SITE CHARACTERIZATION WORK PLAN

Property Identification:

LUST # 06-22-0317
GODDARD ENERGY
530 2ND ST SE
BANDON, OR

Prepared For:

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LUST # 06-22-0317 530 2nd St SE, Bandon

This plan was prepared under the supervision and direction of the undersigned.

ALPHA ENVIRONMENTAL SERVICES, INC.

Zachary Goodman
Underground Storage Tank Supervisor

Phillip Brewer
Principal

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Figure 1: Work Plan Site Map

ACRONYMS AND ABBREVIATIONS

ASTM	American Society for Testing and Materials
bsg	below surface grade
COC	Contaminants of Concern
CSM	Conceptual Site Model
CR	Commercial Retail Zoning
DEQ	Department of Environmental Quality (Oregon)
IDW	Investigation Derived Waste
NFA	No Further Action
NWTPH-Dx	North West Total Petroleum Hydrocarbons – Diesel & Heavy Oil Quantification
NWTPH-Gx	North West Total Petroleum Hydrocarbons – Gasoline Quantification
OAR	Oregon Administrative Rules
PAHs	Polyaromatic Hydrocarbons
PID	Photoionization Detector
PVC	Poly Vinyl Chloride
RBCs	Risk-based Concentrations
RBDM	Risk-based Decision Making
RCRA	Resource Conservation & Recovery Act
REC	Recognized Environmental Condition
VOCs	Volatile Organic Compounds
WRD	Water Resources Department (Oregon)

1.0 INTRODUCTION

Alpha Environmental Services (Alpha) has prepared this Work Plan for the subject property located at 530 2nd St SE, Bandon, Oregon (the Property). The purpose of the Work Plan is to provide an outline of the proposed sampling, laboratory analysis and risk analysis evaluation for site characterization and potential closure. The scope of work proposed is an attempt to define the vertical and lateral extent of the petroleum contamination recently discovered at the Property. The assessment will follow the standard practice of the Oregon Administrative Rules (OAR) 340-122-0205 through 340-122-0360 and Oregon Department of Environmental Quality (DEQ) guidance.

1.1 Project Organization

The following section outlines the project organization, reporting relationships, and lines of communication related to the work to be completed at the Property.

- Donald Goddard: Mr. Goddard is the current owner of the site and will be responsible for the authorization of site work and paying the applicable DEQ fees. Mr. Goddard will contract directly with the consultant (Alpha) to execute the work.
- Oregon Department of Environmental Quality (DEQ): DEQ will be the primary regulatory authority. DEQ will review and approve work plans. The DEQ project manager is Tina Elayer.
- Alpha Environmental Inc (Alpha): Alpha has prepared this work plan for the Property. Alpha will be conducting the site work and submitting reports to the DEQ. The Alpha project manager for the proposed work is Zach Goodman, (503) 292-5346.

1.2 Site Description

The Property is located at 530 2nd St SE, Bandon, Coos County, Oregon. The Property is depicted in Figure 1.

The Property parcel consists of an irregular-shaped lot approximately 0.5 acres in size that is currently used as a commercial/light industrial business. Until April 2022, the property also provided fueling services. The Property is relatively flat and at an approximate elevation of 16 feet above mean sea level.

The vicinity of the Property can generally be described as commercial and residential. Current usage of the adjoining properties includes: north – Hwy 101 with commercial; south – residential; east – commercial, and west – Elmira Ave SE with commercial.

1.3 Project Background

Alpha was initially contacted by the client, Mr. Goddard in March 2022 about completing the decommission work. The site does have a previous LUST ID, 06-12-1585 from an assessment from Universal Applicators, Inc. dated November 30, 2012. The report details assessment of Tank 6, the southern most UST on the property, which was temporarily closed at the time in 2012. The assessment indicated that soil contamination for gasoline and diesel was observed in the west end sample at 472-ppm gasoline, 805-ppm diesel, and 1,180-ppm residual range organics.

An initial site assessment was completed by Alpha in April 2022. Initial assessments of the 6 fuel USTs, 1 heating oil tank, and oil/water separator tank were collected as was shallow surface contamination in dispenser area following dispenser removal. These samples and reports have been previously submitted.

Following discussions with client and DEQ, removal of at least a base amount of contaminated soil in the dispenser area was conducted in May 2022. A total of 97.14 tons of contaminated soil was removed, and

confirmation samples were collected. The results of this investigation was discussed in the initial 20-day report. Most detections are below the applicable commercial Risk-Based Concentrations (RBCs), except for ethylbenzene which exceeded the occupational vapor intrusion pathway. Groundwater was not been assessed at time of soil removal due to unsettled nature of soil/contamination/groundwater in the excavation area.

Based on remaining soil contamination and assumed groundwater contamination, Alpha assumes that, at a minimum, soil delineation, groundwater assessment and delineation, and soil-gas sampling would be needed to characterize site.

1.4 Beneficial Land and Water Use

Land Use

The site is zoned Commercial Retail (CR) with a design overlay (Northgate Mixed-Use Overlay Zone) by the City of Salem. The Northgate Overlay Zone zoning allows for mixed-use and residential development. The purpose of the overlay zone is to identify permissible uses and to establish development standards that promote the creation of a mixed-use center along the Portland/Fairgrounds Road Corridor serving the surrounding community with storefront businesses offering a wide range of goods and services in a pedestrian friendly environment.

Groundwater Use

According to the Oregon Water Resources Department (WRD) online database, a total of 52 water wells were identified within the same township and range section (T28S R14W S30). Of these wells, 57 were identified as domestic wells, 31 as industrial wells and 0 were not specified. The table below summarizes the well use, well status and approximate distance for the Property.

Type of Water Well	Total Wells	Abandoned	No Address	> 1,000 ft	> 500 ft
Domestic	**6**	3	2	3	0
Industrial	**31**	21	0	31	0
Not Specified	**17**	14	11	5	0
Totals	**52**	38	13	39	0

Domestic Wells

Of the 52 wells identified in the section, 6 were labeled as domestic wells. Three of the wells are abandoned and are of no potential concern. The other three wells do not have a well address given and the distance from the Property could not be determined. The nearby domestic wells that do not appear to have been abandoned are well over ¼ mile from the site.

Industrial Wells

Of the 52 wells identified in the section, 31 were labeled as industrial wells. All wells are either abandoned or at least ¼ mi from the site.

Non-Specified Wells

Of the 52 wells identified in the section, 17 were not specified in their use. All wells are either abandoned or at least ¼ mi from the site.

Groundwater Depth

Based on Alpha's observations, groundwater fluctuates from about 6 to 10 feet based on season. Review of the site elevation also indicates flow direction fluctuates from southeast to northwest.

Surface Water Use

The nearest major surface water in the vicinity of the Property is Ferry Creek about 500 feet to the east and flowing to the north. Coquille River is also located about 600 feet to the northwest. Both water bodies provides habitat for wildlife and are used for navigation, fishing and recreation. Stormwater at the site is directed to the City of Bandon's municipal stormwater system and/or into the water/oil tank on site.

1.5 Site Specific Geology

Based on soil boring logs from Universal Applicators, subsurface soils typically consist of fill material and native soils. Fill material consisting of sand was found at depths extending from the surface down to approximately 6 to 8 feet below ground surface in the former tank pit area and then alluvium, clayey and from 6-8 feet to 12 feet below surface grade.

2.0 PREVIOUS INVESTIGATIONS

2.1 Alpha

Alpha previously collected initial site assessment samples in April 2022 and confirmation excavation samples in May 2022.

2.2 DEQ Comments

Formal comments for Alpha's and Universal Applicator's documentation has not been provided; however, general discussion with Tina Elayer on June 21, 2022 included the overall scope and information presented in this document.

3.0 PROPOSED SCOPE OF WORK

3.1 Review and Approval of Work Plan

This Work Plan is being submitted for DEQ review. The Work Plan has been written based on the previous site work and communications with the DEQ. Figure 1 shows the locations of previous soil testing and proposed sample locations.

3.2 Proposed Sampling

Alpha will engage a subcontractor using direct-push drilling techniques for the subsurface investigation. The driller will be responsible to advance the borings at the direction of Alpha, use disposable drill liners to return samples to the surface, install temporary well screens, abandon holes in accordance with the Oregon Water Resources Department (WRD) guidelines and submit well logs to WRD.

Alpha is proposing to drill nineteen (19) shallow borings to approximately 11 feet below surface grade (bsg) to soil/water interface depth and install temporary groundwater well points for groundwater collection.

Soil Sampling

One sample will be placed directly adjacent to previous Boring B2 from Universal Applicators to validate the soil sample results from the Universal Applicator's assessment. Four borings will be placed around Boring B2 from Universal Applicators to delineate the lateral extent of impacts. Since an assessment sample was previously collected by Alpha in this area with no gasoline, diesel, or oil range (residual oil) detections, so it is possible that the high groundwater table has dissipated some or all of the original detection.

Four additional borings will be placed around the dispenser islands. One boring will be placed north of the north dispenser island, one boring will be placed west of the north dispenser island, and one boring will be placed east of the north dispenser island, and one boring will be placed south of the south dispenser island.

Delineation samples will also be collected for the heating oil tank, with four (4) delineation samples around the oil/water separator tank, one sample between tanks 1 and 2, and 1 sample to the west of tank 5 (12,000 gallon diesel UST).

The highest sample from the dispenser area will be analyzed for VOCs, PAHs, and metals. If any detections are observed in oil/water separator areas and by tank next, additional sample(s) will be analyzed for VOCs, PAHs, and metals.

Groundwater Sampling

The groundwater depth at the property ranges between 6-10 feet from Alpha's observations. Alpha will collect groundwater samples in soil borings from slotted PVC temporary wells in each location. Only one groundwater sample for each the heating oil tank and oil/water tank areas are expected.

A temporary PVC well screen will be installed, and the initial water level measured with a digital water level meter and recorded to the nearest 100th of a foot. After the water level measurement, the well will be purged of approximately three volumes of water prior to sampling using a peristaltic pump and disposable sample tubing. Alternately, small-diameter disposable bailers may be used. Groundwater samples will be dispensed directly into the appropriate laboratory-provided sample containers.

Soil-Gas Sampling

At this time, soil-gas sampling is not expected.

Field Screening

Soil samples will be field screened for visual and olfactory signs of petroleum contamination along with headspace vapor screening for volatile organic compounds using a hand-held photoionization detection (PID) meter.

Investigation Derived Waste

Investigation Derived Waste (IDW) may be stored temporarily onsite or transported to Alpha's storage yard pending laboratory testing.

3.3 Selection of Soil Samples for Chemical Analyses

Soil samples will be collected from the depth interval with the greatest contamination, highest PID readings or based on field observations. If no obvious contamination is observed, samples will be collected at approximately 11 feet below ground surface (the approximate vertical extent based previous investigation). Additional soil samples may be collected from areas exhibiting obvious contamination. For the area of former detections, Boring B2 from Universal Applicators, the samples will be collected from 7.5, 8 and 10 feet below ground surface.

3.4 Contaminants of Concern

Based on the types of chemicals possibly released from a former gas station and the previous sampling, the Contaminants of Concern (COC) are as follows below. The risk will be evaluated for each COC in order to determine whether risk is present at the site.

- Gasoline
- Diesel
- Volatile organic compounds (VOCs)
- Polyaromatic Hydrocarbons (PAHs)

3.5 Chemical Analyses

The soil samples will be initially analyzed using test method NWTPH-Dx (quantifies diesel and heavy oil range hydrocarbons) and NWTPH-Gx (quantifies gasoline range hydrocarbons). If samples have detected concentrations of gasoline greater than 100 ppm, then follow up analysis will include EPA Test Method 8260 - VOCs. If samples have detected concentrations of diesel greater than 100 ppm, then follow up analysis will include EPA Test Method 8270 PAHs.

The groundwater samples will be analyzed using test method NWTPH-Gx and NWTPH-Dx and EPA 8260 - VOCs. If samples have detected concentrations of diesel greater than 100 ppb, then follow up analysis will include EPA Test Method 8270 PAHs.

3.6 Additional Chemical Analyses

Any additional laboratory testing from the proposed borings or additional borings and/or follow up analysis is not included in the scope of work. If these conditions exist or are requested by the DEQ, the client will need to be contacted, and approval required prior to the samples being analyzed.

3.7 Adjacent Properties

At this time, it is assumed that adjacent properties and public right of ways have not been impacted by petroleum releases at the Property.

4.0 QUALITY ASSURANCE & QUALITY CONTROL

For the project, all data used for closure purposes will comply with the DEQ's Quality Assurance Project Plan (QAPP) for the Underground Storage Tanks Programs, DEQ02-LQ-0002-QAPP, Version 3.1, dated June 20, 2016.

4.1 Field Equipment & Decontamination

Disposable field equipment anticipated to be used for this project include nitrile gloves, plastic spoons, drill core liners, PVC well screens, Teflon tubing, silicon tubing, disposable bailers, Terra Core™ samplers and Ziplock bags. Reusable field equipment is anticipated to be a soil cutting knife and electronic water level meter.

Soil samples will be field screened for VOCs using a MiniRAE 2000 hand-held PID meter. Prior to using the annually calibrated meter in the field for the day, the meter will be calibrated with a fresh air check and subsequently checked using 100 ppm isobutylene. The meter readings will be checked to make sure they are within 5% of the calibration standard.

Decontamination of Alpha supplied reusable field equipment will include manual removal of particles, wash with Alconox solution, rinse with tap water, wash with Alconox solution and rinse with distilled water. In between each boring, the driller will rinse all sample tubing, cutting bits, etc. with a hot water pressure rinse.

4.2 Field Screening

The soil samples from the investigation will be obtained directly from direct-push disposable liners. The liners will be split open along the longitudinal axis and laid open for visual observation. Any obviously impacted soil will be placed directly into both laboratory-provided jars and a Ziplock bag using new disposable nitrile gloves. The material in the Ziplock will be checked using a PID meter. A new set of gloves will be donned after any sample handling and between each interval of sample is collected.

4.3 Sample Collection

Samples from the investigation will be collected directly from direct-push disposable liners. For samples collected for VOC analysis, the sample of the soil will be collected following EPA Method 5035A using a Terra Core™ sampling tool and placed in a pre-tared vial containing preservative with a septum-sealed screw cap. Once sealed, the sample will not be exposed to the atmosphere until analysis is conducted. The sample collection process will be completed in the least amount of time in order to minimize the loss of VOCs due to volatilization.

Soil collected for non-VOC analysis, will be placed directly into laboratory-provided 4-oz jars and capped.

Groundwater samples will be directly dispensed from the end of the disposable tubing or disposable bailers to the laboratory-provided sample containers.

The order of collection for all samples will be from the most volatile to the least volatile, and samples will be collected in the following order: 1) VOCs 2) Total Petroleum Hydrocarbons 3) PAHs.

Soil-gas samples will be collected using disposable tubing and laboratory-provided Summa canisters and sampling trains.

4.4 Trip Blanks

As per DEQ's requirements, one trip blank provided by the laboratory will be kept in each cooler. The trip blank will be transported to the jobsite and returned to the laboratory.

4.5 Rinsate Blanks

Rinsate blanks will be collected at a rate of 1 per 20 analytical samples collected for each matrix sampled (soil and groundwater). The rinsate blank for the soil sampling will be collected form the soil knife used to inspect coring's. The rinsate blanks for the groundwater will be collected from the electronic water meter downhole probe.

The following procedure will be used for rinsate blanks. After the piece of equipment has been field cleaned and prior to its being used for sample operations, it will be rinsed with organic free water. The rinse water will be collected and submitted for analyses of all constituents for which the samples collected with that piece of equipment are being analyzed.

4.6 Field Duplicates

Field duplicates will be collected at a rate of 1 per 20 analytical samples for each matrix sampled. The field duplicate for the soil sample will be collected from an area of obvious impacts, if possible. For non-VOCs, the sample will be homogenized and then the field investigation and duplicate sample alternately collected. For VOCs, two separate field plugs will be taken side by side from the undisturbed sample, with as little time between samples as possible.

The field duplicate for the groundwater sample will be collected from one of the temporary wells by alternately filling sample containers from the same sampling device for each parameter.

The field duplicate for the soil-gas sample will be collected by connecting a second Summa canister and new sampling train to the existing disposable tubing and obtaining an equal amount of soil vapor.

4.7 Sample Transport

The samples will be packed with an appropriate temperature blank(s), which will consist of a 100-ml polyethylene bottle filled with clean water.

The sample chain of custody will maintain the following protocol for the coolers: be in an authorized person's physical possession or view and/or locked up and kept in a secured area that is restricted to authorized personnel. All changes in sample possession will be documented with the date, time, and personnel.

5.0 RISK SCREENING EVALUATION

5.1 Risk-Based Decision Making

In order to evaluate the current and reasonably likely future risk to human health and the environment, Alpha will compare the data from the current investigation to the DEQ risk-based decision making (RBDM) guidelines.

The RBDM process involves investigating potential sources of the contaminants and the environmental media in which they are contained (e.g., soil or groundwater), receptors (who could potentially be exposed to contaminants), and the exposure pathway (how a receptor might come in contact with contaminants [e.g., inhalation, ingestion or dermal contact]). If any of these elements is missing, the pathway is considered incomplete.

Using the parameters listed above, the laboratory detected concentrations will be compared to DEQ risk-based concentrations (RBCs). An RBC is the concentration of a hazardous substance in soil, water, air or sediment that is determined to be protective of human health and the environment under specified exposure conditions.

To help facilitate the determination of potential risks at the site, a Conceptual Site Model (CSM) will be constructed.

Recommendations will be made following receipt of this data with potential recommendation for closure of both LUST files for the site.

6.0 SCHEDULE

The scope of work described herein will be initiated within 14 to 21 days of the DEQ's approval of the Work Plan, excluding delays beyond the control of Alpha. It is estimated that the boring advancement and sample collection will require approximately one day. The results of the investigation will be presented and discussed in a report to be submitted within approximately two to three weeks following receipt of the analytical data. The report will document the results of the activities proposed in the scope of work.

7.0 LIMITATIONS

Alpha has developed this work plan based on the information currently know about the site. There is a possibility that, even with the proper application of the methodologies described in this plan, there may exist at the Property conditions that could not be identified within the scope of the assessment or which were not reasonably identifiable from the available information.

The methodologies of the proposed assessment are not intended to produce all inclusive or comprehensive results, but rather to provide the client, DEQ and interested parties with an indication of subsurface environmental conditions in specifically targeted areas of the Property at that time.

The investigation will be performed in a professional manner, in accordance with generally accepted environmental practices, using the degree of skill and care ordinarily exercised by reputable professionals. The investigation is not intended to be a definitive investigation of existing or potential adverse environmental impacts of the entire site and/or adjacent site; thus, it is possible that an impact may exist on the Property or adjacent properties that was not identified during the investigation.

8.0 REFERENCES

Alpha Environmental Services Inc., *Initial 20-Day Report*, 530 2nd St SE, Bandon, OR. Dated June 7, 2022.

Universal Applicators, Inc., *Underground Storage Tank Assessment*, 530 2nd St SE, Bandon, Oregon. Dated November 30, 2012.

State of Oregon Water Resources Department, Agency Resources, *Online Well Log Search and Groundwater Level Data*, accessed via website.

Walker, 1991. *Geological Map of Oregon,* United States Geological Survey, Walker, G.W. and MacLeod, N.S., 1991.