Site Investigation Work Plan
Abe's Cleaners (Former)
10863 SE Main Street
Milwaukie, Oregon

Prepared for:
Oregon Department of Environmental Quality
Task Order No. 066-23-12-001

October 2, 2023
32-23009132 / Task 3

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EXPIRES JUNE 30, 2024

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1.0 Introduction

Apex Companies, LLC (Apex) has prepared this *Site Investigation Work Plan* (the SI Work Plan) to present the scope of work for collecting and analyzing indoor/outdoor ambient vapor samples in support of an updated risk-based evaluation at the former Abe's Cleaners (ECSI #1258) located at 10863 SE Main Street in Milwaukie, Oregon (the Site; Figure 1). The focus of Apex's SI Work Plan shall be to provide the Oregon Department of Environmental Quality (DEQ) with laboratory analytical data to better understand the current environmental impact of the Site and potential exposure risks associated with vapor intrusion. This SI Work Plan was prepared for the DEQ under Task 3 of Task Order No. 066-23-12-001. This SI Work Plan does not include discussion of the project background or history, which is discussed in more detail in the *DEQ Staff Report – Abe's Cleaners Facility* and *DEQ Site Assessment Program – Strategy Recommendation* (DEQ, 2002) and other historical reports prepared for the Site.

1.1 Purpose

The purpose of this SI Work Plan is to summarize field activities that are designed to assess vapor intrusion at the Site. A total of two rounds of vapor monitoring will be conducted during both the dry and wet conditions to evaluate seasonal variability. Ambient vapor sampling will be focused particularly in areas within the former dry cleaners and crawlspace and will include an outdoor air vapor sample. The proposed field activities include project coordination, sampling indoor/outdoor ambient vapor, and submitting the samples via chain-of-custody to an accredited laboratory for volatile organic compounds (VOCs) analysis. This SI Work Plan documents the methods that will be used to complete the proposed field activities.

1.2 Scope of Work

To accomplish the above objectives, the scope of work (SOW) described in this SI Work Plan includes conducting two rounds of the following tasks (one during dry conditions and one during wet conditions):

- Coordinate with the owner's representative for access to the building;
- Collect three indoor ambient air samples (per event) using Radiello® sampling methods over a period of one week. Sample locations are as follows: one sample from the main tenant space; one sample from the bathroom located at the rear of the building; and one sample (with duplicate) from the larger storage room in the northwest corner of the space;
- Collect one outdoor ambient air sample (per event) using Radiello® sampling methods over a period of one week from a secure location on the building roof (to minimize the potential for unauthorized tampering with the sampler);
- Analyze the indoor/outdoor RAD-145 ambient air samples (per event) for a short list of VOCs via U.S. Environmental Protection Agency (EPA) Method TO-17;

- Utilize an exploration camera, such as a video pipe camera equipped with 100-feet of cable and LED lights, within the crawlspace to assess the approach of the sampling conduit and search for evidence of a historical tank that may be located underneath the former dry cleaners building; and
- Collect two air samples (per event) from the building crawlspace, one sample targeting the front half of the building and one sample near the rear of the building. Sample collection will be completed by accessing the crawlspace from the rear (west side) of the building through either an existing crawlspace vent (preferred) or through a hole cored through the foundation wall, inserting a conduit (such as threaded 2-inch metallic tubing) to the target distance from the rear of the building, running the sample tubing a pre-determined distance to the end of the conduit, purging the tubing, and collecting the air sample. Depending on the access and the ability to keep the conduit above ground surface , the sample tubing may be affixed to the outside of the conduit. Samples will be collected in 1-Liter Summa or similar vacuum canister and analyzed for VOCs by EPA Method TO-15.

These activities are discussed in further detail within this SI Work Plan.

2.0 Sampling Activities

The proposed indoor/outdoor air vapor sampling and analysis methodologies are described in the sections below. Additional detail is included in the Sampling and Analysis Plan (SAP), included in Appendix B.

2.1 Ambient Vapor Sampling

Based on discussions with DEQ and information gathered from previous Site activities, Apex developed the focused SI Work Plan to collect samples to assess vapor intrusion at the Site.

Apex will implement Standard Operating Procedure (SOP) No. 2.8 *Ambient Vapor Sampling Procedures* (see Appendix A) to collect ambient air vapor samples. Indoor/outdoor ambient vapor samples will be collected with a Radiello® radial diffusive sampler, and samples collected within the crawlspace of the former dry cleaners building will be collected with a 1-Liter Summa® Canister or similar.

2.1.1 Radiello Diffusive Sampler

A Radiello® radial diffusive sampling system will be utilized to collect the indoor/outdoor ambient vapor samples. The main components of the Radiello® system are the supporting plate, diffusive body, and adsorbing cartridge. The Radiello® samplers will be assembled by inserting the adsorbing cartridge into the diffusive body. The ambient vapor sampler will then be positioned within the "breathing zone" (about 5 feet above the floor) over a period of one week, whereby the start and end dates and times will be recorded. Once vapor monitoring is complete, the adsorbent cartridge will be placed back into its original tube and marked with a unique sample number.

2.1.2 Vacuum Canisters

A 1-Liter Summa® vacuum canister or similar laboratory-provided container will be used to collect the ambient vapor samples from within the crawlspace of the former dry cleaners building. The vacuum canisters will be received from the laboratory and the contents of the sampler will be pre-evacuated to approximately -30.0 inches of mercury (in Hg); canister samplers with an initial vacuum less than -25.0 in Hg may indicate a compromised sample due to ambient air leaking into the canister during transport, and Apex will not use the container for sampling. Apex will attach the 1-hour flow controller and vacuum gauge onto the canister and perform a fit check to ensure an airtight seal. The initial vacuum of the canister will be recorded prior to collecting the ambient vapor sample. Due to height and access restrictions associated with the crawlspace, Apex will rely on a polyvinyl chloride (PVC) pipe used as a conduit to reach the target distance into the crawlspace from the building exterior and run sample tubing through the conduit. The sample train will be purged of at least three tubing-volumes of air with a peristaltic pump so that only air from within the crawlspace is collected in the sample container. Once the vacuum canister has reached no less than -5.0 in Hg, the canister will be closed and carefully packaged for shipment to the laboratory.

3.0 Analytical Program

Chemical analyses will be performed to assess ambient air quality within and beneath the Site building and whether an unacceptable risk to human health may be present from vapor intrusion related to the historical contamination. The SAP discusses the analytical program in detail (Appendix B).

The two sampling events will include a total of 10 Radiello® samplers (two duplicates added) and four Summa® canisters or similar. All samples will be identified with a unique sample number and delivered via chain-of-custody to Pace Analytical (Oregon Price Agreement #8903) for the following laboratory analyses:

- EPA Method TO-17 for the short list of VOCs (Radiello® RAD-145 samples); and
- EPA Method TO-15 for the standard list of VOCs (Summa® samples).

Select VOCs in the analytical methods include perchloroethylene (PCE) and its underlying constituents: trichloroethylene (TCE), cis-1,2-dichloroethylene (DCE), trans-1,2-DCE, and vinyl chloride (VC).

Quality assurance/quality control (QA/QC) procedures will be used throughout this project. The SAP in Appendix B includes the QA plan for the project. The plan includes sampling and custody procedures, QA sampling analysis, detection limit goals, field QC, laboratory QC, and QA reporting.

4.0 Reporting

Following the first round of sampling during seasonally dry conditions, Apex will prepare a brief data summary memo for DEQ that will summarize the sampling event and analytical results and will briefly discuss factors that may influence interpretation of results (i.e., occupant activities, HVAC operation, etc.). The memo will also include documentation of the ambient outdoor temperatures and barometric pressure during the sampling period. Following the second round of sampling during seasonally wet conditions, Apex will prepare a comprehensive SI Report that details the monitoring activities from both events, potential factors that may influence results, temperature and pressure documentation, analytical results, risk screening, and conclusions. Data will be screened against applicable DEQ risk-based concentrations (RBCs) to assess whether the Site may pose an unacceptable risk to human health.

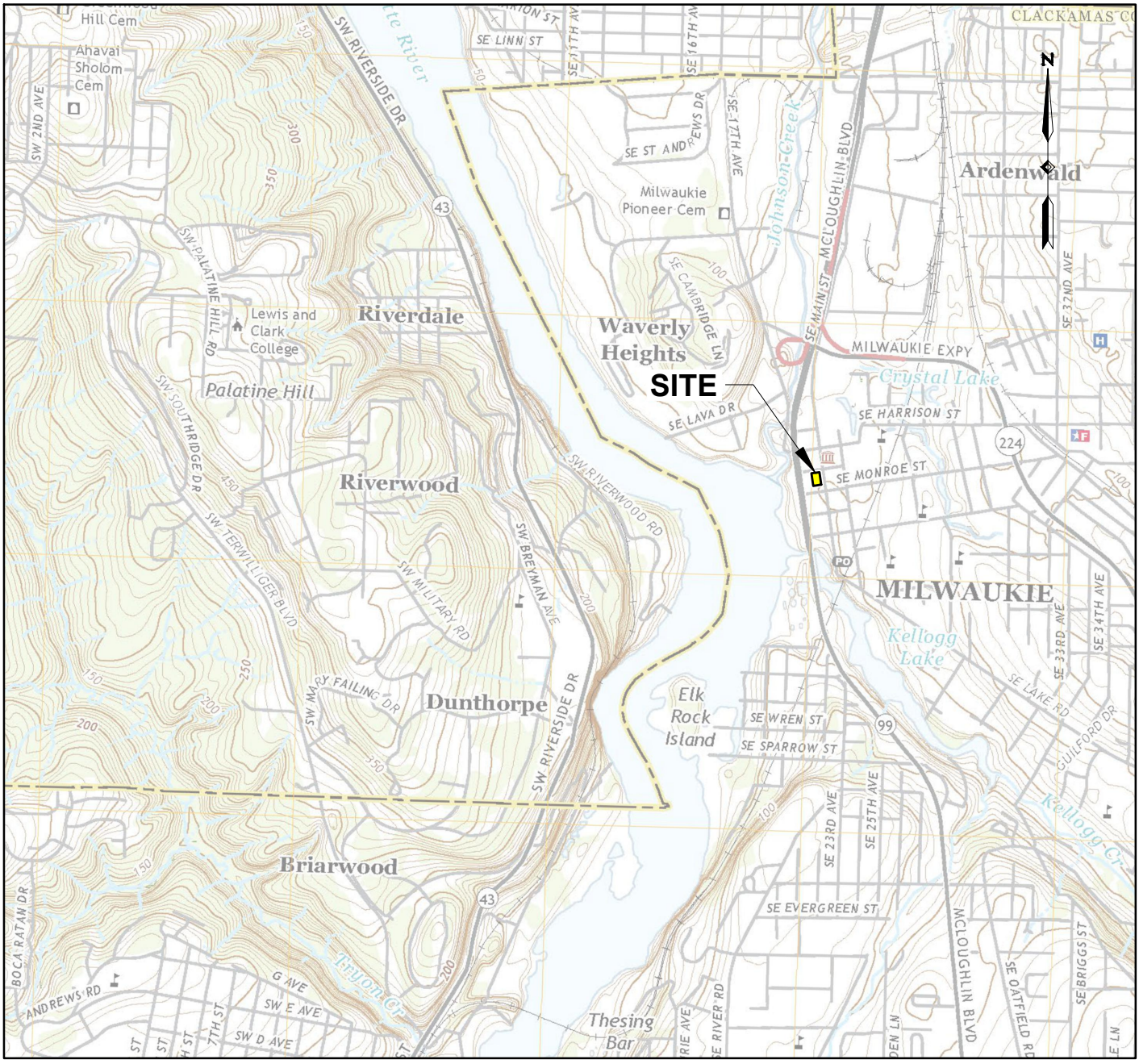
The comprehensive SI Report will be prepared in general accordance with the following outline:

1. Introduction
    a. Purpose
    b. Scope of Work
    c. Limitations
2. Background
    a. Site Location and Description (includes Site maps)
    b. Geology and Hydrogeology
3. Field Activities
4. Chemical Analysis and Results
    a. Analyses Performed
    b. Chemical Results
5. Risk-Based Screening
6. Conclusions and Recommendations
7. Appendices (as applicable)
    a. Backup Documentation and Field Notes (e.g., photographs, temperature/pressure documentation)
    b. Field Methods and Sampling Procedures
    c. Analytical Laboratory Testing Program and Documentation (including a QA review)

A draft of the report will be submitted to DEQ for review. Following DEQ review and comment, the report will be revised, and a final version will be submitted to the DEQ.

5.0 References

Oregon Department of Environmental Quality (DEQ), 2002. *DEQ Staff Report – Abe's Cleaners Facility, Milwaukie, Oregon, ECSI 1258*. October 10, 2002.



Lake Oswego, Oregon

United States Geological Survey
7.5 Minute Series Topographic Map
Contour Interval: 10 feet
Scale: 1 inch = 24,000 feet
Date: 2020

0 2,000 4,000
Scale in Feet

OREGON

Site Location Map

Former Abe's Cleaners
10863 SE Main Street
Milwaukie, Oregon

Apex Companies, LLC 15618 SW 72nd Avenue Tigard, Oregon 97224	Project Number: 32-23009132	Drawn: JP	Approved: AB	Figure 1
	October 2023			

I:\Client\DEQ\Oregon\32-23009132 Abe's Cleaners\32-23009132 01 (Site Location).dwg Modified 9/19/2023 by JPoore

Appendix A

Apex Standard Operating Procedures (SOPs)

1. PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) provides instructions for recording data when documenting a site visit, field measurements, or sample collection. Field data may be recorded in field logbooks, on standardized forms, as annotated maps, as photo documentation, or electronically. This SOP also includes documentation requirements and instructions related to field health and safety documentation. This procedure is applicable during Ash Creek Associates (ACA) site operations.

2. EQUIPMENT AND MATERIALS

The following materials are necessary for this procedure:

- Standardized field data sheets and/or a bound project-specific field notebook (e.g., Rite-in-Rain™)
- Indelible ink pen
- Wristwatch or other time-keeping device
- Corporate Health and Safety Plan (HASP)
- Site specific Health and Safety Plan or other applicable health and safety documentation

The following materials may also be needed: Site maps, clipboard, three-ring binder or equivalent, camera, and ruler or similar scale

3. PREPARATION

Field notebooks and field data sheets are project files and should remain with project documentation when not in use. Pages must be consecutively numbered. The following represents a basic list of field reporting guidelines.

- Record work, observations, quantities of materials, calculations, drawings, and related information.
- Information should be factual and unbiased.
- Do not start a new page until the previous one is full or has been marked with a single diagonal line so that additional entries cannot be made. Use both sides of each page or mark the back with a single diagonal line.
- Write in indelible ink. Do not write in pencil unless working in wet conditions.
- Do not erase or blot out any entry. Indicate any deletion by a single line through the material to be deleted, then initial..
- Do not remove any pages from a field notebook.
- Record sufficient information to completely document field activities.
- Entries should be neat and legible.

Specific Information to be recorded:

- Site name and location
- Personnel on site (ACA, clients, site contacts, regulators, oversight personnel, subcontractors, etc)
- Results of phone calls, conversations
- Chronology of activities, including mobilization, investigatory activities, and demobilization
- Weather conditions (initial and any changes; temperature, wind conditions, precipitation)
- Inspections of equipment, materials, supplies (problems, corrective action)
- Subcontractor name, description of services, and any issues (problems, stand by time)

- Description of major equipment (drill rigs, backhoe, etc)
- Field measurements (including data and time), sampling information, description of procedures and field screening observations
- Instruments (make, model, etc.) and calibration info (date, time, personnel, standard)
- Equipment decontamination procedures and materials
- Well information (depth to water, static water depth, condition of well)
- Well purging information (procedure, equipment, volumes, pumping rate, criteria for acceptance, time and date)
- Presence and detection of immiscible layers, detection method, sampling method
- Sample description, depth, and location identification (e.g., boring, well identification)
- Sample location description (sketch, GPS coordinates, compass and distance measurements from fixed points)
- Unique sample ID
- Any pertinent field observations that could affect data quality (instrument problems, contamination sources)
- Deviations from approved plan (schedule modifications, relocation or elimination of sample locations, change orders), including rationale
- Investigation-derived waste (IDW) types, volumes, storage, and disposal

Health and Safety Field Documentation

- A site-specific HASP should be prepared for any job involving field work. Generally, the health and safety plan will include a route to hospital map, emergency contact phone numbers, a sign-in sheet for field personnel, an evaluation of anticipated risks/hazards associated with the job, and personal protective equipment (PPE) requirements. For smaller jobs where no sampling is to be conducted, such as site walks, an abbreviated HASP containing (at minimum) a route to hospital map, emergency contact numbers, and a sign-in sheet can be used. For all projects involving field work, the Ash Creek corporate HASP should be maintained onsite for the duration of the field work.
- A health and safety meeting should be conducted at the start of each day onsite (or whenever new personnel arrives onsite) and should include onsite Ash Creek personnel and subcontractors under the direction of Ash Creek. The meeting will include review of the site-specific HASP including route to hospital information. For smaller field work jobs that only include one person, such as site walks, the daily field health and safety meeting will include an individual review of the site-specific HASP. Following HASP review, the individual will sign the sign-in sheet. On larger multi-day field projects, a more extensive kick-off meeting will be held on or before the first day of field work, with a daily "tailgate" safety meeting to be conducted at the initiation of each day in the field.
- Sign-in sheets should be maintained along with the field notes in the job folder as a record of the field health and safety meetings. In addition to field personnel signatures, each sign-in sheet shall include the project number, date of field work, corresponding version of site-specific HASP, and PPE required.

1. PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) describes the methods for collecting ambient air vapor samples. Samples from ambient air are collected with laboratory-supplied canisters with flow control valves. The samples are generally obtained using these procedures for the purpose of determining concentrations of chemicals by laboratory analysis. This procedure is applicable to Apex Companies, LLC (Apex) ambient air vapor sampling activities.

This SOP was developed using the following resources:

- American Petroleum Institute (API), Collecting and Interpreting Soil Gas Samples for the Vadose Zone, Publication Number 4741, November 2005
- USEPA, OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Pathway from Groundwater and Soils, EPA530-D-02-004, November 2002
- Commonwealth of Massachusetts, Indoor Air Sampling and Evaluation Guide, WSC Policy #02-430, Office of Research and Standards, Department of Environmental Protection, April, 2002

2. EQUIPMENT AND MATERIALS

The following materials are necessary for this procedure:

- Laboratory-supplied sample containers and flow controllers (as specified in the work plan for time-weighted samples)
- Barricades and straps for outdoor sample placement
- Field documentation materials

3. METHODOLOGY

For ambient vapor sampling, follow steps (a) through (d).

(a) Eliminate or Identify Confounding Sources:

Prior to sampling, potential sources of target or interfering compounds should be identified and removed if possible. The specific methods for this task are site specific and should be developed in the work plan using the resources listed above in Section 1.

(b) Place Sample Canister:

Place the sample canister at the location identified by the work plan. In general, the canister should be placed in the lowest occupied level at a height of 2 to 5 feet above the floor or ground. Canisters should be protected from disturbance during the sampling period.

(c) Sample Collection:

Record the initial container pressure (initial vacuum should be approximately 30 inches of Hg). Slowly open the control valve to allow collection of the sample. Return to the sampler prior to the programmed sample duration so that some vacuum remains in the container (the target finishing vacuum is between 0.5 and 1 inches of water). Close the sample container valve and process the sampling container for shipment to the analytical laboratory.

(d) Data Recording:

Record the following:

- In a field log notebook or sampling event form, record project name, sample date, sampling location, canister serial number, initial vacuum reading, final pressure reading, and sampling time.
- Current weather conditions (temperature, barometric pressure, humidity, sunny/cloudy, wind).
- Maintain records of all field procedures, including any leak testing, purging, and sampling for each sampling location.

Appendix B

Apex Sampling and Analysis Plan (SAP)

1.0 Introduction

This appendix presents the field and sampling procedures and the analytical testing program that will be used to complete the field and analytical work for the indoor/outdoor air monitoring activities being proposed at the former Abe's Cleaners (ECSI #1258) located at 10863 SE Main Street in Milwaukie, Oregon (the Site).

Quality assurance and quality control (QA/QC) procedures discussed in this appendix are consistent with the QA/QC requirements outlined in the Oregon Department of Environmental Quality (DEQ) *Quality Assurance Project Plan for Preliminary Assessment/Site Investigations* (dated December 2017), the DEQ *Guidance for Assessing and Remediating Vapor Intrusion in Buildings* (dated March 2010, and updated May 29, 2020), and the *Guidance on Vapor Intrusion Risk-Based Concentrations Screening Levels* (June 2023).

2.0 Field and Sampling Procedures

The scope of work (SOW) includes collecting both active and passive air samples from indoor air, outdoor air, and from the crawlspace beneath the building. Data from these activities will be used to verify that site conditions remain protective of human health at the Site.

The field and sampling procedures include the following:

- Collection of passive air samples from indoor and outdoor ambient air;
- Collection of air samples from the building crawlspace using Summa® canisters or similar;
- Sample management (e.g., containers, storage, and shipment); and
- Decontamination procedures.

2.1 Preparatory Activities

Site Health and Safety Plan. A Site-specific health and safety plan (HASP) has been prepared for the proposed activities at the Site. The Site Investigation (SI) Work Plan includes a copy of the HASP in Appendix C. The HASP was prepared in general accordance with the Occupational Safety and Health Administration (OSHA) and the Oregon Administrative Rules (OAR). A copy of the HASP will be maintained on-Site during the field activities.

Property Access. It is our understanding that the DEQ has obtained access rights to the Site in order to conduct the proposed work. Apex will coordinate the monitoring schedule directly with the owner's representative for access to the Site building.

Subcontractor Procurement. Air samples will be analyzed by Pace Analytical under Oregon Price Agreement #8903.

2.2 Site Air Monitoring Activities

A total of two sampling events will be conducted at the Site to represent dry and wet conditions during seasonal variability. Field and sampling procedures for air monitoring activities at the Site are discussed below.

For each sampling event, three indoor ambient air samples will be collected within the Site building using Radiello® radial diffusive sampling system methods over a period of one week and include the following: one sample from the main tenant space; one sample from the bathroom located at the rear of the Site building; and one sample (with duplicate) from the larger storage room in the northwest corner of the space. One additional outdoor ambient air sample will be collected using Radiello® system sampling methods over a period of one week from a secure location on the Site building roof to minimize the potential for unauthorized tampering with the sampler.

The indoor air sample locations were selected to represent air quality in the common work areas (such as cubicle work areas, conference rooms, or offices), as well as "worst case scenario" samples collected from small, enclosed rooms that may be more at risk for accumulation of migrated soil and groundwater vapors, such as rooms with no observed ventilation, unfinished flooring, damaged flooring, etc. The outdoor ambient sample will be mounted in a housing that maintains air flow but will protect the sampler from precipitation.

Per sampling event, two ambient vapor samples will be collected from within the crawlspace of the former dry cleaners building with vacuum canisters, such as 1-Liter Summa® canisters or similar. The samples will be collected in accordance with Apex Standard Operating Procedure (SOP) No. 2.6, Soil Vapor Sampling (see Appendix A in SI Work Plan).

2.3 Sample Management

Passive Air Samplers. The adsorbing cartridge of the Radiello® system sampler will not be removed from containment prior to sampling and will immediately be placed back in the original tube and stored on ice upon completion of the sampling to ensure accurate measurements of the Site conditions.

Soil Vapor Sample Containers. Batch certified clean sample containers (1-Liter Summa® canisters) will be provided by the analytical laboratory ready for sample collection. Each container will be filled so that residual vacuum is no less than -5.0 inches of mercury (in Hg).

Labeling Requirements. A sample label will be affixed to each sample container before sample collection. Containers will be marked with the project number, a sample number, date of collection, and the sampler's initials.

Sample Storage and Shipment. Radiello® system samples will be stored in a cooler chilled with ice or blue ice to 4 ±2 degrees Celsius. The cooler lid will be sealed with chain-of-custody seals. Samples will be sent via overnight courier to the analytical laboratory for chemical analysis. Chain of custody will be maintained and documented.

2.4 Decontamination Procedures

Personnel decontamination procedures depend on the level of protection specified for a given activity. The HASP (Appendix C of the SI Work Plan) identifies the appropriate level of protection for the type of work and expected field conditions involved in this project. In general, clothing and other protective equipment can be removed from the investigation area. Field personnel should thoroughly wash their hands and faces at the end of each day and before taking any work breaks. Sampling equipment will be provided clean from the laboratory and will not be reused at the Site.

3.0 Analytical Testing Program

Chemical analyses will be performed to assess ambient air quality within the Site building and whether an unacceptable risk to human health may be present regarding the historical contamination. Samples will be analyzed on a standard turnaround time unless expedited results are requested. Analytical laboratory QC procedures are discussed in Section 5: Laboratory Quality Control.

Table B-1 lists the proposed analytical methods and detection limit goals and lists the anticipated number of samples. Samples will be collected and handled using methods described in Section 2 of this SAP. Specific container and storage requirements for samples will be discussed with the analytical laboratory prior to sample collection and will be in accordance with the container requirements presented in Table B-2.

Indoor/Outdoor Passive Air Samples. Passive air samples (Radiello® [RAD]-145) will be analyzed for select volatile organic compounds (VOCs) by U.S. Environmental Protection Agency (EPA) Method TO-17. Select VOCs in the analytical methods include perchloroethylene (PCE) as an identified Site-related contaminant with its underlying constituents: trichloroethylene (TCE), cis-1,2-dichloroethylene (DCE), trans-1,2-DCE, and vinyl chloride (VC).

Crawlspace Air Samples. Collected crawlspace air samples will be analyzed for VOCs by EPA Method TO-15.

4.0 Field Quality Assurance Program

Table B-3 lists the proposed QA samples.

Field Chain of Custody. A chain-of-custody form will be used to record possession of a sample and to document analyses requested. Each time the samples are transferred between individuals, both the sender and receiver sign and date the chain-of-custody form. When a sample shipment is transported to the laboratory, a copy of the chain-of-custody form is included in the transport container (e.g., ice chest).

Field Duplicates. One field duplicate will be collected per sampling event. A field duplicate will consist of one Radiello® system sample collocated and collected sequentially with another sample to assess data variability. The field duplicate will be analyzed by the same analytical methods used for primary samples. Relative percent differences (RPDs) for field duplicates will be calculated to assess the data precision and accuracy and the potential variability caused by sample handling.

5.0 Laboratory Quality Control

The laboratory maintains an internal QC program as documented in its laboratory QC manual. The laboratory uses a combination of blanks, surrogate recoveries, duplicates, matrix spike recoveries, matrix spike duplicate recoveries, blank spike recoveries, and blank spike duplicate recoveries to evaluate the analytical results. The laboratory also uses data quality goals for individual chemicals or groups of chemicals based on the long-term performance of the test methods.

6.0 References

Oregon Department of Environmental Quality (DEQ), 2017. *DEQ Quality Assurance Project Plan for Preliminary Assessment/Site Investigations*. December 2017.

DEQ, 2020. *DEQ Guidance for Assessing and Remediating Vapor Intrusion in Buildings*. Updated May 29, 2020.

DEQ, 2023. *DEQ Guidance on Vapor Intrusion Risk-Based Concentrations Screening Levels*. June 2023.

Table B-1
Analytical Methods, Anticipated Sample Number, and Detection Limit Goals
Air Monitoring - Abe's Cleaners (Former) Site

	Passive Air by EPA Method TO-17		Air/Vapor by EPA Method TO-15		DEQ Acute Vapor Intrusion RBCs[†] ($\mu g/m^3$)
Analyte	Anticipated # of Samples (2 round total)	Reporting Limit (µg)	Anticipated # of Samples (2 round total)	Reporting Limit (ppbv)	
Volatile Organic Compounds (VOCs)					
Acetone	--	--	4	2.0	190,000
Benzene	10	0.02	4	0.5	87
Bromodichloromethane	--	--	4	0.5	--
Bromoform	--	--	4	0.5	--
Bromomethane	--	--	4	0.5	12,000
4-Bromofluorobenzene*	--	--	4	0.5	--
1,3-Butadiene	--	--	4	0.5	2,000
2-Butanone (MEK)	--	--	4	0.5	15,000
Carbon disulfide	--	--	4	0.5	19,000
Carbon tetrachloride	--	--	4	0.5	5,700
Chlorobenzene	--	--	4	0.5	--
Chloroethane	--	--	4	0.5	--
Chloroform	10	0.005	4	0.5	1,500
Chloromethane	--	--	4	2.0	3,000
alpha-Chlorotoluene	--	--	4	0.5	--
Cumene	--	--	4	0.5	--
Cyclohexane	10	0.01	4	0.5	--
3-Chloropropene	--	--	4	2.0	--
Dibromochloromethane	--	--	4	0.5	--
1,2-Dibromoethane	--	--	4	0.5	--
1,2-Dichlorobenzene	--	--	4	0.5	--
1,3-Dichlorobenzene	--	--	4	0.5	--
1,4-Dichlorobenzene	--	--	4	0.5	36,000
1,1-Dichloroethane	10	0.005	4	0.5	--
1,2-Dichloroethane	10	0.005	4	0.5	--
1,2-Dichloroethane-d4*	--	--	4	0.0	--
1,1-Dichloroethene	10	0.005	4	0.5	600
cis-1,2-Dichloroethene	10	0.005	4	0.5	--
trans-1,2-Dichloroethene	10	0.005	4	0.5	2,400
1,2-Dichloropropane	--	--	4	0.5	690
cis-1,3-Dichloropropene	--	--	4	0.5	--
trans-1,3-Dichloropropene	--	--	4	0.5	--
1,4-Dioxane	--	--	4	2.0	22,000
Ethanol	--	--	4	2.0	--
Ethylbenzene	10	0.01	4	0.5	66,000
4-Ethyltoluene	--	--	4	0.5	--
Freon 11	--	--	4	0.5	--
Freon 113	10	0.005	4	0.5	--
Freon 114	--	--	4	0.5	--
Freon 12	--	--	4	0.5	--
Hexachlorobutadiene	--	--	4	2.0	--
Hexane	--	--	4	0.5	--
2-Hexanone	--	--	4	2.0	--
Heptane	--	--	4	0.5	--
4-Methyl-2-pentanone	--	--	4	0.5	--

Table B-1
Analytical Methods, Anticipated Sample Number, and Detection Limit Goals
Air Monitoring - Abe's Cleaners (Former) Site

Analyte	Passive Air by EPA Method TO-17		Air/Vapor by EPA Method TO-15		DEQ Acute Vapor Intrusion RBCs[†] ($\mu g/m^3$)
	Anticipated # of Samples (2 round total)	Reporting Limit (µg)	Anticipated # of Samples (2 round total)	Reporting Limit (ppbv)	
Methyl tert-butyl ether (MTBE)	--	--	4	0.5	24,000
Methylene chloride	--	--	4	0.5	6,300
2-propanol	--	--	4	2.0	9,600
n-Propylbenzene	--	--	4	0.5	--
Styrene	10	0.01	4	0.5	63,000
1,1,2,2-Tetrachloroethane	--	--	4	0.5	--
Tetrachloroethene	10	0.005	4	0.5	120
Tetrahydrofuran	--	--	4	0.5	--
Toluene	10	0.05	4	0.5	23,000
Toluene-d8*	--	--	4	0.5	--
1,2,4-Trichlorobenzene	--	--	4	2.0	--
1,1,1-Trichloroethane	10	0.01	4	0.5	33,000
1,1,2-Trichloroethane	10	0.005	4	0.5	--
Trichloroethene	10	0.005	4	0.5	6.3
1,2,4-Trimethylbenzene	--	--	4	0.5	--
1,3,5-Trimethylbenzene	--	--	4	0.5	--
2,2,4-Trimethylpentane	--	--	4	0.5	--
Vinyl chloride	--	--	4	0.5	3,900
m,p-Xylene	10	0.01	4	0.5	--
o-Xylene	10	0.01	4	0.5	--

Notes:

1. * - Laboratory surrogate
2. [†] - Based on *DEQ Guidance on Vapor Intrusion Risk-Based Concentrations Screening Levels* (effective June 2023)
3. -- = Not available
4. ppbv = Parts per billion by volume
5. $\mu g/m^3$ = Micrograms per cubic meter
6. EPA = U.S. Environmental Protection Agency
7. DEQ = Oregon Department of Environmental Quality
8. RAD = Radiello

Table B-2
Analytical Methods – Sample Container Requirements
Air Monitoring - Abe's Cleaners (Former) Site

Analysis	Method	Sample Media	Preservative	Storage Temperature	Holding Time
Air/Vapor Samples					
VOCs (Passive)	EPA TO-17	RAD-145	none	4°C	none
VOCs	EPA TO-15	Vaccum canister	none	none	none

Notes:

1. °C = Degrees celcius
2. EPA = U.S. Environmental Protection Agency
3. RAD = Radiello
4. VOCs = Volatile organic compounds.

Table B-3
Quality Assurance Samples
Air Monitoring - Abe's Cleaners (Former) Site

QA Sample Matrix	QA Sample Type	Analyses Requested	Anticipated Number of Samples
Passive Air	Field Duplicate	EPA TO-17	2 (1 per event)

Notes:

1. °C = Degrees celcius
2. RAD = Radiello
3. VOCs = Volatile organic compounds

Appendix C

Apex Health and Safety Plan (HASP)

This Level 2 HASP is intended to provide health and safety guidelines for project field work meeting the following criteria:

- **Short-duration work not exceeding 30 consecutive days**
- **"Buddy System" in use (or communication plan implemented for "lone worker"**
- **Some likelihood of chemical and/or physical hazard exposure**
- **Limited number of job tasks (5 or less)**
- **No supplied-air respirator use**
- **Limited number of subcontractors involved (3 or less)**

The Project Manager should review this Health and Safety Plan with all Apex project personnel. A copy of the HASP must be kept in the field with the project team as well as maintained in project files.

Administrative Information **This document is valid for a maximum time period of one year after initial completion and must be re-evaluated by the project team at that time.** **A minimum of two persons with appropriate training and medical surveillance must be onsite or an appropriate communication plan must be implemented. A mix of Apex and other personnel can satisfy this requirement.**	Site Name and Location Abe's Cleaners (Former) 10863 SE Main Street, Milwaukie, OR	
	Client Contact and Phone Mark Pugh	
	Project Name Abe's Cleaners (Former) Site Investigation	
	Health & Safety Plan Date 9/18/2023	Revision Number and Date v1.0 – 9/18/2023
	Field Work Start Date Fall/Winter 2023	Anticipated Field Work End Date Fall/Winter 2023
	Project Manager (*responsible for implementing the site health and safety program on this project*) Andrew Bisbee	Site Safety Officer (SSO) (*responsible for overall site health and safety performance on this project).* Andrew Bisbee

Project Background and Scope of Work

Include numbered list of tasks to be completed by Apex personnel during this project, and a separate list of tasks to be completed by any subcontractors at the site.

JSAs are to be prepared for each task listed. Subcontractors are responsible for preparing JSAs for their activities.

Apex Scope of Work:

Perform indoor/outdoor ambient/passive air vapor sampling using Radiello and vacuum canisters.

Subcontractor Scope of Work:

N/A

Site/Project General Information

An asterisk (*) indicates that additional checklists or permits are required and must be completed and attached to this document.

A double asterisk (**) indicates that a Risk Review performed by a member of the Corporate Safety Committee must take place prior to beginning fieldwork on the project.

Site Type (check all applicable boxes)

☐ Active Facility	☐ Remote Facility	☒ Inactive Facility	☐ Residential
☐ Mine	☐ Railroad	☐ Industrial	☐ Secured
☐ Uncontrolled	☐ Other (specify)	Bookstore currently	

Main Site Hazards (check all applicable boxes)

☒ Slip/Trip/Fall	☐ Cold Stress	☐ Heat Stress	☐ Extreme Weather
☐ Biological	☒ Organic/Inorganic Chemicals	☐ High Noise	☐ Construction Traffic
☐ Vehicular Traffic	☒ Respirable Particles	☐ Excavations	☐ Buried/Overhead Utilities
☐ Non-Ionizing Radiation	☐ Security	☐ ASTs/USTs	☐ Manlift/Cherry Picker Use
☐ Work Over 6' High*	☐ Hand/Portable Power Tools	☐ Oxygen Deficiency	☐ Construction
☐ Blasting Agents	☐ Confined Spaces	☐ Welding or Hot Work	☐ Lockout/Tagout*
☐ Lockout/Tagout	☐ Forklift Use	☐ Chemical Mixing**	☐ Commercial Vehicle
☐ Scaffold Use	☐ Portable Ladders	☐ Other (*specify*)	

Chemical Products Apex will Use or Store Onsite

For each chemical product identified, an SDS must be attached to this HASP

- ☐ Alconox or Liquinox
- ☐ Hydrochloric acid (HCl)*
- ☐ Nitric acid (HNO_3)*
- ☐ Sodium hydroxide (NaOH)*
- ☐ Calibration gas (Methane)
- ☐ Calibration gas (Isobutylene)
- ☐ Calibration gas (Pentane)
- ☐ Calibration gas (4-gas mixture)
- ☐ Other (specify)
- ☐ Isopropyl Alcohol
- ☐ Household bleach (NaOCl)*
- ☐ Sulfuric acid (H_2SO_4)*
- ☐ Hexane
- ☐ Other (specify)

***NOTE: Eyewash solution shall be readily available on ALL projects where corrosive materials are used or stored, including sample preservatives.**

Safe Work Practices

Place a checkmark by applicable SWPs and attach to this document

For hazards not covered by SWPs listed in this section, ensure the hazard is addressed in the JSA for that task. Otherwise, the JSA may reference the SWP for that hazard.

SWPs Applicable To This Project (check all applicable boxes)

☒ Hazard Communication	☒ Medical Services and First Aid	☒ Airborne Contaminants	☐ Heat Stress
☐ Cold Stress	☐ Natural Hazards	☒ Personal Protective Equipment	☐ Respiratory Protection
☐ Confined Space Entry	☐ Drum Handling	☐ Excavation	☐ Fall Protection and Prevention
☐ Forklift and Truck Operations	☐ Hand/Power Tool Use	☐ Heavy and Material Handling Equipment	☐ Ladder Safety
☐ **Other Task (specify)**	☐ **Other Task (specify)**	☐ **Other Task (specify)**	☐ **Other Task (specify)**
☐ **Other Task (specify)**	☐ **Other Task (specify)**	☐ **Other Task (specify)**	☐ **Other Task (specify)**

Levels of Protection Required for each Task

Signature of the SSO on page 1 of this document signifies certification of PPE Hazard Assessment

Task Description	Level			
	A	B	C	D
Mobilize to/from Site.	☐	☐	☐	☒
Perform indoor/outdoor ambient/passive air vapor sampling.	☐	☐	☐	☒
May need to drill 4-inch hole in concrete foundation to access crawlspace – respirator required.	☐	☐	☐	☒
	☐	☐	☐	☐
	☐	☐	☐	☐

Personal Protective Equipment	Equipment	Req	Rec	NA	Equipment	Req	Rec	NA
Req=Required Rec=Recommended An asterisk (*) indicates that employees must be a participant in the respiratory program, including, annual training and fit testing.	Steel Toe Boots	☒	☐	☐	Tyvek Suit	☐	☐	☒
	Safety Glasses Shields	☒	☐	☐	Outer Disposable Boots	☐	☐	☒
	Hi-Vis Vest (Specify Class 2/3)	☒	☐	☐	Indirect Vented Goggles	☐	☐	☒
	Hi-Vis Shirt	☐	☐	☒	Poly-Coated Tyvek	☐	☐	☒
	Hard Hat	☐	☐	☒	Dust Mask*	☐	☐	☒
	Fire Resistant Clothing (FRC)	☐	☐	☒	Full-Face Respirator*	☐	☐	☒
	Hearing Protection	☒	☐	☐	Half-Face Respirator*	☒	☐	☐
	Work Gloves – Type: Nitrile	☒	☐	☐	Inner Chemical Gloves	☐	☐	☒
	Outer Chemical Gloves	☐	☐	☒	Other (specify)	☐	☐	☒
Training and Medical Surveillance Req=Required Rec=Recommended	**Training**	**Req**	**Rec**	**NA**	**Medical Surveillance**	**Req**	**Rec**	**NA**
	40 Hour HAZWOPER	☒	☐	☐	Medical Clearance (fit for duty)	☒	☐	☐
	Current 8 Hour HAZWOPER	☒	☐	☐	Respirator Clearance	☒	☐	☐
	8 Hour HAZWOPER Supervisor	☐	☐	☒	Blood Lead and ZPP	☐	☐	☒
	24Hour HAZWOPER	☐	☐	☒	Other (specify)	☐	☐	☐
	Current CPR and First Aid	☒	☐	☐	Other (specify)	☐	☐	☐
	10 Hour Construction	☐	☐	☒	Other (specify)	☐	☐	☐
	Other (specify)	☐	☐	☐	Other (specify)	☐	☐	☐
	Other (specify)	☐	☐	☐	Other (specify)	☐	☐	☐
	Other (specify)	☐	☐	☐	Other (specify)	☐	☐	☐
Safety Supplies Req=Required Rec=Recommended	**Supplies**	**Req**	**Rec**	**NA**	**Supplies**	**Req**	**Rec**	**NA**
	First Aid Kit	☒	☐	☐	Fire Extinguisher	☒	☐	☐
	Eyewash Solution	☐	☒	☐	Water/Sports Drink	☐	☒	☐
	Air Horn	☐	☐	☒	Oral Thermometer (heat monitoring)	☐	☐	☒
	Noise Meter (Dosimeter)	☐	☐	☒	Decontamination Supplies	☐	☐	☒

Work Zones **If exclusion zones are necessary because of chemical OR equipment hazards, describe the plan**	Exclusion Zone: NA
	Contamination Reduction Zone: NA
	Support Zone: NA

Site Access/Control **How do we limit unauthorized entry to the site itself?**	Access Control Procedures: NA
DECON Procedures	Decontamination Procedures: Follow Level D PPE decontamination procedures.

Communication Plan **In the event work must be completed alone by an Apex employee or work is performed in a rural area with limited communication, this Communication Plan must be completed.**	The purpose of the communication plan is to provide a "What to Do" if the project manager/supervisor cannot contact field personnel. The field team and PM must coordinate a call in time daily. The check-in intervals will depend on the project setting and hazards. More importantly, if the field team does not check in, what is the requirement or actions of the PM.			
	Daily Check in Time	Responsible Person	Daily Check In Time	Responsible person
	16:00 AM	Field Staff		
	Plan of Action (in the event of no communication): The Responsible Person will contact the Project Manager at the times selected above. If the Project Manager does not hear from the Responsible Person, the Project Manager will contact them. If no response is received within 15 minutes, the Project Manger will make another attempt. If the Project Manager still has not heard from the Responsible Person by 30 minutes, personnel will be sent to the Site to check on the Responsible Person.			

Chemicals of Concern

In the section to the right, check any chemicals present onsite in any media (air, soil water).

In the table below, list chemicals suspected or confirmed to be onsite, and provide requested information.

☐ Diesel- and Oil-Range TPH	☐ alpha-Napthylamine	☐ Methyl chromoethyl ether
☐ 3,3'-Dichlorobenzidine	☐ bis-Chloromethyl ether	☐ beta-Napthylamine
☐ Benzidine	☐ 4-Aminodiphenyl	☐ Ethyleneimine
☐ beta-Propiolactone	☐ 2-Acetylaminoflourene	☐ 4-Dimethylaminoazobenzene
☐ N-Nitrosomethylamine	☐ Vinyl chloride	☐ Inorganic arsenic
☐ RCRA 8 Metals	☐ Chromium (VI)	☐ Cadmium
☐ Dioxins	☐ Coke oven emissions	☐ 1,2-Dibromo-3-chloropropane
☐ Acrylonitrile	☐ Ethylene oxide	☐ Formaldehyde
☐ Methylenedianiline	☐ 1,3-Butadiene	☐ Methylene chloride
☒ Other: VOCs (RAD/TO-15)	☐ **No Apex exposure to these**	☐ Sub Slab VOCs

Materials Present or Suspected at Site	Highest Reported Concentration (specify units and sample medium)	Exposure Limit (specify ppm or mg/m^3)	IDLH Level (specify ppm or mg/m^3)	Primary Hazards of the Material (explosive, flammable, corrosive, toxic, volatile, radioactive, biohazard, oxidizer, or other)	Symptoms and Effects of Acute Exposure	Ionization Potential (eV)
Benzene	--	PEL = 1 ppm REL = 0.1 ppm TLV = Skin Hazard ☐	500 ppm	Flammable	Acute occupational exposure to benzene may cause narcosis: headache, dizziness, drowsiness, confusion, tremors, and loss of consciousness. Use of alcohol enhances the toxic effect.	
Trichloroethylene (TCE)	4.3 ppbv	PEL = 100 ppm REL = TLV = Skin Hazard ☒	1,000 ppm	Toxic	Irritation of eyes/skin, headache, visual disturbance, lassitude (weakness, exhaustion), dizziness, tremor, drowsiness, nausea, vomiting, dermatitis, cardiac arrhythmias, paresthesia, liver injury, potential male reproductive toxin.	
Tetrachloroethene (PCE)	0.25 ppbv	PEL = 100 ppm REL = 2 ppm TLV = Skin Hazard ☒	150 ppm	Toxic	When concentrations in air are high, particularly in closed, poorly ventilated areas, single exposures can cause dizziness, headache, sleepiness, confusion, nausea, difficulty in speaking and walking, unconsciousness, and death. Irritation may result from repeated or extended skin contact with the chemical.	
Chloroform	--	PEL = 50 ppm REL = 2 ppm TLV = Skin Hazard ☐	500 ppm	Toxic	Chloroform affects the central nervous system (brain), liver, and kidneys after a person breathes air or drinks liquids that contain large amounts of chloroform. Breathing approximately 900 ppm for a short time causes fatigue, dizziness, and headache. If you breath air, eat food, or drink water containing elevated levels of chloroform over a long period, the chloroform may damage your liver/kidneys.	

PEL = OSHA Permissible Exposure Limit
REL = NIOSH Recommended Exposure Limit
TLV = ACGIH Threshold Limit Value
IDLH = Immediately Dangerous to Life or Health

Monitoring Equipment: All monitoring equipment on site must be calibrated before and after each use and results recorded.				
Instrument (Check all required)	**Task**	**Instrument Reading**	**Action Guideline**	**Comments**
☐ Combustible gas indicator model:	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5	0 to 10% LEL 10 to 25% LEL >25% LEL	Monitor; evacuate if confined space Potential explosion hazard Explosion hazard; interrupt task; evacuate site	
☐ Oxygen meter model:	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5	>23.5% Oxygen 23.5 to 19.5% Oxygen <19.5% Oxygen	Potential fire hazard; evacuate site Oxygen level normal Oxygen deficiency; interrupt task; evacuate site	
☐ Radiation survey meter model:	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5	Normal background Two to three times background >Three times background	Proceed Notify SSO Radiological hazard; interrupt task; evacuate site	Annual exposure not to exceed 1,250 mrem per quarter Background reading must be taken in an area known to be free of radiation sources
☐ Photoionization detector model: ☐ 11.7 eV ☐ 10.6 eV ☐ 10.2 eV ☐ 9.8 eV ☐ _____ eV	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5	Any response above background to 5 ppm above background 5 ppm above background 50 ppm above background	Level D is acceptable Level C (not anticipated) Discontinue work	Action levels must be determined based on the COCs and concentrations identified in the media sampled. If no COC conentrations are known, then use 5 ppm sustained within the breathing zone as your action level until the contaminants are identified.
☐ Flame ionization detector model:	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5	Any response above background to ppm above background ppm above background above background	Level C is acceptable Level B is recommended Level B Level A	Action levels must be determined based on the COCs and concentrations identified in the media sampled. If no COC conentrations are known, then use 5 ppm sustained within the breathing zone as your action level until the contaminants are identified.
☐ Detector tube models:	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5	Specify:	Specify:	The action level for upgrading the level of protection is one-half of the contaminant's PEL. If the PEL is reached, evacuate the site and notify a safety specialist.
☐ Other (specify):	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5	Specify:	Specify:	

Emergency Response Planning	
In the pre-work briefing and Daily Tailgate Safety meetings, all onsite employees will be trained in the provisions of emergency response planning, site communication systems, and site evacuation routes. **Signal a site emergency or medical emergency with three blasts of a loud horn (car horn, fog horn, or similar device).** **To complete this section, attach a hospital route map to the HASP.**	**All work-related incidents must be reported. For all medical emergencies, call 911 or the local emergency number. For non-emergency incidents, you must:** • Give appropriate first aid care to the injured or ill individual and secure the scene. • Immediately call WorkCare at (888) 449-7787 (available 24 hours/7 days per week) if the injured person is an Apex employee. • Notify the Project Manager and/or SSO after calling WorkCare. • Enter the safety incident into the Apex Incident Report and submit to incidents@apexcos.com within 24 hours. **In the event of an emergency that necessitates evacuation of the work task area or the site as a whole, the following procedures shall occur:** • The Apex site supervisor or Project Manager will contact all nearby personnel using the onsite communications system to advise of the emergency. • Personnel will proceed along site roads to a safe distance upwind from the hazard source to a pre-determined assembly area. • Call 911 • Personnel will remain in that area until the site supervisor or Project Manager or other authorized individual provides further instruction. **In the event of a severe spill or leak, site personnel will follow the procedures listed below:** • Evacuate the affected area and relocate personnel to an upwind, pre-determined assembly area. • Inform the Apex site supervisor or Project Manager, an Apex office, and a site representative immediately. • Locate the source of the spill or leak, and stop the source if it is safe to do so until appropriately trained personnel are onsite to do so. • Begin containment and recovery of spilled or leaked materials. • Notify appropriate local, state, and federal agencies after obtaining client consent to do so. **In the event of severe weather, site personnel will follow the procedures listed below:** • Site work shall not be conducted during severe weather, including high winds and lightning. • In the event of severe weather, stop work, lower any equipment (drill rigs), and evacuate the affected area. • Monitor internet or other sources for sever weather alerts before resuming work. • In the event of lightning, outdoor work must be halted for a minimum of 30 minutes from the last lightening observation.

Emergency Contacts	Name	Location	Phone	Cell Phone
Hospital (attach map)	Providence Hospital	10150 SE 32nd Ave, Milwaukie	503-513-8300	
Police	Milwaukie Police Dept.	3200 SE Harrison St, Milwaukie	911	
Fire	Milwaukie Fire Dept., Sta. #2	3200 SE Harrison St, Milwaukie	911	
Project Manager	Andrew Bisbee	15618 SW 72nd Ave, Tigard, OR	503-974-0414	567-454-2429
Field Manager (if not PM)				
Site Safety Officer (if not PM)				
Division H&S Contact	Josh House	Signal Hill, CA		562-516-1863
Corporate H&S Contact	Jay Strauss			406-672-9357
Incident Intervention	WorkCare	NA	888-449-7787	
Subcontractor Safety Contact				
Subcontractor Safety Contact				

Acknowledgement	***I have read, understood, and agree with the information set forth in this Health & Safety Plan, and will follow guidance in the plan and in the Apex Corporate Health and Safety Manual. I understand the training and medical monitoring requirements for conducting activities covered by this HASP and have met these requirements.*** ***Apex has prepared this plan solely for the purpose of protecting the health and safety of Apex employees. Subcontractors, visitors, and others at the site are required to follow provisions in this document at a minimum, but must refer to their organization's health and safety program for their protection.***		
Printed Name	Signature	Organization	Date

Approval Signatures

Signatures in this section indicate the signing employee will comply with and enforce this HASP, as well as procedures and guidelines established in the Apex Corporate H&S Manual. Signatures in this section also indicate that any subcontractors performing work under contract to Apex agree to comply with this HASP.