UST SITE ASSESSMENT AND SITE CHARACTERIZATION REPORT

Tangent Rural Fire Protection District
Tangent, Oregon

March 11, 2025

Prepared for

Tangent Rural Fire Protection District
Tangent, Oregon

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UST Site Assessment and Site Characterization Report
Tangent Rural Fire Protection District
Tangent, Oregon

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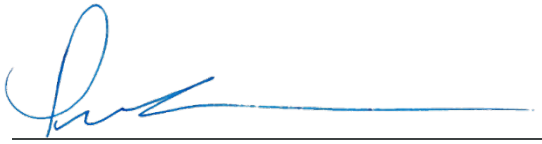
Document prepared by:  Melody Kieneker
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LIST OF ABBREVIATIONS AND ACRONYMS

bgs ..... below ground surface
EPA ..... US Environmental Protection Agency
ft ..... feet; foot
IDW ..... investigation-derived waste
Landau ..... Landau Associates, Inc.
LUST ..... Leaking Underground Storage Tank
NFA ..... No Further Action
NWTPH-Dx ..... Northwest diesel-range total petroleum hydrocarbon extended
NWTPH-Gx ..... Northwest gasoline-range total petroleum hydrocarbon extended
ODEQ ..... Oregon Department of Environmental Quality
PAHs ..... Polycyclic Aromatic Hydrocarbons
ppm ..... parts per million
PVC ..... polyvinyl chloride
RBC ..... Risk-based Concentrations
RBDM ..... Risk-based decision making
RCRA ..... Resource Conservation and Recovery Act
Site ..... 32053 Birdfoot Drive in Tangent, Oregon
Tangent RFPD ..... Tangent Rural Fire Protection District
UST ..... underground storage tank
UST Environmental ..... UST Environmental Services
VOC ..... volatile organic compound

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1.0 INTRODUCTION

At the request of the Tangent Rural Fire Protection District (Tangent RFPD), Landau Associates, Inc. (Landau) conducted an Underground Storage Tank (UST) Removal Verification and Subsurface Investigation (investigation) for the Tangent RFPD site located at 32053 Birdfoot Drive in Tangent, Oregon (Site). The investigation was completed in support of Tangent RFPD's goal of achieving site closure and receiving a No Further Action (NFA) determination for the Oregon Department of Environmental Quality's (ODEQ) Leaking Underground Storage Tanks (LUST) File No. 22-93-4132. A vicinity map of the Site location is shown on Figure 1. A site plan for the project area, including exploration locations and other site features, is shown on Figure 2.

1.1 Background

According to regulatory records and site representatives familiar with the site history, one UST was installed and operational at the site between approximately 1985 and 1992. The tank was approximately 750 to 1,000 gallons in capacity and was used exclusively for unleaded gasoline used for fueling Tangent RFPD vehicles. The former UST location is situated between the western wall of the Fire Station, the former gasoline fueling island and related decommissioned dispenser infrastructure and fuel supply lines, and an above ground water storage tank and well pump house, as indicated on Figure 2. In the late 1980s, the UST was removed by UST Environmental Services (UST Environmental). Tangent RFPD representatives indicated there had been no history or observations of leaks from the UST; however, in 1992 UST Environmental filed a form with ODEQ reporting a petroleum release from the UST during site decommissioning activities. Within the form, UST Environmental erroneously indicated that the type of petroleum contained within the UST was diesel; however, based on tank registration information from the mid-1980s and testimony from site representatives, the UST had been exclusively used to store unleaded gasoline.

In June 1994, ODEQ informed Tangent RFPD that the Site's UST removal records could not be accepted by the agency due to UST Environmental's engagement in fraudulent activities and falsification of documentation and state records. ODEQ requested that Tangent RFPD submit a work plan and perform confirmation sampling to verify that contaminant concentrations in soil and groundwater are below state cleanup levels. In a letter dated September 19, 2006, ODEQ recommended that Tangent RFPD either submit a work plan or discuss the proposed work with ODEQ before initiating investigation activities.

The Investigation activities described herein were conducted in accordance with the Work Plan prepared by Landau dated January 13, 2025 (Landau 2025; Appendix A), along with e-mail correspondence on January 22, 2025 and verbal consultation with ODEQ staff members immediately prior to and during the field investigation (ODEQ 2025; Appendix A), and included the following elements:

- A geophysical survey of the project area to assess for evidence of USTs, underground piping, and subsurface conditions
- Conduct a soil and groundwater investigation and preliminary data evaluation to meet regulatory agency requirements

- Provide regulatory agency communications, data evaluation, and preparation of this report.

2.0 FIELD INVESTIGATION

Field activities associated with this investigation were conducted on January 21 and 23, 2025 and included the completion of a geophysical survey, the collection of subsurface soil samples from direct-push borings, and the collection of groundwater samples from two locations: a temporary well installed in one of the direct-push borings and an on-site water supply well. Two ODEQ representatives, Paul Elias and Bruce Scherzinger, were on site January 23, 2025 during the drilling and sampling portion of the field investigation. Details from the field investigation are provided in the following sections.

2.1 Geophysical Survey

A geophysical survey was conducted to locate the historical UST location from where the gasoline tank had been removed in the late 1980s and the associated fueling island features and gasoline supply lines, as well as site utility infrastructure, such as water, stormwater, power, and natural gas lines. The geophysical survey was performed by Pacific Geophysics of Tigard, Oregon on January 21, 2025 under the direction of Landau.

The initial investigation area west of the Fire Station was selected based on the historical fueling island photograph, the current decommissioned fuel island supply line infrastructure (i.e., former dispenser connection points), and the presence of a decommissioned and presumed UST vent line at the ground surface, as well as interviews with site representatives onsite during the tank removal in the late 1980s who indicated this as the general location of the former UST. The geophysical survey included non-intrusive subsurface testing and consisted of the use of a Radio Detection TX3-Transmitter and an Aqua-Tronics Tracer to detect and map conductive pipes across the survey area. A GSSI SIR 4000 ground-penetrating radar was also used to collect radar profiles.

The geophysical survey identified several anomalies, including the following features of interest, also included in Figure 2:

- An approximately 8-foot by 18-foot zone of disturbed soil detected between the Fire Station building and the former fueling island; this was interpreted as the presumed location of the former UST
- An apparent former steel vent pipe (cut off at the surface and filled with concrete) located along the western perimeter of the Fire Station. The vent pipe ran towards the south, before turning west and terminating on the southern end of the apparent disturbed soil zone, mentioned above.
- Two metal pipes capped and filled with concrete at the ground surface (inferred as historical gasoline fuel lines) were traced from the former fueling island and decommissioned dispenser location to the south. Then, these pipes turn eastward where they terminated near the former UST vent pipe, also in front of the disturbed soil zone. The depths of the former supply lines varied from approximately 0.8- to 1.5-feet (ft) below ground surface (bgs).

A copy of the geophysical investigation report is provided in Appendix B.

2.2 Subsurface Soil Sampling and Analysis

On January 23, 2025, Landau subcontracted Holt Environmental Services of Vancouver, Washington to advance five borings (DP-1 through DP-5) using direct-push drilling technology. The direct-push borings were advanced to depths ranging from 15 to 20 ft bgs and were advanced in the following locations, depicted on Figure 2:

- DP-1 was advanced in the center of the disturbed soil zone interpreted as the former UST location
- DP-2 was advanced immediately outside of the disturbed soil zone to the south, and near the terminuses of the abandoned fuel supply and vent lines
- DP-3 was advanced immediately outside of the disturbed soil zone to the east
- DP-4 was advanced immediately outside of the disturbed soil zone, in the northwest corner of the former UST
- DP-5 was advanced adjacent to the former fuel island dispenser and adjacent to the decommissioned fuel supply lines.

Continuous soil cores were obtained from the direct-push borings and were field screened using visual and olfactory observations, water sheen testing, and headspace vapor testing using a handheld photoionization detector. Except for a slight sheen and mild staining in shallow soil collected from boring DP-5 (advanced adjacent to the former fueling island and dispenser and supply piping), field screening indicators of petroleum contamination were not observed. Copies of the exploration field logs with field screening notes are provided in Appendix C.

Soil samples identified for laboratory analysis were obtained from a recorded interval and homogenized in a decontaminated, stainless-steel bowl prior to being placed in laboratory-supplied containers. Samples for gasoline-range petroleum hydrocarbons and volatile organic compound (VOC) analyses were obtained from an undisturbed section of the soil core in accordance with US Environmental Protection Agency (EPA) Method 5035.

A total of 5 soil samples were collected from the direct-push borings. Soil samples were placed in laboratory-supplied jars and submitted under chain-of-custody to the Apex Laboratories of Tigard, Oregon for selective analysis. Soil samples were submitted for the following analysis:

- Total petroleum hydrocarbons by Northwest Methods diesel-range total petroleum hydrocarbon extended (NWTPH-Dx) and gasoline-range total petroleum hydrocarbon extended (NWTPH-Gx)
- Risk-based decision making (RBDM) VOCs[1] by EPA Method 8260D.
- If detections of NWTPH-Dx are detected, Polycyclic Aromatic Hydrocarbons (PAHs) will be analyzed by EPA Method 8270E.

[1] RBDM VOC list as described within the Landau Work Plan and related ODEQ e-mail correspondence, included within Appendix A.

- If no detections of NWTPH-Dx are detected, but NWTPH-Gx are detected, naphthalene will be analyzed by EPA Method 8260D.

2.3 Groundwater Sampling and Analysis

Groundwater was encountered in each of the bores at depths ranging from 4.3- to 6.6 ft bgs, and in the on-site water supply well at a depth of 5.0 ft bgs.

One groundwater grab sample was collected from a temporary polyvinyl chloride well installed in the boring, advanced within the inferred center of the former UST pit (DP-1). The grab groundwater sample was collected using a peristaltic pump and dedicated polyethylene tubing. Depth to water from the ground surface was measured using an electronic tape, and groundwater was purged into a 5-gallon bucket using low-flow methods. Groundwater parameters (dissolved oxygen, conductivity, oxidation-reduction potential, pH, and turbidity) were measured while purging the well. Once a minimum of three well volumes was purged and the water had cleared to the satisfaction of Landau field personnel, a groundwater sample was collected directly into laboratory-supplied sample containers. Copies of groundwater sample collection forms are provided in Appendix C.

One groundwater sample was also collected from the nearest on-site water supply well, LINN 63383, to evaluate the water quality for potential historical impacts from the UST. The water supply well was constructed in 2020 to a total depth of 139 ft bgs with screen perforations between 96- and 139 ft and is identified by the Oregon Water Resources Department as LINN 63383. Due to access limitations to the wellhead and a viable sample port, Landau field staff collected the second groundwater sample from the water supply well, in consultation and concurrence with in-field ODEQ technical staff (Paul Elias and Bruce Scherzinger), as follows:

The fire hydrant was opened to allow the water storage tank to empty until the water supply well pump turned on. The well pump was operated for approximately 7 minutes, allowing the water supply well to purge, and the associated water storage tank to refill with approximately 2,450 gallons of water. This volume of water was calculated based on the estimated 350-gallon per minute pump rate provided by the Tangent RFPD. The 7-minute purge time allowed for approximately three well-casing volumes of water to be removed from the well prior to sample collection. After the 7 minutes, the pump was turned off and the groundwater was sampled directly from the water supply well using a peristaltic pump with dedicated polyethylene tubing. The sample was collected using low flow purging methods after groundwater parameters (dissolved oxygen, conductivity, oxidation-reduction potential, pH) stabilized. The sample was collected in laboratory-provided containers and submitted to the laboratory for analysis of the following:

- Total petroleum hydrocarbons by Northwest Methods NWTPH-Dx and NWTPH-Gx
- RBDM VOCs by EPA Method 8260D
- Dissolved lead by EPA Method 6020B
- If detections of NWTPH-Dx are detected above 0.5 parts per million (ppm), PAHs will be analyzed by EPA Method 8270E.

- If no detections of NWTPH-Dx are detected above 0.5 ppm, but NWTPH-Gx are detected, naphthalene will be analyzed by EPA Method 8260D.

The groundwater sample was field filtered using a disposable 0.45-micron field filter allowing for laboratory analysis of dissolved lead.

2.4 Investigation Derived Waste

Investigation derived waste (IDW) consisting of soil cuttings and purge water generated during sampling was containerized in a labeled 55-gallon drum and stored on site pending the results of laboratory analysis. The IDW was picked up from the site on February 25, 2025 by WasteXpress and transported for disposal as non-hazardous waste. The WasteXpress non-hazardous IDW waste profile is included as Appendix D.

3.0 ANALYTICAL RESULTS

Analytical results for soil and water samples are presented in Tables 1 and 2 and are summarized below. A copy of the laboratory report is included in Appendix E.

Upon receipt of the chemical analytical results, each laboratory data package was verified and validated in accordance with Landau's EPA-equivalent Level IIA verification and validation check, which included the following review:

- Verification that the laboratory data package contains all necessary documentation (including Chain of Custody records; sample identification; date, time and condition of the samples at the laboratory; date and time of sample analysis; explanation of any significant corrective actions taken by the laboratory during the analytical process; and, date of extraction, definition of laboratory data qualifiers, all sample-related quality control data, and quality control acceptance criteria).
- Verification that all requested analyses, special cleanups, and special handling methods were performed.
- Evaluation of hold times.
- Evaluation of quality control data compared to acceptance criteria, including method blanks, surrogate recoveries, matrix spike results, laboratory duplicates and/or replicates, and laboratory control samples.
- Evaluation of overall data quality and completeness of analytical data.

Based on Landau's review of the analytical data packages, no quality issues were identified and the analytical data appears suitable for use.

3.1 Screening Levels

Chemical analytical results were compared against ODEQ RBDM values, including the following:

- Soil analytical results:
  - ODEQ Soil Ingestion, Dermal Contact, and Inhalation Risk-based Concentrations (RBC) for Residential Receptors.
- Groundwater analytical results:
  - ODEQ Groundwater in Excavation RBC for construction and excavation worker receptors
  - ODEQ Ingestion and Inhalation from Tapwater RBC for Residential Receptors.

3.2 Soil Analytical Results

Petroleum hydrocarbons (Dx and Gx) and RBDM VOCs were not detected above laboratory reporting limits in any of the soil samples. This includes all soil borings (DP-1 through DP-5) collected from within the former UST location (fill material), as well as the borings surrounding the former UST and associated UST infrastructure (native soils). As such, samples were not analyzed for PAHs or naphthalene. Soil sample analytical results are included in Table 1.

3.3 Groundwater Analytical Results

Petroleum hydrocarbons, RBDM VOCs, and dissolved lead were not detected in the groundwater samples (samples collected at DP-1, and the water supply well, LINN 63383) submitted for chemical analysis. As such, samples were not analyzed for PAHs or naphthalene. Groundwater sample analytical results are included in Table 2.

4.0 SUMMARY AND CONCLUSIONS

This report documents the site investigation to verify the absence of a former gasoline UST associated with the Tangent RFPD site, located at 32053 Birdfoot Drive in Tangent, Oregon, and to assess soil and groundwater conditions to evaluate the potential of contamination associated with possible releases from the historical UST and/or fueling system and supply lines. The investigation included the following:

- A geophysical survey which included locate subsurface conductible utilities, and ground penetrating radar to view soil profiles for disturbed soil zones and to evaluate for the possible presence of a UST.
  - One disturbed soil zone was encountered, with an apparent abandoned vent line and fuel supply lines terminating at the southern edge of the disturbed soil zone.
- Soil and groundwater characterization sampling conducted by Landau, which consisted of advancing five direct-push borings in the vicinity of the former UST and fuel dispenser/supply lines, and analysis of soil and groundwater samples collected from the borings.
- Collection and laboratory analysis of a groundwater sample collected from the onsite water supply well, LINN 63383.

Petroleum hydrocarbons, VOCs, and other contaminants of concern were not detected in soil or groundwater samples collected from the vicinity of the former UST, the fueling island and/or related infrastructure. Therefore, it does not appear that a historical release occurred from the former UST, tank location, fueling island, fuel supply lines, or other related infrastructure. As such, the results of this investigation support the Tangent RFPDs' request for site closure and an NFA determination for the site's listing on the ODEQ LUST database (File No. 22-93-4013).

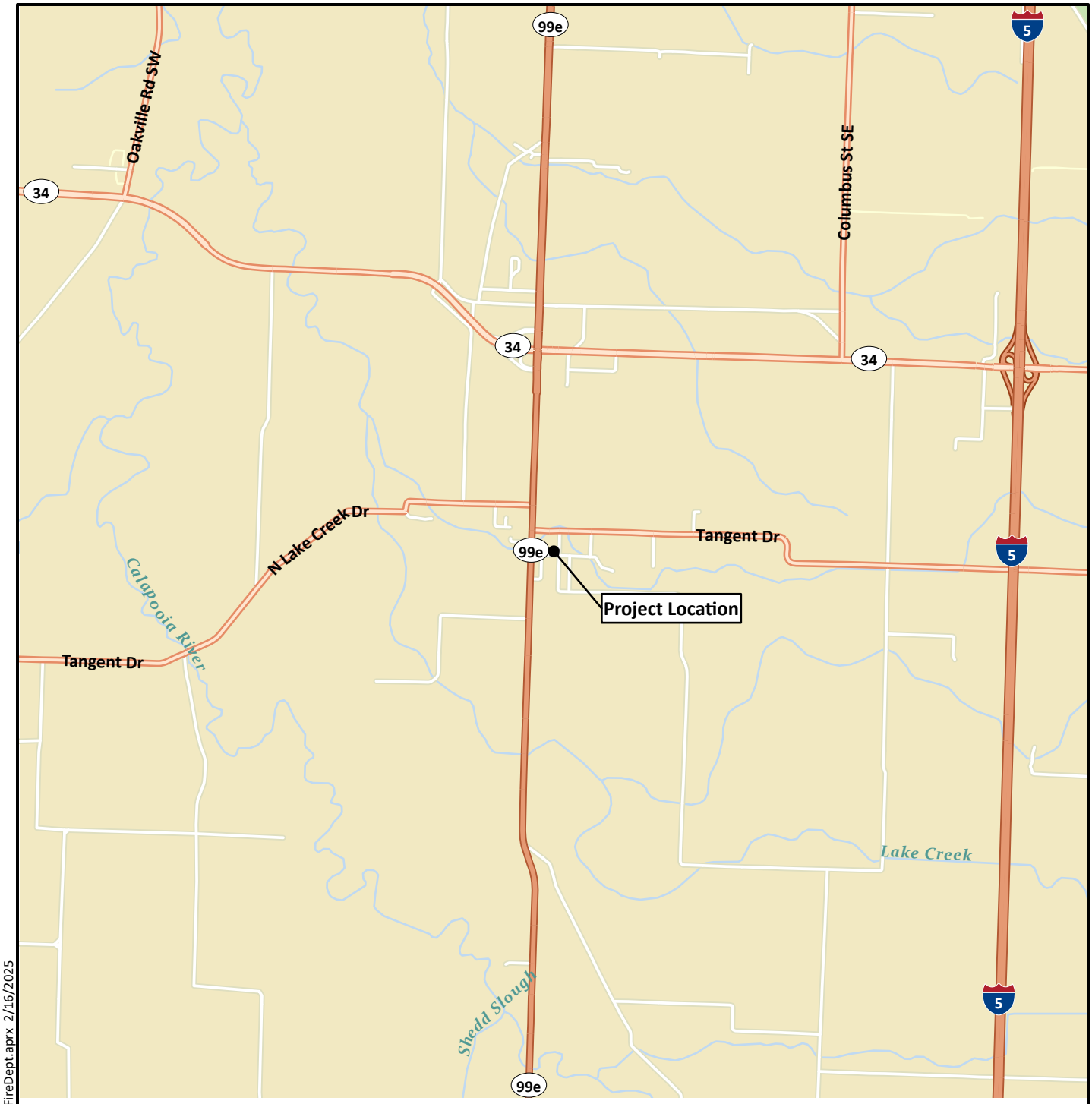
5.0 USE OF THIS REPORT

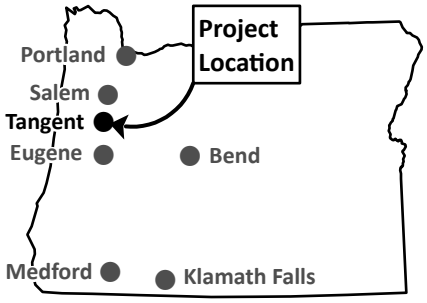
This report has been prepared for the exclusive use of the Tangent RFPD and applicable regulatory agencies for specific application to their Tangent RFPD site located at 32053 Birdfoot Drive in Tangent, Oregon. No other party is entitled to rely on the information, conclusions, and recommendations included in this document without the express written consent of Landau. Further, the reuse of information, conclusions, and recommendations provided herein for extensions of the project or for any other project, without review and authorization by Landau, shall be at the user's sole risk. Landau warrants that within the limitations of scope, schedule, and budget, our services have been provided in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions as this project. We make no other warranty, either express or implied.

6.0 REFERENCES

Landau. 2025. Technical Memorandum Re: Work Plan, Underground Storage Tank Removal Verification and Soil Investigation. Tangent Rural Fire Protection District Property. Tangent, Oregon. UST Facility ID No. 9277. ODEQ LUST No. 22-93-4013. Landau Project No. 2358001.010. Landau Associates, Inc. January 13.

ODEQ. 2025. Email RE: LUST 22-93-4013 Tangent Fire District. From Sarah Eagle, ODEQ. To Melody Kieneker, Landau Associates Inc. Oregon Department of Environmental Quality. January 22.





Data Source: Esri.

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LANDAU ASSOCIATES

Tangent Fire Department UST Investigation Tangent, Oregon	**Vicinity Map**	Figure 1

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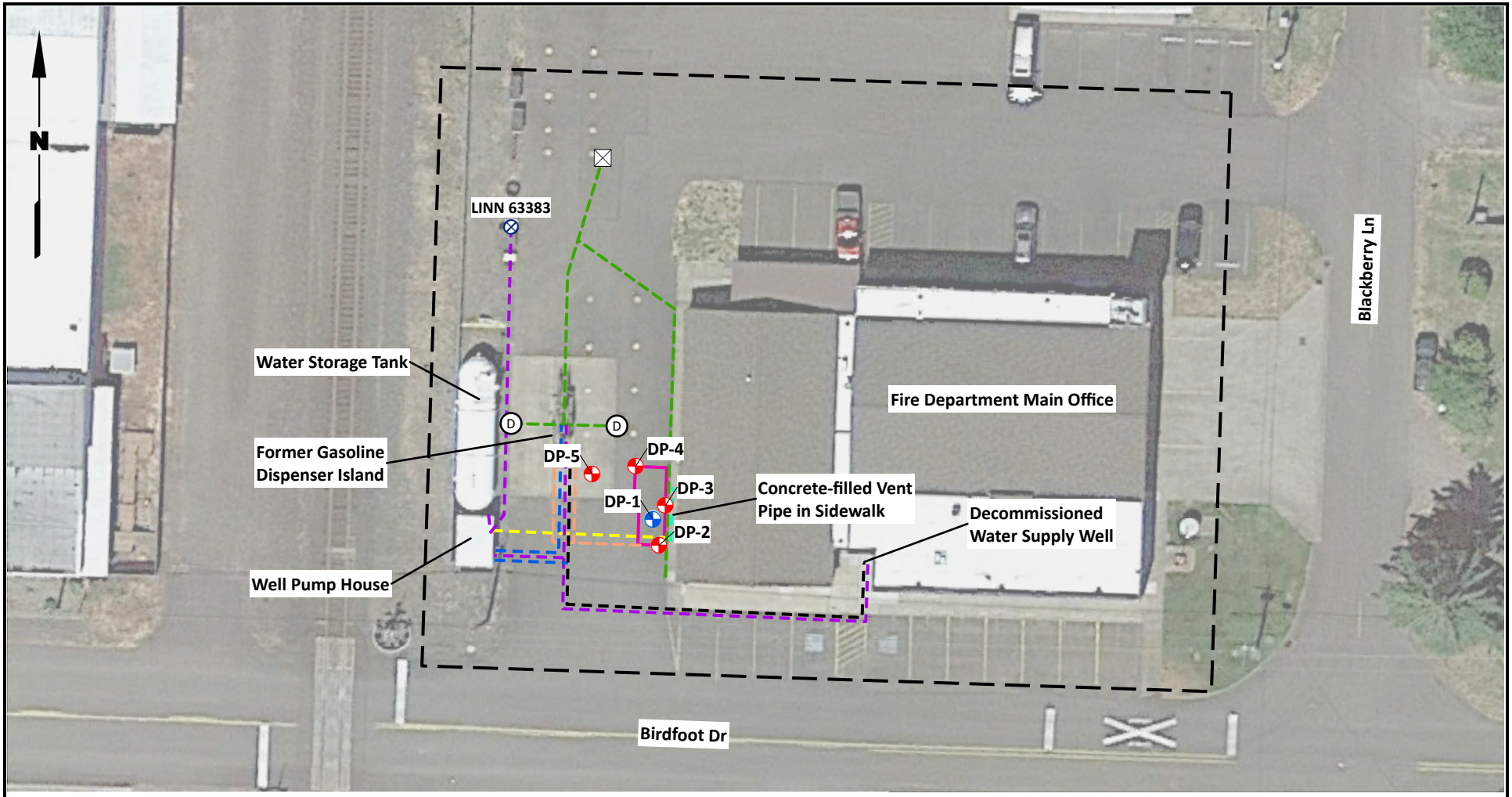


Legend

- Soil Boring
- Soil and Groundwater Boring
- Catch Basin
- Storm Drain
- Water Supply Well
- Natural Gas Line
- Former Product Line
- Storm Line
- Vent Line (Concrete Filled)
- Electrical Line
- Water Line
- Decommissioned Water Line
- Approximate Location of Former UST
- Approximate Site Boundary

Notes

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
2. All locations are approximate.

Data Sources: Linn County GIS; Google Earth Pro.

0 40 80

Scale in Feet

LANDAU ASSOCIATES

Tangent Fire Department
UST Investigation
Tangent, Oregon

Site Plan

Figure
2

Table 1
Soil Analytical Results
Tangent Fire Department

Analyte	RBCss (a)	Sample ID, Approximate Sample Depth (in Feet), Sample Date				
		DP-1(6-7) 6-7 1/23/2025	DP-2(2.5-3) 2.5-3 1/23/2025	DP-3(8.5-9.5) 8.5-9.5 1/23/2025	DP-4(8.5-9.5) 8.5-9.5 1/23/2025	DP-5(2-2.5) 2-2.5 1/23/2025
Total Petroleum Hydrocarbons (mg/kg; NWTPH-Dx)						
Diesel Range Organics	1,100	23.7 U	20.0 U	22.8 U	23.9 U	21.6 U
Residual Range Organics	2,800	47.5 U	40.0 U	45.6 U	47.8 U	43.3 U
NWTPH-Gx						
Gasoline Range Organics	1,200	6.88 U	7.29 U	7.92 U	7.97 U	6.07 U
Volatile Organic Compounds (mg/kg; SW-846 8260D)						
1,2,4-Trimethylbenzene	430	0.0688 U	0.0729 U	0.0792 U	0.0797 U	0.0607 U
1,2-Dibromoethane (EDB)	0.16	0.0688 U	0.0729 U	0.0792 U	0.0797 U	0.0607 U
1,2-Dichloroethane (EDC)	3.6	0.0344 U	0.0364 U	0.0396 U	0.0399 U	0.0304 U
1,3,5-Trimethylbenzene	430	0.0688 U	0.0729 U	0.0792 U	0.0797 U	0.0607 U
Benzene	8.2	0.0138 U	0.0146 U	0.0158 U	0.0159 U	0.0121 U
Ethylbenzene	34	0.0344 U	0.0364 U	0.0396 U	0.0399 U	0.0304 U
Isopropylbenzene	3,500	0.0688 U	0.0729 U	0.0792 U	0.0797 U	0.0607 U
Methyl-tert-butyl ether	250	0.0688 U	0.0729 U	0.0792 U	0.0797 U	0.0607 U
Naphthalene	5.3	0.1380 U	0.1460 U	0.1580 U	0.1590 U	0.1210 U
n-Propylbenzene	NL	0.0344 U	0.0364 U	0.0396 U	0.0399 U	0.0304 U
Toluene	5,800	0.0688 U	0.0729 U	0.0792 U	0.0797 U	0.0607 U
Xylenes, Total	1,400	0.1030 U	0.1090 U	0.1190 U	0.1200 U	0.0911 U

Notes

Screening levels sourced from Oregon Department of Environmental Quality Risk-Based Concentrations (RBC) for individual Chemicals; Revision May 2018, revised August 2023.

(a) Soil Ingestion, Dermal Contact, and Inhalation RBCs (RBCss) for residential receptors

U = The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

Acronyms/Abbreviations:

ID = Identification

mg/kg = milligrams per kilogram

NL = not listed

NWTPH = Northwest total petroleum hydrocarbons

TPH = total petroleum hydrocarbons

Table 2
Groundwater Analytical Results
Tangent Fire Department

Analyte	RBCwe (a)	RBCtw (b)	Sample Location & Sample Date	
			DP-IW	LINN63383
			1/23/2025	1/23/2025
Total Petroleum Hydrocarbons (ug/L; NWTPH-Dx)				
Diesel Range Organics	NL	100	84.2 U	--
Residual Range Organics	NL	300	168 U	--
NWTPH-Gx				
Gasoline Range Organics	14,000	110	100 U	--
Total Metals (ug/L; SW-846 6020B)				
Lead	NL	15	0.200 U	0.200 U
Volatile Organic Compounds (ug/L; SW-846 8260D)				
1,2,4-Trimethylbenzene	6,300	54	1.00 U	1.00 U
1,2-Dibromoethane (EDB)	27	0.0075	0.500 U	0.500 U
1,2-Dichloroethane (EDC)	630	0.17	0.400 U	0.400 U
1,3,5-Trimethylbenzene	7,500	59	1.00 U	1.00 U
Benzene	1,800	0.46	0.200 U	0.200 U
Ethylbenzene	4,500	1.5	0.500 U	0.500 U
Isopropylbenzene	51,000	440	1.00 U	1.00 U
Methyl-tert-butyl ether	63,000	14	1.00 U	1.00 U
Naphthalene	500	0.17	5.00 U	5.00 U
n-Propylbenzene	NL	NL	0.500 U	0.500 U
Toluene	220,000	1,100	1.00 U	1.00 U
Xylenes, Total	23,000	190	1.50 U	1.50 U

Notes

Screening levels sourced from Oregon Department of Environmental Quality Risk-Based Concentrations (RBC) for individual Chemicals; Revision May 2018, revised August 2023.

(a) Groundwater in Excavation RBC (RBCwe) for Construction and Excavation Workers.

(b) Ingestion and Inhalation from Tapwater RBC (RBCtw) for residential receptors.

U = The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

Acronyms/Abbreviations:

ug/L = micrograms per liter

-- = not analyzed

Table 2
Groundwater Analytical Results
Tangent Fire Department

NL = not listed
NWTPH = Northwest total petroleum hydrocarbons
TPH = total petroleum hydrocarbons

APPENDIX A

ODEQ Approved Work Plan and Communications

January 13, 2025

Transmitted via email to: Sarah Eagle, ODEQ Western Region Environmental Cleanup Project Manager

Tangent Rural Fire Protection District
32053 Birdfoot Drive
Tangent, OR 97389

Re: Work Plan, Underground Storage Tank Removal Verification and Soil Investigation
Tangent Rural Fire Protection District Property
Tangent, Oregon
UST Facility ID No. 9277
ODEQ LUST No. 22-93-4013

INTRODUCTION

Landau Associates, Inc. (Landau) has prepared this technical memorandum for Tangent Fire Department (Tangent Fire) to document the work plan related to the former Underground Storage Tank (UST) located at 32053 Birdfoot Drive in Tangent, Oregon, 97389 (the site) and the confirmation of its removal and cleanup status for Oregon Department of Environmental Quality (ODEQ). This includes a soil and groundwater investigation to delineate the lateral and vertical extent of any petroleum contamination in the soil surrounding the former location of the UST and related piping.

BACKGROUND

According to site representatives familiar with the site history, UST Environmental Services Inc. (UST Environmental) removed one UST in November 1992 that historically contained unleaded gasoline. The tank had been operated since approximately 1985 and was empty at the time it was removed. Records indicate that the tank capacity was either 750 or 1,000 gallons. Based on information from site representatives, Landau understands that there was no history of leaks from the UST, even though UST Environmental filed a form with ODEQ reporting that a petroleum release was discovered on November 18, 1992.

In June 1994, ODEQ informed Tangent Fire that the Site's UST removal records could not be accepted by the agency due to UST Environmental's engagement in fraudulent activities and broad falsification of documentation and state records. ODEQ requested that Tangent Fire submit a work plan and confirmation sampling to verify that contaminant concentrations in soil and groundwater are below state cleanup levels. In a letter dated September 19, 2006, ODEQ recommended that Tangent Fire either submit a work plan or discuss the proposed work with ODEQ before initiating investigation activities. ODEQ also specified the following requirements to achieve closure:

1. Investigate soils around the former tank area to determine if there is contamination. If groundwater is encountered during the investigation, groundwater samples must be collected for analysis.
2. Provide documentation on the removal and disposal of soils from the tank excavation during the 1992 decommissioning, including volume excavated, soil contaminant concentration data, extent of removal evaluation, and disposal location of removed materials. ODEQ indicated additional sampling of the removed materials, if feasible, may be required.
3. Submit a report to ODEQ documenting the results of the investigation.

Additionally, a letter from ODEQ dated February 6, 1995 specified that:

- The soil investigation must include the collection of a minimum of five soil samples from the former UST location, one from each sidewall of the excavation and one from the native soil at the bottom of the excavation.
- If groundwater is encountered during the investigation, groundwater samples must be collected and analyzed for benzene, toluene, ethylbenzene and xylenes.

INVESTIGATION ACTIVITIES

Based on the requirements specified by ODEQ, Landau proposes the following investigation activities:

- Conduct a geophysical survey;
- Conduct a soil and groundwater investigation and preliminary data evaluation to meet regulatory agency requirements; and
- Provide regulatory agency communications, data evaluation, and agency-required reporting.

Soil and Groundwater Investigation

Prior to investigative drilling activities, Landau personnel and appropriate subcontractors, Pacific Geophysics, will perform a public and private utility location of the former UST location to delineate the extent of the former tank and any potential utilities or piping that remain within the subsurface surrounding the former UST. Ground-penetrating radar will be used to confirm the presence or absence of the tank, to delineate the former excavation area, to estimate the approximate depth of the former tank, and to inform the anticipated sampling locations and depths. Each proposed boring location will be marked and checked to verify the absence of subsurface structures that may impede the drilling activities. Sampling locations will be adjusted, as needed, to avoid utilities and meet the project objectives.

Soil Sampling Methods

Soil borings will be advanced in 5-foot intervals by a licensed driller subcontracted by Landau, Holt Services, Inc., using a direct-push drill rig. Soils will be evaluated over the entire depth of each direct-push boring location for soil classification, field screening, and potential laboratory analysis as discussed below. Lithology of the soil borings will be recorded on Log of Exploration Forms in accordance with the Unified Soil Classification System (Attachment 1), but formal boring logs will not

be prepared. Field screening methods will consist of visual and olfactory observations, water sheen testing, and headspace vapor measurements using a handheld photoionization detector (PID). For the headspace vapor measurements, a portion of soil will be placed in a sealed container (e.g., plastic re-sealable bag) and allowed to equilibrate to the ambient air temperature. A PID reading will then be collected by inserting the PID tip into the headspace of the sample container and the measurement will be recorded.

Boring Locations, Sample Depths, and Decommissioning Methods

Landau proposes advancing five soil borings to depths up to 15 feet (ft) below ground surface (bgs) at the following locations, to be confirmed in-field (Attachment 2):

- Four soil borings advanced adjacent to each sidewall of the former UST location
  - Soil samples will be collected from native soils at approximately half of the total depth of the former UST (i.e., outside of the backfilled region of the former tank), anticipated to be approximately 7 ft bgs.
- One soil boring advanced within the middle of the former UST location
  - The soil sample will be collected from native soils below the anticipated depth of the former UST, approximately 15 ft bgs.

If field evidence of contamination (e.g., staining, odors, or elevated PID readings) is encountered during drilling, sample depths will be adjusted, or additional samples may be collected for possible laboratory analysis to assess the vertical extent of the identified impacts. Soil samples selected for laboratory analysis will be collected into laboratory-provided sample containers, with samples identified for volatile organic compounds analysis collected using US Environmental Protection Agency (EPA) 5035 sampling methods. Sampling equipment will be decontaminated between intervals and between each boring location.

If groundwater is encountered, Landau will collect one groundwater sample from the boring advanced in the middle of the former UST, as discussed below.

Upon completion of the scope of work, each soil boring will be decommissioned in accordance with Oregon Administrative Rules (OAR) 690-240 (Construction, Maintenance, Alteration, Conversion and Abandonment of Monitoring Wells, Geotechnical Holes and Other Holes in Oregon) and OAR 690-240-0475 (Well Seals). Each borehole will be backfilled from the bottom up using 3/8-inch bentonite chips which are hydrated at appropriate lifts before patching the ground with a like-surface (i.e., concrete or asphalt).

Groundwater Sampling Methods

Groundwater, if encountered, will be collected from a temporary polyvinyl chloride (PVC) well. The temporary well screen will be 5 ft long, ¾ inch diameter, and made of PVC material. Based on an anticipated depth to water of 3 to 8 ft bgs, the temporary well will be placed with the screened

portion from approximately 5 ft to 10 ft bgs and across the elevation of the groundwater table. Once the well screen has been placed, groundwater will be extracted using disposable polyethylene tubing and a peristaltic pump. The target screen depth will be adjusted, as appropriate, based on the depth to water encountered in the field.

Groundwater will be purged and sampled at a rate of no more than 1 liter per minute to help reduce turbidity. Low-flow purging will be performed for 10 minutes or until the purge water is clear, whichever occurs first, using a peristaltic pump. During purging, pH, conductivity, temperature, oxidation reduction potential, dissolved oxygen, and turbidity will be measured using a flow-through cell. The samples will be collected into laboratory-supplied sample containers and immediately placed in an ice-chilled cooler.

Laboratory Analysis

Based on current regulatory requirements for investigations related to UST closure, laboratory analysis for the investigation is to include the below, based on ODEQ's risk-based cleanup levels for No Further Action specified in Table 2.1 of the *Risk-Based Decision Making for the Remediation of Contaminated Sites* (ODEQ 2017).[1] Samples will be collected in laboratory-supplied containers and transported to the laboratory for analysis under standard chain-of-custody procedures.

Landau anticipates that samples will be analyzed for:

- Soil samples
  - Total petroleum hydrocarbons (Northwest Methods NWTPH-Dx and NWTPH-Gx)
  - Benzene, toluene, ethylene, xylenes, methyl tertiary-butyl ether, iso-propylbenzene, n-propylbenzene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene (EPA Method 8260D)
  - Polycyclic aromatic hydrocarbons (PAHs; EPA Method 8270E SIM)
- Groundwater, if encountered
  - Total petroleum hydrocarbons (Northwest Methods NWTPH-Dx and NWTPH-Gx)
  - Benzene, toluene, ethylene, xylenes, methyl tertiary-butyl ether, iso-propylbenzene, n-propylbenzene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene (EPA Method 8260D)
  - PAHs (EPA Method 8270E SIM)
- Waste analysis
  - Total and toxicity characteristic leaching procedure metals required for waste profiling (EPA Method 6020B)

The laboratory data will be reviewed for quality assurance and quality control purposes, including the following laboratory parameters:

- Chain-of-custody records

[1] ODEQ. 2017. *Risk-Based Decision Making for the Remediation of Contaminated Sites*. Oregon Department of Environmental Quality. October 2. https://www.oregon.gov/deq/FilterDocs/RBDMGuidance.pdf.

- Holding times
- Laboratory blank results
- Surrogate recoveries
- Laboratory duplicate results
- Laboratory control sample and laboratory control sample duplicate results
- Quantitation limits
- Audit/corrective action records
- Completeness and overall data quality.

Sample analytical results will be compared to Excavation Worker soil Risk-Based Concentrations (RBCs), and Excavation Worker groundwater RBCs if necessary, as presented in Appendix A, Table of RBCs of the *Risk-Based Decision Making for the Remediation of Contaminated Sites* (ODEQ 2017)[2].

Decontamination and Investigation-Derived Waste

All non-disposable sampling equipment will be decontaminated between sampling intervals. Downhole sampling equipment will be decontaminated between use at boring locations. Decontamination of heavy equipment will consist of a tap water rinse, two cycles of an industrial soap (i.e., Alconox®) wash, followed by a tap water rinse. Any gross contamination will be removed prior to decontamination. Decontamination water generated during the field activities will be contained in labeled drums for storage on the Site pending the results of the laboratory analysis of the soil and, if encountered, groundwater samples. Disposable equipment and clothing will be disposed of as solid waste.

Soil cuttings and purge water generated during direct-push drilling and soil and groundwater sampling will be contained in labeled drums for storage at the Site, pending the results of the laboratory analysis for soil and groundwater. Each drum will be labeled with information including the source and type of material (i.e., boring designation for soil cuttings or purge water, or decontamination water), date generated, and consultant/owner. Landau will coordinate disposal of the drummed material at an approved disposal facility following receipt of the sample analytical results.

Health and Safety Plan

A project health and safety plan (HASP), for implementation of field activities described in this work plan, will be prepared prior to field mobilization. All Landau employees will follow the procedures described in the HASP. Landau subcontractors will either adopt the HASP or prepare their own HASP that is at least as protective as the Landau HASP.

[2] ODEQ. 2017. *Risk-Based Decision Making for the Remediation of Contaminated Sites*. Oregon Department of Environmental Quality. October 2. https://www.oregon.gov/deq/FilterDocs/RBDMGuidance.pdf.

Reporting and Communications

Landau will review and validate the analytical reports provided by the laboratory and then provide the results to Tangent Fire. Following initial data review with Tangent Fire, Landau will prepare a letter report that summarizes the soil investigation, sampling activities, and soil and groundwater analytical results for regulatory review. The report will include an updated site map delineating the extent of the former UST excavation area and finalized boring locations. If residual contamination is not observed, Landau will proceed with applicable documentation and reporting methods for the UST closure and No Further Action (NFA) determination with ODEQ. If residual contamination is observed, additional coordination with Tangent Fire and ODEQ will be required.

SCHEDULE

Upon work plan approval by ODEQ, Landau anticipates conducting initial soil and groundwater investigation activities in January 2025. Initial field investigations described herein will require two days, including one day for excavation extent, utilities, and boring locating, and one associated with drilling activities. Laboratory analysis is planned on a standard turnaround time of 10 days. As discussed, if residual contamination is not observed, Landau will proceed with applicable documentation and reporting methods for the UST closure and NFA determination with ODEQ. If residual contamination is observed, additional coordination with Tangent Fire and ODEQ will be required. The draft summary report schedule will be coordinated with Tangent Fire needs and budgetary concerns, will be compiled post-field investigation, and submitted to ODEQ within the 2025 calendar year.

Please contact Melody Kieneker at (425) 753-0765 or Allie Miles at (503) 841-0166 if you have questions regarding this work plan.

LANDAU ASSOCIATES, INC.

Melody Kieneker
Senior Scientist

Allie Miles, PE
Senior Associate

ARM/MPK/WRH/tmh
\\edmdata01\projects\2358\001\010\R\Landau_Tangent Fire Dept UST Investigation_ DEQ Work Plan1.13.2025.docx

Attachments

Attachment 1. USCS Classification Sheet
Attachment 2. Proposed Sampling Locations

Soil Classification System

MAJOR DIVISIONS			GRAPHIC SYMBOL	USCS LETTER SYMBOL[1]	TYPICAL DESCRIPTIONS [2][3]
COARSE-GRAINED SOIL (More than 50% of material is larger than No. 200 sieve size)	GRAVEL AND GRAVELLY SOIL (More than 50% of coarse fraction retained on No. 4 sieve)	CLEAN GRAVEL (Little or no fines)		GW	Well-graded gravel; gravel/sand mixture(s); little or no fines
				GP	Poorly graded gravel; gravel/sand mixture(s); little or no fines
		GRAVEL WITH FINES (Appreciable amount of fines)		GM	Silty gravel; gravel/sand/silt mixture(s)
				GC	Clayey gravel; gravel/sand/clay mixture(s)
	SAND AND SANDY SOIL (More than 50% of coarse fraction passed through No. 4 sieve)	CLEAN SAND (Little or no fines)		SW	Well-graded sand; gravelly sand; little or no fines
				SP	Poorly graded sand; gravelly sand; little or no fines
		SAND WITH FINES (Appreciable amount of fines)		SM	Silty sand; sand/silt mixture(s)
				SC	Clayey sand; sand/clay mixture(s)
FINE-GRAINED SOIL (More than 50% of material is smaller than No. 200 sieve size)	SILT AND CLAY (Liquid limit less than 50)			ML	Inorganic silt and very fine sand; rock flour; silty or clayey fine sand or clayey silt with slight plasticity
				CL	Inorganic clay of low to medium plasticity; gravelly clay; sandy clay; silty clay; lean clay
				OL	Organic silt; organic, silty clay of low plasticity
	SILT AND CLAY (Liquid limit greater than 50)			MH	Inorganic silt; micaceous or diatomaceous fine sand
				CH	Inorganic clay of high plasticity; fat clay
				OH	Organic clay of medium to high plasticity; organic silt
	HIGHLY ORGANIC SOIL			PT	Peat; humus; swamp soil with high organic content

OTHER MATERIALS	GRAPHIC SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
PAVEMENT		AC or PC	Asphalt concrete pavement or Portland cement pavement
ROCK		RK	Rock (See Rock Classification)
WOOD		WD	Wood, lumber, wood chips
DEBRIS		DB	Construction debris, garbage

Notes:
1. USCS letter symbols correspond to symbols used by the Unified Soil Classification System and ASTM classification methods. Dual letter symbols (e.g., SP-SM for sand or gravel) indicate soil with an estimated 5-15% fines. Multiple letter symbols (e.g., ML/CL) indicate borderline or multiple soil classifications.
2. Soil descriptions are based on the general approach presented in the Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), outlined in ASTM D 2488. Where laboratory index testing has been conducted, soil classifications are based on the Standard Test Method for Classification of Soils for Engineering Purposes, as outlined in ASTM D 2487.
3. Soil description terminology is based on visual estimates (in the absence of laboratory test data) of the percentages of each soil type and is defined as follows:

Primary Constituent:	> 50%	"GRAVEL," "SAND," "SILT," "CLAY," etc.
Secondary Constituents:	> 30% and ≤ 50%	"very gravelly," "very sandy," "very silty," etc.
	> 15% and ≤ 30%	"gravelly," "sandy," "silty," etc.
Additional Constituents:	> 5% and ≤ 15%	"with gravel," "with sand," "with silt," etc.
	≤ 5%	"trace gravel," "trace sand," "trace silt," etc., or not noted.

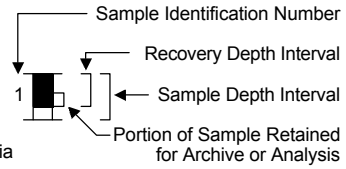
4. Soil density or consistency descriptions are based on judgement using a combination of sampler penetration blow counts, drilling or excavating conditions, field tests, and laboratory tests, as appropriate.

Drilling and Sampling Key

SAMPLER TYPE

Code	Description
a	3.25-inch O.D., 2.42-inch I.D. Split Spoon
b	2.00-inch O.D., 1.50-inch I.D. Split Spoon
c	Shelby Tube
d	Grab Sample
e	Single-Tube Core Barrel
f	Double-Tube Core Barrel
g	2.50-inch O.D., 2.00-inch I.D. WSDOT
h	3.00-inch O.D., 2.375-inch I.D. Mod. California
i	Other - See text if applicable
1	300-lb Hammer, 30-inch Drop
2	140-lb Hammer, 30-inch Drop
3	Pushed
4	Vibrocore (Rotosonic/Geoprobe)
5	Other - See text if applicable

SAMPLE NUMBER & INTERVAL



Field and Lab Test Data

Code	Description
PP = 1.0	Pocket Penetrometer, tsf
TV = 0.5	Torvane, tsf
PID = 100	Photoionization Detector VOC screening, ppm
W = 10	Moisture Content, %
D = 120	Dry Density, pcf
-200 = 60	Material smaller than No. 200 sieve, %
GS	Grain Size - See separate figure for data
AL	Atterberg Limits - See separate figure for data
GT	Other Geotechnical Testing
CA	Chemical Analysis

Groundwater

▽ Approximate water level at time of drilling (ATD)

▼ Approximate water level at time other than ATD

2/5/09 C:\DOCUMENTS AND SETTINGS\DOLCOTT\DESKTOP\TEST PROJECT.GPJ SOIL CLASS SHEET

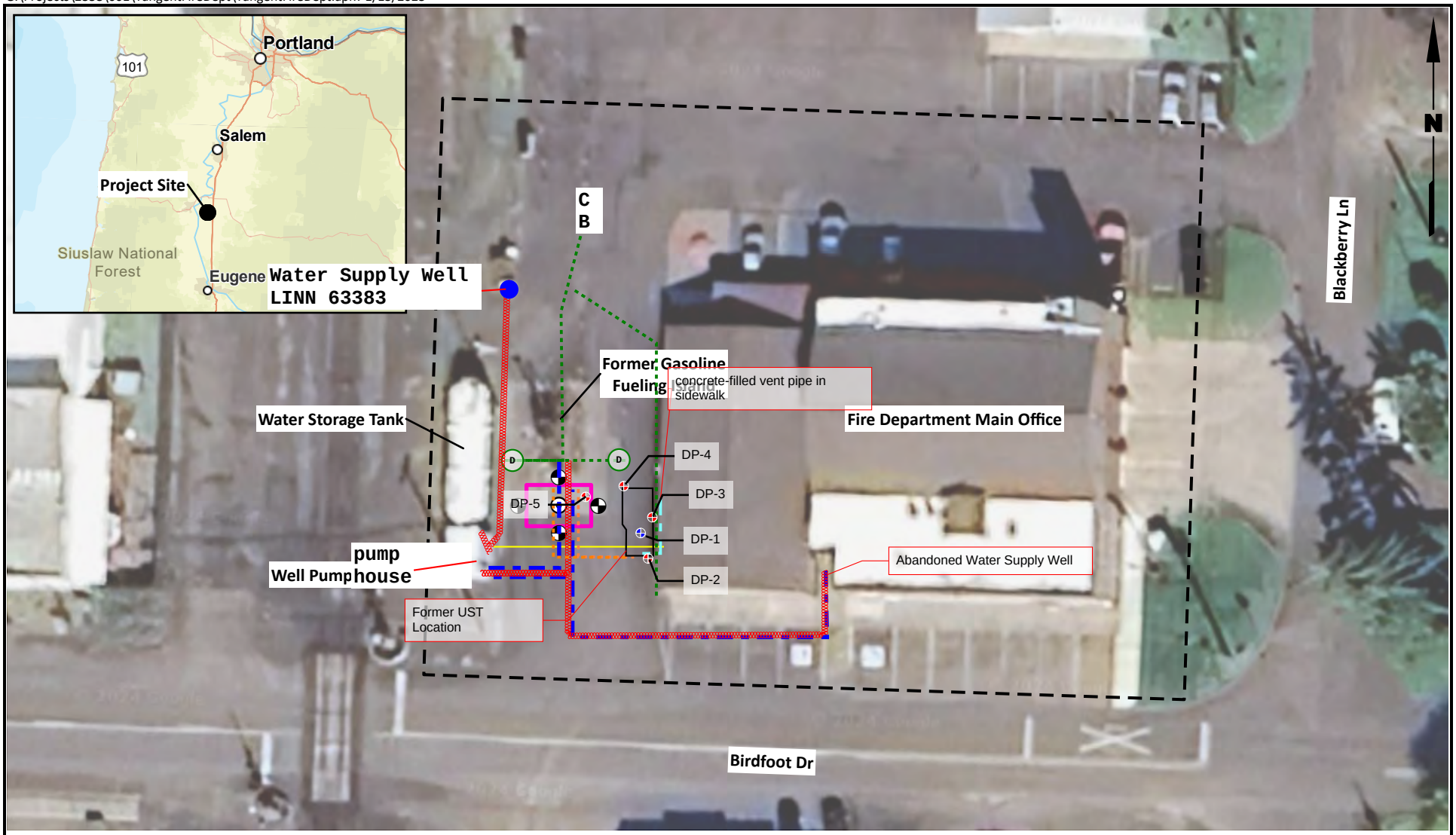
LANDAU ASSOCIATES

Tangent Fire Department
UST Investigation
Tangent, Oregon

Soil Classification System and Key

Attachment 1

G:\Projects\2358\001\TangentFireDept\TangentFireDept.aprx 1/13/2025



Legend

- Approximate Soil Boring/Groundwater Sample Location (if Groundwater is Encountered)
- Approximate Soil Boring Location
- Approximate Location of Former UST
- Approximate Site Boundary

0 40 80

Scale in Feet

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Data Sources: Linn County GIS; Google Earth Pro.

LANDAU ASSOCIATES

Tangent Fire Department UST Investigation Tangent, Oregon	**Proposed Sampling Locations**	Attachment 2

Trey Holland

From: EAGLE Sarah * DEQ <sarah.eagle@deq.oregon.gov>
Sent: Wednesday, January 22, 2025 4:50 PM
To: Melody Kieneker
Cc: Allie Miles; Christopher Griffin; Bill Haldeman; Tim Hainley; ELIAS Paul G * DEQ
Subject: RE: LUST 22-93-4013 Tangent Fire District

Hi Melody,

Thanks for this follow up. The boring locations look good—I understand about the infrastructure to the east. Since the UST location is different than expected, I hope the field observations support that the UST basin was successfully located (i.e. boring from the UST center showing backfill for a significant depth).

I concur with the excel sheet you attached with one exception—lead analysis should be for dissolved not total. And for completeness sake, I'm including Table 2.1 from the RBDM here:

Table 2.1: Constituents of Interest in Petroleum Products[1]

Products / Constituents	Gasoline	Kerosene, Jet Fuel, Diesel, Light Fuel Oil & Heating Oil	Heavy Fuel Oil	Transfo Mine Insula Oil[6]
Total Petroleum Hydrocarbons (TPH)	X	X	X	X
Benzene, toluene, ethylbenzene, and xylenes (BTEX)	X	X	X[2]	
Polynuclear aromatic hydrocarbons (PAHs)	X[3]	X	X	
Methyl t-butyl ether (MTBE[4])	X			
iso-propylbenzene, n-propylbenzene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene	X			
EDC and EDB	X[5]			
Lead	X[5]			
Cadmium and Chromium				
Chlorinated Solvents				
Polychlorinated biphenyls (PCBs)				X

[1] An "X" denotes the COIs most likely to be present in a given petroleum product. Dependin specific conditions, the Department may require that additional constituents be analyzed. not listed in Appendix A, please refer to the Region 9 Preliminary Remediation Goals (EPA
[2] Test in groundwater if heavy fuel oil contamination is suspected.
[3] If only gasoline contamination is present, the PAH test can be limited to naphthalene. The has approved a BTEX+N analytical method for such situations

As mentioned in the footnote above, naphthalene may be analyzed alongside BTEX (as noted in RBDM table 2.2 via EPA 8260).

Best,
Sarah

From: Melody Kieneker <MKieneker@landauinc.com>
Sent: Wednesday, January 22, 2025 3:40 PM
To: EAGLE Sarah * DEQ <sarah.eagle@deq.oregon.gov>
Cc: Allie Miles <AMiles@landauinc.com>; Christopher Griffin <cgriffin@tangentfire.com>; Bill Haldeman <BHaldeman@landauinc.com>; Tim Hainley <THainley@landauinc.com>; ELIAS Paul G * DEQ <Paul.G.Elias@deq.oregon.gov>
Subject: RE: LUST 22-93-4013 Tangent Fire District

Hi Sarah, thanks for the call today. To summarize our sampling analysis and tiered holding scheme, see the attached excel sheet. Please let us know if this matches what we discussed.

Additionally, as mentioned, the former tank location is in a different spot than originally anticipated. See attached site plan of what we found, and proposed boring locations. These locations match with the attached excel sheet location descriptions. Generally, we are trying to spread out the 5 proposed borings to cover the side walls, center/bottom of tank, and the piping infrastructure. The tank's location was close to the building and existing water drainage, so we cannot move closer to the building on the eastern side of the tank than what is proposed in the image. We believe we have spread these out to capture towards the corners of the former tank area and side walls, as well as connection points to the tank / fueling island.

Please let us know if these general locations will work for DEQ tomorrow.
Thank you!

Melody Kieneker *(she/her)*
SENIOR SCIENTIST
M: (425) 753-0765 D: (503) 542-1084 | mkieneker@landauinc.com

---

From: Melody Kieneker
Sent: Tuesday, January 21, 2025 3:46 PM
To: EAGLE Sarah * DEQ <sarah.eagle@deq.oregon.gov>
Cc: Allie Miles <AMiles@landauinc.com>; Christopher Griffin <cgriffin@tangentfire.com>; Bill Haldeman <BHaldeman@landauinc.com>; Tim Hainley

<THainley@landauinc.com>; ELIAS Paul G * DEQ <Paul.G.Elias@deq.oregon.gov>
Subject: RE: LUST 22-93-4013 Tangent Fire District

Thank you, Sarah, I will reach out to Paul. If needed, we will be in touch with questions or comments on the below and our work scope before Thursday.

Melody Kieneker *(she/her)*
SENIOR SCIENTIST
M: (425) 753-0765 D: (503) 542-1084 | mkieneker@landauinc.com

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From: EAGLE Sarah * DEQ <sarah.eagle@deq.oregon.gov>
Sent: Tuesday, January 21, 2025 3:22 PM
To: Melody Kieneker <MKieneker@landauinc.com>
Cc: Allie Miles <AMiles@landauinc.com>; Christopher Griffin <cgriffin@tangentfire.com>; Bill Haldeman <BHaldeman@landauinc.com>; Tim Hainley <THainley@landauinc.com>; ELIAS Paul G * DEQ <Paul.G.Elias@deq.oregon.gov>
Subject: RE: LUST 22-93-4013 Tangent Fire District

Hi Melody,

I've cc'ed Paul Elias on this email—he's a Project Technician in DEQ Cleanup and is located near Tangent. His request to attend the event is pending internal approval, so we may not know until tomorrow whether he will be attending. That being said, here's his phone number:

(971) 985-9390

Paul's travel and time for the site visit will be grant funded, so there will be no costs to Tangent FD for DEQ attendance. Please let me know if you have any questions.

Looks to be lovely weather for field events this week!

Best,
Sarah

From: Melody Kieneker <MKieneker@landauinc.com>
Sent: Monday, January 20, 2025 8:27 AM
To: EAGLE Sarah * DEQ <sarah.eagle@deq.oregon.gov>
Cc: EAGLE Sarah * DEQ <sarah.eagle@deq.oregon.gov>; Allie Miles <AMiles@landauinc.com>; Christopher Griffin <cgriffin@tangentfire.com>; Bill Haldeman <BHaldeman@landauinc.com>; EAGLE Sarah * DEQ <sarah.eagle@deq.oregon.gov>; Tim Hainley <THainley@landauinc.com>
Subject: RE: LUST 22-93-4013 Tangent Fire District

Good morning, all,

We can confirm we will be on site tomorrow near 9 am for the utility locates and prep-work. We will be on site near 8am this Thursday, January 23 to start the drilling activities. Pending all things go as planned, the drilling is anticipated to take one day. Site address for both days: 32053 Birdfoot Dr, Tangent, OR 97389

Sarah, can you confirm the name and phone number of the person who would be meeting us on site on Thursday? I would like to make sure either Allie or I will be there at the same time.

Thank you,
Melody Kieneker *(she/her)*
SENIOR SCIENTIST
M: (425) 753-0765 D: (503) 542-1084 | mkieneker@landauinc.com

---

From: Tim Hainley <THainley@landauinc.com>
Sent: Friday, January 17, 2025 10:57 AM
To: Melody Kieneker <MKieneker@landauinc.com>
Cc: Sarah DEQ EAGLE <sarah.eagle@deq.oregon.gov>; Allie Miles <AMiles@landauinc.com>; Christopher Griffin <cgriffin@tangentfire.com>; Bill Haldeman <BHaldeman@landauinc.com>; Sarah DEQ EAGLE <sarah.eagle@deq.oregon.gov>
Subject: Re: LUST 22-93-4013 Tangent Fire District

I'll chime in with respect to scheduling - the geophysical survey on the 21st to begin ~ 9 am. Drillers should show up at 8 am on the 23rd.

Have a great weekend everyone!

Tim Hainley
PROJECT SCIENTIST
D: (503) 542-1091 | thainley@landauinc.com

> On Jan 17, 2025, at 10:47 AM, Melody Kieneker <MKieneker@landauinc.com> wrote:
>
> Thanks for the clarifications, Sarah! We will review and be in touch if we have further clarifications or questions. I believe we will be conducting the utility / GPR search on Tuesday, and anticipate drilling on Thursday the 23rd. I will confirm with the team and get back to you with firm dates and times.

If I don't speak with you today, hope you have a nice weekend!

Melody Kieneker *(she/her)*
SENIOR SCIENTIST
M: (425) 753-0765 D: (503) 542-1084 | mkieneker@landauinc.com

<image001.png>

From: EAGLE Sarah * DEQ <sarah.eagle@deq.oregon.gov>
Sent: Friday, January 17, 2025 10:44 AM
To: Melody Kieneker <MKieneker@landauinc.com>
Cc: Allie Miles <AMiles@landauinc.com>; Christopher Griffin <cgriffin@tangentfire.com>; Bill Haldeman <BHaldeman@landauinc.com>; Tim Hainley <THainley@landauinc.com>
Subject: RE: LUST 22-93-4013 Tangent Fire District

Hi Melody,

Thank you for your responses. My apologies for the confusion on some of our comments. I've responded in **bold** below. Please give me a call if you'd like to discuss any of them—I definitely don't want to delay your drilling next week.

Also, my leadworker may want to come to the site during the investigation, so could you please provide me with the approximate schedule for your field activities on site next week (once known)?

Best,

Sarah D. Eagle, GIT (she/her)
Project Manager
Western Region Environmental Cleanup
Oregon Department of Environmental Quality
165 E. 7th Avenue, Suite 100
Eugene, OR 97401
971-357-5275

From: Melody Kieneker <MKieneker@landauinc.com>
Sent: Thursday, January 16, 2025 3:12 PM
To: EAGLE Sarah * DEQ <sarah.eagle@deq.oregon.gov>
Cc: Allie Miles <AMiles@landauinc.com>; Christopher Griffin <cgriffin@tangentfire.com>; Bill Haldeman <BHaldeman@landauinc.com>; Tim Hainley <THainley@landauinc.com>
Subject: RE: LUST 22-93-4013 Tangent Fire District

Sarah, thanks for your time and comments on the work plan. We have provided responses and clarifications below. Please let us know if based on the below we are able to proceed with drilling activities next week, and/or if we need further discussion.

Thank you!

1. In addition to utility locates, a Geophysical survey will be completed prior to drilling using ground penetrating radar (GPR). The Locations of samples will be confirmed with GPR to confirm they are placed in appropriate locations before moving forward. Former locations of tanks, piping etc. has been confirmed using historical knowledge, photos and information gathered from site representatives that were present during the installation and removal of the tank. Additionally, GPR will be used to search for any/all subsurface structures or indication of former structures before finalizing sample bore locations. **Thank you.**
2. We will move the boring slightly to north, as feasible. Directly north of the former tank location are remaining surface structures from the decommissioned fueling island making it difficult to much further to the north. We will be confirming former footprint (including subsurface piping) with GPR, as mentioned. Additionally, transfer and/or fueling piping was only located directly adjacent (north) of the tank location, and all other piping was above ground surface. This information will be confirmed via GPR prior to drilling. Based on site knowledge and historical information and photographs, the ground surface is currently paved and was paved when tank was in place. Trucks fueled on top of a large concrete pad adjacent to the fueling island. As such if any incidental spills occurred, they would have been contained to the concrete, and not discharged to soils. **We're not so concerned about minor spills when fueling but rather release from subsurface piping. I understand limitations based on infrastructure though, so all we can ask is that you select the best location with consideration to the possibility of release from subsurface piping. It is unclear to me based on the documentation we have whether subsurface infrastructure associated with the UST (i.e. piping) was removed at the time of decommissioning. If your records (and/or the GPR) are able to conclude the status of any residual subsurface infrastructure, that would be great. But to iterate, I understand limitations on the ground, so we just ask that you do your best with respect to positioning of the northern boring.**
3. We will adjust the side wall sample locations to near the bottom of the anticipated tank depth, unless contamination is suspected/indicated at a shallower depth. If suspected contamination is encountered, samples will be collected from that location/depth. **Thank you.**
4. Thank you – we will hold soil PAH analysis and analyze only if TPH values comes back with a detection. A clarification on your second PAH analysis comment: "If Dx is detected then soil PAHs are required. For GW collect the samples and hold and wait to see if TPH analysis is greater than 0.5 PPM. If so then analyze PAH samples".
    1. Please confirm this comment is related to holding GW samples for PAH. Specifically, we will only analyze GW PAH samples if the soil TPH comes back with a detection. Or, are you requiring GW TPH analysis? A separate comment indicated TPH was not required for GW (only 8260/8270). **Ah yes, these were two comments—one for the requested well water sample and one for the GW sampled from within the UST basin, my apologies for the confusion. We intended to provide this flexibility to accommodate the requested well water sample. To respond to this question and item 6 (below)-- If sampling of the onsite well isn't able to be accommodated at present, please plan to analyze the full suite for GW as described in the workplan (TPH/8260/8270) and lead as well (*unless documentation that the UST only ever contained unleaded gasoline is able to be provided, that seems unlikely to be available at this site?).***
5. We will adhere to UST QAPP information. **Thank you.**
6. Regarding the water well sample request: For additional information, this site water well in question (LINN 63383) pumps groundwater into the large water tank, location indicated on the work plan figure. Water within the holding tank is only used for on site fire training and fire drill exercises at the building located to the north of the project area (not depicted on the work plan

map). This well was installed in 2020, and is screened within a water bearing zone of 55 to 140 feet below ground surface. The water pump depth is approximately 120 – 139 feet below ground surface. If groundwater is encountered within the former UST location, it is anticipated to be perched groundwater between 3 – 5 feet below ground surface. Since groundwater located in the former UST footprint is anticipated to be substantially shallower than the water well intake, Landau proposes to only sample the water well if soil and groundwater analysis within the former UST location comes back with detections. If detections occur, Landau will work with ODEQ to determine next steps and sample analysis requirements. **I understand. The reason this sampling was being requested was to screen deeper groundwater for impacts from the UST that may not be apparent near the surface at present, due to the time since reported release and the heavy use of groundwater in the vicinity. If Tangent FD wants to wait until after the initial investigation, then that's fine. However, in order to close a site, internal concurrence at DEQ is necessary, and it seems like closure may be difficult without confirmation that the onsite well is unaffected by the reported historical release.**

7. We will confirm use of most recent RBCs from May 2018 / August 2023 and comparison versus these, if detected results are found. **Thank you.**

Melody Kieneker *(she/her)*
SENIOR SCIENTIST
M: (425) 753-0765 D: (503) 542-1084 | mkieneker@landauinc.com

<image001.png>

From: EAGLE Sarah * DEQ <sarah.eagle@deq.oregon.gov>
Sent: Wednesday, January 15, 2025 12:38 PM
To: Melody Kieneker <MKieneker@landauinc.com>
Cc: Allie Miles <AMiles@landauinc.com>; Christopher Griffin <cgriffin@tangentfire.com>; Bill Haldeman <BHaldeman@landauinc.com>
Subject: RE: LUST 22-93-4013 Tangent Fire District

Hi Melody,

Many thanks for the opportunity to review. We've made a few comments within the workplan (attached) that will hopefully prevent follow up investigations (if at all possible!). The most meaningful comments are as follows:

1. Slight adjustment in the location of the northern boring to capture possible impacts from dispenser infrastructure.
2. Collection of a sample from the onsite groundwater well. We had not previously discussed this, but my leadworker would really like to see screening of the well prior to closure, so if we could get that done now, that would be ideal. We've made some recommendations about possibly staggering laboratory analysis to accommodate this extra cost, if necessary. If this isn't possible within the current scope, we'll need to coordinate with the Fire District down the line.

Please let me know if you have any concerns about the comments attached or our requests. Our comments are not intended to be burdensome, and if they are interpreted as such, please let us know so that we can clarify.

Best,

Sarah D. Eagle, GIT (she/her)
Project Manager
Western Region Environmental Cleanup
Oregon Department of Environmental Quality
165 E. 7th Avenue, Suite 100
Eugene, OR 97401
971-357-5275

From: Melody Kieneker <MKieneker@landauinc.com>
Sent: Tuesday, January 14, 2025 9:59 AM
To: EAGLE Sarah * DEQ <sarah.eagle@deq.oregon.gov>
Cc: Allie Miles <AMiles@landauinc.com>; Christopher Griffin <cgriffin@tangentfire.com>; Bill Haldeman <BHaldeman@landauinc.com>
Subject: RE: LUST 22-93-4013 Tangent Fire District

Good morning, Sarah, attached you will find the work plan for the Tangent Fire Department UST investigation. I will give you a call this morning to discuss. As feasible, we are trying to get this scope of work started late next week. I understand this does not allow for substantial time for your review, but we would like to get this scope going as best as feasible in the coming weeks. Please let us know if you have questions on the attached, and if the scope is sufficient for our initial investigations at the site.

Thank you,

Melody Kieneker *(she/her)*
SENIOR SCIENTIST
M: (425) 753-0765 D: (503) 542-1084 | mkieneker@landauinc.com

<image001.png>

From: EAGLE Sarah * DEQ <sarah.eagle@deq.oregon.gov>
Sent: Thursday, November 7, 2024 9:47 AM
To: Christopher Griffin <cgriffin@tangentfire.com>
Cc: Melody Kieneker <MKieneker@landauinc.com>; Allie Miles <AMiles@landauinc.com>
Subject: RE: LUST 22-93-4013 Tangent Fire District

Hi Chris,

Thanks for the opportunity to review. The scope described looks sufficient to me. The scope indicates that a workplan will be developed and DEQ will have the opportunity to review—that's very helpful so we can confirm the planned sampling locations and the analytical methods selected.

One other thing I want to note that I assume DEQ has previously mentioned to you, if significant residual contamination is identified during this investigation, additional work may be required. I don't expect this to be the case but I hate to surprise folks if things do go that way.

I look forward to seeing the data and bringing this site to closure. Please don't hesitate to reach out if you'd like to discuss further or if Landau has any questions during the development of the workplan.

Best,
Sarah D. Eagle, GIT (she/her)
Project Manager
Western Region Environmental Cleanup
Oregon Department of Environmental Quality
165 E. 7th Avenue, Suite 100
Eugene, OR 97401
971-357-5275

From: Christopher Griffin <cgriffin@tangentfire.com>
Sent: Tuesday, November 5, 2024 11:56 AM
To: EAGLE Sarah * DEQ <sarah.eagle@deq.oregon.gov>
Cc: Melody Kieneker <MKieneker@landauinc.com>; Allie Miles <AMiles@landauinc.com>
Subject: LUST 22-93-4013 Tangent Fire District

Good afternoon Sarah,

As we spoke of this morning, please find attached the scope of services for the project to confirm the removal of the underground storage tank located at Tangent Rural Fire Protection District. I am hoping for a thumbs up from you and would like to get the project started in the next few months.

I have also copied both Melody Kieneker and Allie Miles of Landau Associates on this email and would like to include them in any future discussions.

Thank you and take care,

Chris Griffin, Fire Chief

<image002.jpg>

Tangent Rural Fire
Protection District
32053 Birdfoot Dr.
Tangent, OR 97389

541-928-8722 Office
541-350-3801 Cell

cgriffin@tangentfire.com

APPENDIX B

Geophysical Survey Report

LETTER REPORT

PROJECT #: 240914
SURVEY DATE: 1/21/25

Melody Kieneker, Tim Hainley
Landau Associates

UST and Utility Survey
32053 Birdfoot Drive
Tangent, Oregon

Hand-held metal detectors and ground-penetrating radar (GPR) were used in the vicinity of a water-filling structure at the Tangent Fire Station (Figure 1). Historically, a fuel pump or pumps associated with a buried underground storage tank (UST) existed on the structure's pad. The scope of the survey included the following:

To locate the excavation from this UST that has been reportedly removed and paved over with asphalt near the structure,
To locate utilities associated with the former tank, and
To locate utilities and other structures connected to the pump-island pad and other features on site.

Surface evidence of the UST included pump piping situated on the raised footing of the filling structure and a suspicious steel pipe that could be a vent, next to the station building. The survey covered the area shown in Figure 1.

A Radio Detection TX3 transmitter was used to connect to several exposed pipes, including the pump remnants, the possible vent pipe, water and electrical fixtures inside the small control building, and a natural-gas pipe by the station building wall. The system's RD7200 receiver was used to trace the current placed onto the pipes. A network of pipes was marked on the ground surface with spray paint. The pump piping was traced to the south and east toward the station building. The possible vent pipe was traced toward the south and west. The current on the vent line was lost near the terminus of the piping from the pump. Due to the number of conductive pipes present, coupling of the signal from a target line to a nearby line was observed. The current from the pump fixtures was detected on other pipes, including power and water lines. Care was taken to minimize this issue, but it was still noticed.

An Aqua-Tronics Tracer metal detector was used to detect and map conductive pipes across the survey area. GPR was used after the hand-held instruments to detect and locate conductive and non-conductive pipes, as well as the excavation from the tank's removal. A flat reflector from an unknown linear feature was detected near the control building. The soil appeared mostly undisturbed in radar profiles collected across the areas of interest. A subtle disturbed-soil zone was detected between the water structure and the station building, near the termini of the pipes traced from the pump features and the possible vent. The typical reflections observed in profiles over tank excavations were missing in the profiles for this zone; however, it was the only disturbed zone identified in the survey area. The shape of reflectors within UST excavations is influenced by the compaction methods applied to the soil.

Our results are shown in Figure 2.

Nikos Tzetos of Pacific Geophysics conducted the survey for Ms. Melody Kieneker and Mr. Tim Hainley of Landau on January 21, 2025. This letter report was written by Nikos Tzetos and emailed to Ms. Kieneker and Mr. Hainley on January 29, 2025.

Limitations

The conclusions presented in this report were based upon widely accepted geophysical principles, methods, and equipment. This survey was conducted with limited knowledge of the site, the site history, and the subsurface conditions.

The goal of near-surface geophysics is to provide a rapid means of characterizing the subsurface using non-intrusive methods. Conclusions based upon these methods are generally reliable; however, due to the inherent ambiguity of the methods, no single interpretation of the data can be made. As an example, rocks and roots produce radar reflections that may appear the same as pipes and tanks.

Under reasonable conditions, geophysical surveys are good at detecting changes in the subsurface caused by fabricated objects or changes in subsurface conditions, but they are poor at actually identifying those objects or subsurface conditions.

Objects of interest are not always detectable due to surface and subsurface conditions. The deeper an object is buried, the more difficult it is to detect, and the less accurately it can be located.

The only way to see an object is to physically expose it.

Nikos Tzetos
Pacific Geophysics

January 29, 2025

Appendix A. Geophysical Survey Methods

Ground Penetrating Radar

A Geophysical Survey Systems, Inc. (GSSI) SIR 4000 GPR system coupled to GSSI antennas of various central frequencies is used to obtain radar data for our surveys.

GPR antennas both transmit and receive electromagnetic energy. EM energy is transmitted into the material the antenna passes over. A portion of that energy is reflected back to the antenna and amplified. Reflections are displayed in real-time in a continuous cross section. Reflections are produced where there is a sufficient electrical contrast between two materials. Changes in the electrical properties (namely the dielectric constant) that produce radar reflections are caused by changes in the moisture content, porosity, mineralogy, and texture of the material. Metallic objects of interest exhibit a strong electrical contrast with the surrounding material and thus produce relatively strong reflections. Non-metallic objects of interest (septic tanks, cesspools, dry wells, and PVC and clay tile pipes) are not always good reflectors.

Radar data are ambiguous. It can be difficult to distinguish the reflection produced by an object of interest from the reflection caused by some natural feature. Rocks or tree roots have reflections that appear similar to reflections from pipes. In concrete investigations reflections produced by metal rebar look exactly like those from electrical conduit or post-tension cables. Objects with too small an electrical contrast may produce no reflections at all and may be missed. Target objects buried below objects with contrasting properties that also produce reflections may be missed (e.g., USTs below roots, concrete pieces, pipes, or rocks). If an object of interest like a UST is buried below the depth of penetration of the radar signal, it will be missed.

In addition to interpreting ambiguous data, radar has several limitations that cannot be controlled by the operator. The radar signal is severely attenuated by electrically conductive material, including wet, clay-rich soil and reinforced concrete. The quality of the data is affected by the surface conditions over which the antenna is pulled. Ideally the antenna should rest firmly on a smooth surface. Rough terrain and tall grass reduce the quality of radar data.

It is the job of an experienced interpreter to examine the GPR profiles and deduce if reflections are from objects of interest. A GPR interpreter cannot see underground but can only interpret reflections based on experience.

The only way to truly identify an object is to excavate.

Hand-held Metal detectors

Two small, non-recording metal detectors are used to locate suspect magnetic anomalies after reconnaissance surveys, as well as ferrous and conductive pipes and objects.

Schonstedt Magnetic Gradiometer: This magnetometer has two magnetic sensors separated vertically by 10". The magnetic field surrounding a ferrous object is strongest near the object and decreases rapidly as the distance increases. If the magnitude measured by the sensor located in the tip of the Schonstedt is very high, and the magnetic field measured by the sensor located farther up the shaft of the Schonstedt is low, there is a large vertical magnetic gradient, and the instrument responds with a loud whistle indicating the object is near the surface. If there is a small difference in the magnitudes measured by the two sensors, the object is deeper. The instrument responds with a softer tone. A discussion of this instrument is available at Schonstedt.com.

Aqua-Tronics A-6 Tracer: The Aqua-Tronics A-6 Tracer uses a different method of detecting metallic objects. This instrument measures the electrical conductivity of a metal object. It is capable of detecting any electrically conductive metal, including non-ferrous aluminum and brass. The Tracer is capable of detecting three-dimensional objects as well as pipes.

The Tracer consists of a transmitter coil and a receiver coil. In the absence of any electrically conductive material in the vicinity of the Tracer, the electromagnetic field around each coil is balanced.

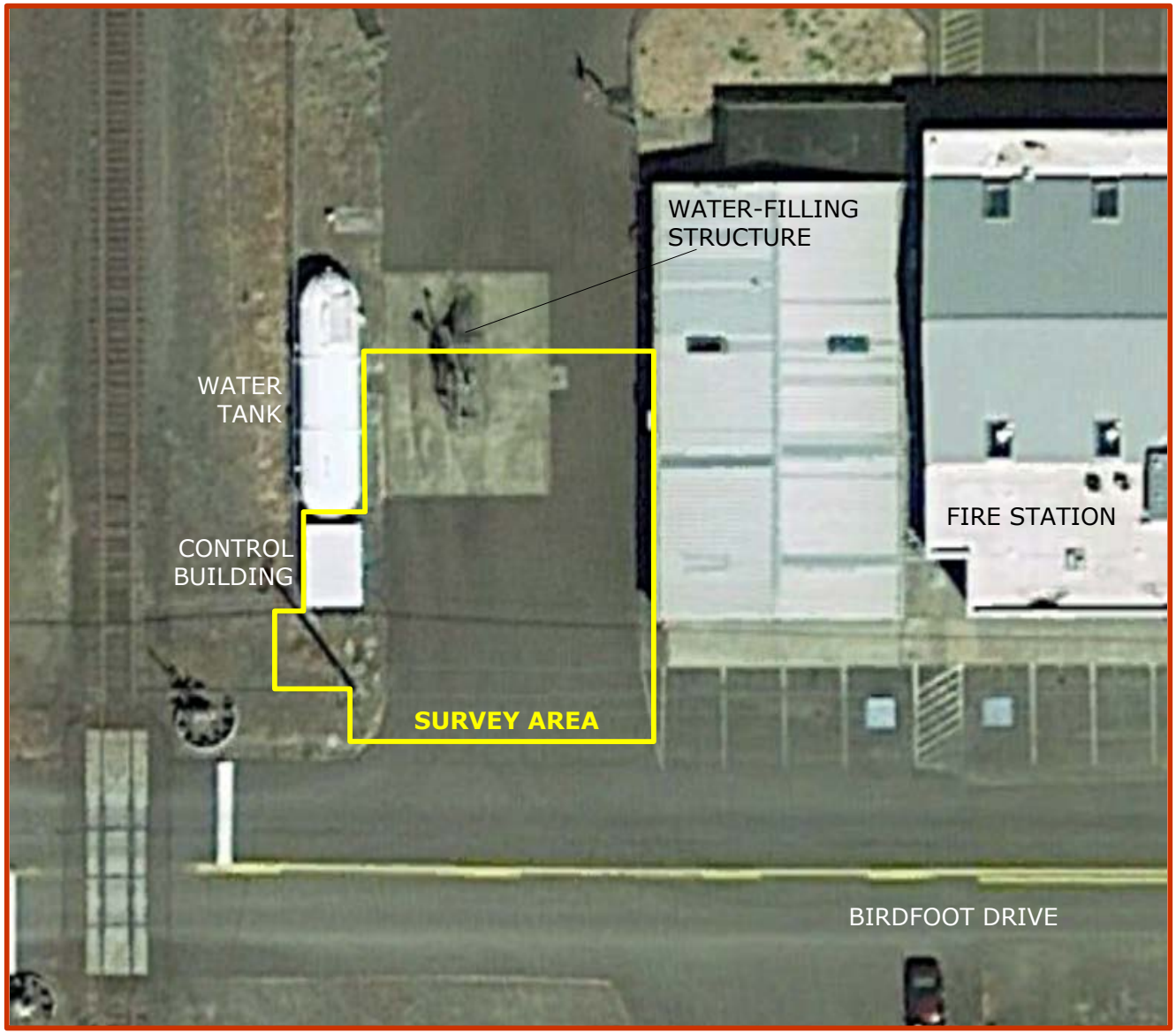
Basically, the electromagnetic field produced by the transmitter induces an electric current into the area surrounding the instrument. Nearby conductive objects distort the EM field. The balance between the two coils is disturbed and the instrument produces an audible tone and meter indication.

Radio Detection RD8000 PDL pipe and cable detector: This instrument may be used to detect buried, conductive pipes and utilities. It consists of a transmitter and a receiver and can be used in two configurations.

The transmitter may be used to directly apply a small electrical current to exposed, electrically conductive pipes and utilities. The RD receiver is then able to "trace" the underground portion of the pipe or utility, under some conditions for several hundred feet. The transmitter can also induce an electrical current into buried pipes and utilities where direct contact is not available.

The receiver can also be used alone. It has the capability to locate pipes and utilities by detecting the very small electrical currents induced into the features by nearby AM/FM radio stations.

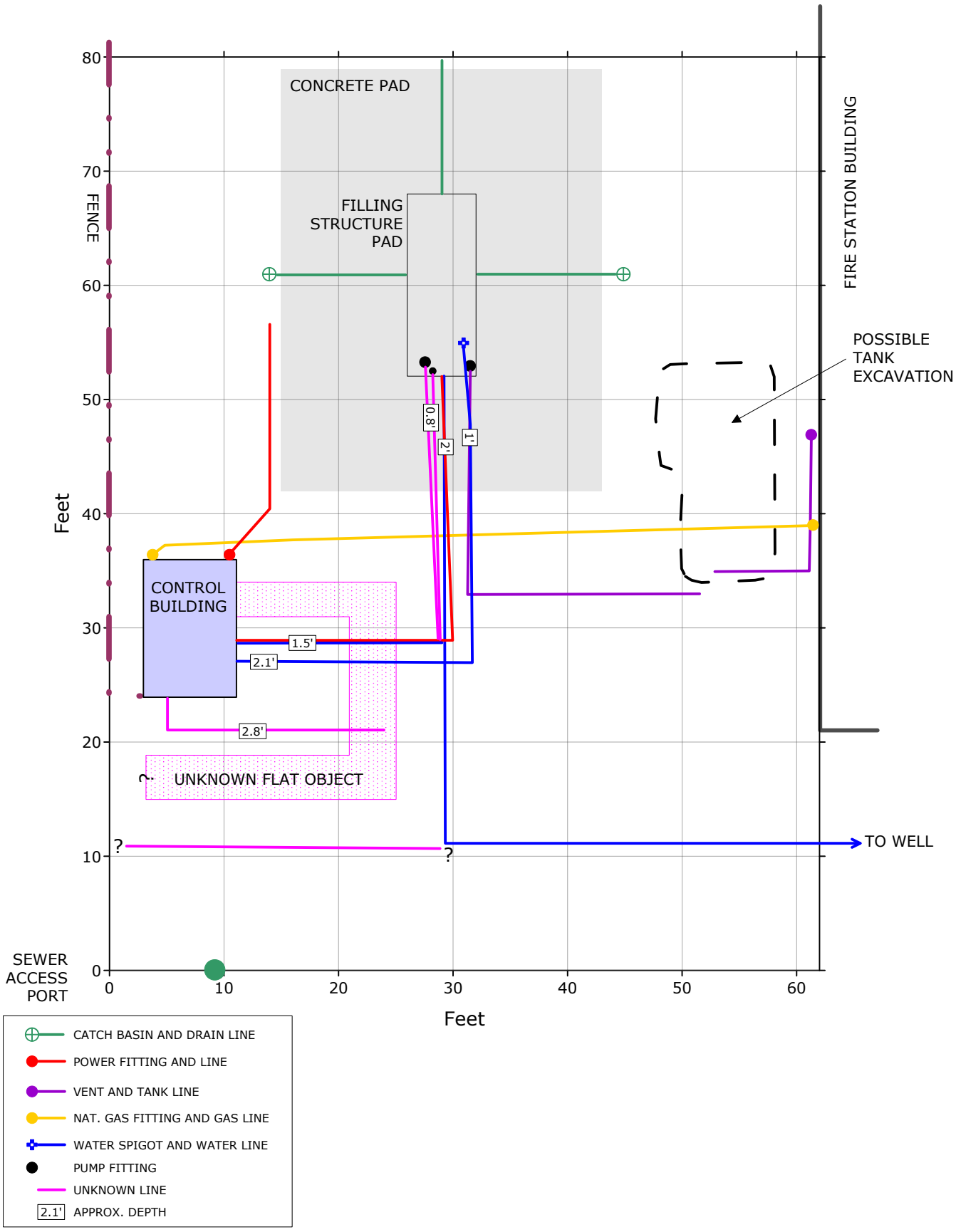
The receiver also has an AC power function that may be used to detect underground power lines.



PACIFIC GEOPHYSICS

N

FIGURE 1	Survey Location and Area	
	Project: 240914	UST and Utility Survey 32053 Birdfoot Drive Tangent, Oregon
	Drawn by : NT	Prepared for: Landau Associates
		Base Photo from Google Earth



PACIFIC GEOPHYSICS

FIGURE 2

Survey Results

Project: 240914	UST and Utility Survey 32053 Birdfoot Drive Tangent, Oregon
Drawn by : NT	Prepared for: Landau Associates
	Survey Date: January 21, 2025

APPENDIX C

Field Forms

Soil Classification System

MAJOR DIVISIONS			GRAPHIC SYMBOL	USCS LETTER SYMBOL[1]	TYPICAL DESCRIPTIONS [2][3]
COARSE-GRAINED SOIL (More than 50% of material is larger than No. 200 sieve size)	GRAVEL AND GRAVELLY SOIL (More than 50% of coarse fraction retained on No. 4 sieve)	CLEAN GRAVEL (Little or no fines)		GW	Well-graded gravel; gravel/sand mixture(s); little or no fines
				GP	Poorly graded gravel; gravel/sand mixture(s); little or no fines
		GRAVEL WITH FINES (Appreciable amount of fines)		GM	Silty gravel; gravel/sand/silt mixture(s)
				GC	Clayey gravel; gravel/sand/clay mixture(s)
	SAND AND SANDY SOIL (More than 50% of coarse fraction passed through No. 4 sieve)	CLEAN SAND (Little or no fines)		SW	Well-graded sand; gravelly sand; little or no fines
				SP	Poorly graded sand; gravelly sand; little or no fines
		SAND WITH FINES (Appreciable amount of fines)		SM	Silty sand; sand/silt mixture(s)
				SC	Clayey sand; sand/clay mixture(s)
FINE-GRAINED SOIL (More than 50% of material is smaller than No. 200 sieve size)	SILT AND CLAY (Liquid limit less than 50)			ML	Inorganic silt and very fine sand; rock flour; silty or clayey fine sand or clayey silt with slight plasticity
				CL	Inorganic clay of low to medium plasticity; gravelly clay; sandy clay; silty clay; lean clay
				OL	Organic silt; organic, silty clay of low plasticity
	SILT AND CLAY (Liquid limit greater than 50)			MH	Inorganic silt; micaceous or diatomaceous fine sand
				CH	Inorganic clay of high plasticity; fat clay
				OH	Organic clay of medium to high plasticity; organic silt
	HIGHLY ORGANIC SOIL			PT	Peat; humus; swamp soil with high organic content

OTHER MATERIALS	GRAPHIC SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
PAVEMENT		AC or PC	Asphalt concrete pavement or Portland cement pavement
ROCK		RK	Rock (See Rock Classification)
WOOD		WD	Wood, lumber, wood chips
DEBRIS		DB	Construction debris, garbage

Notes:
1. USCS letter symbols correspond to symbols used by the Unified Soil Classification System and ASTM classification methods. Dual letter symbols (e.g., SP-SM for sand or gravel) indicate soil with an estimated 5-15% fines. Multiple letter symbols (e.g., ML/CL) indicate borderline or multiple soil classifications.
2. Soil descriptions are based on the general approach presented in the Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), outlined in ASTM D 2488. Where laboratory index testing has been conducted, soil classifications are based on the Standard Test Method for Classification of Soils for Engineering Purposes, as outlined in ASTM D 2487.
3. Soil description terminology is based on visual estimates (in the absence of laboratory test data) of the percentages of each soil type and is defined as follows:

Primary Constituent:	> 50%	"GRAVEL," "SAND," "SILT," "CLAY," etc.
Secondary Constituents:	> 30% and ≤ 50%	"very gravelly," "very sandy," "very silty," etc.
	> 15% and ≤ 30%	"gravelly," "sandy," "silty," etc.
Additional Constituents:	> 5% and ≤ 15%	"with gravel," "with sand," "with silt," etc.
	≤ 5%	"trace gravel," "trace sand," "trace silt," etc., or not noted.

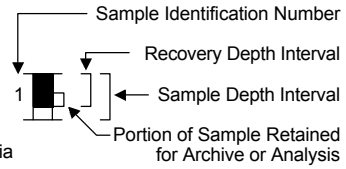
4. Soil density or consistency descriptions are based on judgement using a combination of sampler penetration blow counts, drilling or excavating conditions, field tests, and laboratory tests, as appropriate.

Drilling and Sampling Key

SAMPLER TYPE

Code	Description
a	3.25-inch O.D., 2.42-inch I.D. Split Spoon
b	2.00-inch O.D., 1.50-inch I.D. Split Spoon
c	Shelby Tube
d	Grab Sample
e	Single-Tube Core Barrel
f	Double-Tube Core Barrel
g	2.50-inch O.D., 2.00-inch I.D. WSDOT
h	3.00-inch O.D., 2.375-inch I.D. Mod. California
i	Other - See text if applicable
1	300-lb Hammer, 30-inch Drop
2	140-lb Hammer, 30-inch Drop
3	Pushed
4	Vibrocore (Rotosonic/Geoprobe)
5	Other - See text if applicable

SAMPLE NUMBER & INTERVAL



Field and Lab Test Data

Code	Description
PP = 1.0	Pocket Penetrometer, tsf
TV = 0.5	Torvane, tsf
PID = 100	Photoionization Detector VOC screening, ppm
W = 10	Moisture Content, %
D = 120	Dry Density, pcf
-200 = 60	Material smaller than No. 200 sieve, %
GS	Grain Size - See separate figure for data
AL	Atterberg Limits - See separate figure for data
GT	Other Geotechnical Testing
CA	Chemical Analysis

Groundwater

▽ Approximate water level at time of drilling (ATD)

▼ Approximate water level at time other than ATD

2/5/09 C:\DOCUMENTS AND SETTINGS\DOLCOTT\DESKTOP\TEST PROJECT.GPJ SOIL CLASS SHEET

LANDAU ASSOCIATES

Tangent Fire Department
UST Investigation
Tangent, Oregon

Soil Classification System and Key

Attachment 1

Exploration No. DP-1
Date 1/23/25 Hour 900

Log of Exploration

Project Name	Tangent Fire Department
Project No.	2358001.010
Client/owner	Tangent F.D.
Exploration Operator	Holt
Exploration Method	Direct Push
Logged by	TJH
Exploration Completed	
Ground Surface Conditions	Asphalt concrete
Weather Conditions	30's, partly cloudy

Location Sketch (show dimensions to mapped features)

North Arrow

44.5413995706667, -123.107992348833

(East) Coordinates: "x" ______ (North) "y" ______ Method ______

Elevations ______ Datum ______

Excavator Information

Geoprobe 7822 DT

Water Level Information

Date	1/23
Time	1000
Depth to Water	6.6
Hole Depth	20
Casing Depth	

Depth Scale (ft)	Sample Depth (top) (ft.) / Sample Length (ft.)	Recovery Length (ft.)	Retained Depth (top) (ft.) / Retained Length (ft.)	Sample Number	PID	Sheen (Y/N)	Staining (Y/N)	USCS Symbol / Unit Contact	Sample Description: Color, secondary soil type, PRIMARY SOIL TYPE with modifiers and minor components (density/consistency, moisture)(geologic unit)	Sample ID
0	0 / 5	5						AC / GP	AC (5")	
0.5									gravel Bace Rock (3")	
1					0.0	NS	N		gray-brn, CLAY w/ silt and debris (brick), moist - FILL, medium stiff to soft	
2.5					0.4	NS	N	CL	Brown @ 2.5'	
5	5 / 5	4.5			0.4	NS	N			
6									Brown, CLAY w/ silt, moist to wet, m-stiff to soft	DP-1(6-7) 1035
7					0.4	NS	N			
10	10 / 5	4			0.4	NS	N			DP-1W_012325 1055
13.5					0.4	NS	N			
14									w/ Trace medium GRAVEL and sand, moist, m-stiff to stiff	
15	15 / 5	5			0	NS	N			well set, screen set 15-20'
16									Becomes gravelly	
18					0	NS	N			
20									complete @ 20'	

Total Depth 20' Finish Date ______ Hour ______ Continued

Groundwater/Surface Water Sample Collection Form

LANDAU ASSOCIATES

rojet Name **Tangent Fire**
ocation **Tangent, OR**
Veather Clear, 30's
vent

Project Number **2358001.010**
Date/Time Collected 1/23/25 @ 1055
Sample Number DP-1W-012325
Landau Representative **TJH**

ATER LEVEL/WELL/PURGE DATA

ample Type: [X] Groundwater [ ] Surface Water [ ] Other Sample Location:

epth to Water (ft) 6.6 Time: Meas. From: [ ] Top of Protective Casing [ ] Top of Well Casing

'ell Casing Type: [X] PVC [ ] Stainless Steel [ ] Fiberglass Casing/Well Diameter (", whole no.): 3/4

'ell Condition: Secure (YES or NO) Damaged (YES or NO) Describe

ample Location:

egin Purge: Date/Time 1/23 1010 Casing Volume (gal): 0.31 gal

nd Purge: Date/Time Purge Volume (gal):

otal Depth of Well (ft. below top of well casing) 20'

urge Volume Calculation:

VOLUME OF SCHEDULE 40 PVC PIPE

Diameter (inch)	O.D. (inch)	I.D. (inch)	Volume (gal/ln ft)	Wt. Water (lbs/ln ft)
1.25	1.660	1.380	0.08	0.64
2	2.375	2.067	0.17	1.45
4	4.500	4.026	0.66	5.51
6			1.47	12.24

urge Water Disposal to: [X] 55-gal drum [ ] Storage Tank [ ] Ground [ ] Other Gal. Purged: 4.5

Vol. Purged (gal)	pH	Cond. (uS/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (°F/°C)	Other ORP	Comments/Observations
0.2	6.64	338.8	1000+	5.97	10.5	36.1	
.4	6.62	324.2	1000+	6.00	14.1	43.6	
.8	6.44	315.6	1000+	5.60	14.1	80.9	
1.5	6.44	314.6	1000+	5.14	13.8	89.3	
AMPLE COLLECTION DATA	303.9	1000+	4.70	12.9	123.4		
4.5	6.24						

ample Collected With: [ ] Bailer [X] Pump/Type Peristaltic

ade of: [ ] Stainless Steel [ ] PVC [ ] Teflon [ ] Polyethylene [ ] Other [ ] Dedicated

econ Procedure: [ ] Alconox Wash [ ] Tap Rinse [ ] DI Water [ ] Dedicated [ ] Other

ample Description (color, turbidity, odor, sheen, etc.): light brown, high Turbidity, no odor, no sheen

Replicate	pH	Cond (µS)	Turbidity	Diss. Oxygen	Temp (°F/°C)	Other
1						
2						
3						
4						

pH Meter: Cond Meter: Cond. Range Calibration Date:

eter Calibration Check: pH7 Buffer Reads _____ at _____ °C after sample collection.

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)
3	(8260) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX) WA [ ] OR [X]
4	(8270) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease) WA [ ] OR [X]
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO2) (NO3) (NO2) (F)
	(COD) (TOC) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)
	(Total cyanide) (WAD cyanide)
	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)
1	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silica)
	others

uplicate Sample No(s):

omments:

gnature: TJH Date 1/23/25

LANDAU ASSOCIATES

Exploration No. DP-2
Date 1/23/25 Hour

Log of Exploration

Project Name Tangent Fire Department Project No. 2358001.010

Client/owner Tangent F.D. Exploration Operator Holt

Exploration Method Direct Push

Logged by TJH Exploration Completed

Ground Surface Conditions Asphalt concrete

Weather Conditions Sun, 30's

Location Sketch (show dimensions to mapped features) North Arrow

44.541380570667, -123.108009961667

(East) (North)
Coordinates: "x" "y" Method

Elevations Datum

Excavator Information: Geoprobe 7822 DT

Water Level Information

Date		
Time	1056	
Depth to Water	4.3	
Hole Depth		
Casing Depth		

Sample Depth (top) (ft.)	Sample Length (ft.)	Recovery Length (ft.)	Retained Depth (top) (ft.)	Retained Length (ft.)	Sample Number	PID	Sheen (Y/N)	Staining (Y/N)	USCS Symbol / Unit Contact	Depth Scale (ft)	Sample Description: Color, secondary soil type, PRIMARY SOIL TYPE with modifiers and minor components (density/consistency, moisture)(geologic unit)	Sample ID
0	1.5	1.5							AC	0	AC (5.5" Thick)	
										1	GRAVEL (Basalt Rock)	hand dig to 1.5'
1.5	2	2				0	NS	N	GP	2		
3.5												
						0	NS	N	SP-SM	3	Brn, fine-medium SAND w/ silt -FILL	DP-2 (2.5-3) 1040
										4		
										5		
5	5	0								6	NO Recovery ~Driller notes very sandy, wet	
										7		
										8		
										9		
										10		
10	5	5				0	NS	N	CL		Brown ~~SILT~~ CLAY w/ silt, moist to wet, m. stiff to stiff	DP-2 (11-12) 1050
										2		
										3	w/ Trace gravel + sand, wet	
										4		
						0	NS	N		5	complete @ 15' 1365	
										6		
										7		
										8		
										9		
										0		

Total Depth 15' Finish Date Hour Continued

LANDAU ASSOCIATES

Exploration No. DP-3
Date 1/23/25 Hour

Log of Exploration

Project Name Tangent Fire Department Project No. 2358001.010

Client/owner Tangent F.D. Exploration Operator Holt

Exploration Method Direct Push

Logged by TJH Exploration Completed

Ground Surface Conditions Asphalt concrete

Weather Conditions Sun, 40s

Location Sketch (show dimensions to mapped features) North Arrow

44.541908072 N, -123.108010785 W

(East) (North)
Coordinates: "x" "y" Method

Elevations Datum

Excavator Information

Geoprobe
7822 DT

Water Level Information

Date	1/23	
Time	1210	
Depth to Water	4.3	
Hole Depth		
Casing Depth		

Sample Depth (top) (ft)	Sample Length (ft)	Recovery Length (ft)	Retained Depth (top) (ft)	Retained Length (ft)	Sample Number	PID	Sheen (Y/N)	Staining (Y/N)	USCS Symbol / Unit Contact	Depth Scale (ft)	Sample Description (Color, secondary soil type, PRIMARY SOIL TYPE with modifiers and minor components (density/consistency, moisture)(geologic unit))	Sample ID
0 / 5		4							AC / BP	0	AC (6")	
										1	Base Rock (4")	
						0	NS	N	CL	2	gray-brn SILT CLAY w/ silt (CL), moist, NO, NS m. stiff to soft	
											Brown @ 2'	
						0	NS			3		
						0	NS			4		
5 / 5		4.5				0	NS			5	SAA, m. stiff	
										6		
									CL	7		
						0	NS			8		DP-3 (8.5-9.5) 1200
						0	NS			9		
10 / 5		5				0	NS			0	SAA, m stiff	
										1		
										2		
						0	NS			3		
									CL	4		
15 / 5		4				0	NS	N		5	w/ m gravel + sand, wet	
										6		
										7		
									GC	8	Becomes brn + orange, f-m clayey GRAVEL w/ sand (GC), wet, m. dense	
						0	NS	N		9		
										20	complete @ 20'	

Total Depth 20' Finish Date Hour Continued

LANDAU ASSOCIATES

Exploration No. DP-4
Date 1/23/25 Hour

Log of Exploration

Project Name Tangent Fire Department Project No. 2358001.010

Client/owner Tangent F.D. Exploration Operator Holt

Exploration Method Direct Push

Logged by TJH Exploration Completed

Ground Surface Conditions Asphalt concrete

Weather Conditions Sun, 40s

Location Sketch (show dimensions to mapped features) North Arrow

44.541436451833, -123.10802669716 7

(East) (North)
Coordinates: "x" "y" Method

Elevations Datum

Excavator Information: Geoprobe 7822 DT

Water Level Information

Date	1/23	
Time	1240	
Depth to Water	4.3	
Hole Depth		
Casing Depth		

Sample Depth (top) (ft.)	Sample Length (ft.)	Recovery Length (ft.)	Retained Depth (top) (ft.)	Retained Length (ft.)	Sample Number	PID	Sheen (Y/N)	Staining (Y/N)	USCS Symbol / Unit Contact	Depth Scale (ft)	Sample Description (Color, secondary soil type, PRIMARY SOIL TYPE with modifiers and minor components (density/consistency, moisture)(geologic unit))	Sample ID
0	5	4							AC	0	AC - 8", 2" gravel	
						0	NS	N	CL	1	gray-brown, CLAY w/ Silt + trace gravel, moist, m. stiff, No sheen, no odor	
										2		
						0	NS	N		3	becomes Brown, w/o gravel; m	
										4		
5	5	4.5				0	NS	N		5	SAA, medium stiff	
										6		
										7		
						0	NS	N		8		
										9		DP-4 (8.5-9.5) 1230
10	5	5				0	NS	N	CL	0	becomes wet	
										1		
										2		
						0	NS	N		3		
										4	w/ gravel @ 13.5'	
										5		
										6	complete @ 15' 1365	
										7		
										8		
										9		
										0		

Total Depth Finish Date Hour Continued

Exploration No. DP-5
Date 1/23/25 Hour

Log of Exploration

Project Name Tangent Fire Department Project No. 2358001.010

Client/owner Tangent F.D. Exploration Operator Holt

Exploration Method Direct Push

Logged by TJH Exploration Completed

Ground Surface Conditions concrete

Weather Conditions Sun, 40s

Location Sketch (show dimensions to mapped features) — North Arrow

44.54143433433333, -123.10808873165

(East) (North)

Coordinates: "x" "y" Method

Elevations Datum

Excavator Information: Geoprobe 7822 DT

Water Level Information

Date	1/23	
Time	1315	
Depth to Water	4.4	
Hole Depth	15'	
Casing Depth	—	

Sample Depth (top) (ft)	Sample Length (ft)	Recovery Length (ft)	Retained Depth (top) (ft)	Retained Length (ft)	Sample Number	PID	Sheen (Y/N)	Staining (Y/N)	USCS Symbol / Unit Contact	Depth Scale (ft)	Sample Description (Color, secondary soil type, PRIMARY SOIL TYPE with modifiers and minor components (density/consistency, moisture)(geologic unit))	Sample ID
0	2.5	2.5							C / GP	0	concrete (6" thick)	
							SS		CL	1	grey, m-f GRAVEL (GP), tr. sand, moist (Basalt rock ~3")	Hand-cleared to 2.5'
2.5	2.5	2.5				0.0	SS	N		2	Brn CLAY w/ silt (CL), moist, NO, NS m stiff to soft	DP-5 (2-2.5) 855
						0	NS	N		3		
										4		
5 ~~7.5~~	4.5	4.5				0	NS	N		5	SAA, moist to wet	
										6		
						0	NS	N		7		
										8		DP-5 (8-9) 1304
10	5	5				0	NS	~~N~~		9	SAA, m. stiff, wet	
5										10		
										1		
										2		
						0	NS	N		3	w/ trace gravel and sand @ 13.5'	
										4		
										5	Complete @ 15'	
										6		
										7		
										8		
										9		
										10		

Total Depth 15' Finish Date Hour Continued

// GROUNDWATER LOW-FLOW SAMPLE COLLECTION FORM

Project Name: Tangent Fire Department
Event: UST Investigation
Weather: Sun, 40s
Landau Rep.: TJH

Project Number: 2358001.010
Well ID: LINN 63383
Sample ID: LINN63383_012325
Date: 1/23/25 Time: 1500

WELL INFORMATION

Screened Interval: Top (ft): 55 Bottom (ft): 144
DTW After Cap Opened (ft): 5.0' BGS Time: 1405
Static DTW (ft): Time:
Begin Purge (Date/Time): 1435 End Purge (Date/Time): 1458

Well Secure? ☐ No ☒ Yes Damaged? ☒ No ☐ Yes
Describe: water supply well - ~~abandoned~~ L138974
Flow-Thru Cell Vol.: WQM No.:
Gallons Purged: 2,591

Water Disposal: ☐ 55-gal drum ☐ Storage tank ☐ Ground ☐ Other:

PURGE DATA

Cell shading indicating purge stabilization is for informational purposes only.

Time	Temp (°C)	DO (mg/L)	Cond (µS/cm)	pH (S.U)	ORP (mV)	Turbidity (NTU)	DTW (ft)	Purge Vol ≥1 flow-thru cell vol.	Comments/ Observations
Stabilization →	± 3%	± 10%	± 3%	± 0.1 units	± 10 mV	± 10%	± 0.00 ft	(Yes/No)	
1440	14.2	5.68	370.9	7.31	183.9			yes	
1443	13.8	5.28	370.4	7.25	187.9			yes	
1446	13.8	5.48	370.2	7.15	194.9				
1449	14.1	5.29	370.2	7.13	197.6				
1452	14.1	5.26	370.0	7.13	199.2				
1455	13.9	5.21	369.8	7.12	201.0				
1458	14.0	5.09	370.2	7.11	202.3				

Sample Description (turbidity, color, odor, sheen): mostly clear, low turbidity, NO, NS Fe 2+ (mg/L):

PUMP AND MATERIAL INFORMATION

Collection Method: ☐ Bailer ☒ Pump Type: Peristaltic
Material: ☐ Stainless Steel ☐ PVC ☐ Teflon ☒ Polyethylene ☐ Other ☐ Dedicated
Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Dedicated
☐ Other (describe sequence):

CONFIRMATION PARAMETERS (if applicable per Landau Field Manual)

☐ Applicable

Time	Temp (°C)	DO (mg/L)	Cond (µS/cm)	pH (S.U)	ORP (mV)	Turbidity (NTU)	DTW (ft)	Comments/Observations

Scheduled Analysis (Circle/Bold Applicable)							Bottle Information	
							Number	Type
Volatiles:	8260	8260 SIM	8021	524	624		3	HCL VOAs
Semivolatiles:	8270	8270 SIM	8011	625	~pending / HOLD		2	HCL Ambs
Petroleum Hydrocarbons:	NWTPH-HCID	NWTPH-Gx	NWTPH-Dx	NWTPH-Dx SGC				
Total/Dissolved Metals:	6010	6020	200.7	200.8	7471	☒ Field Filtered	1	Nitric Poly
PCBs & Nitroaromatics:	8082	1668	608	8330				
Dioxin-Furans:	1613	8290						
PFAS:	1633	537.1	533	SOP				
Conventionals:	300.0	SM2450C	SM2450D	SM5310C	RSK175			
Other:								

Duplicate or Parent Sample ID: ☐ MS/MSD

Comments: ~Purged ~2,450 gal via well pump prior to low flow purge ~drew down to 9.6' BGS

Signature: Date: 1/23/25

APPENDIX D

Laboratory Analytical Reports

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

Thursday, February 6, 2025

Melody Kieneker
Landau Associates
1500 SW First Avenue Suite 1015
Portland, OR 97201

RE: A5A1479 - Tangent Fire Department - 2358001.010

Thank you for using Apex Laboratories. We greatly appreciate your business and strive to provide the highest quality services to the environmental industry.

Enclosed are the results of analyses for work order A5A1479, which was received by the laboratory on 1/23/2025 at 5:00:00PM.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: DAuvil@apex-labs.com, or by phone at 503-718-2323.

Please note: All samples will be disposed of within 30 days of sample receipt, unless prior arrangements have been made.

Cooler Receipt Information
Acceptable Receipt Temperature is less than, or equal to, 6 degC (not frozen), or received on ice the same day as sampling.
(See Cooler Receipt Form for details)
Default Cooler 4.7 degC

This Final Report is the official version of the data results for this sample submission, unless superseded by a subsequent, labeled amended report.
All other deliverables derived from this data, including Electronic Data Deliverables (EDDs), CLP-like forms, client requested summary sheets, and all other products are considered secondary to this report.

Apex Laboratories

The results in this report apply to the samples analyzed in accordance with the chain of custody document(s) and updated by any subsequent written communications. This analytical report must be reproduced in its entirety.

Darrell Auvil, Client Services Manager

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

Landau Associates	Project: **Tangent Fire Department**	
1500 SW First Avenue Suite 1015	Project Number: **2358001.010**	**Report ID:**
Portland, OR 97201	Project Manager: **Melody Kieneker**	**A5A1479 - 02 06 25 1509**

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
DP-1(6-7)	A5A1479-01	Soil	01/23/25 10:35	01/23/25 17:00
DP-IW_012325	A5A1479-02	Water	01/23/25 10:55	01/23/25 17:00
DP-2(2.5-3)	A5A1479-03	Soil	01/23/25 10:40	01/23/25 17:00
DP-3(8.5-9.5)	A5A1479-05	Soil	01/23/25 12:00	01/23/25 17:00
DP-4(8.5-9.5)	A5A1479-06	Soil	01/23/25 12:30	01/23/25 17:00
DP-5(2-2.5)	A5A1479-07	Soil	01/23/25 08:55	01/23/25 17:00
LINN63383_012325	A5A1479-09	Water	01/23/25 15:00	01/23/25 17:00

Apex Laboratories

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Darrell Auvil, Client Services Manager

APEX LABORATORIES

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

Landau Associates	Project: **Tangent Fire Department**	
1500 SW First Avenue Suite 1015	Project Number: **2358001.010**	**Report ID:**
Portland, OR 97201	Project Manager: **Melody Kieneker**	**A5A1479 - 02 06 25 1509**

ANALYTICAL SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
DP-1(6-7) (A5A1479-01)				**Matrix: Soil**		**Batch: 25A0976**		
Diesel	ND	---	23.7	mg/kg dry	1	01/30/25 02:17	NWTPH-Dx	
Oil	ND	---	47.5	mg/kg dry	1	01/30/25 02:17	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		*Recovery: 72 %*		*Limits: 50-150 %*	*1*	*01/30/25 02:17*	*NWTPH-Dx*	
DP-IW_012325 (A5A1479-02)				**Matrix: Water**		**Batch: 25A0918**		**DCNT**
Diesel	ND	---	0.0842	mg/L	1	01/28/25 20:32	NWTPH-Dx LL	
Oil	ND	---	0.168	mg/L	1	01/28/25 20:32	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		*Recovery: 92 %*		*Limits: 50-150 %*	*1*	*01/28/25 20:32*	*NWTPH-Dx LL*	
DP-2(2.5-3) (A5A1479-03)				**Matrix: Soil**		**Batch: 25A0976**		
Diesel	ND	---	20.0	mg/kg dry	1	01/30/25 02:58	NWTPH-Dx	
Oil	ND	---	40.0	mg/kg dry	1	01/30/25 02:58	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		*Recovery: 83 %*		*Limits: 50-150 %*	*1*	*01/30/25 02:58*	*NWTPH-Dx*	
DP-3(8.5-9.5) (A5A1479-05)				**Matrix: Soil**		**Batch: 25A0976**		
Diesel	ND	---	22.8	mg/kg dry	1	01/29/25 22:31	NWTPH-Dx	
Oil	ND	---	45.6	mg/kg dry	1	01/29/25 22:31	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		*Recovery: 80 %*		*Limits: 50-150 %*	*1*	*01/29/25 22:31*	*NWTPH-Dx*	
DP-4(8.5-9.5) (A5A1479-06)				**Matrix: Soil**		**Batch: 25A0976**		
Diesel	ND	---	23.9	mg/kg dry	1	01/29/25 21:29	NWTPH-Dx	
Oil	ND	---	47.8	mg/kg dry	1	01/29/25 21:29	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		*Recovery: 83 %*		*Limits: 50-150 %*	*1*	*01/29/25 21:29*	*NWTPH-Dx*	
DP-5(2-2.5) (A5A1479-07)				**Matrix: Soil**		**Batch: 25A0976**		
Diesel	ND	---	21.6	mg/kg dry	1	01/29/25 21:50	NWTPH-Dx	
Oil	ND	---	43.3	mg/kg dry	1	01/29/25 21:50	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		*Recovery: 69 %*		*Limits: 50-150 %*	*1*	*01/29/25 21:50*	*NWTPH-Dx*	

Apex Laboratories

Darrell Auvil, Client Services Manager

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APEX LABORATORIES

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

Landau Associates	Project: **Tangent Fire Department**	
1500 SW First Avenue Suite 1015	Project Number: **2358001.010**	**Report ID:**
Portland, OR 97201	Project Manager: **Melody Kieneker**	**A5A1479 - 02 06 25 1509**

ANALYTICAL SAMPLE RESULTS

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
DP-1(6-7) (A5A1479-01)				**Matrix: Soil**		**Batch: 25A0820**		
Gasoline Range Organics	ND	---	6.88	mg/kg dry	50	01/24/25 17:10	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		*Recovery: 105 %*	*Limits: 50-150 %*		*1*	*01/24/25 17:10*	*NWTPH-Gx (MS)*	
1,4-Difluorobenzene (Sur)			*100 %*	*50-150 %*	*1*	*01/24/25 17:10*	*NWTPH-Gx (MS)*	
DP-IW_012325 (A5A1479-02)				**Matrix: Water**		**Batch: 25A0844**		
Gasoline Range Organics	ND	---	0.100	mg/L	1	01/24/25 20:02	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		*Recovery: 96 %*	*Limits: 50-150 %*		*1*	*01/24/25 20:02*	*NWTPH-Gx (MS)*	
1,4-Difluorobenzene (Sur)			*100 %*	*50-150 %*	*1*	*01/24/25 20:02*	*NWTPH-Gx (MS)*	
DP-2(2.5-3) (A5A1479-03)				**Matrix: Soil**		**Batch: 25A0820**		
Gasoline Range Organics	ND	---	7.29	mg/kg dry	50	01/24/25 17:37	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		*Recovery: 106 %*	*Limits: 50-150 %*		*1*	*01/24/25 17:37*	*NWTPH-Gx (MS)*	
1,4-Difluorobenzene (Sur)			*100 %*	*50-150 %*	*1*	*01/24/25 17:37*	*NWTPH-Gx (MS)*	
DP-3(8.5-9.5) (A5A1479-05)				**Matrix: Soil**		**Batch: 25A0820**		
Gasoline Range Organics	ND	---	7.92	mg/kg dry	50	01/24/25 18:04	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		*Recovery: 107 %*	*Limits: 50-150 %*		*1*	*01/24/25 18:04*	*NWTPH-Gx (MS)*	
1,4-Difluorobenzene (Sur)			*102 %*	*50-150 %*	*1*	*01/24/25 18:04*	*NWTPH-Gx (MS)*	
DP-4(8.5-9.5) (A5A1479-06)				**Matrix: Soil**		**Batch: 25A0820**		
Gasoline Range Organics	ND	---	7.97	mg/kg dry	50	01/24/25 18:32	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		*Recovery: 104 %*	*Limits: 50-150 %*		*1*	*01/24/25 18:32*	*NWTPH-Gx (MS)*	
1,4-Difluorobenzene (Sur)			*101 %*	*50-150 %*	*1*	*01/24/25 18:32*	*NWTPH-Gx (MS)*	
DP-5(2-2.5) (A5A1479-07)				**Matrix: Soil**		**Batch: 25A0820**		
Gasoline Range Organics	ND	---	6.07	mg/kg dry	50	01/24/25 18:59	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		*Recovery: 104 %*	*Limits: 50-150 %*		*1*	*01/24/25 18:59*	*NWTPH-Gx (MS)*	
1,4-Difluorobenzene (Sur)			*101 %*	*50-150 %*	*1*	*01/24/25 18:59*	*NWTPH-Gx (MS)*	

Apex Laboratories

Darrell Auvil, Client Services Manager

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APEX LABORATORIES

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

Landau Associates	Project: **Tangent Fire Department**	
1500 SW First Avenue Suite 1015	Project Number: **2358001.010**	**Report ID:**
Portland, OR 97201	Project Manager: **Melody Kieneker**	**A5A1479 - 02 06 25 1509**

ANALYTICAL SAMPLE RESULTS

Selected Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
DP-IW_012325 (A5A1479-02)				**Matrix: Water**		**Batch: 25A0844**		
Benzene	ND	---	0.200	ug/L	1	01/24/25 20:02	EPA 8260D	
Toluene	ND	---	1.00	ug/L	1	01/24/25 20:02	EPA 8260D	
Ethylbenzene	ND	---	0.500	ug/L	1	01/24/25 20:02	EPA 8260D	
Xylenes, total	ND	---	1.50	ug/L	1	01/24/25 20:02	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND	---	1.00	ug/L	1	01/24/25 20:02	EPA 8260D	
Naphthalene	ND	---	5.00	ug/L	1	01/24/25 20:02	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	01/24/25 20:02	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	01/24/25 20:02	EPA 8260D	
Isopropylbenzene	ND	---	1.00	ug/L	1	01/24/25 20:02	EPA 8260D	
n-Propylbenzene	ND	---	0.500	ug/L	1	01/24/25 20:02	EPA 8260D	
1,2,4-Trimethylbenzene	ND	---	1.00	ug/L	1	01/24/25 20:02	EPA 8260D	
1,3,5-Trimethylbenzene	ND	---	1.00	ug/L	1	01/24/25 20:02	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		*Recovery:*	*99 %*	*Limits:*	*80-120 %*	*1*	*01/24/25 20:02*	*EPA 8260D*
Toluene-d8 (Surr)			*103 %*		*80-120 %*	*1*	*01/24/25 20:02*	*EPA 8260D*
4-Bromofluorobenzene (Surr)			*107 %*		*80-120 %*	*1*	*01/24/25 20:02*	*EPA 8260D*
LINN63383_012325 (A5A1479-09)				**Matrix: Water**		**Batch: 25A0844**		
Benzene	ND	---	0.200	ug/L	1	01/24/25 20:29	EPA 8260D	
Toluene	ND	---	1.00	ug/L	1	01/24/25 20:29	EPA 8260D	
Ethylbenzene	ND	---	0.500	ug/L	1	01/24/25 20:29	EPA 8260D	
Xylenes, total	ND	---	1.50	ug/L	1	01/24/25 20:29	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND	---	1.00	ug/L	1	01/24/25 20:29	EPA 8260D	
Naphthalene	ND	---	5.00	ug/L	1	01/24/25 20:29	EPA 8260D	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	01/24/25 20:29	EPA 8260D	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	01/24/25 20:29	EPA 8260D	
Isopropylbenzene	ND	---	1.00	ug/L	1	01/24/25 20:29	EPA 8260D	
n-Propylbenzene	ND	---	0.500	ug/L	1	01/24/25 20:29	EPA 8260D	
1,2,4-Trimethylbenzene	ND	---	1.00	ug/L	1	01/24/25 20:29	EPA 8260D	
1,3,5-Trimethylbenzene	ND	---	1.00	ug/L	1	01/24/25 20:29	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		*Recovery:*	*98 %*	*Limits:*	*80-120 %*	*1*	*01/24/25 20:29*	*EPA 8260D*
Toluene-d8 (Surr)			*104 %*		*80-120 %*	*1*	*01/24/25 20:29*	*EPA 8260D*
4-Bromofluorobenzene (Surr)			*108 %*		*80-120 %*	*1*	*01/24/25 20:29*	*EPA 8260D*

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6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

Landau Associates	Project: **Tangent Fire Department**	
1500 SW First Avenue Suite 1015	Project Number: **2358001.010**	**Report ID:**
Portland, OR 97201	Project Manager: **Melody Kieneker**	**A5A1479 - 02 06 25 1509**

ANALYTICAL SAMPLE RESULTS

Selected Volatile Organic Compounds by EPA 5035A/8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
DP-1(6-7) (A5A1479-01)				**Matrix: Soil**		**Batch: 25A0820**		
Benzene	ND	---	13.8	ug/kg dry	50	01/24/25 17:10	5035A/8260D	
Toluene	ND	---	68.8	ug/kg dry	50	01/24/25 17:10	5035A/8260D	
Ethylbenzene	ND	---	34.4	ug/kg dry	50	01/24/25 17:10	5035A/8260D	
Xylenes, total	ND	---	103	ug/kg dry	50	01/24/25 17:10	5035A/8260D	
Methyl tert-butyl ether (MTBE)	ND	---	68.8	ug/kg dry	50	01/24/25 17:10	5035A/8260D	
Naphthalene	ND	---	138	ug/kg dry	50	01/24/25 17:10	5035A/8260D	
1,2-Dibromoethane (EDB)	ND	---	68.8	ug/kg dry	50	01/24/25 17:10	5035A/8260D	
1,2-Dichloroethane (EDC)	ND	---	34.4	ug/kg dry	50	01/24/25 17:10	5035A/8260D	
Isopropylbenzene	ND	---	68.8	ug/kg dry	50	01/24/25 17:10	5035A/8260D	
n-Propylbenzene	ND	---	34.4	ug/kg dry	50	01/24/25 17:10	5035A/8260D	
1,2,4-Trimethylbenzene	ND	---	68.8	ug/kg dry	50	01/24/25 17:10	5035A/8260D	
1,3,5-Trimethylbenzene	ND	---	68.8	ug/kg dry	50	01/24/25 17:10	5035A/8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		*Recovery:*	*104 %*	*Limits: 80-120 %*	*1*	*01/24/25 17:10*	*5035A/8260D*	
Toluene-d8 (Surr)			*96 %*	*80-120 %*	*1*	*01/24/25 17:10*	*5035A/8260D*	
4-Bromofluorobenzene (Surr)			*98 %*	*79-120 %*	*1*	*01/24/25 17:10*	*5035A/8260D*	
DP-2(2.5-3) (A5A1479-03)				**Matrix: Soil**		**Batch: 25A0820**		
Benzene	ND	---	14.6	ug/kg dry	50	01/24/25 17:37	5035A/8260D	
Toluene	ND	---	72.9	ug/kg dry	50	01/24/25 17:37	5035A/8260D	
Ethylbenzene	ND	---	36.4	ug/kg dry	50	01/24/25 17:37	5035A/8260D	
Xylenes, total	ND	---	109	ug/kg dry	50	01/24/25 17:37	5035A/8260D	
Methyl tert-butyl ether (MTBE)	ND	---	72.9	ug/kg dry	50	01/24/25 17:37	5035A/8260D	
Naphthalene	ND	---	146	ug/kg dry	50	01/24/25 17:37	5035A/8260D	
1,2-Dibromoethane (EDB)	ND	---	72.9	ug/kg dry	50	01/24/25 17:37	5035A/8260D	
1,2-Dichloroethane (EDC)	ND	---	36.4	ug/kg dry	50	01/24/25 17:37	5035A/8260D	
Isopropylbenzene	ND	---	72.9	ug/kg dry	50	01/24/25 17:37	5035A/8260D	
n-Propylbenzene	ND	---	36.4	ug/kg dry	50	01/24/25 17:37	5035A/8260D	
1,2,4-Trimethylbenzene	ND	---	72.9	ug/kg dry	50	01/24/25 17:37	5035A/8260D	
1,3,5-Trimethylbenzene	ND	---	72.9	ug/kg dry	50	01/24/25 17:37	5035A/8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		*Recovery:*	*104 %*	*Limits: 80-120 %*	*1*	*01/24/25 17:37*	*5035A/8260D*	
Toluene-d8 (Surr)			*95 %*	*80-120 %*	*1*	*01/24/25 17:37*	*5035A/8260D*	
4-Bromofluorobenzene (Surr)			*98 %*	*79-120 %*	*1*	*01/24/25 17:37*	*5035A/8260D*	
DP-3(8.5-9.5) (A5A1479-05)				**Matrix: Soil**		**Batch: 25A0820**		

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503-718-2323
ORELAP ID: **OR100062**

Landau Associates	Project: **Tangent Fire Department**	
1500 SW First Avenue Suite 1015	Project Number: **2358001.010**	**Report ID:**
Portland, OR 97201	Project Manager: **Melody Kieneker**	**A5A1479 - 02 06 25 1509**

ANALYTICAL SAMPLE RESULTS

Selected Volatile Organic Compounds by EPA 5035A/8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
DP-3(8.5-9.5) (A5A1479-05)				**Matrix: Soil**		**Batch: 25A0820**		
Benzene	ND	---	15.8	ug/kg dry	50	01/24/25 18:04	5035A/8260D	
Toluene	ND	---	79.2	ug/kg dry	50	01/24/25 18:04	5035A/8260D	
Ethylbenzene	ND	---	39.6	ug/kg dry	50	01/24/25 18:04	5035A/8260D	
Xylenes, total	ND	---	119	ug/kg dry	50	01/24/25 18:04	5035A/8260D	
Methyl tert-butyl ether (MTBE)	ND	---	79.2	ug/kg dry	50	01/24/25 18:04	5035A/8260D	
Naphthalene	ND	---	158	ug/kg dry	50	01/24/25 18:04	5035A/8260D	
1,2-Dibromoethane (EDB)	ND	---	79.2	ug/kg dry	50	01/24/25 18:04	5035A/8260D	
1,2-Dichloroethane (EDC)	ND	---	39.6	ug/kg dry	50	01/24/25 18:04	5035A/8260D	
Isopropylbenzene	ND	---	79.2	ug/kg dry	50	01/24/25 18:04	5035A/8260D	
n-Propylbenzene	ND	---	39.6	ug/kg dry	50	01/24/25 18:04	5035A/8260D	
1,2,4-Trimethylbenzene	ND	---	79.2	ug/kg dry	50	01/24/25 18:04	5035A/8260D	
1,3,5-Trimethylbenzene	ND	---	79.2	ug/kg dry	50	01/24/25 18:04	5035A/8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		*Recovery:*	*105 %*	*Limits: 80-120 %*	*1*	*01/24/25 18:04*	*5035A/8260D*	
Toluene-d8 (Surr)			*96 %*	*80-120 %*	*1*	*01/24/25 18:04*	*5035A/8260D*	
4-Bromofluorobenzene (Surr)			*99 %*	*79-120 %*	*1*	*01/24/25 18:04*	*5035A/8260D*	
DP-4(8.5-9.5) (A5A1479-06)				**Matrix: Soil**		**Batch: 25A0820**		
Benzene	ND	---	15.9	ug/kg dry	50	01/24/25 18:32	5035A/8260D	
Toluene	ND	---	79.7	ug/kg dry	50	01/24/25 18:32	5035A/8260D	
Ethylbenzene	ND	---	39.9	ug/kg dry	50	01/24/25 18:32	5035A/8260D	
Xylenes, total	ND	---	120	ug/kg dry	50	01/24/25 18:32	5035A/8260D	
Methyl tert-butyl ether (MTBE)	ND	---	79.7	ug/kg dry	50	01/24/25 18:32	5035A/8260D	
Naphthalene	ND	---	159	ug/kg dry	50	01/24/25 18:32	5035A/8260D	
1,2-Dibromoethane (EDB)	ND	---	79.7	ug/kg dry	50	01/24/25 18:32	5035A/8260D	
1,2-Dichloroethane (EDC)	ND	---	39.9	ug/kg dry	50	01/24/25 18:32	5035A/8260D	
Isopropylbenzene	ND	---	79.7	ug/kg dry	50	01/24/25 18:32	5035A/8260D	
n-Propylbenzene	ND	---	39.9	ug/kg dry	50	01/24/25 18:32	5035A/8260D	
1,2,4-Trimethylbenzene	ND	---	79.7	ug/kg dry	50	01/24/25 18:32	5035A/8260D	
1,3,5-Trimethylbenzene	ND	---	79.7	ug/kg dry	50	01/24/25 18:32	5035A/8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		*Recovery:*	*104 %*	*Limits: 80-120 %*	*1*	*01/24/25 18:32*	*5035A/8260D*	
Toluene-d8 (Surr)			*96 %*	*80-120 %*	*1*	*01/24/25 18:32*	*5035A/8260D*	
4-Bromofluorobenzene (Surr)			*97 %*	*79-120 %*	*1*	*01/24/25 18:32*	*5035A/8260D*	
DP-5(2-2.5) (A5A1479-07)				**Matrix: Soil**		**Batch: 25A0820**		

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Apex Laboratories, LLC
6700 S.W. Sandburg Street
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503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

Landau Associates	Project: **Tangent Fire Department**	
1500 SW First Avenue Suite 1015	Project Number: **2358001.010**	**Report ID:**
Portland, OR 97201	Project Manager: **Melody Kieneker**	**A5A1479 - 02 06 25 1509**

ANALYTICAL SAMPLE RESULTS

Selected Volatile Organic Compounds by EPA 5035A/8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
DP-5(2-2.5) (A5A1479-07)				**Matrix: Soil**		**Batch: 25A0820**		
Benzene	ND	---	12.1	ug/kg dry	50	01/24/25 18:59	5035A/8260D	
Toluene	ND	---	60.7	ug/kg dry	50	01/24/25 18:59	5035A/8260D	
Ethylbenzene	ND	---	30.4	ug/kg dry	50	01/24/25 18:59	5035A/8260D	
Xylenes, total	ND	---	91.1	ug/kg dry	50	01/24/25 18:59	5035A/8260D	
Methyl tert-butyl ether (MTBE)	ND	---	60.7	ug/kg dry	50	01/24/25 18:59	5035A/8260D	
Naphthalene	ND	---	121	ug/kg dry	50	01/24/25 18:59	5035A/8260D	
1,2-Dibromoethane (EDB)	ND	---	60.7	ug/kg dry	50	01/24/25 18:59	5035A/8260D	
1,2-Dichloroethane (EDC)	ND	---	30.4	ug/kg dry	50	01/24/25 18:59	5035A/8260D	
Isopropylbenzene	ND	---	60.7	ug/kg dry	50	01/24/25 18:59	5035A/8260D	
n-Propylbenzene	ND	---	30.4	ug/kg dry	50	01/24/25 18:59	5035A/8260D	
1,2,4-Trimethylbenzene	ND	---	60.7	ug/kg dry	50	01/24/25 18:59	5035A/8260D	
1,3,5-Trimethylbenzene	ND	---	60.7	ug/kg dry	50	01/24/25 18:59	5035A/8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		*Recovery:*	*103 %*	*Limits: 80-120 %*	*1*	*01/24/25 18:59*	*5035A/8260D*	
Toluene-d8 (Surr)			*96 %*	*80-120 %*	*1*	*01/24/25 18:59*	*5035A/8260D*	
4-Bromofluorobenzene (Surr)			*98 %*	*79-120 %*	*1*	*01/24/25 18:59*	*5035A/8260D*	

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ORELAP ID: **OR100062**

ANALYTICAL REPORT

Landau Associates	Project: **Tangent Fire Department**	
1500 SW First Avenue Suite 1015	Project Number: **2358001.010**	**Report ID:**
Portland, OR 97201	Project Manager: **Melody Kieneker**	**A5A1479 - 02 06 25 1509**

ANALYTICAL SAMPLE RESULTS

Dissolved Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
DP-IW_012325 (A5A1479-02)				**Matrix: Water**				
Batch: 25A1073								
Lead	ND	---	0.200	ug/L	1	02/01/25 18:05	EPA 6020B (Diss)	
LINN63383_012325 (A5A1479-09)				**Matrix: Water**				
Batch: 25A1073								
Lead	ND	---	0.200	ug/L	1	02/01/25 18:26	EPA 6020B (Diss)	

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ANALYTICAL REPORT

Landau Associates	Project: **Tangent Fire Department**	
1500 SW First Avenue Suite 1015	Project Number: **2358001.010**	**Report ID:**
Portland, OR 97201	Project Manager: **Melody Kieneker**	**A5A1479 - 02 06 25 1509**

ANALYTICAL SAMPLE RESULTS

Percent Dry Weight

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
DP-1(6-7) (A5A1479-01)				**Matrix: Soil**		**Batch: 25A0818**		
% Solids	**74.9**	---	1.00	%	1	01/27/25 07:17	EPA 8000D	
DP-2(2.5-3) (A5A1479-03)				**Matrix: Soil**		**Batch: 25A0818**		
% Solids	**86.1**	---	1.00	%	1	01/27/25 07:17	EPA 8000D	
DP-3(8.5-9.5) (A5A1479-05)				**Matrix: Soil**		**Batch: 25A0818**		
% Solids	**74.8**	---	1.00	%	1	01/27/25 07:17	EPA 8000D	
DP-4(8.5-9.5) (A5A1479-06)				**Matrix: Soil**		**Batch: 25A0818**		
% Solids	**75.0**	---	1.00	%	1	01/27/25 07:17	EPA 8000D	
DP-5(2-2.5) (A5A1479-07)				**Matrix: Soil**		**Batch: 25A0818**		
% Solids	**80.9**	---	1.00	%	1	01/27/25 07:17	EPA 8000D	

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ANALYTICAL REPORT

Landau Associates	Project: **Tangent Fire Department**	
1500 SW First Avenue Suite 1015	Project Number: **2358001.010**	**Report ID:**
Portland, OR 97201	Project Manager: **Melody Kieneker**	**A5A1479 - 02 06 25 1509**

QUALITY CONTROL (QC) SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 25A0918 - EPA 3510C (Fuels/Acid Ext.)							**Water**					
Blank (25A0918-BLK1)			Prepared: 01/28/25 11:09		Analyzed: 01/28/25 19:22							
NWTPH-Dx LL												
Diesel	ND	---	0.0800	mg/L	1	---	---	---	---	---	---	
Oil	ND	---	0.160	mg/L	1	---	---	---	---	---	---	
Surr: o-Terphenyl (Surr)			*Recovery: 95 %*		*Limits: 50-150 %*			*Dilution: 1x*				
LCS (25A0918-BS1)			Prepared: 01/28/25 11:09		Analyzed: 01/28/25 19:45							
NWTPH-Dx LL												
Diesel	0.372	---	0.0800	mg/L	1	0.500	---	74	36-132%	---	---	
Surr: o-Terphenyl (Surr)			*Recovery: 94 %*		*Limits: 50-150 %*			*Dilution: 1x*				
LCS Dup (25A0918-BSD1)			Prepared: 01/28/25 11:09		Analyzed: 01/28/25 20:08							**Q-19**
NWTPH-Dx LL												
Diesel	0.396	---	0.0800	mg/L	1	0.500	---	79	36-132%	6	30%	
Surr: o-Terphenyl (Surr)			*Recovery: 94 %*		*Limits: 50-150 %*			*Dilution: 1x*				
Batch 25A0976 - EPA 3546 (Fuels)							**Soil**					
Blank (25A0976-BLK1)			Prepared: 01/29/25 11:25		Analyzed: 01/29/25 18:46							
NWTPH-Dx												
Diesel	ND	---	20.0	mg/kg wet	1	---	---	---	---	---	---	
Oil	ND	---	40.0	mg/kg wet	1	---	---	---	---	---	---	
Mineral Oil	ND	---	40.0	mg/kg wet	1	---	---	---	---	---	---	
Surr: o-Terphenyl (Surr)			*Recovery: 86 %*		*Limits: 50-150 %*			*Dilution: 1x*				
LCS (25A0976-BS1)			Prepared: 01/29/25 11:25		Analyzed: 01/29/25 19:06							
NWTPH-Dx												
Diesel	109	---	20.0	mg/kg wet	1	125	---	88	38-132%	---	---	
Surr: o-Terphenyl (Surr)			*Recovery: 89 %*		*Limits: 50-150 %*			*Dilution: 1x*				
Duplicate (25A0976-DUP1)			Prepared: 01/29/25 11:25		Analyzed: 01/30/25 01:56							**DCNT**
QC Source Sample: Non-SDG (A5A1447-01)												
Diesel	ND	---	34.1	mg/kg dry	1	---	ND	---	---	---	30%	
Oil	ND	---	68.2	mg/kg dry	1	---	ND	---	---	**---**	**30%**	Q-05

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ORELAP ID: OR100062

ANALYTICAL REPORT

Landau Associates	Project: **Tangent Fire Department**	
1500 SW First Avenue Suite 1015	Project Number: **2358001.010**	**Report ID:**
Portland, OR 97201	Project Manager: **Melody Kieneker**	**A5A1479 - 02 06 25 1509**

QUALITY CONTROL (QC) SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 25A0976 - EPA 3546 (Fuels)							**Soil**					
Duplicate (25A0976-DUP1)			Prepared: 01/29/25 11:25		Analyzed: 01/30/25 01:56							**DCNT**
QC Source Sample: Non-SDG (A5A1447-01)												
Mineral Oil	ND	---	68.2	mg/kg dry	1	---	ND	---	---	---	30%	
Surr: o-Terphenyl (Surr)		*Recovery: 83 %*		*Limits: 50-150 %*			*Dilution: 1x*					
Duplicate (25A0976-DUP2)			Prepared: 01/29/25 11:25		Analyzed: 01/29/25 23:53							
QC Source Sample: Non-SDG (A5A1529-02)												
Diesel	ND	---	18.7	mg/kg dry	1	---	ND	---	---	---	30%	
Oil	ND	---	37.5	mg/kg dry	1	---	ND	---	---	---	30%	
Mineral Oil	ND	---	37.5	mg/kg dry	1	---	ND	---	---	---	30%	
Surr: o-Terphenyl (Surr)		*Recovery: 83 %*		*Limits: 50-150 %*			*Dilution: 1x*					

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Darrell Auvil, Client Services Manager

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APEX LABORATORIES

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

Landau Associates	Project: **Tangent Fire Department**	
1500 SW First Avenue Suite 1015	Project Number: **2358001.010**	**Report ID:**
Portland, OR 97201	Project Manager: **Melody Kieneker**	**A5A1479 - 02 06 25 1509**

QUALITY CONTROL (QC) SAMPLE RESULTS

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 25A0820 - EPA 5035A												**Soil**
Blank (25A0820-BLK1)			Prepared: 01/24/25 09:00 Analyzed: 01/24/25 12:09									
NWTPH-Gx (MS)												
Gasoline Range Organics	ND	---	5.00	mg/kg wet	50	---	---	---	---	---	---	
Surr: 4-Bromofluorobenzene (Sur)		*Recovery: 102 %*	*Limits: 50-150 %*		*Dilution: 1x*							
1,4-Difluorobenzene (Sur)		*97 %*	*50-150 %*		*"*							
LCS (25A0820-BS2)			Prepared: 01/24/25 09:00 Analyzed: 01/24/25 11:42									
NWTPH-Gx (MS)												
Gasoline Range Organics	22.6	---	5.00	mg/kg wet	50	25.0	---	90	80-120%	---	---	
Surr: 4-Bromofluorobenzene (Sur)		*Recovery: 98 %*	*Limits: 50-150 %*		*Dilution: 1x*							
1,4-Difluorobenzene (Sur)		*94 %*	*50-150 %*		*"*							
Duplicate (25A0820-DUP1)			Prepared: 01/23/25 08:55 Analyzed: 01/24/25 19:26									
QC Source Sample: DP-5(2-2.5) (A5A1479-07)												
NWTPH-Gx (MS)												
Gasoline Range Organics	ND	---	6.07	mg/kg dry	50	---	ND	---	---	---	30%	
Surr: 4-Bromofluorobenzene (Sur)		*Recovery: 105 %*	*Limits: 50-150 %*		*Dilution: 1x*							
1,4-Difluorobenzene (Sur)		*101 %*	*50-150 %*		*"*							
Duplicate (25A0820-DUP2)			Prepared: 01/20/25 00:00 Analyzed: 01/24/25 23:05									
QC Source Sample: Non-SDG (A5A1335-02)												
Gasoline Range Organics	**3420**	---	66.2	mg/kg dry	500	---	4030	---	---	17	30%	
Surr: 4-Bromofluorobenzene (Sur)		*Recovery: 107 %*	*Limits: 50-150 %*		*Dilution: 1x*							
1,4-Difluorobenzene (Sur)		*95 %*	*50-150 %*		*"*							

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ORELAP ID: **OR100062**

ANALYTICAL REPORT

Landau Associates	Project: **Tangent Fire Department**	
1500 SW First Avenue Suite 1015	Project Number: **2358001.010**	**Report ID:**
Portland, OR 97201	Project Manager: **Melody Kieneker**	**A5A1479 - 02 06 25 1509**

QUALITY CONTROL (QC) SAMPLE RESULTS

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 25A0844 - EPA 5030C												**Water**
Blank (25A0844-BLK1)			Prepared: 01/24/25 13:00 Analyzed: 01/24/25 14:59									
NWTPH-Gx (MS)												
Gasoline Range Organics	ND	---	0.100	mg/L	1	---	---	---	---	---	---	
Surr: 4-Bromofluorobenzene (Sur)			*Recovery: 96 %*		*Limits: 50-150 %*			*Dilution: 1x*				
1,4-Difluorobenzene (Sur)			*100 %*		*50-150 %*			*"*				
LCS (25A0844-BS2)			Prepared: 01/24/25 13:00 Analyzed: 01/24/25 14:32									
NWTPH-Gx (MS)												
Gasoline Range Organics	0.470	---	0.100	mg/L	1	0.500	---	94	80-120%	---	---	
Surr: 4-Bromofluorobenzene (Sur)			*Recovery: 93 %*		*Limits: 50-150 %*			*Dilution: 1x*				
1,4-Difluorobenzene (Sur)			*96 %*		*50-150 %*			*"*				
Duplicate (25A0844-DUP1)			Prepared: 01/24/25 14:16 Analyzed: 01/25/25 01:31									
QC Source Sample: Non-SDG (A5A1444-03)												
Gasoline Range Organics	**6.59**	---	5.00	mg/L	50	---	6.51	---	---	1	30%	
Surr: 4-Bromofluorobenzene (Sur)			*Recovery: 102 %*		*Limits: 50-150 %*			*Dilution: 1x*				
1,4-Difluorobenzene (Sur)			*99 %*		*50-150 %*			*"*				
Duplicate (25A0844-DUP2)			Prepared: 01/24/25 14:16 Analyzed: 01/25/25 02:53									**T-02**
QC Source Sample: Non-SDG (A5A1485-11)												
Gasoline Range Organics	**5.54**	---	1.00	mg/L	10	---	5.86	---	---	6	30%	
Surr: 4-Bromofluorobenzene (Sur)			*Recovery: 100 %*		*Limits: 50-150 %*			*Dilution: 1x*				
1,4-Difluorobenzene (Sur)			*98 %*		*50-150 %*			*"*				

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Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

Landau Associates	Project: **Tangent Fire Department**	
1500 SW First Avenue Suite 1015	Project Number: **2358001.010**	**Report ID:**
Portland, OR 97201	Project Manager: **Melody Kieneker**	**A5A1479 - 02 06 25 1509**

QUALITY CONTROL (QC) SAMPLE RESULTS

Selected Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 25A0844 - EPA 5030C												**Water**
Blank (25A0844-BLK1)			Prepared: 01/24/25 13:00 Analyzed: 01/24/25 14:59									
EPA 8260D												
Benzene	ND	---	0.200	ug/L	1	---	---	---	---	---	---	
Toluene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Ethylbenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Xylenes, total	ND	---	1.50	ug/L	1	---	---	---	---	---	---	
Methyl tert-butyl ether (MTBE)	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Naphthalene	ND	---	5.00	ug/L	1	---	---	---	---	---	---	
1,2-Dibromoethane (EDB)	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,2-Dichloroethane (EDC)	ND	---	0.400	ug/L	1	---	---	---	---	---	---	
Isopropylbenzene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
n-Propylbenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
1,2,4-Trimethylbenzene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
1,3,5-Trimethylbenzene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Surr: 1,4-Difluorobenzene (Surr)			*Recovery: 98 %*		*Limits: 80-120 %*				*Dilution: 1x*			
Toluene-d8 (Surr)			*103 %*		*80-120 %*				*"*			
4-Bromofluorobenzene (Surr)			*109 %*		*80-120 %*				*"*			
LCS (25A0844-BS1)			Prepared: 01/24/25 13:00 Analyzed: 01/24/25 14:04									
EPA 8260D												
Benzene	17.5	---	0.200	ug/L	1	20.0	---	87	80-120%	---	---	
Toluene	17.8	---	1.00	ug/L	1	20.0	---	89	80-120%	---	---	
Ethylbenzene	19.3	---	0.500	ug/L	1	20.0	---	97	80-120%	---	---	
Xylenes, total	56.5	---	1.50	ug/L	1	60.0	---	94	80-120%	---	---	
Methyl tert-butyl ether (MTBE)	19.7	---	1.00	ug/L	1	20.0	---	98	80-120%	---	---	
Naphthalene	18.8	---	5.00	ug/L	1	20.0	---	94	80-120%	---	---	
1,2-Dibromoethane (EDB)	19.9	---	0.500	ug/L	1	20.0	---	99	80-120%	---	---	
1,2-Dichloroethane (EDC)	18.4	---	0.400	ug/L	1	20.0	---	92	80-120%	---	---	
Isopropylbenzene	18.1	---	1.00	ug/L	1	20.0	---	91	80-120%	---	---	
n-Propylbenzene	19.7	---	0.500	ug/L	1	20.0	---	99	80-120%	---	---	
1,2,4-Trimethylbenzene	19.7	---	1.00	ug/L	1	20.0	---	98	80-120%	---	---	
1,3,5-Trimethylbenzene	22.6	---	1.00	ug/L	1	20.0	---	113	80-120%	---	---	
Surr: 1,4-Difluorobenzene (Surr)			*Recovery: 95 %*		*Limits: 80-120 %*				*Dilution: 1x*			
Toluene-d8 (Surr)			*100 %*		*80-120 %*				*"*			
4-Bromofluorobenzene (Surr)			*95 %*		*80-120 %*				*"*			

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Darrell Auvil, Client Services Manager

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Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

Landau Associates	Project: **Tangent Fire Department**	
1500 SW First Avenue Suite 1015	Project Number: **2358001.010**	**Report ID:**
Portland, OR 97201	Project Manager: **Melody Kieneker**	**A5A1479 - 02 06 25 1509**

QUALITY CONTROL (QC) SAMPLE RESULTS

Selected Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 25A0844 - EPA 5030C												**Water**
Duplicate (25A0844-DUP1)				Prepared: 01/24/25 14:16 Analyzed: 01/25/25 01:31								
QC Source Sample: Non-SDG (A5A1444-03)												
Benzene	**22.0**	---	10.0	ug/L	50	---	22.0	---	---	0	30%	
Toluene	ND	---	50.0	ug/L	50	---	ND	---	---	---	30%	
Ethylbenzene	**92.5**	---	25.0	ug/L	50	---	90.0	---	---	3	30%	
Xylenes, total	**124**	---	75.0	ug/L	50	---	117	---	---	5	30%	
Methyl tert-butyl ether (MTBE)	ND	---	50.0	ug/L	50	---	ND	---	---	---	30%	
Naphthalene	ND	---	250	ug/L	50	---	ND	---	---	---	30%	
1,2-Dibromoethane (EDB)	ND	---	25.0	ug/L	50	---	ND	---	---	---	30%	
1,2-Dichloroethane (EDC)	ND	---	20.0	ug/L	50	---	ND	---	---	---	30%	
Isopropylbenzene	ND	---	50.0	ug/L	50	---	ND	---	---	---	30%	
n-Propylbenzene	**29.5**	---	25.0	ug/L	50	---	28.5	---	---	3	30%	
1,2,4-Trimethylbenzene	**286**	---	50.0	ug/L	50	---	281	---	---	2	30%	
1,3,5-Trimethylbenzene	**68.0**	---	50.0	ug/L	50	---	67.0	---	---	1	30%	
Surr: 1,4-Difluorobenzene (Surr)			*Recovery: 100 %*		*Limits: 80-120 %*			*Dilution: 1x*				
Toluene-d8 (Surr)			*102 %*		*80-120 %*			*"*				
4-Bromofluorobenzene (Surr)			*105 %*		*80-120 %*			*"*				
Duplicate (25A0844-DUP2)				Prepared: 01/24/25 14:16 Analyzed: 01/25/25 02:53								**T-02**
QC Source Sample: Non-SDG (A5A1485-11)												
Benzene	**43.2**	---	2.00	ug/L	10	---	44.0	---	---	2	30%	
Toluene	ND	---	10.0	ug/L	10	---	ND	---	---	---	30%	
Ethylbenzene	**140**	---	5.00	ug/L	10	---	147	---	---	5	30%	
Xylenes, total	**173**	---	15.0	ug/L	10	---	185	---	---	7	30%	
Methyl tert-butyl ether (MTBE)	ND	---	10.0	ug/L	10	---	ND	---	---	---	30%	
Naphthalene	**51.2**	---	50.0	ug/L	10	---	57.1	---	---	11	30%	
1,2-Dibromoethane (EDB)	ND	---	5.00	ug/L	10	---	ND	---	---	---	30%	
1,2-Dichloroethane (EDC)	ND	---	4.00	ug/L	10	---	ND	---	---	---	30%	
Isopropylbenzene	**21.8**	---	10.0	ug/L	10	---	24.0	---	---	10	30%	
n-Propylbenzene	**69.5**	---	5.00	ug/L	10	---	75.5	---	---	8	30%	
1,2,4-Trimethylbenzene	**326**	---	10.0	ug/L	10	---	357	---	---	9	30%	
1,3,5-Trimethylbenzene	**31.0**	---	10.0	ug/L	10	---	33.9	---	---	9	30%	
Surr: 1,4-Difluorobenzene (Surr)			*Recovery: 98 %*		*Limits: 80-120 %*			*Dilution: 1x*				
Toluene-d8 (Surr)			*103 %*		*80-120 %*			*"*				

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ANALYTICAL REPORT

Landau Associates	Project: **Tangent Fire Department**	
1500 SW First Avenue Suite 1015	Project Number: **2358001.010**	**Report ID:**
Portland, OR 97201	Project Manager: **Melody Kieneker**	**A5A1479 - 02 06 25 1509**

QUALITY CONTROL (QC) SAMPLE RESULTS

Selected Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 25A0844 - EPA 5030C							**Water**					
Duplicate (25A0844-DUP2)			Prepared: 01/24/25 14:16 Analyzed: 01/25/25 02:53									**T-02**
QC Source Sample: Non-SDG (A5A1485-11)												
Surr: 4-Bromofluorobenzene (Surr)			*Recovery: 100 %*	*Limits: 80-120 %*			*Dilution: 1x*					
Matrix Spike (25A0844-MS1)			Prepared: 01/24/25 14:16 Analyzed: 01/24/25 20:56									
QC Source Sample: LINN63383_012325 (A5A1479-09)												
EPA 8260D												
Benzene	18.7	---	0.200	ug/L	1	20.0	ND	94	79-120%	---	---	
Toluene	18.8	---	1.00	ug/L	1	20.0	ND	94	80-121%	---	---	
Ethylbenzene	20.3	---	0.500	ug/L	1	20.0	ND	102	79-121%	---	---	
Xylenes, total	58.5	---	1.50	ug/L	1	60.0	ND	97	79-121%	---	---	
Methyl tert-butyl ether (MTBE)	19.1	---	1.00	ug/L	1	20.0	ND	95	71-124%	---	---	
Naphthalene	18.5	---	5.00	ug/L	1	20.0	ND	92	61-128%	---	---	
1,2-Dibromoethane (EDB)	19.2	---	0.500	ug/L	1	20.0	ND	96	77-121%	---	---	
1,2-Dichloroethane (EDC)	18.9	---	0.400	ug/L	1	20.0	ND	94	73-128%	---	---	
Isopropylbenzene	18.8	---	1.00	ug/L	1	20.0	ND	94	72-131%	---	---	
n-Propylbenzene	20.3	---	0.500	ug/L	1	20.0	ND	101	76-126%	---	---	
1,2,4-Trimethylbenzene	19.6	---	1.00	ug/L	1	20.0	ND	98	76-124%	---	---	
1,3,5-Trimethylbenzene	22.5	---	1.00	ug/L	1	20.0	ND	113	75-124%	---	---	
Surr: 1,4-Difluorobenzene (Surr)			*Recovery: 96 %*	*Limits: 80-120 %*			*Dilution: 1x*					
Toluene-d8 (Surr)			*98 %*	*80-120 %*			*"*					
4-Bromofluorobenzene (Surr)			*96 %*	*80-120 %*			*"*					

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ORELAP ID: **OR100062**

ANALYTICAL REPORT

Landau Associates	Project: **Tangent Fire Department**	
1500 SW First Avenue Suite 1015	Project Number: **2358001.010**	**Report ID:**
Portland, OR 97201	Project Manager: **Melody Kieneker**	**A5A1479 - 02 06 25 1509**

QUALITY CONTROL (QC) SAMPLE RESULTS

Selected Volatile Organic Compounds by EPA 5035A/8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 25A0820 - EPA 5035A							**Soil**					
Blank (25A0820-BLK1)			Prepared: 01/24/25 09:00 Analyzed: 01/24/25 12:09									
5035A/8260D												
Benzene	ND	---	10.0	ug/kg wet	50	---	---	---	---	---	---	
Toluene	ND	---	50.0	ug/kg wet	50	---	---	---	---	---	---	
Ethylbenzene	ND	---	25.0	ug/kg wet	50	---	---	---	---	---	---	
Xylenes, total	ND	---	75.0	ug/kg wet	50	---	---	---	---	---	---	
Methyl tert-butyl ether (MTBE)	ND	---	50.0	ug/kg wet	50	---	---	---	---	---	---	
Naphthalene	ND	---	100	ug/kg wet	50	---	---	---	---	---	---	
1,2-Dibromoethane (EDB)	ND	---	50.0	ug/kg wet	50	---	---	---	---	---	---	
1,2-Dichloroethane (EDC)	ND	---	25.0	ug/kg wet	50	---	---	---	---	---	---	
Isopropylbenzene	ND	---	50.0	ug/kg wet	50	---	---	---	---	---	---	
n-Propylbenzene	ND	---	25.0	ug/kg wet	50	---	---	---	---	---	---	
1,2,4-Trimethylbenzene	ND	---	50.0	ug/kg wet	50	---	---	---	---	---	---	
1,3,5-Trimethylbenzene	ND	---	50.0	ug/kg wet	50	---	---	---	---	---	---	
Surr: 1,4-Difluorobenzene (Surr)		*Recovery:*	*106 %*	*Limits:*	*80-120 %*		*Dilution:*	*1x*				
Toluene-d8 (Surr)			*94 %*		*80-120 %*			*"*				
4-Bromofluorobenzene (Surr)			*100 %*		*79-120 %*			*"*				
LCS (25A0820-BS1)			Prepared: 01/24/25 09:00 Analyzed: 01/24/25 11:14									
5035A/8260D												
Benzene	981	---	10.0	ug/kg wet	50	1000	---	98	80-120%	---	---	
Toluene	910	---	50.0	ug/kg wet	50	1000	---	91	80-120%	---	---	
Ethylbenzene	950	---	25.0	ug/kg wet	50	1000	---	95	80-120%	---	---	
Xylenes, total	2890	---	75.0	ug/kg wet	50	3000	---	96	80-120%	---	---	
Methyl tert-butyl ether (MTBE)	1020	---	50.0	ug/kg wet	50	1000	---	102	80-120%	---	---	
Naphthalene	905	---	100	ug/kg wet	50	1000	---	90	80-120%	---	---	
1,2-Dibromoethane (EDB)	1030	---	50.0	ug/kg wet	50	1000	---	103	80-120%	---	---	
1,2-Dichloroethane (EDC)	934	---	25.0	ug/kg wet	50	1000	---	93	80-120%	---	---	
Isopropylbenzene	999	---	50.0	ug/kg wet	50	1000	---	100	80-120%	---	---	
n-Propylbenzene	916	---	25.0	ug/kg wet	50	1000	---	92	80-120%	---	---	
1,2,4-Trimethylbenzene	941	---	50.0	ug/kg wet	50	1000	---	94	80-120%	---	---	
1,3,5-Trimethylbenzene	946	---	50.0	ug/kg wet	50	1000	---	95	80-120%	---	---	
Surr: 1,4-Difluorobenzene (Surr)		*Recovery:*	*105 %*	*Limits:*	*80-120 %*		*Dilution:*	*1x*				
Toluene-d8 (Surr)			*97 %*		*80-120 %*			*"*				
4-Bromofluorobenzene (Surr)			*98 %*		*79-120 %*			*"*				

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ORELAP ID: **OR100062**

ANALYTICAL REPORT

Landau Associates	Project: **Tangent Fire Department**	
1500 SW First Avenue Suite 1015	Project Number: **2358001.010**	**Report ID:**
Portland, OR 97201	Project Manager: **Melody Kieneker**	**A5A1479 - 02 06 25 1509**

QUALITY CONTROL (QC) SAMPLE RESULTS

Selected Volatile Organic Compounds by EPA 5035A/8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 25A0820 - EPA 5035A							**Soil**					
Duplicate (25A0820-DUP1)			Prepared: 01/23/25 08:55 Analyzed: 01/24/25 19:26									
QC Source Sample: DP-5(2-2.5) (A5A1479-07)												
5035A/8260D												
Benzene	ND	---	12.1	ug/kg dry	50	---	ND	---	---	---	30%	
Toluene	ND	---	60.7	ug/kg dry	50	---	ND	---	---	---	30%	
Ethylbenzene	ND	---	30.4	ug/kg dry	50	---	ND	---	---	---	30%	
Xylenes, total	ND	---	91.1	ug/kg dry	50	---	ND	---	---	---	30%	
Methyl tert-butyl ether (MTBE)	ND	---	60.7	ug/kg dry	50	---	ND	---	---	---	30%	
Naphthalene	ND	---	121	ug/kg dry	50	---	ND	---	---	---	30%	
1,2-Dibromoethane (EDB)	ND	---	60.7	ug/kg dry	50	---	ND	---	---	---	30%	
1,2-Dichloroethane (EDC)	ND	---	30.4	ug/kg dry	50	---	ND	---	---	---	30%	
Isopropylbenzene	ND	---	60.7	ug/kg dry	50	---	ND	---	---	---	30%	
n-Propylbenzene	ND	---	30.4	ug/kg dry	50	---	ND	---	---	---	30%	
1,2,4-Trimethylbenzene	ND	---	60.7	ug/kg dry	50	---	ND	---	---	---	30%	
1,3,5-Trimethylbenzene	ND	---	60.7	ug/kg dry	50	---	ND	---	---	---	30%	
Surr: 1,4-Difluorobenzene (Surr)			*Recovery: 105 %*	*Limits: 80-120 %*			*Dilution: 1x*					
Toluene-d8 (Surr)			*95 %*	*80-120 %*			*"*					
4-Bromofluorobenzene (Surr)			*98 %*	*79-120 %*			*"*					
Duplicate (25A0820-DUP2)			Prepared: 01/20/25 00:00 Analyzed: 01/24/25 23:05									
QC Source Sample: Non-SDG (A5A1335-02)												
Benzene	**1420**	---	132	ug/kg dry	500	---	1560	---	---	9	30%	
Toluene	**15700**	---	662	ug/kg dry	500	---	16500	---	---	5	30%	
Ethylbenzene	**13200**	---	331	ug/kg dry	500	---	14000	---	---	6	30%	
Xylenes, total	**67200**	---	993	ug/kg dry	500	---	71200	---	---	6	30%	
Methyl tert-butyl ether (MTBE)	ND	---	662	ug/kg dry	500	---	ND	---	---	---	30%	
Naphthalene	**50000**	---	1320	ug/kg dry	500	---	58200	---	---	15	30%	
1,2-Dibromoethane (EDB)	ND	---	662	ug/kg dry	500	---	ND	---	---	---	30%	
1,2-Dichloroethane (EDC)	ND	---	331	ug/kg dry	500	---	ND	---	---	---	30%	
Isopropylbenzene	**7230**	---	662	ug/kg dry	500	---	7290	---	---	0.8	30%	
n-Propylbenzene	**13300**	---	331	ug/kg dry	500	---	13900	---	---	4	30%	
1,2,4-Trimethylbenzene	**66500**	---	662	ug/kg dry	500	---	69400	---	---	4	30%	
1,3,5-Trimethylbenzene	**17600**	---	662	ug/kg dry	500	---	17900	---	---	2	30%	
Surr: 1,4-Difluorobenzene (Surr)			*Recovery: 108 %*	*Limits: 80-120 %*			*Dilution: 1x*					

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Darrell Auvil, Client Services Manager

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Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

ANALYTICAL REPORT

Landau Associates	Project: **Tangent Fire Department**	
1500 SW First Avenue Suite 1015	Project Number: **2358001.010**	**Report ID:**
Portland, OR 97201	Project Manager: **Melody Kieneker**	**A5A1479 - 02 06 25 1509**

QUALITY CONTROL (QC) SAMPLE RESULTS

Selected Volatile Organic Compounds by EPA 5035A/8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 25A0820 - EPA 5035A							**Soil**					
Duplicate (25A0820-DUP2)			Prepared: 01/20/25 00:00 Analyzed: 01/24/25 23:05									
QC Source Sample: Non-SDG (A5A1335-02)												
Surr: Toluene-d8 (Surr)			*Recovery: 92 %*	*Limits: 80-120 %*			*Dilution: 1x*					
4-Bromofluorobenzene (Surr)			*103 %*	*79-120 %*			*"*					
Matrix Spike (25A0820-MS1)			Prepared: 01/15/25 12:31 Analyzed: 01/24/25 16:15									**DCNT**
QC Source Sample: Non-SDG (A5A1447-08)												
5035A/8260D												
Benzene	2710	---	25.3	ug/kg dry	50	2530	ND	107	77-121%	---	---	
Toluene	2510	---	126	ug/kg dry	50	2530	ND	99	77-121%	---	---	
Ethylbenzene	2660	---	63.2	ug/kg dry	50	2530	ND	105	76-122%	---	---	
Xylenes, total	8030	---	190	ug/kg dry	50	7600	ND	106	78-124%	---	---	
Methyl tert-butyl ether (MTBE)	2730	---	126	ug/kg dry	50	2530	ND	108	73-125%	---	---	
Naphthalene	2220	---	253	ug/kg dry	50	2530	ND	88	62-129%	---	---	
1,2-Dibromoethane (EDB)	2720	---	126	ug/kg dry	50	2530	ND	107	78-122%	---	---	
1,2-Dichloroethane (EDC)	2690	---	63.2	ug/kg dry	50	2530	ND	106	73-128%	---	---	
Isopropylbenzene	2760	---	126	ug/kg dry	50	2530	ND	109	68-134%	---	---	
n-Propylbenzene	2590	---	63.2	ug/kg dry	50	2530	ND	102	73-125%	---	---	
1,2,4-Trimethylbenzene	2640	---	126	ug/kg dry	50	2530	ND	104	75-123%	---	---	
1,3,5-Trimethylbenzene	2670	---	126	ug/kg dry	50	2530	ND	106	73-124%	---	---	
Surr: 1,4-Difluorobenzene (Surr)			*Recovery: 101 %*	*Limits: 80-120 %*			*Dilution: 1x*					
Toluene-d8 (Surr)			*97 %*	*80-120 %*			*"*					
4-Bromofluorobenzene (Surr)			*96 %*	*79-120 %*			*"*					

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ANALYTICAL REPORT

Landau Associates	Project: **Tangent Fire Department**	
1500 SW First Avenue Suite 1015	Project Number: **2358001.010**	**Report ID:**
Portland, OR 97201	Project Manager: **Melody Kieneker**	**A5A1479 - 02 06 25 1509**

QUALITY CONTROL (QC) SAMPLE RESULTS

Dissolved Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 25A1073 - Matrix Matched Direct Inject							**Water**					
Blank (25A1073-BLK1)			Prepared: 01/31/25 13:36 Analyzed: 02/01/25 17:55									
EPA 6020B (Diss)												
Lead	ND	---	0.200	ug/L	1	---	---	---	---	---	---	
LCS (25A1073-BS1)			Prepared: 01/31/25 13:36 Analyzed: 02/01/25 18:00									
EPA 6020B (Diss)												
Lead	54.5	---	0.200	ug/L	1	55.6	---	98	80-120%	---	---	
Duplicate (25A1073-DUP1)			Prepared: 01/31/25 13:36 Analyzed: 02/01/25 18:16									
QC Source Sample: DP-IW_012325 (A5A1479-02)												
EPA 6020B (Diss)												
Lead	**0.202**	---	0.200	ug/L	1	---	0.190	---	---	6	20%	
Matrix Spike (25A1073-MS1)			Prepared: 01/31/25 13:36 Analyzed: 02/01/25 18:21									
QC Source Sample: DP-IW_012325 (A5A1479-02)												
EPA 6020B (Diss)												
Lead	53.7	---	0.200	ug/L	1	55.6	0.190	96	75-125%	---	---	

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ANALYTICAL REPORT

Landau Associates	Project: **Tangent Fire Department**	
1500 SW First Avenue Suite 1015	Project Number: **2358001.010**	**Report ID:**
Portland, OR 97201	Project Manager: **Melody Kieneker**	**A5A1479 - 02 06 25 1509**

QUALITY CONTROL (QC) SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 25A0818 - Dry Weight Prep (EPA 8000D)							**Soil**					
Duplicate (25A0818-DUP1)			Prepared: 01/24/25 08:43		Analyzed: 01/27/25 07:17							**DCNT**
QC Source Sample: Non-SDG (A5A1447-01)												
% Solids	**51.5**	---	1.00	%	1	---	50.9	---	---	1	10%	
Duplicate (25A0818-DUP2)			Prepared: 01/24/25 08:43		Analyzed: 01/27/25 07:17							**DCNT**
QC Source Sample: Non-SDG (A5A1447-02)												
% Solids	**58.2**	---	1.00	%	1	---	58.1	---	---	0.3	10%	
Duplicate (25A0818-DUP3)			Prepared: 01/24/25 08:43		Analyzed: 01/27/25 07:17							
QC Source Sample: Non-SDG (A5A1447-03)												
% Solids	**66.5**	---	1.00	%	1	---	78.3	---	---	**16**	**10%**	Q-17
Duplicate (25A0818-DUP4)			Prepared: 01/24/25 08:43		Analyzed: 01/27/25 07:17							
QC Source Sample: Non-SDG (A5A1447-04)												
% Solids	**66.7**	---	1.00	%	1	---	68.1	---	---	2	10%	
Duplicate (25A0818-DUP5)			Prepared: 01/24/25 18:16		Analyzed: 01/27/25 07:17							
QC Source Sample: Non-SDG (A5A1513-01)												
% Solids	**82.9**	---	1.00	%	1	---	83.8	---	---	1	10%	
Duplicate (25A0818-DUP6)			Prepared: 01/24/25 18:16		Analyzed: 01/27/25 07:17							
QC Source Sample: Non-SDG (A5A1517-04)												
% Solids	**92.5**	---	1.00	%	1	---	92.4	---	---	0.03	10%	
Duplicate (25A0818-DUP7)			Prepared: 01/24/25 18:16		Analyzed: 01/27/25 07:17							
QC Source Sample: Non-SDG (A5A1524-02)												
% Solids	**79.8**	---	1.00	%	1	---	80.8	---	---	1	10%	

No Client related Batch QC samples analyzed for this batch. See notes page for more information.

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ANALYTICAL REPORT

Landau Associates	Project: **Tangent Fire Department**	
1500 SW First Avenue Suite 1015	Project Number: **2358001.010**	**Report ID:**
Portland, OR 97201	Project Manager: **Melody Kieneker**	**A5A1479 - 02 06 25 1509**

SAMPLE PREPARATION INFORMATION

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Prep: EPA 3510C (Fuels/Acid Ext.)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 25A0918							
A5A1479-02	Water	NWTPH-Dx LL	01/23/25 10:55	01/28/25 11:09	950mL/2mL	1000mL/2mL	1.05

Prep: EPA 3546 (Fuels)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 25A0976							
A5A1479-01	Soil	NWTPH-Dx	01/23/25 10:35	01/29/25 11:25	11.25g/5mL	10g/5mL	0.89
A5A1479-03	Soil	NWTPH-Dx	01/23/25 10:40	01/29/25 11:25	11.61g/5mL	10g/5mL	0.86
A5A1479-05	Soil	NWTPH-Dx	01/23/25 12:00	01/29/25 11:25	11.72g/5mL	10g/5mL	0.85
A5A1479-06	Soil	NWTPH-Dx	01/23/25 12:30	01/29/25 11:25	11.15g/5mL	10g/5mL	0.90
A5A1479-07	Soil	NWTPH-Dx	01/23/25 08:55	01/29/25 11:25	11.43g/5mL	10g/5mL	0.88

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Prep: EPA 5030C

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 25A0844							
A5A1479-02	Water	NWTPH-Gx (MS)	01/23/25 10:55	01/24/25 14:27	5mL/5mL	5mL/5mL	1.00

Prep: EPA 5035A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 25A0820							
A5A1479-01	Soil	NWTPH-Gx (MS)	01/23/25 10:35	01/23/25 10:35	6.41g/5mL	5g/5mL	0.78
A5A1479-03	Soil	NWTPH-Gx (MS)	01/23/25 10:40	01/23/25 10:40	4.48g/5mL	5g/5mL	1.12
A5A1479-05	Soil	NWTPH-Gx (MS)	01/23/25 12:00	01/23/25 12:00	5.36g/5mL	5g/5mL	0.93
A5A1479-06	Soil	NWTPH-Gx (MS)	01/23/25 12:30	01/23/25 12:30	5.28g/5mL	5g/5mL	0.95
A5A1479-07	Soil	NWTPH-Gx (MS)	01/23/25 08:55	01/23/25 08:55	6.32g/5mL	5g/5mL	0.79

Selected Volatile Organic Compounds by EPA 8260D

Prep: EPA 5030C

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 25A0844							
A5A1479-02	Water	EPA 8260D	01/23/25 10:55	01/24/25 14:27	5mL/5mL	5mL/5mL	1.00
A5A1479-09	Water	EPA 8260D	01/23/25 15:00	01/24/25 14:27	5mL/5mL	5mL/5mL	1.00

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Landau Associates	Project: **Tangent Fire Department**	
1500 SW First Avenue Suite 1015	Project Number: **2358001.010**	**Report ID:**
Portland, OR 97201	Project Manager: **Melody Kieneker**	**A5A1479 - 02 06 25 1509**

SAMPLE PREPARATION INFORMATION

Selected Volatile Organic Compounds by EPA 5035A/8260D

Prep: EPA 5035A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 25A0820							
A5A1479-01	Soil	5035A/8260D	01/23/25 10:35	01/23/25 10:35	6.41g/5mL	5g/5mL	0.78
A5A1479-03	Soil	5035A/8260D	01/23/25 10:40	01/23/25 10:40	4.48g/5mL	5g/5mL	1.12
A5A1479-05	Soil	5035A/8260D	01/23/25 12:00	01/23/25 12:00	5.36g/5mL	5g/5mL	0.93
A5A1479-06	Soil	5035A/8260D	01/23/25 12:30	01/23/25 12:30	5.28g/5mL	5g/5mL	0.95
A5A1479-07	Soil	5035A/8260D	01/23/25 08:55	01/23/25 08:55	6.32g/5mL	5g/5mL	0.79

Dissolved Metals by EPA 6020B (ICPMS)

Prep: Matrix Matched Direct Inject

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 25A1073							
A5A1479-02	Water	EPA 6020B (Diss)	01/23/25 10:55	01/31/25 13:36	45mL/50mL	45mL/50mL	1.00
A5A1479-09	Water	EPA 6020B (Diss)	01/23/25 15:00	01/31/25 13:36	45mL/50mL	45mL/50mL	1.00

Percent Dry Weight

Prep: Dry Weight Prep (EPA 8000D)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 25A0818							
A5A1479-01	Soil	EPA 8000D	01/23/25 10:35	01/24/25 08:43	1g	1g	1.00
A5A1479-03	Soil	EPA 8000D	01/23/25 10:40	01/24/25 08:43	1g	1g	1.00
A5A1479-05	Soil	EPA 8000D	01/23/25 12:00	01/24/25 08:43	1g	1g	1.00
A5A1479-06	Soil	EPA 8000D	01/23/25 12:30	01/24/25 08:43	1g	1g	1.00
A5A1479-07	Soil	EPA 8000D	01/23/25 08:55	01/24/25 08:43	1g	1g	1.00

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ORELAP ID: **OR100062**

ANALYTICAL REPORT

Landau Associates	Project: **Tangent Fire Department**	
1500 SW First Avenue Suite 1015	Project Number: **2358001.010**	**Report ID:**
Portland, OR 97201	Project Manager: **Melody Kieneker**	**A5A1479 - 02 06 25 1509**

QUALIFIER DEFINITIONS

Client Sample and Quality Control (QC) Sample Qualifier Definitions:

Apex Laboratories

DCNT	Sample decanted due to the presence of sediment in water samples, or water in sediment or soil samples. (Note: Decanted aqueous sample bottles are not solvent rinsed.)
Q-05	Analyses are not controlled on RPD values from sample and duplicate concentrations that are below 5 times the reporting level.
Q-17	RPD between original and duplicate sample, or spike duplicates, is outside of established control limits.
Q-19	Blank Spike Duplicate (BSD) sample analyzed in place of Matrix Spike/Duplicate samples due to limited sample amount available for analysis.
T-02	This Batch QC sample was analyzed outside of the method specified 12 hour analysis window. Results are estimated.

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ANALYTICAL REPORT

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1500 SW First Avenue Suite 1015	Project Number: **2358001.010**	**Report ID:**
Portland, OR 97201	Project Manager: **Melody Kieneker**	**A5A1479 - 02 06 25 1509**

REPORTING NOTES AND CONVENTIONS:

Abbreviations:

DET Analyte DETECTED at or above the detection or reporting limit.

ND Analyte NOT DETECTED at or above the detection or reporting limit.

NR Result Not Reported

RPD Relative Percent Difference. RPDs for Matrix Spikes and Matrix Spike Duplicates are based on concentration, not recovery.

Detection Limits: Limit of Detection (LOD)

Validated Limits of Detection (LODs) are normally set at a level of one half the validated Limit of Quantitation (LOQ). If no value is listed ('-----'), then the data has not been evaluated below the Reporting Limit.

Reporting Limits: Limit of Quantitation (LOQ)

Validated Limits of Quantitation (LOQs) are reported as the Reporting Limits for all analyses where the LOQ, MRL, PQL or CRL are requested. The LOQ represents a level at or above the low point of the calibration curve, that has been validated according to Apex Laboratories' comprehensive LOQ policies and procedures.

Reporting Conventions:

Basis: Results for soil samples are generally reported on a 100% dry weight basis.
The Result Basis is listed following the units as " dry", " wet", or " " (blank) designation.

" dry" Sample results and Reporting Limits are reported on a dry weight basis. (i.e. "ug/kg dry")
See Percent Solids section for details of dry weight analysis.

" wet" Sample results and Reporting Limits for this analysis are normally dry weight corrected, but have not been modified in this case.

" " Results without 'wet' or 'dry' designation are not normally dry weight corrected. These results are considered 'As Received'.

Results for Volatiles analyses on soils and sediments that are reported on a “dry weight” basis include the water miscible solvent (WMS) correction referenced in the EPA 8000 Method guidance documents. Solid and Liquid samples reported on an “As Received” basis do not have the WMS correction applied, as dry weight was not performed.

QC Source:

In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) may be analyzed to demonstrate accuracy and precision of the extraction batch.

Non-Client Batch QC Samples (Duplicates and Matrix Spike/Duplicates) may not be included in this report. Please request a Full QC report if this data is required.

Miscellaneous Notes:

" --- " QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.

" *** " Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

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1500 SW First Avenue Suite 1015	Project Number: **2358001.010**	**Report ID:**
Portland, OR 97201	Project Manager: **Melody Kieneker**	**A5A1479 - 02 06 25 1509**

REPORTING NOTES AND CONVENTIONS (Cont.):

Blanks:

Standard practice is to evaluate the results from Blank QC Samples down to a level equal to one half of the Reporting Limit (RL).
Blank results for gravimetric analyses are evaluated to the Reporting Level, not to half of the Reporting Level.
-For Blank hits falling between ½ the RL and the RL (J flagged hits), the associated sample and QC data will receive a 'B-02' qualifier.
-For Blank hits above the RL, the associated sample and QC data will receive a 'B' qualifier, per Apex Laboratories' Blank Policy.
For further details, please request a copy of this document.
-Sample results flagged with a 'B' or 'B-02' qualifier are potentially biased high if the sample results are less than ten times the level found in the blank for inorganic analyses, or less than five times the level found in the blank for organic analyses.
'B' and 'B-02' qualifications are only applied to sample results detected above the Reporting Level, if results are not reported to the MDL.

Preparation Notes:

Mixed Matrix Samples:

Water Samples:

Water samples containing significant amounts of sediment are decanted or separated prior to extraction, and only the water portion analyzed, unless otherwise directed by the client.

Soil and Sediment Samples:

Soil and Sediment samples containing significant amounts of water are decanted prior to extraction, and only the solid portion analyzed, unless otherwise directed by the client.

Sampling and Preservation Notes:

Certain regulatory programs, such as National Pollutant Discharge Elimination System (NPDES), require that activities such as sample filtration (for dissolved metals, orthophosphate, hexavalent chromium, etc.) and testing of short hold analytes (pH, Dissolved Oxygen, etc.) be performed in the field (on-site) within a short time window. In addition, sample matrix spikes are required for some analyses, and sufficient volume must be provided, and billable site specific QC requested, if this is required. All regulatory permits should be reviewed to ensure that these requirements are being met.

Data users should be aware of which regulations pertain to the samples they submit for testing. If related sample collection activities are not approved for a particular regulatory program, results should be considered estimates. Apex Laboratories will qualify these analytes according to the most stringent requirements, however results for samples that are for non-regulatory purposes may be acceptable.

Samples that have been filtered and preserved at Apex Laboratories per client request are listed in the preparation section of the report with the date and time of filtration listed.

Apex Laboratories maintains detailed records on sample receipt, including client label verification, cooler temperature, sample preservation, hold time compliance and field filtration. Data is qualified as necessary, and the lack of qualification indicates compliance with required parameters.

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

Landau Associates	Project: **Tangent Fire Department**	
1500 SW First Avenue Suite 1015	Project Number: **2358001.010**	**Report ID:**
Portland, OR 97201	Project Manager: **Melody Kieneker**	**A5A1479 - 02 06 25 1509**

Decanted Samples:

Soils/Sediments:
Unless TCLP analysis is required or there is notification otherwise for a specific project, all Soil and Sediments containing excess water are decanted prior to analysis in order to provide the most representative sample for analysis.

Water Samples:
Water samples containing solids and sediment may need to be decanted in order to eliminate these particulates from the water extractions. In the case of organics extractions, a solvent rinse of the container will not be performed.

Volatiles Soils (5035s)
Samples that are field preserved by 5035 for volatiles are dry weight corrected using the same dry weight corretion as for normal analyses. In the case of decanted samples, the dry weight may be performed on a decanted sample, while the aliquot for 5035 may not have been treated the same way. If this is a concern, please submit separate containers for dry weight analysis for volatiles can be provided.

All samples decanted in the laboratory are noted in this report with the DCNT qualifier indicating the sample was decanted.

Apex Laboratories

Darrell Auvil, Client Services Manager

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ANALYTICAL REPORT

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LABORATORY ACCREDITATION INFORMATION

ORELAP Certification ID: OR100062 (Primary Accreditation) - EPA ID: OR01039

All methods and analytes reported from work performed at Apex Laboratories are included on Apex Laboratories' ORELAP Scope of Certification, with the exception of any analyte(s) listed below:

Apex Laboratories

Matrix	Analysis	TNI_ID	Analyte	TNI_ID	Accreditation

All reported analytes are included in Apex Laboratories' current ORELAP scope.

Secondary Accreditations

Apex Laboratories also maintains reciprocal accreditation with non-TNI states (Washington DOE), as well as other state specific accreditations not listed here.

Subcontract Laboratory Accreditations

Subcontracted data falls outside of Apex Laboratories' Scope of Accreditation.
Please see the Subcontract Laboratory report for full details, or contact your Project Manager for more information.

Field Testing Parameters

Results for Field Tested data are provded by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.

Apex Laboratories

Darrell Auvil, Client Services Manager

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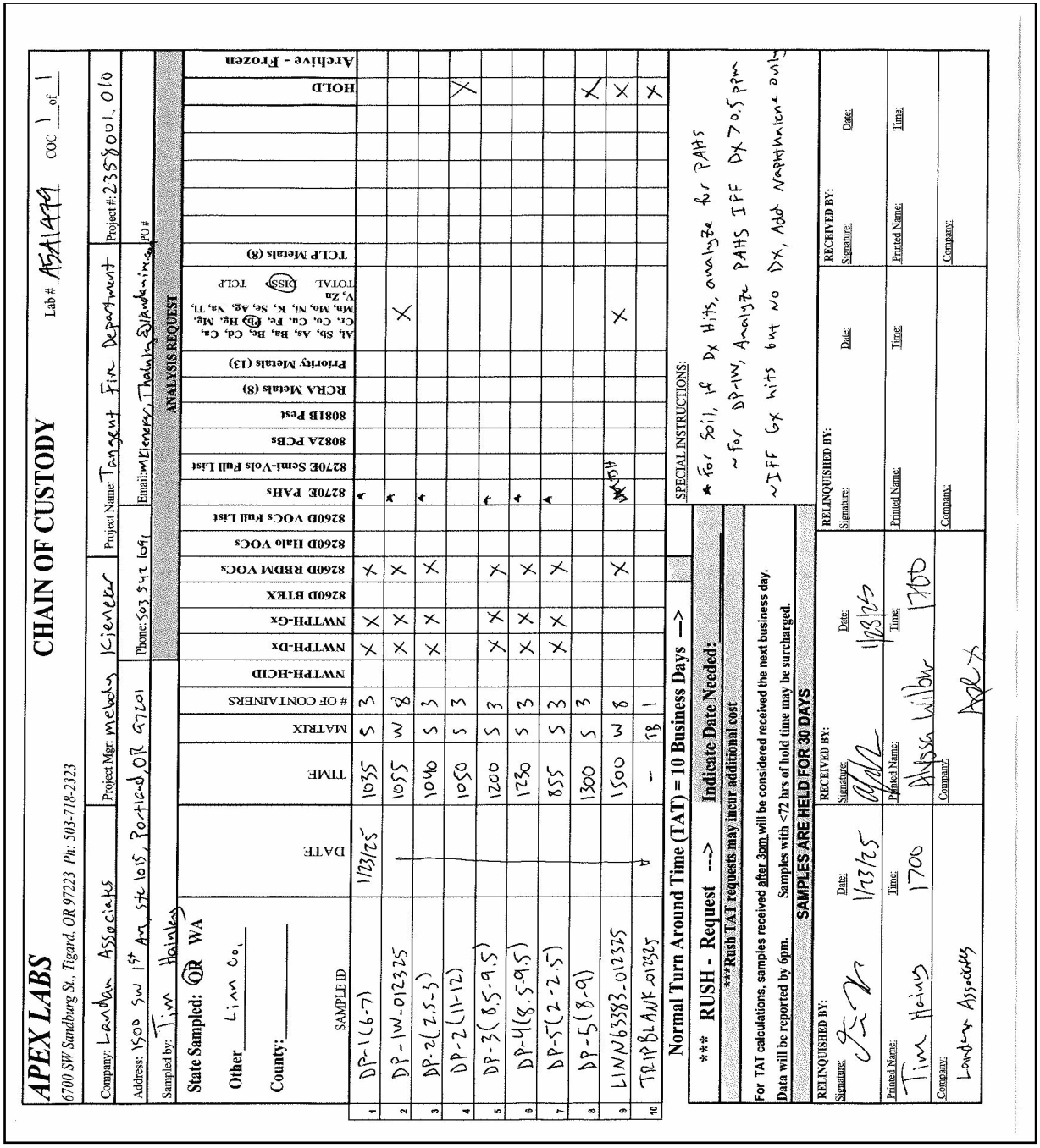

APEX LABS — **CHAIN OF CUSTODY** — Lab # A5A1479 — COC 1 of 1

6700 SW Sandburg St., Tigard, OR 97223 Ph: 503-718-2323

Company: Landau Associates | Project Mgr: Melody Kieneker | Project Name: Tangent Fire Department | Project #: 2358001.010

Address: 1500 SW 1st Ave, Ste 1015, Portland, OR 97201 | Phone: 503 894 1691 | Email: MKieneker@LandauInc.com | PO #

Sampled by: Tim Hainley

State Sampled: OR WA

Other Linn Co.

County:

ANALYSIS REQUEST

#	SAMPLE ID	DATE	TIME	MATRIX	# OF CONTAINERS	NWTPH-HCID	NWTPH-Dx	NWTPH-Gx	8260D BTEX	8260D RBDM VOCs	8260D Halo VOCs	8260D VOCs Full List	8270E PAHs	8270E Semi-Vols Full List	8082A PCBs	8081B Pest	RCRA Metals (8)	Priority Metals (13)	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Tl, V, Zn TOTAL / TCLP (DISS)	TCLP Metals (8)	HOLD	Archive - Frozen
1	DP-1(6-7)	1/23/25	1035	S	3		X	X		X											
2	DP-1W-012325		1055	W	8		X	X		X									X		
3	DP-2(2.5-5)		1040	S	3		X	X		X											
4	DP-2(11-12)		1050	S	3																X
5	DP-3(8.5-9.5)		1200	S	3		X	X		X											
6	DP-4(8.5-9.5)		1230	S	3		X	X		X											
7	DP-5(2-2.5)		855	S	3		X	X		X											
8	DP-5(8-9)		1300	S	3																X
9	LINN63382-012325		1500	W	8					X					X				X		X
10	TRIPBLANK-012325	↓	-	SB	1																X

Normal Turn Around Time (TAT) = 10 Business Days --->

SPECIAL INSTRUCTIONS:

★ for Soil, if Dx Hits, analyze for PAHs
~ for DP-1W, Analyze PAHs IFF Dx 70.5 ppm
~IFF Gx hits but no Dx, Add Naphthalene only

*** RUSH - Request ---> Indicate Date Needed:

***Rush TAT requests may incur additional cost

For TAT calculations, samples received after 3pm will be considered received the next business day.
Data will be reported by 6pm. Samples with <72 hrs of hold time may be surcharged.

SAMPLES ARE HELD FOR 30 DAYS

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature:	Signature:	Signature:	Signature:
Date: 1/23/25	Date: 1/23/25	Date:	Date:
Printed Name: Tim Hainley	Printed Name: Alyssa Wilbur	Printed Name:	Printed Name:
Time: 1700	Time: 1700	Time:	Time:
Company: Landau Associates	Company: APEX	Company:	Company:

Apex Laboratories

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Darrell Auvil, Client Services Manager

APEX LABORATORIES

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

Landau Associates	Project: **Tangent Fire Department**	
1500 SW First Avenue Suite 1015	Project Number: **2358001.010**	**Report ID:**
Portland, OR 97201	Project Manager: **Melody Kieneker**	**A5A1479 - 02 06 25 1509**

APEX LABS COOLER RECEIPT FORM

Client: Landau Associates Element WO#: A5 A1479

Project/Project #: Tangent Fire Department 2358001.010
ACC for AAW 1/23/25

Delivery Info:

Date/time received: 1/23/25 @ 1700 By: AAW

Delivered by: Apex__Client X ESS__FedEx__UPS__Radio__Morgan__SDS__Evergreen__Other__

From USDA Regulated Origin? Yes ____ No X

Cooler Inspection Date/time inspected: 1/23/25 @ 1700 By: AAW

Chain of Custody included? Yes X No ____

Signed/dated by client? Yes X No ____

Contains USDA Reg. Soils? Yes ____ No X Unsure (email RegSoils) ____

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (°C)	4.7						
Custody seals? (Y/N)	N						
Received on ice? (Y/N)	Y						
Temp. blanks? (Y/N)	Y						
Ice type: (Gel/Real/Other)	Real						
Condition (In/Out):	In						

Cooler out of temp? (Y)(N) Possible reason why: ____

Green dots applied to out of temperature samples? Yes/(No)

Out of temperature samples form initiated? Yes/(No)

Sample Inspection: Date/time inspected: 1/23/25@1728 By: KN

All samples intact? Yes √ No ___ Comments: IR# 3680

Bottle labels/COCs agree? Yes ___ No √ Comments: 8 oz jar for DP-5(2-2.5) reads DP-5(2-3), matched by DIT

COC/container discrepancies form initiated? Yes ___ No √

Containers/volumes received appropriate for analysis? Yes √ No ___ Comments: 3 KN 1/23/25

Do VOA vials have visible headspace? Yes ___ No √ NA ___

Comments 3/3 VOAs for DP-1W-012325 have sed.

Water samples: pH checked: Yes √ No___NA___ pH appropriate? Yes √ No___NA___ pH ID: A231172
ACC for KN 1/23/25

Comments: ____

Labeled by: KN Witness: KN Cooler Inspected by: KN

Form Y-003 R-02

Apex Laboratories

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Darrell Auvil, Client Services Manager

APPENDIX E

Waste Profiling Information

WASTEXPRESS ENVIRONMENTAL

P.O. Box 267
Vancouver, WA 98666
855-244-3206

Profile # LF01

A. Generator Information

a. Generator Name: Tangent Fire Dept
b. Site Address: 32053 Birdfoot Dr.
c. City/State/Zip: Tangent, OR 97389
d. Contact:
e. Phone:
f. Email:
g. Generator Status: Washington: ☐ SQG ☐ MQG ☐ LQG
h. EPA ID #: ☑ NA

B. Customer Information:

a. Customer Name: Landau Associates Inc
b. Address: 1500 SW 1st Ave #1015
c. City/State/Zip: Portland, OR 97201
d. Contact: Tim Hainley
e. Phone: 503-542-1091
f. Email: thainley@landauinc.com
Oregon/Other: ☑ VSQG ☐ SQG ☐ LQG

C. Chemical/Waste Stream Description and Characteristics:

a. Name of Waste Stream: IDW Soil
b. Detailed Description of Process Generating Waste: Soil generated from site investigations. Containerized for disposal. Analytical on file.

D. Chemical Components

(total must be > or = to 100%)

		Range in % or ppm e.g. 10 - 20		
a.	Soil	50	100	%
b.	Gravel	0	20	%
c.	Clay	0	20	%
d.	Sand	0	20	%
e.				
f.				
g.				
h.				
i.				
j.				
k.				
l.				
m.				

E. Physical Properties

a. **Physical State:**
☐ Liquid % ____ ☐ Gas
☐ Sludge ☑ Solid (no free liquids)
b. **Viscosity:**
☐ Water ☐ Oil ☐ Honey ☐ Tar
c. **Flash Point:**
☐ < 140F ☐ >140 - <200F ☐ ≥ 200F
☑ No Flash/NA ☐ Exact: ____
d. **pH:**
☐ <2 ____ - ____ ☐ >12.5 ☑ NA
e. **Odor:** ☑ None ☐ Mild ☐ Strong
f. **Color:** Various

F. Hazardous Waste Information

a. EPA Waste Code(s): NA
b. State Waste Code(s): NA
c. PCB's: ☐ Yes ☑ No
d. Bio-Hazardous: ☐ Yes ☑ No

G. DOT Shipping Information

a. DOT UN/ID Number: ____ ☑ Not Regulated by DOT
b. DOT Proper Shipping Name: ____
c. DOT Hazard Class: ____ d. DOT Packing Group: ☐ I ☐ II ☐ III
e. RQ Amount: ____ lbs. RQ Chemical Name or EPA Waste Code: ____
f. Shipping Unit: ☑ Pail ☑ Drum ☐ Tote ☐ CY Bag/Box ☐ Pallet ☐ Roll-off ☐ Tanker ☐ Dump-Truck
g. Quantity per Unit: 5-55 Bulk: ☑ Gallons ☐ Yards ☐ Tons

Waste Stream Certification

I certify this information (including attachments) is a complete and accurate description of the waste. All known or suspected chemicals, properties and hazards have been disclosed. I agree to notify WasteXpress of any known changes to this description, the waste and/or the process generating as submitted for approval on this form. I additionally authorize WasteXpress to proceed with submitting waste profiles, analyses and/or waste approval forms on my behalf to secure all necessary approvals to dispose of this waste at a permitted treatment facility.

Printed Name: CHRISTOPHER M. GRIFFIN Title: FIRE CHIEF
Signature: Christopher M. Griffin Date: 2-19-2025