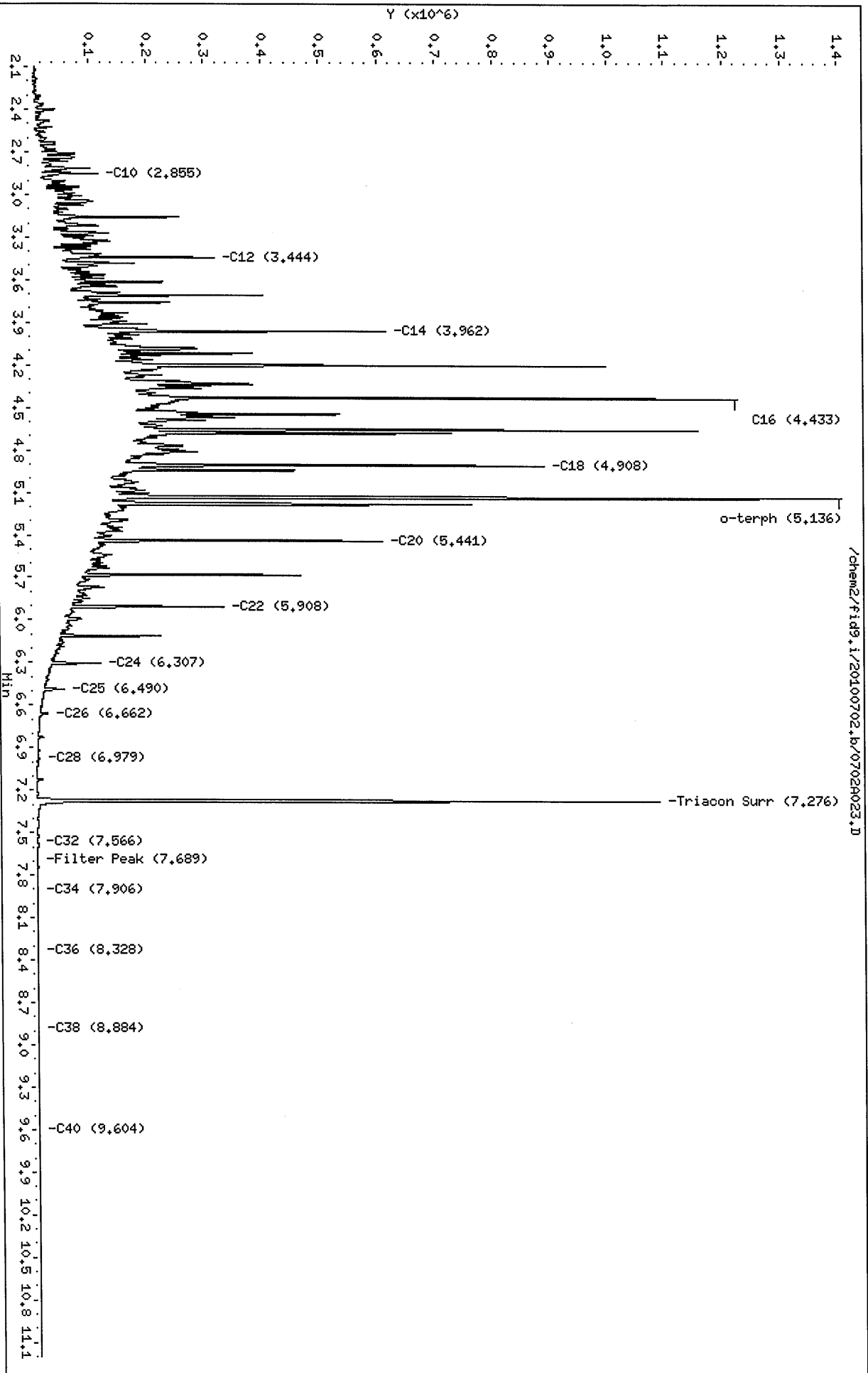
Sample Info: RCS1JMSD

Instrument: fid9.i

Page 1

Column phase: RTX-1

Operator: MS  
Column diameter: 0.25



**ORGANICS ANALYSIS DATA SHEET**

NWTPHD by GC/FID-Silica and Acid Cleaned

Page 1 of 1

Sample ID: LCS-070110

LAB CONTROL

Lab Sample ID: LCS-070110

LIMS ID: 10-15632

Matrix: Soil

Data Release Authorized: *VIS*  
Reported: 07/03/10

QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc

43507.6

Date Sampled: 06/30/10

Date Received: 06/30/10

Date Extracted: 07/01/10

Date Analyzed: 07/02/10 19:26

Instrument/Analyst: FID/MS

Sample Amount: 10.0 g

Final Extract Volume: 1.0 mL

Dilution Factor: 1.0

Range	Lab Control	Spike Added	Recovery
Diesel	138	150	92.0%

**TPHD Surrogate Recovery**

o-Terphenyl	114%
-------------	------

Results reported in mg/kg

Analytical Resources Inc.  
NWTPH Quantitation Report

Data file: /chem2/fid9.i/20100702.b/0702A016.D  
Method: /chem2/fid9.i/20100702.b/ftphfid9a.m  
Instrument: fid9.i  
Operator: MS  
Report Date: 07/03/2010

ARI ID: RC51LCSS1  
Client ID: RC51LCSS1  
Injection: 02-JUL-2010 19:26  
Dilution Factor: 1  
Macro: 15-JUN-2010

FID:9 RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	2.060	0.006	20379	16395	GAS (Tol-C12)	3908144	186
C8	2.189	0.005	9918	9606	DIESEL (C12-C24)	31527825	1375
C10	2.855	-0.001	118360	75797	M.OIL (C24-C38)	454418	33
C12	3.444	0.000	342808	257989	AK-102 (C10-C25)	34778896	1369
C14	3.963	-0.006	657054	421323	AK-103 (C25-C36)	325309	34
C16	4.434	0.001	1351930	906538			
C18	4.911	0.013	962422	925372			
C20	5.426	-0.005	123525	32004			
C22	5.910	0.008	360943	299568			
C24	6.308	0.002	124591	91216			
C25	6.490	-0.001	52982	71197			
C26	6.661	-0.001	20530	33562			
C28	6.980	0.002	4019	5151			
C32	7.566	-0.004	748	204	JP-4 (Tol-C14)	8614616	525
C34	7.911	0.002	290	45	BUNKERC (C10-C38)	35107774	4003
Filter Peak	7.683	0.000	513	227			
C36	8.329	-0.004	517	833			
C38	8.872	-0.006	96	57			
C40	9.605	0.001	122	53			
o-terph	5.138	0.010	1316215	1109197	JET-A (C10-C18)	23971365	1735
Triacon Surr	7.279	-0.001	1190663	893412			

Range Times: NW Diesel (3.445 - 6.306) AK102 (2.86 - 6.49) Jet A (2.86 - 4.90)  
NW M.Oil (6.31 - 8.88) AK103 (6.49 - 8.33) OR Diesel (2.86 - 6.98)

Surrogate	Area	Amount	%Rec
o-Terphenyl	1109197	51.1	113.6
Triacotane	893412	49.3	109.5

Analyte	RF	Curve Date
o-Terph Surr	21702.3	14-MAY-2010
Triacon Surr	18136.2	14-MAY-2010
Gas	21009.8	15-JUN-2010
Diesel	22931.0	14-MAY-2010
Motor Oil	13981.0	14-MAY-2010
AK102	25407.0	14-MAY-2010
AK103	9457.0	10-DEC-2009
JP4	16396.5	09-JUN-2010
JetA	13819.1	11-JUN-2010
Bunker C	8770.6	05-JAN-2010

MANUAL ADJUSTMENTS

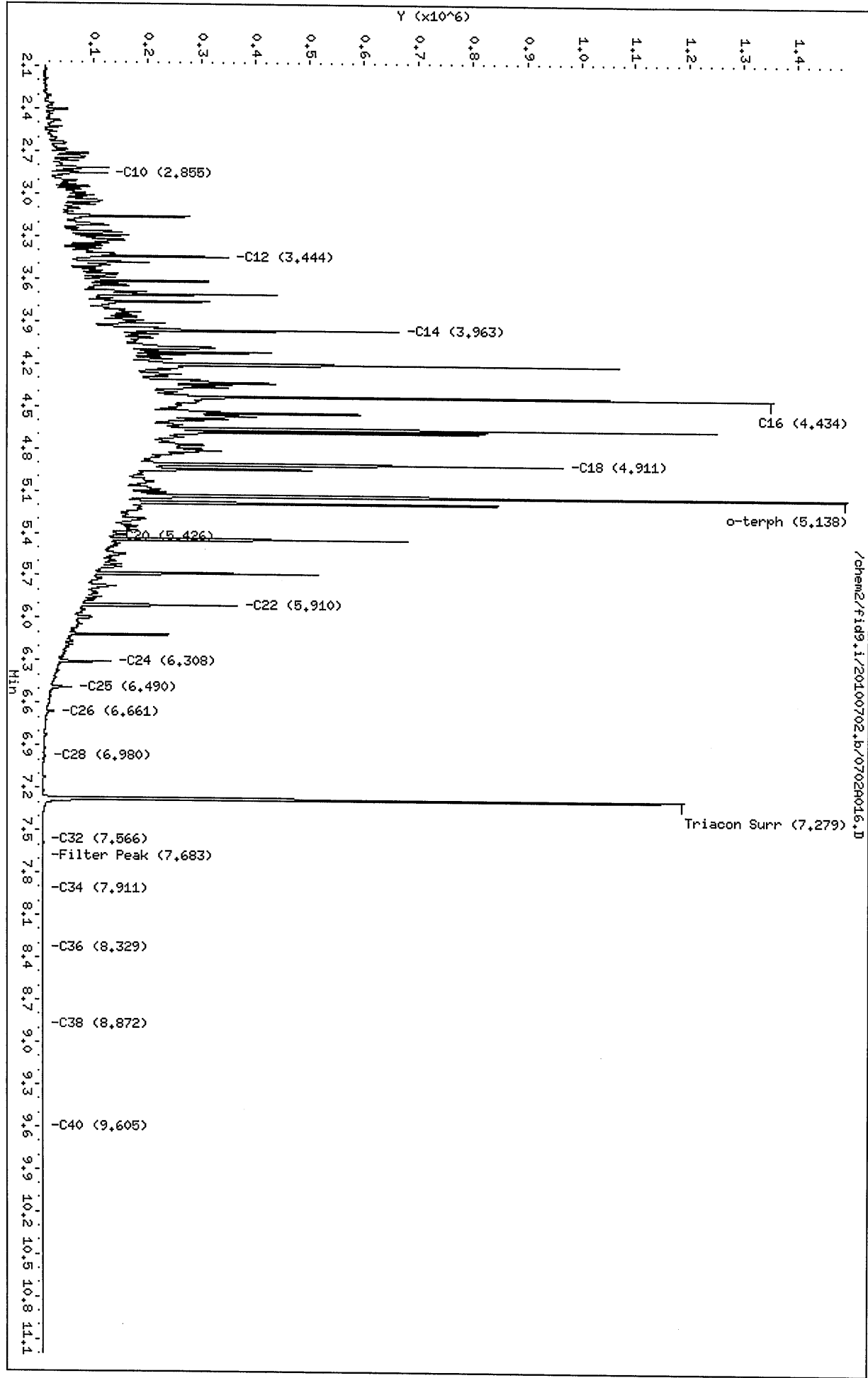
1. Peak not found
2. Poor Chromatography
3. Baseline Correction
4. Totals Calculation
5. Other

Analyst MS Date 7/3/10

Data File: /chem2/fid9.i/20100702.b/0702A016.D  
Date: 02-JUL-2010 19:26  
Client ID: RC51LCSS1  
Sample Info: RC51LCSS1

Column phase: RTX-1

Instrument: fid9.i  
Operator: HS  
Column diameter: 0.25



TOTAL DIESEL RANGE HYDROCARBONS-EXTRACTION REPORT

Matrix: Soil  
Date Received: 06/30/10

ARI Job: RC51  
Project: Emerald Services, Inc  
43507.6

ARI ID	Client ID	Client Amt	Final Vol	Basis	Prep Date
10-15622-RC51A	ES-01-S	8.01 g	1.00 mL	D	07/01/10
10-15623-RC51B	ES-01-D	8.26 g	1.00 mL	D	07/01/10
10-15624-RC51C	ES-02-S	9.23 g	1.00 mL	D	07/01/10
10-15626-RC51D	ES-02-D	8.43 g	1.00 mL	D	07/01/10
10-15627-RC51E	ES-03-S	6.05 g	1.00 mL	D	07/01/10
10-15628-RC51F	ES-03-D	8.76 g	1.00 mL	D	07/01/10
10-15629-RC51G	ES-04-S	8.58 g	1.00 mL	D	07/01/10
10-15630-RC51H	ES-04-D	9.22 g	1.00 mL	D	07/01/10
10-15631-RC51I	ES-05-S	8.46 g	1.00 mL	D	07/01/10
10-15632-070110MB1	Method Blank	10.0 g	1.00 mL	-	07/01/10
10-15632-070110LCS1	Lab Control	10.0 g	1.00 mL	-	07/01/10
10-15632-RC51J	ES-05-D	9.01 g	1.00 mL	D	07/01/10
10-15632-RC51JMS	ES-05-D	9.03 g	1.00 mL	D	07/01/10
10-15632-RC51JMSD	ES-05-D	8.94 g	1.00 mL	D	07/01/10
10-15633-RC51K	ES-06-S	9.05 g	1.00 mL	D	07/01/10
10-15634-RC51L	ES-06-D	8.85 g	1.00 mL	D	07/01/10
10-15635-RC51M	ES-07-S	8.97 g	1.00 mL	D	07/01/10
10-15636-RC51N	ES-07-D	9.87 g	1.00 mL	D	07/01/10
10-15637-RC51O	ES-08-S	9.12 g	1.00 mL	D	07/01/10
10-15638-RC51P	ES-09-S	10.1 g	1.00 mL	D	07/01/10

Basis: D=Dry Weight W=As Received  
Diesel Extraction Report



**ORGANICS ANALYSIS DATA SHEET**

**PNA's by SW8270D GC/MS**

Page 1 of 1

Sample ID: ES-03-S

SAMPLE

Lab Sample ID: RC51E

LIMS ID: 10-15627

Matrix: Soil

Data Release Authorized: *VJB*

Reported: 07/07/10

QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc

43507.6

Date Sampled: 06/30/10

Date Received: 06/30/10

Date Extracted: 07/02/10

Date Analyzed: 07/02/10 15:22

Instrument/Analyst: NT6/JZ

GPC Cleanup: No

Alumina: No

Silica Gel: No

Sample Amount: 7.59 g-dry-wt

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

Percent Moisture: 41.7%

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	66	< 66 U
91-57-6	2-Methylnaphthalene	66	< 66 U
90-12-0	1-Methylnaphthalene	66	< 66 U
56-55-3	Benzo(a)anthracene	66	< 66 U
218-01-9	Chrysene	66	< 66 U
50-32-8	Benzo(a)pyrene	66	< 66 U
193-39-5	Indeno(1,2,3-cd)pyrene	66	< 66 U
53-70-3	Dibenz(a,h)anthracene	66	< 66 U
TOTBFA	Total Benzofluoranthenes	66	< 66 U

Reported in µg/kg (ppb)

**Semivolatile Surrogate Recovery**

d14-p-Terphenyl	69.6%
2-Fluorobiphenyl	66.8%

**ORGANICS ANALYSIS DATA SHEET**

**PNAs by SW8270D GC/MS**

Page 1 of 1

**Sample ID: MB-070210**

**METHOD BLANK**

Lab Sample ID: MB-070210

LIMS ID: 10-15629

Matrix: Soil

Data Release Authorized: *VTS*

Reported: 07/07/10

QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc  
43507.6

Date Sampled: NA

Date Received: NA

Date Extracted: 07/02/10

Date Analyzed: 07/02/10 14:16

Instrument/Analyst: NT6/JZ

GPC Cleanup: No

Alumina: No

Silica Gel: No

Sample Amount: 7.50 g

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

Percent Moisture: NA

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	67	< 67 U
91-57-6	2-Methylnaphthalene	67	< 67 U
90-12-0	1-Methylnaphthalene	67	< 67 U
56-55-3	Benzo(a)anthracene	67	< 67 U
218-01-9	Chrysene	67	< 67 U
50-32-8	Benzo(a)pyrene	67	< 67 U
193-39-5	Indeno(1,2,3-cd)pyrene	67	< 67 U
53-70-3	Dibenz(a,h)anthracene	67	< 67 U
TOTBFA	Total Benzofluoranthenes	67	< 67 U

Reported in µg/kg (ppb)

**Semivolatile Surrogate Recovery**

d14-p-Terphenyl	83.6%
2-Fluorobiphenyl	78.4%

**ORGANICS ANALYSIS DATA SHEET**

PNA's by SW8270D GC/MS

Page 1 of 1

Sample ID: ES-04-S

SAMPLE

Lab Sample ID: RC51G

LIMS ID: 10-15629

Matrix: Soil

Data Release Authorized: *VJ*

Reported: 07/07/10

QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc

43507.6

Date Sampled: 06/30/10

Date Received: 06/30/10

Date Extracted: 07/02/10

Date Analyzed: 07/02/10 15:55

Instrument/Analyst: NT6/JZ

GPC Cleanup: No

Alumina: No

Silica Gel: No

Sample Amount: 8.61 g-dry-wt

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

Percent Moisture: 16.7%

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	58	< 58 U
91-57-6	2-Methylnaphthalene	58	< 58 U
90-12-0	1-Methylnaphthalene	58	< 58 U
56-55-3	Benzo(a)anthracene	58	< 58 U
218-01-9	Chrysene	58	< 58 U
50-32-8	Benzo(a)pyrene	58	< 58 U
193-39-5	Indeno(1,2,3-cd)pyrene	58	< 58 U
53-70-3	Dibenz(a,h)anthracene	58	< 58 U
TOTBFA	Total Benzofluoranthenes	58	< 58 U

Reported in µg/kg (ppb)

**Semivolatile Surrogate Recovery**

d14-p-Terphenyl	69.6%
2-Fluorobiphenyl	64.8%

**ORGANICS ANALYSIS DATA SHEET**

**PNA's by SW8270D GC/MS**

Page 1 of 1

**Sample ID: ES-04-S**

**MATRIX SPIKE**

Lab Sample ID: RC51G

LIMS ID: 10-15629

Matrix: Soil

Data Release Authorized: *VTS*

Reported: 07/07/10

QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc

43507.6

Date Sampled: 06/30/10

Date Received: 06/30/10

Date Extracted: 07/02/10

Date Analyzed: 07/02/10 16:27

Instrument/Analyst: NT6/JZ

GPC Cleanup: No

Alumina: No

Silica Gel: No

Sample Amount: 8.58 g-dry-wt

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

Percent Moisture: 16.7%

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	58	---
91-57-6	2-Methylnaphthalene	58	---
90-12-0	1-Methylnaphthalene	58	---
56-55-3	Benzo(a)anthracene	58	---
218-01-9	Chrysene	58	---
50-32-8	Benzo(a)pyrene	58	---
193-39-5	Indeno(1,2,3-cd)pyrene	58	---
53-70-3	Dibenz(a,h)anthracene	58	---
TOTBFA	Total Benzofluoranthenes	58	---

Reported in µg/kg (ppb)

**Semivolatile Surrogate Recovery**

d14-p-Terphenyl	69.6%
2-Fluorobiphenyl	64.8%

**ORGANICS ANALYSIS DATA SHEET**

**PNA's by SW8270D GC/MS**

Page 1 of 1

**Sample ID: ES-04-S**

**MATRIX SPIKE DUPLICATE**

Lab Sample ID: RC51G

LIMS ID: 10-15629

Matrix: Soil

Data Release Authorized: *VIT*

Reported: 07/07/10

QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc

43507.6

Date Sampled: 06/30/10

Date Received: 06/30/10

Date Extracted: 07/02/10

Date Analyzed: 07/02/10 17:00

Instrument/Analyst: NT6/JZ

GPC Cleanup: No

Alumina: No

Silica Gel: No

Sample Amount: 8.61 g-dry-wt

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

Percent Moisture: 16.7%

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	58	---
91-57-6	2-Methylnaphthalene	58	---
90-12-0	1-Methylnaphthalene	58	---
56-55-3	Benzo(a)anthracene	58	---
218-01-9	Chrysene	58	---
50-32-8	Benzo(a)pyrene	58	---
193-39-5	Indeno(1,2,3-cd)pyrene	58	---
53-70-3	Dibenz(a,h)anthracene	58	---
TOTBFA	Total Benzofluoranthenes	58	---

Reported in µg/kg (ppb)

**Semivolatile Surrogate Recovery**

d14-p-Terphenyl	75.2%
2-Fluorobiphenyl	70.4%

**ORGANICS ANALYSIS DATA SHEET**

PNA's by SW8270D GC/MS

Page 1 of 1

Sample ID: ES-05-S  
SAMPLE

Lab Sample ID: RC51I

LIMS ID: 10-15631

Matrix: Soil

Data Release Authorized: **VTS**

Reported: 07/07/10

QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc  
43507.6

Date Sampled: 06/30/10

Date Received: 06/30/10

Date Extracted: 07/02/10

Date Analyzed: 07/02/10 17:33

Instrument/Analyst: NT6/JZ

GPC Cleanup: No

Alumina: No

Silica Gel: No

Sample Amount: 7.88 g-dry-wt

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

Percent Moisture: 21.5%

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	64	330
91-57-6	2-Methylnaphthalene	64	< 64 U
90-12-0	1-Methylnaphthalene	64	120
56-55-3	Benzo(a)anthracene	64	< 64 U
218-01-9	Chrysene	64	< 64 U
50-32-8	Benzo(a)pyrene	64	< 64 U
193-39-5	Indeno(1,2,3-cd)pyrene	64	< 64 U
53-70-3	Dibenz(a,h)anthracene	64	< 64 U
TOTBFA	Total Benzofluoranthenes	64	< 64 U

Reported in µg/kg (ppb)

**Semivolatile Surrogate Recovery**

d14-p-Terphenyl	70.4%
2-Fluorobiphenyl	66.0%

SW8270 PNA SURROGATE RECOVERY SUMMARY



Matrix: Soil

QC Report No: RC51-Environmental Partners  
 Project: Emerald Services, Inc  
 43507.6

Client ID	TER	FBP	TOT OUT
ES-03-S	69.6%	66.8%	0
MB-070210	83.6%	78.4%	0
LCS-070210	84.0%	76.0%	0
ES-04-S	69.6%	64.8%	0
ES-04-S MS	69.6%	64.8%	0
ES-04-S MSD	75.2%	70.4%	0
ES-05-S	70.4%	66.0%	0

	LCS/MB LIMITS	QC LIMITS
(TER) = d14-p-Terphenyl	(30-160)	(30-160)
(FBP) = 2-Fluorobiphenyl	(30-160)	(30-160)

Prep Method: SW3546  
 Log Number Range: 10-15627 to 10-15631

**ORGANICS ANALYSIS DATA SHEET**

**PNA's by SW8270D GC/MS**

Page 1 of 1

**Sample ID: ES-04-S  
MS/MSD**

Lab Sample ID: RC51G  
LIMS ID: 10-15629  
Matrix: Soil  
Data Release Authorized: *VJB*  
Reported: 07/07/10

QC Report No: RC51-Environmental Partners  
Project: Emerald Services, Inc  
43507.6  
Date Sampled: 06/30/10  
Date Received: 06/30/10

Date Extracted MS/MSD: 07/02/10  
Date Analyzed MS: 07/02/10 16:27  
MSD: 07/02/10 17:00  
Instrument/Analyst MS: NT6/JZ  
MSD: NT6/JZ

Sample Amount MS: 8.58 g-dry-wt  
MSD: 8.61 g-dry-wt  
Final Extract Volume MS: 0.5 mL  
MSD: 0.5 mL  
Dilution Factor MS: 1.00  
MSD: 1.00  
Alumina Cleanup: No

GPC Cleanup: No  
Silica Gel Cleanup: No

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Naphthalene	< 58.1	882	1460	60.4%	922	1450	63.6%	4.4%
2-Methylnaphthalene	< 58.1	938	1460	64.2%	998	1450	68.8%	6.2%
1-Methylnaphthalene	< 58.1	927	1460	63.5%	993	1450	68.5%	6.9%
Benzo(a)anthracene	< 58.1	1040	1460	71.2%	1220	1450	84.1%	15.9%
Chrysene	< 58.1	980	1460	67.1%	1170	1450	80.7%	17.7%
Benzo(a)pyrene	< 58.1	979	1460	67.1%	1120	1450	77.2%	13.4%
Indeno(1,2,3-cd)pyrene	< 58.1	996	1460	68.2%	1150	1450	79.3%	14.4%
Dibenz(a,h)anthracene	< 58.1	988	1460	67.7%	1110	1450	76.6%	11.6%
Total Benzofluoranthenes	< 58.1	2030	2910	69.8%	2300	2900	79.3%	12.5%

Results reported in µg/kg  
RPD calculated using sample concentrations per SW846.



**ORGANICS ANALYSIS DATA SHEET**

**PNA's by SW8270D GC/MS**

Page 1 of 1

**Sample ID: LCS-070210**

**LAB CONTROL**

Lab Sample ID: LCS-070210

LIMS ID: 10-15629

Matrix: Soil

Data Release Authorized: *VDS*

Reported: 07/07/10

QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc

43507.6

Date Sampled: NA

Date Received: 06/30/10

Date Extracted: 07/02/10

Date Analyzed: 07/02/10 14:49

Instrument/Analyst: NT6/JZ

GPC Cleanup: No

Silica Gel Cleanup: No

Sample Amount: 7.50 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Alumina Cleanup: No

<b>Analyte</b>	<b>Lab Control</b>	<b>Spike Added</b>	<b>Recovery</b>
Naphthalene	1170	1670	70.1%
2-Methylnaphthalene	1230	1670	73.7%
1-Methylnaphthalene	1220	1670	73.1%
Benzo(a)anthracene	1420	1670	85.0%
Chrysene	1350	1670	80.8%
Benzo(a)pyrene	1370	1670	82.0%
Indeno(1,2,3-cd)pyrene	1420	1670	85.0%
Dibenz(a,h)anthracene	1400	1670	83.8%
Total Benzofluoranthenes	2880	3330	86.5%

**Semivolatile Surrogate Recovery**

d14-p-Terphenyl	84.0%
2-Fluorobiphenyl	76.0%

Results reported in µg/kg

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1


Sample ID: ES-03-S

SAMPLE

Lab Sample ID: RC51E

LIMS ID: 10-15627

Matrix: Soil

Data Release Authorized: 

Reported: 07/06/10

QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc

43507.6

Date Sampled: 06/30/10

Date Received: 06/30/10

Percent Total Solids: 72.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	07/01/10	6010B	07/06/10	7440-43-9	Cadmium	0.3	0.3	U
3050B	07/01/10	6010B	07/06/10	7439-92-1	Lead	3	3	U

U-Analyte undetected at given RL

RL-Reporting Limit

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1

Sample ID: ES-04-S

SAMPLE

Lab Sample ID: RC51G

LIMS ID: 10-15629

Matrix: Soil

Data Release Authorized: *GR*

Reported: 07/06/10

QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc

43507.6

Date Sampled: 06/30/10

Date Received: 06/30/10

Percent Total Solids: 86.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	07/01/10	6010B	07/06/10	7440-43-9	Cadmium	0.2	0.2	U
3050B	07/01/10	6010B	07/06/10	7439-92-1	Lead	2	2	U

U-Analyte undetected at given RL

RL-Reporting Limit

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1

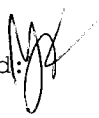
Sample ID: ES-05-S

SAMPLE

Lab Sample ID: RC51I

LIMS ID: 10-15631

Matrix: Soil

Data Release Authorized: 

Reported: 07/06/10

QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc

43507.6

Date Sampled: 06/30/10

Date Received: 06/30/10

Percent Total Solids: 90.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	07/01/10	6010B	07/06/10	7440-43-9	Cadmium	0.2	0.2	U
3050B	07/01/10	6010B	07/06/10	7439-92-1	Lead	2	2	U

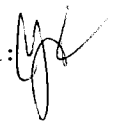
U-Analyte undetected at given RL

RL-Reporting Limit

**INORGANICS ANALYSIS DATA SHEET**  
**TOTAL METALS**  
 Page 1 of 1

Sample ID: **ES-03-S**  
**DUPLICATE**

Lab Sample ID: RC51E  
 LIMS ID: 10-15627  
 Matrix: Soil  
 Data Release Authorized:  
 Reported: 07/06/10



QC Report No: RC51-Environmental Partners  
 Project: Emerald Services, Inc  
 43507.6  
 Date Sampled: 06/30/10  
 Date Received: 06/30/10

**MATRIX DUPLICATE QUALITY CONTROL REPORT**


Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Cadmium	6010B	0.3 U	0.3 U	0.0%	+/- 0.3	L
Lead	6010B	3 U	3 U	0.0%	+/- 3	L

Reported in mg/kg-dry

\*-Control Limit Not Met  
 L-RPD Invalid, Limit = Detection Limit

**INORGANICS ANALYSIS DATA SHEET**  
**TOTAL METALS**  
 Page 1 of 1

Sample ID: ES-03-S  
**MATRIX SPIKE**

Lab Sample ID: RC51E  
 LIMS ID: 10-15627  
 Matrix: Soil  
 Data Release Authorized:   
 Reported: 07/06/10

QC Report No: RC51-Environmental Partners  
 Project: Emerald Services, Inc  
 43507.6  
 Date Sampled: 06/30/10  
 Date Received: 06/30/10

**MATRIX SPIKE QUALITY CONTROL REPORT**

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Cadmium	6010B	0.3 U	62.4	65.9	94.7%	
Lead	6010B	3 U	247	264	93.6%	

Reported in mg/kg-dry

N-Control Limit Not Met  
 H-% Recovery Not Applicable, Sample Concentration Too High  
 NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

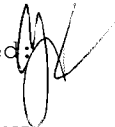
Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: RC51MB

LIMS ID: 10-15629

Matrix: Soil

Data Release Authorized: 

Reported: 07/06/10

QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc

43507.6

Date Sampled: NA

Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	07/01/10	6010B	07/06/10	7440-43-9	Cadmium	0.2	0.2	U
3050B	07/01/10	6010B	07/06/10	7439-92-1	Lead	2	2	U

U-Analyte undetected at given RL

RL-Reporting Limit

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**


Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: RC51LCS

LIMS ID: 10-15629

Matrix: Soil

Data Release Authorized: 

Reported: 07/06/10

QC Report No: RC51-Environmental Partners

Project: Emerald Services, Inc

43507.6

Date Sampled: NA

Date Received: NA

**BLANK SPIKE QUALITY CONTROL REPORT**

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Cadmium	6010B	48.1	50.0	96.2%	
Lead	6010B	192	200	96.0%	

Reported in mg/kg-dry

N-Control limit not met

NA-Not Applicable, Analyte Not Spiked

Control Limits: 80-120%



**Educator Building**

**Phase II Environmental Site Assessment**

**Appendix B**

**Documentation of Asbestos Removal**



3315 South Pine Street  
Tacoma, WA 98409-5793  
(253) 472-4489  
Fax (253) 472-4521  
Bid Fax (253) 473-1226

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September 10, 2018

Attn: Sam Evans – Sierra Construction Company

Subject: Portside 55 South Warehouse Project – Hazardous Materials Abatement Completion

Dear Mr. Evans:

Please let this letter serve as a formal notification that, to the best of our knowledge, all hazardous materials which were required to be removed prior to demolition, were removed from the above named project, at 3401 Lincoln Ave, Tacoma, WA 98421, according to our contractual agreement.

All materials were removed in accordance with local, state and federal regulations.

Sincerely,  
Dickson Company

A handwritten signature in blue ink that reads "David Dickson".

David Dickson  
Vice President

Cc: File



**Educator Building**

**Phase II Environmental Site Assessment**

**Appendix C**  
**Laboratory Reports**

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

September 6, 2018

Tom Colligan, Project Manager  
Floyd-Snider  
Two Union Square, Suite 600  
601 Union St  
Seattle, WA 98101

Dear Mr Colligan:

Included are the results from the testing of material submitted on August 28, 2018 from the Ave 55-Educator, F&BI 808618 project. There are 8 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
c: Pamela Osterhaut  
FDS0906R.DOC

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on August 28, 2018 by Friedman & Bruya, Inc. from the Floyd-Snider Ave 55-Educator, F&BI 808618 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Floyd-Snider</u>
808618 -01	SG-1
808618 -02	SG-2
808618 -03	SG-3

Several compounds were detected in the TO-15 method blank at a level within 10 times the concentration detected in the samples. The data were flagged accordingly.

The laboratory control sample failed the acceptance criteria for ethanol and 2-propanol. In addition, the acetaldehyde concentration in sample SG-1 exceeded the calibration range of the instrument. The data were flagged accordingly.

All other quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

ZZZ Analysis For Volatile Compounds By Method TO-15

Client Sample ID: SG-1	Client: Floyd-Snider
Date Received: 08/28/18	Project: Ave 55-Educator, F&BI 808618
Date Collected: 08/28/18	Lab ID: 808618-01 1/3.3
Date Analyzed: 09/04/18	Data File: 090409.D
Matrix: Air	Instrument: GCMS7
Units: ug/m3	Operator: MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	97	70	130

Compounds:	Concentration		Compounds:	Concentration	
	ug/m3	ppbv		ug/m3	ppbv
Chlorodifluoromethane	<1.2	<0.33	1-Butanol	<20	<6.6
Propene	160	95	Carbon tetrachloride	<2.1	<0.33
Dichlorodifluoromethane	3.1	0.63	Benzene	6.3	2.0
Chloromethane	12	5.8	Cyclohexane	<23	<6.6
F-114	<2.3	<0.33	3-Pentanone	<12	<3.3
Isobutene	100	44	2-Pentanone	<12	<3.3
Acetaldehyde	550 ve	300 ve	Pentanal	220	63
Vinyl chloride	<0.84	<0.33	1,2-Dichloropropane	<0.76	<0.16
1,3-Butadiene	14	6.5	1,4-Dioxane	<1.2	<0.33
Bromomethane	<5.1	<1.3	Bromodichloromethane	<0.22	<0.033
Chloroethane	<0.87	<0.33	Trichloroethene	1.6 fb	0.30 fb
Ethanol	<25 jl	<13 jl	cis-1,3-Dichloropropene	<1.5	<0.33
Acetonitrile	<5.5	<3.3	4-Methyl-2-pentanone	<14	<3.3
Acrolein	21	9.3	trans-1,3-Dichloropropene	<1.5	<0.33
Acrylonitrile	<0.73	<0.33	Toluene	33	8.8
Pentane	30	10	1,1,2-Trichloroethane	<0.18	<0.033
Trichlorofluoromethane	3.5 fb	0.62 fb	3-Hexanone	<14	<3.3
Acetone	160	68	2-Hexanone	<14	<3.3
2-Propanol	<28 jl	<12 jl	Hexanal	250	62
Isoprene	4.2	1.5	Tetrachloroethene	<2.2	<0.33
Iodomethane	<1.9	<0.33	Dibromochloromethane	<0.28	<0.033
1,1-Dichloroethene	<1.3	<0.33	1,2-Dibromoethane (EDB)	<0.25	<0.033
Methacrolein	<9.5	<3.3	Chlorobenzene	<1.5	<0.33
trans-1,2-Dichloroethene	<1.3	<0.33	Ethylbenzene	4.3	0.98
Cyclopentane	2.2	0.78	1,1,2,2-Tetrachloroethane	<0.45	<0.066
Methyl vinyl ketone	<9.5	<3.3	m,p-Xylene	16	3.7
Butanal	88	30	o-Xylene	5.1	1.2
Methylene chloride	<290	<82	Styrene	<2.8	<0.66
CFC-113	6.1 fb	0.79 fb	Bromoform	<6.8	<0.66
Carbon disulfide	<21	<6.6	Benzyl chloride	<0.17	<0.033
Methyl t-butyl ether (MTBE)	<5.9	<1.6	1,3,5-Trimethylbenzene	<8.1	<1.6
Vinyl acetate	<23	<6.6	1,2,4-Trimethylbenzene	<8.1	<1.6
1,1-Dichloroethane	<1.3	<0.33	1,3-Dichlorobenzene	<2	<0.33
cis-1,2-Dichloroethene	<1.3	<0.33	1,4-Dichlorobenzene	<0.79	<0.13
Hexane	18	5.2	1,2,3-Trimethylbenzene	<8.1	<1.6
Chloroform	1.2	0.25	1,2-Dichlorobenzene	<2	<0.33
2-Butanone (MEK)	26	8.7	1,2,4-Trichlorobenzene	<2.4	<0.33
1,2-Dichloroethane (EDC)	<0.13	<0.033	Naphthalene	1.1 fb	0.21 fb
1,1,1-Trichloroethane	<1.8	<0.33	Hexachlorobutadiene	<0.7	<0.066

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

ZZZ Analysis For Volatile Compounds By Method TO-15

Client Sample ID: SG-2	Client: Floyd-Snider
Date Received: 08/28/18	Project: Ave 55-Educator, F&BI 808618
Date Collected: 08/28/18	Lab ID: 808618-02 1/3.3
Date Analyzed: 09/04/18	Data File: 090410.D
Matrix: Air	Instrument: GCMS7
Units: ug/m3	Operator: MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	99	70	130

Compounds:	Concentration		Compounds:	Concentration	
	ug/m3	ppbv		ug/m3	ppbv
Chlorodifluoromethane	<1.2	<0.33	1-Butanol	35	12
Propene	180	110	Carbon tetrachloride	<2.1	<0.33
Dichlorodifluoromethane	3.2	0.64	Benzene	6.0	1.9
Chloromethane	6.2	3.0	Cyclohexane	<23	<6.6
F-114	<2.3	<0.33	3-Pentanone	<12	<3.3
Isobutene	110	46	2-Pentanone	<12	<3.3
Acetaldehyde	250	140	Pentanal	36	10
Vinyl chloride	<0.84	<0.33	1,2-Dichloropropane	<0.76	<0.16
1,3-Butadiene	15	6.9	1,4-Dioxane	<1.2	<0.33
Bromomethane	<5.1	<1.3	Bromodichloromethane	<0.22	<0.033
Chloroethane	<0.87	<0.33	Trichloroethene	1.6 fb	0.31 fb
Ethanol	30 fb, jl	16 fb, jl	cis-1,3-Dichloropropene	<1.5	<0.33
Acetonitrile	<5.5	<3.3	4-Methyl-2-pentanone	<14	<3.3
Acrolein	5.7	2.5	trans-1,3-Dichloropropene	<1.5	<0.33
Acrylonitrile	<0.73	<0.33	Toluene	10	2.8
Pentane	27	9.1	1,1,2-Trichloroethane	<0.18	<0.033
Trichlorofluoromethane	2.8 fb	0.50 fb	3-Hexanone	<14	<3.3
Acetone	170	72	2-Hexanone	<14	<3.3
2-Propanol	<28 jl	<12 jl	Hexanal	54	13
Isoprene	4.8	1.7	Tetrachloroethene	3.2	0.48
Iodomethane	<1.9	<0.33	Dibromochloromethane	<0.28	<0.033
1,1-Dichloroethene	<1.3	<0.33	1,2-Dibromoethane (EDB)	<0.25	<0.033
Methacrolein	<9.5	<3.3	Chlorobenzene	<1.5	<0.33
trans-1,2-Dichloroethene	<1.3	<0.33	Ethylbenzene	3.5	0.81
Cyclopentane	<0.95	<0.33	1,1,2,2-Tetrachloroethane	<0.45	<0.066
Methyl vinyl ketone	<9.5	<3.3	m,p-Xylene	13	3.0
Butanal	26	8.7	o-Xylene	6.0	1.4
Methylene chloride	<290	<82	Styrene	<2.8	<0.66
CFC-113	4.8 fb	0.62 fb	Bromoform	<6.8	<0.66
Carbon disulfide	<21	<6.6	Benzyl chloride	<0.17	<0.033
Methyl t-butyl ether (MTBE)	<5.9	<1.6	1,3,5-Trimethylbenzene	<8.1	<1.6
Vinyl acetate	<23	<6.6	1,2,4-Trimethylbenzene	<8.1	<1.6
1,1-Dichloroethane	<1.3	<0.33	1,3-Dichlorobenzene	2.2	0.37
cis-1,2-Dichloroethene	<1.3	<0.33	1,4-Dichlorobenzene	<0.79	<0.13
Hexane	13	3.8	1,2,3-Trimethylbenzene	<8.1	<1.6
Chloroform	1.9	0.38	1,2-Dichlorobenzene	<2	<0.33
2-Butanone (MEK)	28	9.6	1,2,4-Trichlorobenzene	<2.4	<0.33
1,2-Dichloroethane (EDC)	<0.13	<0.033	Naphthalene	2.0 fb	0.37 fb
1,1,1-Trichloroethane	<1.8	<0.33	Hexachlorobutadiene	<0.7	<0.066

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

ZZZ Analysis For Volatile Compounds By Method TO-15

Client Sample ID: SG-3	Client: Floyd-Snider
Date Received: 08/28/18	Project: Ave 55-Educator, F&BI 808618
Date Collected: 08/28/18	Lab ID: 808618-03 1/5
Date Analyzed: 09/04/18	Data File: 090411.D
Matrix: Air	Instrument: GCMS7
Units: ug/m3	Operator: MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	99	70	130

Compounds:	Concentration		Compounds:	Concentration	
	ug/m3	ppbv		ug/m3	ppbv
Chlorodifluoromethane	<1.8	<0.5	1-Butanol	36	12
Propene	390	230	Carbon tetrachloride	<3.1	<0.5
Dichlorodifluoromethane	3.2	0.65	Benzene	18	5.7
Chloromethane	3.2	1.6	Cyclohexane	<34	<10
F-114	<3.5	<0.5	3-Pentanone	<18	<5
Isobutene	220	96	2-Pentanone	<18	<5
Acetaldehyde	<45	<25	Pentanal	31	8.9
Vinyl chloride	<1.3	<0.5	1,2-Dichloropropane	1.7	0.36
1,3-Butadiene	25	11	1,4-Dioxane	<1.8	<0.5
Bromomethane	<7.8	<2	Bromodichloromethane	<0.34	<0.05
Chloroethane	<1.3	<0.5	Trichloroethene	210	38
Ethanol	<38 jl	<20 jl	cis-1,3-Dichloropropene	<2.3	<0.5
Acetonitrile	<8.5	<5	4-Methyl-2-pentanone	<20	<5
Acrolein	<4.6	<2	trans-1,3-Dichloropropene	<2.3	<0.5
Acrylonitrile	12	5.5	Toluene	210	55
Pentane	67	23	1,1,2-Trichloroethane	<0.27	<0.05
Trichlorofluoromethane	19	3.5	3-Hexanone	<20	<5
Acetone	180	77	2-Hexanone	<20	<5
2-Propanol	<43 jl	<17 jl	Hexanal	54	13
Isoprene	11	3.9	Tetrachloroethene	63	9.3
Iodomethane	<2.9	<0.5	Dibromochloromethane	<0.43	<0.05
1,1-Dichloroethene	48	12	1,2-Dibromoethane (EDB)	<0.38	<0.05
Methacrolein	<14	<5	Chlorobenzene	<2.3	<0.5
trans-1,2-Dichloroethene	<2	<0.5	Ethylbenzene	20	4.6
Cyclopentane	<1.4	<0.5	1,1,2,2-Tetrachloroethane	<0.69	<0.1
Methyl vinyl ketone	<14	<5	m,p-Xylene	47	11
Butanal	23	7.6	o-Xylene	21	4.9
Methylene chloride	<430	<120	Styrene	<4.3	<1
CFC-113	77	10	Bromoform	<10	<1
Carbon disulfide	<31	<10	Benzyl chloride	<0.26	<0.05
Methyl t-butyl ether (MTBE)	<9	<2.5	1,3,5-Trimethylbenzene	<12	<2.5
Vinyl acetate	<35	<10	1,2,4-Trimethylbenzene	<12	<2.5
1,1-Dichloroethane	15	3.6	1,3-Dichlorobenzene	5.8	0.96
cis-1,2-Dichloroethene	<2	<0.5	1,4-Dichlorobenzene	<1.2	<0.2
Hexane	31	8.9	1,2,3-Trimethylbenzene	<12	<2.5
Chloroform	2.5	0.51	1,2-Dichlorobenzene	<3	<0.5
2-Butanone (MEK)	35	12	1,2,4-Trichlorobenzene	<3.7	<0.5
1,2-Dichloroethane (EDC)	0.28 fb	0.070 fb	Naphthalene	2.6 fb	0.50 fb
1,1,1-Trichloroethane	69	13	Hexachlorobutadiene	<1.1	<0.1



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

ZZZ Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Method Blank	Client:	Floyd-Snider
Date Received:	Not Applicable	Project:	Ave 55-Educator, F&BI 808618
Date Collected:	Not Applicable	Lab ID:	08-2001 MB
Date Analyzed:	09/04/18	Data File:	090408.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	96	70	130

Compounds:	Concentration		Compounds:	Concentration	
	ug/m3	ppbv		ug/m3	ppbv
Chlorodifluoromethane	<0.35	<0.1	1-Butanol	<6.1	<2
Propene	<0.69	<0.4	Carbon tetrachloride	<0.63	<0.1
Dichlorodifluoromethane	<0.49	<0.1	Benzene	<0.32	<0.1
Chloromethane	<0.21	<0.1	Cyclohexane	<6.9	<2
F-114	<0.7	<0.1	3-Pentanone	<3.5	<1
Isobutene	<0.92	<0.4	2-Pentanone	<3.5	<1
Acetaldehyde	<9	<5	Pentanal	<3.5	<1
Vinyl chloride	<0.26	<0.1	1,2-Dichloropropane	<0.23	<0.05
1,3-Butadiene	<0.022	<0.01	1,4-Dioxane	<0.36	<0.1
Bromomethane	<1.6	<0.4	Bromodichloromethane	<0.067	<0.01
Chloroethane	<0.26	<0.1	Trichloroethene	<0.27	<0.05
Ethanol	11 lc	5.8 lc	cis-1,3-Dichloropropene	<0.45	<0.1
Acetonitrile	<1.7	<1	4-Methyl-2-pentanone	<4.1	<1
Acrolein	<0.92	<0.4	trans-1,3-Dichloropropene	<0.45	<0.1
Acrylonitrile	<0.22	<0.1	Toluene	<0.38	<0.1
Pentane	<3	<1	1,1,2-Trichloroethane	<0.055	<0.01
Trichlorofluoromethane	<0.56	<0.1	3-Hexanone	<4.1	<1
Acetone	<4.8	<2	2-Hexanone	<4.1	<1
2-Propanol	<8.6	<3.5	Hexanal	<4.1	<1
Isoprene	<0.28	<0.1	Tetrachloroethene	<0.68	<0.1
Iodomethane	<0.58	<0.1	Dibromochloromethane	<0.085	<0.01
1,1-Dichloroethene	<0.4	<0.1	1,2-Dibromoethane (EDB)	<0.077	<0.01
Methacrolein	<2.9	<1	Chlorobenzene	<0.46	<0.1
trans-1,2-Dichloroethene	<0.4	<0.1	Ethylbenzene	<0.43	<0.1
Cyclopentane	<0.29	<0.1	1,1,2,2-Tetrachloroethane	<0.14	<0.02
Methyl vinyl ketone	<2.9	<1	m,p-Xylene	<0.87	<0.2
Butanal	<2.9	<1	o-Xylene	<0.43	<0.1
Methylene chloride	<87	<25	Styrene	<0.85	<0.2
CFC-113	<0.77	<0.1	Bromoform	<2.1	<0.2
Carbon disulfide	<6.2	<2	Benzyl chloride	<0.052	<0.01
Methyl t-butyl ether (MTBE)	<1.8	<0.5	1,3,5-Trimethylbenzene	<2.5	<0.5
Vinyl acetate	<7	<2	1,2,4-Trimethylbenzene	<2.5	<0.5
1,1-Dichloroethane	<0.4	<0.1	1,3-Dichlorobenzene	<0.6	<0.1
cis-1,2-Dichloroethene	<0.4	<0.1	1,4-Dichlorobenzene	<0.24	<0.04
Hexane	<3.5	<1	1,2,3-Trimethylbenzene	<2.5	<0.5
Chloroform	<0.049	<0.01	1,2-Dichlorobenzene	<0.6	<0.1
2-Butanone (MEK)	<2.9	<1	1,2,4-Trichlorobenzene	<0.74	<0.1
1,2-Dichloroethane (EDC)	<0.04	<0.01	Naphthalene	<0.1	<0.02
1,1,1-Trichloroethane	<0.55	<0.1	Hexachlorobutadiene	<0.21	<0.02

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/06/18

Date Received: 08/28/18

Project: Ave 55-Educator, F&BI 808618

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES FOR  
VOLATILES BY METHOD TO-15**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Chlorodifluoromethane	ppbv	5	96	70-130
Propene	ppbv	5	78	70-130
Dichlorodifluoromethane	ppbv	5	92	70-130
Chloromethane	ppbv	5	85	70-130
F-114	ppbv	5	94	70-130
Isobutene	ppbv	5	86	70-130
Acetaldehyde	ppbv	5	83	70-130
Vinyl chloride	ppbv	5	89	70-130
1,3-Butadiene	ppbv	5	95	70-130
Bromomethane	ppbv	5	130	70-130
Chloroethane	ppbv	5	88	70-130
Ethanol	ppbv	5	0 vo	70-130
Acetonitrile	ppbv	5	87	70-130
Acrolein	ppbv	5	98	70-130
Acrylonitrile	ppbv	5	108	70-130
Pentane	ppbv	5	93	70-130
Trichlorofluoromethane	ppbv	5	95	70-130
Acetone	ppbv	5	73	70-130
2-Propanol	ppbv	5	63 vo	70-130
Isoprene	ppbv	5	92	70-130
Iodomethane	ppbv	5	91	70-130
1,1-Dichloroethene	ppbv	5	91	70-130
Methacrolein	ppbv	5	86	70-130
trans-1,2-Dichloroethene	ppbv	5	92	70-130
Cyclopentane	ppbv	5	95	70-130
Methyl vinyl ketone	ppbv	5	97	70-130
Butanal	ppbv	5	83	70-130
Methylene chloride	ppbv	5	81	70-130
CFC-113	ppbv	5	88	70-130
Carbon disulfide	ppbv	5	84	70-130
Methyl t-butyl ether (MTBE)	ppbv	5	94	70-130
Vinyl acetate	ppbv	5	80	70-130
1,1-Dichloroethane	ppbv	5	94	70-130
cis-1,2-Dichloroethene	ppbv	5	91	70-130
Hexane	ppbv	5	95	70-130
Chloroform	ppbv	5	97	70-130
2-Butanone (MEK)	ppbv	5	91	70-130
1,2-Dichloroethane (EDC)	ppbv	5	97	70-130
1,1,1-Trichloroethane	ppbv	5	99	70-130

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/06/18

Date Received: 08/28/18

Project: Ave 55-Educator, F&BI 808618

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES FOR  
VOLATILES BY METHOD TO-15**

Laboratory Code: Laboratory Control Sample (continued)

Analyte	Reporting Units	Spike Level	Percent	Acceptance Criteria
			Recovery LCS	
1-Butanol	ppbv	5	79	70-130
Carbon tetrachloride	ppbv	5	94	70-130
Benzene	ppbv	5	93	70-130
Cyclohexane	ppbv	5	94	70-130
2-Pentanone	ppbv	5	91	70-130
3-Pentanone	ppbv	5	102	70-130
Pentanal	ppbv	5	83	70-130
1,2-Dichloropropane	ppbv	5	89	70-130
1,4-Dioxane	ppbv	5	94	70-130
Bromodichloromethane	ppbv	5	97	70-130
Trichloroethene	ppbv	5	89	70-130
cis-1,3-Dichloropropene	ppbv	5	86	70-130
4-Methyl-2-pentanone	ppbv	5	82	70-130
trans-1,3-Dichloropropene	ppbv	5	94	70-130
Toluene	ppbv	5	87	70-130
1,1,2-Trichloroethane	ppbv	5	90	70-130
3-Hexanone	ppbv	5	84	70-130
2-Hexanone	ppbv	5	89	70-130
Hexanal	ppbv	5	80	70-130
Tetrachloroethene	ppbv	5	90	70-130
Dibromochloromethane	ppbv	5	103	70-130
1,2-Dibromoethane (EDB)	ppbv	5	96	70-130
Chlorobenzene	ppbv	5	93	70-130
Ethylbenzene	ppbv	5	96	70-130
1,1,2,2,-Tetrachloroethane	ppbv	5	102	70-130
m,p-Xylene	ppbv	10	101	70-130
o-Xylene	ppbv	5	107	70-130
Styrene	ppbv	5	96	70-130
Bromoform	ppbv	5	99	70-130
Benzyl chloride	ppbv	5	111	70-130
1,3,5-Trimethylbenzene	ppbv	5	98	70-130
1,2,4-Trimethylbenzene	ppbv	5	95	70-130
1,3-Dichlorobenzene	ppbv	5	100	70-130
1,4-Dichlorobenzene	ppbv	5	110	70-130
1,2,3-Trimethylbenzene	ppbv	5	97	70-130
1,2-Dichlorobenzene	ppbv	5	105	70-130
1,2,4-Trichlorobenzene	ppbv	5	96	70-130
Naphthalene	ppbv	5	96	70-130
Hexachloro-1,3-butadiene	ppbv	5	99	70-130

**Data Qualifiers & Definitions**

- a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.
- b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.
- ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.
- c - The presence of the analyte may be due to carryover from previous sample injections.
- cf - The sample was centrifuged prior to analysis.
- d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.
- dv - Insufficient sample volume was available to achieve normal reporting limits.
- f - The sample was laboratory filtered prior to analysis.
- fb - The analyte was detected in the method blank.
- fc - The compound is a common laboratory and field contaminant.
- hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.
- hs - Headspace was present in the container used for analysis.
- ht - The analysis was performed outside the method or client-specified holding time requirement.
- ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.
- j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.
- J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.
- jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.
- js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.
- lc - The presence of the analyte is likely due to laboratory contamination.
- L - The reported concentration was generated from a library search.
- nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.
- pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.
- ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.
- vo - The value reported fell outside the control limits established for this analyte.
- x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.



FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
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September 7, 2018

Tom Colligan, Project Manager  
Floyd-Snider  
Two Union Square, Suite 600  
601 Union St  
Seattle, WA 98101

Dear Mr Colligan:

Included are the results from the testing of material submitted on August 28, 2018 from the Ave 55-Educator, F&BI 808619 project. There are 33 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures

c: Pamela Osterhaut  
FDS0907R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on August 28, 2018 by Friedman & Bruya, Inc. from the Floyd-Snider Ave 55-Educator, F&BI 808619 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Floyd-Snider</u>
808619 -01	SB-2-8-8.5
808619 -02	SB-1-4-4.5
808619 -03	SB-3-7.5-8.0
808619 -04	SB-4-7.5-8.0
808619 -05	TP-10-5.5ft
808619 -06	TP-10-6ft
808619 -07	TP-11-5ft
808619 -08	TP-11-5.5ft
808619 -09	TP-12-5.5ft
808619 -10	TP-12-6ft
808619 -11	TP-13-5.5ft
808619 -12	TP-13-6ft
808619 -13	TP-14-5ft
808619 -14	TP-14-5.5ft
808619 -15	TP-15-3.0ft
808619 -16	TW-12-3-13
808619 -17	TW-13-3-13
808619 -18	UST-7.5ft

The dissolved metals samples were filtered at Friedman and Bruya on August 31st, 2018 at 16:09. The data were flagged accordingly.

Several compounds in the 8260C soil laboratory control sample exceeded the acceptance criteria. The analytes were not detected in the samples, therefore the data were acceptable.

All other quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/07/18  
Date Received: 08/28/18  
Project: Ave 55-Educator, F&BI 808619  
Date Extracted: 08/29/18  
Date Analyzed: 08/29/18

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR GASOLINE, DIESEL AND HEAVY OIL BY NWTPH-HCID**

Results Reported on a Dry Weight Basis  
Results Reported as Not Detected (ND) or Detected (D)

**THE DATA PROVIDED BELOW WAS PERFORMED PER THE GUIDELINES ESTABLISHED BY THE  
WASHINGTON DEPARTMENT OF ECOLOGY AND WERE NOT DESIGNED TO PROVIDE INFORMATION  
WITH REGARDS TO THE ACTUAL IDENTIFICATION OF ANY MATERIAL PRESENT**

<u>Sample ID</u> Laboratory ID	<u>Gasoline</u>	<u>Diesel</u>	<u>Heavy Oil</u>	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 53-144)
SB-2-8-8.5 808619-01	ND	ND	ND	90
SB-1-4-4.5 808619-02	ND	ND	ND	80
SB-3-7.5-8.0 808619-03	ND	ND	ND	88
SB-4-7.5-8.0 808619-04	ND	ND	ND	89
TP-10-5.5ft 808619-05	ND	ND	ND	87
TP-11-5ft 808619-07	ND	ND	ND	86
TP-12-5.5ft 808619-09	ND	ND	ND	80
TP-13-5.5ft 808619-11	ND	ND	ND	77
TP-14-5ft 808619-13	ND	ND	ND	87
TP-15-3.0ft 808619-15	ND	ND	ND	78

ND - Material not detected at or above 20 mg/kg gas, 50 mg/kg diesel and 250 mg/kg heavy oil.



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/07/18  
Date Received: 08/28/18  
Project: Ave 55-Educator, F&BI 808619  
Date Extracted: 08/29/18  
Date Analyzed: 08/29/18

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR GASOLINE, DIESEL AND HEAVY OIL BY NWTPH-HCID**

Results Reported on a Dry Weight Basis  
Results Reported as Not Detected (ND) or Detected (D)

**THE DATA PROVIDED BELOW WAS PERFORMED PER THE GUIDELINES ESTABLISHED BY THE  
WASHINGTON DEPARTMENT OF ECOLOGY AND WERE NOT DESIGNED TO PROVIDE INFORMATION  
WITH REGARDS TO THE ACTUAL IDENTIFICATION OF ANY MATERIAL PRESENT**

<u>Sample ID</u> Laboratory ID	<u>Gasoline</u>	<u>Diesel</u>	<u>Heavy Oil</u>	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 53-144)
UST-7.5ft 808619-18	ND	ND	ND	87
Method Blank 08-1925 MB	ND	ND	ND	89

ND - Material not detected at or above 20 mg/kg gas, 50 mg/kg diesel and 250 mg/kg heavy oil.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/07/18  
Date Received: 08/28/18  
Project: Ave 55-Educator, F&BI 808619  
Date Extracted: 08/29/18  
Date Analyzed: 08/29/18 and 08/30/18

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE  
USING METHOD NWTPH-Gx**  
Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Gasoline Range</u>	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 50-150)
TW-12-3-13 808619-16	<100	86
TW-13-3-13 808619-17	<100	77
Method Blank 08-1772 MB	<100	79

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/07/18  
Date Received: 08/28/18  
Project: Ave 55-Educator, F&BI 808619  
Date Extracted: 08/29/18  
Date Analyzed: 08/29/18

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-Dx**  
Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> (% Recovery) (Limit 41-152)
TW-12-3-13 808619-16	190	<390	81
TW-13-3-13 808619-17	390	<250	74
Method Blank 08-1926 MB2	<50	<250	75

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	TW-12-3-13 f	Client:	Floyd-Snider
Date Received:	08/28/18	Project:	Ave 55-Educator, F&BI 808619
Date Extracted:	09/04/18	Lab ID:	808619-16
Date Analyzed:	09/05/18	Data File:	808619-16.048
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	AP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Cadmium	<1
Chromium	<1
Lead	<1
Mercury	<1

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	TW-13-3-13 f	Client:	Floyd-Snider
Date Received:	08/28/18	Project:	Ave 55-Educator, F&BI 808619
Date Extracted:	09/04/18	Lab ID:	808619-17
Date Analyzed:	09/05/18	Data File:	808619-17.051
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	AP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Cadmium	<1
Chromium	<1
Lead	<1
Mercury	<1

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	Method Blank f	Client:	Floyd-Snider
Date Received:	NA	Project:	Ave 55-Educator, F&BI 808619
Date Extracted:	09/04/18	Lab ID:	I8-572 mb
Date Analyzed:	09/05/18	Data File:	I8-572 mb.046
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	AP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Cadmium	<1
Chromium	<1
Lead	<1
Mercury	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	TP-10-5.5ft	Client:	Floyd-Snider
Date Received:	08/28/18	Project:	Ave 55-Educator, F&BI 808619
Date Extracted:	08/29/18	Lab ID:	808619-05
Date Analyzed:	08/29/18	Data File:	808619-05.114
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1
Cadmium	<1
Chromium	8.86
Lead	1.06
Mercury	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	TP-11-5ft	Client:	Floyd-Snider
Date Received:	08/28/18	Project:	Ave 55-Educator, F&BI 808619
Date Extracted:	08/29/18	Lab ID:	808619-07
Date Analyzed:	08/29/18	Data File:	808619-07.117
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	1.20
Cadmium	<1
Chromium	9.39
Lead	1.29
Mercury	<1



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	TP-12-5.5ft	Client:	Floyd-Snider
Date Received:	08/28/18	Project:	Ave 55-Educator, F&BI 808619
Date Extracted:	08/29/18	Lab ID:	808619-09
Date Analyzed:	08/29/18	Data File:	808619-09.120
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	3.49
Cadmium	<1
Chromium	11.3
Lead	11.6
Mercury	<1

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Total Metals By EPA Method 6020B

Client ID:	TP-13-5.5ft	Client:	Floyd-Snider
Date Received:	08/28/18	Project:	Ave 55-Educator, F&BI 808619
Date Extracted:	08/29/18	Lab ID:	808619-11
Date Analyzed:	08/29/18	Data File:	808619-11.121
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	1.28
Cadmium	<1
Chromium	11.9
Lead	3.51
Mercury	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	TP-14-5ft	Client:	Floyd-Snider
Date Received:	08/28/18	Project:	Ave 55-Educator, F&BI 808619
Date Extracted:	08/29/18	Lab ID:	808619-13
Date Analyzed:	08/29/18	Data File:	808619-13.122
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	1.74
Cadmium	<1
Chromium	9.28
Lead	3.69
Mercury	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	TP-15-3.0ft	Client:	Floyd-Snider
Date Received:	08/28/18	Project:	Ave 55-Educator, F&BI 808619
Date Extracted:	08/29/18	Lab ID:	808619-15
Date Analyzed:	08/29/18	Data File:	808619-15.123
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1
Cadmium	<1
Chromium	9.53
Lead	1.12
Mercury	<1

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	UST-7.5ft	Client:	Floyd-Snider
Date Received:	08/28/18	Project:	Ave 55-Educator, F&BI 808619
Date Extracted:	08/29/18	Lab ID:	808619-18
Date Analyzed:	08/29/18	Data File:	808619-18.124
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	1.34
Cadmium	<1
Chromium	22.1
Lead	2.07
Mercury	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Floyd-Snider
Date Received:	NA	Project:	Ave 55-Educator, F&BI 808619
Date Extracted:	08/29/18	Lab ID:	I8-562 mb
Date Analyzed:	08/29/18	Data File:	I8-562 mb.112
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1
Cadmium	<1
Chromium	<1
Lead	<1
Mercury	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID: SB-2-8-8.5	Client: Floyd-Snider
Date Received: 08/28/18	Project: Ave 55-Educator, F&BI 808619
Date Extracted: 08/29/18	Lab ID: 808619-01
Date Analyzed: 08/29/18	Data File: 082925.D
Matrix: Soil	Instrument: GCMS9
Units: mg/kg (ppm) Dry Weight	Operator: JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	50	150
Toluene-d8	98	50	150
4-Bromofluorobenzene	98	50	150

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	SB-3-7.5-8.0	Client:	Floyd-Snider
Date Received:	08/28/18	Project:	Ave 55-Educator, F&BI 808619
Date Extracted:	08/29/18	Lab ID:	808619-03
Date Analyzed:	08/29/18	Data File:	082926.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	50	150
Toluene-d8	97	50	150
4-Bromofluorobenzene	100	50	150

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	SB-4-7.5-8.0	Client:	Floyd-Snider
Date Received:	08/28/18	Project:	Ave 55-Educator, F&BI 808619
Date Extracted:	08/29/18	Lab ID:	808619-04
Date Analyzed:	08/29/18	Data File:	082927.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	50	150
Toluene-d8	97	50	150
4-Bromofluorobenzene	99	50	150

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	TP-15-3.0ft	Client:	Floyd-Snider
Date Received:	08/28/18	Project:	Ave 55-Educator, F&BI 808619
Date Extracted:	08/29/18	Lab ID:	808619-15
Date Analyzed:	08/29/18	Data File:	082928.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	50	150
Toluene-d8	98	50	150
4-Bromofluorobenzene	99	50	150

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Floyd-Snider
Date Received:	Not Applicable	Project:	Ave 55-Educator, F&BI 808619
Date Extracted:	08/29/18	Lab ID:	08-1909 mb
Date Analyzed:	08/29/18	Data File:	082924.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	96	50	150
Toluene-d8	96	50	150
4-Bromofluorobenzene	99	50	150

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	TW-12-3-13	Client:	Floyd-Snider
Date Received:	08/28/18	Project:	Ave 55-Educator, F&BI 808619
Date Extracted:	08/29/18	Lab ID:	808619-16
Date Analyzed:	08/30/18	Data File:	082948.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	50	150
Toluene-d8	91	50	150
4-Bromofluorobenzene	94	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	0.21	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<1
2-Butanone (MEK)	<10	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<1	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<1	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<1	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	<1
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	TW-13-3-13	Client:	Floyd-Snider
Date Received:	08/28/18	Project:	Ave 55-Educator, F&BI 808619
Date Extracted:	08/29/18	Lab ID:	808619-17
Date Analyzed:	08/30/18	Data File:	082949.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	50	150
Toluene-d8	96	50	150
4-Bromofluorobenzene	98	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<1
2-Butanone (MEK)	<10	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<1	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<1	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<1	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	<1
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Floyd-Snider
Date Received:	Not Applicable	Project:	Ave 55-Educator, F&BI 808619
Date Extracted:	08/29/18	Lab ID:	08-1907 mb
Date Analyzed:	08/29/18	Data File:	082908.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	104	50	150
Toluene-d8	97	50	150
4-Bromofluorobenzene	101	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<1
2-Butanone (MEK)	<10	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<1	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<1	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<1	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	<1
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/07/18

Date Received: 08/28/18

Project: Ave 55-Educator, F&BI 808619

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR TPH AS GASOLINE  
USING METHOD NWTPH-Gx**

Laboratory Code: 808635-02 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Gasoline	ug/L (ppb)	1,000	93	70-119

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/07/18

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Project: Ave 55-Educator, F&BI 808619

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-Dx**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	80	76	61-133	5



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/07/18

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Project: Ave 55-Educator, F&BI 808619

**QUALITY ASSURANCE RESULTS  
FOR THE ANALYSIS OF WATER SAMPLES  
FOR DISSOLVED METALS USING EPA METHOD 6020B**

Laboratory Code: 808619-16 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	<1	104	114	75-125	9
Cadmium	ug/L (ppb)	5	<1	104	111	75-125	7
Chromium	ug/L (ppb)	20	<1	111	123	75-125	10
Lead	ug/L (ppb)	10	<1	105	110	75-125	5
Mercury	ug/L (ppb)	5	<1	104	111	75-125	7

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	110	80-120
Cadmium	ug/L (ppb)	5	115	80-120
Chromium	ug/L (ppb)	20	119	80-120
Lead	ug/L (ppb)	10	119	80-120
Mercury	ug/L (ppb)	5	111	80-120

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/07/18

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Project: Ave 55-Educator, F&BI 808619

**QUALITY ASSURANCE RESULTS  
FOR THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL METALS USING EPA METHOD 6020B**

Laboratory Code: 808619-07 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/kg (ppm)	10	1.10	98	96	75-125	2
Cadmium	mg/kg (ppm)	10	<1	105	105	75-125	0
Chromium	mg/kg (ppm)	50	8.64	100	100	75-125	0
Lead	mg/kg (ppm)	50	1.19	93	92	75-125	1
Mercury	mg/kg (ppm)	5	<1	89	95	75-125	7

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	98	80-120
Cadmium	mg/kg (ppm)	10	105	80-120
Chromium	mg/kg (ppm)	50	107	80-120
Lead	mg/kg (ppm)	50	103	80-120
Mercury	mg/kg (ppm)	5	99	80-120

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

Date of Report: 09/07/18

Date Received: 08/28/18

Project: Ave 55-Educator, F&BI 808619

### QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 808619-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Acceptance Criteria
Dichlorodifluoromethane	mg/kg (ppm)	2.5	<0.5	20	10-56
Chloromethane	mg/kg (ppm)	2.5	<0.5	51	10-90
Vinyl chloride	mg/kg (ppm)	2.5	<0.05	52	10-91
Bromomethane	mg/kg (ppm)	2.5	<0.5	61	10-110
Chloroethane	mg/kg (ppm)	2.5	<0.5	61	10-101
Trichlorofluoromethane	mg/kg (ppm)	2.5	<0.5	58	10-95
Acetone	mg/kg (ppm)	12.5	<0.5	96	11-141
1,1-Dichloroethene	mg/kg (ppm)	2.5	<0.05	68	22-107
Hexane	mg/kg (ppm)	2.5	<0.25	53	10-95
Methylene chloride	mg/kg (ppm)	2.5	<0.5	83	14-128
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	<0.05	88	17-134
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	78	13-112
1,1-Dichloroethane	mg/kg (ppm)	2.5	<0.05	86	23-115
2,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	85	18-117
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	86	25-120
Chloroform	mg/kg (ppm)	2.5	<0.05	86	29-117
2-Butanone (MEK)	mg/kg (ppm)	12.5	<0.5	96	20-133
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	<0.05	92	22-124
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	<0.05	82	27-112
1,1-Dichloropropene	mg/kg (ppm)	2.5	<0.05	83	26-107
Carbon tetrachloride	mg/kg (ppm)	2.5	<0.05	83	28-126
Benzene	mg/kg (ppm)	2.5	<0.03	83	26-114
Trichloroethene	mg/kg (ppm)	2.5	<0.02	82	30-112
1,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	89	31-119
Bromodichloromethane	mg/kg (ppm)	2.5	<0.05	88	31-131
Dibromomethane	mg/kg (ppm)	2.5	<0.05	86	27-124
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	<0.5	93	16-147
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	87	28-137
Toluene	mg/kg (ppm)	2.5	<0.05	89	34-112
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	89	30-136
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	<0.05	90	32-126
2-Hexanone	mg/kg (ppm)	12.5	<0.5	93	17-147
1,3-Dichloropropane	mg/kg (ppm)	2.5	<0.05	91	29-125
Tetrachloroethene	mg/kg (ppm)	2.5	<0.025	84	25-114
Dibromochloromethane	mg/kg (ppm)	2.5	<0.05	91	32-143
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	<0.05	88	32-126
Chlorobenzene	mg/kg (ppm)	2.5	<0.05	87	37-113
Ethylbenzene	mg/kg (ppm)	2.5	<0.05	89	34-115
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	94	35-126
m,p-Xylene	mg/kg (ppm)	5	<0.1	88	25-125
o-Xylene	mg/kg (ppm)	2.5	<0.05	90	27-126
Styrene	mg/kg (ppm)	2.5	<0.05	89	39-121
Isopropylbenzene	mg/kg (ppm)	2.5	<0.05	88	34-123
Bromoform	mg/kg (ppm)	2.5	<0.05	90	18-155
n-Propylbenzene	mg/kg (ppm)	2.5	<0.05	92	31-120
Bromobenzene	mg/kg (ppm)	2.5	<0.05	91	40-115
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	<0.05	91	24-130
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	94	27-148
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	<0.05	92	33-123
2-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	91	39-110
4-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	89	39-111
tert-Butylbenzene	mg/kg (ppm)	2.5	<0.05	90	36-116
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	<0.05	90	35-116
sec-Butylbenzene	mg/kg (ppm)	2.5	<0.05	92	33-118
p-Isopropyltoluene	mg/kg (ppm)	2.5	<0.05	90	32-119
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	90	38-111
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	87	39-109
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	91	40-111
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	<0.5	95	47-127
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	91	31-121
Hexachlorobutadiene	mg/kg (ppm)	2.5	<0.25	93	24-128
Naphthalene	mg/kg (ppm)	2.5	<0.05	91	24-139
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	92	35-117

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/07/18

Date Received: 08/28/18

Project: Ave 55-Educator, F&BI 808619

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES  
FOR VOLATILES BY EPA METHOD 8260C**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	mg/kg (ppm)	2.5	51	47	10-76	8
Chloromethane	mg/kg (ppm)	2.5	77	71	34-98	8
Vinyl chloride	mg/kg (ppm)	2.5	84	78	42-107	7
Bromomethane	mg/kg (ppm)	2.5	86	82	46-113	5
Chloroethane	mg/kg (ppm)	2.5	88	82	47-115	7
Trichlorofluoromethane	mg/kg (ppm)	2.5	93	87	53-112	7
Acetone	mg/kg (ppm)	12.5	120	100	39-147	18
1,1-Dichloroethene	mg/kg (ppm)	2.5	101	93	65-110	8
Hexane	mg/kg (ppm)	2.5	92	89	55-107	3
Methylene chloride	mg/kg (ppm)	2.5	111	98	50-127	12
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	108	98	72-122	10
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	107	97	71-113	10
1,1-Dichloroethane	mg/kg (ppm)	2.5	110 vo	102	74-109	8
2,2-Dichloropropane	mg/kg (ppm)	2.5	114	103	64-151	10
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	111 vo	101	73-110	9
Chloroform	mg/kg (ppm)	2.5	108	98	76-110	10
2-Butanone (MEK)	mg/kg (ppm)	12.5	95	100	60-121	5
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	106	103	73-111	3
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	107	100	72-116	7
1,1-Dichloropropene	mg/kg (ppm)	2.5	105	98	72-112	7
Carbon tetrachloride	mg/kg (ppm)	2.5	108	102	67-123	6
Benzene	mg/kg (ppm)	2.5	99	96	72-106	3
Trichloroethene	mg/kg (ppm)	2.5	98	95	72-107	3
1,2-Dichloropropane	mg/kg (ppm)	2.5	100	102	74-115	2
Bromodichloromethane	mg/kg (ppm)	2.5	102	99	75-126	3
Dibromomethane	mg/kg (ppm)	2.5	97	95	76-116	2
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	92	102	80-128	10
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	92	99	71-138	7
Toluene	mg/kg (ppm)	2.5	105	101	74-111	4
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	95	100	77-135	5
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	99	100	77-116	1
2-Hexanone	mg/kg (ppm)	12.5	88	105	70-129	18
1,3-Dichloropropane	mg/kg (ppm)	2.5	97	100	75-115	3
Tetrachloroethene	mg/kg (ppm)	2.5	101	95	73-111	6
Dibromochloromethane	mg/kg (ppm)	2.5	104	102	64-152	2
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	95	98	77-117	3
Chlorobenzene	mg/kg (ppm)	2.5	101	97	76-109	4
Ethylbenzene	mg/kg (ppm)	2.5	104	99	75-112	5
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	119	105	76-125	12
m,p-Xylene	mg/kg (ppm)	5	101	97	77-115	4
o-Xylene	mg/kg (ppm)	2.5	108	101	76-115	7
Styrene	mg/kg (ppm)	2.5	102	100	76-119	2
Isopropylbenzene	mg/kg (ppm)	2.5	107	99	76-120	8
Bromoform	mg/kg (ppm)	2.5	103	101	50-174	2
n-Propylbenzene	mg/kg (ppm)	2.5	105	102	77-115	3
Bromobenzene	mg/kg (ppm)	2.5	101	100	76-112	1
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	107	100	77-121	7
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	106	101	74-121	5
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	100	98	74-116	2
2-Chlorotoluene	mg/kg (ppm)	2.5	107	101	75-113	6
4-Chlorotoluene	mg/kg (ppm)	2.5	100	100	77-115	0
tert-Butylbenzene	mg/kg (ppm)	2.5	106	99	77-123	7
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	106	99	77-119	7
sec-Butylbenzene	mg/kg (ppm)	2.5	108	101	78-120	7
p-Isopropyltoluene	mg/kg (ppm)	2.5	106	99	77-120	7
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	104	99	76-112	5
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	100	96	74-109	4
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	110	99	75-114	11
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	117	103	68-122	13
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	116	98	75-122	17
Hexachlorobutadiene	mg/kg (ppm)	2.5	116	99	74-130	16
Naphthalene	mg/kg (ppm)	2.5	115	98	73-122	16
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	118 vo	101	75-117	16

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/07/18

Date Received: 08/28/18

Project: Ave 55-Educator, F&BI 808619

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR VOLATILES BY EPA METHOD 8260C**

Laboratory Code: 808542-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent	Acceptance
				Recovery MS	Criteria
Dichlorodifluoromethane	ug/L (ppb)	50	<1	124	55-137
Chloromethane	ug/L (ppb)	50	<10	115	61-120
Vinyl chloride	ug/L (ppb)	50	<0.2	115	61-139
Bromomethane	ug/L (ppb)	50	<1	110	20-265
Chloroethane	ug/L (ppb)	50	<1	105	55-149
Trichlorofluoromethane	ug/L (ppb)	50	<1	114	71-128
Acetone	ug/L (ppb)	250	<50	123	48-149
1,1-Dichloroethene	ug/L (ppb)	50	<1	112	71-123
Hexane	ug/L (ppb)	50	<1	106	44-139
Methylene chloride	ug/L (ppb)	50	<5	113	61-126
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	112	68-125
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	110	72-122
1,1-Dichloroethane	ug/L (ppb)	50	<1	113	79-113
2,2-Dichloropropane	ug/L (ppb)	50	<1	121	48-157
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	109	63-126
Chloroform	ug/L (ppb)	50	<1	106	77-117
2-Butanone (MEK)	ug/L (ppb)	250	<10	115	70-135
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	112	70-119
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	110	75-121
1,1-Dichloropropene	ug/L (ppb)	50	<1	108	67-121
Carbon tetrachloride	ug/L (ppb)	50	<1	112	70-132
Benzene	ug/L (ppb)	50	<0.35	104	75-114
Trichloroethene	ug/L (ppb)	50	<1	102	73-122
1,2-Dichloropropane	ug/L (ppb)	50	<1	111	80-111
Bromodichloromethane	ug/L (ppb)	50	<1	109	78-117
Dibromomethane	ug/L (ppb)	50	<1	104	73-125
4-Methyl-2-pentanone	ug/L (ppb)	250	<10	112	79-140
cis-1,3-Dichloropropene	ug/L (ppb)	50	<1	109	76-120
Toluene	ug/L (ppb)	50	<1	110	73-117
trans-1,3-Dichloropropene	ug/L (ppb)	50	<1	109	75-122
1,1,2-Trichloroethane	ug/L (ppb)	50	<1	109	81-116
2-Hexanone	ug/L (ppb)	250	<10	113	74-127
1,3-Dichloropropane	ug/L (ppb)	50	<1	109	80-113
Tetrachloroethene	ug/L (ppb)	50	<1	104	72-113
Dibromochloromethane	ug/L (ppb)	50	<1	109	69-129
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	<1	107	79-120
Chlorobenzene	ug/L (ppb)	50	<1	106	75-115
Ethylbenzene	ug/L (ppb)	50	<1	107	66-124
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	<1	113	76-130
m,p-Xylene	ug/L (ppb)	100	<2	104	63-128
o-Xylene	ug/L (ppb)	50	<1	107	64-129
Styrene	ug/L (ppb)	50	<1	107	56-142
Isopropylbenzene	ug/L (ppb)	50	<1	105	74-122
Bromoform	ug/L (ppb)	50	<1	108	49-138
n-Propylbenzene	ug/L (ppb)	50	<1	111	65-129
Bromobenzene	ug/L (ppb)	50	<1	110	70-121
1,3,5-Trimethylbenzene	ug/L (ppb)	50	<1	109	60-138
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	<1	113	79-120
1,2,3-Trichloropropane	ug/L (ppb)	50	<1	111	62-125
2-Chlorotoluene	ug/L (ppb)	50	<1	110	40-159
4-Chlorotoluene	ug/L (ppb)	50	<1	107	76-122
tert-Butylbenzene	ug/L (ppb)	50	<1	109	74-125
1,2,4-Trimethylbenzene	ug/L (ppb)	50	<1	107	59-136
sec-Butylbenzene	ug/L (ppb)	50	<1	110	69-127
p-Isopropyltoluene	ug/L (ppb)	50	<1	106	64-132
1,3-Dichlorobenzene	ug/L (ppb)	50	<1	108	77-113
1,4-Dichlorobenzene	ug/L (ppb)	50	<1	104	75-110
1,2-Dichlorobenzene	ug/L (ppb)	50	<1	109	70-120
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	<10	116	69-129
1,2,4-Trichlorobenzene	ug/L (ppb)	50	<1	110	66-123
Hexachlorobutadiene	ug/L (ppb)	50	<1	108	53-136
Naphthalene	ug/L (ppb)	50	<1	112	60-145
1,2,3-Trichlorobenzene	ug/L (ppb)	50	<1	111	59-130

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/07/18

Date Received: 08/28/18

Project: Ave 55-Educator, F&BI 808619

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR VOLATILES BY EPA METHOD 8260C**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	ug/L (ppb)	50	126	126	50-157	0
Chloromethane	ug/L (ppb)	50	116	116	62-130	0
Vinyl chloride	ug/L (ppb)	50	116	115	70-128	1
Bromomethane	ug/L (ppb)	50	111	111	62-188	0
Chloroethane	ug/L (ppb)	50	107	107	66-149	0
Trichlorofluoromethane	ug/L (ppb)	50	114	115	70-132	1
Acetone	ug/L (ppb)	250	112	118	44-145	5
1,1-Dichloroethene	ug/L (ppb)	50	111	113	75-119	2
Hexane	ug/L (ppb)	50	105	105	51-153	0
Methylene chloride	ug/L (ppb)	50	106	111	63-132	5
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	111	112	70-122	1
trans-1,2-Dichloroethene	ug/L (ppb)	50	110	110	76-118	0
1,1-Dichloroethane	ug/L (ppb)	50	112	112	77-119	0
2,2-Dichloropropane	ug/L (ppb)	50	124	124	62-141	0
cis-1,2-Dichloroethene	ug/L (ppb)	50	108	108	76-119	0
Chloroform	ug/L (ppb)	50	105	106	78-117	1
2-Butanone (MEK)	ug/L (ppb)	250	112	110	49-147	2
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	112	111	78-114	1
1,1,1-Trichloroethane	ug/L (ppb)	50	107	109	80-116	2
1,1-Dichloropropene	ug/L (ppb)	50	107	107	78-119	0
Carbon tetrachloride	ug/L (ppb)	50	108	108	72-128	0
Benzene	ug/L (ppb)	50	103	103	75-116	0
Trichloroethene	ug/L (ppb)	50	102	101	72-119	1
1,2-Dichloropropane	ug/L (ppb)	50	110	110	79-121	0
Bromodichloromethane	ug/L (ppb)	50	106	107	76-120	1
Dibromomethane	ug/L (ppb)	50	103	104	79-121	1
4-Methyl-2-pentanone	ug/L (ppb)	250	111	111	54-153	0
cis-1,3-Dichloropropene	ug/L (ppb)	50	109	108	76-128	1
Toluene	ug/L (ppb)	50	107	109	79-115	2
trans-1,3-Dichloropropene	ug/L (ppb)	50	107	109	76-128	2
1,1,2-Trichloroethane	ug/L (ppb)	50	106	108	78-120	2
2-Hexanone	ug/L (ppb)	250	111	114	49-147	3
1,3-Dichloropropane	ug/L (ppb)	50	107	108	81-115	1
Tetrachloroethene	ug/L (ppb)	50	102	103	78-109	1
Dibromochloromethane	ug/L (ppb)	50	105	108	63-140	3
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	103	107	82-118	4
Chlorobenzene	ug/L (ppb)	50	103	105	80-113	2
Ethylbenzene	ug/L (ppb)	50	105	106	83-111	1
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	110	113	76-125	3
m,p-Xylene	ug/L (ppb)	100	103	104	84-112	1
o-Xylene	ug/L (ppb)	50	105	107	81-117	2
Styrene	ug/L (ppb)	50	105	107	83-121	2
Isopropylbenzene	ug/L (ppb)	50	102	104	81-122	2
Bromoform	ug/L (ppb)	50	105	108	40-161	3
n-Propylbenzene	ug/L (ppb)	50	108	109	81-115	1
Bromobenzene	ug/L (ppb)	50	108	108	80-113	0
1,3,5-Trimethylbenzene	ug/L (ppb)	50	106	107	83-117	1
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	111	112	79-118	1
1,2,3-Trichloropropane	ug/L (ppb)	50	108	111	74-116	3
2-Chlorotoluene	ug/L (ppb)	50	108	108	79-112	0
4-Chlorotoluene	ug/L (ppb)	50	105	106	80-116	1
tert-Butylbenzene	ug/L (ppb)	50	105	108	81-119	3
1,2,4-Trimethylbenzene	ug/L (ppb)	50	105	106	81-121	1
sec-Butylbenzene	ug/L (ppb)	50	108	108	83-123	0
p-Isopropyltoluene	ug/L (ppb)	50	105	106	81-122	1
1,3-Dichlorobenzene	ug/L (ppb)	50	105	107	80-115	2
1,4-Dichlorobenzene	ug/L (ppb)	50	101	102	77-112	1
1,2-Dichlorobenzene	ug/L (ppb)	50	107	107	79-115	0
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	111	113	62-133	2
1,2,4-Trichlorobenzene	ug/L (ppb)	50	108	107	75-119	1
Hexachlorobutadiene	ug/L (ppb)	50	105	106	70-116	1
Naphthalene	ug/L (ppb)	50	110	110	72-131	0
1,2,3-Trichlorobenzene	ug/L (ppb)	50	109	108	74-122	1

**Data Qualifiers & Definitions**

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

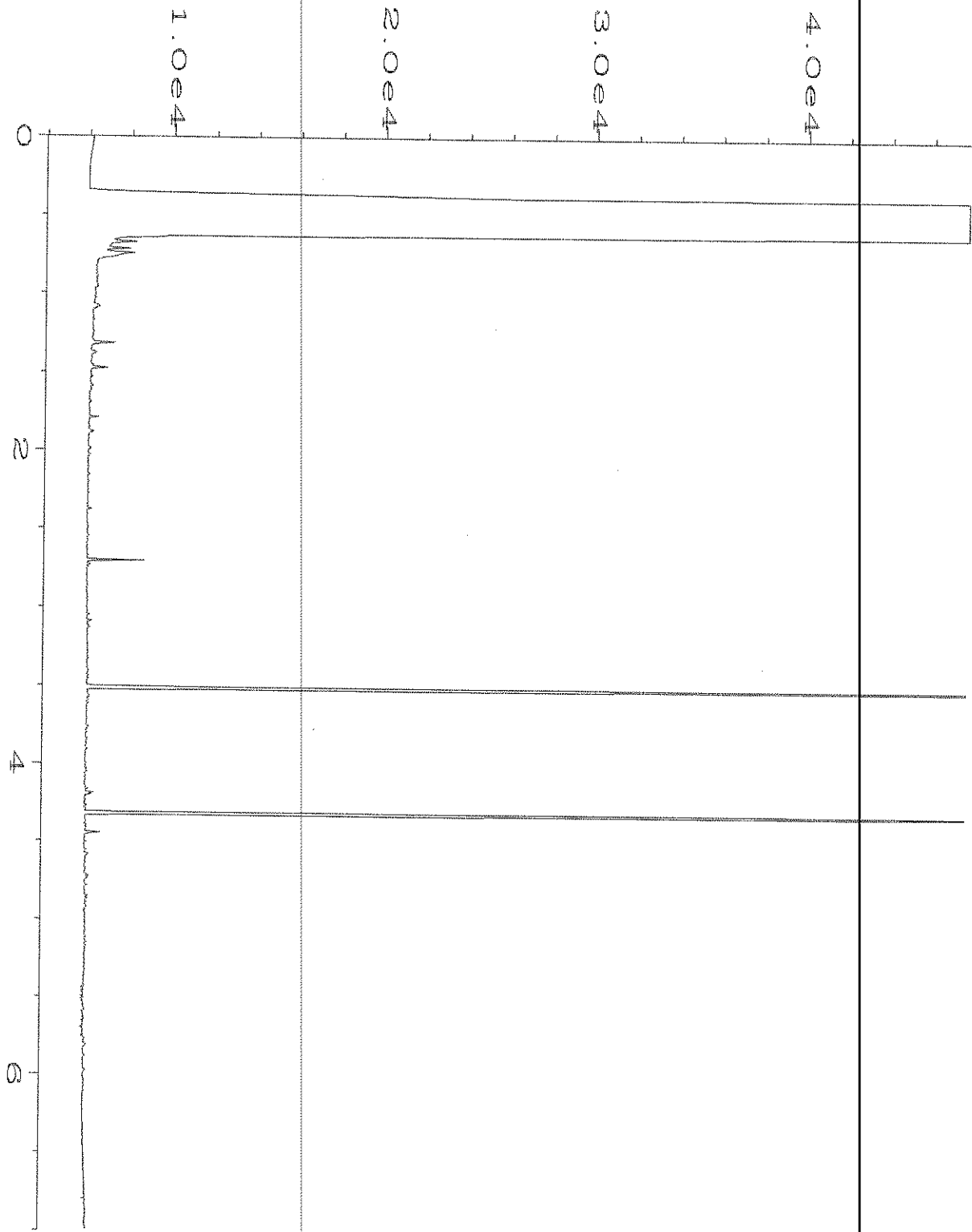
nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

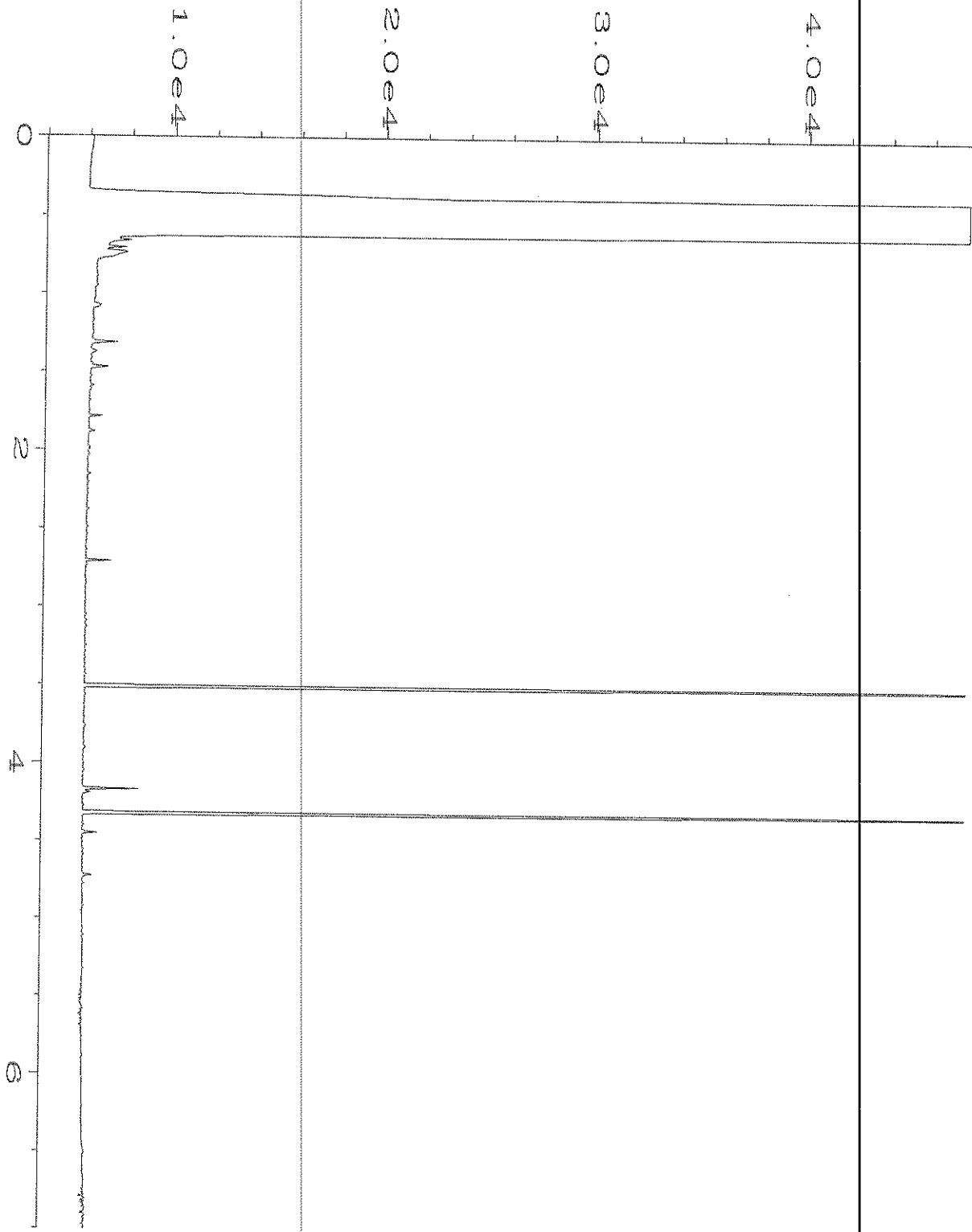
vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

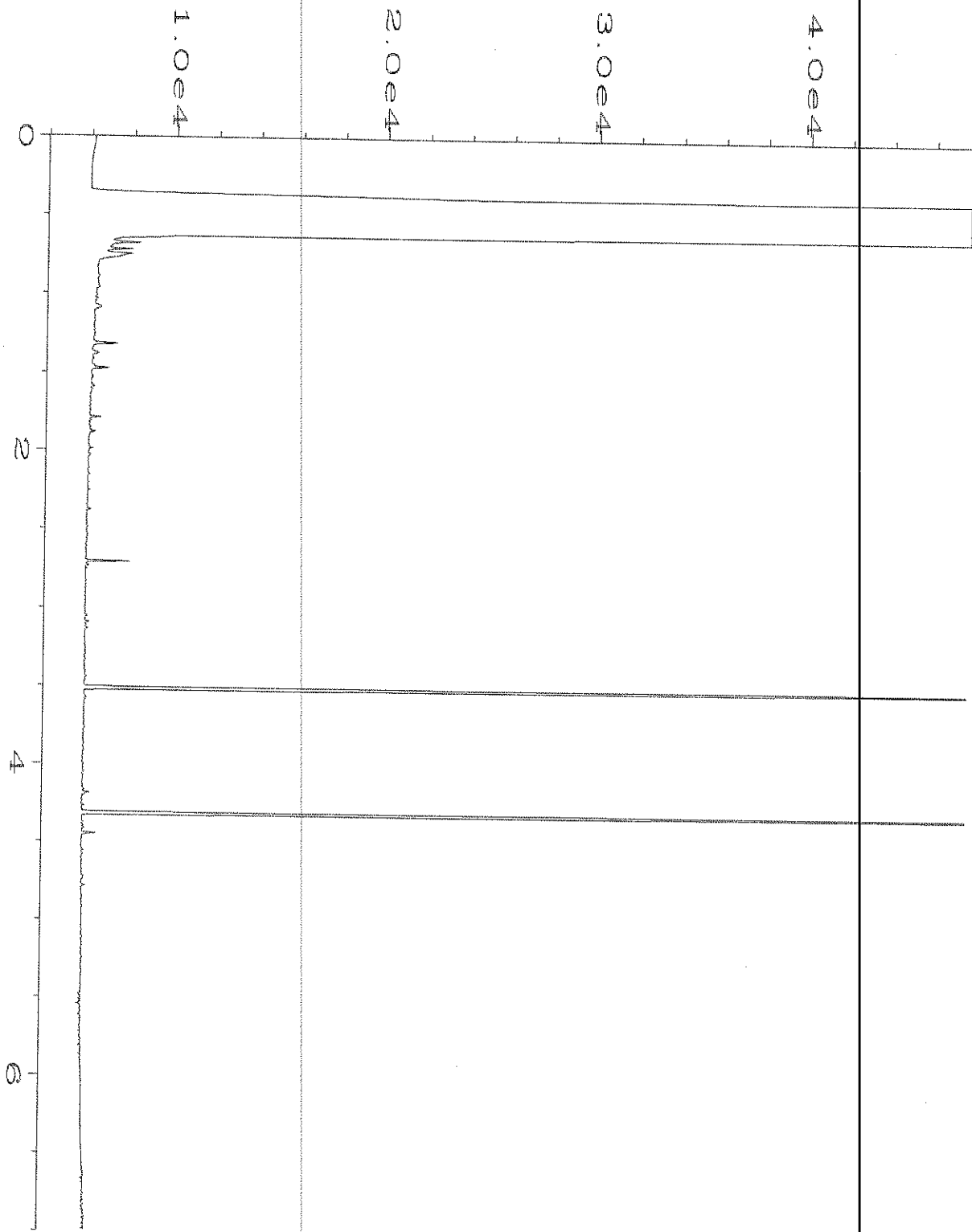


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Instrument	: GC6	Injection Number	: 1
Sample Name	: 808619-01	Sequence Line	: 6
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 29 Aug 18 03:28 PM	Analysis Method	: DX.MTH
Report Created on:	30 Aug 18 07:35 AM		

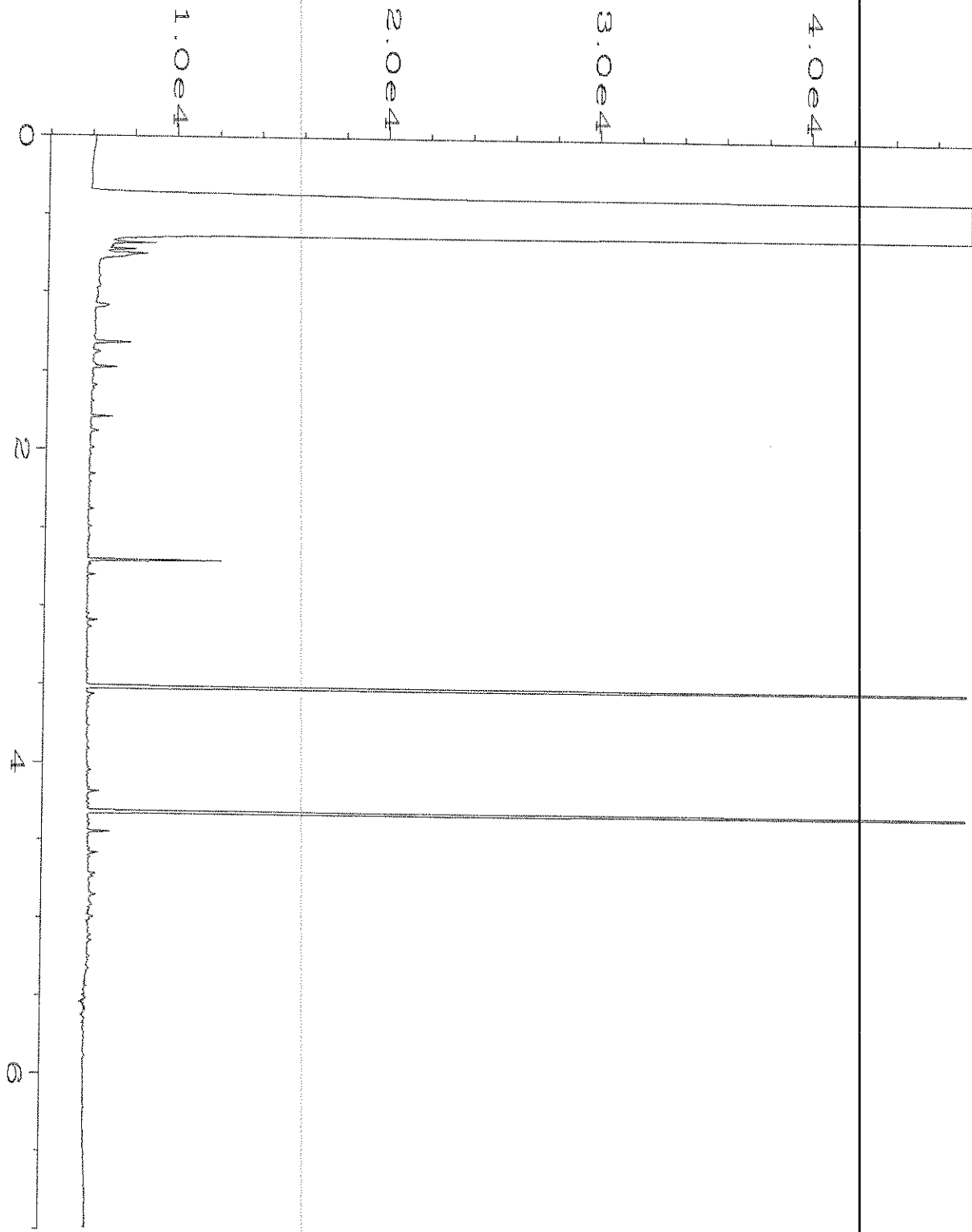




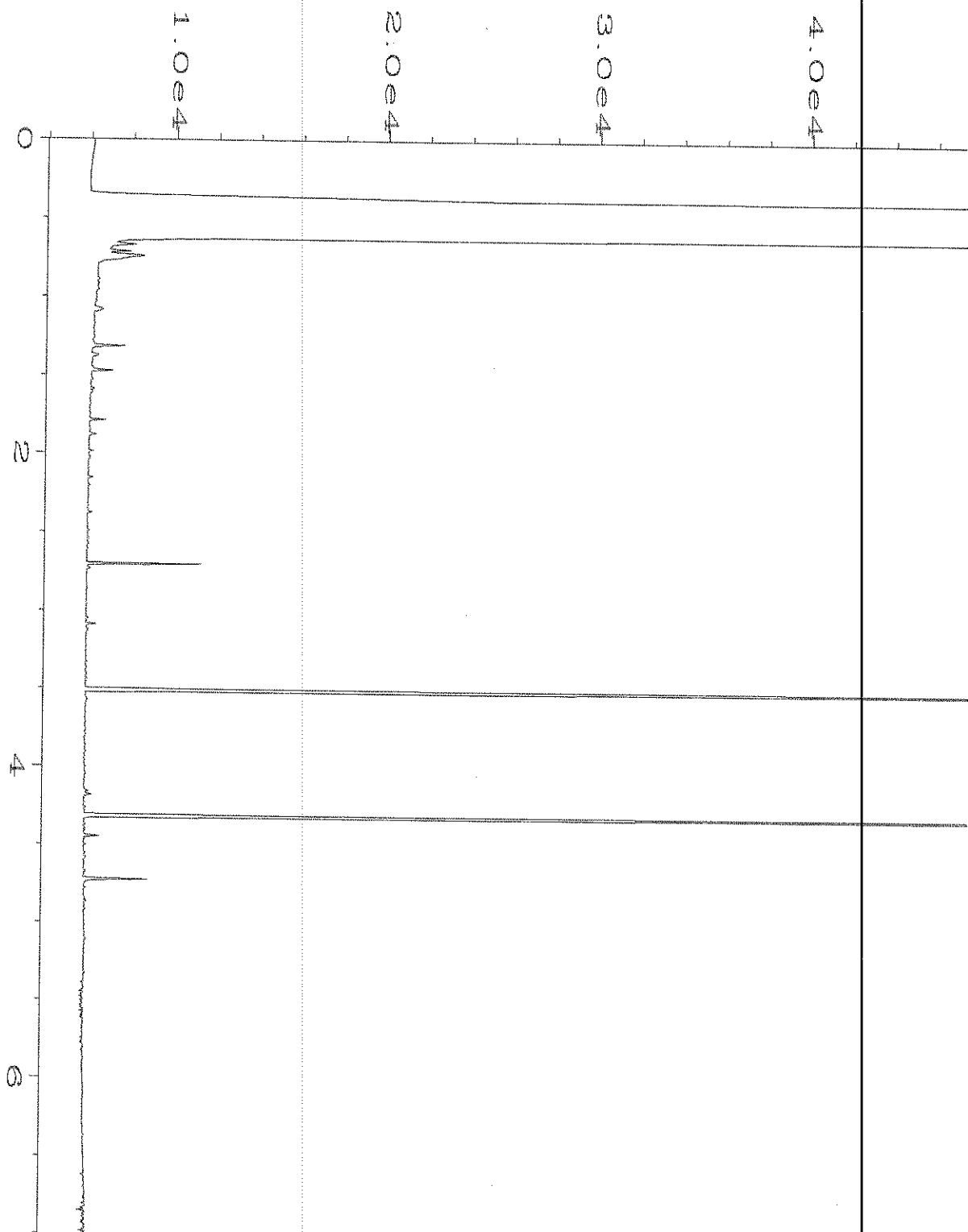
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Instrument	: GC6	Injection Number	: 1
Sample Name	: 808619-02	Sequence Line	: 6
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 29 Aug 18 03:39 PM	Analysis Method	: DX.MTH
Report Created on:	30 Aug 18 07:35 AM		



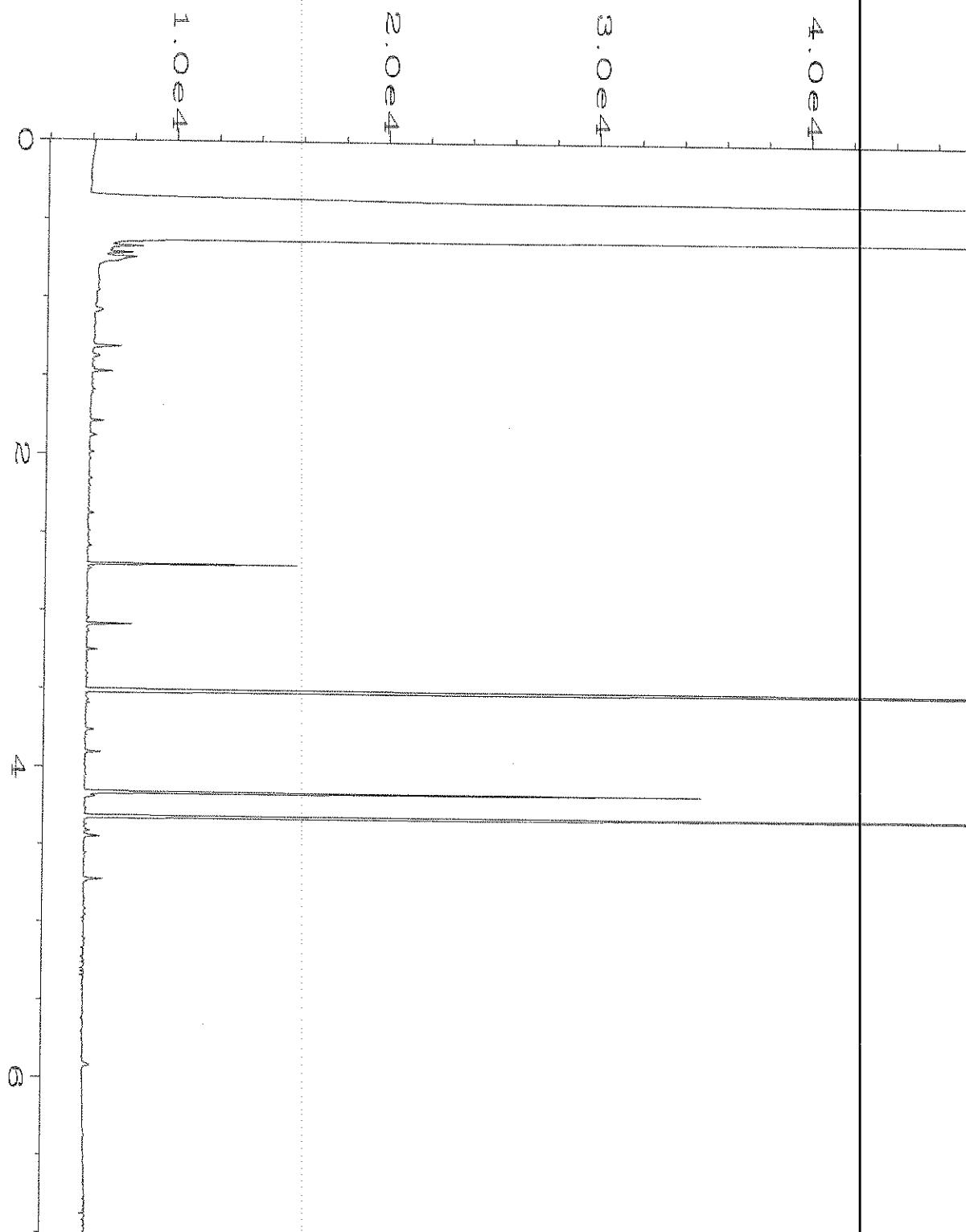
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Operator	: TL	Vial Number	: 33
Instrument	: GC6	Injection Number	: 1
Sample Name	: 808619-03	Sequence Line	: 6
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 29 Aug 18 03:51 PM	Analysis Method	: DX.MTH
Report Created on:	30 Aug 18 07:35 AM		



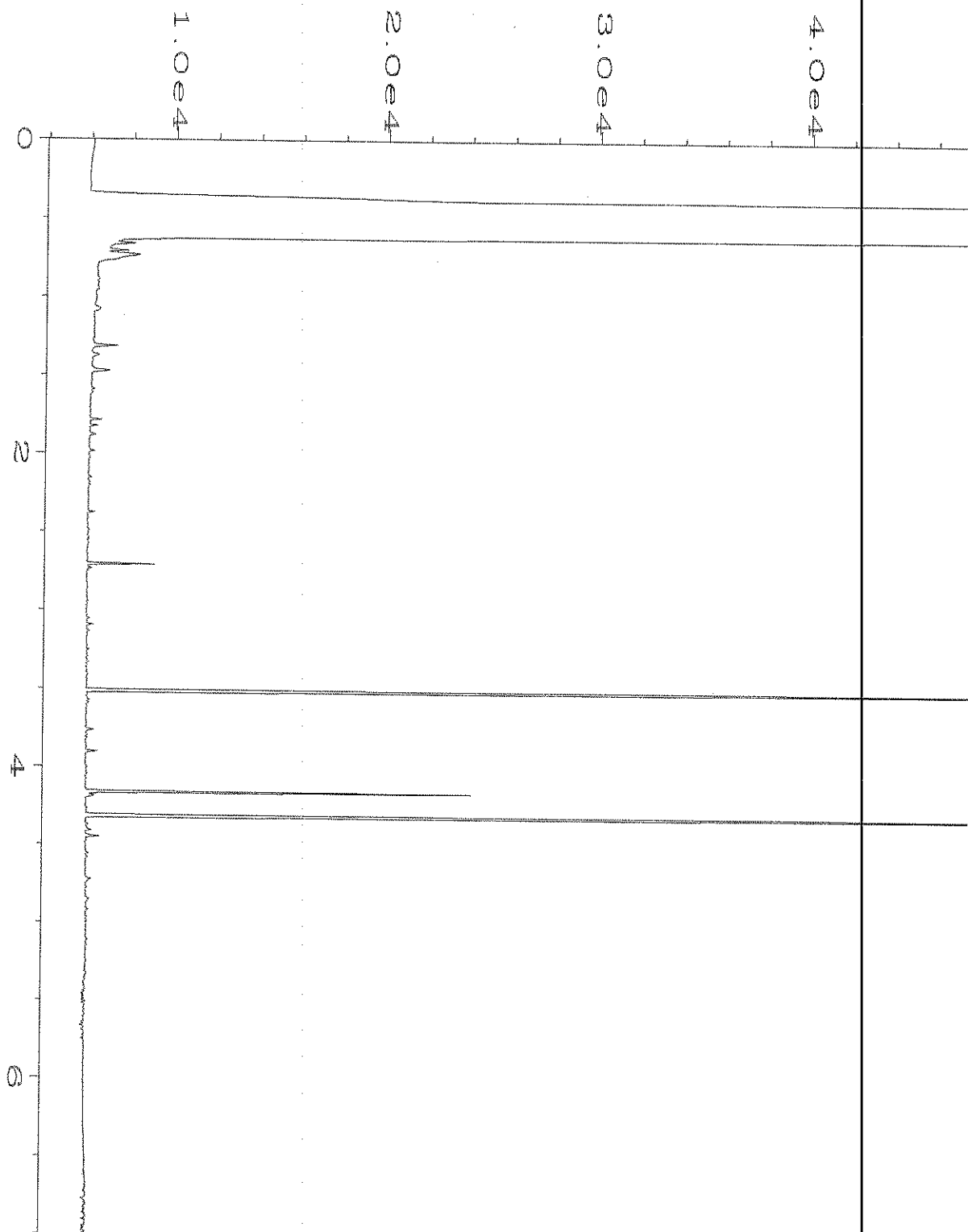
Data File Name	: C:\HPCHEM\6\DATA\08-29-18\034F0601.D	Page Number	: 1
Operator	: TL	Vial Number	: 34
Instrument	: GC6	Injection Number	: 1
Sample Name	: 808619-04	Sequence Line	: 6
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 29 Aug 18 04:02 PM	Analysis Method	: DX.MTH
Report Created on:	30 Aug 18 07:36 AM		



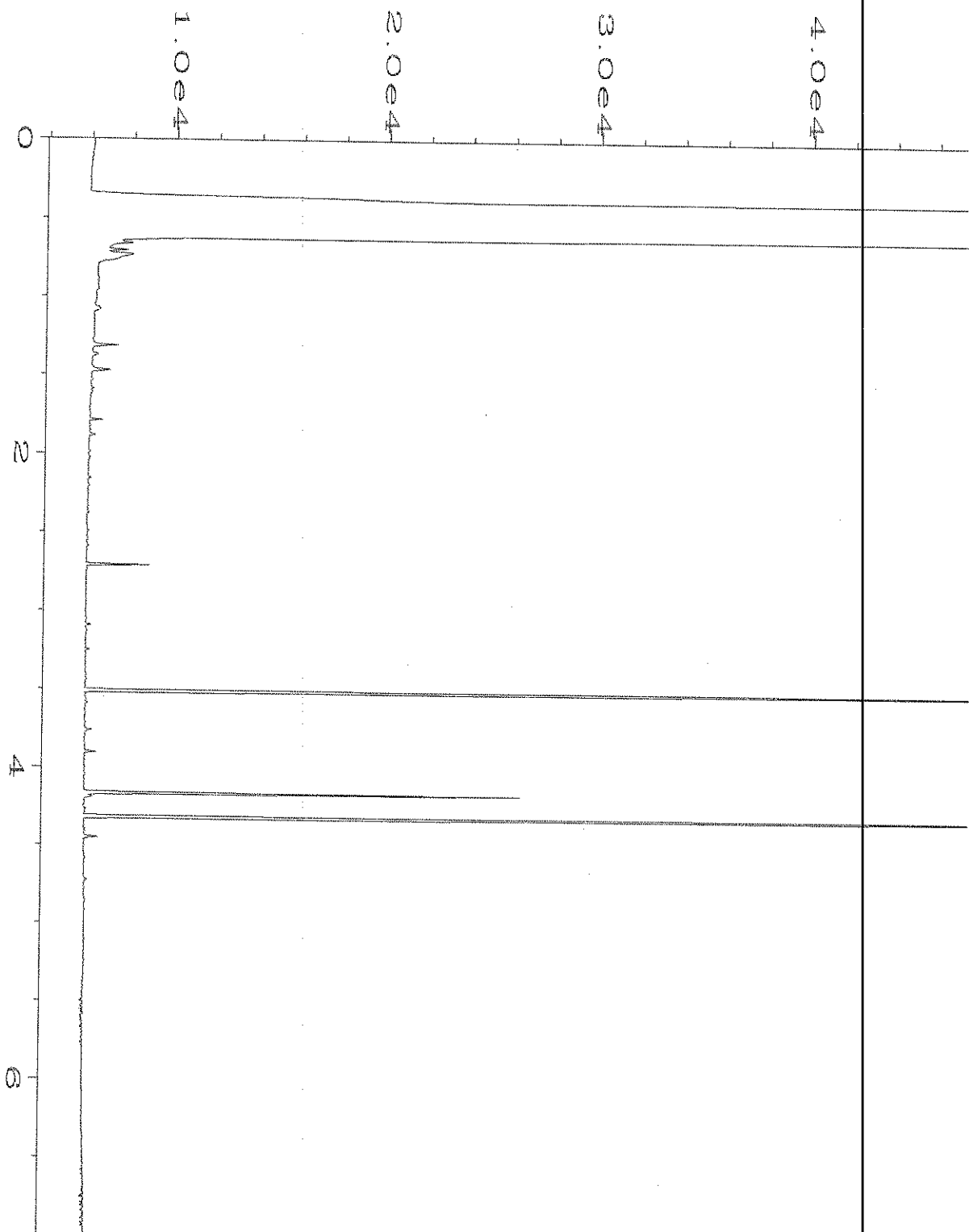
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Operator	: TL	Vial Number	: 35
Instrument	: GC6	Injection Number	: 1
Sample Name	: 808619-05	Sequence Line	: 6
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 29 Aug 18 04:13 PM	Analysis Method	: DX.MTH
Report Created on:	30 Aug 18 07:36 AM		



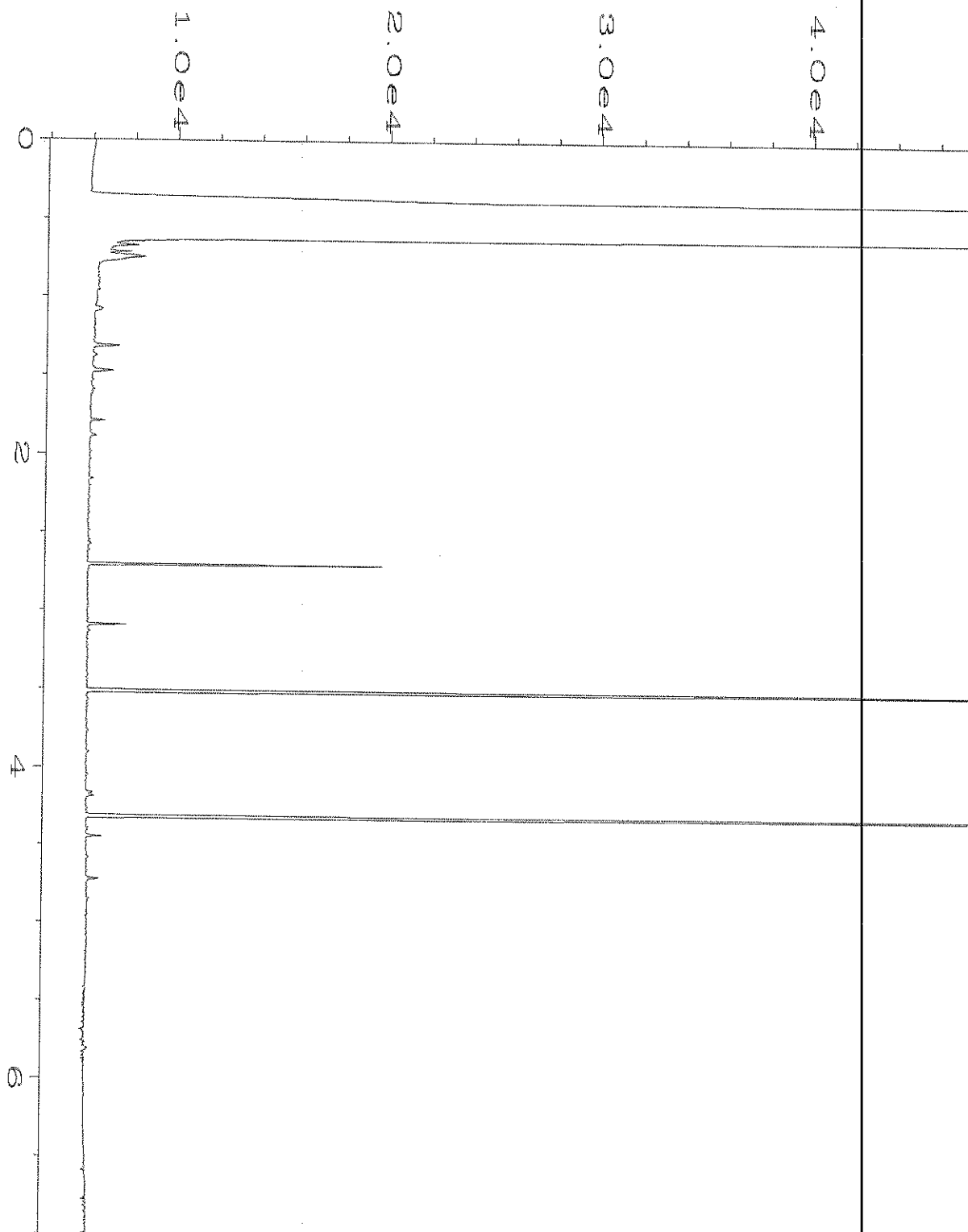
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Instrument	: GC6	Injection Number	: 1
Sample Name	: 808619-07	Sequence Line	: 6
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 29 Aug 18 04:24 PM	Analysis Method	: DX.MTH
Report Created on:	30 Aug 18 07:36 AM		



Data File Name	: C:\HPCHEM\6\DATA\08-29-18\037F0601.D	Page Number	: 1
Operator	: TL	Vial Number	: 37
Instrument	: GC6	Injection Number	: 1
Sample Name	: 808619-09	Sequence Line	: 6
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 29 Aug 18 04:36 PM	Analysis Method	: DX.MTH
Report Created on:	30 Aug 18 07:36 AM		

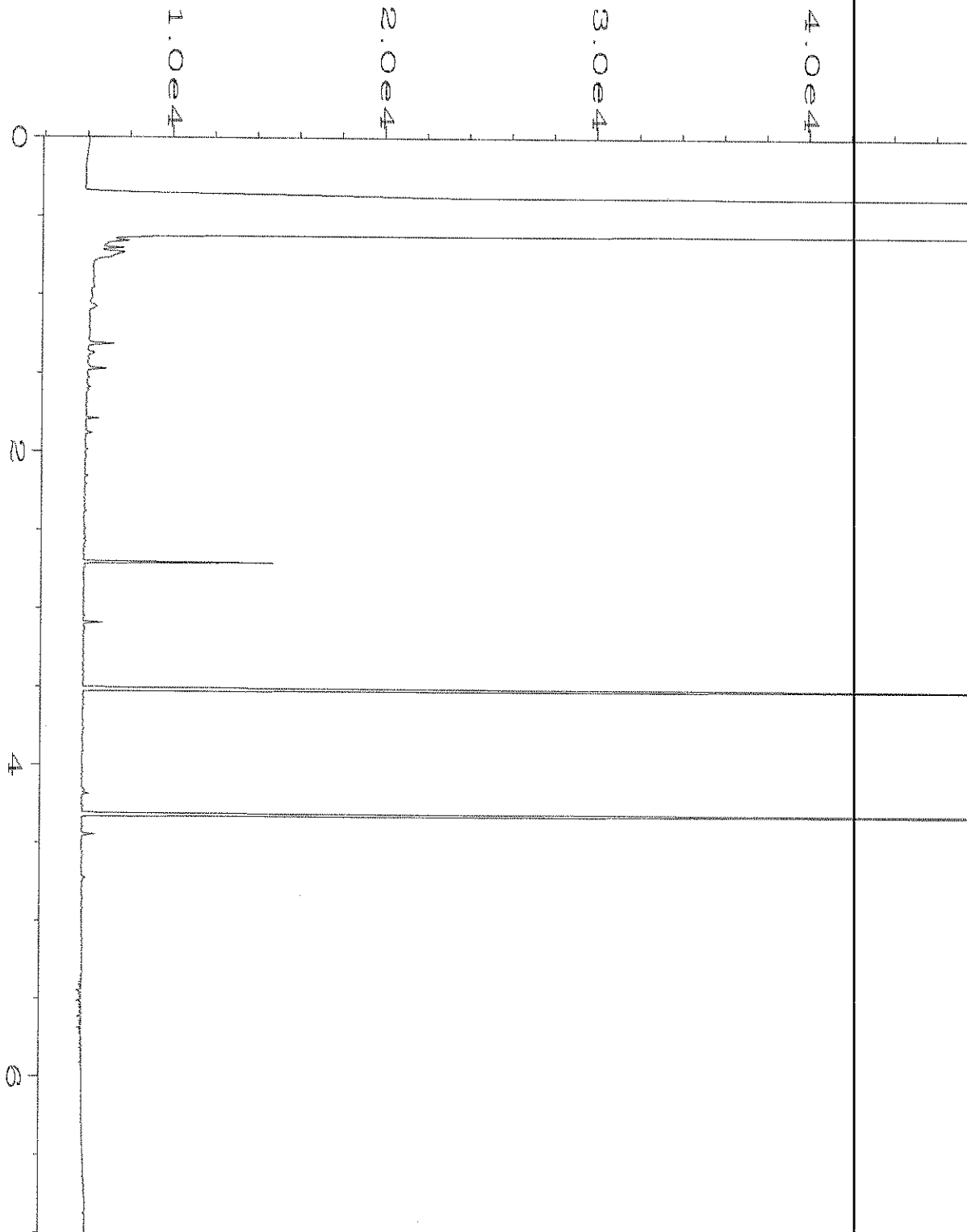


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Operator	: TL	Vial Number	: 38
Instrument	: GC6	Injection Number	: 1
Sample Name	: 808619-11	Sequence Line	: 6
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 29 Aug 18 04:47 PM	Analysis Method	: DX.MTH
Report Created on:	30 Aug 18 07:36 AM		

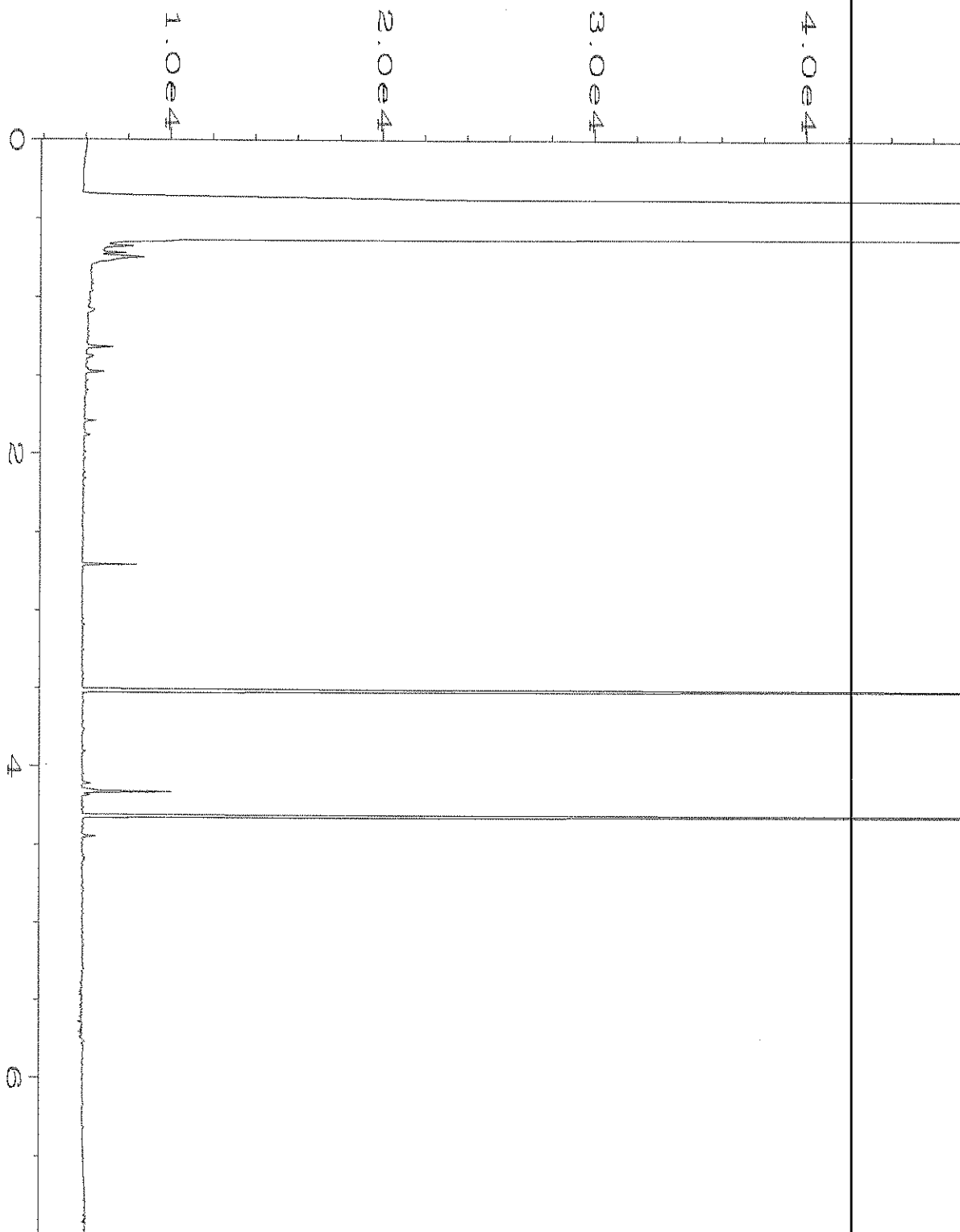


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Operator	: TL	Vial Number	: 39
Instrument	: GC6	Injection Number	: 1
Sample Name	: 808619-13	Sequence Line	: 6
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 29 Aug 18 04:58 PM	Analysis Method	: DX.MTH
Report Created on:	30 Aug 18 07:37 AM		

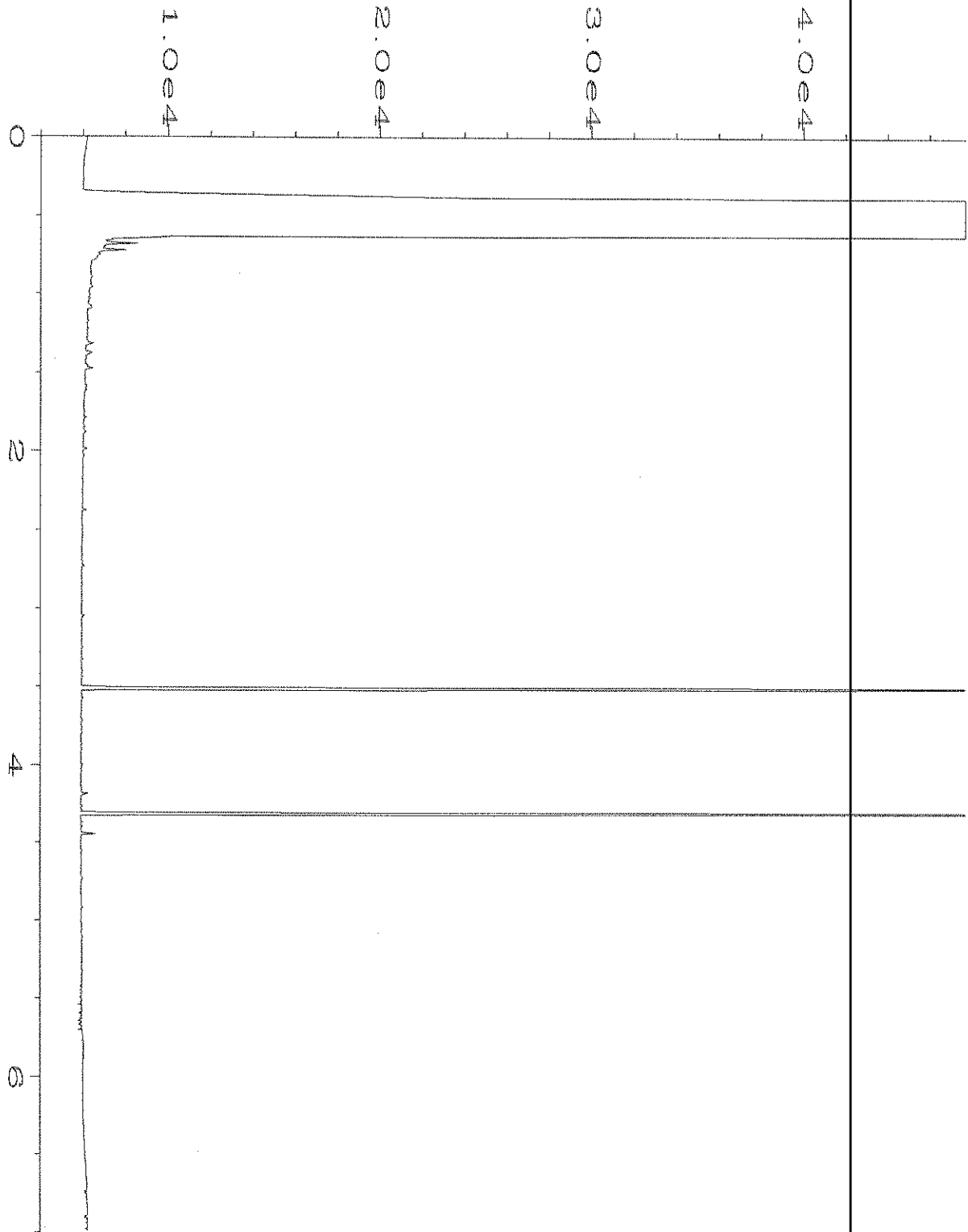




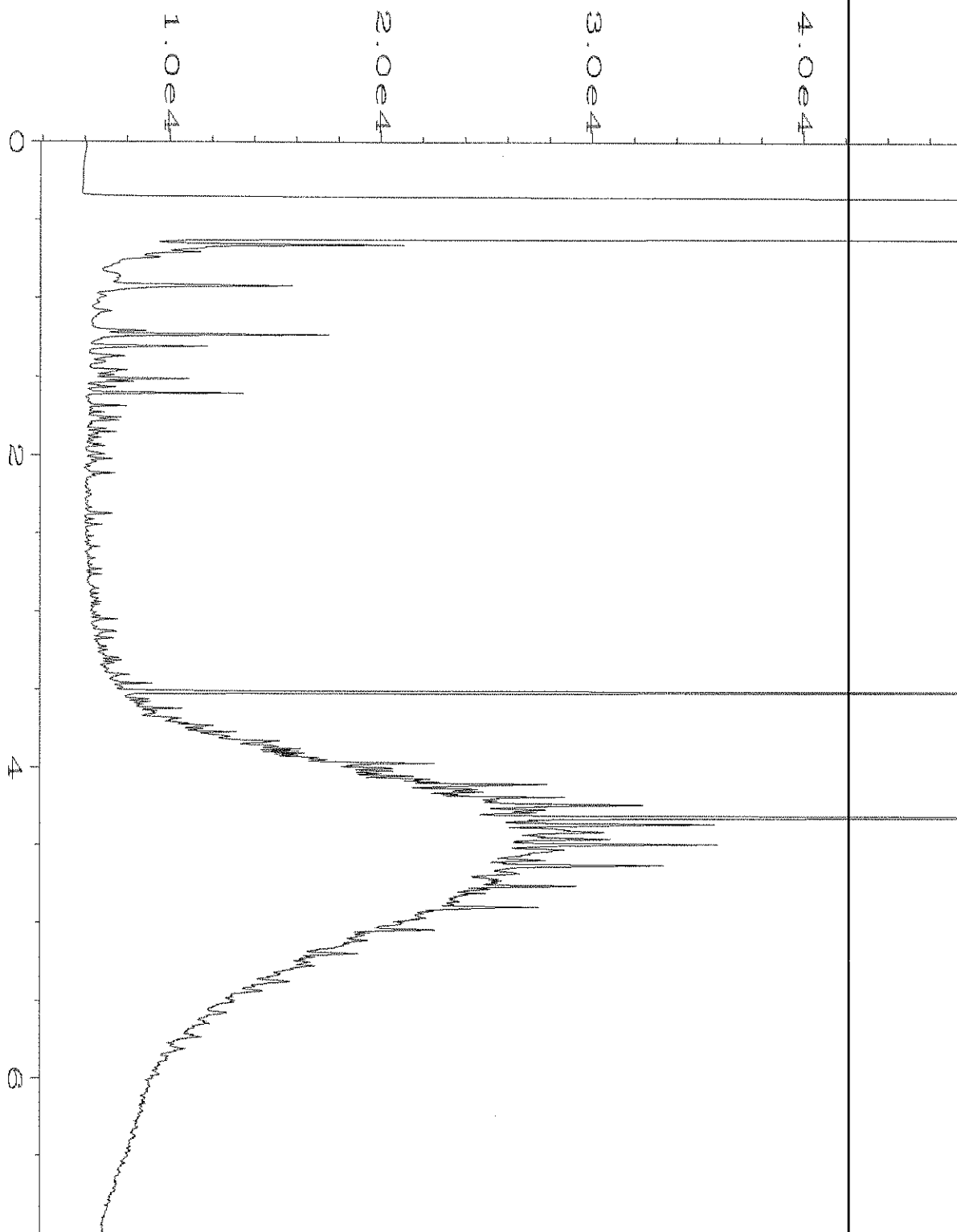
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Operator	: TL	Vial Number	40
Instrument	: GC6	Injection Number	1
Sample Name	: 808619-15	Sequence Line	6
Run Time Bar Code:		Instrument Method	DX.MTH
Acquired on	: 29 Aug 18 05:10 PM	Analysis Method	DX.MTH
Report Created on:	30 Aug 18 07:37 AM		



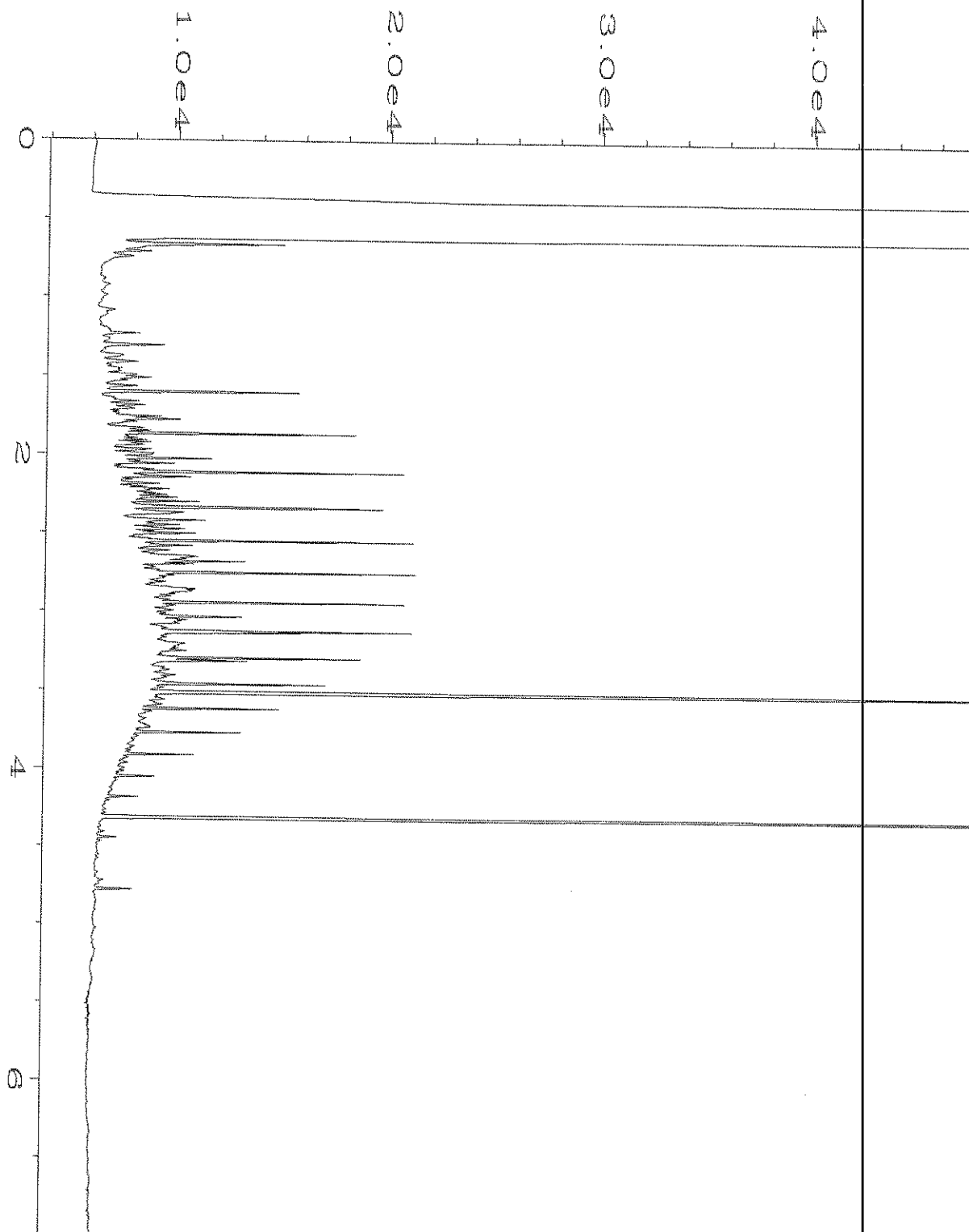
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Instrument	: GC6	Injection Number	: 1
Sample Name	: 808619-18	Sequence Line	: 6
Run Time Bar Code:		Instrument Method	: DX.MTH
Acquired on	: 29 Aug 18 05:21 PM	Analysis Method	: DX.MTH
Report Created on:	30 Aug 18 07:37 AM		



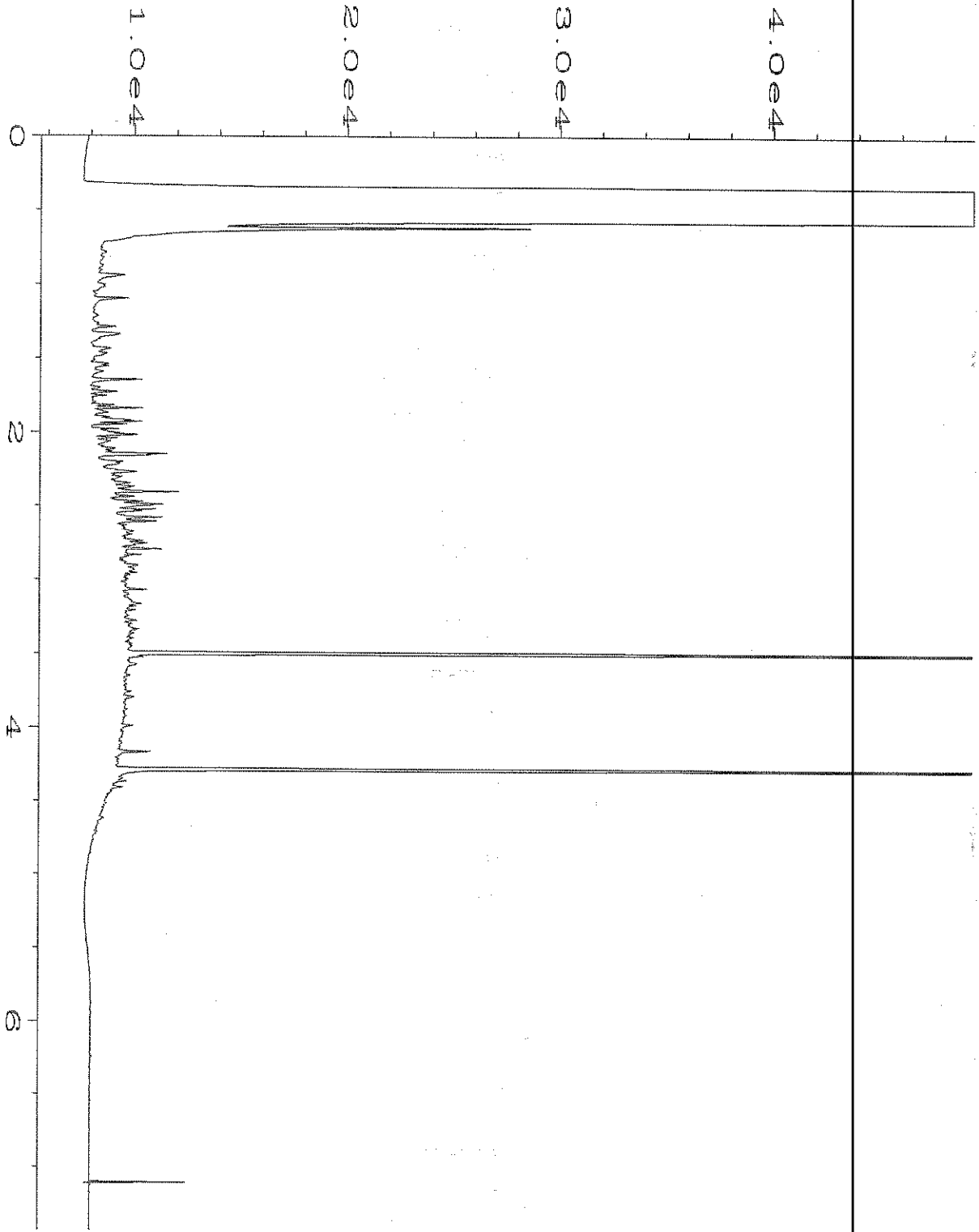
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Operator	: TL	Vial Number	: 23
Instrument	: GC6	Injection Number	: 1
Sample Name	: 08-1925 mb	Sequence Line	: 6
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 29 Aug 18 01:58 PM	Analysis Method	: DX.MTH
Report Created on:	30 Aug 18 07:34 AM		



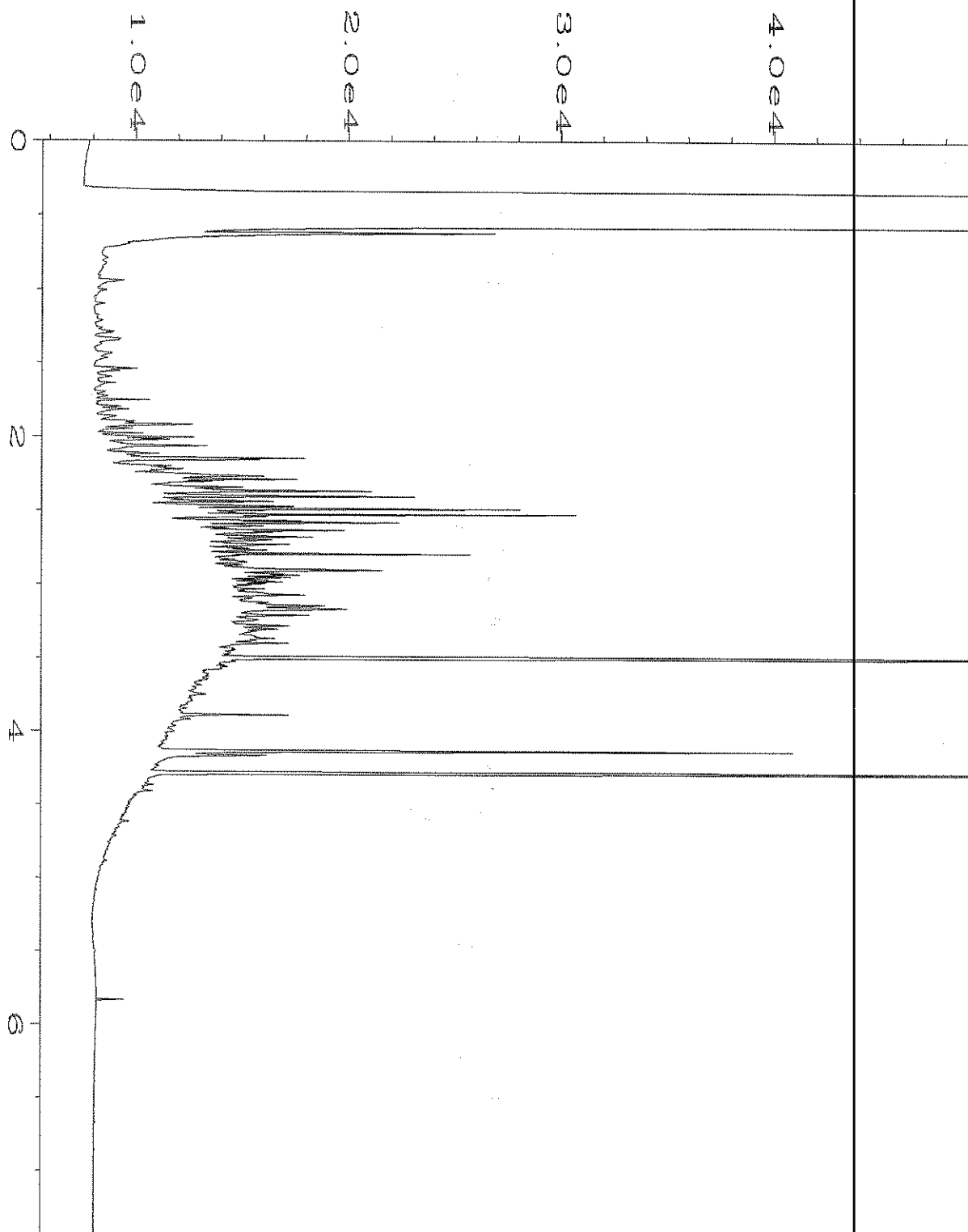
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Operator	: TL	Vial Number	: 96
Instrument	: GC6	Injection Number	: 1
Sample Name	: HCIDs G/M 52-133	Sequence Line	: 7
Run Time Bar Code:		Instrument Method	: DX.MTH
Acquired on	: 29 Aug 18 06:17 PM	Analysis Method	: DX.MTH
Report Created on:	30 Aug 18 07:38 AM		



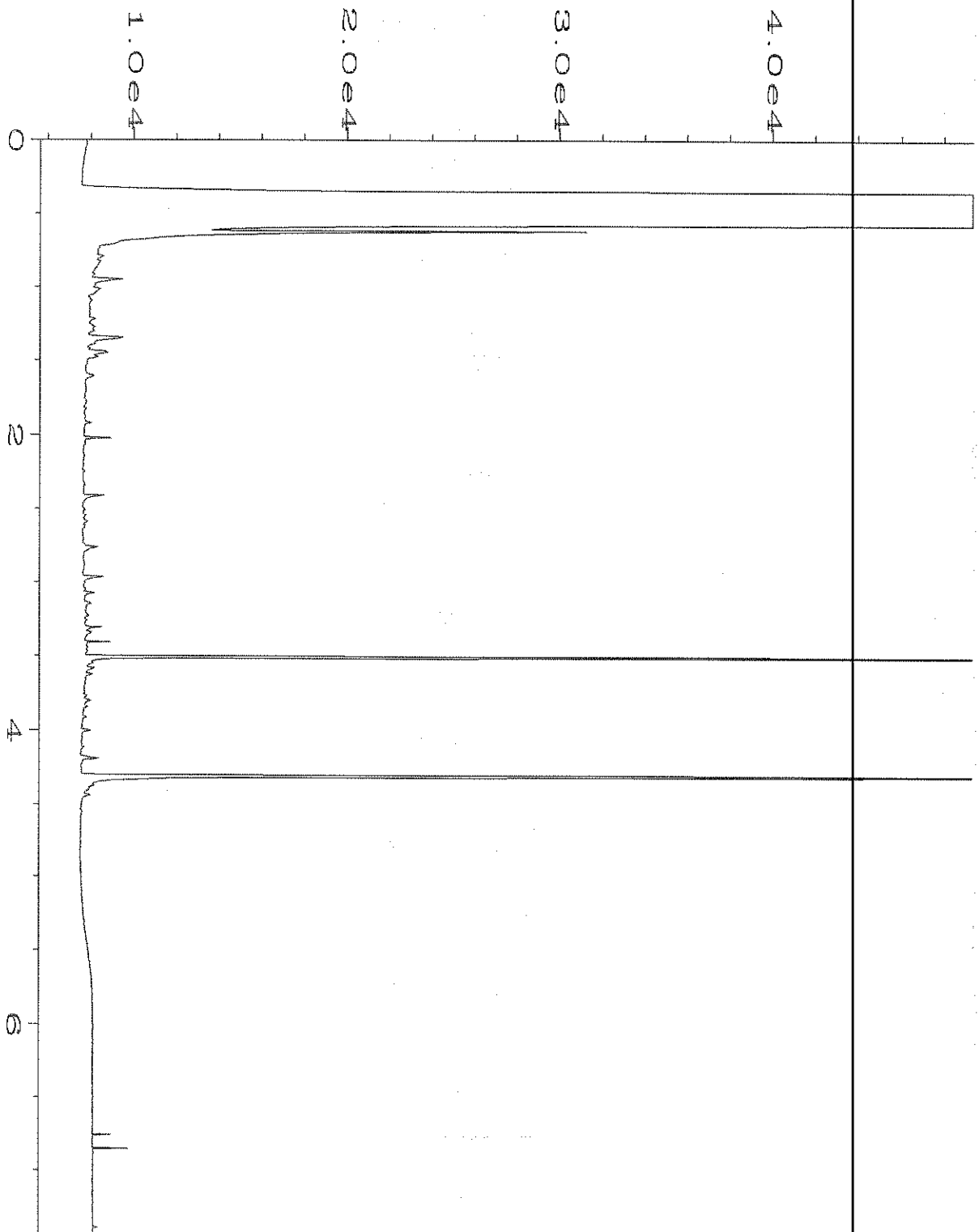
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Operator	: TL	Vial Number	: 97
Instrument	: GC6	Injection Number	: 1
Sample Name	: HCIDs Dx 52-71C	Sequence Line	: 7
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 29 Aug 18 06:28 PM	Analysis Method	: DX.MTH
Report Created on:	30 Aug 18 07:38 AM		



Data File Name	: C:\HPCHEM\1\DATA\08-29-18\026F0901.D	Page Number	: 1
Operator	: TL	Vial Number	: 26
Instrument	: GC1	Injection Number	: 1
Sample Name	: 808619-16	Sequence Line	: 9
Run Time Bar Code:		Instrument Method	: DX.MTH
Acquired on	: 29 Aug 18 01:06 PM	Analysis Method	: DX.MTH
Report Created on:	30 Aug 18 08:03 AM		

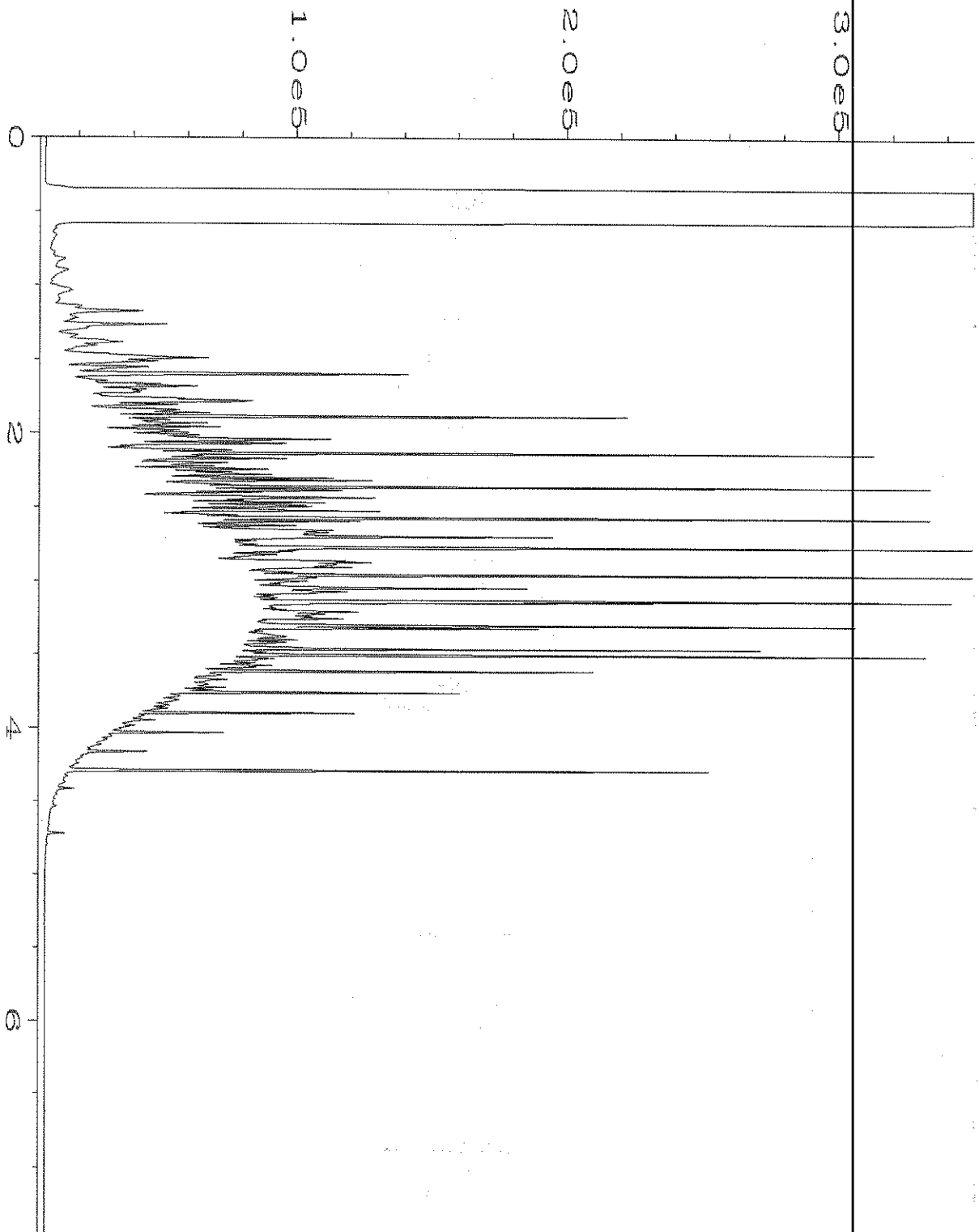


Data File Name	: C:\HPCHEM\1\DATA\08-29-18\027F0901.D	Page Number	: 1
Operator	: TL	Vial Number	: 27
Instrument	: GC1	Injection Number	: 1
Sample Name	: 808619-17	Sequence Line	: 9
Run Time Bar Code:		Instrument Method	: DX.MTH
Acquired on	: 29 Aug 18 01:18 PM	Analysis Method	: DX.MTH
Report Created on:	30 Aug 18 08:03 AM		



Data File Name	: C:\HPCHEM\1\DATA\08-29-18\017F0901.D	Page Number	: 1
Operator	: TL	Vial Number	: 17
Instrument	: GC1	Injection Number	: 1
Sample Name	: 08-1926 mb2	Sequence Line	: 9
Run Time Bar Code:		Instrument Method	: DX.MTH
Acquired on	: 29 Aug 18 11:23 AM	Analysis Method	: DX.MTH
Report Created on:	30 Aug 18 08:02 AM		





Data File Name	: C:\HPCHEM\1\DATA\08-29-18\005F1201.D	Page Number	: 1
Operator	: TL	Vial Number	: 5
Instrument	: GC1	Injection Number	: 1
Sample Name	: 1000 Dx 52-185B	Sequence Line	: 12
Run Time Bar Code:		Instrument Method	: DX.MTH
Acquired on	: 29 Aug 18 03:45 PM	Analysis Method	: DX.MTH
Report Created on:	30 Aug 18 08:03 AM		

508619

SAMPLE CHAIN OF CUSTODY

ME 08-28-18

NSI/MS/ARJ  
Page # 1 of 2  
2012

Report To T. Colligan / P. Osterhout

Company Floyd / Snider

Address 600 Union St. Suite 6000

City, State, ZIP Seattle, WA 98101

Phone 206-298-2007 Email \_\_\_\_\_

SAMPLERS (signature) <u>Cedric Jones</u>	
PROJECT NAME <b>Ave 55-Educator</b>	PO #
REMARKS MTC A 5 Metals - As, Cd, Cr, Hg, Pb	INVOICE TO

TURNAROUND TIME	<input type="checkbox"/> Standard Turnaround <input checked="" type="checkbox"/> RUSH <u>5 days</u> Rush charges authorized by:
SAMPLE DISPOSAL	<input checked="" type="checkbox"/> Dispose after 30 days <input type="checkbox"/> Archive Samples <input type="checkbox"/> Other

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED							Notes		
						TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM		MTC A 5	
SB-2-8-8.5	01A-E	8/28/18	10:20	Soil	5	X				X					
SB-1-4-4.5	02	}	8:40	}	1	X									
SB-3-7.5-8.0	03A-E		10:55		5	X				X					
SB-4-7.5-8.0	04	}	11:25	}	5	X				X					
TP-10-5.5ft	05		8/27/18		10:55	1	X					X			
TP-10-6ft	06	}	11:00	}	1										Archive
TP-11-5ft	07		11:15		1	X						X			
TP-11-5.5ft	08	}	11:20	}	1										Archive
TP-12-5.5ft	09		11:50		1	X						X			
TP-12-6ft	10	}	11:48	}	1										Archive

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
<u>[Signature]</u>	Parola Osterhout	Floyd Snider	8/28/18	1445
<u>[Signature]</u>	Nhan Phan	FCBI	8/28/18	1445
Received by:		Samples received at	<u>4</u>	or C

Friedman & Bruya, Inc.  
 3012 16th Avenue West  
 Seattle, WA 98119-2029  
 Ph. (206) 285-8282

808619

**SAMPLE CHAIN OF CUSTODY**

ME 08-28-18 2 of 2  
 151/1W3/1003  
 A12

Report To: T. Colligan / P Osterback

Company: Floyd / Snider

Address: 601 Union St Suite 600

City, State, ZIP: Seattle, WA 98101

Phone: 206-292-2077 Email: \_\_\_\_\_

SAMPLERS (signature) <i>Pamela Osterback</i>	PROJECT NAME <u>Ave 55 - Educator</u>	PO #
REMARKS <u>MTCAS metals = As, Cd, Cr Hg, Pb</u>	INVOICE TO	

TURNAROUND TIME Standard Turnaround <input checked="" type="checkbox"/> RUSH <u>5 day</u> Rush charges authorized by: _____	SAMPLE DISPOSAL <input checked="" type="checkbox"/> Dispose after 30 days <input type="checkbox"/> Archive Samples <input type="checkbox"/> Other _____
--	--

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED										Notes	
						TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	MTCAS	dissolved metals			
TP-13-5, 5ft	11	8/27/18	12:12	Soil	1	X							X			Archive	
TP-13-6ft	12	}	12:15	}	1											Archive	
TP-14-5ft	13		13:08		1	X								X			
TP-14-5.5ft	14		13:10		1												Archive
TP-15-3.0ft	15A-E	}	14:20	}	5	X							X				
TP-12-3-13	16A-P		8/28/18		12:40	15	X	X	X	X	X				X		Metals NOT Fwd Filtered
TP-13-3-13	17A-H	}	13:16	}	8	X	X	X	X				X				
UST-7.5ft	18		8/27/18		09:50	Soil	1	X							X		Archive

Reinquinshed by: <i>Pamela Osterback</i>	PRINT NAME	COMPANY	DATE	TIME
Reinquinshed by: <i>mlb/ams</i>	Pamela Osterback	Floyd Snider	8/28/18	1445
Reinquinshed by: _____	Rohan Pham	FEB T	8/28/18	1445
Reinquinshed by: _____				

Friedman & Bruya, Inc.  
 3012 16th Avenue West  
 Seattle, WA 98119-2029  
 Ph. (206) 286-8282

**Educator Building**

**Phase II Environmental Site Assessment**

**Appendix D**

**Johnson & Ettinger Model Outputs**

**Model Input**

Site Name/Run Number: Educator Building Run 1

Note:  
 -Yellow highlighted cells indicate parameters that typically are changed or must be inputted by the user.  
 -Dotted outline cells indicate default values that may be changed with justification.  
 -Toxicity values are taken from Regional Screening Level tables. These tables are updated semi-annually and may not reflect the most current toxicity information.

[Use English / Metric Converter](#)

Source Characteristics:	Units	Symbol	Value	Default	Potential Span	CV	Flag	Comment
Source medium		Source	Sub-slab Soil Gas					
Soil gas concentration	(ug/m3)	Cmedium	550		NA			
Depth below grade to soil gas sample	(m)	Ls	1.10		Vary - 50	NA		
Average vadose zone temperature	(°C)	Ts	15	25	3-30			
Calc: Source vapor concentration	(ug/m3)	Cs	550					
Calc: % of pure component saturated vapor concentration	(%)	%Sat	0.000%					

Chemical:	Units	Symbol	Value	Default	Potential Span	CV	Flag	Comment
Chemical Name		Chem	Acetaldehyde					
CAS No.		CAS	75-07-0					
Toxicity Factors								
Unit risk factor	(ug/m <sup>3</sup> ) <sup>-1</sup>	IUR	2.20E-06	2.20E-06	NA	NA		
Mutagenic compound		Mut	No	NA	NA	NA		
Reference concentration	(mg/m <sup>3</sup> )	RfC	9.00E-03	9.00E-03	NA	NA		

Chemical Properties:	Units	Symbol	Value	Default	Potential Span	CV	Flag	Comment
Pure component water solubility	(mg/L)	S	1.00E+06	1.00E+06	NA	NA		
Henry's Law Constant @ 25°C	(atm·m <sup>3</sup> /mol)	Hc	6.67E-05	6.67E-05	NA	NA		
Calc: Henry's Law Constant @ 25°C	(dimensionless)	Hr	2.73E-03	2.73E-03				
Calc: Henry's Law Constant @ system temperature	(dimensionless)	Hs	1.96E-03	2.82E-03				
Diffusivity in air	(cm <sup>2</sup> /s)	Dair	1.28E-01	1.28E-01	NA	NA		
Diffusivity in water	(cm <sup>2</sup> /s)	Dwater	1.35E-05	1.35E-05	NA	NA		

**Building Characteristics:**

Select Building Assumptions

Use ratio for Qsoil/Qbuilding (recommended if no site specific data available)

Specify Qsoil and Qbuilding separately; calculate ratio

	Units	Symbol	Value	Default	Potential Span	CV	Flag	Comment
Building setting		Bldg_Setting	Commercial	Commercial				
Foundation type		Found_Type	Slab-on-grade	Slab-on-grade				
Depth below grade to base of foundation	(m)	Lb	0.11	0.20	0.1 - 2.44	NA		
Foundation thickness	(m)	Lf	0.20	0.20	0.1 - 0.25	NA		
Fraction of foundation area with cracks	(-)	eta	0.001	0.001	0.00019-0.0019	1.00		
Enclosed space floor area	(m <sup>2</sup> )	Abf	560.00	1500.00	80-1000	NA	WARNING	Value is different from default value; please justify.
Enclosed space mixing height	(m)	Hb	3.00	3.00	2.13 - 3.05	NA		
Indoor air exchange rate	(1 / hr)	ach	1.50	1.50	.3-4.1	NA		
Qsoil/Qbuilding	(-)	Qsoil_Qb	0.0030	0.0030	0.0001 - 0.05	1.24		
Calc: Building ventilation rate	(m <sup>3</sup> /hr)	Qb	2520.00	6750.00	NA	0.30		
Calc: Average vapor flow rate into building	(m <sup>3</sup> /hr)	Qsoil	7.56	20.25	NA	NA		

Model Input Site Name/Run Number: Educator Building Run 1  
 Chemical Name: Acetaldehyde CAS No. 75-07-0  
 Depth below grade to soil gas sample: 1.10 meters

<u>Vadose zone characteristics:</u>	Units	Symbol	Value	Default	Potential Span	CV	Flag	Comment
<b>Stratum A (Top of soil profile):</b>								
Stratum A SCS soil type		SCS_A	Sand					
Stratum A thickness (from surface)	(m)	hSA	1.10					
Stratum A total porosity	(-)	nSA	0.375	0.375	NA	0.20		
Stratum A water-filled porosity	(-)	nWSA	0.054	0.054	0.053 - 0.055	0.25		
Stratum A bulk density	(g/cm <sup>3</sup> )	rhoSA	1.660	1.660	NA	0.05		
<b>Stratum B (Soil layer below Stratum A):</b>								
Stratum B SCS soil type		SCS_B	Not Present					
Stratum B thickness	(m)	hSB	0.00					
Stratum B total porosity	(-)	nSB			NA	NA		
Stratum B water-filled porosity	(-)	nWSB			NA	NA		
Stratum B bulk density	(g/cm <sup>3</sup> )	rhoSB			NA	NA		
<b>Stratum C (Soil layer below Stratum B):</b>								
Stratum C SCS soil type		SCS_C	Not Present					
Stratum C thickness	(m)	hSC						
Stratum C total porosity	(-)	nSC			NA	NA		
Stratum C water-filled porosity	(-)	nWSC			NA	NA		
Stratum C bulk density	(g/cm <sup>3</sup> )	rhoSC			NA	NA		
<b>Stratum containing soil gas sample</b>								
Stratum A, B, or C		src_soil	Stratum A					
					NA	NA		
					NA	NA		
					NA	NA		
<u>Exposure Parameters:</u>	Units	Symbol	Value	Default	Potential Span	CV	Flag	Comment
Target risk for carcinogens	(-)	Target_CR	1.00E-06	1.00E-06	NA	NA		
Target hazard quotient for non-carcinogens	(-)	Target_HQ	1	1	NA	NA		
Exposure Scenario		Scenario	Commercial	Commercial				
Averaging time for carcinogens	(yrs)	ATc	70	70	NA	NA		
Averaging time for non-carcinogens	(yrs)	ATnc	25	25	NA	NA		
Exposure duration	(yrs)	ED	25	25	NA	NA		
Exposure frequency	(days/yr)	EF	250	250	NA	NA		
Exposure time	(hrs/24 hrs)	ET	8	8	NA	NA		
Mutagenic mode-of-action factor	(yrs)	MMOAF	72	72	NA	NA	NOTE	MMOAF not relevant for non-mutagenic compounds

**Model Output**

Site Name/Run Number: Educator Building Run 1

Range is based on the reasonable range of Qsoil/Qbuilding values, as reported in the literature.

Source to Indoor Air Attenuation Factor		Units	Symbol	Value	Range	Default	Default Range	Flag	Comment
Soil gas to indoor air attenuation coefficient		(-)	alpha	3.0E-03	1.0E-04 - 5.0E-02	3.0E-03	1.0E-04 - 5.0E-02	WARNING	Please review warning messages
Predicted Indoor Air Concentration		Units	Symbol	Value	Range	Default	Default Range	Flag	Comment
Indoor air concentration due to vapor intrusion		(ug/m3)	Cia	1.7E+00	5.5E-02 - 2.8E+01	1.7E+00	5.5E-02 - 2.8E+01	WARNING	May be overestimated; biodegradation not considered
		(ppbv)		9.2E-01	3.1E-02 - 1.5E+01	9.2E-01	3.1E-02 - 1.5E+01	WARNING	Please review warning messages
Predicted Vapor Conc. Beneath Foundation		Units	Symbol	Value	Range	Default	Default Range	Flag	Comment
Subslab vapor concentration		(ug/m3)	Css	5.5E+02	5.5E+02 - 5.5E+02	5.5E+02	5.5E+02 - 2.8E+05		
		(ppbv)		3.1E+02	3.1E+02 - 3.1E+02	3.1E+02	3.1E+02 - 1.5E+05		
Diffusive Transport Upward Through Vadose Zone		Units	Symbol	Value	Range	Default	Default Range	Flag	Comment
Effective diffusion coefficient through Stratum A		(cm2/sec)	DeffA	2.1E-02	-	2.1E-02	-		
Effective diffusion coefficient through Stratum B		(cm2/sec)	DeffB	-	-	-	-		
Effective diffusion coefficient through Stratum C		(cm2/sec)	DeffC	-	-	-	-		
Effective diffusion coefficient through unsaturated zone		(cm2/sec)	DeffT	2.1E-02	-	2.1E-02	-		
Critical Parameters			Symbol	Value	Range	Default	Default Range	Flag	
α for diffusive transport from source to building with dirt floor foundation		(-)	A_Param	1.7E-03	-	1.9E-03			
Pe (Peclet Number) for transport through the foundation (advection / diffusion)		(-)	B_Param	3.6E+02	1.2E+01 - 5.9E+03	3.6E+02	1.2E+01 - 5.9E+03		
α for convective transport from subslab to building		(-)	C_Param	3.0E-03	1.0E-04 - 5.0E-02	3.0E-03	1.0E-04 - 5.0E-02		
Interpretation		Concentration versus Depth Profile							
Advection is the dominant mechanism across the foundation. Diffusion through soil and advection through foundation both control intrusion.									
Critical Parameters		Hb, Ls, DeffT, ach, Qsoil_Qb							
Non-Critical Parameters		Lf, DeffA, eta							

Please check WARNING or ERROR flags

Model Output

Site Name/Run Number: Educator Building Run 1

Chemical Name: Acetaldehyde CAS No. 75-07-0

Risk Calculations	Units	Symbol	Value	Range	Default	Range	Flag	Comment
<b>Risk-Based Target Screening Levels</b> Scenario: Commercial								
Target risk for carcinogens	(-)	Target_CR	1E-06	-	1E-06	-		
Target hazard quotient for noncarcinogens	(-)	Target_HQ	1	-	1	-		
Target indoor air concentration	(ug/m3)	Target_IA	5.57E+00	-	5.57E+00	-		Target indoor air concentration based on cancer risk (unit risk factor)
	(ppbv)		3.10E+00	-	3.10E+00	-		
Target soil gas concentration	(ug/m3)	Target_SV	1.86E+03	1.1E+02 - 5.6E+04	1.86E+03	1.1E+02 - 5.6E+04		
<b>Incremental Risk Estimates</b>								
Incremental cancer risk from vapor intrusion	(-)	Cancer_Risk	2.96E-07	9.9E-09 - 4.9E-06	2.96E-07	9.9E-09 - 4.9E-06		
Hazard quotient from vapor intrusion	(-)	HQ	4.19E-02	1.4E-03 - 7.0E-01	4.19E-02	1.4E-03 - 7.0E-01		



**Model Input**

Site Name/Run Number: Educator Building Run.3

Note:  
 -Yellow highlighted cells indicate parameters that typically are changed or must be inputted by the user.  
 -Dotted outline cells indicate default values that may be changed with justification.  
 -Toxicity values are taken from Regional Screening Level tables. These tables are updated semi-annually and may not reflect the most current toxicity information.

[Use English / Metric Converter](#)

Source Characteristics:	Units	Symbol	Value	Default	Potential Span	CV	Flag	Comment
Source medium		Source	Sub-slab Soil Gas					
Soil gas concentration	(ug/m3)	Cmedium	21		NA			
Depth below grade to soil gas sample	(m)	Ls	1.10		Vary - 50	NA		
Average vadose zone temperature	(°C)	Ts	15	25	3-30			
Calc: Source vapor concentration	(ug/m3)	Cs	21					
Calc: % of pure component saturated vapor concentration	(%)	%Sat	0.000%					

Chemical:	Units	Symbol	Value	Default	Potential Span	CV	Flag	Comment
Chemical Name		Chem	Acrolein					
CAS No.		CAS	107-02-8					
Toxicity Factors								
Unit risk factor	(ug/m <sup>3</sup> ) <sup>-1</sup>	IUR	Not Available	Not Available	NA	NA		No IUR available for this compound.
Mutagenic compound		Mut	No	NA	NA	NA		
Reference concentration	(mg/m <sup>3</sup> )	RfC	2.00E-05	2.00E-05	NA	NA		

Chemical Properties:	Units	Symbol	Value	Default	Potential Span	CV	Flag	Comment
Pure component water solubility	(mg/L)	S	2.12E+05	2.12E+05	NA	NA		
Henry's Law Constant @ 25°C	(atm·m <sup>3</sup> /mol)	Hc	1.22E-04	1.22E-04	NA	NA		
Calc: Henry's Law Constant @ 25°C	(dimensionless)	Hr	4.99E-03	4.99E-03				
Calc: Henry's Law Constant @ system temperature	(dimensionless)	Hs	3.38E-03	5.16E-03				
Diffusivity in air	(cm <sup>2</sup> /s)	Dair	1.12E-01	1.12E-01	NA	NA		
Diffusivity in water	(cm <sup>2</sup> /s)	Dwater	1.22E-05	1.22E-05	NA	NA		

**Building Characteristics:**

Select Building Assumptions

Use ratio for Qsoil/Qbuilding (recommended if no site specific data available)

Specify Qsoil and Qbuilding separately; calculate ratio

Building setting	Units	Symbol	Value	Default	Potential Span	CV	Flag	Comment
Building setting		Bldg_Setting	Commercial	Commercial				
Foundation type		Found_Type	Slab-on-grade	Slab-on-grade				
Depth below grade to base of foundation	(m)	Lb	0.11	0.20	0.1 - 2.44	NA		
Foundation thickness	(m)	Lf	0.20	0.20	0.1 - 0.25	NA		
Fraction of foundation area with cracks	(-)	eta	0.001	0.001	0.00019-0.0019	1.00		
Enclosed space floor area	(m <sup>2</sup> )	Abf	560.00	1500.00	80-1000	NA	WARNING	Value is different from default value; please justify.
Enclosed space mixing height	(m)	Hb	3.00	3.00	2.13 - 3.05	NA		
Indoor air exchange rate	(1 / hr)	ach	1.50	1.50	.3-4.1	NA		
Qsoil/Qbuilding	(-)	Qsoil_Qb	0.0030	0.0030	0.0001 - 0.05	1.24		
Calc: Building ventilation rate	(m <sup>3</sup> /hr)	Qb	2520.00	6750.00	NA	0.30		
Calc: Average vapor flow rate into building	(m <sup>3</sup> /hr)	Qsoil	7.56	20.25	NA	NA		

Model Input

Site Name/Run Number: Educator Building Run 3

Chemical Name: Acrolein CAS No. 107-02-8

Depth below grade to soil gas sample: 1.10 meters

Vadose zone characteristics:							
Units	Symbol	Value	Default	Potential Span	CV	Flag	Comment
<b>Stratum A (Top of soil profile):</b>							
	SCS_A	Sand					
(m)	hSA	1.10					
(-)	nSA	0.375	0.375	NA	0.20		
(-)	nWSA	0.054	0.054	0.053 - 0.055	0.25		
(g/cm <sup>3</sup> )	rhoSA	1.660	1.660	NA	0.05		
<b>Stratum B (Soil layer below Stratum A):</b>							
	SCS_B	Not Present					
(m)	hSB						
(-)	nSB			NA	NA		
(-)	nWSB			NA	NA		
(g/cm <sup>3</sup> )	rhoSB			NA	NA		
<b>Stratum C (Soil layer below Stratum B):</b>							
	SCS_C	Not Present					
(m)	hSC						
(-)	nSC			NA	NA		
(-)	nWSC			NA	NA		
(g/cm <sup>3</sup> )	rhoSC			NA	NA		
<b>Stratum containing soil gas sample</b>							
	src_soil	Stratum A					
				NA	NA		
				NA	NA		
				NA	NA		
Exposure Parameters:							
Units	Symbol	Value	Default	Potential Span	CV	Flag	Comment
(-)	Target_CR	1.00E-06	1.00E-06	NA	NA		
(-)	Target_HQ	1	1	NA	NA		
	Scenario	Commercial	Commercial				
(yrs)	ATc	70	70	NA	NA		
(yrs)	ATnc	25	25	NA	NA		
(yrs)	ED	25	25	NA	NA		
(days/yr)	EF	250	250	NA	NA		
(hrs/24 hrs)	ET	8	8	NA	NA		
(yrs)	MMOAF	72	72	NA	NA	NOTE	MMOAF not relevant for non-mutagenic compounds

**Model Output**

Site Name/Run Number: Educator Building Run 3

Range is based on the reasonable range of Qsoil/Qbuilding values, as reported in the literature.

Chemical Name: Acrolein CAS No. 107-02-8

Source to Indoor Air Attenuation Factor	Units	Symbol	Value	Range	Default	Default Range	Flag	Comment
Soil gas to indoor air attenuation coefficient	(-)	alpha	3.0E-03	1.0E-04 - 5.0E-02	3.0E-03	1.0E-04 - 5.0E-02		
								WARNING Please review warning messages
Predicted Indoor Air Concentration	Units	Symbol	Value	Range	Default	Default Range	Flag	Comment
Indoor air concentration due to vapor intrusion	(ug/m3)	Cia	6.3E-02	2.1E-03 - 1.1E+00	6.3E-02	2.1E-03 - 1.1E+00		
	(ppbv)		2.7E-02	9.2E-04 - 4.6E-01	2.7E-02	9.2E-04 - 4.6E-01	WARNING Please review warning messages	
Predicted Vapor Conc. Beneath Foundation	Units	Symbol	Value	Range	Default	Default Range	Flag	Comment
Subslab vapor concentration	(ug/m3)	Css	2.1E+01	2.1E+01 - 2.1E+01	2.1E+01	2.1E+01 - 1.1E+04		
	(ppbv)		9.2E+00	9.2E+00 - 9.2E+00	9.2E+00	9.2E+00 - 4.6E+03		
Diffusive Transport Upward Through Vadose Zone	Units	Symbol	Value	Range	Default	Default Range	Flag	Comment
Effective diffusion coefficient through Stratum A	(cm2/sec)	DeffA	1.8E-02	-	1.8E-02	-		
Effective diffusion coefficient through Stratum B	(cm2/sec)	DeffB	-	-	-	-		
Effective diffusion coefficient through Stratum C	(cm2/sec)	DeffC	-	-	-	-		
Effective diffusion coefficient through unsaturated zone	(cm2/sec)	DeffT	1.8E-02	-	1.8E-02	-		
Critical Parameters		Symbol	Value	Range	Default	Default Range	Flag	
α for diffusive transport from source to building with dirt floor foundation	(-)	A_Param	1.5E-03	-	1.6E-03	-		
Pe (Peclet Number) for transport through the foundation (advection / diffusion)	(-)	B_Param	4.1E+02	1.4E+01 - 6.8E+03	4.1E+02	1.4E+01 - 6.8E+03		
α for convective transport from subslab to building	(-)	C_Param	3.0E-03	1.0E-04 - 5.0E-02	3.0E-03	1.0E-04 - 5.0E-02		
Interpretation	Concentration versus Depth Profile							
Advection is the dominant mechanism across the foundation. Diffusion through soil and advection through foundation both control intrusion.								
Critical Parameters								
Hb, Ls, DeffT, ach, Qsoil_Qb								
Non-Critical Parameters	Lf, DeffA, eta							

Please check WARNING or ERROR flags

Model Output

Site Name/Run Number: Educator Building Run 3

Chemical Name: Acrolein CAS No. 107-02-8

Risk Calculations	Units	Symbol	Value	Range	Default	Range	Flag
<b>Risk-Based Target Screening Levels</b> Scenario: Commercial							
Target risk for carcinogens	(-)	Target_CR	1E-06	-	1E-06	-	
Target hazard quotient for noncarcinogens	(-)	Target_HQ	1	-	1	-	
Target indoor air concentration	(ug/m3)	Target_IA	8.76E-02	-	8.76E-02	-	Target indoor air concentration based on concentration)
	(ppbv)		3.82E-02	-	3.82E-02	-	
Target soil gas concentration	(ug/m3)	Target_SV	2.92E+01	1.8E+00 - 8.8E+02	2.92E+01	1.8E+00 - 8.8E+02	
<b>Incremental Risk Estimates</b>							
Incremental cancer risk from vapor intrusion	(-)	Cancer_Risk	No IUR	-	No IUR	No IUR - No IUR	
Hazard quotient from vapor intrusion	(-)	HQ	7.19E-01	2.4E-02 - 1.2E+01	7.19E-01	2.4E-02 - 1.2E+01	

**Model Input**

Site Name/Run Number: Educator Building Run 2

Note:  
 -Yellow highlighted cells indicate parameters that typically are changed or must be inputted by the user.  
 -Dotted outline cells indicate default values that may be changed with justification.  
 -Toxicity values are taken from Regional Screening Level tables. These tables are updated semi-annually and may not reflect the most current toxicity information.

[Use English / Metric Converter](#)

Source Characteristics:	Units	Symbol	Value	Default	Potential Span	CV	Flag	Comment
Source medium		Source	Sub-slab Soil Gas					
Soil gas concentration	(ug/m3)	Cmedium	210		NA			
Depth below grade to soil gas sample	(m)	Ls	1.10		Vary - 50	NA		
Average vadose zone temperature	(°C)	Ts	15	25	3-30			
Calc: Source vapor concentration	(ug/m3)	Cs	210					
Calc: % of pure component saturated vapor concentration	(%)	%Sat	0.000%					

Chemical:	Units	Symbol	Value	Default	Potential Span	CV	Flag	Comment
Chemical Name		Chem	Trichloroethylene					
CAS No.		CAS	79-01-6					
Toxicity Factors								
Unit risk factor	(ug/m <sup>3</sup> ) <sup>-1</sup>	IUR	see note	see note	NA	NA		
Mutagenic compound		Mut	Yes	NA	NA	NA		
Reference concentration	(mg/m <sup>3</sup> )	RfC	2.00E-03	2.00E-03	NA	NA		

Chemical Properties:	Units	Symbol	Value	Default	Potential Span	CV	Flag	Comment
Pure component water solubility	(mg/L)	S	1.28E+03	1.28E+03	NA	NA		
Henry's Law Constant @ 25°C	(atm·m <sup>3</sup> /mol)	Hc	9.85E-03	9.85E-03	NA	NA		
Calc: Henry's Law Constant @ 25°C	(dimensionless)	Hr	4.03E-01	4.03E-01				
Calc: Henry's Law Constant @ system temperature	(dimensionless)	Hs	2.53E-01	4.17E-01				
Diffusivity in air	(cm2/s)	Dair	6.87E-02	6.87E-02	NA	NA		
Diffusivity in water	(cm2/s)	Dwater	1.02E-05	1.02E-05	NA	NA		

**Building Characteristics:**

Select Building Assumptions

Use ratio for Qsoil/Qbuilding (recommended if no site specific data available)

Specify Qsoil and Qbuilding separately; calculate ratio

	Units	Symbol	Value	Default	Potential Span	CV	Flag	Comment
Building setting		Bldg_Setting	Commercial	Commercial				
Foundation type		Found_Type	Slab-on-grade	Slab-on-grade				
Depth below grade to base of foundation	(m)	Lb	0.11	0.20	0.1 - 2.44	NA		
Foundation thickness	(m)	Lf	0.20	0.20	0.1 - 0.25	NA		
Fraction of foundation area with cracks	(-)	eta	0.001	0.001	0.00019-0.0019	1.00		
Enclosed space floor area	(m2)	Abf	330.00	1500.00	80-1000	NA	WARNING	Value is different from default value; please justify.
Enclosed space mixing height	(m)	Hb	3.00	3.00	2.13 - 3.05	NA		
Indoor air exchange rate	(1 / hr)	ach	1.50	1.50	.3-4.1	NA		
Qsoil/Qbuilding	(-)	Qsoil_Qb	0.0030	0.0030	0.0001 - 0.05	1.24		
Calc: Building ventilation rate	(m3/hr)	Qb	1485.00	6750.00	NA	0.30		
Calc: Average vapor flow rate into building	(m3/hr)	Qsoil	4.46	20.25	NA	NA		

Model Input Site Name/Run Number: Educator Building Run 2  
 Chemical Name: Trichloroethylene CAS No. 79-01-6  
 Depth below grade to soil gas sample: 1.10 meters

<u>Vadose zone characteristics:</u>	Units	Symbol	Value	Default	Potential Span	CV	Flag	Comment
<b>Stratum A (Top of soil profile):</b>								
Stratum A SCS soil type		SCS_A	Sand					
Stratum A thickness (from surface)	(m)	hSA	1.10					
Stratum A total porosity	(-)	nSA	0.375	0.375	NA	0.20		
Stratum A water-filled porosity	(-)	nWSA	0.054	0.054	0.053 - 0.055	0.25		
Stratum A bulk density	(g/cm <sup>3</sup> )	rhoSA	1.660	1.660	NA	0.05		
<b>Stratum B (Soil layer below Stratum A):</b>								
Stratum B SCS soil type		SCS_B	Not Present					
Stratum B thickness	(m)	hSB	0.00					
Stratum B total porosity	(-)	nSB			NA	NA		
Stratum B water-filled porosity	(-)	nWSB			NA	NA		
Stratum B bulk density	(g/cm <sup>3</sup> )	rhoSB			NA	NA		
<b>Stratum C (Soil layer below Stratum B):</b>								
Stratum C SCS soil type		SCS_C	Not Present					
Stratum C thickness	(m)	hSC						
Stratum C total porosity	(-)	nSC			NA	NA		
Stratum C water-filled porosity	(-)	nWSC			NA	NA		
Stratum C bulk density	(g/cm <sup>3</sup> )	rhoSC			NA	NA		
<b>Stratum containing soil gas sample</b>								
Stratum A, B, or C		src_soil	Stratum A					
					NA	NA		
					NA	NA		
					NA	NA		
<u>Exposure Parameters:</u>	Units	Symbol	Value	Default	Potential Span	CV	Flag	Comment
Target risk for carcinogens	(-)	Target_CR	1.00E-06	1.00E-06	NA	NA		
Target hazard quotient for non-carcinogens	(-)	Target_HQ	1	1	NA	NA		
Exposure Scenario		Scenario	Commercial	Commercial				
Averaging time for carcinogens	(yrs)	ATc	70	70	NA	NA		
Averaging time for non-carcinogens	(yrs)	ATnc	25	25	NA	NA		
Exposure duration	(yrs)	ED	25	25	NA	NA		
Exposure frequency	(days/yr)	EF	250	250	NA	NA		
Exposure time	(hrs/24 hrs)	ET	8	8	NA	NA		
Mutagenic mode-of-action factor	(yrs)	MMOAF	72	72	NA	NA		MMOAF used in place of ED in risk calculations

**Model Output**

Site Name/Run Number: Educator Building Run 2

Range is based on the reasonable range of Qsoil/Qbuilding values, as reported in the literature.

Chemical Name: Trichloroethylene CAS No. 79-01-6

Source to Indoor Air Attenuation Factor	Units	Symbol	Value	Range	Default	Default Range	Flag	Comment
Soil gas to indoor air attenuation coefficient	(-)	alpha	3.0E-03	1.0E-04 - 5.0E-02	3.0E-03	1.0E-04 - 5.0E-02	WARNING	Please review warning messages
<b>Predicted Indoor Air Concentration</b>								
Indoor air concentration due to vapor intrusion	(ug/m3) (ppbv)	Cia	6.3E-01 1.2E-01	2.1E-02 - 1.1E+01 3.9E-03 - 2.0E+00	6.3E-01 1.2E-01	2.1E-02 - 1.1E+01 3.9E-03 - 2.0E+00	WARNING	Please review warning messages
<b>Predicted Vapor Conc. Beneath Foundation</b>								
Subslab vapor concentration	(ug/m3) (ppbv)	Css	2.1E+02 3.9E+01	2.1E+02 - 2.1E+02 3.9E+01 - 3.9E+01	2.1E+02 3.9E+01	2.1E+02 - 1.1E+05 3.9E+01 - 2.0E+04		
<b>Diffusive Transport Upward Through Vadose Zone</b>								
Effective diffusion coefficient through Stratum A	(cm2/sec)	DeffA	1.1E-02	-	1.1E-02	-		
Effective diffusion coefficient through Stratum B	(cm2/sec)	DeffB	-	-	-	-		
Effective diffusion coefficient through Stratum C	(cm2/sec)	DeffC	-	-	-	-		
Effective diffusion coefficient through unsaturated zone	(cm2/sec)	DeffT	1.1E-02	-	1.1E-02	-		

Critical Parameters	Symbol	Value	Range	Default	Default Range	Flag
$\alpha$ for diffusive transport from source to building with dirt floor foundation	(-)	A_Param	9.2E-04	-	1.0E-03	
Pe (Peclet Number) for transport through the foundation (advection / diffusion)	(-)	B_Param	6.6E+02	2.2E+01 - 1.1E+04	6.6E+02	2.2E+01 - 1.1E+04
$\alpha$ for convective transport from subslab to building	(-)	C_Param	3.0E-03	1.0E-04 - 5.0E-02	3.0E-03	1.0E-04 - 5.0E-02

Interpretation	Concentration versus Depth Profile
<p>Advection is the dominant mechanism across the foundation. Diffusion through soil and advection through foundation both control intrusion.</p>	
<p><b>Critical Parameters</b></p> <p>Hb, Ls, DeffT, ach, Qsoil_Qb</p>	
<p><b>Non-Critical Parameters</b></p> <p>Lf, DeffA, eta</p>	

Please check WARNING or ERROR flags

Model Output

Site Name/Run Number: Educator Building Run 2

Chemical Name: Trichloroethylene CAS No. 79-01-6

Risk Calculations	Units	Symbol	Value	Range	Default	Range	Flag	Comment
<b>Risk-Based Target Screening Levels Scenario: Commercial</b>								
Target risk for carcinogens	(-)	Target_CR	1E-06	-	1E-06	-		
Target hazard quotient for noncarcinogens	(-)	Target_HQ	1	-	1	-		
Target indoor air concentration	(ug/m3)	Target_IA	2.05E+00	-	2.05E+00	-		Target indoor air concentration based on both cancer risk and non-cancer toxicity
	(ppbv)		3.82E-01	-	3.82E-01	-		
Target soil gas concentration	(ug/m3)	Target_SV	6.84E+02	4.1E+01 - 2.1E+04	6.84E+02	4.1E+01 - 2.1E+04		
<b>Incremental Risk Estimates</b>								
Incremental cancer risk from vapor intrusion	(-)	Cancer_Risk	8.17E-07	2.7E-08 - 1.4E-05	8.17E-07	2.7E-08 - 1.4E-05		
Hazard quotient from vapor intrusion	(-)	HQ	7.19E-02	2.4E-03 - 1.2E+00	7.19E-02	2.4E-03 - 1.2E+00		





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4227 S Meridian, STE C, #625 • Puyallup, WA 98373 • (253) 683-1144

# **Heating Oil Storage Tank Removals Site Assessment, Remediation and Closure Report Portside 55 Demolition Project**

## **Owner**

Port of Tacoma  
PO Box 1837  
Tacoma, WA 98401-1837

## **Contractor**

Dickson Company  
3315 S Pine  
Tacoma, WA 98409

## **General Contractor**

Sierra Construction (GC)  
733 E 11<sup>th</sup>  
Tacoma, WA 98421

## **Site Assessor**

Environmental Specialties  
4227 S Meridian Ste C #625  
Puyallup, WA 98373



Environmental Specialties  
4227 S Meridian, STE C, #625 • Puyallup, WA 98373 • (253) 683-1144

**Heating Oil Storage Tank Removal  
Site Assessment, Remediation and Closure Report  
Portside 55 Demolition Project**

**Project Date:** Heating Oil Storage Tank Removal #1 & #2, 9-25-18  
Petroleum Impacted Soil Removal Site #2, 10-9-18  
Parcel No: 0321351051  
TPCHD Case #: RO0004758

**Site:** Portside 55 Demolition/Construction Site  
3401 Lincoln Avenue  
Tacoma, WA 98421

**Owner** Port of Tacoma  
PO Box 1837  
Tacoma, WA 98401-1837

**Contact:** Robert Simons – ES 253-683-1144  
Dickson, 253-372-4489

**Site Assessor  
Decommissioner  
Supervisor:** Robert F. Simons, ES ICC32000769

**Decommissioner  
Supervisor :** Jeff Lewis, DC ICC 00237304

This report is for the use of our Client, Dickson Co. Remediation at this site was performed as an independent remedial action under the Washington Model Toxic Control Act (MTCA).



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Conclusions and recommendations prescribed by this analysis are predicated upon visual inspection, laboratory analysis, and the interview responses from involved parties. Interpretation of these elements has been performed within the generally accepted scope of a petroleum site assessment investigation and the scope of work.

This report documents the removal of two underground heating oil storage tanks (#1 & #2) on September 25, 2018. A confirmed release of diesel-weight heating oil was documented beneath heating oil tank #2, and remnant soil contamination was subsequently excavated and removed from the property on October 9, 2018. Samples collected after removal show that concentrations of petroleum constituents are lower than MTCA Method A Soil Cleanup Levels for Unrestricted Land Uses. No release is associated with heating oil storage tank #1.

The property is currently undergoing redevelopment as warehouse in the heart of the Port of Tacoma. The heating oil storage tanks were encountered during the demolition of the Educator Building, the only building of significance constructed on the property. It was originally built to fabricate laminated cabinetry for schools. It was later converted to a multi-tenant building used for general warehousing and light manufacturing.

### **Discussion**

During the demolition of the Educator Building, Dickson Company encountered an 8,000-gallon heavy heating oil tank (#1) and a 400-gallon diesel heating oil tank (#2). Both were located near the northern property boundary. The #1 8,000-gallon tank supplied oil to a steam/hot water boiler and the #2 400-gallon tank supplied oil to an interior furnace. The two tanks were separate systems, separated by about 200 lateral feet.

Removal permits were obtained from the Tacoma Pierce County Health Department (Permit # RO0004758) and the Tacoma Fire Department (Permit Number: 18-020764). Marine Vacuum Service removed residues and cleaned the tanks on September 25, 2018. Measurements subsequently obtained from within the tanks indicated vapor concentrations below the Lower Explosive Limit (LEL) and so the tanks were deemed safe to remove.

The #1 8000-gallon tank was removed first. Wood pilings were encountered in the excavation dug to remove the tank. The bottom of the tank at 13 feet below grade was bedded in a zone containing woody debris. The tank was removed and five samples were collected from the perimeter of the excavation on October 2, 2018. The samples were submitted for laboratory analysis by Friedman & Bruya, Inc., and tested for Total Petroleum Hydrocarbons as Diesel and Motor Oil (using Method NWTPH-Dx). All sample results showed concentration less than the method reporting limit. Several days after the tank was removed, standing water was observed at the bottom of the excavation. The water may represent stormwater run-off, groundwater, or both. The accumulated water was sampled on October 10, 2018 and tested for Total Petroleum Hydrocarbons as Diesel and Motor Oil (using Method NWTPH-Dx), Benzene, Toluene,



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Ethylbenzene and Xylenes (BETX) by Friedman & Bruya, Inc. Reported BETX concentrations are less than the method reporting limit. Diesel and Motor Oil results are below Method A Cleanup Levels for Ground Water. No indication of a petroleum release is associated with the #1 8000-gallon heavy heating oil tank.

The bottom of the #2 400-gallon diesel tank was visibly corroded, and a petroleum odor and discoloration were observed in soil directly beneath the bottom the tank during removal. Six samples were obtained from the excavated area on October 2, 2018 and tested for Total Petroleum Hydrocarbons as Diesel and Motor Oil (using Method NWTPH-Dx) by Friedman & Bruya, Inc. The Total Petroleum Hydrocarbon as Diesel results for those samples exhibiting petroleum odors and discoloration (#9 and #10) located immediately below the bottom of the storage tank exceeded MTCA Method A Soil Cleanup Levels for Unrestricted Land Uses, consistent with the occurrence of a petroleum release originating from the #2 400-gallon diesel tank.

### **Remediation**

On October 9, 2018, additional soil was removed from the #2 400-gallon diesel tank excavation in an attempt to remediate the diesel release. Contamination ran laterally an estimated 20 feet north and 10 feet wide through sand lenses and stopped when the sand blended into a slightly different less dense mixture of soils. Wood debris bounded the release vertically. Where the release appeared to end laterally, soil samples were collected. The highest concentration of NWTPH-Dx (470 mg/kg) was sampled at the bottom center of the excavation, coinciding with the former location of the storage tank. The result is well below the MTCA Method A Soil Cleanup Level for Unrestricted Land Uses of 2000 mg/kg. A total of 65.35 tons of soil was disposed at the Pierce County Landfill in Graham, Washington. Remediation of the release associated with the #2 400-gallon diesel storage tank is now considered complete.

### **Soil**

Soil around the #1 8000-gallon heavy heating oil tank consisted of fine gray sand that had a mild swampy organic odor and appeared consistent with dredge fill. The material was homogeneous until a depth of 12-13 feet below grade where a layer containing woody debris was found. It was reddish brown in appearance and varied in thickness from 6 inches to 18 inches. The soil changed in appearance below the woody debris to a sandy silt with clay seams. No petroleum odors, discoloration or other indications of a petroleum release were noted during the excavation.

Soil around the #2 400-gallon diesel tank was gravely pit run sand, poorly graded gravels, and gravel sand mixtures. At six feet below grade, sand content increased until the woody debris was encountered at eight feet below grade. Below that was sand, silt and clay that appeared to be native.



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A combination of pit run and new crushed rock were being used to fill the excavations and establish a finished subgrade for construction.

### **Tanks**

The #1 8000-gallon heavy heating oil tank was 9 feet in diameter and 24 feet long with a manhole in the middle. A two-inch supply and a two-inch return line for black oil were found on the east end of the tank. The two-inch vent was also on the east end. On the west end was a four-inch fill. A brass tag listed the tank as having 8000-gallon capacity. The steel was 5/16 thick. The tank had double angle iron brace at each end. Both the inside and outside of the tank were in good condition with no significant corrosion. It is assumed that the tank was installed during construction of the Educator Building.

The #2 400-gallon diesel heating oil tank was asphalt coated, 1/8-thick steel tank. It was located next to the building under a paved ramp. Corrosion was noted along the bottom of the tank, and petroleum discoloration and odors were observed in the underlying soil. The tank was empty with no water or condensation.

### **Water**

No groundwater was observed entering the excavation during tank removal or remediation. Within a week the #1 large tank bottom had filled in with sand and water that was at eight feet below grade. Groundwater is known to be relatively shallow in the area but the exact groundwater level is unknown. A grab sample of the water was collected and analyzed for diesel and heavy oil. Some oil was found but was below MTCA Method A Cleanup Levels for Ground Water. BTEX was low and also below MTCA Method A Cleanup Levels for Ground Water .

### **Sampling**

Sample Definitions:

#### *Characterization (CH)*

*A sample collected to provide information about the level of contamination, the type of contamination and information regarding plume location. This sample can be converted to a confirmation sample if the level of contamination is lower than the MTCA limit or the project limit with a low value generally representing the boundary of the contamination plume.*

#### *Confirmation (C)*

*This sample is collected to show that the level of contamination is below MTCA or project limits or to define the outer limits of a plume. Values below MTCA or project limits could be used for closure. A high value sample originally collected as confirmation would be reclassified as*



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*Characterization would generally be used to show contamination is still present, and that the plume boundary had not been reached.*

#### *Confirmation/Closure (CC)*

*These samples are collected to confirm the level of contamination at the boundaries of an excavation during a site assessment or at the end of a remediation project. Media type, proximity to the contamination and field screening are all considered when selecting the location for these samples. Samples expected to yield the highest concentration of potential contamination (based on odor and visible indications of a release) are collected for this purpose.*

The MTCA Method A Soil Cleanup Level for Unrestricted Land Uses of 2000 mg/kg for heating oil and heavy heating oil (NWTPH-DX) was chosen as the cleanup level. Black heating oil was found in tank #1. This was characterized and found to contain 30% diesel, asphalt and aliphatics with low BTEX. This is in the mid-range of heavy heating oil.

For closure all appropriate sampling protocols were followed. Closure samples were kept cool or refrigerated until delivery to Friedman & Bruya Laboratories, 3012 16<sup>th</sup> Avenue West, Seattle, WA. NWTPH-Dx was used as the sampling analysis method.

#1 tank (8000-gallon black oil) soil sampling did not show any values above the laboratory reporting limit. These samples were used for closure. The absence of odors or other visual indications of petroleum contamination are consistent with the soil analytical results. Later, after water accumulated within the excavation, a grab water sample was collected and results indicated no BTEX with some NWTPH at concentrations below the MTCA Method A Cleanup Level for Groundwater of 500 ug/L. The laboratory designated these results with an "X" because the sample chromatogram pattern did not resemble the fuel standard used for quantitation. This can occur in cases where petroleum has undergone biodegradation and contains non-polar organics, or interferences can be caused by naturally occurring non-petroleum organic matter (such as leaf litter, bark and peat).

A release was associated with the #2 tank (diesel heating oil). Samples collected directly beneath corrosion along the tank bottom exceeded the MTCA Method A Soil Cleanup Level for Unrestricted Land Uses by a factor 3.5 to 6.5. Discolored soil was excavated and found to have extended to the north above a layer of wood debris. Just past a piling to the north of the tank the discoloration ended. Sampling after excavation showed no concentration above method reporting limits in the sidewalls with the highest remnant hydrocarbon concentration of 470 mg/kg NWTPD-Dx located at the bottom center of the excavation, coincident with the former storage tank location. This concentration is well below MTCA A Soil Cleanup Level for Unrestricted Land Uses of 2000 mg/kg.

Samples were collected at areas exhibiting discolored soil or petroleum contamination (where present). Where no petroleum was indicated, samples were chosen for site location and soil type to provide coverage for the excavation.



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### Summary & Conclusions

On October 2, 2018, an 8,000 (tank #1) gallon black heating oil storage tank and a 400-gallon diesel heating oil storage tank (tank #2) were removed from the Portside 55 development site in the Tacoma Tide-flats Industrial area. There are no indications of a petroleum release associated with Tank #1. No ground water was encountered on the day the tank was removed and the excavation was dug to a depth of 13 feet below grade. Some days later, water was observed at 8 feet below grade. A grab sample of the water showed oil and diesel range TPH at concentrations below MTCA Method A Levels for Ground Water.

Diesel was released from Tank #2 into the soil. On October 9, 2018, 65.32 tons of soil was excavated and disposed at the Pierce County Landfill. Laboratory analysis indicated the remaining soil was well below the MTCA A level of 2000 mg/kg; 470 mg/kg NWTPH-Dx for one out of five total soil samples. BTEX analysis of soil was also below MTCA Method A Soil Cleanup Levels for Unrestricted Land Use.

Based on the findings contained in this report, no further action is recommended relating to the former #1 8000-gallon heavy heating oil storage tank and the #2 400-gallon diesel storage tank removed from this site.

*Robert F. Simons*

Site Assessor:

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Robert F. Simons  
Environmental Specialties  
4227 S Meridian, Ste C, #625  
Puyallup, WA 98373  
253-686-1144  
#ICC- 32000769

Enclosures: Permits (2), Data Summary, Lab Reports, Sketch, Disposal Receipt, Decommissioning Certificate, Pictures

Portside 55												
Site Assessment, Remediation												
3401 Lincoln, Tacoma, WA												
Soil Sampling Data Summary												
Site Assessment 10/2/18												
Remediation 10/9/18												
Soil												
Project #	Sample	Site	Other #	Type	NWTPH-DX Diesel Range C10-C25 mg/kg	NWTPH-DX Motor Oil Range C25-C36 mg/kg	8021B Benzene mg/kg	8021B Toluene mg/kg	8021B E Benzene mg/kg	8021B Xylene mg/kg	Depth BG feet	Notes
1-A	10/2/18	1	1	CC	<50	<250					14	dark gray sand, excavation
2-A	10/2/18	1	2	CC	<100	<500					13	dark gray sand, excavation
3-A	10/2/18	1	3	CC	<50	<250					11	dark gray sand, excavation
4-A	10/2/18	1	4	CC	<50	<250					13.5	dark gray sand, excavation
5-A	10/2/18	1	5	CC	<50	<250					13	dark gray sand, excavation
6-A	10/2/18	1	6	CC	<50	<250					0.5	dark gray sand, SP
7-A	10/2/18	1	7	CC	<50	<250					0.5	dark gray sand, SP
8-A	10/2/18	1	8	CC	<50	<250					0.5	dark gray sand Sp
9	10/2/18	2	9	CH	13,000	<250					6	dark gray/tan pit run, sand, gravel, excavation
10	10/2/18	2	10	CH	7,500	310x	<.02	<.02	0.25	0.56	6	dark gry/tank pit run, sand, gravel, excavation
11	10/2/18	2	11	CC	<50	<250					5.5	Tan/gray sand, excavation
12	10/2/18	2	12	CC	<50	<250					5.5	Tan/gray sand, excavation
13	10/2/18	2	13	CC	<50	<250					6	Tan/gray sand, excavation
14	10/2/18	2	14	CC	<50	<250					5.5	Tan/gray sand, excavation
15	10/2/18	2	15	CC	<50	<250					0.5	Tan/gray sand, stockpile
16	10/2/18	2	16	CC	<50	<250					0.5	Tan/gray sand, Stockpile
17	10/2/18	2	17	CC	<50	<250					0.5	Tan/gray sand, Stockpile
18	10/9/18	2	18	CC	470	<250					8	gray course sand
19	10/9/18	2	19	CC	<50	<250					7	gray/tan sand
20	10/9/18	2	20	CC	<50	<250					8	gray/tan sand
21	10/9/18	2	21	CC	<50	<250					7.5	gray/tan sand
22	10/9/18	2	22	CC	<50	<250					6.5	gray/tan sand
Water												
23	10/10/18	1	23	CH	Ug/L	Ug/L	Ug/L	Ug/L	Ug/L	Ug/L	grab	Water, Ust #1 excavation, mild sheen, clear
24	10/10/18	1	24	CH	330x	430x	<1	<1	<1	<3	grab	Water, Ust #1 excavation, mild sheen, clear

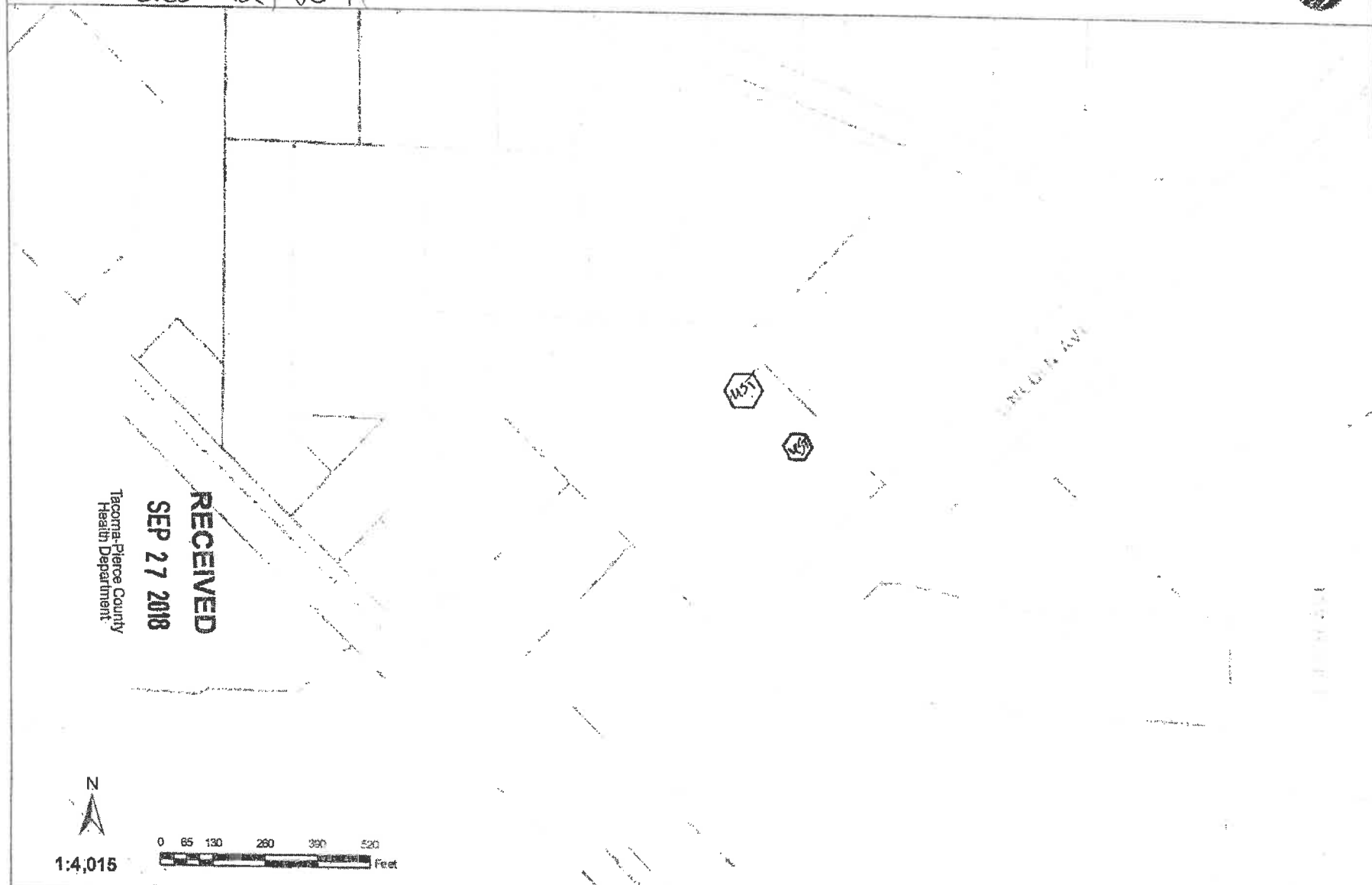




3401 Lincoln Avenue  
Tacoma, WA

PublicGIS

Parcel 0321351051



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SEP 27 2018  
Tacoma-Pierce County  
Health Department

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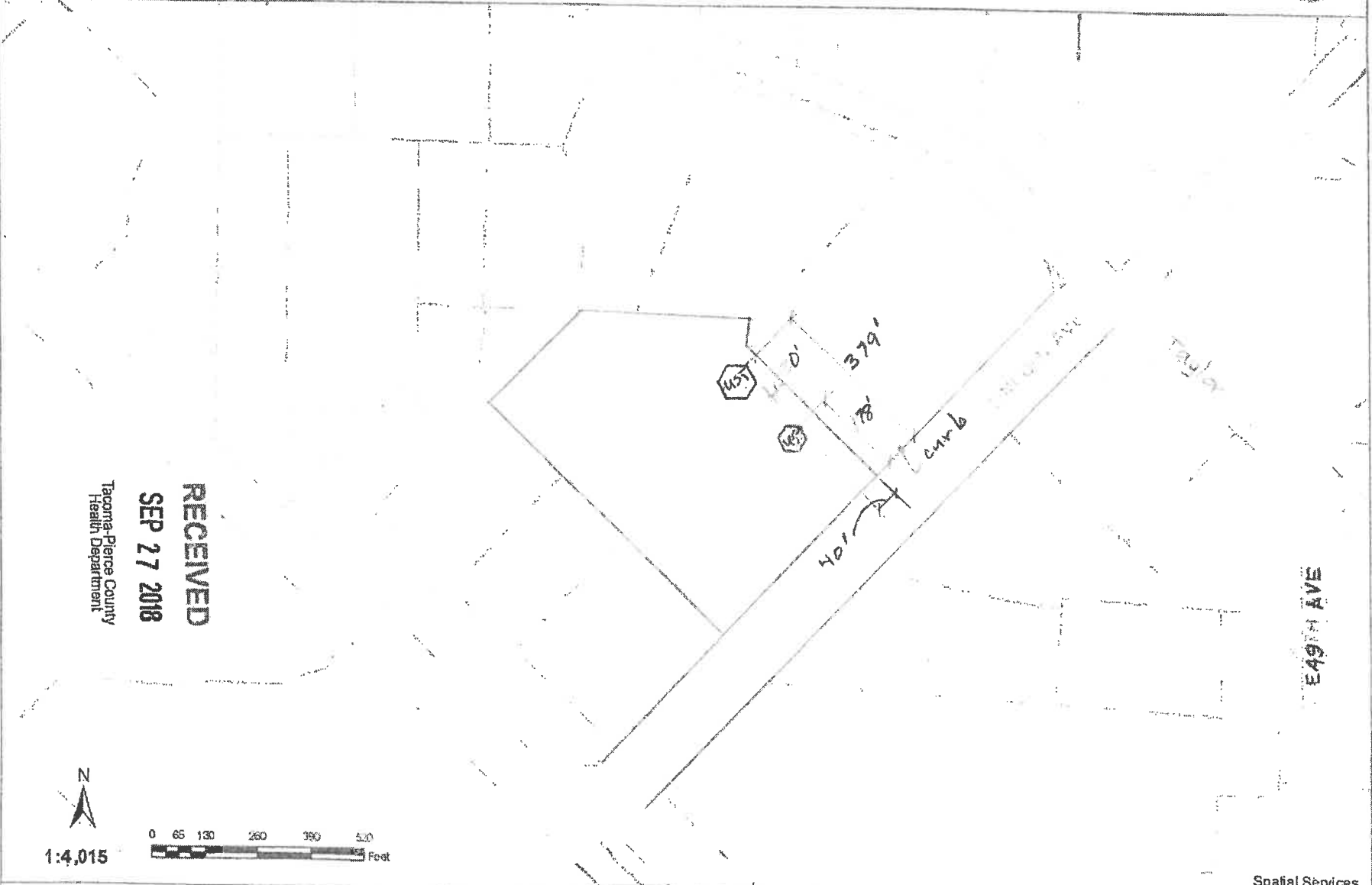
Spatial Services

Disclaimer: Map features are approximate and have not been surveyed. Additional features not yet mapped may be present.  
Pierce County assumes no liability for variations ascertained by formal survey. 9/26/2018

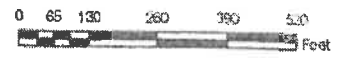
3401 Lincoln Avenue  
Tacoma, WA

PublicGIS

Parcel 0321351051

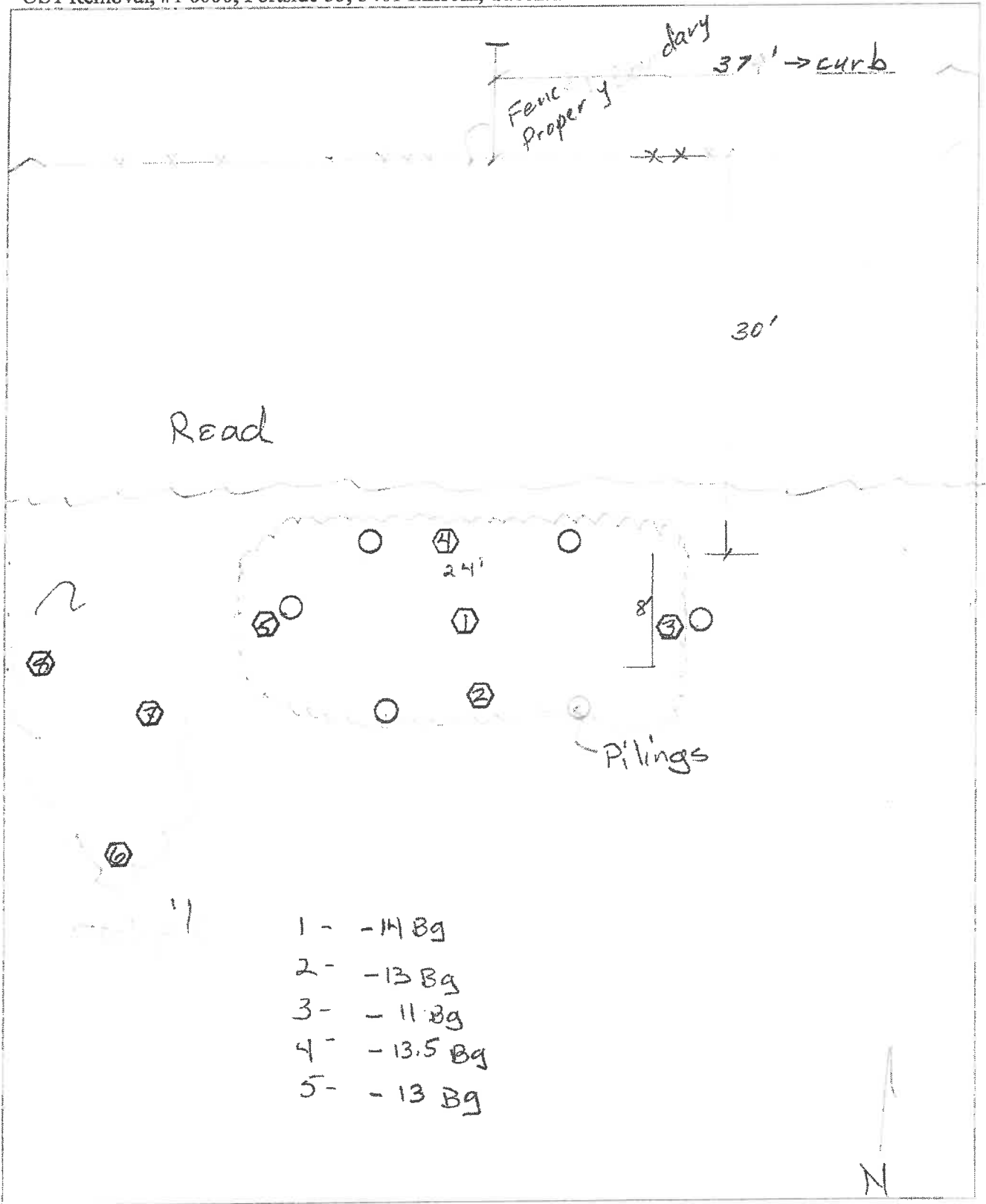


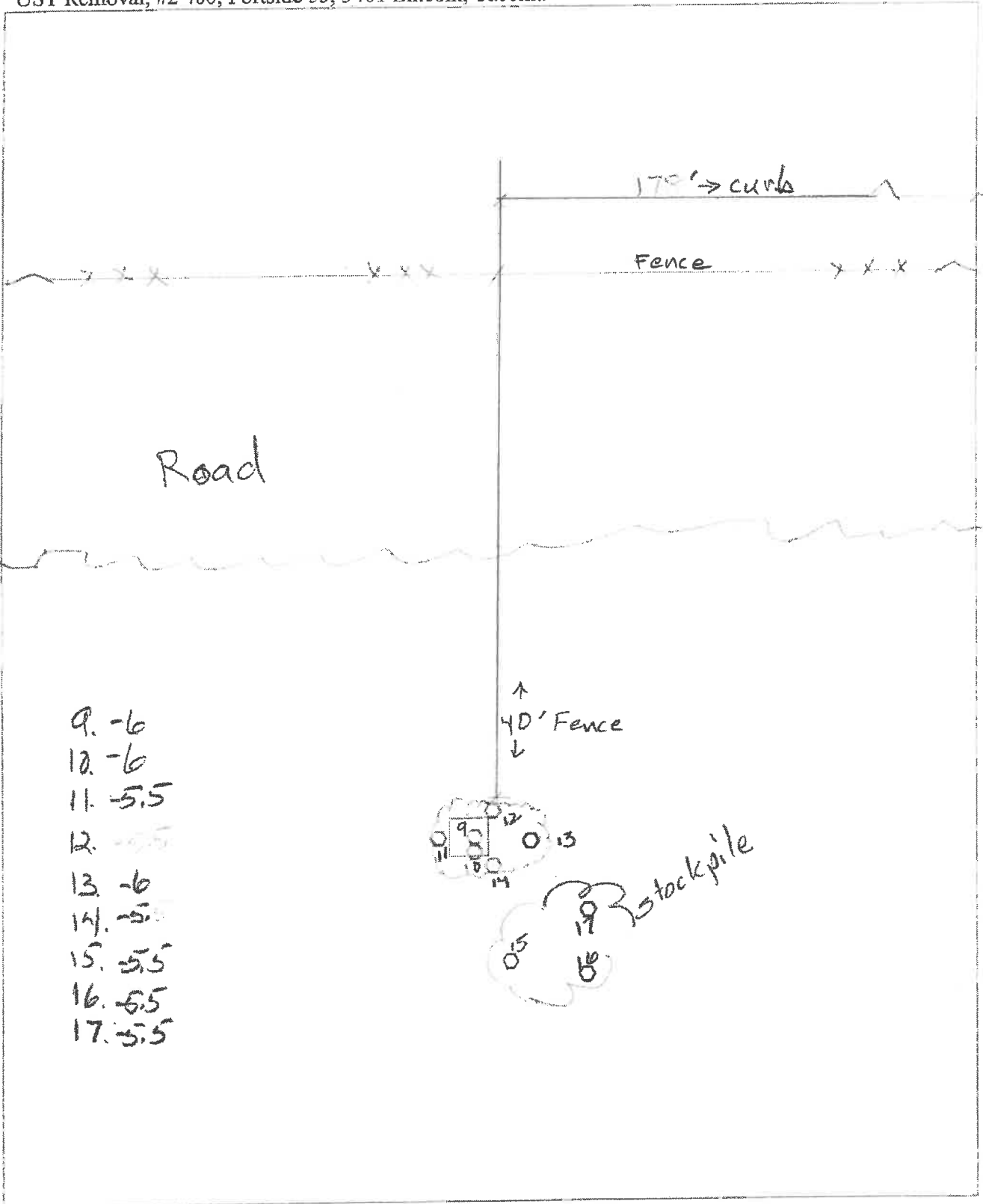
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Tacoma Pierce County  
Health Department



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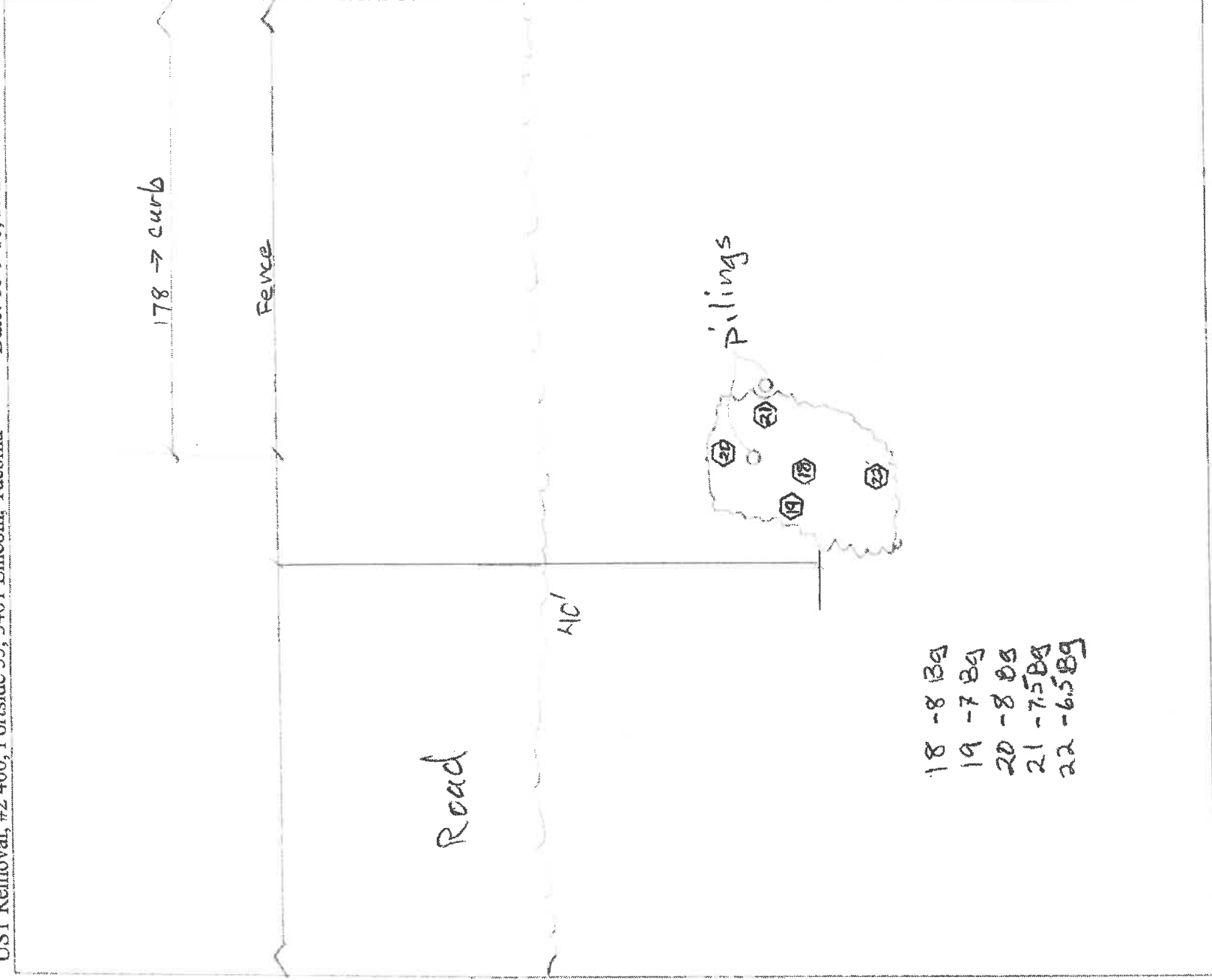




- 9. -6
- 10. -6
- 11. -5.5
- 12. -5.5
- 13. -6
- 14. -5.5
- 15. -5.5
- 16. -6.5
- 17. -5.5

UST Removal, #2 400, Portside 55, 3401 Lincoln, Tacoma

Date: 10-9-18, Remediation



18 - 8 Bg  
19 - 7 Bg  
20 - 8 Bg  
21 - 7.5 Bg  
22 - 6.5 Bg

# Site Cleanup/Underground Storage Tank Removal Permit Letter



September 28, 2018

Case#: R00000150

Port of Tacoma  
PO BOX 1837  
Tacoma, WA98401-

**Re: Underground Storage Tank Removal**  
**Facility Name:** Weyerhaeuser Cascade Operations, Tf  
**Site Address:** 3401 TAYLOR WY, Tacoma, 98421  
**Parcel Number:** 0321362046

Here is a copy of the Site Cleanup/Underground Storage Tank (UST) Removal Permit for cleanup, investigation and tank removal activities located at the address listed above. A Site Assessment/Site Closure or appropriate status report is due within 90 days of UST removal or other UST Site activity.

In accordance with the Environmental Health Code Chapter 4: USTs, the current Site Owner or Operator must achieve Site Closure by demonstrating to the Health Department the UST and related components have been properly decommissioned and all contamination cleaned up. If Site Closure is not achieved by the time of permit expiration, the permit must be renewed.

If you have any questions regarding Health Department cleanup and UST removal requirements, contact us at [rolsen@tpchd.org](mailto:rolsen@tpchd.org) or (253) 798-2855.

See more information about our Underground Storage Tank Program at [www.tpchd.org/ust](http://www.tpchd.org/ust).

Sincerely,

Rob Olsen  
Environmental Health Specialist II  
UST Program/Environmental Health Division

Enclosures

cc:

Jeff Brewer, Dickson CO  
Robert Simons, Environmental Specialties





# Site Cleanup/Underground Storage Tank (UST) Removal Application



Description of current facility use, past facility use and plans for facility.

Warehouse 200,000 sq ft, Boiler heat  
Recently demolished

Description of UST(s) to be removed (if applicable).

UST Size	Material Contained	Material of Construction	Age
1. 10,000	Black HO	steel	75 yrs
2. 500	diesel	steel	50 yrs
3.			
4.			
5.			
6.			

Number of product dispensers None

Do the results of a previous investigation indicate contamination from the UST system?  Yes  No  
 Other \_\_\_\_\_

If a prior investigation identified a release, the Health Department will likely require the submission of that data before issuing a Site Cleanup/UST Removal Permit. For permit renewals, the Health Department may already have this data. In this case, enter "Filed with Health Department." Call the UST Program with questions about submittal requirements.

Have all other permits and approvals been provided by the appropriate agencies (Washington State Department of Ecology, Fire Marshal, Building Official)?  Yes  No. Other \_\_\_\_\_

Attach a site diagram identifying features of the project area along with any other information pertinent to Health Department review of this application.

For additional information, visit [www.tpchd.org/ust](http://www.tpchd.org/ust) or call (253) 798-2855.

### Certification

I hereby certify I am authorized to sign on behalf of the UST owner/site owner. I have personally examined and am familiar with the information submitted in this document. I believe the submitted information is true, accurate and complete to the best of my knowledge and ability and all known and suspected hazards have been disclosed. I understand a closure/site assessment or status report must be submitted within 90 days of tank removal or other UST site activity and this permit is valid only for one year, after which a new permit is required if Site Closure has not been achieved.

Robert F. Simions  
 Submitted By (Print Name)

Robert F. Simions 9/26/18  
 Signature

**RECEIVED**  
**SEP 27 2018**

Information submitted is subject to Public Records Act, Chapter 42.56 RCW.

# Site Cleanup/Underground Storage Tank Removal Permit Letter



October 10, 2018

Case#: R00004758

Port of Tacoma  
PO BOX 1837  
Tacoma, WA98401-1837

**Re: Underground Storage Tank Removal**  
**Facility Name:** Portside 55  
**Site Address:** 3401 Lincoln AVE, Tacoma, 98421-  
**Parcel Number:** 0321351051

Here is a copy of the Site Cleanup/Underground Storage Tank (UST) Removal Permit for cleanup, investigation and tank removal activities located at the address listed above. A Site Assessment/Site Closure or appropriate status report is due within 90 days of UST removal or other UST Site activity.

In accordance with the Environmental Health Code Chapter 4: USTs, the current Site Owner or Operator must achieve Site Closure by demonstrating to the Health Department the UST and related components have been properly decommissioned and all contamination cleaned up. If Site Closure is not achieved by the time of permit expiration, the permit must be renewed.

If you have any questions regarding Health Department cleanup and UST removal requirements, contact us at [rolsen@tpchd.org](mailto:rolsen@tpchd.org) or (253) 798-2855.

See more information about our Underground Storage Tank Program at [www.tpchd.org/ust](http://www.tpchd.org/ust).

Sincerely,

A handwritten signature in black ink that reads "Rob Olsen".

Rob Olsen  
Environmental Health Specialist II  
UST Program/Environmental Health Division

Enclosures

Jeff Brewer, Dickson CO  
Robert Simons, Environmental Specialties

# Site Cleanup/Underground Storage Tank Removal Permit



This permit grants the individuals listed below permission to perform Underground Storage Tank(UST) work at the site listed below in accordance with Chapter 4 of the Tacoma Pierce County Environmental Health Code. The Site Owner and Operator are required to demonstrate no contamination and achieve Site Closure as defined in Chapter 4.


Site Location 3401 Lincoln AVE, Tacoma, WA 98421

Facility Name Portside 55

Removal/Consulting Firm Environmental Specialties

Number of Tanks to be Removed (if applicable) 2

**Permit #: RO0004758**

  
Approval Signature

**Permit Issued: 09/27/2018**

All work must be performed in accordance with Environmental Health Code, Chapter 4 Underground Storage Tanks Board of Health Resolution, #2010-4225.

All UST Site activity schedules must be approved by the Health Department at least five business days before activity start date. Contact [rolsen@tpchd.org](mailto:rolsen@tpchd.org) or (253) 798-2855.

Reporting documents must be submitted within 90 days of UST Site activities, including UST removal, investigation and remedial actions.

Site Cleanup/UST Removal permits must be renewed after one year if Site Closure is not achieved.

**Permit must be accessible at site, DO NOT ALTER OR DEFACE.  
This permit expires one year from permit issued date.**

PROFILE NO.

**GENERATOR'S WASTE PROFILE QUESTIONNAIRE**

<b>GENERATOR INFORMATION</b>	<b>CUSTOMER INFORMATION</b>
Generator Name : <u>Pool of Tacoma</u>	Company Name : <u>Environmental Specialties, SA</u>
Site Address : <u>3401 Lincoln</u>	Company Address : <u>41227 S Waverly Ave</u>
City, State, Zip : _____	City, State, Zip : <u>Puyallup, WA 99373</u>
Generator Contact : _____	Company Contact : <u>Robert Simmons</u>
Title : _____	Company Phone# : <u>253-683-1741</u>
Generator Ph# : _____	Treatment Code : _____
Facility EPA # : _____	CWT Code : _____

**WASTE DESCRIPTION**

General Waste Description : Black Heating oil  
 Process Generating Waste : \_\_\_\_\_

Is this Waste a "Hazardous Waste"?  NO Based on: Lab Analysis:  MSDS:  Generator Knowledge:

Waste Generations Rate: \_\_\_\_\_ Per: \_\_\_\_\_ Waste will be transported in: \_\_\_\_\_ One Time Disposal?

Cubic Yards: \_\_\_\_\_ Day: 2  
 Drums: \_\_\_\_\_ Week: 1  
 Tons: \_\_\_\_\_ Month: 10  
 Gallons: 200 Year: 18

Roll-Off Boxes:  \_\_\_\_\_  
 Vacuum Truck:  \_\_\_\_\_  
 Drum (Type Size): \_\_\_\_\_

**CHEMICAL COMPOSITION AND OTHER INGREDIENTS**

(State for each chemical. Total maximum column must be greater than or equal to 100%). NO TRADE NAMES.

	MIN	MAX
<u>80% Black Petroleum Heavy</u>		
<u>20% waste</u>		
<u>NO STEEL</u>		
<u>no Motor Oil</u>		
<u>Black Pourable Heating oil</u>		

Physical State	Odor	Phases	Water	Ph
Liquid: <input checked="" type="checkbox"/>	None: <input type="checkbox"/>	Homogenous: <input checked="" type="checkbox"/>	<1%: <input checked="" type="checkbox"/>	>2-6: <input type="checkbox"/>
Sludge: <input type="checkbox"/>	Mild: <input checked="" type="checkbox"/>	Bi-Layered: <input type="checkbox"/>	1-5%: <input type="checkbox"/>	>6-10: <input checked="" type="checkbox"/>
Solid: <input type="checkbox"/>	Strong: <input type="checkbox"/>	Multi: <input type="checkbox"/>	80-90%: <input type="checkbox"/>	>10-<12.5: <input type="checkbox"/>

Free Liquids  % of Volume: \_\_\_\_\_ BTU's Per LB: Black Color: \_\_\_\_\_

Notes, Additional Information or Special Handling Instructions: GENERATOR CERTIFIES THAT NO OTHER MATERIALS ARE PRESENT

**CERTIFICATION**

I hereby certify that the above attached description is complete and accurate to the best of my knowledge and ability to determine that no deliberate or willfull omission of composition or properties exist, and that all known or suspected hazards have been disclosed I certify that the materials tested are representative of all material described by this Waste Product Questionnaire.

Generator's Signature: Robert F. Simmons Title: Site Assessor  
 Name (Type or Print): \_\_\_\_\_ Date: 10/1/18

Reviewed by: \_\_\_\_\_

PCRCO, LLC dba LRI-304th  
 304TH LANDFILL  
 17925 Meridian St E  
 Puyallup, WA 98375

*Landfill*

PCRCO, LLC dba LRI-304th  
 304TH LANDFILL  
 17925 Meridian St E  
 Puyallup, WA 98375

Weighted: Dana  
 Deposit: Dana  
 BILL TO: 190  
 SIERRA CONSTRUCTION  
 19900 144TH AVE NE  
 WOODINVILLE WA 98072

Weighted: Dana  
 Deposit: Dana  
 BILL TO: 190  
 SIERRA CONSTRUCTION  
 19900 144TH AVE NE  
 WOODINVILLE WA 98072

Vehicle ID:  
 Reference: T3  
 PO #: WDA 2155  
 NOTES: MCKEE 3

Vehicle ID:  
 Reference: 3  
 PO #: WDA 2155  
 NOTES: MCKEE 3

Origin: OTHER  
 DATE IN: 10/09/2018 TIME IN: 09:58:03  
 DATE OUT: 10/09/2018 TIME OUT: 10:13:49

Origin: OTHER  
 DATE IN: 10/09/2018 TIME IN: 13:01:16  
 DATE OUT: 10/09/2018 TIME OUT: 13:17:22

INBOUND TICKET Number: 03-00536536

INBOUND TICKET Number: 03-00536628

SCALE 1 GROSS WT. 105480 LB  
 SCALE 2 TARE WT. 40520 LB  
 NET WEIGHT 64960 LB

SCALE 1 GROSS WT. 105880 LB  
 SCALE 2 TARE WT. 40140 LB  
 NET WEIGHT 65740 LB

Qty	Description	Amount
32.48	SPECIAL WASTE-OUT CD	

Qty	Description	Amount
32.87	SPECIAL WASTE-OUT CD	

*Total  
 65.35 TONS*

**MCKEE**  
 Enterprises llc

PO Box 5  
 Enumclaw, WA 98022  
 (253) 266-5431

Date: 10-9-18	No. 1111
Truck No. 3	Truck Charges:
Truck Type: Solo	Driver Charge:
Truck Rate:	SubTotal:
Truck Hours:	*Add Charges:
Driver Hours:	Total Charges:

Customer: Billin Address: Job Number:

Job Location: *Transfer from Phase 2*  
 Start: *7:00* Stop: *3:00* Lunch: From: To: Choose not to  Breaks:  Downtime: Reason:

Material	From	To	Load	Hours
<i>Transfer from Phase 2</i>		<i>LRT</i>	<i>11</i>	
<i>Transfer to Sierra</i>				

Productive: AM PM

My hours are reported correctly and I have reported injuries occurring on this day to my supervisor.

Supervisor Signature: *M. Ke* Author Co. Rep. Signature:

PLEASE NOTE: ADDITIONAL TERMS AND CONDITIONS:  
 THE TERMS AND CONDITIONS STATED ON THE REVERSE OF THIS INVOICE ARE A PART OF CARRIER'S AGREEMENT TO PROVIDE SERVICE. YOUR SIGNATURE ON THE FACE OF THIS INVOICE SIGNIFIES YOUR KNOWLEDGE, AND ACCEPTANCE, OF THE TERMS ON THE REVERSE

# Site Cleanup/Underground Storage Tank Removal Permit



This permit grants the individuals listed below permission to perform Underground Storage Tank(UST) work at the site listed below in accordance with Chapter 4 of the Tacoma Pierce County Environmental Health Code. The Site Owner and Operator are required to demonstrate no contamination and achieve Site Closure as defined in Chapter 4.

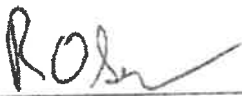
Site Location 3401 TAYLOR WY, Tacoma, WA 98421

Facility Name Weyerhaeuser Cascade Operations, Tf

Removal/Consulting Firm Environmental Specialties

Number of Tanks to be Removed (if applicable) \_\_\_\_\_

**Permit #: RO0000150**

  
Approval Signature

**Permit Issued: 09/27/2018**

All work must be performed in accordance with Environmental Health Code, Chapter 4 Underground Storage Tanks Board of Health Resolution, #2010-4225.

All UST Site activity schedules must be approved by the Health Department at least five business days before activity start date. Contact [rolsen@tpchd.org](mailto:rolsen@tpchd.org) or (253) 798-2855.

Reporting documents must be submitted within 90 days of UST Site activities, including UST removal, investigation and remedial actions.

Site Cleanup/UST Removal permits must be renewed after one year if Site Closure is not achieved.

**Permit must be accessible at site, DO NOT ALTER OR DEFACE.  
This permit expires one year from permit issued date.**



TACOMA FIRE DEPARTMENT  
Fire Prevention Division (253) 591-5754  
Fire Marshal (253) 591-7911  
3471 S. 35th St. Tacoma, WA 98409  
www.tacomafire.org

## PERMIT

For inspection call (253) 591-5754 or  
Inspection request form can be faxed or e-mailed to TFDPermits@cityoftacoma.org

<b>Permit Type: Underground Tank - Removal or Decommissioning - Commercial</b>		<b>Permit Number: 18-020764</b>	
<b>PERMIT INFORMATION</b>			
Date Issued:	10/01/2018		
Issued to:	Portside 55		
Address:	3401 Lincoln	City: Tacoma	State: WA Zip: 98421
Site Address:	(if different from above) Same		
Contact Name:	Robert Simons		
Phone:	(253) 683-1144	Alternate Phone/Cell: ( )	
E-mail Address:	rscmsi@hotmail.com		
<b>ADDITIONAL CONDITIONS OF PERMIT</b>			
1. Comply with permit conditions			
2.			
3.			
<b>FPB OFFICIAL USE ONLY</b>			
Issued By:	Lt. Mark Wagner		
<b>INSPECTION RECORD</b>			
Date: 10/2/18	Inspector: Mark Wagner	Passed <input checked="" type="checkbox"/>	Fail <input type="checkbox"/>
Reason for inspection failure:			
<b>RE-INSPECTION RECORD</b>			
Date:	Inspector:	Passed <input type="checkbox"/>	Fail <input type="checkbox"/>
Reason for inspection failure:			

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

*Initial  
Excavation  
Sampling*  
3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

October 8, 2018

Bob Simons, Project Manager  
CMSI  
4227 S Meridian, Ste C, No. 625  
Puyallup, WA 98373

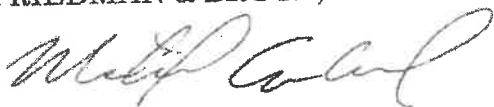
Dear Mr Simons:

Included are the results from the testing of material submitted on October 3, 2018 from the Portside 55 UST Removal, F&BI 810067 project. There are 5 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
CMS1008R.DOC



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on October 3, 2018 by Friedman & Bruya, Inc. from the CMSI Portside 55 UST Removal, F&BI 810067 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>CMSI</u>
810067 -01	1-A
810067 -02	2-A
810067 -03	3-A
810067 -04	4-A
810067 -05	5-A
810067 -06	6-A
810067 -07	7-A
810067 -08	8-A
810067 -09	9
810067 -10	10
810067 -11	11
810067 -12	12
810067 -13	13
810067 -14	14
810067 -15	15
810067 -16	16
810067 -17	17

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/08/18  
Date Received: 10/03/18  
Project: Portside 55 UST Removal, F&BI 810067  
Date Extracted: 10/04/18  
Date Analyzed: 10/04/18

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-Dx**  
Results Reported on a Dry Weight Basis  
Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 53-144)
1-A 810067-01	<50	<250	85
2-A 810067-02 1/2	<100	<500	89
3-A 810067-03	<50	<250	89
4-A 810067-04	<50	<250	90
5-A 810067-05	<50	<250	83
6-A 810067-06	<50	<250	83
7-A 810067-07	<50	<250	88
8-A 810067-08	<50	<250	88
9 810067-09	13,000	<250	117
10 810067-10	7.500	310 x	86

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/08/18  
Date Received: 10/03/18  
Project: Portside 55 UST Removal, F&BI 810067  
Date Extracted: 10/04/18  
Date Analyzed: 10/04/18

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-Dx**  
Results Reported on a Dry Weight Basis  
Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> (% Recovery) (Limit 53-144)
11 810067-11	<50	<250	88
12 810067-12	<50	<250	95
13 810067-13	<50	<250	87
14 810067-14	<50	<250	93
15 810067-15	<50	<250	96
16 810067-16	<50	<250	94
17 810067-17	<50	<250	97
Method Blank 08-2245 MB	<50	<250	95

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/08/18

Date Received: 10/03/18

Project: Portside 55 UST Removal, F&BI 810067

**QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-Dx**

Laboratory Code: 810067-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	90	94	64-133	4

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	96	58-147

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Data Qualifiers & Definitions

- a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.
- b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.
- ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.
- c - The presence of the analyte may be due to carryover from previous sample injections.
- cf - The sample was centrifuged prior to analysis.
- d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.
- dv - Insufficient sample volume was available to achieve normal reporting limits.
- f - The sample was laboratory filtered prior to analysis.
- fb - The analyte was detected in the method blank.
- fc - The compound is a common laboratory and field contaminant.
- hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.
- hs - Headspace was present in the container used for analysis.
- ht - The analysis was performed outside the method or client-specified holding time requirement.
- ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.
- j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.
- J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.
- jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.
- js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.
- lc - The presence of the analyte is likely due to laboratory contamination.
- L - The reported concentration was generated from a library search.
- nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.
- pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.
- ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.
- vo - The value reported fell outside the control limits established for this analyte.
- x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

810067

SAMPLE CHAIN OF CUSTODY

ME 10-03-18

Do3

Report to CMSI-Environmental Specialties  
 Company 4227 Meridian S. Ste C #225  
Prattville, WA 98373  
 Address \_\_\_\_\_  
 City, State, ZIP \_\_\_\_\_  
 Phone 253-683-1141 / hph

SAMPLERS (signature) Robert T. Simmons  
 PROJECT NAME Portside 55 PO # \_\_\_\_\_  
Hot Removal  
 REMARKS Black Diesel INVOICE TO \_\_\_\_\_  
A = 8000 UST B = 4000 UST  
Run BTEX on one from each  
with vac line

TURNAROUND TIME  
 Standard Turnaround  
 RUSH  
 Rush charges authorized by: \_\_\_\_\_  
 SAMPLE DISPOSAL  
 Dispose after 90 days  
 Archive Samples  
 Other

ANALYSES REQUESTED

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED							Notes	
						TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM		
1-A	01	10/2/18	1:06	1402 SPIT	1		X							-14 <u>Gravel</u>
2-A	02	}	1:07											-13 <u>Gravel</u>
3-A	03		1:10											-11 <u>Gravel</u>
4-A	04		1:12											-13.5 <u>Gravel</u>
5-A	05		1:17											-13 <u>W sand</u>
6-A	06		1:22											-0.5 <u>Gravel</u>
7-A	07		1:23											-0.5 <u>Gravel</u>
8-A	08		1:25											-0.5 <u>Gravel</u>

Samples received at 17 ac

Friedman & Bruya, Inc.  
 3012 16<sup>th</sup> Avenue West  
 Seattle, WA 98119-2029  
 Ph. (206) 285-8282

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
<u>Robert T. Simmons</u>	Robert T. Simmons	CMSI/ES	10/2/18	5:30
<u>Liz Weber-Bruya</u>	Liz Weber-Bruya	FBI	10/3/18	11:50

810067

SAMPLE CHAIN OF CUSTODY

ME 10-03-18 D03  
Page # 2 of 2

Report to GMSI-Environmental Specialties  
 4227 Meridian S. Ste C #625  
 Company Puyallup, WA 98373  
 Address \_\_\_\_\_  
 City, State, ZIP \_\_\_\_\_  
 Phone 253-883-1144 Email \_\_\_\_\_

SAMPLERS (Signature) Robert F. Simons  
 PROJECT NAME Poultside 55 PO # \_\_\_\_\_  
Ust Removal  
 REMARKS black Diesel INVOICE TO \_\_\_\_\_  
A=8000 B=400  
Run BTEX on one with  
value

TURNAROUND TIME  
 Standard Turnaround  
 RUSH  
 Rush charges authorized by: \_\_\_\_\_  
 SAMPLE DISPOSAL  
 Dispose after 30 days  
 Archive Samples  
 Other

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED							Notes	
						TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM		
9	09	10/2/18	1:48	Soil	1402		X							BTM -5 Drk
10	10	}	1:49	}	}									BTM -6 Drk
11	11		1:50											N -5 Tan
12	12		1:52											W -5 Tan
13	13		1:59											E -5 Tan
14	14		2:01											S -4.5 Tan
15	15		2:03											SP -5 Tan
16	16		2:06											SP -5 Tan
17	17		2:10											SP -5 Tan

Friedman & Bruya, Inc.  
 3012 16<sup>th</sup> Avenue West  
 Seattle, WA 98119-2029  
 Ph. (206) 285-8282

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: <u>Robert F. Simons</u>	Robert F. Simons	GMSI/ES	10/2/18	5:40
Received by: <u>Liz Webber-Bruya</u>	Liz Webber-Bruya	FBI	10/3/18	1150
Relinquished by:				
Received by:				

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Remediation  
10/9/18

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

October 12, 2018

Bob Simons, Project Manager  
CMSI  
4227 S Meridian, Ste C, No. 625  
Puyallup, WA 98373

Dear Mr Simons:

Included are the results from the testing of material submitted on October 10, 2018 from the Portside 55 No.2 HD Remediation, F&BI 810202 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
CMS1012R.DOC



FRIEDMAN & BRUYA, INC.

---

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on October 10, 2018 by Friedman & Bruya, Inc. from the CMSI Portside 55 No.2 HD Remediation, F&BI 810202 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>CMSI</u>
810202 -01	18
810202 -02	19
810202 -03	20
810202 -04	21
810202 -05	22

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/12/18

Date Received: 10/10/18

Project: Portside 55 No.2 HD Remediation, F&BI 810202

Date Extracted: 10/10/18

Date Analyzed: 10/10/18

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-Dx**  
Results Reported on a Dry Weight Basis  
Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> (% Recovery) (Limit 56-165)
18 810202-01	470	<250	88
19 810202-02	<50	<250	81
20 810202-03	<50	<250	76
21 810202-04	<50	<250	83
22 810202-05	<50	<250	77
Method Blank 08-2297 MB	<50	<250	82

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/12/18

Date Received: 10/10/18

Project: Portside 55 No.2 HD Remediation, F&BI 810202

**QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-Dx**

Laboratory Code: 810188-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	98	98	63-146	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	100	79-144

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Data Qualifiers & Definitions

- a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.
- b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.
- ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.
- c - The presence of the analyte may be due to carryover from previous sample injections.
- cf - The sample was centrifuged prior to analysis.
- d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.
- dv - Insufficient sample volume was available to achieve normal reporting limits.
- f - The sample was laboratory filtered prior to analysis.
- fb - The analyte was detected in the method blank.
- fc - The compound is a common laboratory and field contaminant.
- hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.
- hs - Headspace was present in the container used for analysis.
- ht - The analysis was performed outside the method or client-specified holding time requirement.
- ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.
- j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.
- J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.
- jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.
- js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.
- lc - The presence of the analyte is likely due to laboratory contamination.
- L - The reported concentration was generated from a library search.
- nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.
- pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.
- ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.
- vo - The value reported fell outside the control limits established for this analyte.
- x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

810202

SAMPLE CHAIN OF CUSTODY

ME 10/10/18

1 D02

Report To CMSI-Environmental Specialties  
 Company 4227 Meridian S. Ste C #625  
Puyallup, WA 98373  
 Address \_\_\_\_\_  
 City, State, ZIP \_\_\_\_\_  
 Phone 253-683-1144 Email vecmsi@kdcmail.com

SAMPLERS (signature) Robert F. Simons  
 PROJECT NAME Portside 55#2 HD Remediation PO # \_\_\_\_\_  
 REMARKS Woodgallon St INVOICE TO \_\_\_\_\_

Page # 1 of 1  
 TURNAROUND TIME  
 Standard Turnaround  
 RUSH \_\_\_\_\_  
 Rush charges authorized by: \_\_\_\_\_  
 SAMPLE DISPOSAL  
 Dispose after 30 days  
 Archive Samples  
 Other \_\_\_\_\_

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED							Notes	
						TPH-HCID	TPH-Diesel X	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM		
18	01	10/9/18	8:50	Soil	1402		X							BTM <sup>Coarse sand</sup> <sub>Grey Tan</sub>
19	02	}	8:53	}	}	}	}	}	}	}	}	}	}	SW <sup>sand</sup> <sub>Grey Tan</sub>
20	03		11:40											SW <sup>sand</sup> <sub>Grey Tan</sub>
21	04		11:43											SW <sup>sand</sup> <sub>Grey Tan</sub>
22	05		11:44											SW <sup>Fine</sup> <sub>Grey sand</sub>

Samples received at 19 °C

Niedman & Bruya, Inc.  
 3012 16<sup>th</sup> Avenue West  
 Seattle, WA 98119-2029  
 Ph. (206) 285-8282

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
<u>Robert F. Simons</u>	Robert F. Simons	CMSI/ES	10/9/18	5:30
<u>Nhan Phan</u>	Nhan Phan	FBI	10/10/18	1330
Relinquished by:				
Received by:				

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

#2  
BTEX in soil

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

October 16, 2018

Bob Simons, Project Manager  
CMSI  
4227 S Meridian, Ste C, No. 625  
Puyallup, WA 98373

Dear Mr Simons:

Included are the additional results from the testing of material submitted on October 3, 2018 from the Portside 55 UST Removal, F&BI 810067 project. There are 4 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
CMS1016R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on October 3, 2018 by Friedman & Bruya, Inc. from the CMSI Portside 55 UST Removal, F&BI 810067 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>CMSI</u>
810067 -01	1-A
810067 -02	2-A
810067 -03	3-A
810067 -04	4-A
810067 -05	5-A
810067 -06	6-A
810067 -07	7-A
810067 -08	8-A
810067 -09	9
810067 -10	10
810067 -11	11
810067 -12	12
810067 -13	13
810067 -14	14
810067 -15	15
810067 -16	16
810067 -17	17

Sample 10 was extracted from a 4 ounce jar. The data were flagged accordingly.

All other quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/16/18  
Date Received: 10/03/18  
Project: Portside 55 UST Removal, F&BI 810067  
Date Extracted: 10/10/18  
Date Analyzed: 10/10/18

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES  
USING METHOD 8021B**

Results Reported on a Dry Weight Basis

Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Surrogate (% Recovery)</u> (Limit 50-150)
10 pc 810067-10	<0.02	<0.02	0.25	0.56	95
Method Blank 08-2263 MB2	<0.02	<0.02	<0.02	<0.06	81



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/16/18  
 Date Received: 10/03/18  
 Project: Portside 55 UST Removal, F&BI 810067

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES  
 FOR BENZENE, TOLUENE, ETHYLBENZENE,  
 AND XYLENES  
 USING EPA METHOD 8021B**

Laboratory Code: 810100-01 (Duplicate)

Analyte	Reporting Units	Sample Result (Wet Wt)	Duplicate Result (Wet Wt)	RPD (Limit 20)
Benzene	mg/kg (ppm)	<0.02	<0.02	nm
Toluene	mg/kg (ppm)	<0.02	<0.02	nm
Ethylbenzene	mg/kg (ppm)	<0.02	<0.02	nm
Xylenes	mg/kg (ppm)	<0.06	<0.06	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent	
			Recovery LCS	Acceptance Criteria
Benzene	mg/kg (ppm)	0.5	88	66-121
Toluene	mg/kg (ppm)	0.5	86	72-128
Ethylbenzene	mg/kg (ppm)	0.5	89	69-132
Xylenes	mg/kg (ppm)	1.5	88	69-131

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Data Qualifiers & Definitions

- a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.
- b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.
- ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.
- c - The presence of the analyte may be due to carryover from previous sample injections.
- cf - The sample was centrifuged prior to analysis.
- d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.
- dv - Insufficient sample volume was available to achieve normal reporting limits.
- f - The sample was laboratory filtered prior to analysis.
- fb - The analyte was detected in the method blank.
- fc - The compound is a common laboratory and field contaminant.
- hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.
- hs - Headspace was present in the container used for analysis.
- ht - The analysis was performed outside the method or client-specified holding time requirement.
- ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.
- j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.
- J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.
- jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.
- js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.
- lc - The presence of the analyte is likely due to laboratory contamination.
- L - The reported concentration was generated from a library search.
- nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.
- pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.
- ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.
- vo - The value reported fell outside the control limits established for this analyte.
- x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

810067

SAMPLE CHAIN OF CUSTODY

ME 10-03-18

Do3

Report To CM3: Environmental Spectacles  
 Company 4227 Meridian S. Ste C 9826  
Puyallup, WA 98373  
 Address \_\_\_\_\_  
 City, State, ZIP \_\_\_\_\_  
 Phone 253-683-1444/hil

SAMPLERS *(signature)*  
 PROJECT NAME Portside 55 PO # \_\_\_\_\_  
Hot Removal  
 REMARKS black Diesel INVOICE TO \_\_\_\_\_  
A=8000 ust B=4000 ust  
Run BTEX on one from each  
with diesel

TURNAROUND TIME  
 Standard Turnaround  
 RUSH  
 Rush charges authorized by: \_\_\_\_\_  
 SAMPLE DISPOSAL  
 Dispose after 30 days  
 Archive Samples  
 Other

ANALYSES REQUESTED

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	Notes
1-A	01	10/2/18	1:06	Hot Diesel	1		X						-14 Excess BTM
2-A	02	}	1:08										-13 Excess Bony Fibers
3-A	03		1:10										-11 Excess E
4-A	04		1:12										-135 Excess N Fuel
5-A	05		1:17										-10 W Fuel
6-A	06		1:22										-5 Excess Bony
7-A	07		1:23										-5 Excess Bony SP Fuel
8-A	08		1:25										-5 Excess Bony SP Fuel

Samples received at 17:00

Friedman & Bruya, Inc.  
 3012 16<sup>th</sup> Avenue West  
 Seattle, WA 98119-2029  
 Ph. (206) 285-8282

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
<i>(Signature)</i>	Robert F. Simmons	CM3/ES	10/2/18	5:30
<i>(Signature)</i>	Liz Weber Bruya	FBI	10/3/18	1150
Received by:				

810067

SAMPLE CHAIN OF CUSTODY

ME 10-03-18 D03 Page # 2 of 2

Report to CMSI-Environmental Specialties  
4227 Meridian S. Ste C #625  
 Company Puyallup, WA 98373  
 Address \_\_\_\_\_  
 City, State, ZIP \_\_\_\_\_  
 Phone 253-883-1144 Email \_\_\_\_\_

SAMPLERS (signature) Robert F. Swanson  
 PROJECT NAME Povtside 55 PO# \_\_\_\_\_  
Ust Removal  
 REMARKS Block A=8000 B=4000 INVOICE TO \_\_\_\_\_  
Run BTEX on new with

TURNAROUND TIME  
 Standard Turnaround  
 RUSH  
 Rush charges authorized by: \_\_\_\_\_  
 SAMPLE DISPOSAL  
 Dispose after 30 days  
 Archive Samples  
 Other

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED							Notes
						TPH-HCID	TPH-Diesel X	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	FAHs 8270D SIM	
9	09	10/2/18	1:48	soil	1 jar		X						per BS 10/9/18 ME
10	10	}	1:49	}	}								BTM -5 Drk
11	11		1:50									BTM -6 Drk	
12	12		1:52									N -5 Tan	
13	13		1:59									W -5 Tan	
14	14		2:01									E -5 Tan	
15	15		2:03									S -4.5 Tan	
16	16		2:06									SP -5 Tan	
17	17		2:10									SP -5 Tan	

Friedman & Bruya, Inc.  
 2012 16th Avenue West  
 Seattle, WA 98119-2029  
 Ph. (206) 286-8282

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: <u>Robert F. Swanson</u>	<u>Robert F. Swanson</u>	<u>CMSI</u>	<u>10/2/18</u>	<u>5:40</u>
Received by: <u>Liz Walker Bruya</u>	<u>Liz Walker Bruya</u>	<u>FBI</u>	<u>10/3/18</u>	<u>1:50</u>
Relinquish by: _____				
Received by: _____				

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

#1 Water  
Sample

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

October 16, 2018

Bob Simons, Project Manager  
CMSI  
4227 S Meridian, Ste C, No. 625  
Puyallup, WA 98373

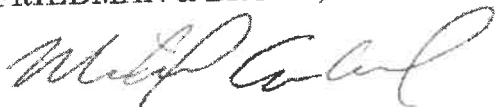
Dear Mr Simons:

Included are the results from the testing of material submitted on October 11, 2018 from the Portside 55 No.1 HO Water Sample, F&BI 810230 project. There are 6 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
CMS1016R.DOC

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on October 11, 2018 by Friedman & Bruya, Inc. from the CMSI Portside 55 No.1 HO Water Sample, F&BI 810230 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>CMSI</u>
810230 -01	23
810230 -02	24

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/16/18

Date Received: 10/11/18

Project: Portside 55 No.1 HO Water Sample, F&BI 810230

Date Extracted: 10/11/18

Date Analyzed: 10/11/18

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES  
USING METHOD 8021B**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Surrogate (% Recovery) Limit (52-124)</u>
23 810230-01	<1	<1	<1	<3	86
Method Blank 08-2266 MB	<1	<1	<1	<3	89

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/16/18  
Date Received: 10/11/18  
Project: Portside 55 No.1 HO Water Sample, F&BI 810230  
Date Extracted: 10/12/18  
Date Analyzed: 10/12/18

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-Dx  
Results Reported as ug/L (ppb)**

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>26</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 51-134)
24 810230-02	330 x	430 x	103
Method Blank 08-2309 MB	<50	<250	96



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/16/18

Date Received: 10/11/18

Project: Portside 55 No.1 HO Water Sample, F&BI 810230

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE,  
AND XYLENES  
USING EPA METHOD 8021B**

Laboratory Code: 810182-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Benzene	ug/L (ppb)	50	<1	106	108	50-150	2
Toluene	ug/L (ppb)	50	<1	106	110	50-150	4
Ethylbenzene	ug/L (ppb)	50	<1	112	114	50-150	2
Xylenes	ug/L (ppb)	150	<3	107	107	50-150	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	110	65-118
Toluene	ug/L (ppb)	50	110	72-122
Ethylbenzene	ug/L (ppb)	50	114	73-126
Xylenes	ug/L (ppb)	150	107	74-118

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/16/18

Date Received: 10/11/18

Project: Portside 55 No.1 HO Water Sample, F&BI 810230

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-Dx**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	88	108	58-134	20

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Data Qualifiers & Definitions

- a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.
- b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.
- ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.
- c - The presence of the analyte may be due to carryover from previous sample injections.
- cf - The sample was centrifuged prior to analysis.
- d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.
- dv - Insufficient sample volume was available to achieve normal reporting limits.
- f - The sample was laboratory filtered prior to analysis.
- fb - The analyte was detected in the method blank.
- fc - The compound is a common laboratory and field contaminant.
- hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.
- hs - Headspace was present in the container used for analysis.
- ht - The analysis was performed outside the method or client-specified holding time requirement.
- ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.
- j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.
- J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.
- jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.
- js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.
- lc - The presence of the analyte is likely due to laboratory contamination.
- L - The reported concentration was generated from a library search.
- nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.
- pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.
- ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.
- vo - The value reported fell outside the control limits established for this analyte.
- x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

D10A70

# SAMPLE CHAIN OF CUSTODY

ME 10-11-18 Page # 1 of 1  
vw 1/204

Report To CMSI-Environmental Specialties  
4227 Meridian S. Ste C #525  
 Company Puyallup, WA 98373  
 Address \_\_\_\_\_  
 City, State, ZIP \_\_\_\_\_  
 Phone 253-163-1144 Email vsc.cmsi@besttaill.com

SAMPLERS (signature) Robert K. Simon  
 PROJECT NAME Portside 55  
# 1 HD Water Sample  
 REMARKS Coval sample  
water in open excavation

TURNAROUND TIME  
 Standard Turnaround  
 RUSH  
 Rush charges authorized by: \_\_\_\_\_  
 SAMPLE DISPOSAL  
 Dispose after 30 days  
 Archive Samples  
 Other

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED										Notes	
						TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8011B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM					
23	01 A-D	10/10/18		Water	4 jars 402				X								Water in 14-84 excavation 10/3/18
24	02	10/10/18		Water	1 1/2 TRJA		X										Water in 14-84 excavation 10/3/18

Friedman & Bruya, Inc.  
 3012 16<sup>th</sup> Avenue West  
 Seattle, WA 98119-2029  
 Ph. (206) 285-8282

SIGNATURE		PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	<u>Robert K. Simon</u>	<u>Robert K. Simon</u>	<u>CMSI</u>	<u>10/10/18</u>	<u>5:20</u>
Received by:	<u>James Bruya</u>	<u>JAMES BRUYA</u>	<u>F&amp;B</u>	<u>10/11</u>	<u>11:10</u>
Relinquished by:					
Received by:					

Samples received at 14 °C

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

*Black oil  
CH*  
3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

October 9, 2018

Bob Simons, Project Manager  
CMSI  
4227 S Meridian, Ste C, No. 625  
Puyallup, WA 98373

Dear Mr Simons:

Included are the results from the testing of material submitted on September 26, 2018 from the WD-55 Project, Tacoma, F&BI 809450 project. There are 6 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
CMS1009R.DOC

FRIEDMAN & BRUYA, INC.

---

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on September 26, 2018 by Friedman & Bruya, Inc. from the CMSI WD-55 Project, Tacoma, F&BI 809450 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>CMSI</u>
809450 -01	1

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/09/18  
Date Received: 09/26/18  
Project: WD-55 Project, Tacoma, F&BI 809450  
Date Extracted: 10/02/18  
Date Analyzed: 10/04/18

**RESULTS FROM THE ANALYSIS OF SOIL/PRODUCT SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES  
USING METHOD 8021B**

Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Surrogate (% Recovery)</u> (Limit 50-150)
1 809450-01 1/1,000	<20	<20	80	910	109
Method Blank 08-2117 MB2	<0.02	<0.02	<0.02	<0.06	81

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/09/18  
Date Received: 09/26/18  
Project: WD-55 Project, Tacoma, F&BI 809450  
Date Extracted: 09/28/18  
Date Analyzed: 09/28/18

**RESULTS FROM THE ANALYSIS OF SOIL/PRODUCT SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-Dx  
Results Reported as mg/kg (ppm)**

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 48-168)
1 809450-01 1/200	360,000	<50,000	86
Method Blank 08-2186 MB	<50	<250	103



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/09/18

Date Received: 09/26/18

Project: WD-55 Project, Tacoma, F&BI 809450

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL/PRODUCT  
SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE,  
AND XYLENES  
USING EPA METHOD 8021B**

Laboratory Code: 809535-01 (Duplicate)

Analyte	Reporting Units	Sample Result (Wet Wt)	Duplicate Result (Wet Wt)	RPD (Limit 20)
Benzene	mg/kg (ppm)	<0.02	<0.02	nm
Toluene	mg/kg (ppm)	<0.02	<0.02	nm
Ethylbenzene	mg/kg (ppm)	<0.02	<0.02	nm
Xylenes	mg/kg (ppm)	<0.06	<0.06	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/kg (ppm)	0.5	92	69-120
Toluene	mg/kg (ppm)	0.5	92	70-117
Ethylbenzene	mg/kg (ppm)	0.5	94	65-123
Xylenes	mg/kg (ppm)	1.5	93	66-120

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/09/18

Date Received: 09/26/18

Project: WD-55 Project, Tacoma, F&BI 809450

**QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-Dx**

Laboratory Code: 809463-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	590	121	123	73-135	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	112	74-139

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Data Qualifiers & Definitions

- a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.
- b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.
- ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.
- c - The presence of the analyte may be due to carryover from previous sample injections.
- cf - The sample was centrifuged prior to analysis.
- d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.
- dv - Insufficient sample volume was available to achieve normal reporting limits.
- f - The sample was laboratory filtered prior to analysis.
- fb - The analyte was detected in the method blank.
- fc - The compound is a common laboratory and field contaminant.
- hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.
- hs - Headspace was present in the container used for analysis.
- ht - The analysis was performed outside the method or client-specified holding time requirement.
- ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.
- j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.
- J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.
- jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.
- js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.
- lc - The presence of the analyte is likely due to laboratory contamination.
- L - The reported concentration was generated from a library search.
- nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.
- pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.
- ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.
- vo - The value reported fell outside the control limits established for this analyte.
- x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.



# 3401 Lincoln Ave



Imagery ©2018 Google, Map data ©2018 Google 200 ft



 UST Location

**3401 Lincoln Ave**  
Tacoma, WA 98421

 7JC6+3M Tacoma, Washington





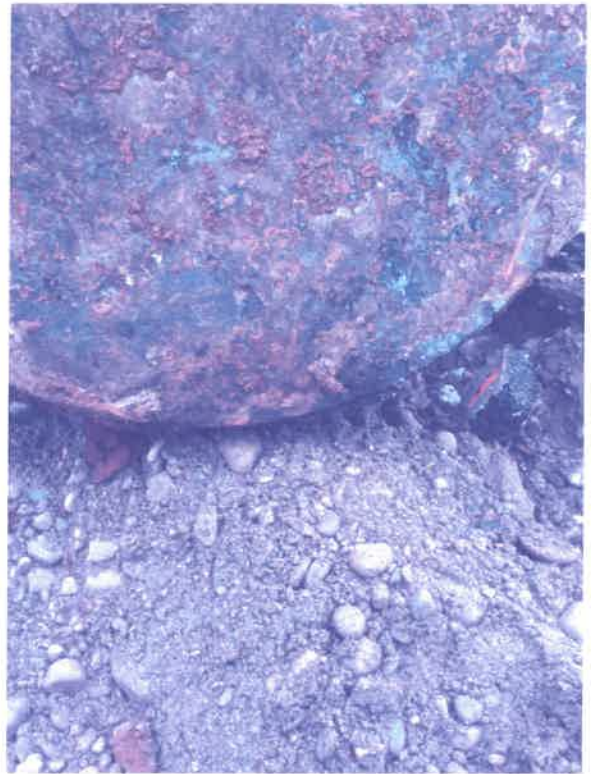
UST  
#1



Final



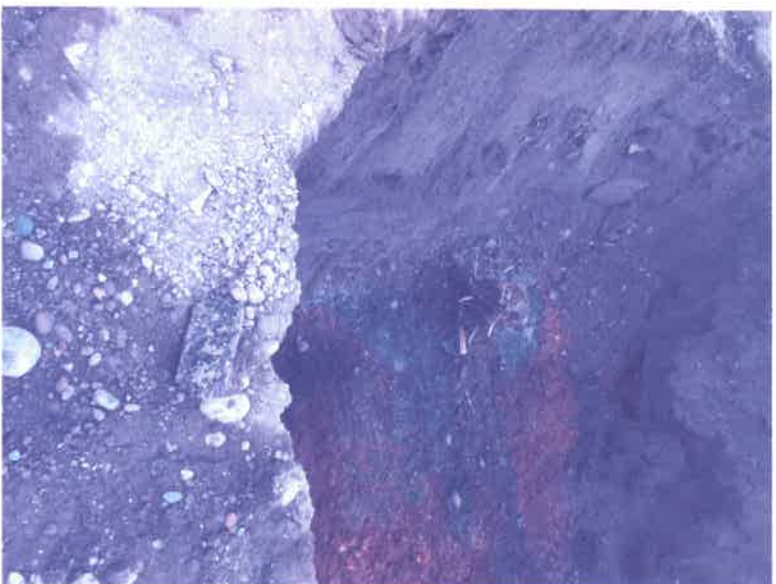
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SouthWall

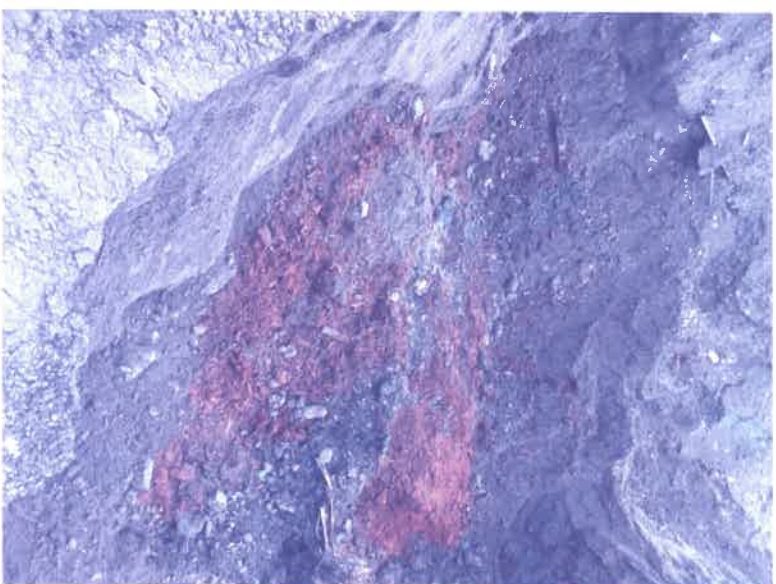


EastWall



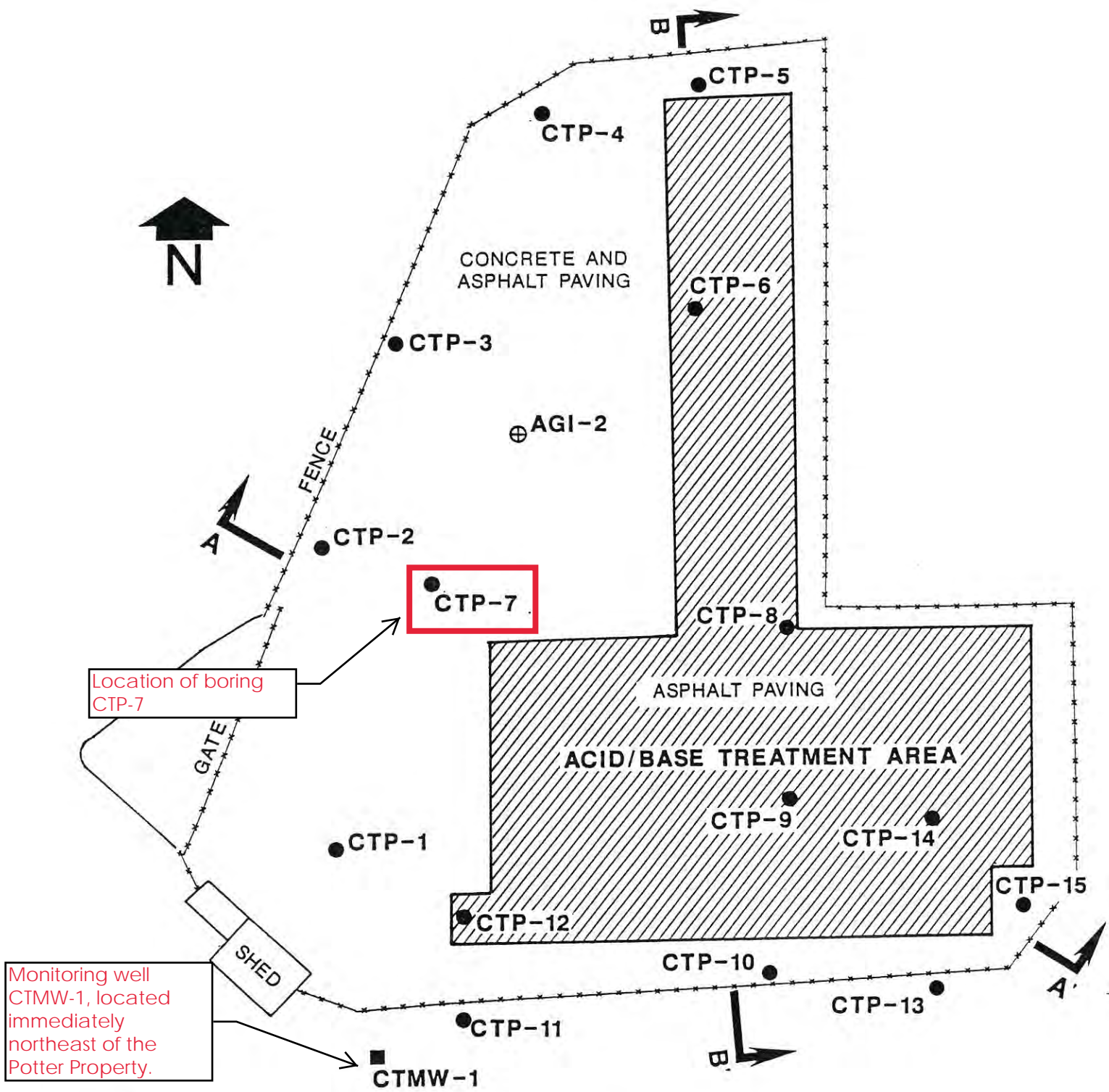
Plume

USI  
#2



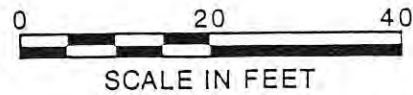
Final





**LEGEND**

- CTP-1 Approximate location of Sweet-Edwards boring
- CTMW-1 Existing Sweet-Edwards Monitoring Well
- ⊕ Decommissioned Monitoring Well
- A ↑ A' Geologic Cross-Section Location



Chempro, Inc., Tacoma, WA  
Figure 1-3  
BORING LOCATIONS - PARCEL A

Sweet, Edwards & Associates



INITIALS	DATE
DRAWN BY <u>SL</u>	<u>11/20/87</u>
CHECKED BY <u>[Signature]</u>	<u>[Signature]</u>
REVISED	

S94-03.02

**TABLE 6**  
**AUTO-FLUFF HISTORICAL ANALYTICAL DATA**  
Taylor Way and Alexander Avenue Fill Area Site  
Tacoma, Washington

CTP-7 sample ID

	TB-1 and TB-1A	TB-1B	TB-2 and TB-2A	TB-2B	TB-3 and TB-3A	TB-3B	TB-4 and TB-4A	TB-4B	CTMW-6	CTP-3B #1	CTP-7B #2
Sample Depth (feet bgs)	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	1.5	3
Sample Date	9/28/1988	9/28/1988	9/28/1988	9/28/1988	9/28/1988	9/28/1988	9/28/1988	9/28/1988	6/1/1987	9/29/1987	9/29/1987
Metals (mg/kg)											
Arsenic	151	72	22	22	50	58	7.7	10	10	4.4	14
Barium	2,050	4,880	1,360	1,720	5,800	3,490	604	407	407	66	1,090
Cadmium	86	146	19	34	53	67	12	9	9	4.2	22
Chromium	110	287	99	121	230	229	83	38	38	386	71
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	39	179
Lead	2970	6,460	1,140	2,190	3,150	8,230	1,080	558	558	120	2250
Mercury	2	4.3	1.2	1.7	3.2	2.5	0.67	0.79	0.79	0.2	1.4
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	36	111
Selenium	ND	45	ND	ND	2.1	ND	ND	ND	ND	NA	NA
Silver	10	6.1	ND	ND	5.3	4.9	ND	ND	ND	1	1
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA	51	2120
Total cyanide	3.5	4.2	ND	ND	ND	ND	ND	ND	ND	1.8	NA
Volatiles Organics (ug/kg)											
2-Butanone	180	NA	82	NA	ND	NA	30	NA	ND	NA	<36
4-Methyl-2-pentanone	ND	NA	17	NA	ND	NA	ND	NA	ND	NA	<21
Acetone	1200	NA	430	NA	26	NA	200	NA	ND	NA	<67
Benzene	5.2	NA	17	NA	ND	NA	1.1	NA	ND	NA	<9.8
Carbon disulfide	ND	NA	13	NA	ND	NA	ND	NA	ND	NA	<12
Chlorobenzene	ND	NA	25	NA	ND	NA	Nd	NA	ND	NA	<7.5
Ethylbenzene	22	NA	220	NA	ND	NA	44	NA	250	880	<12
Methylene chloride	16	NA	15	NA	16	NA	10	NA	ND	ND	<6
Styrene	ND	NA	110	NA	ND	NA	ND	NA	ND	NA	<16
Tetrachloroethene	ND	NA	ND	NA	16	NA	ND	NA	ND	NA	<6.9
Toluene	31	NA	320	NA	3	NA	13	NA	210	490	9.2
Total xylenes	80	NA	560	NA	ND	NA	62	NA	840	ND	57
Trichloroethene	ND	NA	5.2	NA	ND	NA	ND	NA	ND	NA	<8.1
Semivolatiles Organics (ug/kg)											
2-methylnaphthalene	NA	NA	NA	NA	NA	NA	NA	NA	2,000	ND	20000
Acenaphthene	NA	NA	NA	NA	NA	NA	NA	NA	190	ND	<2400
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	770	ND	<5300
Bis (2-ethylhexyl)phthalate	NA	NA	NA	NA	NA	NA	NA	NA	66,000	10000	<8100
Butylbenzylphthalate	NA	NA	NA	NA	NA	NA	NA	NA	17,000	ND	120000
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA	2,000	NA	<1300
Di-n-butylphthalate	NA	NA	NA	NA	NA	NA	NA	NA	2,800	ND	<3200
Di-n-octylphthalate	NA	NA	NA	NA	NA	NA	NA	NA	21,000	NA	140000
Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	4,100	NA	<7400
Naphthalene	NA	NA	NA	NA	NA	NA	NA	NA	1,700	NA	11000
Phenanthrene	NA	NA	NA	NA	NA	NA	NA	NA	3,000	NA	8500
Pyrene	NA	NA	NA	NA	NA	NA	NA	NA	2,600	NA	<6800
Pesticides/PCBs (ug/kg)											
Total PCBs	NA	NA	NA	NA	NA	NA	NA	NA	21	940	14400

Notes:  
Data from sampling performed on the former Parcel A (Stericycle Property) as part of closure activities  
Material is generally described in historical reports as pulverized or fragmented wire, glass shards, upholstery, tire shreds, paint chips, metal, string, plastic, and rubber from General Metals.  
NA = Not available; ND = not detected; < = not detected above value shown

**TABLE 13**  
**SUMMARY SOIL DATA - STERICYCLE PROPERTY**  
 Taylor Way and Alexander Avenue Fill Area Site  
 Tacoma, Washington

Benzo(a)pyrene

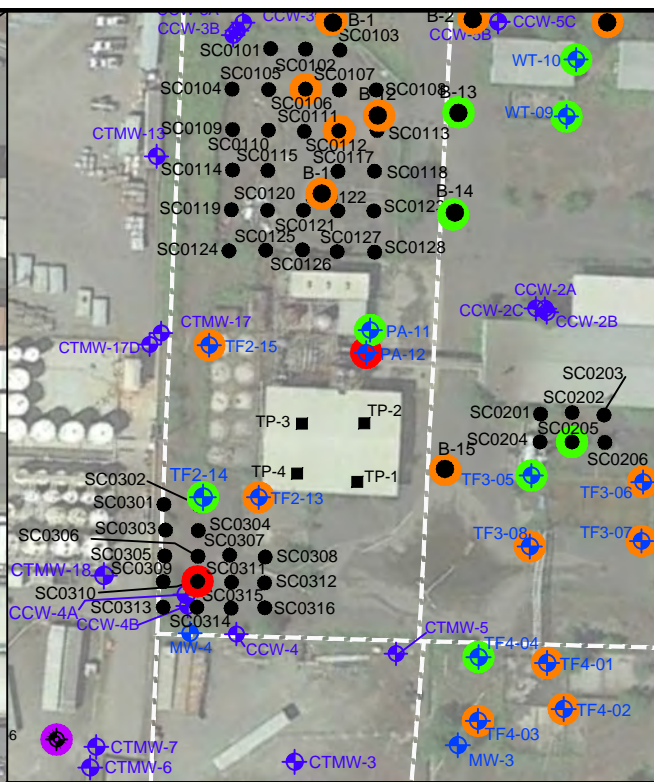
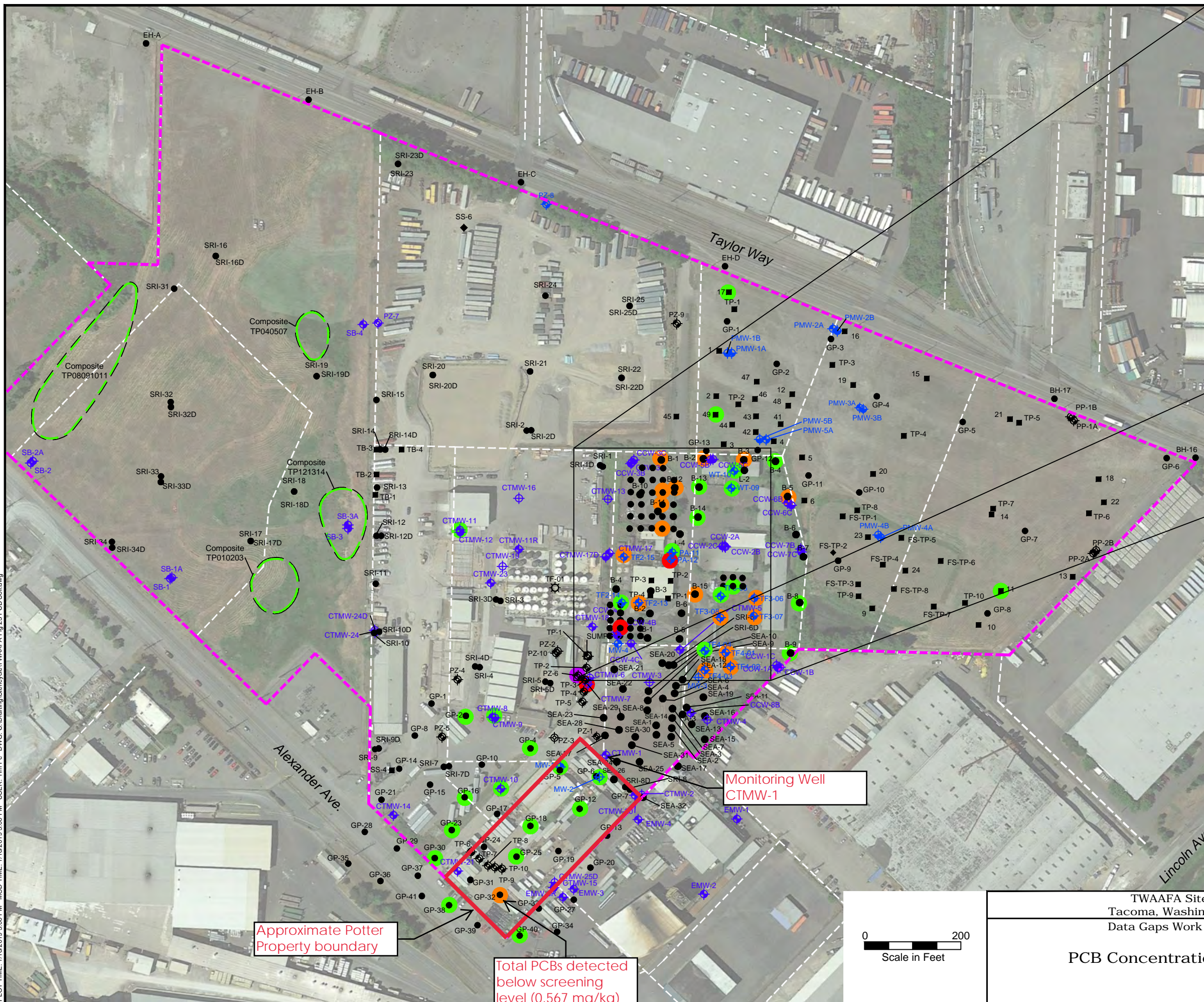
Sample location ID

Sample collection date

Concentration in milligrams per kilogram

Location	Date	Depth (ft)	Gas	Diesel	Oil	B(a)P	bis(2-Ethylhexyl) phthalate	TCE	Toluene	PCE	Benzene	Butyl Benzyl Phthalate	Diethyl Phthalate	Ethyl-benzene	Hexachloro-butadiene	Vinyl Chloride	Total Xylenes	1,4-Dioxane	Arsenic	Lead	Total PCBs
Units			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Screening Levels			30	2000	2000	5.14	13.4	0.0254	4.52	0.0499	0.0274	12.8	72.2	6.05	0.605	0.00167	13.1	10	7.3	24	1
GP-16	10/14/1999	6	<0.30	0.98	--	<0.037	<0.00018	<0.25	<0.25	<0.25	<0.25	<0.000037	<0.000037	<0.25	<0.25	<0.50	--	--	--	--	ND
GP-17	10/13/1999	6	<b>1200</b>	<b>2000</b>	--	<0.041	0.00027	<0.25	<0.25	<0.25	<0.25	<0.000041	<0.000041	<0.00025	<0.25	<0.50	--	--	--	--	--
GP-18	10/13/1999	3	<1.5	43	--	<0.038	0.00048	<0.25	<0.25	<0.25	<0.25	<0.000038	<0.000038	<0.25	<0.25	<0.50	--	--	--	--	ND
GP-2	10/12/1999	6	<1.5	71	--	<0.038	<0.00019	<0.25	<0.25	<0.25	<0.25	<0.000038	<0.000038	<0.25	<0.25	<0.50	--	--	--	<b>27.3</b>	ND
GP-23	10/14/1999	6	<0.30	11	--	<0.037	<0.00018	<0.25	<0.25	<0.25	<0.25	<0.000037	<0.000037	<0.25	<0.25	<0.50	--	--	--	--	ND
GP-24	10/13/1999	6	<1.5	31	--	<0.045	<0.00023	<0.25	<0.25	<0.25	<0.25	<0.000045	<0.000045	<0.25	<0.25	<0.50	--	--	--	--	--
GP-25	10/13/1999	6	<1.5	3.2	--	<0.043	<0.00022	<0.25	<0.25	<0.25	<0.25	<0.000043	<0.000043	<0.25	<0.25	<0.50	--	--	--	--	ND
GP-30	10/14/1999	6	0.50 J	15	--	<0.046	0.00033	<0.25	<0.25	<0.25	<0.25	0.00039	<0.00046	<0.25	<0.25	<0.50	--	--	--	--	ND
GP-31	10/13/1999	6	<38	470	--	<0.045	0.00085	<0.25	0.29	<0.25	<0.25	0.00088	<0.000045	<0.25	<0.25	<0.50	--	--	--	--	--
GP-32	10/13/1999	6	<b>150</b>	<b>4000</b>	--	<0.044	0.0038	<0.25	<0.25	<0.25	<0.25	0.0011	<0.000044	<0.25	<0.25	<0.50	--	--	--	--	0.567
GP-32	10/14/1999	6	<0.30	5.1	--	<0.046	<0.00023	<0.25	<0.25	<0.25	<0.25	<0.000046	<0.000046	<0.25	<0.25	<0.50	--	--	--	--	--
GP-3	10/14/1999	6	<1.5	15	--	<0.038	<0.00019	<0.25	<0.25	<0.25	<0.25	<0.000038	<0.000038	<0.25	<0.25	<0.50	--	--	--	--	--
GP-3	10/14/1999	6	<1.5	38	--	<0.038	<0.00019	<0.25	<0.25	<0.25	<0.25	<0.000038	<0.000038	<0.25	<0.25	<0.50	--	--	--	--	--
GP-3	10/14/1999	6	<1.5	38	--	<0.038	<0.00019	<0.25	<0.25	<0.25	<0.25	<0.000038	<0.000038	<0.25	<0.25	<0.50	--	--	--	--	--
GP-39	10/15/1999	6	<1.5	120	--	<0.049	<0.00018	<0.25	<0.25	<0.25	<0.25	<0.000036	<0.000036	<0.25	<0.25	<0.50	--	--	--	--	--
GP-40	10/14/1999	8	<b>1400</b>	<b>13000</b>	--	<0.049	<0.00025	<0.25	0.21	<0.25	0.34	<0.00064	<0.00064	2.6	<0.25	<0.50	--	--	--	<b>114</b>	ND
GP-6	10/12/1999	3	3.1	15	--	<0.64	<0.0032	<0.25	<0.25	<0.25	<0.25	<0.00064	<0.00064	<0.25	<0.25	<0.50	--	--	--	5.0	ND
GP-7	10/12/1999	6	<1.5	1.6	--	<0.039	<0.00019	<0.25	<0.25	<0.25	<0.25	<0.000039	<0.000039	<0.25	<0.25	<0.50	--	--	--	1.5	--
MW-1	12/21/2001	0	<b>18900</b>	<b>401000</b>	<b>206000</b>	<b>9.6</b>	<0.10	<100	<0.0200	<100	<0.0200	<0.10	<0.10	<0.10	<100	<100	--	--	--	--	ND
MW-1	5/21/2002		<b>18900 DJ</b>	<b>401000 D</b>	<b>206000 D</b>	<b>9.6 D</b>	--	<0.0200	<0.0200	--	--	--	--	<b>45.2 D</b>	--	--	--	--	--	--	--
PZ-6	6/15/1999	4	--	--	--	<0.33	0.21	<0.010	0.65	<0.0050	0.11	0.025	<0.00033	0.41	<0.33	<0.0050	--	--	--	--	<b>14.69</b>
PZ-6	6/15/1999	13.5	0.70	190	--	<0.033	0.002	<9.4	<b>20</b>	<4.7	<4.7	0.00041	<0.000033	11	<4.7	<4.7	--	--	3.3	16.8	--
PZ-7	1/10/2001	3	<5.00	11.1 J	33.3	--	--	<0.100	<0.100	<0.100	<0.100	--	--	<0.100	--	<0.100	--	--	2.42	12.6	--
PZ-7	1/10/2001	10.5	6.13	767	<b>2530</b>	--	--	<0.100	<0.100	<0.100	<0.100	--	--	<0.101	--	<0.100	--	--	3.56	<b>47.1</b>	--
PZ-8	1/9/2001	2.5	<5.00	<10.0	<25.0	--	--	<0.100	<0.100	<0.100	<0.100	--	--	<0.102	--	<0.100	--	--	3.32	9.17	--
PZ-8	1/9/2001	6	<5.00	<10.0	<25.0	--	--	<0.100	<0.100	<0.100	<0.100	--	--	<0.103	--	<0.100	--	--	1.45	1.47	--
PZ-9	1/9/2001	4	<5.00	113	577	--	--	<0.100	<0.100	<0.100	<0.100	--	--	<0.104	--	<0.100	--	--	<b>11.9</b>	<b>25.1</b>	--
PZ-9	1/9/2001	8	<5.00	90.8	287	--	--	<0.100	<0.100	<0.100	<0.100	--	--	<0.105	--	<0.100	--	--	<b>10.3</b>	<b>53.9</b>	--
SEA-1	5/13/1987	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.4	<b>587</b>	--
SEA-1	5/13/1987		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.4	<b>31</b>	--
SEA-1	5/14/1987	2.5	--	--	<b>34000</b>	<0.080	0.0018	<0.38	<b>9.9</b>	1.2	<0.46	<0.00076	<0.00015	1.5	<0.34	<0.99	--	--	1.1	<b>54</b>	--
SEA-10	5/19/1987	2.5	--	--	--	<0.060	<0.00059	<0.29	<0.31	<0.25	<0.35	<0.00061	<0.00061	<0.43	<0.27	<0.76	--	--	1.4	ND	--
SEA-11	5/18/1987	2.5	--	--	--	<0.070	0.002	<0.31	<b>7.9</b>	<0.26	<0.37	<0.00066	<0.00013	2.6	<0.00030	<0.00081	--	--	1.7	17	--
SEA-12	5/18/1987	2.5	--	--	--	<0.080	0.00028 J	<0.37	0.098	<0.32	<0.45	<0.00072	<0.00014	0.45 J	<0.32	<0.98	--	--	0.95	ND	--
SEA-13	5/19/1987	2.5	--	--	--	<0.070	0.0011	<0.30	0.53	<0.25	<0.36	<0.00063	<0.00012	1.7	<0.28	<0.98	--	--	2	ND	--
SEA-14	5/19/1987	4.7	--	--	--	3.5	0.033	<b>19</b>	<b>78</b>	<b>80</b>	6.6	<0.00060	<0.00012	2.3	<0.27	<0.85	--	--	<b>32.2</b>	<b>909</b>	--
SEA-15	5/19/1987	2.5	--	--	13	<0.070	--	<0.29	<0.31	<0.25	<0.36	--	--	--	--	--	--	--	1.7	ND	--
SEA-16	5/19/1987	2.5	--	--	--	<0.070	--	<0.27	0.091	<0.23	<0.33	--	--	--	--	--	--	--	1.4	ND	--
SEA-17	5/19/1987	2.5	--	--	--	<0.070	--	<0.32	<0.34	<0.27	<0.38	--	--	--	--	--	--	--	1.6	ND	--
SEA-18	5/21/1987	2.8	--	--	--	<0.090	1.6	<0.38	<0.41	<0.33	<0.46	--	--	--	--	--	--	--	5.3	<b>233</b>	--
SEA-18	5/21/1987	4.5	--	--	--	--	--	<0.32	<0.34	<0.27	<0.39	--	--	--	--	--	--	--	--	--	--
SEA-19	5/21/1987	2.5	--	--	51	<0.065	--	<0.29	<0.31	<0.25	<0.35	--	--	--	--	--	--	--	2.9	<b>29</b>	--

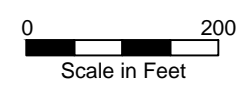
PLOT TIME: 1/16/2019 5:00 PM MOD TIME: 1/16/2019 5:00 PM USER: Tim Pc DWG: C:\Drafting\Stencycle\TWAFA\Fig 23 PCB Solid.dwg



**Legend**

- TWAFA Site Boundary
- Parcel Boundary
- + CTMW-23 Groundwater Monitoring Well
- SRI-3D Boring
- TP-7 Test Pit
- Composite Sample Area
- Not Detected
- Detected, Below Screening Level (1mg/kg)
- Detected, Above Screening Level (1mg/kg)
- Detected, Above 10 mg/kg

- Note:
1. Highest concentration at each location reflected.
  2. Color coding not shown for all points where point density is high. See enlargement above for clarity of this portion of the site.



TWAFA Site  
Tacoma, Washington  
Data Gaps Work Plan

**PCB Concentrations, Soil**

**DOF** DALTON  
OLMSTED  
FUGLEVAND

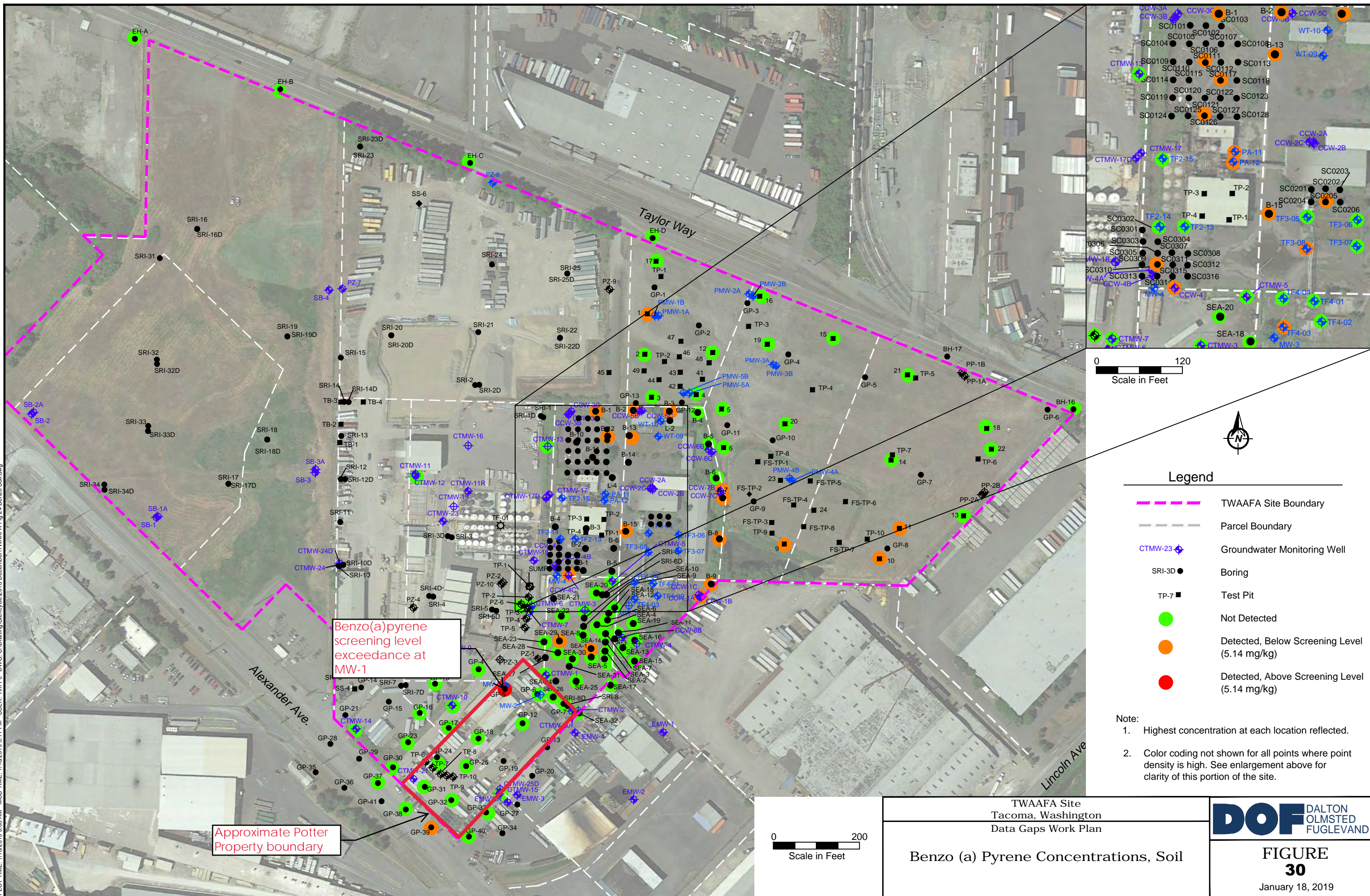
**FIGURE 29**  
January 18, 2019

Approximate Potter Property boundary

Total PCBs detected below screening level (0.567 mg/kg)

Monitoring Well CTMW-1

PLOT TIME: 1/18/2019 6:05 AM MOD TIME: 1/16/2019 5:11 PM USER: Tim Pc DWG: C:\Drafting\Stericycle\2018 December\TWAFA Fig 24 Benzo Soil.dwg



**Legend**

- TWAFA Site Boundary
- Parcel Boundary
- ◆ CTMW-23 Groundwater Monitoring Well
- SRI-3D Boring
- TP-7 Test Pit
- Not Detected
- Detected, Below Screening Level (5.14 mg/kg)
- Detected, Above Screening Level (5.14 mg/kg)

**Note:**

- Highest concentration at each location reflected.
- Color coding not shown for all points where point density is high. See enlargement above for clarity of this portion of the site.

0 200  
Scale in Feet

TWAFA Site  
Tacoma, Washington  
Data Gaps Work Plan

**Benzo (a) Pyrene Concentrations, Soil**

**DOF** DALTON  
OLMSTED  
FUGLEVAND

**FIGURE 30**  
January 18, 2019

# ATTACHMENT B

FIELD SAMPLING DATA SHEET



Sampler(s):

**Subslab and Soil Vapor Sampling Data Sheet**  
**Parcel 110**  
**Port of Tacoma**  
**Tacoma, Washington**



Sample ID	Date	Shut-in Test Pass/Fail	Summa Canister ID	Manifold ID	Canister Type/Rate	Purge				Helium		Sample			
						Begin Time	End Time	Volume (L)	Helium (ppm)	Indoor Ambient Air (ppm)	Under Shroud (%) (ideal = 40)	Begin Time	End Time	Initial Vacuum ("Hg)	Final Vacuum ("Hg)
Example	4/6/2021	Pass	3671	225	1 L Summa	13:46	13:51	1	50	0	43.9	13:55	14:00	-30	-5
Example	4/6/2021	Pass	3347	204	1 L Summa	13:05	13:10	1	175	0	58	13:13	13:19	-29	-5

NOTES:  
 1% = 10,000 ppm.  
 To avoid data rejection during validation, the amount of helium in the sample must be less than 5% of the helium concentration under the shroud. For example, if there is 50% helium in the shroud, your sample may contain up to 2.5%, (25,000 ppm) helium.  
 "Hg = inches of mercury.  
 ID = identification.  
 L = liter.  
 ppm = parts per million.