ADDITIONAL SITE CHARACTERIZATION REPORT

Performed at:
Swindahl Properties LLC
2218 Marine View Drive
Tacoma, Washington 98422

AEROTECH
Environmental Consulting Inc.

July 20, 2018

Anchorage Seattle Portland

Cost-effective environmental solutions
for the western United States and Alaska

www.AerotechEnvironmental.com

ADDITIONAL SITE CHARACTERIZATION REPORT

Performed at:
Swindahl Properties
2218 Marine View Drive
Tacoma, Washington 98442

July 20, 2018

Performed by:

AEROTECH Environmental Consulting Inc.
13925 Interurban Avenue South, Suite No. 210
Seattle, Washington 98168
Fax 206 402 3872
866 800 4030
www.AerotechEnvironmental.com

SITE CHARACTERIZATION

Client:	**SWINDAHL PROPERTIES, LLC**
Address:	2218 Marine View Drive Tacoma, Washington 98442
Point of Contact:	Carl Swindahl Owner, Swindahl Properties, LLC 253-272-9319
Property:	**SWINDAHL PROPERTIES** 2218 Marine View Drive Tacoma, Washington 98442
County:	Pierce County, Washington
Parcel Number:	0321264056
Commercial Activity:	Shipyard
UST Site Assessor:	Nicholas Gerkin (ICC No. 8452487)
Licensed Geologist:	Justin Foslien (Washington State License No. 2540)
Project Number:	218-6004
Report Date:	July 20, 2018

EXECUTIVE SUMMARY

The subject of this Phase I Environmental Site Assessment is a rectangular-shaped approximately 5.98-acre (260,470 square foot) Parcel of industrial land located on the Hylebos Waterway in Tacoma, Washington. Significant bodies of water include Commencement Bay approximately two miles northwest.

The subject Property is configured with four buildings and a small boatyard that comprise the facility for the fiberglass and steel boat manufacturer, Modutech Marine, Inc. Two adjoining office buildings are situated in the center of the Parcel facing northeast toward Marine View Drive. Asphalt paved parking spaces are provided northeast of the buildings. Adjacent to the east is the manufacturing and production warehouse. A fabrication and spray building is situated along the east Property border. South of the building are material storage sheds, including a metal shipping container housing shelves of petroleum products. West of the warehouse are two large canvas tents that are used for sandblasting vessels. The eastern portion of the Property houses several boats, trailers, electric hoists, metal parts and pieces, and wood products.

The contiguous office buildings comprise approximately 6,560 square feet and are configured with offices, a reception area, restrooms, and a conference room. The warehouse comprises approximately 19,136 square feet and houses the marine manufacturing, repair, and production operations. Additionally, the warehouse contains an electrical room, an employee break area, a welding shop, and an approximately 1,530 square foot mezzanine used for storage. The building along the southeast Property boundary comprises approximately 4,440 square feet and is divided into two sections; one side was used for spray applications and the other side was used for fabrication.

The marina houses 50 covered slips and is accessible via a dock in the southeast corner of the Property. There are no permanent live-on board residents.

Vehicular access onto the Property is provided by a driveway entrance on the south side of Marine View Drive.

The subject Property was first developed sometime prior to 1940 with the construction of a residence and a garage or shed. Between 1960 and 1965, the residence was vacant. By 1969, the former structures were demolished, and the present-day warehouse was constructed to occupy the ship building plant, Tide Bay Inc. By 1975, the Property occupied Martinolich Ship Builders. In 1980, a two-story office building and a dock marina were constructed. By then, the boat manufacturer, Marine Technical Services, occupied the Property. In 1985, a material storage shed was constructed. In 2013, an additional two-story office building was constructed onto the existing structure. The subject Property has occupied the steel and fiberglass marine boat manufacturer, Modutech Marine Inc, since1986 throughout to present-day.

The subject Property is located in an industrially dominated area. To the north is Marine View Drive (Highway 509) followed by a steep bluff. To the south is the Hylebos Waterway. To the east is a storage yard. To the west is the Hylebos Waterway.

During a Site Inspection conducted by the Department of Ecology on June 17, 1992, inspectors confirmed the presence of sandblast grit spread along the roads and surfaces in certain areas of the Site. Following a request by Ecology to stop contaminants from spent sandblast grit from reaching the Hylebos Waterway, Modutech Inc removed the waste sandblast grit from the subject Property. The Model Toxics Control Act requires confirmation sampling to confirm that remedial efforts have been successful at a Site. Based on the information provided, confirmatory sampling had not been completed.

Upon completion of the *Phase I Environmental Site Assessment*, dated February 26, 2018, further action was recommended due to the lack of confirmatory sampling. The subsequent *Site Characterization Report,* dated April 19, 2018, recommended additional sampling to delineate Arsenic and Lead near SB25.

Mr. Carl Swindahl of Swindahl Properties, LLC retained Aerotech Environmental Consulting ("Aerotech") to conduct a *Site Characterization* to delineate elevated Arsenic and Lead within soil above MTCA Method A Screening Levels.

Conclusions & Recommendations:

Ten soil borings were advanced in the area near SB25 to delineate the vertical and horizontal extent of Arsenic and Lead. Aerotech collected additional samples from soil boring locations SB02, SB12, SB19, SB24, SB25, and SB29 through SB33. Samples were collected from depths ranging from 3 to 16 feet below ground surface. Soil samples collected from soil boring SB25 contained of Arsenic and Lead above the MTCA Method A Cleanup Levels (CULs).

During sampling activities at soil boring SB31, field observations included a dark gray stained interval that also smelled oily. Concentrations of total petroleum hydrocarbons as diesel (TPHd) and oil (TPHo) did not exceed the CULs. However, the detections of TPHo at 1,600 mg/kg from the 8 and 12-foot sample interval at SB25 meant further analyses based on Table 830-1 of the MTCA needed to be completed to rule out carcinogenic polycyclic aromatic hydrocarbons ("cPAHs").

Results of cPAH analyses exceeded the MTCA Method A CUL of 0.1 mg/kg at SB25 from the sample collected at 12 feet below grade surface. An additional sample interval collected at 16 feet below grade did not contain any cPAHs above the CULs.

The source of this heavy oil and cPAH impact is not currently known. However, immediately north of the Swindahl Property there has been a Site Hazard Assessment ("SHA") completed by Tacoma-Pierce County Health Department for a Site named: *Pump STN 4103 ROW 2222 Marine View Drive*. The address of the parcel is 2222 Marine View Drive, Tacoma, WA 98442. The SHA summarized previous investigative data that confirmed the presence of total petroleum hydrocarbons as oil range in both soil and groundwater beneath the parcel.

The presence of Arsenic and Lead in the subsurface has been confirmed above the MTCA A Cleanup Levels. Vertical and horizontal definition of the extent of metals above cleanup standard has been achieved to the extent practicable.

Further Action is Recommended. 1)Aerotech recommends the continuation of groundwater monitoring to obtain four consecutive quarter of clean data below groundwater CULs; and 2) Perform a Remedial Investigation and Feasibility Study with a Disproportionate Cost Analyses to evaluate options to address the remaining concentrations of Arsenic and Lead to be submitted to the Ecology Voluntary Cleanup Program to achieve a No Further Action Determination.

TABLE OF CONTENTS

INTRODUCTION

Mr. Carl Swindahl of Swindahl Properties, LLC, engaged Aerotech Environmental Consulting, Inc. ("Aerotech") of Seattle, Washington to perform a *Site Characterization Report* at the subject property. The purpose of this report is to summarize environmental characterization activities completed at the subject property herein referred to as the "Site". Aerotech advanced ten soil borings throughout the northern portion of Site.

SECTION I.

SITE DESCRIPTION

Property Exterior Description:

This *Site Characterization Report* is an environmentally-based risk assessment of a rectangular-shaped approximately 5.98-acre (260,470 square foot) Parcel of industrial land located in Tacoma, Washington, occupied by Modutech Marine Inc.

The Property is configured with two adjoining office buildings situated in the center of the Parcel facing northeast toward Marine View Drive. Asphalt paved parking spaces are provided northeast of the buildings. Adjacent to the east is the manufacturing and production warehouse. A fabrication and spray building is situated along the east Property border. South of the building are material storage sheds, including a metal shipping container housing shelves of petroleum products. A metal awning extends north and south off of the container. The south side houses used boat-size refrigerators and other appliances, small propane tanks, spools of metal wiring, metal pipes, and other miscellaneous items. The north side houses tarps, plastic barrels, a plastic fuel tote, a metal tote labeled diesel, and 55 gallon drums labeled Hetron FR 650 T-20 Resin.

To the south is a tarped canopy housing a large plastic container labeled "used oil only" that contained five gallon buckets, oil funnels, and used filters. Several propane tanks were stored behind the container. A wooden shelf was located along the northern wall of the canopy. Next to the shelf were 55 gallon drums and plastic barrels labeled Chevron Rando HD ISO; "Bad gas", dated December 1, 2016; and "power cool 50/50". The items are situated atop a concrete slab, however, no secondary containment was present.

Situated along the northeast corner of the warehouse is a shipping container used as an employee break area. To the south is a small metal awning that covers a fuel tank and associated piping. A 500 gallon above ground storage tank and a fuel tote are located at the southeast corner of the warehouse. Several large boats are parked along the eastern side of the warehouse. West of the warehouse are two large canvas tents that are used for sandblasting vessels. Plastic sheets covered the gravel under the tents. A fuel tote was stored on a concrete slab inside one of the tents.

The northwest corner of the Property stores heavy equipment such as cranes and hydraulic lifts. Additionally, there are two shipping containers. The eastern portion of the Property houses several boats, trailers, electric lifts, metal parts and pieces, and wood products. The southern portion of the Property consists primarily of concrete slabs up to the edge of the waterway, but contains some gravel areas as well.

In the southeast corner of the Property is a metal ramp that extends into the marina. The north portion of the ramp is used as a pressure wash station that contains a catch basin that filters to the warehouse where the water is reused. Adjacent east of the wash station is an electric hoist and a small shed. Behind the shed is an Aquip stormwater filtration system that was implemented in 2012. According to the Property Owner, Mr. Carl Swindahl, the water is disposed of by Clean Harbors approximately every five months.

The marina houses 50 covered slips and is accessible via dock in the southeast corner of the Property. There are no permanent live-on board residents.

Vehicular access onto the Property is provided by a driveway entrance on the south side of Marine View Drive.

As observed and notated by the Aerotech Environmental Assessor during the on Site Reconnaissance activities, there were no readily observed visual indicators of active underground storage tanks, stained soils, stressed vegetation, oily sheens, or discolorations on standing water surfaces. There was no evidence of foul odors. Additionally, the Site Reconnaissance did not reveal the presence of discarded drums, barrels, or containers, construction debris, damaged or discarded containers of chemicals, paints, or pesticides. There are no waste storage or treatment lagoons, pits, ponds, or surface impoundments on the Site, or the adjoining properties.

Property Interior Description:

The contiguous office buildings comprise approximately 6,560 square feet and are configured with offices, a reception area, restrooms, and a conference room. An exterior staircase is located on the south side of the buildings.

The warehouse comprises approximately 19,136 square feet and houses the marine manufacturing and production operations. Within the warehouse is an electric crane that runs along the ceiling; a fork lift; steel tug boat parts, batteries, and other heavy machine equipment. The southeast corner of the warehouse is used for manufacturing fiberglass boats. Several 55 gallon drums labeled Hydrex 100 33350-15 were stored along the wall next to an air compressor. Additionally, the warehouse contains an electrical room, an employee break area, a welding shop, and an approximately 1,530 square foot mezzanine used for storage. The warehouse contains concrete flooring. Product staining was observed during the Site Inspection.

The building along the southeast Property boundary comprises approximately 4,440 square feet and is divided into two sections. One side was used for spray applications and the other side was used for fabrication. The building contains concrete flooring. Metal shards were observed covering the floor in the fabrication area. Several five gallon buckets of Pyrotek vibration damping compound were stored on wooden pallets.

Site History and Reported Conditions:

The subject Property was first developed sometime prior to 1940 with the construction of a residence and a garage or shed. Between 1960 and 1965, the residence was vacant. By 1969, the former structures were demolished, and the present-day warehouse was constructed to occupy the ship building plant, Tide Bay Inc. By 1975, the Property occupied Martinolich Ship Builders. In 1980, a two-story office building and a dock marina were constructed. By then, the boat

manufacturer, Marine Technical Services, occupied the Property. In 1985, a material storage shed was constructed. In 2013, an additional two-story office building was constructed onto the existing structure. The subject Property has occupied the steel and fiberglass marine boat manufacturer, Modutech Marine Inc, since 1986 throughout to the present-day.

The subject Property is located in an industrially dominated area. To the north is Marine View Drive (Highway 509) followed by a steep bluff. To the south is the Hylebos Waterway. To the east is a storage yard. To the west is the Hylebos Waterway.

Previously Identified Contaminants of Concern:

A *Phase I Environmental Site Assessment*, completed February 26, 2018 by Aerotech, identified Contaminants of Concern as compounds related to spent sandblast grit: Metals ("MTCA 5") which include Arsenic, Chromium, Cadmium, Lead and Mercury.

SECTION II.

FIELD WORK

Notifications – "Public Utilities:

Due to the age and nature of the Site, a "public" utilities notification was performed prior to the start of work. Aerotech requested the notification on June 26, 2018 and was issued ticket number 18273692 by the Utilities Underground Location Center ("UULC").

According to the UULC the utilities in the vicinity of the Site that required notification included:

Company	Marking Concerns	Customer Service	Repair
COMCAST CABLE	(800)762-0592	(800)266-2278	(855)537-6296
PUGET SOUND ENERGY GAS	(888)728-9343	(888)225-5773	(888)225-5773
CTLQL-CENTURYLINK	(800)778-9140	(800)283-4237	(800)573-1311
CTLQL-CENTURYLINK	(800)778-9140	(800)283-4237	(800)573-1311
CITY OF TACOMA PUB WORKS SIG	(253)591-5287	(253)591-5287	(253)591-5287
TACOMA WATER DEPARTMENT	(253)502-8398	(253)502-8344	(253)502-8344
TACOMA PWR & CLICK NETWORK	(253)502-8263	(253)502-8600	(253)383-0982
TACOMA SEWER DEPARTMENT	(253)591-5585	(253)591-5585	(253)591-5585
WSDOT OLYMPIC REGION-AREA 1	(253)983-7550	(253)983-7550	(253)983-7550

Private Utilities Location:

Additionally, Aerotech engaged personnel of Mountain View Locating Services LLC. ("Mountain View") of Bonney Lake, Washington to locate building and site utilities on June 29, 2018, prior to the start of the on Site drilling activities. No anticipated or unexpected situations were discovered or encountered during the "private" locating activities.

Based in part upon the pavement markings made by utility location technicians; the locations of utility fixtures such as water, electrical, or manholes, and the presence of anomalies detected by induction or ground penetrating radar methodologies final soil boring and monitoring well locations were chosen. Refer to Figure 4 for details regarding the soil boring locations and site features.

Site Activities:

Ten soil borings were completed during the *Site Characterization*, performed on June 29, 2018, under contract with Aerotech. All the work was performed during business hours. No unusual or unforeseen circumstances occurred during the Site activities.

Drilling Activities:

During the June 29, 2018 mobilization, drilling operations utilized a Truck-mounted Direct Push Drilling Rig. The subsurface soil borings were performed by equipment owned and operated by Licensed Driller from Standard Environmental Probe of Olympia.

All subsurface work was overseen by State of Washington Licensed Geologist, Mr. Justin Foslien (State of Washington License No. 2540). The laboratory analytical services were performed by a State of Washington licensed lab, Advance Analytical Labs located in Renton, Washington.

Soil Borings:

Soil borings were advanced at ten (10) locations on Site. Soil borings SB2A, SB03A, SB19A, SB24A, and SB25A were advanced to delineate vertical extent of Arsenic and Lead above MTCA Method A Cleanup Levels (CULs). Soil borings SB29 through SB33 were advanced to delineate the lateral extent of Arsenic and Lead above MTCA Method A Cleanup Levels (CULs). Boring locations are depicted on Figure 4.

A gray stained sample was observed at SB31. Based on the field observations, the sample appeared to be in the heavy oil range of hydrocarbons. Additional analyses for TPHd and TPHo not previously anticipated were requested of the samples collected at the soil boring and vicinity to delineate any exceedances of the CULs.

Soil Sample Collection:

A total of twenty-eight (28) discrete soil samples were collected and submitted for analyses from ten (10) soil boring locations.

Soils from each location were visually inspected for color quality and evidence of discoloration, and physically observed for the purpose of recording composition and noting color, where distinctive. Each sample was handled with a fresh pair of clean latex gloves. Samples were then placed into sterile four-ounce glass jars and/or 40cc glass vials preserved with 5 ml of methanol in accordance with procedures specified for USEPA Method 5035A.

Each sample was given a unique identifier number and placed into an iced cooler for preservation. Samples were held in the custody of Nicholas Gerkin until delivery to Advanced Analytical Inc. of Redmond, Washington.

Equipment Decontamination:

All sample acquisition equipment was decontaminated before and after the completion of each borehole to eliminate the potential for cross-contamination between borings, as required. All reusable sampling equipment for soil sampling, drive rods, and probes were decontaminated after each sampling point by washing with an Alconox-distilled water solution and rinsing with distilled water.

Site Restoration:

Each borehole was backfilled with soil cuttings and/or gravel and patched with asphalt or concrete to match with the surrounding grade.

SECTION III.

GEOLOGY AND HYDROGEOLOGY

Physical Setting Source:

In order to ascertain the physical setting of the subject Property, a review was conducted of the appropriate current United States Geological Survey ("USGS") 7.5 Minute Topographic Quadrangle (quad) Map. The USGS 7.5 minute quad map has an approximate scale of 1" to 2,000 feet, shows physical features such as wetlands, water bodies, roadways, mines, and buildings. These physical and natural features shown should be the areas of visual emphasis, when conducting the on-site inspection of the subject Property. The USGS 7.5 quad map is considered to be the only Standard Physical Setting Source, and is sufficient as a single reference. The applicable USGS 7.5 minute topo map is the Quadrangle 6005511 - Tacoma North, WA., photo revised in 2014 (Figure 3).

Surface Characteristics:

The precise Property location is N 47º 16' 25.71" / W 122º 22' 44.61" as determined by DeLorme mapping data. The Site is located within Universal Tranverse Mercator Zone No.10. The Site elevation is approximately 13 feet above mean sea level. As observed during the Site visit and confirmed on the USGS topographic map, the subject Property exhibits a surficial drainage towards the southwest, based upon overall Site topography. Additionally, the assumed general groundwater flow is to the southwest.

Geology - Regional:

The Geologic map of the Tacoma North 7.5-Minute Quadrangle mapped the Site as artificial fill (af). As discussed above, depth to shallow groundwater is assumed to be approximately 5 feet below ground surface (bgs). However, the groundwater table is likely subject to tidal fluctuations. Inferred groundwater How direction is generally to the southwest, towards the Hylebos Waterway.

Geology - On-Site Conditions:

The predominant subsurface across the Site is artificial fill consisting of fine to medium grained sand and gravelly sand with occasional pieces of debris intermixed. Along the eastern portion of the Site along the shoreline, the fill material extended to from the grade surface to approximately 10 to 12 feet below grade surface. The fill decreases in thickness from the grade surface to approximately 4 feet below grade surface toward MW1 and the western portion of the Site. Beneath the fill, a well sorted silty Sand with alternating layers of fine sand and silt indicated the historical tide flat deposits.

GENERALIZED LITHOLOGY

0-10 ft	Fill – Asphalt, then Gravelly Sand GP

10 – 19 feet below grade	SP – Brown well sorted sand and silt.

Subsurface Hydrogeological Characteristics – Groundwater Occurrence:

Groundwater was observed in soil borings at approximately 8 to 9 feet below ground surface. Groundwater monitoring wells have previously been installed at locations MW1 through MW4 to monitor groundwater conditions at the Site.

SECTION IV.

ANALYTICAL RESULTS

Arsenic and Lead

Soil samples collected from Soil Borings SB03, SB07, SB08, SB11, SB20, SB25, and SB27 contain Arsenic and/or Lead above the MTCA Method A Cleanup Levels. See Table 1 for the complete summary of the analyses completed on soil samples collected at the Site.

Total Petroleum Hydrocarbons as Diesel & Motor Oil ("TPHd & TPHo")

During sampling activities at soil boring SB31, field observations included a dark gray stained interval that also smelled oily. Concentrations of total petroleum hydrocarbons as diesel (TPHd) and oil (TPHo) did not exceed the CULs. However, the detections of TPHo at 1,600 mg/kg from the 8 and 12-foot sample interval at SB25 meant further analyses based on Table 830-1 of the MTCA needed to be completed to rule out carcinogenic polycyclic aromatic hydrocarbons ("cPAHs").

Results of cPAH analyses exceeded the MTCA Method A CUL of 0.1 mg/kg at SB25 from the sample collected from 12 feet below grade surface. An additional sample interval collected at 16 feet below grade did not contain any cPAHs above the CULs. Concentrations of cPAHs were based on the toxic equivalent factors from Table 708-1 in the MTCA. See Table 1 for further details.

Polycyclic Aromatic Hydrocarbons ("PAHs")

The detections of TPHo at 1,600 mg/kg from the 8 and 12-foot sample interval at SB25 meant further analyses based on Table 830-1 of the MTCA needed to be completed to rule out carcinogenic polycyclic aromatic hydrocarbons ("cPAHs").

Results of cPAH analyses exceeded the MTCA Method A CUL of 0.1 mg/kg at SB25 from the sample collected at 12 feet below grade surface. An additional sample interval collected at 16 feet below grade did not contain any cPAHs above the CULs. Additional delineation samples collected at, SB19, SB30 and SB31 did not contain concentrations of cPAHs above the CUL.

The source of this heavy oil and cPAH impact is not currently known. However, immediately north of the Swindahl Property there has been a Site Hazard Assessment ("SHA") completed by Tacoma-Pierce County Health Department for a Site named: Pump STN 4103 ROW 2222 Marine View Drive. The address of the parcel is 2222 Marine View Drive, Tacoma, WA 98442. The SHA summarized previous investigative data that confirmed the presence of total petroleum hydrocarbons as oil range in both soil and groundwater beneath the parcel.

APPLICABLE ANALYTICAL METHODOLOGIES AND PARAMETERS

The analytical parameters were chosen based upon the results of previous investigations to provide a comprehensive characterization of the subsurface soils and groundwater present at the Site Areas of Concern and to comply with State of Washington recommendations.

Analytical Methodology:

Soil: **Arsenic and Lead**

USEPA 7010

Soil: **Total Petroleum Hydrocarbons as Diesel & Motor Oil ("TPHd & TPHo")**

State of Washington NWTPH-Dx/Dx Extended

Soil: **PAHs**

USEPA 8270 SIM

Laboratory analysis was provided by:

Advanced Analytical Laboratory, LLC
4078 148 Avenue NE
Redmond, WA 98052
425.702.8571
aachemlab@yahoo.com

STATEMENT OF THE SITE ASSESSOR

I have performed this *Site Characterization* in accordance with generally accepted environmental practices, procedures, and regulatory requirements, as of the date of this Report. I have employed the degree of care and skill ordinarily exercised under similar circumstances by reputable environmental professionals practicing in this area.

I declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in § 312.10 of this part. I have the specific qualifications based upon education, training, and experience necessary to conduct Remedial Investigations.

Signature of Washington Certified UST Site Assessor:

Signature – Nicholas Gerkin (Certificate No. 8452487)

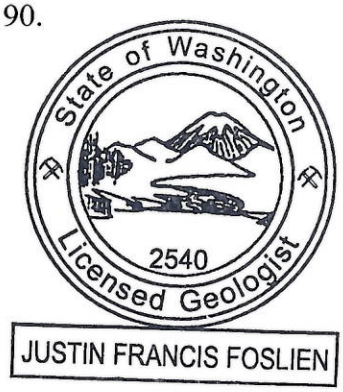
STATEMENT OF THE LICENSED GEOLOGIST

As stipulated in the Regulatory Code of the State of Washington Title 18, Chapter 18.220, the undersigned is a licensed Geologist in the State of Washington, and has met the statutory requirements of RCW § 18.220.060 for such licensing including, but not limited to, educational requirements, work and field experience, examination proficiency, and acceptance by the State Licensing Board.

The undersigned Licensed Geologist has supervised the geological work performed as described in attached Report – a majority of said work being performed by employees of the firm which employs undersigned Licensed Geologist – as delineated in RCW Title 18, Chapter 18.220, Paragraph 190.

Signature of Licensed Washington Geologist:

Signature – Justin Francis Foslien (License No. 2540)



APPENDIX

- Analytical Results Tables & Figures
- Photographs
- Project Contract Documents
- Laboratory Analytical Reports and Chains of Custody
- Standard Operating Procedures
- TPCHD Site Hazard Assessment: Pump STN 4103 ROW 2222 MARINE VIEW DR

· Analytical Results Tables & Figures

TABLE 1
SOIL ANALYTICAL RESULTS
Swindahl Properties LLC
2218 Marine View Drive
Tacoma, Washington

Aerotech Environmental Consulting, Inc. - Site Characterization Report - April 19, 2018 & July 20, 2018

Sample ID	Soil Boring/Point Well ID	Sampling Date	Sample Depth	TPHd	TPHo	cPAHs	Arsenic	Lead	Chromium	Cadmium	Mercury	VOCs
			Feet BGS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
SB01@3'	SB01	03/08/18	3	--	--	--	2.2	5.4	2.0	<1.0	<0.5	--
SB02@4'	SB02	03/08/18	4	--	--	--	2.9	5.0	2.0	<1.0	<0.5	--
SB02A(4)	SB02	06/29/18	4	<20	<50	--	--	--	--	--	--	--
SB02A(8)	SB02	06/29/18	8	<20	<50	--	2.2	2.9	--	--	--	--
SB02A(12)	SB02	06/29/18	12	<20	<50	--	--	--	--	--	--	--
SB03@4'	SB03	03/08/18	4	--	--	--	7.0	**1,100**	18	<1.0	<0.5	--
SB03A(8)	SB03	03/28/18	8	--	--	--	<1.0	50	--	--	--	--
SB04@3'	SB04	03/08/18	3	--	--	--	<1.0	6.2	2.0	<1.0	<0.5	--
SB04A(8)	SB04	04/02/18	8	--	--	--	1.5	27	--	--	--	--
SB05@4'	SB05	03/08/18	4	--	--	--	19	210	4.0	1.6	<0.5	--
SB06@4'	SB06	03/08/18	4	--	--	--	1.7	67	2.1	<1.0	<0.5	--
SB07@4'	SB07	03/08/18	4	--	--	--	**45**	16	3.1	<1.0	<0.5	--
SB07A(8)	SB07	03/28/18	8	--	--	--	**38**	25	--	--	--	--
SB07B(12)	SB07	04/02/18	12	--	--	--	1.3	1.4	--	--	--	--
SB08@4'	SB08	03/08/18	4	--	--	--	**31**	20	3.2	<1.0	<0.5	ND
SB08A(8)	SB08	03/28/18	8	--	--	--	**32**	30	--	--	--	--
SB08B(12)	SB08	04/02/18	12	--	--	--	17	30	--	--	--	--
SB09@4'	SB09	03/08/18	4	--	--	--	9.1	160	12	<1.0	<0.5	--
SB10@4'	SB10	03/08/18	4	--	--	--	4.7	25	4.6	<1.0	<0.5	--
SB11@4'	SB11	03/08/18	4	--	--	--	**39**	97	5.9	<1.0	<0.5	--
SB11A(8)	SB11	03/28/18	8	--	--	--	1.2	7.7	--	--	--	--
SB12@4'	SB12	03/08/18	4	--	--	--	17	490	9.2	<1.0	<0.5	--
SB12A(8)	SB12	03/28/18	8	--	--	--	9	290	--	--	--	--
MTCA Method A Industrial Cleanup Levels				2,000	2,000	0.1	20	1,000	19	2	2	Varies

TABLE 1
SOIL ANALYTICAL RESULTS
Swindahl Properties LLC
2218 Marine View Drive
Tacoma, Washington

Aerotech Environmental Consulting, Inc. - Site Charaterization Report - April 19, 2018 & July 20, 2018 (continued)

Sample ID	Soil Boring/Point Well ID	Sampling Date	Sample Depth	TPHd	TPHo	cPAHs	Arsenic	Lead	Chromium	Cadmium	Mercury	VOCs
			Feet BGS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
SB12B(12)	SB12	03/08/18	12	--	--	--	10	15	--	--	--	--
SB13@4'	SB13	03/08/18	4	--	--	--	11	220	5.9	<1.0	<0.5	--
SB14@4'	SB14	03/08/18	4	--	--	--	6.1	4.8	1.3	<1.0	<0.5	--
SB15@4'	SB15	03/08/18	4	--	--	--	3.4	23	4.5	<1.0	<0.5	--
SB16@4'	SB16	03/08/18	4	--	--	--	14	40	6.2	<1.0	<0.5	--
SB17(4)	SB17	03/28/18	4	--	--	--	1.4	290	--	--	--	--
SB17(8)	SB17	03/28/18	8	--	--	--	<1.0	33	--	--	--	--
SB18(4)	SB18	03/28/18	4	--	--	--	<1.0	3.2	--	--	--	--
SB18(8)	SB18	03/28/18	8	--	--	--	<1.0	6.7	--	--	--	--
SB19(4)	SB19	03/28/18	4	--	--	--	17	850	--	--	--	--
SB19(8)	SB19	03/28/18	8	--	--	--	1.6	33	--	--	--	--
SB19A(8)	SB19	06/29/18	8	<20	<50		<1.0	34	--	--	--	--
SB19A(12)	SB19	06/29/18	12	<20	<50	0.0525	<1.0	4.1	--	--	--	--
SB20(4)	SB20	03/28/18	4	--	--	--	**22**	13	--	--	--	--
SB20(8)	SB20	03/28/18	8	--	--	--	1.9	18	--	--	--	--
SB21(4)	SB21	03/28/18	4	--	--	--	14	11	--	--	--	--
SB21(8)	SB21	03/28/18	8	--	--	--	3.8	24	--	--	--	--
SB22(4)	SB22	03/28/18	4	--	--	--	5.9	38	--	--	--	--
SB22(8)	SB22	03/28/18	8	--	--	--	4.7	9.2	--	--	--	--
SB23(4)	SB23	03/28/18	4	--	--	--	2.4	91	--	--	--	--
SB23(8)	SB23	03/28/18	8	--	--	--	1.3	7.6	--	--	--	--
SB24(4)	SB24	04/02/18	4	--	--	--	<1.0	2.7	--	--	--	--
MTCA Method A Industrial Cleanup Levels				2,000	2,000	0.1	20	1,000	19	2	2	Varies

TABLE 1
SOIL ANALYTICAL RESULTS
Swindahl Properties LLC
2218 Marine View Drive
Tacoma, Washington

Aerotech Environmental Consulting, Inc. - Site Charaterization Report - April 19, 2018 & July 20, 2018 (continued)

Sample ID	Soil Boring/Point Well ID	Sampling Date	Sample Depth	TPHd	TPHo	cPAHs	Arsenic	Lead	Chromium	Cadmium	Mercury	VOCs
			Feet BGS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
SB24(8)	SB24	04/02/18	8	--	--	--	11	12	--	--	--	--
SB24A(12)	SB24	06/29/18	12	<20	<50	--	1.3	1.6	--	--	--	--
SB24A(16)	SB24	06/29/18	16	--	--	--	--	--	--	--	--	--
SB25(4)	SB25	04/02/18	4	--	--	--	2.0	4.3	--	--	--	--
SB25(8)	SB25	04/02/18	8	--	--	--	**27**	260	--	--	--	--
SB25A(8)	SB25	06/29/18	8	<20	1,600	--	--	--	--	--	--	--
SB25A(12)	SB25	06/29/18	12	<20	1,600	**0.924**	**21**	**3,300**	--	--	--	--
SB25A(16)	SB25	06/29/18	16	--	--	0.0525	3.8	32	--	--	--	--
SB26(4)	SB26	04/02/18	4	--	--	--	4.3	470	--	--	--	--
SB26(8)	SB26	04/02/18	8	--	--	--	1.6	26	--	--	--	--
SB27(4)	SB27	04/02/18	4	--	--	--	**31**	170	--	--	--	--
SB27(8)	SB27	04/02/18	8	--	--	--	2.0	19	--	--	--	--
SB28(4)	SB28	04/02/18	4	--	--	--	<1.0	3.8	--	--	--	--
SB29(4)	SB29	06/29/18	4	--	--	--	<1.0	10	--	--	--	--
SB29(8)	SB29	06/29/18	8	--	--	--	2.8	2.2	--	--	--	--
SB29(12)	SB29	06/29/18	12	--	--	--	--	--	--	--	--	--
SB30(4)	SB30	06/29/18	4	--	--	--	2.1	30	--	--	--	--
SB30(8)	SB30	06/29/18	8	<20	<50		3.5	8.4	--	--	--	--
SB30(12)	SB30	06/29/18	12	<20	<50	0.0525	<1.0	2.4	--	--	--	--
SB30(16)	SB30	06/29/18	16	--	--	--	--	--	--	--	--	--
SB31(4)	SB31	06/29/18	4	<20	<50	--	90	19	--	--	--	--
SB31(8)	SB31	06/29/18	8	<20	<50	0.0525	21	21	--	--	--	--
SB31(12)	SB31	06/29/18	12	44	<50	0.0525	1.6	20	--	--	--	--
SB31(16)	SB31	06/29/18	16	<20	<50	--	--	--	--	--	--	--
SB32(4)	SB32	06/29/18	4	--	--	--	--	--	--	--	--	--
SB32(8)	SB32	06/29/18	8	--	--	--	--	--	--	--	--	--
SB32(12)	SB32	06/29/18	12	--	--	--	--	--	--	--	--	--

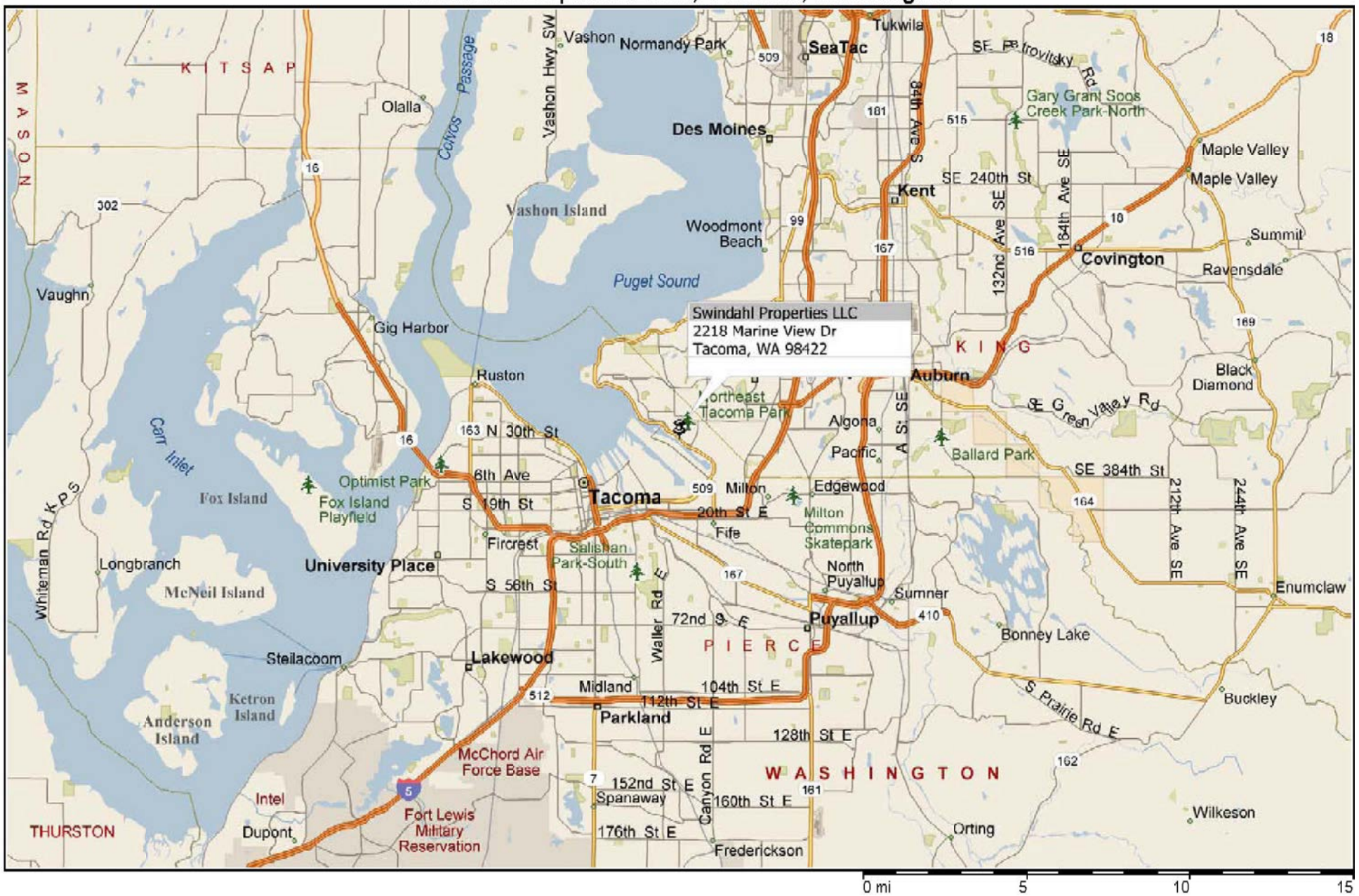
TABLE 1
SOIL ANALYTICAL RESULTS
Swindahl Properties LLC
2218 Marine View Drive
Tacoma, Washington

Aerotech Environmental Consulting, Inc. - Site Charaterization Report - April 19, 2018 & July 20, 2018 (continued)

Sample ID	Soil Boring/Point Well ID	Sampling Date	Sample Depth	TPHd	TPHo	cPAHs	Arsenic	Lead	Chromium	Cadmium	Mercury	VOCs
			Feet BGS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
SB33(4)	SB33	06/29/18	4	--	--	--	--	--	--	--	--	--
SB33(8)	SB33	06/29/18	8	--	--	--	--	--	--	--	--	--
SB33(12)	SB33	06/29/18	12	--	--	--	--	--	--	--	--	--
MTCA Method A Industrial Cleanup Levels				2,000	2,000	0.1	20	1,000	19	2	2	Varies

MTCA = Model Toxic Control Act Cleanup Level (WAC173-340-900)
BGS = Below Ground Surface mg/kg = milligram of analyte per kilogram of soil
< = not detected at indicated Laboratory Detection Limits -- = not analyzed
Lead and Arsenic by EPA Method 7010 VOCs by EPA Method 8260B
Mercury by EPA Method 7471 cPAHs = Carcenogenic Polycyclic Aromatic Hydrocarbons by 8270 SIM
ND = Not Detected (minimum detection limit unknown)
Bolded numbers and red-shaded cells denote concentrations above the MTCA Method A Cleanup Levels for soil
cPAHs results were calculated using the toxic equivalent concentration factors from Table 708-1 and adding them together for each sample
For samples where no cPAHs were detected, 1/2 of the reporting limit was used to calculate the result value

Swindahl Properties LLC, Tacoma, Washington



AEROTECH ENVIRONMENTAL CONSULTING

REGIONAL MAP

Swindahl Properties LLC
2218 Marine View Drive
Tacoma, Washington

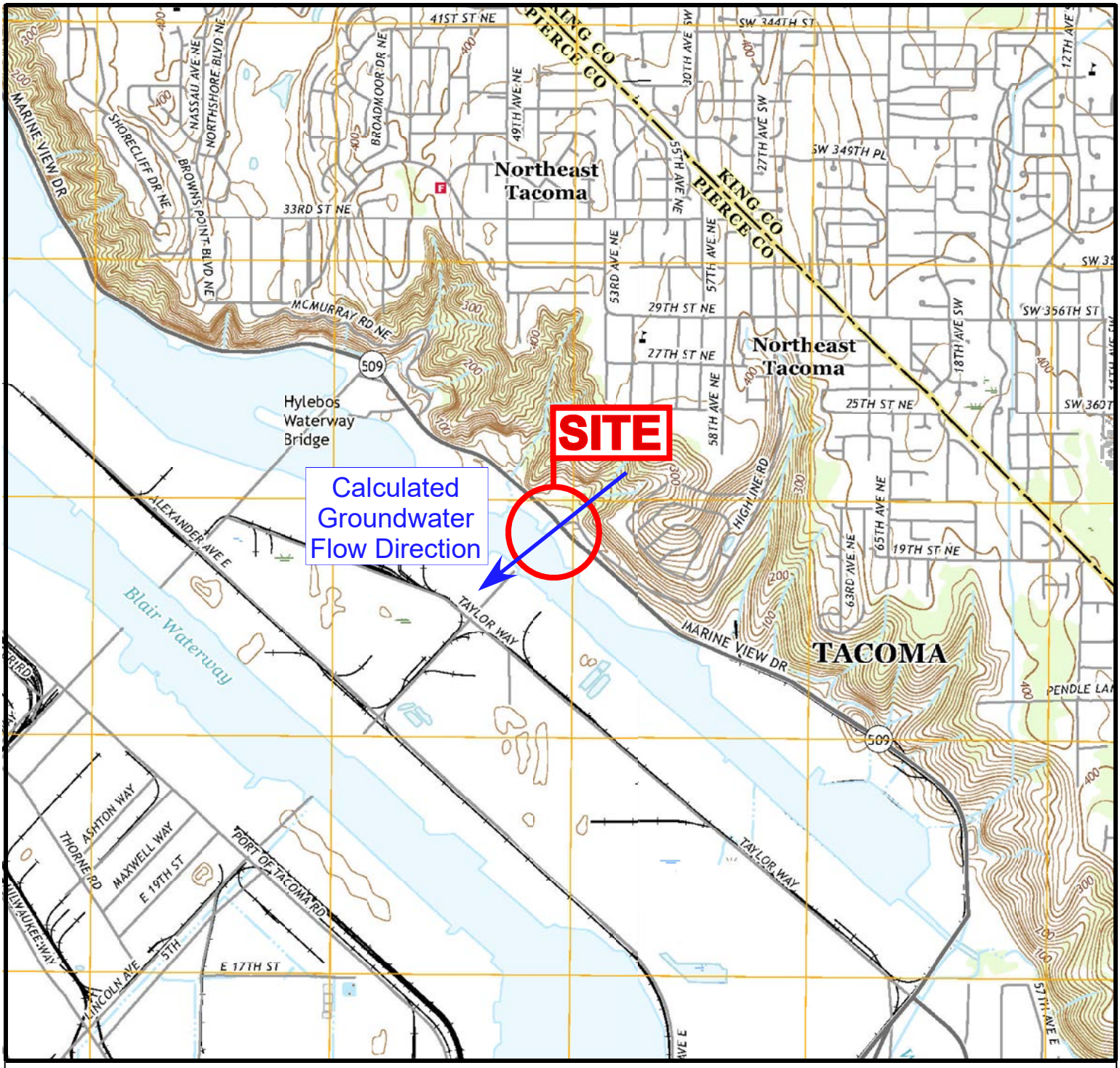
Date: 04/19/18
By: Nick Gerkin
Figure: 1

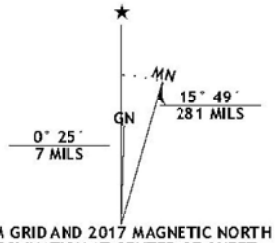
AEROTECH ENVIRONMENTAL CONSULTING

NEIGHBORHOOD MAP

Swindahl Properties LLC
2218 Marine View Drive
Tacoma, Washington

Date: 04/19/18
By: Nick Gerkin
Figure: 2





UTM GRID AND 2017 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

0 0.5 1

SCALE (mile)

CONTOUR INTERVAL 20 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

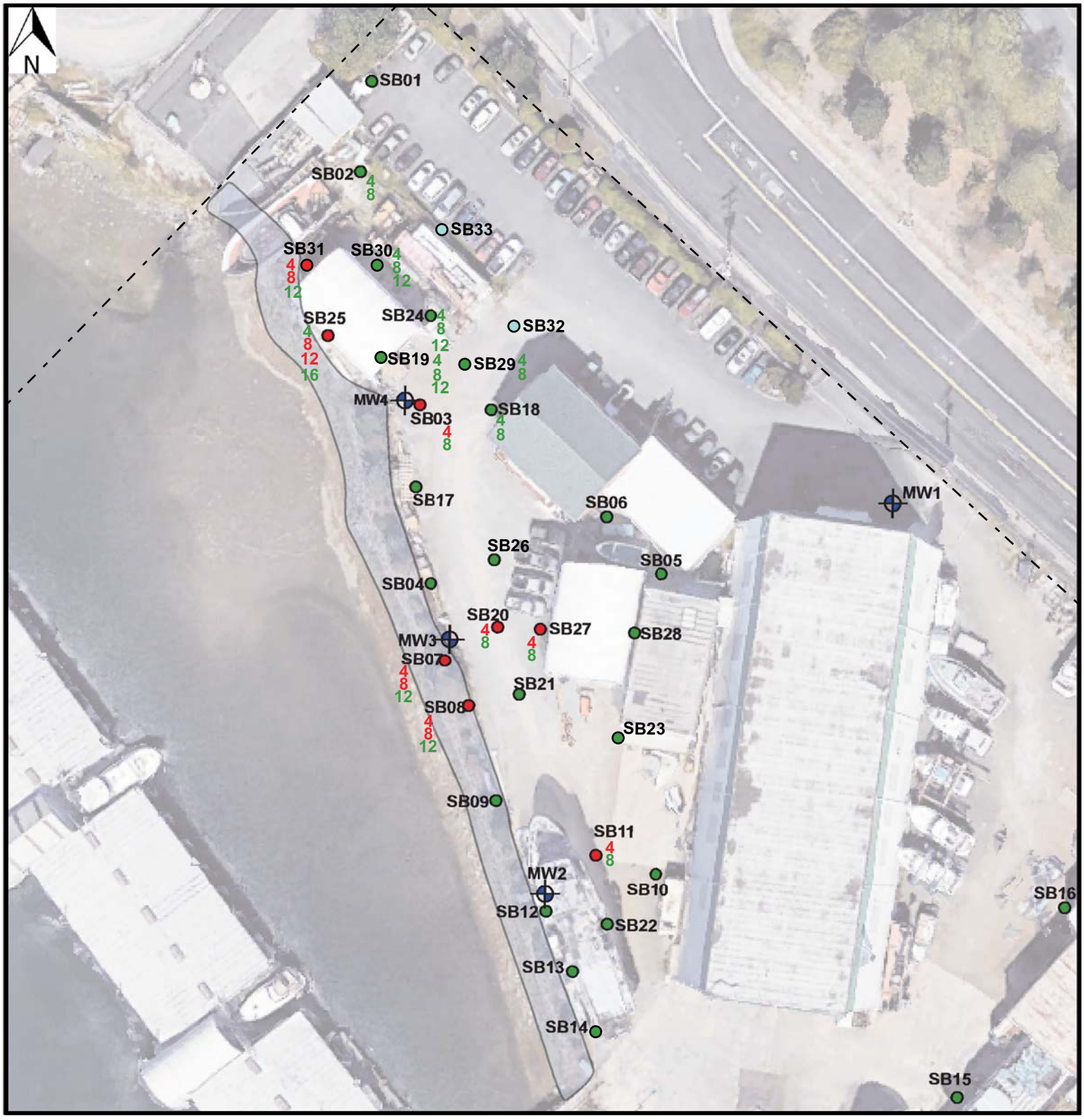
QUADRANGLE LOCATION

AEROTECH ENVIRONMENTAL CONSULTING

USGS TOPOGRAPHIC MAP

Swindahl Properties LLC
2218 Marine View Drive
Tacoma, Washington

Date: 04/19/18
By: Nick Gerkin
Figure: 3



EXPLANATION

0 25 50 100
SCALE (feet)

SB31
Depth of Sample (feet)
4
8
12

SB28 Soil Boring Location

MW4 Groundwater Monitoring Well

Concrete Shoreline Fill

Property Line

Green numbers and symbols indicate concentrations below the MTCA Method A Cleanup Levels

Red numbers and symbols indicate concentrations above the MTCA Method A Cleanup Levels

Blue numbers and symbols indicate a samples were collected for lateral delineation however existing data from surrounding boring(s) deemed analyses not necessary

AEROTECH
ENVIRONMENTAL CONSULTING

SOIL BORING LOCATIONS MAP

Swindahl Properties LLC
2218 Marine View Drive
Tacoma, Washington

Date: 07/20/18
By: Justin Foslien
Figure: 4

- Photographs

GPR survey prior to drilling

Truck-mounted direct push drill rig

Close-up of sticky dark gray stained material

Samples from SB31 where dark oily sheen, stain and odor were observed

View of Soil Boring SB25

Backfilling soil borings with bentonite to surface

· Project Contract Documents

ENVIRONMENTAL CONTRACTOR'S CERTIFICATION

Swindahl Properties LLC
2218 Marine View Drive
Tacoma, Washington 98422

1. Contractor's Name: Aerotech Environmental Consulting, Inc.

2. Contractor's Address: 13925 Interurban Avenue South, Ste. 210, Seattle, Washington 98168

3. Name and title of person completing this certification: Alan T. Blotch / President

4. Answer the following questions about each employee that contractor will have perform the assessment or prepare the report showing the results of the inspection:

   a. Name and Title of Employee: Alan T. Blotch – Environmental Professional

   b. Length of experience doing environmental assessments: 31 years

   c. Education degrees received: Masters of Business Administration
   Juris Doctor – Environmental Law

   d. Relevant training received: ASTM E50 Environmental Assessment Committee Meetings

5. Identify any certifications and approvals issued to contractor pursuant to an official Federal, State of local program or policy to conduct environmental assessments: Registered Environmental Assessor
   Issued by State of California

6. Describe the generally recognized standards which the contractor will use to perform the assessment. *Standard Practice for Environmental Site Assessments: Phase II Environmental Site Assessment Process* (ASTM E 1903)

7. Disclose the nature of any previous environmental inspections contractor has ever performed for the Owner of the property: Phase I Environmental Site Assessment

8. Disclose the nature of any affiliation or association contractor now has, or ever had, with the above referenced seller of the property, of the above referenced buyer of the property: N/A

9. Describe the liability insurance carried by contractor to cover claims in the event that ir fails to discover adverse environmental conditions during an environmental inspection.
   Professional Errors & Omissions Coverage $1,000,000 / claim and $1,000,000 aggregate liability

THE UNDERSIGNED HEREBY CERTIFIES, UNDER PENALTY OF THE CRIMINAL AND/OR CIVIL PENALTIES IN 18 U.S.C. § 1001 FOR FALSE STATEMENTS TO THE UNITED STATES GOVERNMENT, THAT THE ABOVE INFORMATION IS TRUE AND CORRECT.

Signature _____ Date 7/20/18

· Laboratory Analytical Reports and Chains of Custody

ADVANCED ANALYTICAL

Environmental Testing Laboratory

July 17, 2018

Nick Gerkin
Aerotech Environmental, Inc.
13925 Interurban Avenue South, Suite 210
Seattle, WA 98168

Dear Mr. Gerkin:

Please find enclosed the analytical data report for the *Swindahl Properties* ***(C80704-4)*** Project.

Samples were received on *July 04, 2018.* The results of the analyses are presented in the attached tables. Applicable reporting limits, QA/QC data and data qualifiers are included. A copy of the chain-of-custody and an invoice for the work is also enclosed.

ADVANCED ANALYTICAL LABORATORY appreciates the opportunity to provide analytical services for this project. Should there be any questions regarding this report, please contact me at (425) 702-8571.

It was a pleasure working with you, and we are looking forward to the next opportunity to work together.

Sincerely,

V. Ivanov

Val G. Ivanov, Ph.D.
Laboratory Manager

4078 148 Ave NE■ Redmond, WA 98052
425.702-8571
E-mail: aachemlab@yahoo.com

Advanced Analytical Laboratory
(425) 702-8571

AAL Job Number:	C80704-4
Client:	Aerotech Environmental
Project Manager:	Nick Gerkin
Client Project Name:	Swindahl Properties
Client Project Number:	na
Date received:	07/04/18

AAL Job Number: C80704-4
Client: Aerotech Environmental
Project Manager: Nick Gerkin
Client Project Name: Swindahl Properties
Client Project Number: na
Date received: 07/04/18

Analytical Results

NWTPH-Dx, mg/kg		MTH BLK	SB02A(4)	SB02A(8)	SB02A(12)	SB19A(8)
Matrix	Soil	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	07/06/18	07/06/18	07/06/18	07/06/18	07/06/18
Date analyzed	Limits	07/06/18	07/06/18	07/06/18	07/06/18	07/06/18
Kerosene/Jet fuel	20	nd	nd	nd	nd	nd
Diesel/Fuel oil/Creosote	20	nd	nd	nd	nd	nd
Heavy oil	50	nd	nd	nd	nd	nd
Surrogate recoveries:						
Fluorobiphenyl		90%	81%	86%	80%	87%
o-Terphenyl		92%	87%	88%	86%	89%

Data Qualifiers and Analytical Comments
na - not analyzed
Results reported on dry-weight basis
M - matrix interference
Acceptable Recovery limits: 70% TO 130%
Acceptable RPD limit: 30%

AAL Job Number: C80704-4
Client: Aerotech Environmental
Project Manager: Nick Gerkin
Client Project Name: Swindahl Properties
Client Project Number: na
Date received: 07/04/18

Analytical Results

NWTPH-Dx, mg/kg		SB19A(12)	SB24A(12)	SB25A(8)	SB25A(12)	SB30(8)
Matrix	Soil	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	07/06/18	07/06/18	07/06/18	07/06/18	07/06/18
Date analyzed	Limits	07/06/18	07/06/18	07/06/18	07/06/18	07/06/18
Kerosene/Jet fuel	20	nd	nd	nd	nd	nd
Diesel/Fuel oil/Creosote	20	nd	nd	nd	nd	nd
Heavy oil	50	nd	nd	1,600	1,600	nd
Surrogate recoveries:						
Fluorobiphenyl		79%	79%	96%	98%	93%
o-Terphenyl		83%	79%	97%	129%	90%

Data Qualifiers and Analytical Comments
na - not analyzed
Results reported on dry-weight basis
M - matrix interference
Acceptable Recovery limits: 70% TO 130%
Acceptable RPD limit: 30%

AAL Job Number: C80704-4
Client: Aerotech Environmental
Project Manager: Nick Gerkin
Client Project Name: Swindahl Properties
Client Project Number: na
Date received: 07/04/18

Analytical Results

NWTPH-Dx, mg/kg		SB30(12)	SB31(4)	SB31(8)	SB31(12)	SB31(16)	Dupl SB31(16)
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	07/06/18	07/06/18	07/06/18	07/06/18	07/06/18	07/06/18
Date analyzed	Limits	07/06/18	07/06/18	07/06/18	07/06/18	07/06/18	07/06/18
Kerosene/Jet fuel	20	nd	nd	nd	nd	nd	nd
Diesel/Fuel oil/Creosote	20	nd	nd	nd	44	nd	nd
Heavy oil	50	nd	nd	nd	nd	nd	nd
Surrogate recoveries:							
Fluorobiphenyl		92%	87%	85%	91%	89%	91%
o-Terphenyl		91%	87%	84%	88%	87%	92%

Data Qualifiers and Analytical Comments
na - not analyzed
Results reported on dry-weight basis
M - matrix interference
Acceptable Recovery limits: 70% TO 130%
Acceptable RPD limit: 30%

AAL Job Number: C80704-4
Client: Aerotech Environmental
Project Manager: Nick Gerkin
Client Project Name: Swindahl Properties
Client Project Number: na
Date received: 07/04/18

Analytical Results

PAH (8270 sim), mg/kg		MTH BLK	LCS	SB31(12)	MS	MSD	RPD
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	07/06/18	07/06/18	07/06/18	07/06/18	07/06/18	07/06/18
Date analyzed	Limits	07/06/18	07/06/18	07/06/18	07/06/18	07/06/18	07/06/18
1-Methylnaphthalene	0.10	nd		0.84			
2-Methylnaphthalene	0.10	nd		0.28			
Naphthalene	0.10	nd		6.5			
Acenaphthylene	0.10	nd		nd			
Acenaphthene	0.10	nd	113%	1.6	115%	113%	2%
Fluorene	0.10	nd		nd			
Phenanthrene	0.10	nd		4.5			
Anthracene	0.10	nd		0.58			
Fluoranthene	0.10	nd		nd			
Pyrene	0.10	nd	101%	2.2	105%	103%	2%
Benzo(a)anthracene	0.10	nd		0.14			
Chrysene	0.10	nd		0.15			
Benzo(b)fluoranthene	0.10	nd		0.31			
Benzo(k)fluoranthene	0.10	nd		nd			
Benzo(a)pyrene	0.10	nd		nd			
Indeno(1,2,3-cd)pyrene	0.10	nd		nd			
Dibenzo(ah)anthracene	0.10	nd		nd			
Benzo(ghi)perylene	0.10	nd		nd			
Surrogate recoveries:							
2-Fluorobyphenyl		72%	54%	73%	54%	86%	
o-Terphenyl		101%	98%	101%	98%	97%	

Data Qualifiers and Analytical Comments
nd - not detected at listed reporting limits
na - not analyzed
M - matrix interference
Results reported on dry-weight basis
Acceptable Recovery limits: 50% TO 150%
Acceptable RPD limit: 50%

AAL Job Number: C80704-4
Client: Aerotech Environmental
Project Manager: Nick Gerkin
Client Project Name: Swindahl Properties
Client Project Number: na
Date received: 07/04/18

Analytical Results

PAH (8270 sim), mg/kg		MTH BLK	LCS	SB25A(12)	SB31(8)	MTH BLK	LCS
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	07/15/18	07/15/18	07/15/18	07/15/18	07/16/18	07/16/18
Date analyzed	Limits	07/15/18	07/15/18	07/15/18	07/15/18	07/16/18	07/16/18
1-Methylnaphthalene	0.10	nd		1.6	nd	nd	
2-Methylnaphthalene	0.10	nd		0.36	nd	nd	
Naphthalene	0.10	nd		4.1	nd	nd	
Acenaphthylene	0.10	nd		nd	nd	nd	
Acenaphthene	0.10	nd	112%	9.9	nd	nd	113%
Fluorene	0.10	nd		nd	nd	nd	
Phenanthrene	0.10	nd		22	nd	nd	
Anthracene	0.10	nd		3.8	nd	nd	
Fluoranthene	0.10	nd		nd	nd	nd	
Pyrene	0.10	nd	101%	19	nd	nd	105%
Benzo(a)anthracene	0.10	nd		1.5	nd	nd	
Chrysene	0.10	nd		1.4	nd	nd	
Benzo(b)fluoranthene	0.10	nd		8.9	nd	nd	
Benzo(k)fluoranthene	0.10	nd		nd	nd	nd	
Benzo(a)pyrene	0.10	nd		nd	nd	nd	
Indeno(1,2,3-cd)pyrene	0.10	nd		nd	nd	nd	
Dibenzo(ah)anthracene	0.10	nd		nd	nd	nd	
Benzo(ghi)perylene	0.10	nd		nd	nd	nd	
Surrogate recoveries:							
2-Fluorobyphenyl		71%	54%	75%	81%	81%	55%
o-Terphenyl		101%	97%	88%	99%	99%	98%

Data Qualifiers and Analytical Comments
nd - not detected at listed reporting limits
na - not analyzed
M - matrix interference
Results reported on dry-weight basis
Acceptable Recovery limits: 50% TO 150%
Acceptable RPD limit: 50%

AAL Job Number: C80704-4
Client: Aerotech Environmental
Project Manager: Nick Gerkin
Client Project Name: Swindahl Properties
Client Project Number: na
Date received: 07/04/18

Analytical Results

PAH (8270 sim), mg/kg		SB19A(12)	SB25A(16)	SB30(12)
Matrix	Soil	Soil	Soil	Soil
Date extracted	Reporting	07/16/18	07/16/18	07/16/18
Date analyzed	Limits	07/16/18	07/16/18	07/16/18
1-Methylnaphthalene	0.10	nd	nd	nd
2-Methylnaphthalene	0.10	nd	nd	nd
Naphthalene	0.10	nd	nd	nd
Acenaphthylene	0.10	nd	nd	nd
Acenaphthene	0.10	nd	nd	nd
Fluorene	0.10	nd	nd	nd
Phenanthrene	0.10	nd	nd	nd
Anthracene	0.10	nd	nd	nd
Fluoranthene	0.10	nd	nd	nd
Pyrene	0.10	nd	nd	nd
Benzo(a)anthracene	0.10	nd	nd	nd
Chrysene	0.10	nd	nd	nd
Benzo(b)fluoranthene	0.10	nd	nd	nd
Benzo(k)fluoranthene	0.10	nd	nd	nd
Benzo(a)pyrene	0.10	nd	nd	nd
Indeno(1,2,3-cd)pyrene	0.10	nd	nd	nd
Dibenzo(ah)anthracene	0.10	nd	nd	nd
Benzo(ghi)perylene	0.10	nd	nd	nd
Surrogate recoveries:				
2-Fluorobyphenyl		78%	71%	85%
o-Terphenyl		103%	102%	95%

Data Qualifiers and Analytical Comments
nd - not detected at listed reporting limits
na - not analyzed
M - matrix interference
Results reported on dry-weight basis
Acceptable Recovery limits: 50% TO 150%
Acceptable RPD limit: 50%

AAL Job Number: C80704-4
Client: Aerotech Environmental
Project Manager: Nick Gerkin
Client Project Name: Swindahl Properties
Client Project Number: na
Date received: 07/04/18

Analytical Results

Metals (7010), mg/kg		MTH BLK	LCS	SB02A(8)	SB19A(8)	SB25A(12)	SB29(4)
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	07/10/18	07/10/18	07/10/18	07/10/18	07/10/18	07/10/18
Date analyzed	Limits	07/10/18	07/10/18	07/10/18	07/10/18	07/10/18	07/10/18
Lead (Pb)	1.0	nd	102%	2.9	34	3,300	10
Arsenic (As)	1.0	nd	97%	2.2	nd	21	nd

Data Qualifiers and Analytical Comments
nd - not detected at listed reporting limits
na - not analyzed
Results reported on dry-weight basis
Acceptable Recovery limits: 70% TO 130%
Acceptable RPD limit: 30%

AAL Job Number: C80704-4
Client: Aerotech Environmental
Project Manager: Nick Gerkin
Client Project Name: Swindahl Properties
Client Project Number: na
Date received: 07/04/18

Analytical Results

Metals (7010), mg/kg		SB29(8)	SB30(4)	SB30(8)	SB30(12)	SB31(4)	SB31(8)
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	07/10/18	07/10/18	07/10/18	07/10/18	07/10/18	07/10/18
Date analyzed	Limits	07/10/18	07/10/18	07/10/18	07/10/18	07/10/18	07/10/18
Lead (Pb)	1.0	2.2	30	8.4	2.4	19	21
Arsenic (As)	1.0	2.8	2.1	3.5	nd	90	21

Data Qualifiers and Analytical Comments
nd - not detected at listed reporting limits
na - not analyzed
Results reported on dry-weight basis
Acceptable Recovery limits: 70% TO 130%
Acceptable RPD limit: 30%

AAL Job Number: C80704-4
Client: Aerotech Environmental
Project Manager: Nick Gerkin
Client Project Name: Swindahl Properties
Client Project Number: na
Date received: 07/04/18

Analytical Results

Metals (7010), mg/kg		SB31(12)	MS	MSD	RPD	MTH BLK	LCS
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	07/10/18	07/10/18	07/10/18	07/10/18	07/13/18	07/13/18
Date analyzed	Limits	07/10/18	07/10/18	07/10/18	07/10/18	07/13/18	07/13/18
Lead (Pb)	1.0	20	71%	84%	17%	nd	84%
Arsenic (As)	1.0	1.6	88%	76%	14%	nd	89%

Data Qualifiers and Analytical Comments
nd - not detected at listed reporting limits
na - not analyzed
Results reported on dry-weight basis
Acceptable Recovery limits: 70% TO 130%
Acceptable RPD limit: 30%

AAL Job Number: C80704-4
Client: Aerotech Environmental
Project Manager: Nick Gerkin
Client Project Name: Swindahl Properties
Client Project Number: na
Date received: 07/04/18

Analytical Results

Metals (7010), mg/kg		SB19A(12)	SB24A(12)	SB25A(16)
Matrix	Soil	Soil	Soil	Soil
Date extracted	Reporting	07/13/18	07/13/18	07/13/18
Date analyzed	Limits	07/13/18	07/13/18	07/13/18
Lead (Pb)	1.0	4.1	1.6	32
Arsenic (As)	1.0	nd	1.3	3.8

Data Qualifiers and Analytical Comments
nd - not detected at listed reporting limits
na - not analyzed
Results reported on dry-weight basis
Acceptable Recovery limits: 70% TO 130%
Acceptable RPD limit: 30%

AAL Job Number: C80704-4
Client: Aerotech Environmental
Project Manager: Nick Gerkin
Client Project Name: Swindahl Properties
Client Project Number: na
Date received: 07/04/18

Analytical Results

Metals (7010/7417/1311), ug/L		MTH BLK	LCS	SB25A(8)	SB25A(8) Dupl	SB25A(8) RPD
Matrix	Soil Extract	Soil Extract	Soil Extract	Soil Extract	Soil Extract	Soil Extract
Date extracted	Reporting	07/12/18	07/12/18	07/12/18	07/12/18	07/12/18
Date analyzed	Limits	07/12/18	07/12/18	07/12/18	07/12/18	07/12/18
Lead (Pb)	2.0	nd	82%	4,200	5,000	17%
Chromium (Cr)	10	nd	79%	81	93	14%
Cadmium (Cd)	5.0	nd	80%	7.2	6.7	7%
Arsenic (As)	5.0	nd	100%	16	18	12%
Mercury (Hg) (7470A)	0.50	nd	94%	1.8	1.4	25%
Barium (Ba)	50	nd	98%	nd	nd	
Silver (Ag)	10	nd	96%	nd	nd	
Selenium (Se)	50	nd	116%	nd	nd	

Data Qualifiers and Analytical Comments
nd - not detected at listed reporting limits
na - not analyzed
Acceptable Recovery limits: 70% TO 130%
Acceptable RPD limit: 30%

Please Copy

ADVANCED ANALYTICAL

Chain of Custody Record

Laboratory Job #: C807044

4078 148 Avenue NE
Redmond, WA 98052
(425) 702-8571
aachemlab@yahoo.com

Client: Aerotech

Project Manager: Nick Gerkin, Justin Fosliew

Address: 13925 Interurban Ave S, Tukwila, WA

Phone: 206 482 3287 Fax:

Project Name: Swindahl Properties

Project Number: —

Collector: Nick Gerkin, ~~Justin~~

Date of collection: 6/29/18

	Sample ID *	Time	Matrix	Container type	8260 Volatiles	HVOC 8260	BTEX	BTEX/NWTPH-Gx	NWTPH-Gx	NWTPH-Dx	NWTPH-HCID	8270 Semivolatiles	8270 PAH	8082 PCBs	8081 Pesticides	RCRA 8 Metals TCLP Lead	MTCA5 Metals Arsenic	Notes, comments	# of containers
1	SB02A ~~(8)~~ (4) *	1340	S	Jar					X							X	X	No Pb + As	1
2	SB02A ~~(12)~~ (8)	1345							X							X	X		
3	SB02A (12)	1350							X									~~MAG~~	
4	SB19A (8)	1220							X							X	X		
5	SB19A (12)	1225							X			⊕				⊗	⊗	*Per J. Fosliew	
6	SB24A (12)	0945							X							⊗	⊗	07/11/18 VH	
7	SB24A (16)	0955																HOLD	
8	SB25A (8)	1125							X						X			⊗ Added by	
9	SB25A (12)	1130							X			⊗				X	X	N. Gerkin 07/13/18	
10	SB25A (16)	1135										⊕				⊗	⊗	HOLD VH	
11	SB29 (4)	0855														X	X		
12	SB29 (8)	0900	↓	↓												X	X		↓

Relinquished by:	Date/Time	Received by:	Date/Time
	7/4/18 0930	V. Ivanov	07/04/18 11:00
Relinquished by:	Date/Time	Received by:	Date/Time

Sample receipt info:

Total # of containers:	
Condition (temp, °C)	
Seals (intact?, Y/N)	
Comments:	

Turnaround time:

- Same day ○
- 24 hr ○
- 48 hr ○
- Standard ⊗

Please Copy

ADVANCED ANALYTICAL

Chain of Custody Record

Page 2 of 3

Laboratory Job #: C80704-4

4078 148 Avenue NE
Redmond, WA 98052
(425) 702-8571
aachemlab@yahoo.com

Client: Aerotech

Project Name: Swindahl Properties

Project Manager: Nick Gerkin, Justin Foslien

Project Number: —

Address: 13925 Interurban Ave S, Tukwila, WA

Collector: Nick Gerkin

Phone: 206 482 2287 Fax:

Date of collection: 6/29/18

	Sample ID	Time	Matrix	Container type	8260 Volatiles	HVOC 8260	BTEX	BTEX/NWTPH-Gx	NWTPH-Gx	NWTPH-Dx	NWTPH-HCID	8270 Semivolatiles	8270 PAH <PAH	8082 PCBs	8081 Pesticides	RCRA 8 Metals	Lead	MTCA5 Metals	Arsenic	Notes, comments	# of containers
1	SB29(12)	0935	S	Jr																HOLD	1
2	SB29(16)	0940																		HOLD	
3	SB30(4)	1015														X		X			
4	SB30(8)	1020							X							X		X			
5	SB30(12)	1025							X			⊕				X		X			
6	SB30(16)	1030																		HOLD	
7	SB31(4)	1050							X							X		X			
8	SB31(8)	1055							X			⊗				X		X			
9	SB31(12)	1100							X			X				X		X			
10	SB31(16)	1105							X											HOLD	
11	SB32(4)	1240																		HOLD	
12	SB32(8)	1245	↓	↓																HOLD	✓

Relinquished by:	Date/Time	Received by:	Date/Time
	7/1/18 0430	V. Ivanov	07/02/18 1100
Relinquished by:	Date/Time	Received by:	Date/Time

Sample receipt info:

Total # of containers:

Condition (temp, °C)

Seals (intact?, Y/N)

Comments:

Turnaround time:

Same day O

24 hr O

48 hr O

Standard ⊗

Please Copy

ADVANCED ANALYTICAL

Chain of Custody Record

Laboratory Job #: 180704-4

4078 148 Avenue NE
Redmond, WA 98052
(425) 702-8571
aachemlab@yahoo.com

Client: Aerotech

Project Name: Swindahl Properties

Project Manager: Nick Gerkin, Justin Foster

Project Number: —

Address: 13925 Interurban Ave S, Tukwila, WA

Collector: Nick Gerkin

Phone: 206 482 2257 Fax:

Date of collection: 6/29/18

	Sample ID	Time	Matrix	Container type	8260 Volatiles	HVOC 8260	BTEX	BTEX/NWTPH-Gx	NWTPH-Gx	NWTPH-Dx	NWTPH-HCID	8270 Semivolatiles	8270 PAH	8082 PCBs	8081 Pesticides	RCRA 8 Metals	Lead	MTCA5 Metals	Notes, comments	# of containers
1	SB32(12)	1250	S	Jar															HOLD	1
2	SB33(4)	1310																	HOLD	
3	SB33(8)	1315																	HOLD	
4	SB33(12)	1320	↓	↓															HOLD	↓
5																				
6																				
7																				
8																				
9																				
10																				
11																				
12																				

Relinquished by:	Date/Time	Received by:	Date/Time
	7/4/18 0430	V. Hamer	07/04/18 1100
Relinquished by:	Date/Time	Received by:	Date/Time

Sample receipt Info:

Total # of containers:

Condition (temp, °C)

Seals (intact?, Y/N)

Comments:

Turnaround time:

Same day ○

24 hr ○

48 hr ○

Standard ☒

· Standard Operating Procedures

AEROTECH
Environmental Consulting Inc.

13925 Interurban Avenue South, Suite 210
Seattle, Washington 98168
(360) 710-5899

512 W. International Airport Road, Suite 201
Anchorage, Alaska 99518
(907) 575-6661

SOIL BORING AND WELL INSTALLATION STANDARD OPERATING PROCEDURE

EQUIPMENT *(Items in italic provided by drilling subcontractor, verify according to the site sampling plan they bring the appropriate equipment and material.)*

- Sampling and Analyses Plan (SAP)
- Site-specific sampling plan
- Sample location map
- Sample table
- Safety equipment, as specified in the Health and Safety Plan
- Permanent pens/marker (e.g. Sharpies®)
- Site logbook, boring log and/or sampling form
- Camera
- Candlestick/cones/barricade
- Caution tape
- Trash bags/plastic sheeting
- Assorted tools (e.g. shovels, wrenches, etc.)
- *Annular materials: silica sand, bentonite pellets and chips, grout*
- *Monitoring well materials: 2-inch schedule 40 PVC riser, well screen and end caps*
- *Completion materials: posts or traffic rated steel monuments, concrete mix, concrete forms*
- *Drilling rig (e.g. hollow stem auger, air/mud rotary, direct push, or sonic)*
- *Disposable acetate liners for direct push*
- *Decontamination equipment such as pressure washer to decontaminate rig and bucket with water and phosphate-free soap (e.g. Alconox®, Liquinox®) for split spoon samplers*

Preliminary Activities

Prior to the onset of field activities at the site, Aerotech obtains the appropriate permit(s) from the governing agency(s). Advance notification is made as required by the agency(s) prior to the start of work. Aerotech marks the borehole locations and contacts the local one call utility locating service at least 2 full business days prior to the start of work to mark buried utilities. Borehole locations may also be checked for buried utilities by a private geophysical surveyor. Additionally, borehole locations may be cleared via air-knife and vacuum operations where proposed locations are in close proximity of buried utilities. Fieldwork is conducted under the advisement of a state registered professional geologist. Monitoring well construction will

comply with Monitoring Well Construction: General, 690-240-100 through Well Seals, WAC 173-160.

Drilling

Aerotech contracts a licensed driller to advance each boring and collect soil samples. The specific drilling method (e.g., hollow-stem auger, direct push method, or sonic drilling), sampling method [e.g., core barrel or California-modified split spoon sampler (CMSSS)] and sampling depths are documented on the boring log and may be specified in a work plan. Soil samples are typically collected at the capillary fringe and at 5-foot intervals to the total depth of the boring. To determine the depth of the capillary fringe prior to drilling, the static groundwater level is measured with a water level indicator in the closest monitoring well to the boring location, if available.

The borehole is advanced to just above the desired sampling depth. For CMSSSs, the sampler is placed inside the auger and driven to a depth of 18 inches past the bit of the auger. The sampler is driven into the soil with a standard 140-pound hammer repeatedly dropped from a height of 30 inches onto the sampler. The number of blows required to drive the sampler each 6-inch increment is recorded on the boring log. For core samplers (e.g., direct push), the core is driven 18 inches using the rig apparatus.

Soil Sampling

Soil is collected according to Aerotech's SOIL SAMPLING STANDARD OPERATING PROCEDURE.

Grab Groundwater Sampling from Soil Boring

In the event that undeveloped grab-groundwater samples are necessary for the scope of work, a temporary well screen is placed across the desired interval of the soil boring. The sample can be collected via disposable bailer or peristaltic pump and disposable tubing. Additionally if direct push technology has been utilized for advancing the soil boring, a groundwater sample, is collected from the boring by using HydropunchTM sampling technology. In the case of using HydropunchTM technology, after collecting the capillary fringe soil sample, the boring is advanced to the top of the soil/groundwater interface and a sampling probe is pushed to approximately 2 feet below the top of the static water level. The probe is opened by partially withdrawing it and thereby exposing the screen. New polyethylene tubing with a peristaltic pump or decontaminated bailer is used to collect a water sample from the probe. The water sample is then emptied into laboratory-supplied containers constructed of the correct material and with the correct volume and preservative to comply with the proposed laboratory test. The container is slowly filled with the retrieved water sample until no headspace remains and then promptly sealed with a Teflon-lined cap, checked for the presence of bubbles, labeled, entered onto a COC record and placed in chilled storage at 4° Celsius. Laboratory-supplied trip blanks accompany the water samples as a quality assurance/quality control procedure. Equipment blanks may be collected as required. The samples are kept in chilled storage and transported under COC protocol to a client-approved, state-certified laboratory for analysis.

Field Screening Procedures

Aerotech staff place the soil from the middle of the sampling interval into a plastic re-sealable bag. The bag is then labeled with the sample number. The tip of a photoionization detector (PID) or similar device is inserted through the plastic bag to measure organic vapor concentrations in the headspace. The highest sustained PID measurement is recorded on the boring log. At a minimum, the PID or organic vapor monitoring device is calibrated on a daily basis in accordance with manufacturer's specifications using a hexane or isobutylene standard. The calibration gas and concentration are recorded on a calibration log. Instruments such as the PID are useful for evaluating relative concentrations of volatilized hydrocarbons, but they do not measure the concentration of petroleum hydrocarbons in the soil matrix with the same precision as laboratory analysis. Aerotech trained personnel describe the soil in the bag according to the Unified Soil Classification System and record the description on the boring log, which is included in the final report.

Backfilling of Soil Boring

If a well is not installed, the boring is backfilled from total depth to approximately 5 feet below ground surface (bgs) with either neat cement or bentonite grout using a tremie pipe. The boring is backfilled from 5 feet bgs to approximately 1 foot bgs with hydrated bentonite chips. The borehole is completed from 1 foot bgs to surface grade with material that best matches existing surface conditions and meets local agency requirements. Site-specific backfilling details are shown on the respective boring log.

Monitoring Well Construction

A well (if constructed) is completed using materials documented on the boring log or specified in a work plan. The well is constructed with slotted casing across the desired groundwater sampling depth(s) and completed with blank casing to within 6 inches of surface grade. No further construction is conducted on temporary wells. For permanent wells, the annular space of the well is backfilled with Monterey sand from the total depth to approximately 2 feet above the top of the screened casing. A hydrated granular bentonite seal is placed on top of the sand filter pack. Grout may be placed on top of the bentonite seal to the desired depth using a tremie pipe. The well may be completed to surface grade with a 1-foot thick concrete pad. A traffic-rated well vault and locking cap for the well casing may be installed to protect against surface-water infiltration and unauthorized entry. Site-specific well construction details including type of well, well depth, casing diameter, slot size, length of screen interval and sand size are documented on the boring log or specified in the work plan.

Monitoring Well Development

Following well construction, each monitoring well is developed and surveyed according to Aerotech's MONITORING WELL DEVELOPMENT AND SURVEYING STANDARD OPERATING PROCEDURE.

Well Sampling

Following development, groundwater is collected according to Aerotech's LOW-FLOW GROUNDWATER SAMPLING STANDARD OPERATING PROCEDURE.

Decontamination Procedures

Aerotech and/or the contracted driller decontaminate soil and water sampling equipment between each sampling event with a non-phosphate solution, followed by a minimum of two tap water rinses. Deionized water may be used for the final rinse. Downhole drilling equipment is steam-cleaned prior to drilling the borehole and at completion of the borehole.

Waste Treatment and Soil Disposal

Soil cuttings and decontamination fluids generated from the drilling or sampling are stored on site in labeled, Department of Transportation-approved, 55-gallon drums or other appropriate storage container. Unless otherwise specified in the contract with Aerotech, the client is responsible for disposal of investigation derived waste. Should Aerotech be contracted to complete disposal for the client, drums containing investigation derived waste are subsequently transported under manifest to a client- and regulatory-approved facility for disposal.

AEROTECH
Environmental Consulting Inc.

13925 Interurban Avenue South, Suite 210
Seattle, Washington 98168
(360) 710-5899

512 W. International Airport Road, Suite 201
Anchorage, Alaska 99518
(907) 575-6661

SOIL SAMPLING STANDARD OPERATING PROCEDURE

EQUIPMENT

- Sampling and Analyses Plan (SAP)
- Site-specific sampling plan
- Sample location map
- Sample table
- Safety equipment, as specified in the Health and Safety Plan
- Permanent pens/marker (e.g. Sharpies®)
- Site logbook and/or sampling form
- Camera
- Screening equipment (e.g. Photoionization detector (PID))
- Survey stakes or flags
- Tape measure or measuring wheel
- Plastic sheet
- Soil collection device, heavy equipment (e.g. spoons spade shovel, hand auger, hollow stem auger – split spoon sampler, direct push rig – macro core, shelby tube, backhoe)
- Syringes for EPA Method 5035
- Syringe tool for EPA Method 5035 (e.g. En Core® sampler)
- Pre-weighed and preserved sample vials for EPA Method 5035
- Stainless steel and/or plastic bowls (only if homogenizing composite samples)
- Sample containers, precleaned (e.g., I-Chem)
- Chain-of-custody forms, custody seals, sample labels
- Ziploc® Bags
- Insulated cooler
- Ice
- Plastic bags for sample containers and ice
- Decontamination equipment including tap water and/or deionized water and phosphate-free soap (e.g. Alconox®, Liquinox®)

Soil Sampling

Soil samples are preserved in the metal or plastic sleeve used with the California-modified split spoon sampler (CMSSS) or core sampler, in glass jars or other containers according to the test method and regulatory guidelines (e.g., Environmental Protection Agency Method 5035). Sleeves are removed from the sample barrel, and the lowermost sample sleeve is labeled. Soil is collected from the split spoon sample or direct push core sample into appropriate containers based on the planned test method. Besides the use of a drilling rig, soil may also be collected via hand auger or with a scoop or spoon from the surface or a selected interval from an excavation, trench or test pit.

Soil Sample Collection

Aerotech field personnel are to review the SAP for sample locations and analysis as well as obtain photograph(s) of the material before sampling. If the soil sample is to be a discrete sample, collect soil using a clean/decontaminated stainless-steel (organic analyses) or plastic (inorganic analyses) spoon. If the soil sample is to be a composite, collect soil from all locations to be sampled into one stainless-steel (organic analyses) or plastic (inorganic analyses) bowl and homogenize the soil. If the soil sample is to be a discrete sample for volatile analyses, collect soil using a syringe and place into appropriate pre-weighed sample vial (Volatiles samples may not be composited.).

Next, use the syringe, stainless-steel or plastic spoon to transfer soil sample as appropriate into sample container as specified by the analytical test method. Label and manage sample containers. Decontaminate sampling equipment between each sampling event with a non-phosphate solution, followed by a minimum of two tap water rinses. Deionized water may be used for the final rinse. Ensure activities are well documented in the site logbook or on a designated sampling form. (i.e. collection method, presence of sheen or odor and PID measurement.

Field Screening Procedures

Aerotech field staff place soil from sampling interval into a plastic re-sealable bag. The bag is then labeled with the sample number. The tip of a photoionization detector (PID) or similar device is inserted through the plastic bag to measure organic vapor concentrations in the headspace. The highest sustained PID measurement is recorded on the boring log. At a minimum, the PID or organic vapor monitoring device is calibrated on a daily basis in accordance with manufacturer's specifications using a hexane or isobutylene standard. The calibration gas and concentration are recorded on a calibration log. Instruments such as the PID are useful for evaluating relative concentrations of volatilized hydrocarbons, but they do not measure the concentration of petroleum hydrocarbons in the soil matrix with the same precision as laboratory analysis. Aerotech trained personnel describe the soil in the bag according to the Unified Soil Classification System and record the description on the boring log, sampling form or logbook. Selected soil samples for analysis are then placed Samples are placed in a cooler chilled to 4º Celsius and transported to a state-certified laboratory under chain-of custody (COC) protocol.

Extractable Petroleum Hydrocarbons (EPH)/Volatile Petroleum Hydrocarbons (VPH)

To evaluate the potential utilization of site specific cleanup levels (e.g. Ecology's Method B or Method C cleanup levels), Aerotech field personnel will collect additional sample volume to complete EPH/VPH analysis. This test will be completed on samples that are containing petroleum hydrocarbons only, utilizing the previously discussed field screening procedures as well as contaminant source data from previous investigation work.

· TPCHD Site Hazard Assessment: Pump STN 4103 ROW 2222 MARINE VIEW DR

Site Hazard Assessment
Worksheet 1
Summary Score Sheet

SITE INFORMATION

Name: Pump STN 4103 ROW 2222 MARINE VIEW DR
Address: ROW 2222 Marine View Drive
City: Tacoma **County:** Pierce **State:** WA **Zip:** 98422
Section/Township/Range: 26 / 21N / 03E
Latitude: 47.27455 **Longitude:** -122.37986
Facility Site ID Number: 1806706

January 20, 2011

Site Description (Include management areas, substances of concern, and quantities):

General Site Description

The subject site operates in a right of way (ROW) that totals approximately seven thousand two hundred square feet (7,200 ft^2; 60 ft by 120 ft). The property's elevation is approximately twelve feet above mean sea level. The Pump Station 4103 ROW is bordered to the northwest by several parcels owned by Thomas Walrath and Teri and Jay Larry. The Walrath parcels are used for the storage and material handling of sand, soil and aggregates used in their business, TE Walrath Trucking, Inc. The southeastern border is Modutech Marina (Modutech Marine Inc.). The intersection of *Marineview Drive* and *Norpoint Way* provide the northeastern border, and the Hylebos Waterway is the property's southwestern border. The area is zoned "Port Maritime and Industrial" and lies within the Tide Flats of the City of Tacoma.

The Tideflats is a subwatershed of the Puyallup watershed. Covering 2,112 acres, the Tideflats is the most highly industrial and commercial section of Tacoma. Hylebos Creek discharges into the head of the Hylebos Waterway.[1] In July 2009, all of Tacoma's 42 miles of shoreline were designated as Fish and Wildlife Habitat Conservation Areas (FWHCA), and associated critical areas protections were put into place. These protections include buffers ranging from 50 to 200 feet and the requirement to obtain a FWHCA permit for all activities in these areas, unless specifically exempted in the Tacoma Municipal Code, Section 13.11.140.[2]

The site is underlain by a layered sequence of fill, alluvium, and pre-Vashon deposits beneath well maintained pavement. The pavement is approximately three inches (3'') thick and the fill extends to approximately eight feet below ground surface (7.5-8 ft bgs). The fill material consists of loose sandy gravel. Alluvium underlies the fill, extending to a depth of sixty eight feet (68') bgs. The first twenty six feet (6') of alluvium was expressed as interbedded, very soft to soft sandy silt and silty clay. The remainder (26 ft bgs – 68 ft bgs) was observed as interbedded loose to dense, sand with silt and variable gravel content, silty sand, and sandy to very sandy gravel. Below sixty eight feet (68') bgs, pre-Vashon deposits of very dense, very

[1] http://www.cityoftacoma.org
[2] 2009 Annual Amendment Application No. 2009-02 Critical Areas Preservation Code Amendments

sandy gravel; very silty, sand with gravel, and silty sand were encountered to a depth of one hundred forty four feet (144') bgs. Groundwater was measured at depths between three to nine feet (3'-9') bgs at various locations on the subject site and may be tidally influenced.[3]

The closest active groundwater drinking well is a Group A Municipal Water System (City of Tacoma) that is approximately four thousand three hundred twelve feet (4312') to the northwest and has a depth of approximately seven hundred eighty feet below ground surface (780' bgs). The Pump STN 4103 ROW 2222 Marine View DR site is adjacent to the Hylebos Waterway.

The subject site currently serves as the site for a pump station, Pump Station 4301, which is part of the Sewer Crossing System that connects to Pump Station 4102. Pump Station 4102 lies on the southwestern side of Alexander Avenue, just north of the intersection with Lincoln Avenue. The existing sanitary sewer force main extends beneath the Hylebos Waterway. The Hylebos Waterway is approximately six hundred fifty feet (650') wide from bank to bank.

The Sewer Crossing System extends across the Hylebos Waterway, the Blair Waterway and the Puyallup River before reaching its terminus at the City of Tacoma's Central Wastewater Treatment Plant located on the west side of the Puyallup River.

Site History

On October 26, 2006, Landau Associates submitted their "Geotechnical Report Hylebos Waterway Crossing and Pump Station Upgrades Tacoma, Washington" (Landau Report). The Landau Report presented the results of field investigations, provided geotechnical engineering conclusions and recommendations to support design and construction of the proposed Hylebos Waterway Sewer Crossing and Pump Station Upgrades.

Field investigations included characterization of subsurface soil and groundwater conditions at the two pump station sites. A total of six (6) subsurface soil borings were advanced at the project site. The Landau Report was submitted to fulfill the City of Tacoma contract (G-258-03), otherwise known as "Task 1300 – Pumping Stations 4102 and 4103 Replacement Project".

The project generally consisted of replacing the existing sanitary sewer force main that extends beneath the Hylebos Waterway with twenty two inch (22'') HDPE pipe that would travel a total distance of one thousand sixty feet, from Pump Station 4301 to Pump Station 4201. The subsurface HDPE piping was expected to extend to approximately six feet (6') bgs.

Borings B-1 and B-1A were advanced at the subject site. Boring B-2 was advanced on the southwestern side of the Hylebos Waterway. Borings B-3, B-4, and B-4P were advanced at the Pump Station 4201 site.

Groundwater samples were collected from Borings B-1 and B-4P on March 30, 2006 and March 29, 2006, respectively. Petroleum hydrocarbon sheen was observed in the groundwater during the groundwater sample collection from Boring B-1. No sheen was observed at Boring B-4P.

[3] Geotechnical Report Hylebos Waterway Crossing and Pump Station Upgrades Tacoma, Washington. Landau Associates, October 26, 2006.

Soil and groundwater samples were analyzed for total metals (arsenic, copper, lead, mercury, and zinc), total petroleum hydrocarbons – diesel (TPH-Dx), and total petroleum hydrocarbons – heavy oil (TPH-Oil).

The groundwater analytical results indicated that, in Boring B-1, TPH-Oil was present above current Model Toxics Control Act Method A Cleanup Levels for Groundwater (MTCA Method A - Groundwater)[4], and copper was detected above water quality standards for surface waters of the state of Washington[5]. The results are summarized below.

Landau Associates - March 29 to March 30, 2006
Groundwater Analysis (ug/l)

Sample ID	Depth (ft bgs)	TPH-Dx	TPH-Oil	Arsenic	Copper	Lead	Mercury	Zinc
B-1	7.5 - 19	nd	1300	nd	63.91	nd	nd	72.84
MTCA Method A - Groundwater		**500**	**500**	**5**	**na**	**15**	**2**	**na**
WAC 173-201A-240 (dissolved; acute / chronic)		**na**	**na**	**69/36**	**4.8/3.1**	**210/8.1**	**1.8/.025**	**90/81**

Dissolved CFs were applied to the Landau Associates data

The soil samples did not contain any contaminants above MTCA Method A – Soil for any of the analytes measured. Landau speculated that the presence of high heavy oil fraction could be due to the samples proximity to the pavement cap. The concentration of copper has no known source. As mentioned this area of Tacoma is heavily industrialized. Over forty industries involved in metal and/or wood manufacturing and repair lay within a one mile radius of the subject property. The True Grit Roofing Granules site[6] is located approximately 5,000 feet to the west, across the Hylebos waterway. This site accepts copper smelter slag brought in by barge from Anyox, located on Grandby Bay in British Columbia, Canada, and has documented copper contamination in its near shore sediments.

On July 12, 2007, the City of Tacoma (CoT) notified the Washington State Department of Ecology (Ecology) of the presence of contaminants as discussed in the Landau Report. Ecology recorded the information in the Environmental Report Tracking System (ERTS) and assigned the incident an ERTS number of 563792. The incident was referred to the Tacoma-Pierce County Health Department (the Health Department) for follow up through the Initial Investigation (II) process.

The Health Department conducted an II and met with CoT - Source Control program staff on October 10, 2007. It was noted in the II report that the CoT collected an additional groundwater sample from Boring B-1. The sample was analyzed for TPH-Dx and TPH-Oil. The results indicate that TPH-Dx was present at approximately 200 ug/l, and TPH-Oil was present at

[4] Geotechnical Report Hylebos Waterway Crossing and Pump Station Upgrades Tacoma, Washngton. Landau Associates, October 26, 2006.

[5] Washington State Administrative Code 173-201A-240

[6] Ecology FSID: 1206878, Rank 1, December 2010.

approximately 400 ug/l. These concentrations are below MTCA-Method A Groundwater cleanup levels.

On November 14, 2007, the Health Department submitted the II report with a recommendation that the subject site be listed on Ecology's Confirmed or Suspected Contaminated Sites List (CSCSL) found in the Integrated Site Information System (ISIS) database.

On January 18, 2008, Ecology added the subject site to the CSCSL with a status of "Awaiting SHA". Pump STN 4103 ROW 2222 Marine View DR was assigned a Facility Site ID of 1806706.

On December 15, 2010, The Health Department conducted a brief phone interview with the City of Tacoma Public Works – Science and Engineering Program and confirmed that conditions remain as they were in 2006. The proposed upgrade has not been started. The documented contamination of groundwater has not been further characterized or monitored.

Special Considerations (Include limitations in site file data or data which cannot be accommodated in the model, but which are important in evaluating the risk associated with the site, or any other factor(s) over-riding a decision of no further action for the site):

The scope of this Site Hazard Assessment did not include a hydrogeologic survey of the subject site and surrounding area. The groundwater contamination documented or inferred at the subject site is therefore considered to have the potential to impact any well located within the prescribed 2-mile radius and all such wells were used in the scoring process.

The contaminants of concern persist in the subsurface soils, which are capped with pavement. Therefore only the surface water and ground water routes will be scored.

ROUTE SCORES:

Surface Water/Human Health: **2.8**

Surface Water/Environ. **10.0**

Air/Human Health: **NS**

Air/ Environmental: **NS**

Ground Water/Human Health: **10.8**

OVERALL RANK: 5

Worksheet 2--Route Documentation

1. SURFACE WATER ROUTE:

a. List those substances to be considered for scoring: **Source: 1,2,3**

TPH – Heavy Oil
Copper

b. Explain basis for choice of substances(s) to be used in scoring:

TPH-Heavy Oil and Copper will be used to score this site due to available analytical data, and that constituents are available to the Surface Water route due to less than perfect containment. TPH-Oil is present in groundwater, adjacent to surface water in concentrations that exceed the Model Toxics Control Act Method A Cleanup Levels for Groundwater. Copper is present in groundwater available to surface water in concentrations that exceed Marine Water Quality Standards.

c. List those management units to be considered for scoring: **Source: 1,2,3**

Spills, Discharges, and Contaminated Soil

d. Explain basis for choice of unit to be used in scoring:

Spills, Discharges, and Contaminated Soil Contamination will be the management unit used for scoring due to analytical confirmation of contaminated subsurface soil available to surface water due to less than perfect containment.

2. AIR ROUTE: not scored

a. List those substances to be considered for scoring: **Source: 1,2,3**

b. Explain basis for choice of substances(s) to be used in scoring:

c. List those management units to be considered for scoring: **Source: 1,2,3**

d. Explain basis for choice of unit to be used in scoring:

3. GROUND WATER ROUTE:

a. List those substances to be considered for scoring: **Source: 1,2,3**

Heavy Oil

b. Explain basis for choice of substances(s) to be used in scoring:

Heavy Oil will be used to score this site due to available analytical data, and the fact that the constituent is available to the groundwater route due to less than perfect containment. TPH-Oil is present in groundwater at concentrations that exceed the Model Toxics Control Act Method A Cleanup Levels for Groundwater.

c. List those management units to be considered for scoring: **Source: 1,2,3**

Spills, Discharges, and Contaminated Soil

d. Explain basis for choice of unit to be used in scoring:

Spills, Discharge, Contaminated Soil will be the management unit used for scoring due to the fact that the contaminant is present in subsurface soils and is available to groundwater due to less than perfect containment.

Worksheet 4 - Surface Water Route

1.0 SUBSTANCE CHARACTERISTICS

1.1 Human Toxicity

	Substance	Drinking Water Standard (ug/1)	Val.	Acute Toxicity (mg/kg-bw)	Val.	Chronic Toxicity (mg/kg-bw)	Val.	Carcinogenicity WOE	Carcinogenicity PF*	Val.
1	TPH-oil	--	ND	--	ND	2	1	--	--	ND
2	Copper	1300	2	--	ND	0.037	1	--	--	ND
3										
4										
5										
6										

*Potency Factor

Source: 3

Highest Value: 2 (Max=10)

Plus 2 Bonus Points? 0

Final Toxicity Value: 2 (Max=12)

1.2 Environmental Toxicity

	Substance	☐ Freshwater ☒ Marine Acute Water Quality Criteria	Value	Non-human Mammalian Acute Toxicity (mg/kg)	Value
1	Heavy Oil	$>10^3$	2		
2	Copper	2.9	8		
3					
4					
5					
6					

Source: 2

Value: 8 (Max 10)

1.3 Substance Quantity

Substance Quantity: 14,000 ft^2

Explain Basis: Conservative estimate based on the entire right of way have soil contamination.

Source: 2

Value: 7 (Max 10)

Worksheet 4 (cont'd)

2.0 MIGRATION POTENTIAL		SOURCE	VALUE
2.1	**Containment** Spills, Discharge, and Contaminated Soil **Explain Basis:** Subsurface soil contamination that has been covered.	2	0 (Max = 10)
2.2	**Surface Soil Permeability:** adjacent to surface water	2	7 (Max = 7)
2.3	**Total Annual Precipitation:** 35 inches	9,11	3 (Max = 5)
2.4	**Max. 2-Yr/24-hour Precipitation:** > 2-4	2	3 (Max = 5)
2.5	**Flood Plain:** FEMA Zone A, 100 year flood plain	11	2 (Max = 2)
2.6	**Terrain Slope:** Adjacent to Surface Water, ~ 13%	11	5 (Max = 5)

3.0 TARGETS		SOURCE	VALUE
3.1	**Distance to Surface Water:** Adjacent to the Hylebos Waterway, which drains into Puget Sound.	11	10 (Max = 10)
3.2	**Population served within 2 miles (See WARM Scoring Manua regarding direction): √ pop.= √0**	11	0 (Max = 75)
3.3	**Area irrigated within 2 miles: (0.75) √ no. acres = (Refer to note in 3.2.) : (0.75) √ 37= 4.6 = 5**	11	5 (Max = 30)
3.4	**Distance to nearest fishery resource:** Adjacent to Hylebos waterway / Hylebos Creek	11	12 (Max = 12)
3.5	**Distance to, and name(s) of, nearest sensitive environment(s)** < 1,000 ft, Hylebos Waterway	11	12 (Max = 12)

4.0 RELEASE	Source	Value
Explain basis for scoring a release to surface water: Release to surface water not confirmed	1	0 (Max = 5)

Worksheet 6 – Ground Water Route

1.0 SUBSTANCE CHARACTERISTICS

1.1 Human Toxicity

	Substance	Drinking Water Standard (ug/1)	Val	Acute Toxicity (mg/kg-bw)	Val	Chronic Toxicity (mg/kg/day)	Val	Carcinogenicity		Val
								WOE	PF*	
1	TPH-oil	--	ND	--	ND	2	1	--	--	ND
2										
3										
4										
5										
6										

***Potency Factor**

Source: 2, 3

Highest Value: 1 (Max=10)

Plus 2 Bonus Points? 0

Final Toxicity Value: 1 (Max=12)

1.2 Mobility (Use numbers to refer to above listed substances)

Cations/Anions:	OR	Solubility (mg/1):
1=		1= TPH-oil = 0
2=		2=
3=		3=
4=		4=
5=		5=
6=		6=

Source: 2, 3

Value: 0 (Max=3)

1.3 Substance Quantity: 1556 yd^3

Explain basis: Conservative estimate of entire site having soil contamination to a depth of three feet.

Source: 1, 2

Value: 4 (Max=10)

Worksheet 6 (cont'd)

2.0 MIGRATION POTENTIAL

2.1	**Containment** Spills, Discharges, and Contaminated Soil. **Explain basis:** Scored as a landfill with a cover (0), no liner (3), no leachate collection system (2).	**Source:** 1, 2	**Value:** 5 (Max = 10)
2.2	**Net precipitation:** (Nov. – Apr.) 22.9 inches (29.3'' – 6.4'')	**Source:** 2, 9	**Value:** 3 (Max = 5)
2.3	**Subsurface hydraulic conductivity:** Compact fill material of dredged sandy silts.	**Source:** 1, 2	**Value:** 3 (Max = 4)
2.4	**Vertical depth to ground water:** 0-25 **feet**	**Source:** 1,2,7	**Value:** 8 (Max = 8)

3.0 TARGETS

3.1	**Ground water usage:** Aquifer Recharge Area, public supply; no alternate unthreatened sources available with minimal hook ups.	**Source:** 2, 11	**Value:** 9 (Max = 10)
3.2	**Distance to nearest drinking water well:** 4312' **feet.** (City of Tacoma Well)	**Source:** 2,7,11	**Value:** 2 (Max = 5)
3.3	**Population served within 2 miles:** √ **pop.** = √ 359811 = ≥100	**Source:** 2,8,11	**Value:** 100 (Max = 100)
3.4	**Area irrigated by (groundwater) wells within 2 miles: (0.75)** √ 268**No. acres** = 12.27	**Source:** 2, 6	**Value:** 13 (Max = 50)

4.0 RELEASE

Explain basis for scoring a release to ground water: Groundwater contaminated, verified through laboratory analysis.	**Source:** 1, 2	**Value:** 5 (Max = 5)

Sources Used in Scoring

1. Tacoma-Pierce County Health Department Site Hazard Assessment File/Ecology TCP File
2. Washington State Department of Ecology, WARM Scoring Manual, April 1992.
3. Washington State Department of Ecology, Toxicology Database for Use in Washington Ranking Method Scoring, January 1992.
4. U.S. Department of Interior Geological Survey Topographical Map
5. Soil Survey of Pierce County, U.S.D.A. Soil Conservation Service
6. Water Rights Information System (WRIS), Ecology
7. Department of Ecology/Tacoma-Pierce County Health Department Well Logs
8. Washington State Department of Health Public Water Supply System
9. Washington Climate for Pierce County, National Weather Service Forecast Office
10. Department of Fish and Wildlife, Catalog of Washington Streams and Salmon
11. Pierce County Geographic Information System Countyview Database

Washington Ranking Method
Route Scores Summary and Ranking Calculation Sheet

Site Name: Pump STN 4301 ROW 2222 Marine View Drive

Street, City, County: ROW 2222 Marine View Dr., Tacoma, Pierce

Ecology FS ID#: 1806706 Ecology Region: Southwest

This site was (X) ranked, ( ) reranked, on January 20, 2011 based on quintile values from a total of 1365 assessed/scored sites.

Pathway	Route Scores	Quintile Group #	Priority Scores:
SW-HH	2.8	1	$H^2 + 2M + L/8 = 0.37 = 1$
Air-HH	NS	-	
GW-HH	10.8	1	
SW-En	10.0	1	$H^2 + 2L/7 = 0.43 = 1$
Air-En	NS	-	

Use the matrix presented below, along with the two priority scores, to determine the site ranking. N/A refers to where there is no applicable pathway.

Human Health	**Environmental**					
	5	**4**	**3**	**2**	**1**	**N/A**
5	1	1	1	1	1	1
4	1	2	2	2	3	2
3	1	2	3	4	4	3
2	2	3	4	4	5	3
1	2	3	4	5	5	**5**
N/A	3	4	5	5	5	NFA

DRAFT / FINAL

Matrix (bin) Ranking: 5, or _____ **No Further Action**

Confidence Level: The relative position of this site within this bin is:

_____Almost into the next higher bin.
_____Right in the middle, unlikely to ever change.
_____Almost into the next lower bin.

Water Right Tracking System

Department of Ecology

Pump STN 4301 ROW Irrigation Via Surface Water 2 Mile Radius					
Person	**Purpose**	**Ir Acres**	**TRS**	**QQ/Q**	**1stSrc**
CHESLOCK LEO P	IR	4	21.0N 04.0E 31		HYLEHOS CREEK
HENRICHSEN HARRY C.	ST,IR	6	21.0N 04.0E 31		UNNAMED CREEK
YOTSUUYE K	IR	27	20.0N 03.0E 01	NE/SW	WAPATO CREEK
		37			

Pump STN 4301 ROW

Ortho Overview

0 65 ft.

Scale 1:769

The map features are approximate and are intended only to provide an indication of said feature. Additional areas that have not been mapped may be present. This is not a survey. Orthophotos and other data may not align. The County assumes no liability for variations ascertained by actual survey. All data is expressly provided AS IS and WITH ALL FAULTS. The County makes no warranty of fitness for a particular purpose.

Tacoma | Pierce County Health Department
Healthier. Safer. Smarter.

TPCHD-SHA

Map Legend

Roads

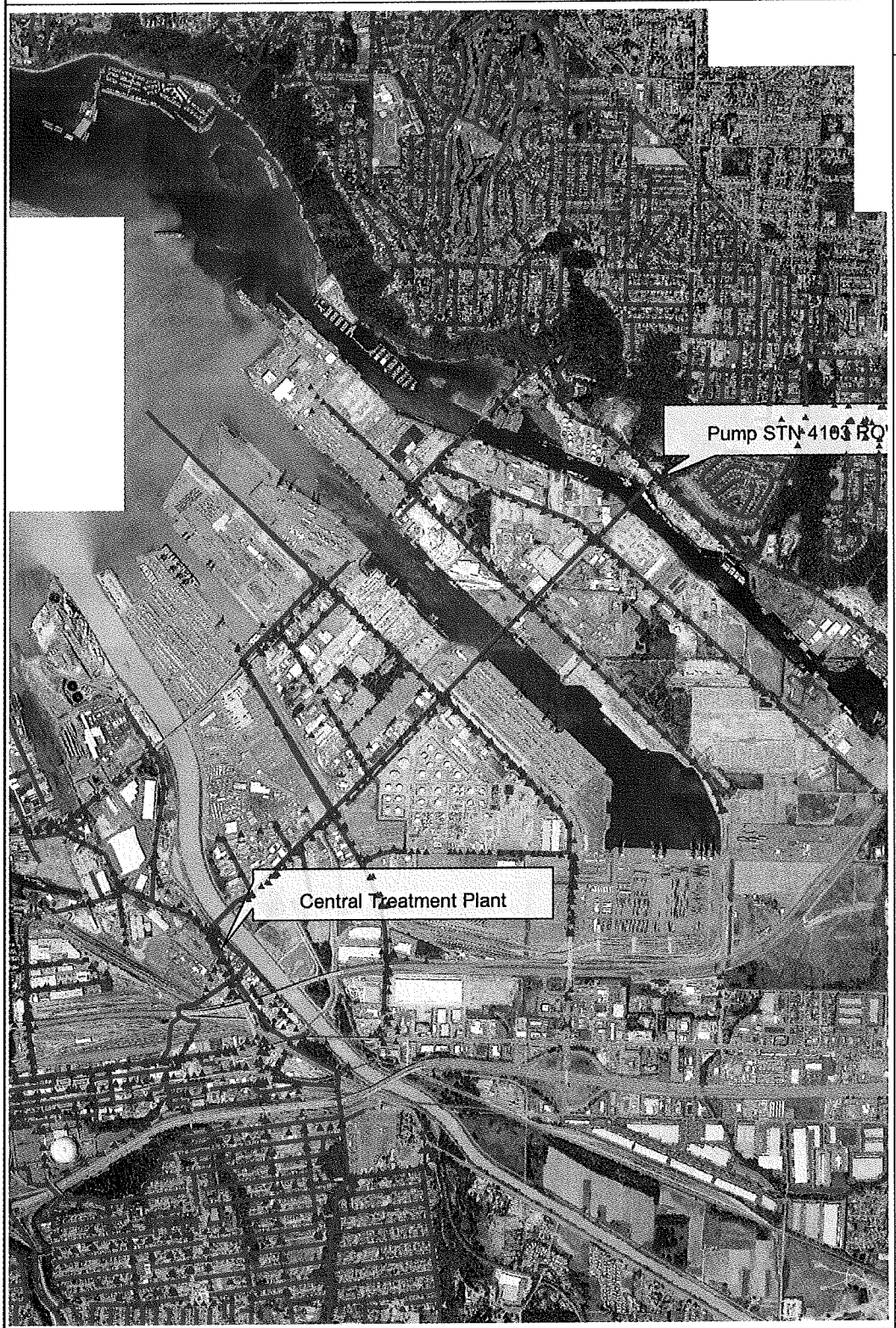
- Interstate
- Limited Access State Routes
- Other State Routes
- Ramps
- Major Arterial
- Collector
- Local Access

County - 2008 - Ortho

Printed: 12/9/10 8:36 AM

Pump STN 4301 ROW 2222 Marine View Dr.

Pump Station 4301 to Treatment Plant



Tacoma | Pierce County Health Department
Healthier. Safer. Smarter.

TPCHD-SHA

Map Legend

- Wastewater - Sanitary Sewer - Tacoma (pts)
- Wastewater - Sanitary Sewer - Tacoma (arcs)
- County - 2008 - Ortho

0 3250 ft.

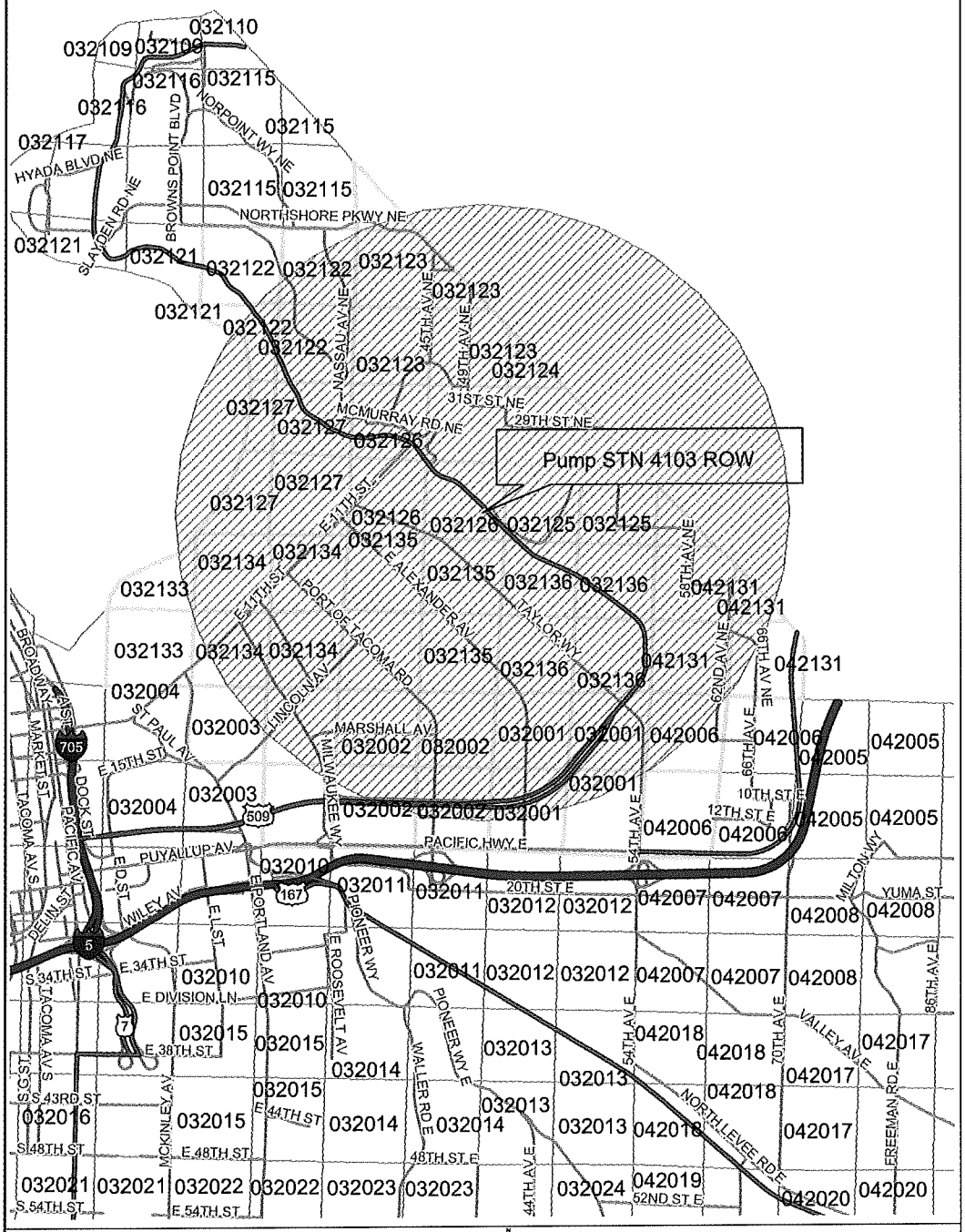
Scale 1:37,988

The map features are approximate and are intended only to provide an indication of said feature. Additional areas that have not been mapped may be present. This is not a survey. Orthophotos and other data may not align. The County assumes no liability for variations ascertained by actual survey. All data is expressly provided AS IS and WITH ALL FAULTS. The County makes no warranty of fitness for a particular purpose.

Printed: 12/16/10 8:41 AM

Pump STN 4103 ROW

R-T-S ; 2-Mile Radius



0 5500 ft.

Scale 1:68,378

The map features are approximate and are intended only to provide an indication of said feature. Additional areas that have not been mapped may be present. This is not a survey. Orthophotos and other data may not align. The County assumes no liability for variations ascertained by actual survey. All data is expressly provided AS IS and WITH ALL FAULTS. The County makes no warranty of fitness for a particular purpose.

Tacoma | Pierce County Health Department
Healthier. Safer. Smarter.

TPCHD-SHA

Map Legend

Roads

- Interstate
- Limited Access State Routes
- Other State Routes
- Ramps
- Major Arterial
- Collector

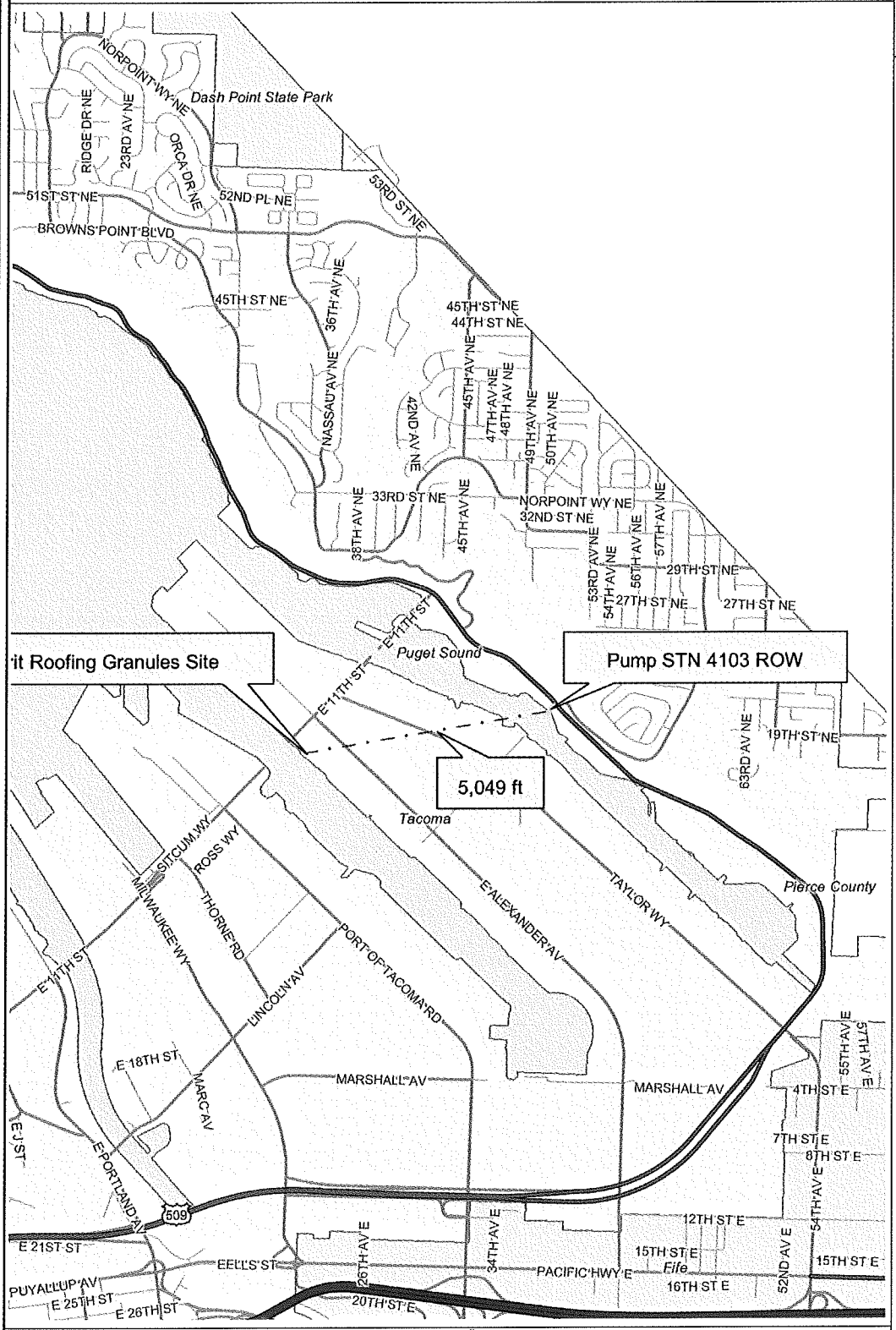
Highlighted RTSQ (WA DNR)

RTSQ (WA DNR)

Printed: 12/13/10 2:40 PM

Pump STN 4103 ROW

Distance to Potential Copper Contamination Source



0 3250 ft.

Scale 1:37,988

The map features are approximata and are intended only to provide an indication of said feature. Additional areas that have not been mapped may be present. This is not a survey. Orthophotos and other data may not align. The County assumes no liability for variations ascertained by actual survey. All data is expressly provided AS IS and WITH ALL FAULTS. The County makes no warranty of fitness for a particular purpose.

Tacoma | Pierce County Health Department
Healthier. Safer. Smarter.

TPCHD-SHA

Map Legend

Roads

- Interstate
- Limited Access State Routes
- Other State Routes
- Ramps
- Major Arterial
- Collector
- Local Access

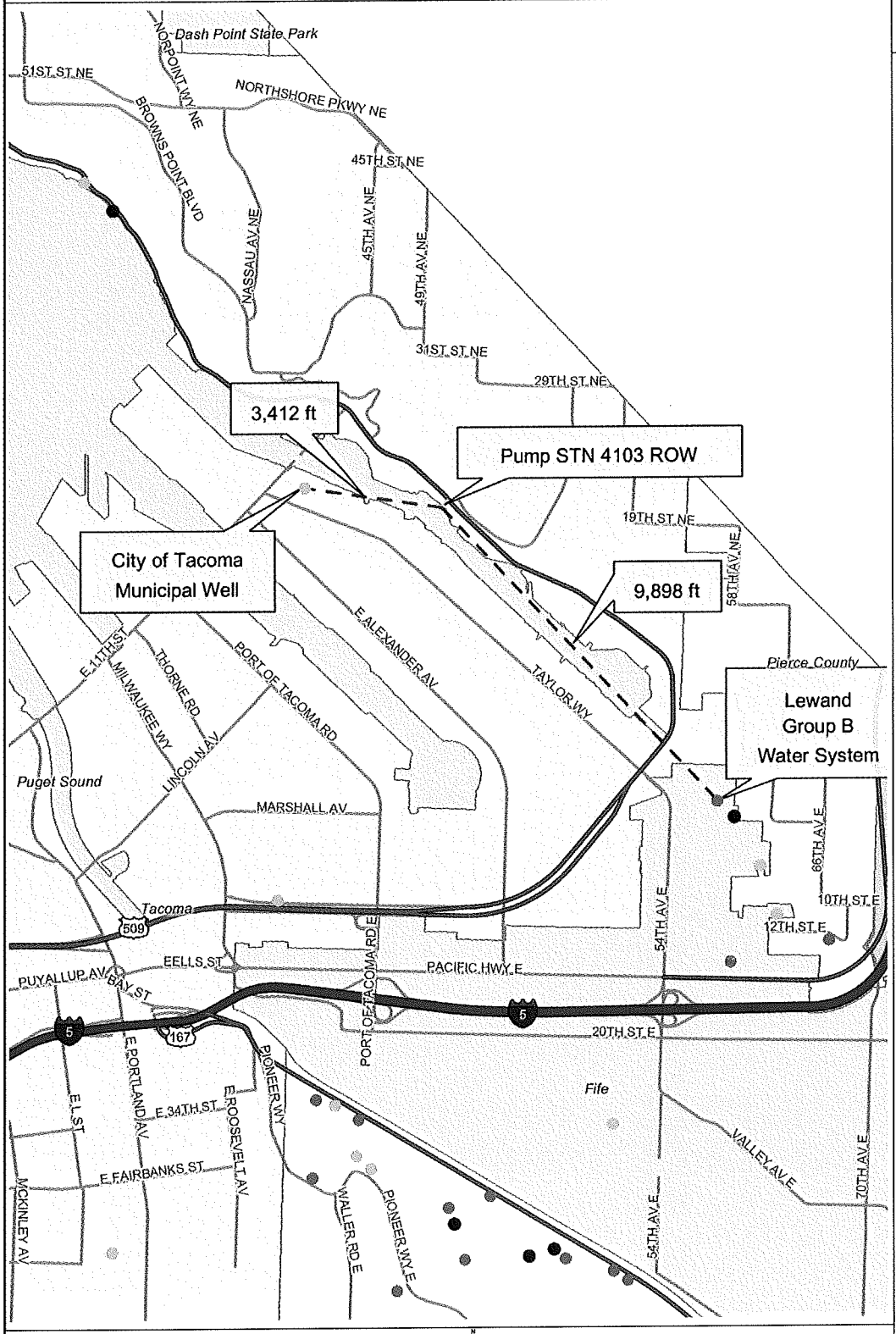
Pierce County Basemap

- Unincorporated County
- Tacoma
- Lakewood, Edgewood, Bonney Lake, Buckley, South Prairie
- Steilacoom, Fircrest, Fife, Gig Harbor, Orting, Eatonville, Roy, Carbonado, Wilkeson, Mt Rainier
- University Place, Puyallup, Auburn
- DuPont, Milton, Sumner
- Fort Lewis, McChord, McNeil Island
- Water

Printed: 12/16/10 2:15 PM

Pump STN 4103 ROW

Linear Distance to Nearest Drinking Water Well



0 3750 ft.

Scale 1:45,585

The map features are approximate and are intended only to provide an indication of said feature. Additional areas that have not been mapped may be present. This is not a survey. Orthophotos and other data may not align. The County assumes no liability for variations ascertained by actual survey. All data is expressly provided AS IS and WITH ALL FAULTS. The County makes no warranty of fitness for a particular purpose.

Tacoma | Pierce County Health Department
Healthier. Safer. Smarter.

TPCHD-SHA

Map Legend

- Group B Water Systems
- Group A Wells
- Individual Wells

Roads

- Interstate
- Limited Access State Routes
- Other State Routes
- Ramps
- Major Arterial
- Collector

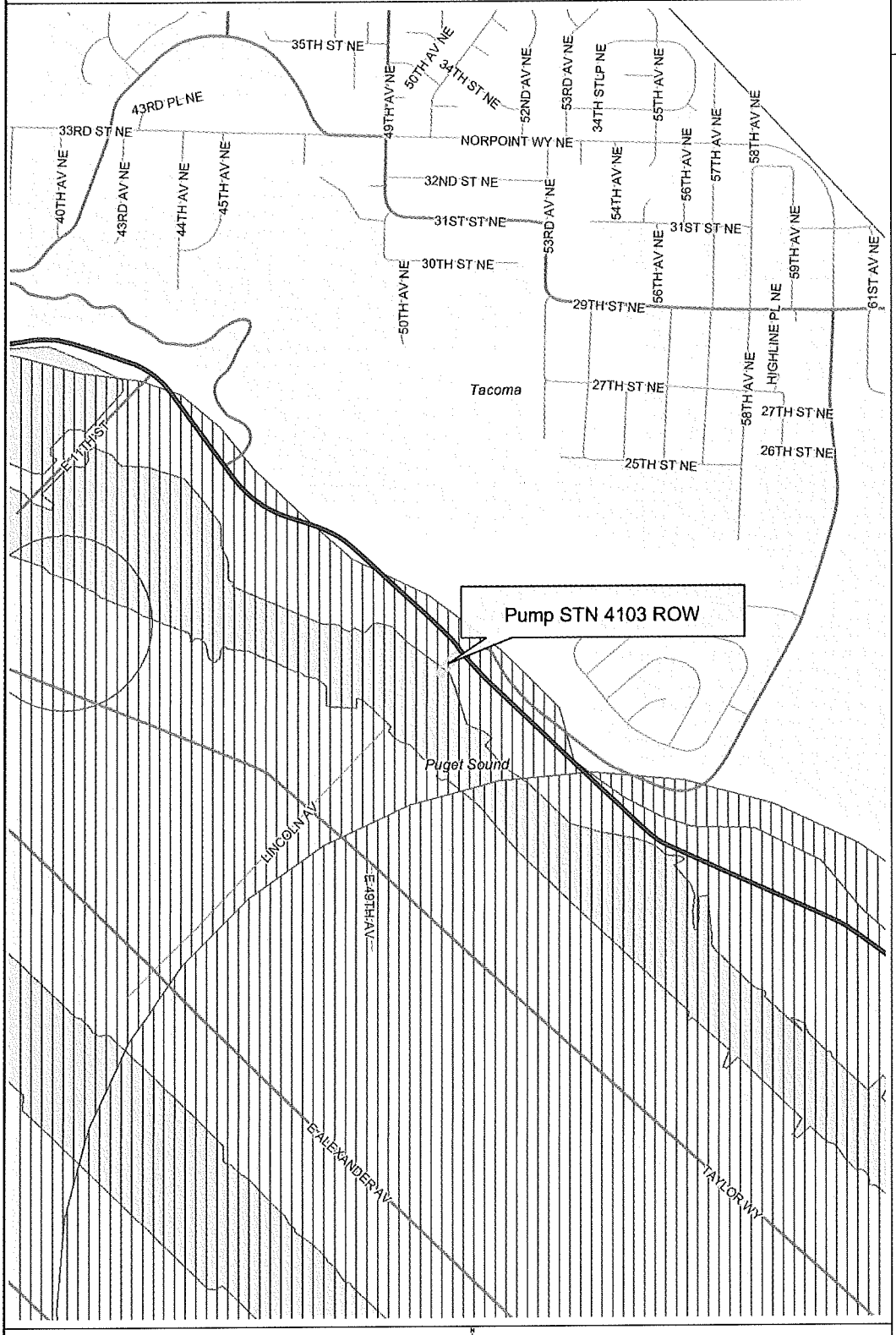
Pierce County Basemap

- Unincorporated County
- Tacoma
- Lakewood, Edgewood, Bonney Lake, Buckley, South Prairie
- Steilacoom, Fircrest, Fife, Gig Harbor, Orting, Eatonville, Roy, Carbonado, Wilkeson, Mt Rainier
- University Place, Puyallup, Auburn
- DuPont, Milton, Sumner
- Fort Lewis, McChord, McNeil Island
- Water

Printed: 12/10/10 11:57 AM

Pump STN 4103 ROW

Aquifer Usage



0 1250 ft.

Scale 1:15,195

The map features are approximate and are intended only to provide an indication of said feature. Additional areas that have not been mapped may be present. This is not a survey. Orthophotos and other data may not align. The County assumes no liability for variations ascertained by actual survey. All data is expressly provided AS IS and WITH ALL FAULTS. The County makes no warranty of fitness for a particular purpose.

Tacoma | Pierce County Health Department
Healthier. Safer. Smarter.

TPCHD-SHA

Map Legend

Roads

- Interstate
- Limited Access State Routes
- Other State Routes
- Ramps
- Major Arterial
- Collector
- Local Access

Aquifer - Vulnerable Deep Aquifer Areas

- Not vulnerable
- Vulnerable

Aquifer - Recharge Areas

Aquifer - EPA Sole Source Aquifer

Aquifer - Clover/Chambers Creek Aquifer

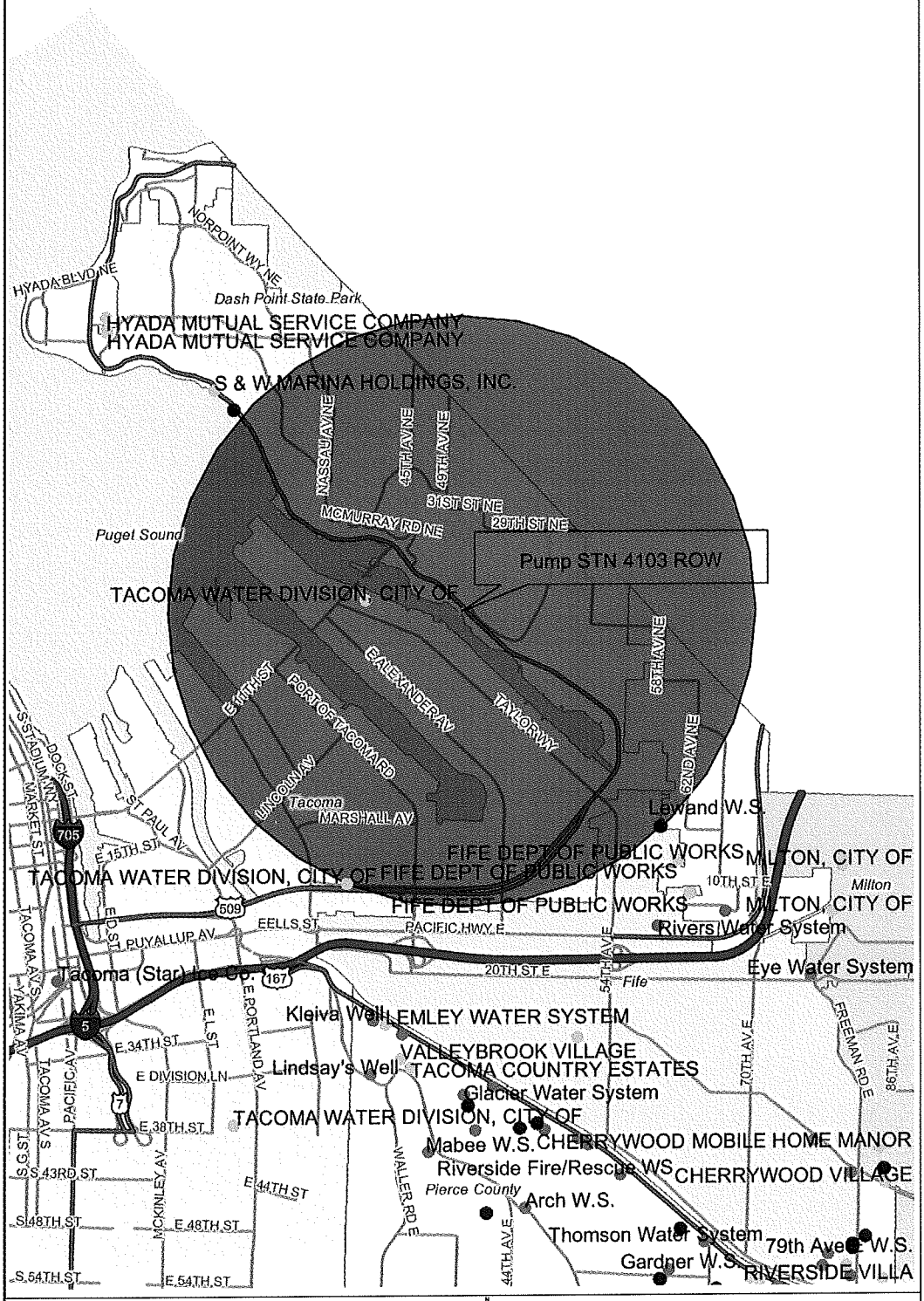
Pierce County Basemap

- Unincorporated County
- Tacoma
- Lakewood, Edgewood, Bonney Lake, Buckley, South Prairie
- Steilacoom, Fircrest, Fife, Gig Harbor, Orting, Eatonville, Roy, Carbonado, Wilkeson, Mt Rainier
- University Place, Puyallup, Auburn
- DuPont, Milton, Sumner
- Fort Lewis, McChord, McNeil Island
- Water

Printed: 12/10/10 11:59 AM

Pump STN 4301 ROW

Drinking Water Wells; 2 Mile Radius



0 5500 ft.

Scale 1:68,378

The map features are approximate and are intended only to provide an indication of said feature. Additional areas that have not been mapped may be present. This is not a survey. Orthophotos and other data may not align. The County assumes no liability for variations ascertained by actual survey. All data is expressly provided AS IS and WITH ALL FAULTS. The County makes no warranty of fitness for a particular purpose.

Tacoma | Pierce County Health Department
Healthier. Safer. Smarter.

TPCHD-SHA

Map Legend

- Individual Wells
- Group A Wells
- Group B Water Systems

Roads

- Interstate
- Limited Access State Routes
- Other State Routes
- Ramps
- Major Arterial
- Collector

Pierce County Basemap

- Unincorporated County
- Tacoma
- Lakewood, Edgewood, Bonney Lake, Buckley, South Prairie
- Steilacoom, Fircrest, Fife, Gig Harbor, Orting, Eatonville, Roy, Carbonado, Wilkeson, Mt Rainier
- University Place, Puyallup, Auburn
- DuPont, Milton, Sumner
- Fort Lewis, McChord, McNeil Island
- Water

Printed: 12/9/10 8:40 AM