From: FULLER Brian * DEQ
To: Sam Imperati; Rough, Ginger
Cc: REDICK Daniel; NICHOLS Darren; WILLIAMS Inga; VERRET Greg J
Subject: RE: Tour Q&A
Date: Wednesday, October 26, 2022 2:36:59 PM
Attachments: image001.png
CBLFTour Questions And Responses 10-17-22 Draft.docx
Coffin Butte_Burn Dump Clean Closure_Workplan_w Appendices.pdf

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Hello
Attached are answers to the questions that seemed applicable to DEQ. Sorry for the delay. Let me know if you have questions.
Thanks

Brian Fuller
Manager – Hazardous Waste and Materials Management Programs
Oregon DEQ - Western Region - Eugene
541-501-3349 - Mobile
http://www.oregon.gov/DEQ/
He/Him/His

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From: Sam Imperati <samimperati@icmresolutions.com>
Sent: Monday, October 17, 2022 7:45 PM
To: FULLER Brian * DEQ <Brian.FULLER@deq.oregon.gov>; Rough, Ginger <GRough@republicservices.com>
Cc: REDICK Daniel <daniel.redick@Co.Benton.OR.US>; NICHOLS Darren <darren.nichols@Co.Benton.OR.US>; WILLIAMS Inga <Inga.Williams@Co.Benton.OR.US>; VERRET Greg J <Greg.J.VERRET@co.benton.or.us>
Subject: Tour Q&A

Ginger and Brian,

Daniel combined the questions from the two tours into the attached document. The County and the Neighborhood Tour Leaders have drafted responses.

I will remember you in my will* if your answer the questions that are relevant to you, and

return this document to me by COB on 10/25/22, so we can include them in the packet for the 10/27 BCTT meeting.

Happy to discuss.

Thanks, Sam

* All my debts will go to you!

WORK PLAN

COFFIN BUTTE LANDFILL
"BURN DUMP" CLEAN CLOSURE

BENTON COUNTY, OREGON

OCTOBER 2018
PROJECT NO. AU18.1148.00

SUBMITTED TO:

VALLEY LANDFILLS, INC.

Valley Landfills, Inc.
28972 Coffin Butte Road
Corvallis, Oregon 97330

PREPARED BY:

Geo-Logic ASSOCIATES

Geo-Logic Associates
803 SW Industrial Way, Suite 211
Bend, Oregon 97702
(541) 678-5733

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1.0 INTRODUCTION

1.1 General

Geo-Logic Associates (GLA) was retained by Republic Services (Republic) to develop clean closure plans and construction documents for the removal of the former burn dump, also known as the former Army landfill that is located in the westernmost portion of the site's landfill zoning boundary at the Coffin Butte Landfill (CBL). This report presents a work plan for the excavation and relocation of the non-hazardous solid waste in the burn dump area to the active landfill at the CBL. This report consists of a discussion of the overall project, site history and characteristics, proposed clean closure work, excavation and management plans, confirmation sampling plan, health and safety issues, and schedule.

1.2 Project Location

The CBL is located in Benton County, Oregon, approximately 10 miles north of the city of Corvallis. The CBL is owned and operated by Valley Landfills, Inc. (VLI), a subsidiary of Republic. The CBL is an active municipal solid waste (MSW) landfill operating under Oregon Department of Environmental Quality (ODEQ) Solid Waste Permit No. 306. The site is located at 28972 Coffin Butte Road, Corvallis, Oregon. The former burn dump encompasses approximately 17.9 acres in the westernmost portion of the site's landfill zoning boundary.

1.3 Site and Project Descriptions

The permitted landfill site encompasses approximately 184 acres, of which approximately 119 acres have been developed to date and 42 acres have received final closure to date. The active landfill is divided into six major cells and subcells that are designed based on waste filling demands and fill planning. Cell 5B is the most recently constructed active cell.

The former burn dump encompasses the western portion of future Cell 6, west of the existing quarry that is operated by Knife River (see Drawing G02). Based on the grades depicted in the most recent Site Development Plan (Thiel Engineering, 2013), the former burn dump area would need to be removed as part of the Cell 6 excavation.

The burn dump has been identified to contain non-hazardous waste located below an un-engineered soil cover. The area is heavily vegetated with grasses and shrubs. The surface topography slopes in a southwesterly direction from approximate elevation 280 feet to 420 feet above mean sea level (amsl). The burn dump is bordered on the southwest by the site's landfill zoning boundary and a wetland and to northeast by the existing Knife River active rock quarry that resides within the footprint of the CBL's future Cell 6.

2.0 EXISTING CONDITIONS

2.1 Site History

Landfill operations in the burn dump area began in the 1940s by the Army as part of disposal operations for Camp Adair. A former rock quarry excavated into the hillside on the southwestern portion of the site was reportedly used for the initial disposal area, and an open burn dump was reportedly operated by the Army in the 1940s in this area (URS, 1995). Wastes were received in this area until 1975 when VLI purchased the Coffin Butte site. The former Army landfill/burn dump was officially capped and closed in 1977 with an all soil cover (ODEQ, 1995). There is limited information on the types or extents of materials deposited in the former Army landfill/burn dump. It has been assumed that typical military base-generated waste (i.e. domestic refuse, waste ordnance, metals, and waste oils) were deposited (URS, 1995). The approximate boundary of the closure area was reported by URS (1995). However, reliable pre-landfill topography does not exist, and until recent characterization studies, the thickness and volume of the waste have remained largely unknown.

2.2 Site Geology

The Coffin Butte Landfill area is located on part of the broad alluvial plain that lies between the Cascade Mountains and the Coast Range within the central Willamette Valley of northwestern Oregon. The lowland areas consist of an alleviated valley plain, with elevations ranging from approximately 200 to 300 ft amsl. Irregular bottom lands exist along the streams, which are 5 to 30 ft below the valley-plain terrace. The upland parts of the area consist of hills and ridges of the Coast Range with elevations ranging from 500 to 1500 ft amsl (URS, 1995; Frank, 1974).

The Coffin Butte Landfill is located along the northern end of a prominent Lower Eocene volcanic feature. The basalt feature consists of dark greenish-gray aphanitic to porphyritic flows, breccia, tuff, and related intrusive rocks with pillow structures and zeolite and calcite amygdules. West of this basaltic feature on the westernmost portion of the site lies the Siletz River Volcanic Series, including subordinate waterlaid tuffaceous sedimentary rocks known as the Kings Valley siltstone (Peck, 1961). Alluvial deposits (clays, silty clays with gravel, or silty sands) overlie the volcanics and are present along the lower slope areas of Coffin Butte (URS, 1995).

2.3 Site Hydrogeology

The Coffin Butte Landfill is sited along the southern flank of Coffin Butte. In areas of the site that are undeveloped, the upper third of the butte consists of steep grass covered slopes. The middle third of the butte consists of exposed bedrock with little vegetation. The lower third of the butte consists of gentle, soil-covered slopes. Generally, the steeper slopes of the butte are underlain by basalt bedrock and lower, flatter slopes on the flanks of the butte are underlain by alluvium that consists of silty clay to clayey silt with variable amounts of thin, interbedded sands and silty to sandy gravels that are commonly known as Willamette Silt (Tuppan Consultants, 2017).

The two principal water-bearing units consist of unconsolidated alluvium and weathered to unweathered bedrock volcanics. Groundwater is known to exist in both units at the site, however, alluvial deposits are either absent or unsaturated over much of the landfill property. In areas of the landfill where both units are present, the units are hydraulically connected. Groundwater elevations have been shown to fluctuate seasonally within the existing groundwater monitoring network. In 2017 the average site-wide seasonal groundwater elevation fluctuation was approximately 3.2 feet (Tuppan Consultants, 2017).

The direction of groundwater flow is controlled by the topography of Coffin Butte and Poison Oak Hill and the intervening lowland areas. Groundwater quality in the Burn Dump area is currently monitored using two monitoring wells. Well MW-20 is completed in the alluvial aquifer and well MW-21 is completed in bedrock. Both monitoring wells are located to the west of, and immediately downgradient from, the Burn Dump area. The estimated horizontal velocity of groundwater downgradient of the Burn Dump area is approximately 20 ft/yr for the alluvium, and 240 ft/yr for the bedrock aquifer. The estimates for horizontal groundwater velocity assume a hydraulic conductivity for the alluvium of 0.22 ft/day, and 2.7 ft/day in the bedrock, and an effective porosity of 25 percent for both units. The average hydraulic gradient in the vicinity of the Burn Dump area is estimated to be 0.061 ft/ft. During the 2017 monitoring events, groundwater elevation in the vicinity of the Burn Dump was reported to range from 255.92 to 251.45 ft amsl in the alluvium (well MW-20), and from 253.87 to 249.66 ft amsl in the bedrock aquifer (well MW-21) (Tuppan Consultants, 2017).

Historically, VOCs including chlorobenzene, 1,2-dichlorobenzene, and cis-1,2-dichloroethene have been detected in compliance well MW-21. However, VOCs were not detected at concentrations above maximum contaminant levels (MCLs), and no VOCs have been detected in compliance wells MW-20 and MW-21 since 2006 (Tuppan Consultants, 2017).

2.4 Subsurface Investigations and Characterizations

A preliminary waste characterization study was performed within the former burn dump area during 2016. Because the former burn dump resides within the footprint of the CBL's future Cell 6 (Thiel Engineering, 2013), the primary objectives of this study were to characterize the waste constituents and extents for use in future landfill planning. The field investigation commenced in May 2016 and consisted of geophysical seismic surveys of four transects through the burn dump area as wells as excavation and logging of 15 exploratory test pits. In addition, samples of waste were collected for analytical testing. The results from this investigation were included in the "Waste Characterization Study: Coffin Butte Landfill 'Burn Dump' Exploration" dated July 2016 and prepared by Geo-Logic Associates (GLA, 2016). The results from this study indicated the presence of 0 to 5 feet of clean cover soils with an average thickness of 2.3 feet overlying waste with the appearance of household trash up to 15 feet below the ground surface. No burn ash or hazardous materials were encountered in the test pits. Analytical laboratory testing on two waste samples indicated that the waste classifies as non-hazardous. Geophysical (seismic) surveying was used to assess the vertical extents of the waste and to develop a three-dimensional surface of the base of waste. The resulting volume of waste was calculated to be

about 535,000 cy with another estimated 145,000 cy of contaminated native material beneath the waste and an estimated 70,000 cy of usable cover soil overlying the waste.

In 2017, GLA performed a second phase waste characterization study that consisted of nine (9) boreholes through the former burn dump waste, extending into the underlying native materials. Continuous core samples of the waste were collected and logged, and analytical laboratory testing on twelve (12) samples indicated that the waste classifies as non-hazardous and may therefore be relocated to the adjacent active municipal solid waste (MSW) landfill. Based on the bottom of waste (BOW) encountered in the boreholes, the estimated subgrade surface was refined relative to the subgrade surface estimated in 2016, as were the estimated volumes of waste in-place, contaminated native material, and existing cover soil that will be required for removal. The updated volume estimations were approximately 574,000 cy of waste with another estimated 60,000 cy of contaminated native material beneath the waste and an estimated 90,000 cy of usable cover soil overlying the waste.

3.0 CLEAN CLOSURE SCHEDULE

VLI is proposing to complete the clean closure activities in three phases over the course of 3 years, as follows:

- Phase I (2019) – Starting at the east end of the burn dump area, Phase I would consist of excavation and relocation of the waste in the area to the east of the access road that bisects the burn dump area (see Drawing G02). Based on the volume estimates reported in GLA (2017), the volume of material to be relocated during Phase I is estimated to be approximately 94,000 cubic yards (cy) of waste, 4,400 cy of impacted soil beneath existing waste, and 14,900 cy of cover material.
- Phase II (2020) – Phase II would consist of continued excavation and relocation of the eastern half of the burn dump area. Based on GLA (2017), the volume of material to be relocated during Phase II is estimated to be approximately 257,600 cy of waste, 10,600 cy of impacted soil beneath existing waste, and 49,300 cy of cover material.
- Phase III (2021) – Phase III would consist of excavation and relocation of waste located in the western half of the burn dump area. Based on GLA (2017), the volume of material to be relocated during Phase III is estimated to be approximately 255,100 cy of waste, 44,500 cy of impacted soil, and 78,800 cy of cover material.

The volumes listed above are estimates only based on the subsurface investigations by GLA (2016) and GLA (2017). Actual phase-by-phase quantities are subject to change based on the conditions found during construction in conjunction with the clean closure criteria outlined in this Work Plan and annual construction budgets.

4.0 EXCAVATION AND MATERIAL MANAGEMENT

This section focuses on the activities associated with waste and soil excavation from the historic Burn Dump area. The general purpose of the proposed clean closure is to relocate all waste contained within the unlined, historic burn dump area by excavating the area and transferring waste to the existing lined active cells of the CBL.

The objective of the proposed historic Burn Dump clean closure is to remove all waste materials, contaminated components of the cover system, and geologic materials (soils, rock, groundwater) impacted by the waste beneath or surrounding the historic Burn Dump, and to relocate the associated materials to an appropriate lined landfill unit so that they no longer pose a threat to water quality, human health, or the environment, to create the appropriate surface grades for the existing quarry to continue expanding to the west, and for excavation of the CBL's future Cell 6.

4.1 Excavation Plan

4.1.1 Site Preparation

Prior to commencing excavation, the Contractor will prepare the site by:

- Protecting existing structures that are not to be decommissioned (i.e. groundwater monitoring wells, stormwater conveyance structures, electrical lines, LFG wells and laterals, etc. associated with other phases)
- Providing site security
- Establishing temporary construction facilities, staging areas, and temporary haul routes
- Surveying and delineating the limits of excavation

4.1.2 Excavation Sequence and Process Plan

A brief summary of the excavation procedures is provided in this section. The excavation and relocation of waste is expected to proceed in three sequential phases spanning 3 years.

The excavation of wastes within the Burn Dump area will generally begin at the eastern end of the Burn Dump limits and will proceed in a westward direction. During excavation activities, the contractor's operation is expected to impact the quarry access road near the southern end of the Phase I excavation. As such, traffic control will be required to prevent conflicts between contractor traffic and quarry traffic.

The excavation will be conducted in vertical tiers that are approximately 15 to 18 ft deep. The width of the excavation will vary from approximately 100 to 250 ft wide during Phase I excavation, depending which tier is being excavated. During Phase II and Phase III excavation, the width of excavation is expected to increase to approximately 450 to 550 ft. It is expected

that three to four simultaneous excavation faces (i.e. three to four tiers) may be occurring at certain times during the project.

As excavation of Burn Dump wastes reaches the vertical and lateral limits of the proposed excavation, field testing will be performed to verify that all waste and impacted soils are removed. The Contractor will be required to provide stormwater and erosion control systems according to the plans and specifications, and in accordance with the site's Operations Plan (GLA, 2013) and the site's NPDES Storm Water Discharge Permit.

Drawings C01 to C03 of this Work Plan show the proposed waste relocation excavation for each excavation phase, and present the excavation concept. Drawing C05 provides cross sections of the waste relocation excavation, and shows the estimated depth of waste.

4.2 Materials Management Plan

This section focuses on the activities associated with waste and soil excavation from the Burn Dump area. Waste relocation of a landfill will be considered complete only when all waste materials, contaminated components of the cover system, and impacted geologic materials (soils, rock) beneath or surrounding the Unit, and caused by a release from the Unit, are either removed or discharged to an appropriate Unit.

Waste excavation activities at the historic Burn Dump will include excavation of existing cover soils, refuse (including interim cover), and as appropriate, underlying soils impacted by Burn Dump waste. Additional soils may also be excavated at the base of the waste relocation excavation to grade it for stormwater management purposes. Based on updated estimates of the BOW surface, the proposed excavation may include up to about 610,000 cy of waste, an estimated 143,000 cy of cover soil (includes double-handling of cover soils for seasonal closures between phases), and 60,000 cy of impacted soil from below the waste. Waste and impacted soils will be hauled, placed, and compacted within the lined limits of the active MSW landfill, and cover soils will be stockpiled within the lined limits of the active MSW landfill for operational use as daily cover.

4.3 Transport and Disposal of Excavated Waste Materials

Burn Dump materials will be excavated and directly loaded on to large capacity off-highway dump trucks. Once loaded on the dump trucks, the wastes will be transported to the active landfill for final placement and compaction. To help prevent the release of odor and/or dust into the environment during transport of waste materials, the Contractor is to ensure that the loaded waste is either appropriately covered or sufficiently moist. It is anticipated that standing water may be present in the waste, and if so, the Contractor is to take proper precautions not to drip or spread standing water along the haul route or otherwise outside of the active landfill's lined limits.

Drawing G02 of this Work Plan presents the proposed waste haul and return routes. Waste manifests will not be generated as the excavated materials will not be leaving the Coffin Butte facility. However, truck counts will be maintained on a daily basis to help track the quantity of material excavated and removed from the Burn Dump area.

4.4 Waste Placement and Compaction

All re-located wastes shall be placed and compacted in accordance with the site's Operations Plan (GLA, 2013). Waste shall be spread in 18-24 inch lifts and compacted with 4-6 wheel passes of a CAT 836 landfill compactor, or equivalent. Compactive effort of the waste is paramount to the active landfill's usable airspace and is subject to monitoring by the Owner, Engineer, or construction quality assurance (CQA) consultant.

4.5 Hazardous Wastes

No hazardous wastes were found during the waste characterization studies (GLA, 2016, 2017). However, there is always the potential to encounter hazardous or non-conforming wastes or other unanticipated materials during MSW excavation activities, and the detection and prevention of hazardous wastes from the Burn Dump area should be performed in accordance with the site's Operations Plan (GLA, 2013).

Trained personnel provided by the Contractor in conjunction with the CQA representative will observe the excavation process to identify non-conforming waste materials. These personnel will also observe the exposed subgrade soils to identify areas affected by a release from the Landfill, if any.

Such items include barrels, batteries, pesticide packaging, paints, and solvent cans. Hazardous wastes are defined in the Code of Federal Regulations (CFR) Title 40 Part 261 Subpart C, ORS 466.005, and OAR 340 Division 101. Hazardous wastes have the following characteristics:

- Are ignitable, corrosive, reactive, or toxic.
- Have the potential to cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness.
- Have the potential to pose a substantial present or potential hazard to human health or the environment, due to factors including, but not limited to, carcinogenicity, acute toxicity, chronic toxicity, bioaccumulative properties, or persistence in the environment, when improperly treated, stored, transported, or disposed of, or otherwise managed.

Non-conforming wastes include all other waste material that are not accepted at the identified CBL disposal facility, as described in the site's Operations Plan (GLA, 2013).

If hazardous wastes are identified during the course of the work, the Contractor will cease work in the affected area, remove personnel from the affected area, and contact the site Safety Manager. A licensed hazardous material response contractor will be contacted to contain, characterize, load, transport, and dispose of any hazardous waste encountered.

Non-conforming waste will be stored on-site in a designated area following all applicable regulatory laws. Disposal and transportation of non-conforming wastes may require specially permitted transporters and facilities. A hauler and disposal facility specially permitted for hauling and receiving non-conforming wastes will be engaged to properly transport and dispose the waste.

All activities involving hazardous and non-conforming wastes will be performed in accordance with the Site-specific Health and Safety Plan and all applicable laws and regulations.

4.6 Daily and Interim Cover

Daily and interim cover will be required for both the Burn Dump excavation area and the waste relocation area, in accordance with the site's Operations Plan (GLA, 2013). Due to a soil deficiency at the site, the CBL has approved alternative daily cover (ADC) materials. The list of ADC materials is included in the site's Operations Plan. The preferred ADC for the Burn Dump closure activities consists of synthetic tarps.

Interim cover consisting of 1 foot of soil will be placed over areas of waste that are at final grade or that will not receive additional waste for 3 months. This includes exterior waste slopes in the waste relocation area and areas of the Burn Dump excavation that will have seasonally exposed waste between phases, as denoted in Drawings C01 and C02 of this Work Plan. The cover soil that is excavated from the Burn Dump area should be stockpiled at the approximate locations shown in Drawings G02, C01, and C02, and subsequently used as interim cover material.

4.7 Decontamination of Excavation Equipment

In the event hazardous wastes are encountered during the waste relocation excavation work, decontamination procedures shall be followed for equipment handling of such materials. The Contractor will either decontaminate excavation equipment between hazardous waste excavation and cover soil/non-hazardous waste moving activities, or use different pieces of equipment for such activities. If decontamination is used, at a minimum, it will consist of brushing waste or soil off equipment prior to handling clean soils. If decontamination by rinsing is used, the Contractor will collect all rinse water and dispose of in accordance with the site's Operations Plan (GLA, 2013). No decontamination rinse water will be released on site. Decontamination procedures shall be in compliance with the site's NPDES Storm Water Discharge Permit.

5.0 CONFIRMATION OF WASTE EXCAVATION

5.1 General

Specific activities will be performed to confirm removal of waste materials and residuals. These activities will include:

- Observation and documentation of waste and residuals removal
- Documentation verifying the final disposition of all waste and residual materials
- Soil sampling
- Reporting of waste excavation activities and confirmation sampling

Procedures regarding observation and documentation of waste and residuals removal are presented in Section 4. Confirmation sampling procedures, reporting of waste excavation activities and sampling results, and non-compliance actions are discussed in the following sections.

5.2 Clean Closure Monitoring Procedures

As waste from each phase of excavation is removed and the excavation reaches the bottom of waste and visual signs indicate that all waste and impacted soils have been removed, soils and rock at the base of the excavation will be sampled and analyzed to confirm the removal of all waste and impacted materials that could pose a threat to water quality, human health, or the environment. Confirmation samples will be analyzed at a frequency of one (1) sample per acre for comparison to the established cleanup goals and confirmation that all wastes and impacted materials have been removed from the excavation area. The list of constituents for confirmation sampling is shown in Section 5.4.2 below.

5.3 Determination of Proposed Cleanup Levels

As described previously, the existing refuse will be removed by excavating down to the bottom of waste and impacted soil. The deepest waste and impacted soil excavation elevation is estimated to be approximately 358 ft amsl during Phase I excavation, 326 ft amsl during Phase II excavation, and 276 ft amsl during Phase III excavation. The waste removal excavation will remove all known and observable wastes and impacted soil. The area will ultimately be overexcavated to the proposed future Cell 6 base grades and covered with an approved liner system as part of the future Cell 6 construction. Removal of the existing wastes and impacted soil within the historic Burn Dump area should significantly reduce the potential for future impacts to groundwater quality in the vicinity of the historic Burn Dump at the CBL. However, because soils from below the excavated Burn Dump will remain exposed for a period of time prior to the lining of future Cell 6 modules, an objective of this Work Plan is to develop criteria that may be used to reduce the potential for water quality impacts associated with the exposed soils resulting from this project.

With this in mind, soil cleanup goals were developed based on background levels as described in the following sections for the CAM17 metals, and for other chemical groups (VOCs, SVOCs including polycyclic aromatic hydrocarbons (PAHs), organochloride pesticides, PCBs and nitrates), cleanup goals are based on analytical laboratory reporting limits.

5.3.1 Basis of Criteria

General clean-up criteria protective of water quality were developed based on soil samples collected from the site that are believed to have not been impacted by landfill operations, the State of Oregon Regional 95% Upper Prediction Limit Background Concentration levels for the South Willamette Valley (DEQ, 2013), and the US EPA Regional Screening Levels for industrial soil (USEPA, 2018).

5.3.2 Approach to Developing Criteria

Residual soil clean-up threshold concentrations for the CBL Burn Dump clean closure project were developed based on a tiered approach that included the following:

- Metals Concentrations:

  Some potential residual waste constituents, particularly metals, occur naturally in soil. The cleanup concentrations developed for the Burn Dump project included the following assumptions: (i) the concentrations of naturally-occurring constituents that occur in soil (e.g. arsenic) are assumed to represent background for the landfill; (ii) background concentrations may be estimated based on published or otherwise available information; and (iii) if background concentrations are greater than the prescribed and/or calculated cleanup concentrations, but are lower than the applicable hazardous waste levels, the background concentrations will govern acceptance.

  Samples of basalt at various states of weathering in the vicinity of the CBL were collected from the active Knife River quarry that operates on an area of the CBL property that has not been used for landfill operations. A total of seven samples were collected for background metals concentration testing. The collected samples consisted of weathered, moderately weathered, and unweathered basalt rock. The samples were submitted to Apex Laboratories in Tigard, Oregon for analysis of 17 metals (antimony, arsenic, barium, beryllium, cadmium, cobalt, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, thallium, vanadium, and zinc).

  Results from the background analytical testing of native basalt specimens was analyzed for the concentration corresponding to the 95^{th} percentile for the metals listed previously. These values were then compared to the State of Oregon Regional 95% Upper Prediction Limit (UPL) Background Concentration levels for the South Willamette Valley (DEQ, 2013). Residual contaminant thresholds were assumed to be the greater of the local 95^{th} percentile concentration or the UPL95 developed by the State of Oregon.

5.3.3 Recommended Threshold Criteria

Clean-up thresholds judged protective of groundwater quality are summarized in the tables discussed below:

- Federal and state hazardous waste thresholds are summarized in Table 5-1 for the project contaminants of concern (COCs). If a sample constituent has a total concentration that is 20 times the toxicity characteristic leaching procedure (TCLP) concentration, the waste extraction test (WET) or TCLP extraction test should be performed. If either of the thresholds is exceeded, the soil is hazardous.[1]
- CAM metals-contaminated soil thresholds for site COCs are summarized in Table 5-2A. As shown in this table, threshold values for arsenic, cadmium, chromium, cobalt, and thallium were increased to reflect background concentrations. The analytical results for background metals concentrations are summarized in Table 5-2B, and the complete analytical report for the background basalt rock samples are included in Appendix A.

Thresholds for soils contaminated with constituents that do not have applicable hazardous waste criteria but do have water quality objectives (WQOs) are summarized in Table 5-3. Threshold concentrations for constituents that do not have WQOs are summarized in Table 5-4. The acceptance thresholds for unlined cell disposal are equal to the USEPA preliminary remediation goals (PRG) for residential sites.

5.4 Confirmation Sampling and Analysis

Confirmation sampling and analysis shall be conducted within the Burn Dump clean closure area after each phase of waste relocation to document that waste and impacted soils have been removed and residual concentrations of COCs do not exceed the clean-up goals proposed in Section 5.3.3. The following subsections discuss the minimum confirmation sampling requirements.

5.4.1 Sample Collection

Confirmation sampling of the Burn Dump subgrade materials will be accomplished at a rate of one (1) sample per acre at locations selected by the Engineer or CQA personnel. Because the landfill covers an area of approximately 19 acres, the total number of confirmation samples would be 19. Selection of the sample locations shall be completed using a grid system established for the waste relocation area. Sample locations within each grid quadrant shall be selected at random by the Engineer or CQA personnel. The contractor shall survey and mark the sample location(s).

[1] Depending on observations or testing, additional hazardous waste testing may be required to evaluate other hazardous waste properties such as toxicity, reactivity, ignitability, and corrosivity.

Confirmation of waste removal will be considered complete if no confirmation samples have concentrations exceeding the proposed clean-up levels discussed in Section 5.3.3. If samples have concentrations that exceed the proposed clean-up levels, further excavation will be conducted in an area delineated by methods discussed below until all samples are at or below the clean-up goals presented in Table 5-2A, Table 5-3, and Table 5-4.

If any confirmation sample result exceeds the clean-up goals, the extent of the affected area to be further excavated shall be delineated as follows:

1. Samples shall be collected from four adjacent nodes of the pre-defined grid system, as located by the surveyor (unless previously sampled or residing outside the waste excavation area) and shall be analyzed only for the target parameter(s) that correspond to the exceeded clean-up goal.
2. If any of the four step-out samples contain the subject parameter(s) above the clean-up goal, then additional step-out samples shall be collected and analyzed.
3. This process shall be repeated until the area containing the subject parameter(s) above the clean-up goal has been delineated. The affected area shall be defined to extend to half-way between a sample location that yielded a parameter concentration above a clean-up goal, and a sample location that yielded a parameter concentration below or equal to a clean-up goal.
4. Once the affected area is delineated through step-out sampling and analysis, the affected area shall be over-excavated by at least 1 foot. The previously affected area shall be re-sampled at the same locations where the previous confirmation samples were obtained, as located by the surveyor. If the results of the "re-confirmation" samples collected after the over-excavation are at or below clean-up goals, then the remediation for the affected area shall be considered complete. If results of the "re-confirmation" samples exceed a clean-up goal, the area shall undergo a subsequent excavation. When all affected areas have passed confirmation sampling the waste removal will be considered complete.

Between each sample collection with re-useable sampling equipment, rigorous decontamination procedures shall be employed to prevent cross contamination of samples.

Each sample shall be packaged in a clean, laboratory supplied glass jar with a screw-on cover. The sample containers shall be labeled with the sample identification, sample date and time, and the sampler's initials and placed in an iced cooler for transport under chain-of-custody to a certified analytical laboratory. The sample identification shall consist of the coordinates and/or grid number where the sample was collected.

As samples are collected, sample information shall be recorded in a field logbook and on a chain-of-custody form. The chain-of-custody form shall include the sample identification as described previously, the date and time of sampling, quantity and type of containers, and list of

analyses to be performed. These documents shall be completed onsite and shall accompany the samples through transportation and laboratory analysis.

Once the waste in a specific area has been relocated, the necessary precautions shall be taken to protect that area from recontamination during activity in adjacent areas.

5.4.2 Sample Analysis

All confirmation samples will be analyzed by a certified analytical testing laboratory by the following methods for the COCs listed in Tables 5-2A, 5-3, and 5-4:

- CAM 17 metals (antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc) by EPA Methods 6010B/7471A
- VOCs including gasoline range organics by EPA Method 8260B/5035
- SVOCs including PAHs by EPA Method 8270C
- Organochlorine pesticides by USEPA Method 8081A
- PCBs by EPA Method 8082

5.4.3 Coordination of Sampling and Results

The Contractor shall assure that the sampling personnel have safe access to the work for the purposes of monitoring, observation, and duplicate sample collection at all times. The Contractor shall coordinate with and cooperate with all sampling personnel during all sample collection, testing, and certification required by this Work Plan. No additional allowance shall be made for delays or work stoppage associated with coordination, sampling, testing or other activities.

The Engineer or CQA consultant will be required to supply the Contractor with analytical results as soon as they are available for review.

5.5 Reporting

After clean-closure activities have been completed, the Engineer or CQA consultant will prepare a report that documents the waste relocation activities and verifying that waste removal in the affected areas has been completed in accordance with this Work Plan, construction drawings, and specifications. The report will be prepared by the Engineer or CQA consultant on behalf of VLI and include the information described below:

- Explanation of any variances to the approved Work Plan and design drawings/specifications
- Field notes and observations
- Quantities of material excavated, disposed, and backfilled

- Quantities, types, and final disposition of any hazardous and non-conforming waste encountered
- Confirmation sampling analytical results and interpretation
- Transportation manifests and landfill receipts, if any
- As-built drawings showing the final grade

The report will be certified by an Oregon licensed professional civil engineer or certified engineering geologist.

6.0 POST-CLOSURE MAINTENANCE AND LAND USE

The proposed future land use of the Burn Dump waste relocation area will be initially a continuation of the existing rock quarry, and subsequently as a lined MSW disposal cell. Because the ultimate land use is currently planned as a lined disposal cell, the excavation resulting from the waste relocation activities discussed in this Work Plan will not be backfilled after waste removal and relocation has been completed. The excavation will be left in place until the existing quarry expands into that space.

In the interim period between waste relocation activities and the rock quarry expansion, the waste relocation excavation will be left in an open and passive condition. It is important to note that the excavation will not be part of the Coffin Butte Landfill stormwater management system. Rather, it will be a hydrologically disconnected basin that will accumulate stormwater that is generated only by precipitation falling within the excavation. Measures will be incorporated into the waste relocation construction activities to control run on into the excavation from the Coffin Butte Landfill stormwater system.

Upon completion of excavation activities, the resulting excavation surface will be prepared by:

- During the intervening time between phased excavations, intermediate cover will be placed in accordance with the site's Operations Plan (GLA, 2013) over remaining Burn Dump areas that have been exposed without reaching the final excavation grades (see reference Drawings C01 and C02)
- Constructing berms at the crest of the of the waste relocation excavation slopes to prevent run on into the excavation
- Implementing stormwater best management practices (BMPs) on the active excavation surface, on the intermediate cover, on the crest berms, and on the final Phase III excavation surface. BMPs may include:
    - Hydroseeding
    - Installing fiber waddles on contour
    - Using soil binders

  - Using jute or coir matting
- Sloping the base of the excavation away from the sides of the excavation where remaining wastes will be left in place between project phases with an intermediate cover
- Implementing the Erosion Control Plan shown on Drawing C04 of this Work Plan

Periodic maintenance of the excavation will consist of regular visual observation of the intermediate cover, the excavation side slopes, the berms at the crest of the excavation, and the base of the excavation.

The intermediate cover and excavation slopes will be visually observed to evaluate whether the installed BMPs are working as intended and have not sustained damage. If damage to a BMP is noted or it is found that a BMP is inadequate, the BMP's condition will be improved, the BMP will be replaced, or additional BMPs will be installed to help improve the condition. If erosion of the intermediate cover or excavation side slops is observed, the eroded area will be repaired and additional or improved BMPs will be installed to help prevent future erosion in the area. If areas of vegetation are observed to have died, reseeding will occur by an appropriate method.

The berms at the crest of the waste relocation excavation will be periodically visually observed for signs of erosion and/or overtopping. If overtopping, or evidence of overtopping, is observed, either the flow causing the overtopping will be diverted or the height of the berm will be increased using compacted soil, or both. If erosion is observed, the berm will be repaired using clean compacted backfill and BMPs will be installed to help prevent further and future erosion in the area.

7.0 CONTRACTOR SUBMITTALS

Contractor submittals will be required to be submitted prior to the start of work as required by the specifications portion of the contract documents for the project. The specifications will require that these submittals be submitted and approved by VLI prior to the start of work at the site.

7.1 Health and Safety Plan

The health and safety of site construction personnel, landfill and quarry personnel, and all other personnel on site is paramount.

Each contractor and subcontractor onsite will be responsible for the health and safety of their own employees, and for protecting VLI staff and others from hazards during construction. A Health and Safety Plan (HASP) will be developed by each contractor and subcontractor that identifies, at a minimum, the following topics:

- Project personnel and responsibilities
- Description of activities to be performed

- Hazard communication (e.g. initial briefing, daily tailgate meeting)
- Personal protective equipment
- Air monitoring
- Site control measures
- Training requirements
- Medical surveillance requirements
- Unexploded Ordnance (UXO) procedures
- Contingency procedures (e.g. injury, illness, spill)
- Documentation

The air monitoring portion of the plan will address the protection of site construction workers, VLI employees, and others during clean closure activities. At a minimum, the air monitoring plan will provide the following information: constituents of potential concern, action levels, air monitoring locations and frequency, and equipment. Methane has not been detected during recent monitoring in the Burn Dump area. To be protective, the Contractor will be required to monitor for landfill gases (methane lower explosive limit (LEL), oxygen, carbon dioxide, and hydrogen sulfide) and fugitive dust at the downwind edge of the excavation periodically throughout each day that excavation activities are conducted. If action levels are exceeded, then the Contractor will be required to increase institutional or engineering controls for the suppression of dust and/or landfill gasses. An example HASP for the work is included in Appendix B.

7.2 Excavation Management Plan

The Contractor shall be required to submit a detailed Excavation Management Plan (EMP) before excavation activities begin. This plan will present the design of shoring, bracing, sloping, benching, or other provisions to be made for worker protection from the hazard of caving ground during the excavation of any trench or excavations 4 ft or more in depth, if required. If the EMP varies from shoring system industry standards, the excavation safety plan shall be required to bear the signature of a civil engineer registered in the State of Oregon. The EMP will also address securing the excavation areas from unauthorized entry by the public, waste haulers, or others not specifically associated with the excavation activities.

7.3 Traffic Control Plan

Construction activities will use active haul roads at the CBL to transport waste for relocation to active cells at the site for disposal. Therefore, appropriate measures shall be implemented to manage potential traffic concerns. The Contractor will be required to submit a detailed Traffic Control Plan that, at a minimum, provides:

- Types of construction vehicles that will be on-site

- Construction traffic pathways on-site and the haul routes from each phase of excavation to the designated disposal area(s)
- Estimated number, frequency, and distances of vehicle trips
- Traffic signage, controls, and mitigation measures to be implemented
- Measures that will be taken to minimize potential impacts to the CBL's active disposal operations and the quarry operations

Drawing G02 presents the general traffic routing considerations that should be incorporated into the Contractor's Traffic Control Plan.

7.4 Environmental Monitoring and Dust Control Plan

The Contractor shall prepare an Environmental Monitoring and Dust Control Plan describing all fugitive dust control and air monitoring measures to be implemented before, during, and after all work activity. The requirements for environmental monitoring and dust control should be consistent with applicable Oregon Administrative Rule (OAR) regulations and the site's Title V Operating Permit (No. 02-9502-TV-01), which requires that *"the permittee must not allow or permit any materials to be handled, transported or stored; or a building, its appurtenances, or a road to be used, constructed, altered, repaired, or demolished; or any equipment to be operated, without taking reasonable precautions to prevent particulate matter from becoming airborn."* Visible emissions requirements for the facility include not exceeding an opacity of 20 percent (EPA Method 9) for a period or periods aggregating more than 3 minutes in any one hour, and not allowing emission of particulate matter in excess of 0.1 grain per standard cubic foot.

The BMPs for dust mitigation discussed in the report should include, at a minimum:

- Site and haul road watering
- Use of dust palliatives or other soil stabilizers
- Use of wind barriers
- Use of tarps or load wetting

The purpose of air monitoring shall be to verify that the working environment remains safe for workers and the public, and to verify that nuisance conditions do not develop.

7.5 Leachate and Stormwater Management Plan

The Contractor shall submit a Construction Stormwater Management Plan (CSMP) prior to the start of waste relocation activities that complies with the project documents and the site's NPDES Storm Water Discharge Permit. The proposed construction activities will be subject to the requirements of the existing permit for the CBL, and thus a Construction Stormwater Pollution, Prevention, and Control Plan (SWPPP) is not required. The CSMP will be required to

include provisions for preventing the creation of leachate by stormwater contact with wastes. BMPs necessary to prevent, or minimize, the generation of leachate shall be thoroughly explained in the CSMP, including a detailed description for handling any leachate that may be generated during construction activities.

8.0 LIMITATIONS

The data, analyses, results, and recommendations presented in this report pertain only to the Coffin Butte Landfill site in Corvallis, Oregon and assume that the subsurface conditions do not deviate substantially from those reported. If any variations or conditions are encountered that are materially inconsistent with those used in this report, or if the proposed development differs from that anticipated herein, GLA should be notified so that supplemental evaluations can be provided.

This report has not been prepared for use by parties or projects other than those named above. It may not contain sufficient information for other parties or other purposes. This document conforms to generally accepted geoenvironmental practice and makes no other warranties, either expressed or implied, as to the professional advice or data included.

9.0 REFERENCES

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TABLES

Table 5-1
SUMMARY OF TCLP HAZARDOUS WASTE CRITERIA
CBL Waste Relocation Project
Benton County, Oregon

ANALYTE	TCLP (mg/L)
Aldrin	NS
Antimony and/or Antimony Compounds	NS
Arsenic and/or Arsenic Compounds	5.0
Barium and/or Barium Compounds (Excluding Barite and Barium Sulfate)	100
Benzene	0.50
Beryllium and/or Beryllium Compounds	NS
Cadmium and/or Cadmium Compounds	1.0
Carbon Tetrachloride	0.50
Chlordane	0.030
Chlorobenzene	100
Chloroform	6.0
Chromium and/or Chromium III Compounds (See Note 5)	5.0
Chromium (VI) Compounds	NS
Cobalt and/or Cobalt Compounds	NS
Copper and/or Copper Compounds	NS
Cresol (Total)	200
Cresol, m-	200
Cresol, o-	200
Cresol, p-	200
DDT, DDE, DDD	NS
Dichloroethane, 1,2-	0.50
Dichlorobenzene, 1,4-	7.5
Dichloroethylene, 1,1-	0.70
Dichlorophenoxy Acetic Acid, 2,4- (2,4-D)	10
Dieldrin	NS
Dinitrotoluene, 2,4-	0.13
Endrin	0.020
Fluoride Salts	NS
Heptachlor and Heptachlor Epoxide	0.008
Hexachlorobenzene	0.13
Hexachlorobutadiene	0.50
Hexachloroethane	3.0
Kepone	NS
Lead and/or Lead Compounds (See Note 6)	5.0
Lead Compounds (Organic)	NS
Lindane	0.40
Mercury and/or Mercury Compounds	0.20
Methoxychlor	10
Methyl Ethyl Ketone (2-Butanone)	200
Mirex	NS
Molybdenum and/or Molybdenum Compounds (Exluding Molybdenum Disulfide)	NS
Nickel and/or Nickel Compounds	NS
Nitrobenzene	2.0
Pentachlorophenol	100
Polychlorinated Biphenyls (PCBs)	NS
Pyridine	5.0

Table 5-1
SUMMARY OF TCLP HAZARDOUS WASTE CRITERIA
CBL Waste Relocation Project
Benton County, Oregon

ANALYTE	TCLP (mg/L)
Selenium and/or Selenium Compounds	1.0
Silver	5.0
Dioxin (2,3,7,8-TCDD)	NS
Tetrachloroethylene	0.70
Thallium and/or Thallium Compounds	NS
Toxaphene	0.50
Silvex (2,4,5-TP)	1.0
Trichloroethylene	0.50
Trichlorophenol, 2,4,5-	400
Trichlorophenol, 2,4,6-	2.0
Trichlorophenoxypropionic acid, -2,4,5	NS
Vanadium and/or Vanadium Compounds	NS
Vinyl Chloride	0.20
Zinc and/or Zinc Compounds	NS

NOTES:

1. TCLP - Toxicity Characteristic Leachate Procedure. Wastes with extract concentrations determined using the TCLP that exceed these values are hazardous.
2. Note that this table does not address all aspects of whether a waste is hazardous. In some cases, it may be necessary to perform specific testing to assess whether the waste exhibits any of the hazardous waste characteristics of ignitability, corrosivity, reactivity, or toxicity. Typical test procedures are described in Section 4.

NS - Not Specified.

Table 5-2A
SUMMARY OF CAM METALS THRESHOLD CONCENTRATIONS JUDGED PROTECTIVE OF GROUNDWATER
CBL Waste Relocation Project
Benton County, Oregon

ANALYTE	CAS Number	THRESHOLD CONCENTRATION (mg/kg)	BASIS OF VALUE	MCL_{EPA} (ug/L)	MCL_{OR} (ug/L)	RESIDENTIAL RSL (mg/kg) ①	RESIDENTIAL RBC (mg/kg) ②	INDUSTRIAL RSL (mg/kg) ③	OCCUPATIONAL RBC (mg/kg) ④	BACKGROUND (mg/kg) ⑤
Antimony	7440-36-0	31	Lesser of ①②	6.0	6.0	31	NS	470	NS	0.39
Arsenic	7440-38-2	18	Background ⑤	10.00	10.00	0.68	0.43	3.0	1.9	18
Barium	7440-39-3	15,000	Lesser of ①②	2,000	2,000	15,000	15,000	220,000	220,000	734
Beryllium	7440-41-7	160	Lesser of ①②	4.0	4.0	160	160	2,300	2,300	2.8
Cadmium	7440-43-9	71	Lesser of ①②	5.0	5.0	71.00	78.00	980.00	1100.00	1.6
Chromium (Total)	7440-47-3	103	Background ⑤	100	100	NS	NS	NS	NS	103
Cobalt	7440-48-4	42	Background ⑤	NS	NS	23	NS	350	NS	42
Copper	7440-50-8	3,100	Lesser of ①②	1,300	1,300	3,100	3,100	47,000	47,000	254
Lead	7439-92-1	400	Lesser of ①②	15	15	400	400	800	800	28
Mercury	7439-97-6	11	Lesser of ①②	2.0	2.0	11	23	46	350	0.07
Molybdenum	7439-98-7	390	Lesser of ①②	NS	NS	390	NS	5,800	NS	NA
Nickel	7440-02-0	1,500	Lesser of ①②	NS	NS	1,500	1,500	22,000	22,000	53
Selenium	7782-49-2	390	Lesser of ①②	50	50	390	NS	5,800	NS	0.68
Silver	7440-22-4	390	Lesser of ①②	NS	NS	390	390	5,800	5,800	0.33
Thallium	7440-28-0	5.7	Background ⑤	2.0	2.0	0.78	NS	12	NS	5.7
Vanadium	7440-62-2	390	Lesser of ①②	NS	NS	390	NS	5,800	NS	371
Zinc	7440-66-6	23,000	Lesser of ①②	NS	NS	23,000	NS	350,000	NS	200

Table 5-2B
SUMMARY OF NATURALLY-OCCURRING BACKGROUND CONCENTRATIONS IN SOIL
(Partially Based on Published Data)
CBL Waste Relocation Project
Benton County, Oregon

CONSTITUENT	REFERENCE	LOCATION	UNITS	REPORTED BACKGROUND CONCENTRATIONS														RECOMMENDED THRESHOLD VALUE	COMMENT
				MEAN	ST DEV	GEO-MEAN	GEO DEV	MIN	LOWER QUARTILE	MEDIAN	UPPER QUARTILE	MAX	90TH PERCENTILE	95TH PERCENTILE	UPL90	UPL95	UTL90		
Antimony	1	Statewide	mg/kg	0.225	0.29			0.0204				1.9						0.385	South Willamette Valley UPL95
	1	Coast Range	mg/kg	0.208	0.199			0.046				1.2	0.464	0.536	0.473	0.551	0.533		
	1	South Willamette Valley	mg/kg	0.212	0.098			0.108				0.123	0.337	0.372	0.345	0.385	0.384		
	2	Coffin Butte Basalt	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					
Arsenic	1	Statewide	mg/kg	5.0	5.6			0.228				73						18	South Willamette Valley UPL95
	1	Coast Range	mg/kg	5.6	3.4			0.573				16	10	12	10	12	11		
	1	South Willamette Valley	mg/kg	9.5	8.1			1.9				59	17	18	17	18	17		
	2	Coffin Butte Basalt	mg/kg	1.7	0.25604	1.6	1.2	1.3	1.3	1.7	1.3	1.9	1.9	1.9					
Barium	1	Statewide	mg/kg	509	234			11				1,855						734	South Willamette Valley UPL95
	1	Coast Range	mg/kg	459	270			11				990	804	835	806	843	811		
	1	South Willamette Valley	mg/kg	413	201			72				768	682	709	684	734	689		
	2	Coffin Butte Basalt	mg/kg	94	54	82	1.8	37	37	88	37	199	149	174					
Beryllium	1	Statewide	mg/kg	1.3	0.721			0.031				6.0						2.8	South Willamette Valley UPL95
	1	Coast Range	mg/kg	1.5	0.74			0.361				4.0	2.5	2.8	2.5	2.8	2.6		
	1	South Willamette Valley	mg/kg	1.5	0.668			0.284				3.0	2.3	2.6	2.3	2.6	2.5		
	2	Coffin Butte Basalt	mg/kg	0.5674	0.12247	0.5573814	1.2	0.446	0.446	0.558	0.446	0.84	0.6678	0.7539					
Cadmium	1	Statewide	mg/kg	0.297	0.319			0.0263				4.7						1.59	South Willamette Valley UPL95
	1	Coast Range	mg/kg	0.264	0.169			0.026				0.701	0.48	0.541	0.482	0.544	0.508		
	1	South Willamette Valley	mg/kg	0.478	0.659			0.065				4.7	1.3	1.6	1.3	1.6	1.5		
	2	Coffin Butte Basalt	mg/kg	0.8974	0.16867	0.8824915	1.2	0.662	0.662	0.939	0.662	1.1	1.1	1.1					
Chromium	1	Statewide	mg/kg	77	111			0.878				1,520						103	South Willamette Valley UPL95
	1	Coast Range	mg/kg	84	82			5.5				473	160	222	172	241	202		
	1	South Willamette Valley	mg/kg	49	37			8.3				256	82	95	82	103	91		
	2	Coffin Butte Basalt	mg/kg	32	16	28	1.8	9.6	9.6	33	9.6	56	51	54					
Cobalt	2	Coffin Butte Basalt	mg/kg	35	4.7	35	1.1	30	30	34	30	44	41	42				42	Coffin Butte Basalt 95th Percentile
Copper	1	Statewide	mg/kg	38	30			2.0				308						254	Coffin Butte Basalt 95th Percentile
	1	Coast Range	mg/kg	37	40			2.0				202	89	103	89	104	95		
	1	South Willamette Valley	mg/kg	40	39			5.0				194	74	125	79	141	105		
	2	Coffin Butte Basalt	mg/kg	191	47	185	1.3	134	134	197	134	268	240	254					
Lead	1	Statewide	mg/kg	13	11			1.0				135						28	South Willamette Valley UPL95
	1	Coast Range	mg/kg	14	12			1.3				105	29	33	29	34	31		
	1	South Willamette Valley	mg/kg	14	8.4			1.9				61	25	28	25	28	27		
	2	Coffin Butte Basalt	mg/kg	1.5	0.65079	1.3	1.5	0.818	0.818	1.2	0.818	2.5	2.5	2.5					
Manganese	1	Statewide	mg/kg	1,015	558			23				5,914						2,936	South Willamette Valley UPL95
	1	Coast Range	mg/kg	915	648			23				5,115	1,547	2,046	1,574	2,138	1,750		
	1	South Willamette Valley	mg/kg	1,619	900			310				5,914	2,434	2,845	2,439	2,936	2,540		
	2	Coffin Butte Basalt	mg/kg	666	278	619	1.5	339	339	622	339	1,180	1,017	1,098					
Mercury	1	Statewide	mg/kg	0.062	0.394			0.007				12						0.07	South Willamette Valley UPL95
	1	Coast Range	mg/kg	0.045	0.04			0.015				0.31	0.096	0.111	0.097	0.112	0.103		
	1	South Willamette Valley	mg/kg	0.037	0.02			0.015				0.13	0.064	0.071	0.064	0.072	0.069		
	2	Coffin Butte Basalt	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
Nickel	1	Statewide	mg/kg	45	106			1.0				2,850						53	Coffin Butte Basalt 95th Percentile
	1	Coast Range	mg/kg	43	46			4.0				249	97	142	97	157	102		
	1	South Willamette Valley	mg/kg	25	15			5.0				82	45	49	47	50	49		
	2	Coffin Butte Basalt	mg/kg	40	11	39	1.3	28	28	40	28	55	51	53					
Selenium	1	Statewide	mg/kg	0.239	0.348			0.0613				5.0						0.675	South Willamette Valley UPL95
	1	Coast Range	mg/kg	0.457	0.616			0.153				5.0	1.2	1.5	1.3	1.5	1.3		
	1	South Willamette Valley	mg/kg	0.277	0.236			0.089				0.882	0.579	0.665	0.586	0.675	0.641		
	2	Coffin Butte Basalt	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		

Table 5-2B
SUMMARY OF NATURALLY-OCCURRING BACKGROUND CONCENTRATIONS IN SOIL
(Partially Based on Published Data)
CBL Waste Relocation Project
Benton County, Oregon

CONSTITUENT	REFERENCE	LOCATION	UNITS	REPORTED BACKGROUND CONCENTRATIONS														RECOMMENDED THRESHOLD VALUE	COMMENT
				MEAN	ST DEV	GEO-MEAN	GEO DEV	MIN	LOWER QUARTILE	MEDIAN	UPPER QUARTILE	MAX	90TH PERCENTILE	95TH PERCENTILE	UPL90	UPL95	UTL90		
Silver	1	Statewide	mg/kg	0.114	0.293			0.02				4.0						0.33	South Willamette Valley UPL95
	1	Coast Range	mg/kg	0.151	0.154			0.093				0.866	0.348	0.404	0.35	0.407	0.373		
	1	South Willamette Valley	mg/kg	0.126	0.122			0.101				0.71	0.282	0.326	0.286	0.333	0.316		
	2	Coffin Butte Basalt	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
Thallium	1	Statewide	mg/kg	1.3	1.9			0.0705				5.6						5.676	South Willamette Valley UPL95
	1	Coast Range	mg/kg	1.9	2.1			0.114				5.2	4.5	5.3	4.6	5.4	5.3		
	1	South Willamette Valley	mg/kg	2.1	2.0			0.108				4.2	4.7	5.4	4.8	5.7	5.7		
	2	Coffin Butte Basalt	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
Vanadium	1	Statewide	mg/kg	150	82			4.0				486						371	South Willamette Valley UPL95
	1	Coast Range	mg/kg	123	72			6.0				330	239	255	239	255	251		
	1	South Willamette Valley	mg/kg	188	91			39				439	324	366	371	371	369		
	2	Coffin Butte Basalt	mg/kg	125	32	121	1.3	75	75	124	75	179	159	169					
Zinc	1	Statewide	mg/kg	93	41			12				730						200	South Willamette Valley UPL95
	1	Coast Range	mg/kg	88	47			12				413	128	134	128	138	130		
	1	South Willamette Valley	mg/kg	106	45			26				238	167	188	200	200	196		
	2	Coffin Butte Basalt	mg/kg	63	11	62	1.2	42	42	64	42	79	76	77					

REFERENCES:

1. Oregon Department of Environmental Quality (ODEQ), 2013, "Development of Oregon Background Metals Concentrations in Soil: Technical Report;" Land Quality Division Cleanup Program, Portland, Oregon, Dated March 2013.
2. GLA, 2018, Local Field Sampling of Coffin Butte Basalt. Field samples collected August 7, 2018.

Table 5-3
SUMMARY OF THRESHOLD CONCENTRATIONS JUDGED PROTECTIVE OF WATER QUALITY FOR VOCs, SVOCs, PCBs, ORGANOCHLORINE PESTICIDES, AND OTHER CONSTITUENTS WITH WATER QUALITY OBJECTIVES
CBL Waste Relocation Project
Benton County, Oregon

ANALYTE	CAS Number	THRESHOLD CONCENTRATION (mg/kg)	BASIS OF VALUES	MCL_{EPA} (ug/L)	MCL_{OR} (ug/L)	RESIDENTIAL RSL (mg/kg) ①	RESIDENTIAL RBC (mg/kg) ②	INDUSTRIAL RSL (mg/kg) ③	OCCUPATIONAL RBC (mg/kg) ④
Benzene	71-43-2	1.2	Lesser of ①②	5.0	5.0	1.2	8.2	5.1	37
Bromodichloromethane	75-27-4	0.29	Lesser of ①②	80	NS	0.29	3.4	1.3	15
Bromoform	75-25-2	19	Lesser of ①②	80	NS	19	57	86	260
Carbon Tetrachloride	56-23-5	0.65	Lesser of ①②	5.0	5.0	0.65	7.5	2.9	34
Chlorobenzene	108-90-7	280	Lesser of ①②	100	NS	280	530	1,300	8,700
Chloroform	67-66-3	0.32	Lesser of ①②	80	NS	0.32	5.8	1.4	26
Dibromo-3-chloropropane, 1,2-	96-12-8	5.3E-03	Lesser of ①②	0.20	0.20	5.3E-03	NS	0.064	NS
Dibromochloromethane	124-48-1	8.3	Lesser of ①②	80	NS	8.3	NS	39	NS
Dibromoethane, 1,2-	106-93-4	0.036	Lesser of ①②	0.050	NS	0.036	NS	0.16	NS
Dichlorobenzene, 1,2-	95-50-1	1,800	Lesser of ①②	600	600	1,800	2,200	9,300	36,000
Dichlorobenzene, 1,4-	106-46-7	2.6	Lesser of ①②	75	75	2.6	14	11	64
Dichloroethane, 1,2-	107-06-2	0.46	Lesser of ①②	5.0	5.0	0.46	NS	2.0	NS
Dichloroethylene, 1,1-	75-35-4	230	Lesser of ①②	7.0	7.0	230	1,800	1,000	29,000
Dichloroethylene, 1,2-cis-	156-59-2	160	Lesser of ①②	70	70	160	160	2,300	2,300
Dichloroethylene, 1,2-trans-	156-60-5	1,600	Lesser of ①②	100	100	1,600	1,600	23,000	23,000

Table 5-3
SUMMARY OF THRESHOLD CONCENTRATIONS JUDGED PROTECTIVE OF WATER QUALITY FOR VOCs, SVOCs, PCBs, ORGANOCHLORINE PESTICIDES, AND OTHER CONSTITUENTS WITH WATER QUALITY OBJECTIVES
CBL Waste Relocation Project
Benton County, Oregon

ANALYTE	CAS Number	THRESHOLD CONCENTRATION (mg/kg)	BASIS OF VALUES	MCL_{EPA} (ug/L)	MCL_{OR} (ug/L)	RESIDENTIAL RSL (mg/kg) ①	RESIDENTIAL RBC (mg/kg) ②	INDUSTRIAL RSL (mg/kg) ③	OCCUPATIONAL RBC (mg/kg) ④
Dichloropropane, 1,2-	78-87-5	2.5	Lesser of ①②	5.0	5.0	2.5	NS	11	NS
Endrin	72-20-8	19	Lesser of ①②	2.0	2.0	19	19	250	250
Ethylbenzene	100-41-4	5.8	Lesser of ①②	700	700	5.8	34	25	150
Heptachlor	76-44-8	0.11	Lesser of ①②	0.40	0.40	0.13	0.11	0.63	0.45
Heptachlor Epoxide	1024-57-3	0.055	Lesser of ①②	0.20	0.20	0.070	0.055	0.33	0.24
Hexachlorobenzene	118-74-1	0.21	Lesser of ①②	1.0	1.0	0.21	0.21	0.96	0.93
Hexachlorocyclohexane, Gamma- (Lindane)	58-89-9	0.49	Lesser of ①②	0.20	0.20	0.57	0.49	2.5	2.1
Hexachlorocyclopentadiene	77-47-4	1.8	Lesser of ①②	50	50	1.8	NS	7.5	NS
Methoxychlor	72-43-5	320	Lesser of ①②	40	40	320	NS	4,100	NS
Methylene Chloride	75-09-2	57	Lesser of ①②	5.0	NS	57	NS	1,000	NS
Pentachlorophenol	87-86-5	1.0	Lesser of ①②	1.0	1.0	1.0	1.0	4.0	4.0
Polychlorinated Biphenyls (PCBs)	1336-36-3	0.23	Lesser of ①②	0.50	0.50	0.23	0.23	0.94	0.59
Styrene	100-42-5	6,000	Lesser of ①②	100	100	6,000	7,900	35,000	130,000
Tetrachloroethylene	127-18-4	24	Lesser of ①②	5.0	5.0	24	220	100	1,000
Toluene	108-88-3	4,900	Lesser of ①②	1,000	1,000	4,900	5,800	47,000	88,000

Table 5-3
SUMMARY OF THRESHOLD CONCENTRATIONS JUDGED PROTECTIVE OF WATER QUALITY FOR VOCs, SVOCs, PCBs, ORGANOCHLORINE PESTICIDES, AND OTHER CONSTITUENTS WITH WATER QUALITY OBJECTIVES
CBL Waste Relocation Project
Benton County, Oregon

ANALYTE	CAS Number	THRESHOLD CONCENTRATION (mg/kg)	BASIS OF VALUES	MCL_{EPA} (ug/L)	MCL_{OR} (ug/L)	RESIDENTIAL RSL (mg/kg) ①	RESIDENTIAL RBC (mg/kg) ②	INDUSTRIAL RSL (mg/kg) ③	OCCUPATIONAL RBC (mg/kg) ④
Toxaphene	8001-35-2	0.49	Lesser of ①②	3.0	3.0	0.49	0.49	2.1	2.1
Trichlorobenzene, 1,2,4-	120-82-1	24	Lesser of ①②	70	70	24	NS	110	NS
Trichloroethane, 1,1,1-	71-55-6	8,100	Lesser of ①②	200	200	8,100	53,000	36,000	870,000
Trichloroethane, 1,1,2-	79-00-5	1.1	Lesser of ①②	5.0	5.0	1.1	3.2	5.0	26
Trichloroethylene	79-01-6	0.94	Lesser of ①②	5.0	5.0	0.94	6.7	6.0	51
Vinyl Chloride	75-01-4	0.059	Lesser of ①②	2.0	2.0	0.059	0.36	1.7	4.4
Xylenes	1330-20-7	580	Lesser of ①②	10,000	10,000	580	1,400	2,500	25,000

NOTES:

1. REFERENCES:

a. EPA RSLs - EPA RSLs - U.S. EPA Regional Screening Levels, May 2018, Summary Table (TR=1E-06 and THQ=1.0), https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables/.

b. RBCs - Oregon Department of Environmental Quality, 2018, Risk-Based Concentrations for Individual Chemicals; Environmental Cleanup Program.

c. MCLs - Oregon Administrative Rules (OAR 333-061-0030).

2**. ABBREVIATIONS:**

RBC - Risk Based Concentration, RSL - Regional Screening Level, NS - Not Specified, NA - Not Applicable, DAF - Dulution Attenuation Factor, MCL - Maximum Contaminant Level, NIC - Not Included.

Table 5-4
SUMMARY OF THRESHOLD CONCENTRATIONS JUDGED PROTECTIVE OF GROUNDWATER QUALITY FOR VOCs, SVOCs, PCBs, ORGANOCHLORINE PESTICIDES, AND OTHER CONSTITUENTS THAT DO NOT HAVE WATER QUALITY OBJECTIVES
CBL Waste Relocation Project
Benton County, Oregon

ANALYTE	CAS Number	THRESHOLD CONCENTRATION (mg/kg)	BASIS OF VALUES	MCL_{EPA} (ug/L)	MCL_{OR} (ug/L)	RESIDENTIAL RSL (mg/kg) ①	RESIDENTIAL RBC (mg/kg) ②	INDUSTRIAL RSL (mg/kg) ③	OCCUPATIONAL RBC (mg/kg) ④
Acetone	67-64-1	61,000	Lesser of ①②	NS	NS	61,000	NS	670,000	NS
Acetophenone	98-86-2	7,800	Lesser of ①②	NS	NS	7,800	NS	120,000	NS
Aldrin	309-00-2	0.03	Lesser of ①②	NS	NS	0.04	0.03	0.18	0.13
Aniline	62-53-3	95	Lesser of ①②	NS	NS	95	NS	400	NS
Benzidine	92-87-5	5.2E-04	Lesser of ①②	NS	NS	5.3E-04	5.2E-04	0.01	0.01
Benzoic Acid	65-85-0	250,000	Lesser of ①②	NS	NS	250,000	NS	3,300,000	NS
Benzyl Alcohol	100-51-6	6,300	Lesser of ①②	NS	NS	6,300	NS	82,000	NS
Bis(2-chloroethoxy)methane	111-91-1	190	Lesser of ①②	NS	NS	190	NS	2,500	NS
Bis(2-chloroethyl)ether	111-44-4	0.23	Lesser of ①②	NS	NS	0.23	NS	1.0	NS
Bromobenzene	108-86-1	290	Lesser of ①②	NS	NS	290	NS	1,800	NS
Bromochloromethane	74-97-5	150	Lesser of ①②	NS	NS	150	NS	630	NS
Bromomethane	74-83-9	6.8	Lesser of ①②	NS	NS	6.8	46	30	750
Butyl Benzyl Phthlate	85-68-7	290	Lesser of ①②	NS	NS	290	NS	1,200	NS
Butylbenzene, n-	104-51-8	3,900	Lesser of ①②	NS	NS	3,900	NS	58,000	NS
Butylbenzene, sec-	135-98-8	7,800	Lesser of ①②	NS	NS	7,800	NS	120,000	NS
Butylbenzene, tert-	98-06-6	7,800	Lesser of ①②	NS	NS	7,800	NS	120,000	NS
Carbon Disulfide	75-15-0	770	Lesser of ①②	NS	NS	770	NS	3,500	NS
Chloromethane	74-87-3	110	Lesser of ①②	NS	NS	110	1,400	460	25,000
Chlorophenol, 2-	95-57-8	390	Lesser of ①②	NS	NS	390	NS	5,800	NS
Chlorotoluene, o-	95-49-8	1,600	Lesser of ①②	NS	NS	1,600	NS	23,000	NS
Chlorotoluene, p-	106-43-4	1,600	Lesser of ①②	NS	NS	1,600	NS	23,000	NS
Cumene (Isopropylbenzene)	98-82-8	1,900	Lesser of ①②	NS	NS	1,900	3,500	9,900	57,000
DDD	72-54-8	1.9	Lesser of ①②	NS	NS	1.9	2.2	9.6	12
DDE, p,p'-	72-55-9	1.8	Lesser of ①②	NS	NS	2.0	1.8	9.3	8.2
DDT	50-29-3	1.9	Lesser of ①②	NS	NS	1.9	1.9	8.5	8.5
Demeton	8065-48-3	2.5	Lesser of ①②	NS	NS	2.5	NS	33	NS
Diazinon	333-41-5	44	Lesser of ①②	NS	NS	44	NS	570	NS
Dibromomethane (Methylene Bromide)	74-95-3	24	Lesser of ①②	NS	NS	24	NS	99	NS
Dibutyl Phthalate	84-74-2	6,300	Lesser of ①②	NS	NS	6,300	NS	82,000	NS
Dicamba	1918-00-9	1,900	Lesser of ①②	NS	NS	1,900	NS	25,000	NS
Dichlorodifluoromethane	75-71-8	87	Lesser of ①②	NS	NS	87	NS	370	NS
Dichloroethane, 1,1-	75-34-3	3.6	Lesser of ①②	NS	NS	3.6	58	16	260
Dichlorophenol, 2,4-	120-83-2	190	Lesser of ①②	NS	NS	190	NS	2,500	NS
Dichloropropane, 1,3-	142-28-9	1,600	Lesser of ①②	NS	NS	1,600	NS	23,000	NS
Dichloropropene, 1,3-	542-75-6	1.8	Lesser of ①②	NS	NS	1.8	NS	8.2	NS
Dichlorvos	62-73-7	1.9	Lesser of ①②	NS	NS	1.9	NS	7.9	NS
Dieldrin	60-57-1	0.03	Lesser of ①②	NS	NS	0.03	0.03	0.14	0.14

Table 5-4
SUMMARY OF THRESHOLD CONCENTRATIONS JUDGED PROTECTIVE OF GROUNDWATER QUALITY FOR VOCs, SVOCs, PCBs, ORGANOCHLORINE PESTICIDES, AND OTHER CONSTITUENTS THAT DO NOT HAVE WATER QUALITY OBJECTIVES
CBL Waste Relocation Project
Benton County, Oregon

ANALYTE	CAS Number	THRESHOLD CONCENTRATION (mg/kg)	BASIS OF VALUES	MCL_{EPA} (ug/L)	MCL_{OR} (ug/L)	RESIDENTIAL RSL (mg/kg) ①	RESIDENTIAL RBC (mg/kg) ②	INDUSTRIAL RSL (mg/kg) ③	OCCUPATIONAL RBC (mg/kg) ④
Diethyl Phthalate	84-66-2	51,000	Lesser of ①②	NS	NS	51,000	NS	660,000	NS
Dimethoate	60-51-5	140	Lesser of ①②	NS	NS	140	NS	1,800	NS
Dimethylbenzidine, 3,3'-	119-93-7	0.05	Lesser of ①②	NS	NS	0.05	NS	0.21	NS
Dimethylphenol, 2,4-	105-67-9	1,300	Lesser of ①②	NS	NS	1,300	NS	16,000	NS
Dinitro-o-cresol, 4,6-	534-52-1	5.1	Lesser of ①②	NS	NS	5.1	NS	66	NS
Dinitrophenol, 2,4-	51-28-5	130	Lesser of ①②	NS	NS	130	NS	1,600	NS
Diphenylamine	122-39-4	6,300	Lesser of ①②	NS	NS	6,300	NS	82,000	NS
Disulfoton	298-04-4	2.5	Lesser of ①②	NS	NS	2.5	NS	33	NS
Ethyl Chloride (Chloroethane)	75-00-3	14,000	Lesser of ①②	NS	NS	14,000	160,000	57,000	NS
Hexachlorobutadiene	87-68-3	1.2	Lesser of ①②	NS	NS	1.2	NS	5.3	NS
Hexachlorocyclohexane, Alpha-	319-84-6	0.09	Lesser of ①②	NS	NS	0.09	0.09	0.36	0.36
Hexachlorocyclohexane, Beta-	319-85-7	0.30	Lesser of ①②	NS	NS	0.30	NS	1.3	NS
Hexachloroethane	67-72-1	1.8	Lesser of ①②	NS	NS	1.8	7.4	8.0	32
Hexanone, 2-	591-78-6	200	Lesser of ①②	NS	NS	200	NS	1,300	NS
Isophorone	78-59-1	570	Lesser of ①②	NS	NS	570	NS	2,400	NS
Malathion	121-75-5	1,300	Lesser of ①②	NS	NS	1,300	NS	16,000	NS
Merphos	150-50-5	2.3	Lesser of ①②	NS	NS	2.3	NS	35	NS
Methyl Ethyl Ketone (2-Butanone)	78-93-3	27,000	Lesser of ①②	NS	NS	27,000	NS	190,000	NS
Methyl Isobutyl Ketone (4-methyl-2-pentanone)	108-10-1	33,000	Lesser of ①②	NS	NS	33,000	NS	140,000	NS
Methyl Parathion	298-00-0	16	Lesser of ①②	NS	NS	16	NS	210	NS
Methyl tert-Butyl Ether (MTBE)	1634-04-4	47	Lesser of ①②	NS	NS	47	250	210	1,100
Naled	300-76-5	160	Lesser of ①②	NS	NS	160	NS	2,300	NS
Parathion	56-38-2	380	Lesser of ①②	NS	NS	380	NS	4,900	NS
Phenol	108-95-2	19,000	Lesser of ①②	NS	NS	19,000	NS	250,000	NS
Phorate	298-02-2	13	Lesser of ①②	NS	NS	13	NS	160	NS
Polychlorinated Biphenyls (PCBs)									
Aroclor 1016	12674-11-2	4.1	Lesser of ①②	NS	NS	4.1	NS	27	NS
Aroclor 1221	11104-28-2	0.20	Lesser of ①②	NS	NS	0.20	NS	0.83	NS
Aroclor 1232	11141-16-5	0.17	Lesser of ①②	NS	NS	0.17	NS	0.72	NS
Aroclor 1242	53469-21-9	0.23	Lesser of ①②	NS	NS	0.23	NS	0.95	NS
Aroclor 1248	12672-29-6	0.23	Lesser of ①②	NS	NS	0.23	NS	0.95	NS
Aroclor 1254	11097-69-1	0.24	Lesser of ①②	NS	NS	0.24	NS	0.97	NS
Aroclor 1260	11096-82-5	0.24	Lesser of ①②	NS	NS	0.24	NS	0.99	NS
Polynuclear Aromatic Hydrocarbons (PAHs)									
Acenaphthene	83-32-9	3,600	Lesser of ①②	NS	NS	3,600	4,700	45,000	70,000
Chloronaphthalene, Beta-	91-58-7	4,800	Lesser of ①②	NS	NS	4,800	NS	60,000	NS
Methylnaphthalene, 1-	90-12-0	18	Lesser of ①②	NS	NS	18	NS	73	NS
Methylnaphthalene, 2-	91-57-6	240	Lesser of ①②	NS	NS	240	NS	3,000	NS

Table 5-4
SUMMARY OF THRESHOLD CONCENTRATIONS JUDGED PROTECTIVE OF GROUNDWATER QUALITY FOR VOCs, SVOCs, PCBs, ORGANOCHLORINE PESTICIDES, AND OTHER CONSTITUENTS THAT DO NOT HAVE WATER QUALITY OBJECTIVES
CBL Waste Relocation Project
Benton County, Oregon

ANALYTE	CAS Number	THRESHOLD CONCENTRATION (mg/kg)	BASIS OF VALUES	MCL_{EPA} (ug/L)	MCL_{OR} (ug/L)	RESIDENTIAL RSL (mg/kg) ①	RESIDENTIAL RBC (mg/kg) ②	INDUSTRIAL RSL (mg/kg) ③	OCCUPATIONAL RBC (mg/kg) ④
Naphthalene	91-20-3	3.8	Lesser of ①②	NS	NS	3.8	5.3	17	23
Propyl benzene	103-65-1	3,800	Lesser of ①②	NS	NS	3,800	NS	24,000	NS
Ronnel	299-84-3	3,900	Lesser of ①②	NS	NS	3,900	NS	58,000	NS
Tetrachloroethane, 1,1,1,2-	630-20-6	2.0	Lesser of ①②	NS	NS	2.0	NS	8.8	NS
Tetrachloroethane, 1,1,2,2-	79-34-5	0.60	Lesser of ①②	NS	NS	0.60	NS	2.7	NS
Tetraethyl Dithiopyrophosphate	3689-24-5	32	Lesser of ①②	NS	NS	32	NS	410	NS
Trichlorobenzene, 1,2,3-	87-61-6	63	Lesser of ①②	NS	NS	63	NS	930	NS
Trichlorofluoromethane	75-69-4	7,600	Lesser of ①②	NS	NS	23,000	7,600	350,000	130,000
Trichlorophenol, 2,4,5-	95-95-4	6,300	Lesser of ①②	NS	NS	6,300	NS	82,000	NS
Trichlorophenol, 2,4,6-	88-06-2	49	Lesser of ①②	NS	NS	49	49	210	210
Trichloropropane, 1,1,2-	598-77-6	390	Lesser of ①②	NS	NS	390	NS	5,800	NS
Trichloropropane, 1,2,3-	96-18-4	5.1E-03	Lesser of ①②	NS	NS	5.1E-03	NS	0.11	NS
Trimethylbenzene, 1,2,3-	526-73-8	340	Lesser of ①②	NS	NS	340	NS	2,000	NS
Trimethylbenzene, 1,2,4-	95-63-6	300	Lesser of ①②	NS	NS	300	430	1,800	6,900
Trimethylbenzene, 1,3,5-	108-67-8	270	Lesser of ①②	NS	NS	270	430	1,500	6,900
Vinyl Acetate	108-05-4	910	Lesser of ①②	NS	NS	910	NS	3,800	NS
Xylene, P-	106-42-3	560	Lesser of ①②	NS	NS	560	NS	2,400	NS
Xylene, m-	108-38-3	550	Lesser of ①②	NS	NS	550	NS	2,400	NS
Xylene, o-	95-47-6	650	Lesser of ①②	NS	NS	650	NS	2,800	NS

NOTES:

1. **REFERENCES:**

a. EPA RSLs - EPA RSLs - U.S. EPA Regional Screening Levels, May 2018, Summary Table (TR=1E-06 and THQ=1.0), https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables/.

b. RBCs - Oregon Department of Environmental Quality, 2018, Risk-Based Concentrations for Individual Chemicals; Environmental Cleanup Program.

c. MCLs - Oregon Administrative Rules (OAR 333-061-0030).

2. **ABBREVIATIONS:**

RBC - Risk Based Concentration, RSL - Regional Screening Level, NS - Not Specified, NA - Not Applicable, DAF - Dulution Attenuation Factor, MCL - Maximum Contaminant Level, NIC - Not Included.

APPENDIX A

ANALYTICAL RESULTS

Apex Laboratories, LLC

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323
EPA ID: OR01039

Friday, August 24, 2018

Gabriel Iltis
Geo-Logic Associates (Lakewood, CO)
13949 West Colfax Avenue, Suite 220
Lakewood, CO 80401

RE: A8H0221 - Corvallis Basalt Testing - Coffin Butte/AU18.1148.00

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 A8H0221, which was received by the laboratory on 8/8/2018 at 3:30:00PM.

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

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

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

Lisa A Domenighini

Lisa Domenighini, Client Services Manager

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Apex Laboratories, LLC

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323
EPA ID: OR01039

Geo-Logic Associates (Lakewood, CO)	Project: **Corvallis Basalt Testing**	
13949 West Colfax Avenue, Suite 220	Project Number: **Coffin Butte/AU18.1148.00**	**Report ID:**
Lakewood, CO 80401	Project Manager: **Gabriel Iltis**	**A8H0221 - 08 24 18 1450**

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
GLA-BG-1 (As Received)	A8H0221-01	Solid	08/07/18 12:30	08/08/18 15:30
GLA-BG-1 (After Processing)	A8H0221-02	Solid	08/07/18 12:30	08/08/18 15:30
GLA-BG-2 (As Received)	A8H0221-03	Solid	08/07/18 12:40	08/08/18 15:30
GLA-BG-2 (After Processing)	A8H0221-04	Solid	08/07/18 12:40	08/08/18 15:30
GLA-BG-3 (As Received)	A8H0221-05	Solid	08/07/18 12:55	08/08/18 15:30
GLA-BG-3 (After Processing)	A8H0221-06	Solid	08/07/18 12:55	08/08/18 15:30
GLA-BG-4 (As Received)	A8H0221-07	Solid	08/07/18 13:05	08/08/18 15:30
GLA-BG-4 (After Processing)	A8H0221-08	Solid	08/07/18 13:05	08/08/18 15:30
GLA-BG-5 (As Received)	A8H0221-09	Solid	08/07/18 13:15	08/08/18 15:30
GLA-BG-5 (After Processing)	A8H0221-10	Solid	08/07/18 13:15	08/08/18 15:30
GLA-BG-6 (As Received)	A8H0221-11	Solid	08/07/18 13:30	08/08/18 15:30
GLA-BG-6 (After Processing)	A8H0221-12	Solid	08/07/18 13:30	08/08/18 15:30
GLA-BG-7 (As Received)	A8H0221-13	Solid	08/07/18 13:35	08/08/18 15:30
GLA-BG-7 (After Processing)	A8H0221-14	Solid	08/07/18 13:35	08/08/18 15:30

Apex Laboratories

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13949 West Colfax Avenue, Suite 220	Project Number: **Coffin Butte/AU18.1148.00**	**Report ID:**
Lakewood, CO 80401	Project Manager: **Gabriel Iltis**	**A8H0221 - 08 24 18 1450**

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
GLA-BG-1 (After Processing) (A8H0221-02)				**Matrix: Solid**				
Batch: 8080783								
Antimony	ND	---	1.11	mg/kg	10	08/20/18	EPA 6020A	
Arsenic	ND	---	1.11	mg/kg	10	08/20/18	EPA 6020A	
Barium	**37.2**	---	1.11	mg/kg	10	08/20/18	EPA 6020A	
Beryllium	**0.489**	---	0.221	mg/kg	10	08/20/18	EPA 6020A	
Cadmium	**1.05**	---	0.221	mg/kg	10	08/20/18	EPA 6020A	
Chromium	**20.7**	---	1.11	mg/kg	10	08/20/18	EPA 6020A	
Cobalt	**34.6**	---	0.221	mg/kg	10	08/20/18	EPA 6020A	
Copper	**191**	---	1.11	mg/kg	10	08/20/18	EPA 6020A	
Lead	**1.05**	---	0.221	mg/kg	10	08/20/18	EPA 6020A	
Manganese	**659**	---	1.11	mg/kg	10	08/20/18	EPA 6020A	
Mercury	ND	---	0.0885	mg/kg	10	08/20/18	EPA 6020A	
Nickel	**27.8**	---	1.11	mg/kg	10	08/20/18	EPA 6020A	
Selenium	ND	---	1.11	mg/kg	10	08/20/18	EPA 6020A	
Silver	ND	---	0.221	mg/kg	10	08/20/18	EPA 6020A	
Thallium	ND	---	0.221	mg/kg	10	08/20/18	EPA 6020A	
Vanadium	**99.6**	---	1.11	mg/kg	10	08/20/18	EPA 6020A	
Zinc	**59.2**	---	4.42	mg/kg	10	08/20/18	EPA 6020A	
GLA-BG-2 (After Processing) (A8H0221-04)				**Matrix: Solid**				
Batch: 8080783								
Antimony	ND	---	1.08	mg/kg	10	08/20/18	EPA 6020A	
Arsenic	**1.75**	---	1.08	mg/kg	10	08/20/18	EPA 6020A	
Barium	**199**	---	1.08	mg/kg	10	08/20/18	EPA 6020A	
Beryllium	**0.540**	---	0.216	mg/kg	10	08/20/18	EPA 6020A	
Cadmium	**0.806**	---	0.216	mg/kg	10	08/20/18	EPA 6020A	
Chromium	**40.0**	---	1.08	mg/kg	10	08/20/18	EPA 6020A	
Cobalt	**33.5**	---	0.216	mg/kg	10	08/20/18	EPA 6020A	
Copper	**134**	---	1.08	mg/kg	10	08/20/18	EPA 6020A	
Lead	**2.51**	---	0.216	mg/kg	10	08/20/18	EPA 6020A	
Manganese	**947**	---	1.08	mg/kg	10	08/20/18	EPA 6020A	
Mercury	ND	---	0.0862	mg/kg	10	08/20/18	EPA 6020A	
Nickel	**49.7**	---	1.08	mg/kg	10	08/20/18	EPA 6020A	
Selenium	ND	---	1.08	mg/kg	10	08/20/18	EPA 6020A	
Silver	ND	---	0.216	mg/kg	10	08/20/18	EPA 6020A	
Thallium	ND	---	0.216	mg/kg	10	08/20/18	EPA 6020A	
Vanadium	**134**	---	1.08	mg/kg	10	08/20/18	EPA 6020A	
Zinc	**74.3**	---	4.31	mg/kg	10	08/20/18	EPA 6020A	

Apex Laboratories

Lisa Domenighini, Client Services Manager

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Apex Laboratories, LLC

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323
EPA ID: OR01039

Geo-Logic Associates (Lakewood, CO)	Project: **Corvallis Basalt Testing**	
13949 West Colfax Avenue, Suite 220	Project Number: **Coffin Butte/AU18.1148.00**	**Report ID:**
Lakewood, CO 80401	Project Manager: **Gabriel Iltis**	**A8H0221 - 08 24 18 1450**

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
GLA-BG-3 (After Processing) (A8H0221-06)				**Matrix: Solid**				
Batch: 8080783								
Antimony	ND	---	1.01	mg/kg	10	08/20/18	EPA 6020A	
Arsenic	ND	---	1.01	mg/kg	10	08/20/18	EPA 6020A	
Barium	**47.9**	---	1.01	mg/kg	10	08/20/18	EPA 6020A	
Beryllium	**0.577**	---	0.202	mg/kg	10	08/20/18	EPA 6020A	
Cadmium	**1.04**	---	0.202	mg/kg	10	08/20/18	EPA 6020A	
Chromium	**9.63**	---	1.01	mg/kg	10	08/20/18	EPA 6020A	
Cobalt	**35.1**	---	0.202	mg/kg	10	08/20/18	EPA 6020A	
Copper	**268**	---	1.01	mg/kg	10	08/20/18	EPA 6020A	
Lead	**1.23**	---	0.202	mg/kg	10	08/20/18	EPA 6020A	
Manganese	**339**	---	1.01	mg/kg	10	08/20/18	EPA 6020A	
Mercury	ND	---	0.0808	mg/kg	10	08/20/18	EPA 6020A	
Nickel	**29.3**	---	1.01	mg/kg	10	08/20/18	EPA 6020A	
Selenium	ND	---	1.01	mg/kg	10	08/20/18	EPA 6020A	
Silver	ND	---	0.202	mg/kg	10	08/20/18	EPA 6020A	
Thallium	ND	---	0.202	mg/kg	10	08/20/18	EPA 6020A	
Vanadium	**75.1**	---	1.01	mg/kg	10	08/20/18	EPA 6020A	
Zinc	**42.3**	---	4.04	mg/kg	10	08/20/18	EPA 6020A	
GLA-BG-4 (After Processing) (A8H0221-08)				**Matrix: Solid**				
Batch: 8080783								
Antimony	ND	---	0.977	mg/kg	10	08/20/18	EPA 6020A	Q-42
Arsenic	**1.65**	---	0.977	mg/kg	10	08/20/18	EPA 6020A	
Barium	**111**	---	0.977	mg/kg	10	08/20/18	EPA 6020A	**Q-42**
Beryllium	**0.446**	---	0.195	mg/kg	10	08/20/18	EPA 6020A	
Cadmium	**0.662**	---	0.195	mg/kg	10	08/20/18	EPA 6020A	
Chromium	**48.8**	---	0.977	mg/kg	10	08/20/18	EPA 6020A	
Cobalt	**29.5**	---	0.195	mg/kg	10	08/20/18	EPA 6020A	
Copper	**139**	---	0.977	mg/kg	10	08/20/18	EPA 6020A	**Q-42**
Lead	**1.09**	---	0.195	mg/kg	10	08/20/18	EPA 6020A	
Manganese	**601**	---	0.977	mg/kg	10	08/20/18	EPA 6020A	**Q-42**
Mercury	ND	---	0.0781	mg/kg	10	08/20/18	EPA 6020A	
Nickel	**48.5**	---	0.977	mg/kg	10	08/20/18	EPA 6020A	
Selenium	ND	---	0.977	mg/kg	10	08/20/18	EPA 6020A	
Silver	ND	---	0.195	mg/kg	10	08/20/18	EPA 6020A	
Thallium	ND	---	0.195	mg/kg	10	08/20/18	EPA 6020A	
Vanadium	**131**	---	0.977	mg/kg	10	08/20/18	EPA 6020A	**Q-42**

Apex Laboratories

Lisa Domenighini, Client Services Manager

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Apex Laboratories, LLC

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Tigard, OR 97223
503-718-2323
EPA ID: OR01039

Geo-Logic Associates (Lakewood, CO)	Project: **Corvallis Basalt Testing**	
13949 West Colfax Avenue, Suite 220	Project Number: **Coffin Butte/AU18.1148.00**	**Report ID:**
Lakewood, CO 80401	Project Manager: **Gabriel Iltis**	**A8H0221 - 08 24 18 1450**

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
GLA-BG-4 (After Processing) (A8H0221-08)				**Matrix: Solid**				
Zinc	**55.9**	---	3.91	mg/kg	10	08/20/18	EPA 6020A	
GLA-BG-5 (After Processing) (A8H0221-10)				**Matrix: Solid**				
Batch: 8080783								
Antimony	ND	---	1.10	mg/kg	10	08/20/18	EPA 6020A	
Arsenic	**1.32**	---	1.10	mg/kg	10	08/20/18	EPA 6020A	
Beryllium	**0.594**	---	0.220	mg/kg	10	08/20/18	EPA 6020A	
Cadmium	**0.939**	---	0.220	mg/kg	10	08/20/18	EPA 6020A	
Chromium	**33.2**	---	1.10	mg/kg	10	08/20/18	EPA 6020A	
Cobalt	**30.7**	---	0.220	mg/kg	10	08/20/18	EPA 6020A	
Copper	**202**	---	1.10	mg/kg	10	08/20/18	EPA 6020A	
Lead	**1.31**	---	0.220	mg/kg	10	08/20/18	EPA 6020A	
Manganese	**568**	---	1.10	mg/kg	10	08/20/18	EPA 6020A	
Mercury	ND	---	0.0881	mg/kg	10	08/20/18	EPA 6020A	
Nickel	**46.7**	---	1.10	mg/kg	10	08/20/18	EPA 6020A	
Selenium	ND	---	1.10	mg/kg	10	08/20/18	EPA 6020A	
Silver	ND	---	0.220	mg/kg	10	08/20/18	EPA 6020A	
Thallium	ND	---	0.220	mg/kg	10	08/20/18	EPA 6020A	
Vanadium	**112**	---	1.10	mg/kg	10	08/20/18	EPA 6020A	
Zinc	**63.5**	---	4.41	mg/kg	10	08/20/18	EPA 6020A	
GLA-BG-5 (After Processing) (A8H0221-10RE1)				**Matrix: Solid**				
Batch: 8080783								
Barium	**111**	---	1.10	mg/kg	10	08/21/18	EPA 6020A	
GLA-BG-6 (After Processing) (A8H0221-12)				**Matrix: Solid**				
Batch: 8080783								
Antimony	ND	---	1.08	mg/kg	10	08/20/18	EPA 6020A	
Arsenic	ND	---	1.08	mg/kg	10	08/20/18	EPA 6020A	
Beryllium	**0.840**	---	0.216	mg/kg	10	08/20/18	EPA 6020A	
Cadmium	**1.08**	---	0.216	mg/kg	10	08/20/18	EPA 6020A	
Chromium	**33.7**	---	1.08	mg/kg	10	08/20/18	EPA 6020A	
Cobalt	**43.6**	---	0.216	mg/kg	10	08/20/18	EPA 6020A	
Copper	**228**	---	1.08	mg/kg	10	08/20/18	EPA 6020A	
Lead	**2.45**	---	0.216	mg/kg	10	08/20/18	EPA 6020A	
Manganese	**1180**	---	1.08	mg/kg	10	08/20/18	EPA 6020A	
Mercury	ND	---	0.0864	mg/kg	10	08/20/18	EPA 6020A	

Apex Laboratories

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13949 West Colfax Avenue, Suite 220	Project Number: **Coffin Butte/AU18.1148.00**	**Report ID:**
Lakewood, CO 80401	Project Manager: **Gabriel Iltis**	**A8H0221 - 08 24 18 1450**

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
GLA-BG-6 (After Processing) (A8H0221-12)				**Matrix: Solid**				
Nickel	**31.7**	---	1.08	mg/kg	10	08/20/18	EPA 6020A	
Selenium	ND	---	1.08	mg/kg	10	08/20/18	EPA 6020A	
Silver	ND	---	0.216	mg/kg	10	08/20/18	EPA 6020A	
Thallium	ND	---	0.216	mg/kg	10	08/20/18	EPA 6020A	
Vanadium	**179**	---	1.08	mg/kg	10	08/20/18	EPA 6020A	
Zinc	**78.7**	---	4.32	mg/kg	10	08/20/18	EPA 6020A	
GLA-BG-6 (After Processing) (A8H0221-12RE1)				**Matrix: Solid**				
Batch: 8080783								
Barium	**57.9**	---	1.08	mg/kg	10	08/21/18	EPA 6020A	
GLA-BG-7 (After Processing) (A8H0221-14)				**Matrix: Solid**				
Batch: 8080783								
Antimony	ND	---	0.967	mg/kg	10	08/20/18	EPA 6020A	
Arsenic	ND	---	0.967	mg/kg	10	08/20/18	EPA 6020A	
Beryllium	**0.576**	---	0.193	mg/kg	10	08/20/18	EPA 6020A	
Cadmium	**0.939**	---	0.193	mg/kg	10	08/20/18	EPA 6020A	
Chromium	**16.5**	---	0.967	mg/kg	10	08/20/18	EPA 6020A	
Cobalt	**39.8**	---	0.193	mg/kg	10	08/20/18	EPA 6020A	
Copper	**214**	---	0.967	mg/kg	10	08/20/18	EPA 6020A	
Lead	**0.818**	---	0.193	mg/kg	10	08/20/18	EPA 6020A	
Manganese	**391**	---	0.967	mg/kg	10	08/20/18	EPA 6020A	
Mercury	ND	---	0.0774	mg/kg	10	08/20/18	EPA 6020A	
Nickel	**32.9**	---	0.967	mg/kg	10	08/20/18	EPA 6020A	
Selenium	ND	---	0.967	mg/kg	10	08/20/18	EPA 6020A	
Silver	ND	---	0.193	mg/kg	10	08/20/18	EPA 6020A	
Thallium	ND	---	0.193	mg/kg	10	08/20/18	EPA 6020A	
Vanadium	**117**	---	0.967	mg/kg	10	08/20/18	EPA 6020A	
Zinc	**67.7**	---	3.87	mg/kg	10	08/20/18	EPA 6020A	
GLA-BG-7 (After Processing) (A8H0221-14RE1)				**Matrix: Solid**				
Batch: 8080783								
Barium	**64.4**	---	0.967	mg/kg	10	08/21/18	EPA 6020A	

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13949 West Colfax Avenue, Suite 220	Project Number: **Coffin Butte/AU18.1148.00**	**Report ID:**
Lakewood, CO 80401	Project Manager: **Gabriel Iltis**	**A8H0221 - 08 24 18 1450**

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8080783 - EPA 3051A							**Solid**					
Blank (8080783-BLK1)		Prepared: 08/15/18 12:57		Analyzed: 08/20/18 19:53								
EPA 6020A												
Antimony	ND	---	0.962	mg/kg	10	---	---	---	---	---	---	
Arsenic	ND	---	0.962	mg/kg	10	---	---	---	---	---	---	
Barium	ND	---	0.962	mg/kg	10	---	---	---	---	---	---	
Beryllium	ND	---	0.192	mg/kg	10	---	---	---	---	---	---	
Cadmium	ND	---	0.192	mg/kg	10	---	---	---	---	---	---	
Chromium	ND	---	0.962	mg/kg	10	---	---	---	---	---	---	
Cobalt	ND	---	0.192	mg/kg	10	---	---	---	---	---	---	
Copper	ND	---	0.962	mg/kg	10	---	---	---	---	---	---	
Lead	ND	---	0.192	mg/kg	10	---	---	---	---	---	---	
Manganese	ND	---	0.962	mg/kg	10	---	---	---	---	---	---	
Mercury	ND	---	0.0769	mg/kg	10	---	---	---	---	---	---	
Nickel	ND	---	0.962	mg/kg	10	---	---	---	---	---	---	
Selenium	ND	---	0.962	mg/kg	10	---	---	---	---	---	---	
Silver	ND	---	0.192	mg/kg	10	---	---	---	---	---	---	
Thallium	ND	---	0.192	mg/kg	10	---	---	---	---	---	---	
Vanadium	ND	---	0.962	mg/kg	10	---	---	---	---	---	---	
Zinc	ND	---	3.85	mg/kg	10	---	---	---	---	---	---	
LCS (8080783-BS1)		Prepared: 08/15/18 12:57		Analyzed: 08/20/18 20:06								
EPA 6020A												
Antimony	23.6	---	1.00	mg/kg	10	25.0	---	94	80-120%	---	---	
Arsenic	48.4	---	1.00	mg/kg	10	50.0	---	97	80-120%	---	---	
Barium	52.4	---	1.00	mg/kg	10	50.0	---	105	80-120%	---	---	
Beryllium	23.1	---	0.200	mg/kg	10	25.0	---	92	80-120%	---	---	
Cadmium	47.9	---	0.200	mg/kg	10	50.0	---	96	80-120%	---	---	
Chromium	47.7	---	1.00	mg/kg	10	50.0	---	95	80-120%	---	---	
Cobalt	51.0	---	0.200	mg/kg	10	50.0	---	102	80-120%	---	---	
Copper	47.4	---	1.00	mg/kg	10	50.0	---	95	80-120%	---	---	
Lead	49.1	---	0.200	mg/kg	10	50.0	---	98	80-120%	---	---	
Manganese	55.3	---	1.00	mg/kg	10	50.0	---	111	80-120%	---	---	
Mercury	0.962	---	0.0800	mg/kg	10	1.00	---	96	80-120%	---	---	
Nickel	48.0	---	1.00	mg/kg	10	50.0	---	96	80-120%	---	---	
Selenium	24.1	---	1.00	mg/kg	10	25.0	---	96	80-120%	---	---	

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Lisa Domenighini, Client Services Manager

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Apex Laboratories, LLC

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323
EPA ID: OR01039

Geo-Logic Associates (Lakewood, CO)	Project: **Corvallis Basalt Testing**	
13949 West Colfax Avenue, Suite 220	Project Number: **Coffin Butte/AU18.1148.00**	**Report ID:**
Lakewood, CO 80401	Project Manager: **Gabriel Iltis**	**A8H0221 - 08 24 18 1450**

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8080783 - EPA 3051A							**Solid**					
LCS (8080783-BS1)		Prepared: 08/15/18 12:57		Analyzed: 08/20/18 20:06								
Silver	24.7	---	0.200	mg/kg	10	25.0	---	99	80-120%	---	---	
Thallium	23.8	---	0.200	mg/kg	10	25.0	---	95	80-120%	---	---	
Vanadium	46.5	---	1.00	mg/kg	10	50.0	---	93	80-120%	---	---	
Zinc	48.8	---	4.00	mg/kg	10	50.0	---	98	80-120%	---	---	
Duplicate (8080783-DUP1)		Prepared: 08/15/18 12:57		Analyzed: 08/20/18 20:38								
QC Source Sample: GLA-BG-4 (After Processing) (A8H0221-08)												
EPA 6020A												
Antimony	ND	---	1.09	mg/kg	10	---	ND	---	---	---	40%	
Arsenic	**1.93**	---	1.09	mg/kg	10	---	1.65	---	---	16	40%	
Beryllium	**0.477**	---	0.218	mg/kg	10	---	0.446	---	---	7	40%	
Cadmium	**0.663**	---	0.218	mg/kg	10	---	0.662	---	---	0.2	40%	
Chromium	**56.1**	---	1.09	mg/kg	10	---	48.8	---	---	14	40%	
Cobalt	**32.3**	---	0.218	mg/kg	10	---	29.5	---	---	9	40%	
Copper	**149**	---	1.09	mg/kg	10	---	139	---	---	7	40%	
Lead	**1.16**	---	0.218	mg/kg	10	---	1.09	---	---	7	40%	
Manganese	**643**	---	1.09	mg/kg	10	---	601	---	---	7	40%	
Mercury	ND	---	0.0873	mg/kg	10	---	ND	---	---	---	40%	
Nickel	**54.6**	---	1.09	mg/kg	10	---	48.5	---	---	12	40%	
Selenium	ND	---	1.09	mg/kg	10	---	ND	---	---	---	40%	
Silver	ND	---	0.218	mg/kg	10	---	ND	---	---	---	40%	
Thallium	ND	---	0.218	mg/kg	10	---	ND	---	---	---	40%	
Vanadium	**150**	---	1.09	mg/kg	10	---	131	---	---	14	40%	
Zinc	**64.1**	---	4.37	mg/kg	10	---	55.9	---	---	14	40%	
Duplicate (8080783-DUP2)		Prepared: 08/15/18 12:57		Analyzed: 08/21/18 19:31								
QC Source Sample: GLA-BG-4 (After Processing) (A8H0221-08)												
EPA 6020A												
Barium	**127**	---	1.09	mg/kg	10	---	111	---	---	14	40%	Q-16
Matrix Spike (8080783-MS1)		Prepared: 08/15/18 12:57		Analyzed: 08/20/18 20:43								
QC Source Sample: GLA-BG-4 (After Processing) (A8H0221-08)												
EPA 6020A												

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Geo-Logic Associates (Lakewood, CO)	Project: **Corvallis Basalt Testing**	
13949 West Colfax Avenue, Suite 220	Project Number: **Coffin Butte/AU18.1148.00**	**Report ID:**
Lakewood, CO 80401	Project Manager: **Gabriel Iltis**	**A8H0221 - 08 24 18 1450**

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8080783 - EPA 3051A							**Solid**					
Matrix Spike (8080783-MS1)		Prepared: 08/15/18 12:57			Analyzed: 08/20/18 20:43							
QC Source Sample: GLA-BG-4 (After Processing) (A8H0221-08)												
Antimony	16.7	---	1.04	mg/kg	10	26.1	ND	**64**	**75-125%**	---	---	A-02, Q-01
Arsenic	53.1	---	1.04	mg/kg	10	52.2	1.65	99	75-125%	---	---	
Beryllium	26.4	---	0.209	mg/kg	10	26.1	0.446	99	75-125%	---	---	
Cadmium	52.4	---	0.209	mg/kg	10	52.2	0.662	99	75-125%	---	---	
Chromium	111	---	1.04	mg/kg	10	52.2	48.8	120	75-125%	---	---	
Cobalt	88.6	---	0.209	mg/kg	10	52.2	29.5	113	75-125%	---	---	
Copper	215	---	1.04	mg/kg	10	52.2	139	**144**	**75-125%**	---	---	Q-04
Lead	50.8	---	0.209	mg/kg	10	52.2	1.09	95	75-125%	---	---	
Manganese	726	---	1.04	mg/kg	10	52.2	601	**239**	**75-125%**	---	---	Q-03
Mercury	1.03	---	0.0835	mg/kg	10	1.04	ND	98	75-125%	---	---	
Nickel	109	---	1.04	mg/kg	10	52.2	48.5	117	75-125%	---	---	
Selenium	24.0	---	1.04	mg/kg	10	26.1	ND	92	75-125%	---	---	
Silver	26.5	---	0.209	mg/kg	10	26.1	ND	102	75-125%	---	---	
Thallium	24.3	---	0.209	mg/kg	10	26.1	ND	93	75-125%	---	---	
Vanadium	205	---	1.04	mg/kg	10	52.2	131	**143**	**75-125%**	---	---	Q-04
Zinc	118	---	4.18	mg/kg	10	52.2	55.9	120	75-125%	---	---	
Matrix Spike (8080783-MS2)		Prepared: 08/15/18 12:57			Analyzed: 08/21/18 19:38							
QC Source Sample: GLA-BG-4 (After Processing) (A8H0221-08)												
EPA 6020A												
Barium	186	---	1.04	mg/kg	10	52.2	111	**144**	**75-125%**	---	---	Q-16

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13949 West Colfax Avenue, Suite 220	Project Number: **Coffin Butte/AU18.1148.00**	**Report ID:**
Lakewood, CO 80401	Project Manager: **Gabriel Iltis**	**A8H0221 - 08 24 18 1450**

SAMPLE PREPARATION INFORMATION

Total Metals by EPA 6020 (ICPMS)

Prep: EPA 3051A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 8080783							
A8H0221-02	Solid	EPA 6020A	08/07/18 12:30	08/15/18 12:57	0.452g/50mL	0.5g/50mL	1.11
A8H0221-04	Solid	EPA 6020A	08/07/18 12:40	08/15/18 12:57	0.464g/50mL	0.5g/50mL	1.08
A8H0221-06	Solid	EPA 6020A	08/07/18 12:55	08/15/18 12:57	0.495g/50mL	0.5g/50mL	1.01
A8H0221-08	Solid	EPA 6020A	08/07/18 13:05	08/15/18 12:57	0.512g/50mL	0.5g/50mL	0.98
A8H0221-10	Solid	EPA 6020A	08/07/18 13:15	08/15/18 12:57	0.454g/50mL	0.5g/50mL	1.10
A8H0221-10RE1	Solid	EPA 6020A	08/07/18 13:15	08/15/18 12:57	0.454g/50mL	0.5g/50mL	1.10
A8H0221-12	Solid	EPA 6020A	08/07/18 13:30	08/15/18 12:57	0.463g/50mL	0.5g/50mL	1.08
A8H0221-12RE1	Solid	EPA 6020A	08/07/18 13:30	08/15/18 12:57	0.463g/50mL	0.5g/50mL	1.08
A8H0221-14	Solid	EPA 6020A	08/07/18 13:35	08/15/18 12:57	0.517g/50mL	0.5g/50mL	0.97
A8H0221-14RE1	Solid	EPA 6020A	08/07/18 13:35	08/15/18 12:57	0.517g/50mL	0.5g/50mL	0.97

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QUALIFIER DEFINITIONS

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

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A-02	Serial dilution was performed and was within limits. Data is acceptable.
Q-01	Spike recovery and/or RPD is outside acceptance limits.
Q-03	Spike recovery and/or RPD is outside control limits due to the high concentration of analyte present in the sample.
Q-04	Spike recovery and/or RPD is outside control limits due to a non-homogeneous sample matrix.
Q-16	Reanalysis of an original Batch QC sample.
Q-42	Matrix Spike and/or Duplicate analysis was performed on this sample. % Recovery or RPD for this analyte is outside laboratory control limits. (Refer to the QC Section of Analytical Report.)

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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

Detection Limits: Limit of Detection (LOD)

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'.

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) are not 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).

Blanks:

Standard practice is to evaluate the results from Blank QC Samples down to a level equal to ½ the Reporting Limit (RL).
-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.

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Lakewood, CO 80401	Project Manager: **Gabriel Iltis**	**A8H0221 - 08 24 18 1450**

REPORTING NOTES AND CONVENTIONS (Cont.):

Blanks (Cont.):

Sample results flagged with a 'B' or 'B-02' qualifier are potentially biased high if the blank 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.

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.

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LABORATORY ACCREDITATION INFORMATION

TNI 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

Lisa A Domenighini

Lisa Domenighini, Client Services Manager

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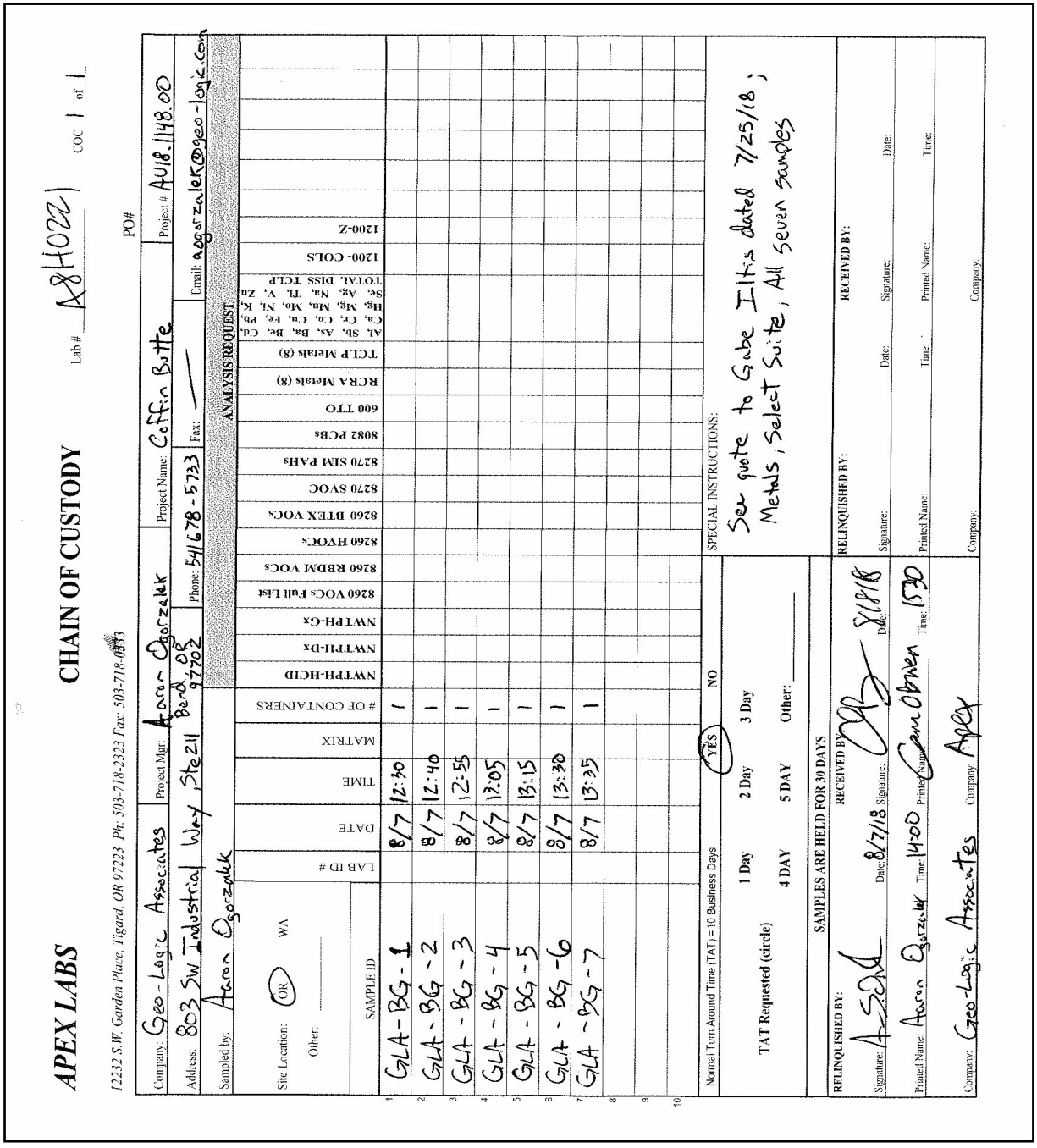

APEX LABS — CHAIN OF CUSTODY — Lab # A8H0221 — COC 1 of 1 — PO#

12232 S.W. Garden Place, Tigard, OR 97223 Ph: 503-718-2323 Fax: 503-718-0333

Company: Geo-Logic Associates | Project Mgr: Aaron Ogorzalek | Project Name: Coffin Butte | Project # AU18.1148.00

Address: 803 SW Industrial Way, Ste 211 Bend, OR 97702 | Phone: 541 678-5733 | Fax: — | Email: aogorzalek@geo-logic.com

Sampled by: Aaron Ogorzalek

Site Location: (OR) WA — Other: —

ANALYSIS REQUEST

#	SAMPLE ID	LAB ID #	DATE	TIME	MATRIX	# OF CONTAINERS	NWTPH-HCID	NWTPH-Dx	NWTPH-Gx	8260 VOCs Full List	8260 RBDM VOCs	8260 HVOCs	8260 BTEX VOCs	8270 SVOC	8270 SIM PAHs	8082 PCBs	600 TTO	RCRA Metals (8)	TCLP Metals (8)	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Hg, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Tl, V, Zn TOTAL DISS TCLP	1200- COLS	1200-Z
1	GLA-BG-1		8/7	12:30		1																
2	GLA-BG-2		8/7	12:40		1																
3	GLA-BG-3		8/7	12:55		1																
4	GLA-BG-4		8/7	13:05		1																
5	GLA-BG-5		8/7	13:15		1																
6	GLA-BG-6		8/7	13:30		1																
7	GLA-BG-7		8/7	13:35		1																
8																						
9																						
10																						

Normal Turn Around Time (TAT) = 10 Business Days — (YES) NO

TAT Requested (circle): 1 Day | 2 Day | 3 Day | 4 DAY | 5 DAY | Other: ____

SPECIAL INSTRUCTIONS: See quote to Gabe Iltis dated 7/25/18; Metals, Select Suite, All seven samples

SAMPLES ARE HELD FOR 30 DAYS

RELINQUISHED BY: Signature: A Seal — Date: 8/7/18 — Time: 1400 — Printed Name: Aaron Ogorzalek — Company: Geo-Logic Associates

RECEIVED BY: Signature: [signature] — Date: 8/7/18 — Time: 1530 — Printed Name: Sam Obmen — Company: APEX

RELINQUISHED BY: Signature: — Date: — Time: — Printed Name: — Company:

RECEIVED BY: Signature: — Date: — Time: — Printed Name: — Company:

Apex Laboratories

Lisa A Domenighini

Lisa Domenighini, Client Services Manager

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13949 West Colfax Avenue, Suite 220	Project Number: **Coffin Butte/AU18.1148.00**	**Report ID:**
Lakewood, CO 80401	Project Manager: **Gabriel Iltis**	**A8H0221 - 08 24 18 1450**

APEX LABS COOLER RECEIPT FORM

Client: Geo-Logic Associates Element WO#: A8 H0221

Project/Project #: Coffin Butte / AU18.1148.00

Delivery info:

Date/Time Received: 8/8/18 @ 1530 By: [initials]

Delivered by: Apex ___ Client ___ ESS ___ FedEx X UPS ___ Swift ___ Senvoy ___ SDS ___ Other ___

Cooler Inspection Inspected by: [initials] : 8/8/18 @ 1530

Chain of Custody Included? Yes X No ___ Custody Seals? Yes ___ No ✓

Signed/Dated by Client? Yes X No ___

Signed/Dated by Apex? Yes X No ___

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (deg. C)							
Received on Ice? (Y/N)							
Temp. Blanks? (Y/N)	5.6						
Ice Type: (Gel/Real/Other)							
Condition:							

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

If some coolers are in temp and some out, were green dot applied to out of temperature samples? Yes/No/NA

Samples Inspection: Inspected by: [initials] : 8/8/18 @ 1848

All Samples Intact? Yes X No ___ Comments:

Bottle Labels/COCs agree? Yes X No ___ Comments:

Containers/Volumes Received Appropriate for Analysis? Yes X No ___ Comments:

Do VOA Vials have Visible Headspace? Yes ___ No ___ NA X

Comments

Water Samples: pH Checked and Appropriate (except VOAs): Yes ___ No ___ NA X

Comments:

Additional Information:

Labeled by: [initials] Witness: [initials] Cooler Inspected by: [initials] See Project Contact Form: Y

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APPENDIX B

EXAMPLE HEALTH AND SAFETY PLAN (HASP)

HEALTH AND SAFETY PLAN

COFFIN BUTTE LANDFILL
BURN DUMP EXPLORATION, PHASE 2

BENTON COUNTY, OREGON

JUNE 2017
PROJECT NO. AU17.1136.00

SUBMITTED TO:

VALLEY LANDFILLS, INC.

Valley Landfills, Inc.
28972 Coffin Butte Road
Corvallis, Oregon 97330

PREPARED BY:

Geo-Logic ASSOCIATES

Geo-Logic Associates
803 SW Industrial Way, Suite 211
Bend, Oregon 97702
(541) 678-5733

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1.0 INTRODUCTION

This health and safety plan pertains to the field investigation to be carried out at the Coffin Butte Landfill (CBL) in Benton County, Oregon, approximately 10 miles north of the city of Corvallis. The CBL is owned and operated by Valley Landfills, Inc. (VLI). The work to be completed is part of the characterization study of the old military/burn dump that is known to exist in the westernmost portion of the site's landfill zoning boundary. The scope of field work for this project includes: three days of logging exploratory boreholes into the waste as well as sample collection, transport and shipment. Detailed descriptions of the methodology of these work tasks are found in the Scope of Work outlined in the project proposal document (GLA, April 24, 2017).

Engineering services will be provided by Geo-Logic Associates (GLA) under the supervision of Mr. Aaron Ogorzalek, P.E. Mr. Aaron Ogorzalek (GLA) will serve as the Project Manager, and John Hower, PG, CEG will serve as the Project Safety Officer (PSO). Drilling services will be provided by Holocene Drilling, Inc., based in Puyallup, Washington. For every work task, the PSO will appoint a Task Safety Officer (TSO), who will be present at the site throughout the duration of field operations associated with individual tasks.

This plan is based on existing information regarding the site and upon past experience at other solid waste disposal sites. This document describes the specific safety procedures to be utilized for all GLA personnel involved in the investigation. This plan also represents the minimum standards for Health & Safety compliance for project workers but does not substitute for each project subcontractor having his/her own project safety plan. Whenever the subcontractor's Health & Safety Plan is in conflict with this plan, the more stringent (conservative) requirement will be followed.

This plan presents a general approach to avoid or mitigate anticipated hazards at the site. Site conditions may vary throughout the duration of the project, however, and as actual site conditions change, parts of the plan may be upgraded or downgraded as conditions warrant. All changes in the health and safety measures specified must be approved by the PSO. Such changes will be conveyed in a timely and clear manner to all affected employees.

All workers, visitors and regulatory personnel are expected to be familiar with, and comply with all aspects of this plan. Any individuals who fail to comply with the protection levels or other provisions of the plan will be excluded from all active work areas (exclusion zones), as deemed appropriate by the TSO. Any visitors and regulatory personnel wishing to have access to the active work areas must, prior to entry, provide written documentation of compliance with the training and medical monitoring requirements of the plan.

All protective equipment necessary for on-site workers will be provided by their respective companies. Landfill employees and employees of regulatory agencies visiting the site are

expected to provide their own protective equipment, which equals or exceeds the protection required by this plan.

The information presented in this plan will be reviewed with employees during the site specific training and a copy of this plan will be maintained at the work site and will be available at all times.

2.0 SITE DESCRIPTION

The CBL is an active solid waste landfill which is owned and operated by Valley Landfills, Inc. under Oregon Department of Environmental Quality (ODEQ) Solid Waste Permit No. 306. The site is located at 28972 Coffin Butte Road, Corvallis, Oregon. The permitted landfill site encompasses approximately 184 acres, of which approximately 42 acres have received final closure. The landfill is divided into 6 major cells, and subcells are designed based on waste filling demands and fill planning. The active landfill currently places waste in Cell 5A, and construction of Cell 5B is underway for the 2017 construction season.

The former military landfill/burn dump encompasses an approximate 17-acre area that resides at the far western portion of future Cell 6 (see Figure 1). Landfill operations began in the 1940's by the Army as part of disposal operations for Camp Adair. A former rock quarry on the southwestern portion of the site was used for the initial disposal area, and an open burn dump was reportedly operated by the Army in the 1940's (URS, 1995). Wastes were received in this area until 1975 when VLI purchased the Coffin Butte site. The military landfill/burn dump was officially capped and closed in 1977 with an all soil cover (ODEQ, 1995). There is limited information on the types of materials deposited in the former military landfill/burn dump. It is assumed that typical military base-generated waste (i.e., domestic refuse, waste ordnance, metals, and waste oils) were deposited (URS, 1995).

In 2016, GLA performed a preliminary characterization study of the burn dump area, which consisted of test pitting, waste sampling, laboratory testing, and geophysical seismic surveying. The 2016 study concluded that the upper 10 to 15 ft of the existing waste in the burn dump area consists of municipal solid waste, that the waste thickness is up to 50 feet thick (based on the geophysical seismic survey results), and that additional work needs to be conducted to define the limits and classify the remaining waste materials between those that were reached in the surface test pits and the underlying subgrade.

3.0 PERSONNEL RESPONSIBILITIES

The key personnel for the monitoring of the various tasks and monitoring activities will include the Project Manager, site supervisor, PSO, and TSO's. The various project assignments are discussed below:

Site Supervisor: Mr. Ian Macnab (Valley Landfills, Inc.)

Tel. (541) 745-5792, Ext. 17 / Cell: (541) 230-4022

The VLI Site Supervisor is responsible for assuring that the health and safety plan is implemented in conformance with known site conditions and with VLI policies and procedures.

GLA Project Manager: Aaron Ogorzalek (Geo-Logic Associates)
Tel. (541) 678-5733 / Cell: (262) 751-9042

The GLA project manager is responsible for overall implementation of the field investigation and the health and safety plan. The GLA Project Manger reports directly to the Site Supervisor.

GLA Project Safety Officer: John Hower (Geo-Logic Associates)
Tel. (909) 626-2282 / Cell: (858) 864-2584

The PSO is responsible for direct implementation of the health and safety plan. All changes to the health and safety plan must be approved and implemented by the PSO. For every work task the PSO will appoint a Task Safety Officer (TSO).

GLA Task Safety Officer: Gabriel Iltis (Geo-Logic Associates)
Tel. (303) 232-3310 / Cell: (541) 231-9580

The TSO is responsible for implementation of the safety plan in the field. The TSO will be present at the site throughout the duration of field operations associated to that task.

4.0 HAZARD ASSESSMENT

GLA will be responsible for staking, logging, and sampling of exploratory borings. Work will occur at the Coffin Butte old military landfill/burn dump, which is a historical waste disposal site. Based on past experience with similar burn dumps and historical waste disposal site, the presence of heavy metals and heavy organic compounds is anticipated. Waste dumps associated with military facilities may also contain radioactive debris and unexploded ordnance (UXO). As with any solid waste disposal site, organic gases may be present. A summary of the known and anticipated hazards is provided in the following table.

Activity	Physical Hazard	Chemical/Biological Hazard
Borehole Drilling, Logging, and Sampling	• Inclement/cold weather • Hot weather • Slips/trips/uneven terrain • Dust exposure • Broken glass/sharp objects • Heavy Equipment • Entrapment • UXO	• Heavy metals • Organic vapors/gases • Radioactive debris • PCBs and dioxins • Wildlife • Medical Wastes

4.1 Cold Stress

Site investigation work is expected to occur in June 2017. Spring and summer months in the site vicinity bring the potential for daily changes in weather, with temperatures commonly ranging from 40 to 90 degrees Fahrenheit. As a result, GLA employees are expected to be exposed to cold working conditions that may lead to cold stress, particularly in the morning hours of work days.

Four factors contribute to cold stress: cold temperatures, high or cold wind, dampness, and cold water. A cold environment forces the body to work harder to maintain its temperature. Cold air, water, and snow all draw heat from the body. Wind chill is the combination of air temperature and wind speed. For example, when the air temperature is 40°F, and the wind speed is 35 mph, your exposed skin receives conditions equivalent to the air temperature being 11° F.

Anyone working in a cold environment may be at risk for cold stress. However, older people may be at more risk than younger adults, since older people are not able to generate heat as quickly. Certain medications may prevent the body from generating heat normally. These include anti-depressants, sedatives, tranquilizers and some heart medications.

When in a cold environment, most of your body's energy is used to keep your internal temperature warm. Over time, your body will begin to shift blood flow from your extremities (hands, feet, arms, and legs) and outer skin to the core (chest and abdomen). This allows exposed skin and the extremities to cool rapidly and increases the risk of frostbite and hypothermia. Combine this with cold water, and trench foot may also be a problem.

4.1.1 Types of Cold Stresses

Hypothermia **-** Hypothermia means "low heat" and is a potentially serious health condition. This occurs when body heat is lost from being in a cold environment faster than it can be replaced. When the body temperature drops below the normal 98.6° F to around 95° F, the onset of symptoms normally begins. The person begins to shiver and stomp feet in order to generate heat. As the body temperature continues to fall, slurred speech, lack of coordination and memory loss develop and the person will stop shivering. Once the body temperature falls to around 85° F, the person may become unconscious, and at 78°, the person could die.

Signs and symptoms:

Mild hypothermia (98 - 90° F): Shivering, lack of coordination, stumbling, fumbling hands, slurred speech, memory loss, pale, cold skin.

Moderate hypothermia (90 - 86° F): Shivering stops, unable to walk or stand, confused and irrational.

Severe hypothermia (86 - 78° F): Severe muscle stiffness, very sleepy or unconscious, ice cold skin, death.

What to do:
(Proper treatment depends on the severity of the hypothermia.)

Mild hypothermia: Move to warm area, stay active, remove wet clothes and replace with dry clothes or blankets, cover head, drink warm (not hot) sugary drink.

Moderate hypothermia: All of the above, plus:
Call 911 for an ambulance, cover all extremities completely, place very warm objects, such as hot packs or water bottles on the victim's head, neck, chest and groin.

Severe hypothermia: Call 911 for an ambulance, treat the victim very gently, do not attempt to re-warm - the victim should receive treatment in a hospital.

Frostbite **-** Frostbite occurs when the skin actually freezes and loses water. In severe cases, amputation of the frostbitten area may be required. While frostbite usually occurs when the temperatures are 30° F or lower, wind chill factors can allow frostbite to occur in above freezing temperatures. Frostbite typically affects the extremities, particularly the feet and hands.

Signs and symptoms
Cold, tingling, stinging or aching feeling in the frostbitten area, followed by numbness.
Skin color turns red, then purple, then white or very pale skin, cold to the touch.
Blisters in severe cases.

What to do:
Call 911, do not rub the area, wrap in soft cloth.
If help is delayed, immerse in warm, not hot, water.

Trench Foot **-** Trench foot or immersion foot is caused by having feet immersed in cold water for long periods of time. It is similar to frostbite, but considered less severe.

Signs and symptoms:
Tingling, itching or burning sensation, blisters.

What to do:
Soak feet in warm water, then wrap with dry cloth bandages. Drink a warm, sugary drink.

4.1.2 Mitigating Cold Stress

Planning for work in cold weather is the most important defense. Wearing appropriate clothing and being aware of how your body is reacting to the cold are important to preventing cold stress. Avoiding alcohol, certain medications and smoking can also help to minimize the risk.

Clothing - Wearing the right clothing is the most important way to avoid cold stress. The type of fabric also makes a difference. Cotton loses its insulation value when it becomes wet. Wool, on the other hand, retains its insulation even when wet. The following are recommendations for working in cold environments:

Wear *at least three layers* of clothing:

- An outer layer to break the wind and allow some ventilation (like Gortex® or nylon).
- A middle layer of down or wool to absorb sweat and provide insulation even when wet.
- An inner layer of cotton or synthetic weave to allow ventilation.

In addition:

- Wear a hat. Up to 40% of body heat can be lost when the head is left exposed.
- Wear insulated boots or other footwear.
- Keep a change of dry clothing available in case work clothes become wet.
- Do not wear tight clothing. Loose clothing allows better ventilation.

Work Practices -

Drinking: Drink plenty of liquids, avoiding caffeine and alcohol. It is easy to become dehydrated in cold weather.

Work Schedule: If possible, heavy work should be scheduled during the warmer parts of the day. Take breaks out of the cold.

Buddy System: Try to work in pairs to keep an eye on each other and watch for signs of cold stress

Engineering Controls -Some engineering controls are available to reduce the risk of cold stress:

Radiant heaters may be used to warm workers
Shield work areas from drafts or wind
Use insulating material on equipment handles when temperatures drop below 30° F.

Training - Employees and supervisors need to be trained to be able to detect early signs of cold stress. Work partners and supervisors should watch for signs of cold stress and allow workers to interrupt their work if they are extremely uncomfortable. Supervisors should also ensure that work schedules allow appropriate rest periods and ensure liquids are available. They should use appropriate engineering controls, personal protective equipment and work practices to reduce the risk of cold stress.

4.2 Heat Illness / Heat Stress

Heat illness and/or heat stress may result from the use of personal protective equipment, over-exertion, high ambient temperatures, or a combination of all three. All workers will be advised of the symptoms of heat illness and heat stress, and will adhere to a strict buddy system, such that workers can observe each other for these symptoms.

4.2.1 Heat Illness Signs and Symptoms

The symptoms of heat stress include:

- Fatigue,
- Irritability,
- Anxiety,
- Decreased concentration and dexterity,
- Impaired movement,
- Shallow breathing,
- Pulse rate above 110 beats for minute,
- Oral temperature above 99ºF.

Heat related effects include:

- Rashes,
- Cramps,
- Exhaustion (accompanied by shallow breathing; pale, cool, moist skin; profuse sweating; dizziness; and lassitude),
- Stroke (accompanied by red, hot, dry skin; no perspiration; nausea; dizziness and confusion; strong, rapid pulse; and coma).

4.2.2 Heat Illness Prevention

GLA, as a company, has adopted the California OSHA Heat Illness Prevention Standard in 8CCR Section 3395. These procedures have been created to assist the employer in crafting their heat illness prevention procedures, and to reduce the risk of work related heat illnesses among their employees. Although part of California OSHA law, GLA has adopted these procedures for all projects, even those outside of California. These procedures provide the minimal steps applicable to most outdoor work settings and are essential to reducing the incidence of heat related illnesses. In working environments with a higher risk for heat illness (e.g., during a heat wave, or other severe working or environmental conditions), GLA will exercise greater caution and additional protective measures beyond what is listed in this document, as needed to protect their employees.

The elements reflected within this section of the Health and Safety Plan are those contained

in 8CCR Section 3395 and consist of the following:

- Provision of Water
- Access to Shade and Rest
- Written Procedures
- Training

4.2.2.1 Provision of Water

Water is a key preventive measure to minimize the risk of heat related illnesses. Employees shall have access to potable drinking water provided by GLA. Where the supply of water is not plumbed or otherwise continuously supplied, water shall be provided in sufficient quantity at the beginning of the work shift to provide one quart per employee per hour for drinking for the entire shift. Employers may begin the shift with smaller quantities of water if they have effective procedures for replenishment during the shift as needed to allow employees to drink one quart or more per hour. GLA encourages its employees to drink water frequently throughout the day.

The following water supply procedures shall be adhered to by all GLA employees participating in this project:

- Field employees will check their daily water supply at the daily tailgate safety meeting. If an employee's water supply is less than 2 quarts at the start of the day, water will be exchanged among field employees or will be purchased from local vendors before commencing field work, so that each employee has a minimum of 2 quarts of water at the start of the day.
- At the tailgate safety meeting, the field employees will determine their work areas and identify the nearest water vendor to that area. If no water vendor is nearby, the employee shall purchase or otherwise obtain a full day supply of water before commencing field work.
- The PSO will routinely remind field employees of the importance of maintaining their drinking water supply.
- GLA will provide field employees with funding to purchase bottled water as needed throughout the project.
- The PSO will routinely remind field employees to keep water in their field vehicles at all times during the project.
- The PSO will periodically remind field employees to check their water supply, and to replenish it whenever an individual's supply is less than two quarts.

To encourage frequent drinking of potable water, the following steps will be taken:

- The PSO will periodically contact the field employees to discuss water consumption.
- The PSO will periodically contact the field employees to remind them to take breaks.
- Water consumption will be discussed at tailgate safety meetings.
- GLA will provide sufficient funding or will rapidly reimburse its employees for water purchases.

4.2.2.2 Access To Shade

Access to rest and shade or other cooling measures are important preventive steps to minimize the risk of heat related illnesses.

> 8CCR Section 3395(d) indicates that employees suffering from heat illness or believing a preventative recovery period is needed, shall be provided access to an area with shade that is either open to the air or provided with ventilation or cooling for a period of no less than five minutes. Such access to shade shall be permitted at all times. Except for employers in the agriculture industry, cooling measures other than shade (e.g., use of misting machines) may be provided in lieu of shade if the employer can demonstrate that these measures are at least as effective as shade in allowing employees to cool.

To ensure access to shade at all time, the following steps will be taken:

- During field operations, employees are encouraged to use their personal vehicles to provide shade and air conditioning to maintain a personal comfort level.
- If necessary, employees can utilize the VLI office building on Coffin Butte Road for sun shelter and air conditioning.
- In periods of extreme heat and sun exposure, employees are encouraged to limit their field time and exertion.

4.2.2.3 Rest Periods

To ensure that employees have access to a preventative recovery period, the following steps will be taken:

- The PSO will be aware of daily weather conditions within the project work area, and will advise site workers of standard work-break procedures, and whether or not additional breaks are warranted.
- Tailgate safety meetings will discuss weather and work conditions.
- Employees will be instructed to take a minimum 15-minute break for every two hours of work. Employees are encouraged to park their vehicles near live shade trees or use the vehicle ventilation system to achieve a comfortable temperature.

- While driving between work locations, employees will be encouraged to use their vehicle air conditioning or ventilation systems to create a comfortable recovery temperature.

4.2.2.4 Written Procedures

Written procedures help reduce the risk of heat related illnesses, and ensure that emergency assistance is provided without delay. 8CCR Section 3395(e)(3) states that GLA's procedures required by subsections (e)(1)(B), (G), (H), and (I) shall be in writing and shall be made available to employees and to representatives of Cal/OSHA upon request. These include:

(B) Procedures for complying with the requirements of this standard,

(G) Procedures for responding to symptoms of possible heat illness, including how emergency medical services will be provided should they become necessary,

(H) Procedures for contacting emergency medical services, and if necessary, for transporting employees to a point where they can be reached by an emergency medical service provider;

(I) Procedures for ensuring that, in the event of emergency, clear and precise directions to the work site can and will be provided as needed to emergency responders.

To reduce the risk of heat-related illness (HI) and respond to possible symptoms of HI, the following steps will be taken:

- All employees will be trained prior to working outdoors.
- Working hours will be modified to work during the cooler hours of the day, when possible.
- When a modified or shorter work-shift is not possible, more water and rest breaks will be provided.
- The PSO will routinely check in with all employees, and each field employee will stay alert to the presence of heat related symptoms.
- Each field employee will carry cell phones or other means of communication, to ensure that emergency services can be called, and check that these are functional at the worksite prior to each shift.
- Every morning, workers will be reminded about address and directions to the worksite and emergency procedures.

To ensure that emergency medical services are provided without delay, the following steps will be taken:

- Field employees shall maintain visual, radio, or cell phone contact at all times, and shall periodically check on each other throughout each working day.
- The PSO shall be aware of the properties that the field employees are working on at all times.
- All field employees need to be aware of their location with respect to the nearest main streets.
- All field employees shall carry cellular telephone phones, and will be instructed to call 911 when symptoms of HI are present.
- After calling 911, the field employee shall contact his or her PSO to inform him of the emergency.
- The PSO shall follow up with local emergency services and other field employees to relay work information.

4.2.2.5 Training

Training is critical to help reduce the risk of heat related illnesses and to assist with obtaining emergency assistance without delay. As outlined in 8CCR Section 3395(e)(1), training in the following topics shall be provided to all supervisory and non-supervisory employees:

(A) The environmental and personal risk factors for heat illness;

(B) The employer's procedures for complying with the requirements of this standard;

(C) The importance of frequent consumption of small quantities of water, up to 4 cups per hour, when the work environment is hot and employees are likely to be sweating more than usual in the performance of their duties;

(D) The importance of acclimatization;

(E) The different types of heat illness and the common signs and symptoms of heat illness;

(F) The importance to employees of immediately reporting to the employer, directly or through the employee's supervisor, symptoms or signs of heat illness in themselves, or in co-workers;

(G) The employer's procedures for responding to symptoms of possible heat illness, including how emergency medical services will be provided should they become necessary;

(H) The employer's procedures for contacting emergency medical services, and if necessary, for transporting employees to a point where they can be reached by an emergency medical service provider;

(I) The employer's procedures for ensuring that, in the event of an emergency, clear and precise directions to the work site can and will be provided as needed to emergency responders.

Note: 8CCR Section 3203(a)(3) requires that communication for employees shall be in a form readily understandable by all affected employees.

Supervisor training: Prior to assignment to supervision of employees working in the heat, training on the following topics shall be provided:

(A) The information required to be provided in A through I, above.

(B) The procedures the supervisor is to follow to implement the applicable provisions in this section.

(C) The procedures the supervisor is to follow when an employee exhibits symptoms consistent with possible heat illness, including emergency response procedures.

To ensure employees are trained, the following steps will be taken:

- All employees will receive heat illness prevention training prior to working outdoors, especially all newly-hired employees or employees who are new to the project.
- On hot days, and during a heat wave, the PSO will hold short tailgate meetings to review this important information with all workers.
- All newly hired workers will be assigned a buddy or experienced coworker to ensure that they understood the training and follow the company procedures.
- The PSO will be trained prior to being assigned to supervise outdoor workers.
- Primary and secondary employers will ensure that all employee's (including temporary) working outdoors are trained in heat illness prevention.

To ensure the PSO is provided training, the following steps will be taken:

- The PSO will be required to review and sign this plan to acknowledge that they understand its contents.
- PSOs will receive first-aid training by the American Red Cross or other accredited organization.

The PSO will brief the field employees on the contents of this document and the HI plans and outline the procedure to follow to minimize the risk of HI.

4.3 Physical Hazards

In addition to hazards resulting from inclement weather and cold stress, other physical hazards exist at the site. The Coffin Butte old military landfill/burn dump includes areas with very steep terrain that is covered with moderate to dense vegetation that can hide depressions and uneven terrain. Slips, trips, and falls are the most common physical hazards, and can be caused

by steep slopes, uneven or slippery terrain. Additionally, portions of the site may have waste exposed at the ground surface, and as a result, sharp objects such as glass and metal debris may be present in the work area. Since the area is known to be an old military dump site, military munitions/unexploded ordnance (UXO) are a potential physical hazard (see Section 7.5 and Appendix B for safety guidelines and procedures).

The following summarizes anticipated physical hazards and the control measures established to minimize employee risks.

Physical Hazard	Exposure Potential	Control Measures
Slips/trips/uneven and steep terrain	Borehole exploration & sampling	• Look Ahead. • Wear proper footwear. • Do not run in the work area.
Dust exposure	Borehole exploration & sampling	• Work upwind of Operations. • Pre-wet work area. • Dust suppression. • Wear coveralls, gloves, and APR when working in the exclusion zone or when other engineering and administrative controls are not effective.
Heavy Equipment	Borehole exploration & sampling	• Maintain visual contact with operator. • Do not enter the "kill zone" of the equipment. • Maintain the same work position to the extent possible. • Wear safety vest to increase visibility. • Wear hard hat and steel-toed boots to minimize impact injuries.
Noise	Borehole exploration & sampling	• Increase distance from noise source. • Take breaks away from noise source. • Wear noise-suppressing ear plugs.
Unexploded Ordnance (UXO)	Borehole exploration & sampling	• Do not handle waste that has the appearance of UXO. • Drill slowly and watch for suspicious looking objects. • If observed, leave in place and notify site and appropriate authorities (Follow the 3Rs: RECOGNIZE, RETREAT, REPORT).
Vehicular Traffic	Borehole exploration & sampling	• Watch for and yield to truck traffic related to nearby quarry operations.
Sharp objects	Borehole exploration & sampling	• Look ahead. • Don appropriate gloves/PPE if objects must be handled.

4.4 Biological Hazards

Potentially dangerous animals, including rattlesnakes, spiders, ticks, bees, wasps, and scorpions, may inhabit the site. The risk of encountering these hazards may be especially high

when working in areas of heavy brush or, in the case of spiders, working in dark, quiet spaces. When working in heavy brush areas, workers shall wear heavy boots and pants to protect against snake bites. During and after each working day, each person should check him/herself for ticks. Ticks which have not embedded themselves should be promptly brushed off. Ticks which have embedded themselves into the skin should be removed by a medical doctor. Any person who is stung or bitten by a potentially dangerous animal should be immediately taken to the local hospital (see Appendix A).

Medical wastes also pose a potential hazard to workers. Syringes may be present at the work area, and pose a puncture/blood born pathogen hazard. Although nitrile gloves will be worn by each worker during sampling to provide effective protection against contamination, these gloves do not provide much resistance to cuts, tears, or punctures. Care should be taken when handling any material in the work area so as to prevent breakage of the skin and possible infection. Any employee that sustains an injury that breaks the skin should seek immediate medical attention.

4.5 Chemical Hazards

Contact with chemical hazards at the work site is possible during all activities. Wastes at the Coffin Butte old military landfill/burn dump have potential to contain concentrations of heavy metals and organic compounds that exceed hazardous waste levels. Methane and other organic gases may also be present in and adjacent to the landfilled wastes.

The following summarizes anticipated chemical hazards and the control measures established to minimize employee risks.

Chemical Hazards	Exposure Potential	Control Measures
Heavy metals Dioxins and PCBs	Borehole exploration & sampling	• Minimize debris disturbance. • Dust suppression. • Work upwind of waste drilling operations. • Don APR and appropriate PPE if engineering and administrative measures are not effective at suppressing dust. • If necessary to handle, don chemical resistant coveralls and gloves. • If splashed with organic chemical, notify PSO and seek medical attention immediately.
Organic Gases	Borehole exploration & sampling	• Monitor the breathing zone around boreholes with CGI for methane, hydrogen sulfide, and carbon monoxide. • If the CGI detects between 4% and 15% of the LEL, the field staff will contact the PSO and continue with caution. • If the CGI detects between 16% and 20% of the LEL, work may continue with extreme caution, only under the direct supervision of

		the PSO. • If the CGI detects more than 20% of the LEL, all work operations must cease and employees must withdraw in an upwind direction.
Radioactive Wastes	Borehole exploration & sampling	• Minimize exposure time. Increase distance between workers and radioactive materials. Add shielding to block radioactivity. • Measure background radioactivity daily. • Monitor borehole cuttings using Ludlum with sodium iodide probe. • If borehole cuttings show radioactivity greater than 10 times background, the materials should be backfilled in the borehole immediately and cover with sufficient clean soil until radioactivity levels are consistent with background levels. • Document location of radioactive debris and radiation levels.

5.0 SITE AND WORK AREA PROCEDURES

5.1 Site and Work Area Security

Areas available for public access are not included in the site's work zones except when operations and activities, which may pose a potential hazard or risk, are being performed in or near these areas. In these instances, adequate barricading of the work area with traffic cones and flagging must be performed to warn the public of the associated hazards of these activities and to preclude their access. Areas requiring personal protective equipment should be clearly marked.

All personnel should be aware of unauthorized persons in their work areas, including persons without proper personal protective equipment or training. Visitors should be required to sign in at the main office building. Should any unauthorized personnel gain access to the work area within the barricaded zones, all work operations will cease until that person is removed from the area. A team member should be available to prevent any unauthorized entry into the work area, and all personnel should report concerns to the PSO or TSO immediately.

5.2 Work Zones

The work being conducted at the Coffin Butte old military landfill/burn dump involves drilling and sampling of solid waste and potential burn ash. The field team will establish an exclusion zone around the work area and a support zone, which will extend at least 50 feet upwind of the exclusion zone and should be clean and free of contaminated materials. The work zones will be defined for each borehole, or for each general area of field activity, as deemed appropriate by the TSO. Only those who comply with this health and safety plan may enter the work zones.

5.3 Buddy System

Each worker will have a co-worker with whom visual, radio, or cellular telephone contact will be maintained throughout the day. The co-worker may be an affiliate of another company, such as the drilling subcontractor. Field employees shall maintain visual contact to the extent possible. When work requires that field employees do not have visual contact, field employees shall develop a daily protocol for periodic check-ins by cellular telephone or physical meetings. The buddy system will ensure against an employee becoming affected by illness or injury without the awareness of this condition by a co-worker. It will also enable co-workers to observe the integrity of their personal protective equipment.

6.0 SAFETY AND PERSONNEL PROTECTION

6.1 Training

All employees assigned to the field project shall have the approved training required by OSHA for working with potentially hazardous waste. The training requirements are described in the Hazardous Waste Operations and Emergency Response Standard (HAZWOPER). General training is required for employees that are potentially exposed to hazardous substances, health hazards, or safety hazards, or are engaged in hazardous waste operations that could expose them to hazardous substances, health hazards, or safety hazards.

6.1.1 Personnel Training

A minimum of 40 hours of off-site classroom training and one day of supervised work activities will be required for all workers who enter the work zone.

The PSO and designated TSO's will be responsible for providing health and safety hazard awareness and personal protective equipment training specific to this site for all field personnel, prior to each day's commencement of work. This training shall include a brief overview of the health and safety plan and will specifically address the following:

- Basic operational safety, emphasizing the hazards expected on site
- Use of personal protective equipment
- Work practices by which the employee can minimize risks from potential hazards.
- Site controls, including areas of contamination to avoid, and access and egress from the site
- Use of controls (dust suppression) and equipment on site
- Medical surveillance, including the recognition of signs indicating overexposure to hazards, heat stress, and cold exposure
- Personnel and equipment decontamination facilities and procedures
- Prohibited site activities
- Emergency response

6.1.2 Visitor training

Work area visitors must remain outside of the work at all times. Site visitors will not be required to receive health and safety training; however, they will be escorted at all times by a VLI employee or a representative of GLA.

6.2 Levels of Protection

The levels of personal protection to be used by field personnel will conform to the levels defined by the EPA in the Standard Operating Safety Guides (November, 1992). Personal protective equipment shall be used by field personnel to reduce employee exposure hazards, and provide an additional measure of safety beyond that provided by engineering or other controls. Protective equipment selection is based on the results of preliminary site inspections, and historical data of contaminants known to exist at the site. The major hazard that personnel may be exposed to during the field work is inhalation of airborne contaminants in the form of dust emanating from contaminated soils generated by drilling work.

Work shall be conducted in modified EPA Level D PPE. Respirator use is anticipated only if observable dust is generated by drilling activities, indicating that airborne particulate concentrations may exceed nuisance dust PELs. When visible dust is generated, respirators will be donned, and all work will cease until adequate dust control has mitigated this occurrence.

6.3 Personal Protective Equipment

Personal protective equipment required for field personnel during the field investigation include:

- Hard hat
- High visibility vest
- Leather steel-toe and steel-shank work boots
- Safety glasses
- Hearing protection
- Gloves
- Tyvek® suit or other disposable chemical protective coveralls
- Air purifying respirator with HEPA cartridges

6.4 Air Monitoring

Air monitoring will be conducted by the TSO, and will consist of periodic monitoring of the breathing zone around boreholes using a Combustible Gas Indicator. Additionally, the TSO will set up perimeter dust monitors to record fugitive dust crossing site boundaries.

6.5 Radiation Monitoring

Background gamma radiation is typically measured between 20 and 50 microRoentgens per hour (μR/hr), though local construction materials and geological conditions may result in background radiation of 100 μR/hr or more. It is important to establish the background radioactivity of a site prior to conducting radiation surveys for potential anomalies.

Radiation monitoring will be conducted using a Ludlum meter with a sodium iodide probe capable of detecting gamma radiation. Monitoring will be performed throughout the day by the TSO. At the start of each day the TSO will measure and document background radiation by placing the Ludlum instrument probe on native soils and observing the readings for approximately five minutes. The TSO will document the background measurement in a field notebook. The TSO will periodically scan the borehole cuttings and the surface of the borehole to detect radiation anomalies. If an anomaly is identified with a radiation reading of greater than 10 times the background level, drilling will stop, the materials will be backfilled in the borehole and covered with clean soils. Backfilling shall be conducted as quickly as possible to minimize exposure time. Once backfilled, the TSO shall measure radiation over the filled borehole to ensure that radiation levels are consistent with background. Additional soils shall be added on the borehole backfill until background radiation levels are reached.

If radiation readings are greater than 500 times background or more than 2 milliRoentgens per hour (mR/hour), then operations must cease immediately, and GLA employees must leave the site immediately.

6.6 Medical Monitoring

Medical monitoring shall be provided to all site workers, and will include pre-project monitoring, annual monitoring, and post-employment monitoring to meet Federal, State and local code requirements.

In addition, if an employee is injured or develops illness during the course of this project, or who is exposed to concentrations of chemical above the PEL, that employee will receive additional medical monitoring as soon as possible following the exposure or emergency or following development of signs or symptoms. Additional medical monitoring may be required by the attending physician.

All costs for employee medical monitoring will be born by GLA.

6.7 Safe Work Practices and Personnel Protection Methods

Work activities associated with drilling and sampling may involve some potential physical and/or chemical risks to field personnel. Personal protective equipment will be required to safely perform the various work activities. Field personnel will be required to wear the personal protective equipment described in Section 6.3 at all times during the field investigation.

The following sections address the potential risks to be aware of, and the safe work practices to be followed, which will minimize the potential for personnel to be exposed to hazardous situations. The potential hazards will be mitigated by implementing the following safe work practices:

- Appropriate personal protective equipment will be worn at all times.
- Underground utility lines or other buried hazards will be clearly marked and known prior to beginning work.
- All heavy equipment will be in good working order, well-maintained, and equipped with back-up alarms.
- Adequate dust control will be maintained at all times.

6.7.1 Protection from Adverse Weather

Sudden inclement weather can encroach on unprepared field personnel. Field personnel shall carry appropriate clothing for changeable weather. In severe weather conditions (e.g., high wind or electrical storms) work will cease and field personnel will leave the area (as secured as is possible) and find shelter until the weather abates and it is safe to continue working.

6.7.2 Eye Protection

Field personnel will use eye protection when in the exclusion and contamination reduction zones. This consists of wearing safety glasses with side shields designed to protect the eyes from physical impact, liquid splashes, or solids. A field first aid kit and a portable eye wash kit shall be available. The TSO shall post in an accessible support vehicle containing a portable telephone, emergency telephone numbers and a map showing the route to the nearest emergency facility. In the event of an eye injury, the victim shall be examined by a physician as soon as possible after the appropriate first aid is administered.

6.7.3 Dermal Protection

Dermal exposure to chemical and physical agents may occur via direct or indirect contact with solids, liquids or vapors. Field personnel will use gloves when handling site materials and/or equipment that pose risk of direct exposure to chemical or physical agents. Examples of indirect contact include skin exposures to contaminated dusts or the transfer of contamination from other surfaces, such as tools or outer clothing, to the skin. Decontamination of surfaces will be employed to reduce the possibility or amount of dermal contact with contaminated materials.

6.7.4 Dust Control

Dust control activities in situations where wind picks up surface soil, or drilling generates dust, will consist of the use of water sprinkling devices within the exclusion

zones and/or contamination reduction zones, should field personnel be present during these periods. In addition, drilling will be conducted so as to minimize the generation of dust, by drilling at a reasonable rate, or misting the cuttings as they rise to the surface. If all measures do not eliminate dust in the work area, work will cease until conditions become more favorable.

6.7.5 Hearing Protection

Some field activities or site activities may expose field personnel to excessive noise levels. These activities consist primarily of temporary operations, such as excavating or nearby construction work. Routine site activities do not expose personnel to sound levels above the OSHA limits (equal to or exceeding an 8-hour time-weighted average sound level of 85 decibels).

Noise control measures will include source and path control, as well as receiver control. The main method of noise control will be the determination of exclusion zones outside of which noise levels are below allowable limits. Inside these zones, and during any other tasks which the TSO designates as having the potential for excessive noise levels, hearing protection will be required. Hearing protection will consist of ear muffs, mar inserts, or ear plugs, and will be provided by the consulting or contracted field personnel.

6.7.6 Protection from Heat or Cold Stress

Temperature extremes may cause health-related problems. Temperatures below 30ºF or a combination of rain and temperatures below 55ºF can promote hypothermia, requiring warm-up breaks to prevent fatigue and inattention. Temperatures above 70ºF require heat stress prevention because some protective clothing promotes heat stress.

Symptoms associated to heat stress include:

> Fatigue, irritability, anxiety, decreased concentration and dexterity, impaired movement, shallow breathing, pulse rate above 110 beats per minute and oral temperature above 99ºF. Heat related effects include rashes, cramps, exhaustion (accompanied by shallow breathing; pale, cool, moist skin; profuse sweating; dizziness; and lassitude), and stroke (accompanied by red, hot, dry skin; no perspiration; nausea; dizziness and confusion; strong, rapid pulse; and coma).

Drinking water and electrolyte drinks such as Gatorade will be provided for site workers by their companies, to be consumed only after decontamination and outside of the exclusion zones. All workers will be encouraged to take breaks, as needed, to prevent heat stress. Mandatory work/rest regimens may be implemented by the TSO, as necessary, in light of site conditions. Pulse measurements and the individual employee's subjective need for rest will supplement this schedule.

Symptoms associated to cold exposure include:

- Frost nip or incipient frostbite: characterized by sudden blanching or whitening of the skin
- Superficial frostbite: skin has a waxy or white appearance and is firm to the touch, but tissue beneath is resilient
- Deep frostbite: tissues are cold, pale, and solid; extremely serious injury

Systemic hypothermia is caused by exposure to freezing or rapidly dropping temperature. Its symptoms are usually exhibited in five stages: 1) shivering; 2) apathy, listlessness, sleepiness, and (sometimes) rapid cooling of the body to less than 95ºF; 3) unconsciousness, glassy stare, slow pulse, and slow respiratory rate; 4) freezing of the extremities, and finally, 5) death.

Mandatory work/rest regimens may be implemented by the TSO, as necessary, in light of site conditions. Pulse measurements and the individual employee's subjective need for warmth will supplement this schedule.

6.7.7 Safe Work Practice for Manual Lifting

Manual lifting and shoveling will be performed in conformance with the following manual lifting rules:

- Determine the size of the object(s) to be lifted.
- Request help if needed (use team work). Do not lift objects over 50 pounds in weight without assistance.
- Place feet close to the object to be lifted, 10-12 inches apart for good balance.
- Bend knees to the degree that is comfortable, and secure a good hand hold. Using both legs and the back muscles, lift the load straight up in a smooth even motion. Push with the legs, keeping the load close to the body.
- Lift the object(s) into carrying position, making no turning or twisting motions until the lift is completed.
- Turn the body with changes of foot position after looking aver the path of travel making sure that it is clear.

6.7.8 General Safe Work Practices

The following procedures shall be followed at all times:

- Eating, drinking, chewing gum or tobacco, smoking or any practice that increases the probability of hand to mouth transfer and ingestion of material is prohibited in any area where the possibility of contamination of any kind exists
- Hands must be thoroughly washed upon leaving a contaminated or suspected contaminated area before eating or drinking
- Thorough washing of the entire body should be accomplished whenever decontamination procedures for outer garments are in effect; the washing should occur as soon as possible after the final wearing of protective garments each day
- Legible and precautionary labels shall be prominently affixed to containers of raw materials, intermediates, products, mixtures, scrap, waste, debris, and contaminated clothing
- Contaminated protective equipment shall not be removed from the regulated area until it has been cleaned or properly packaged and labeled
- Removal of materials from protective clothing or equipment by blowing, shaking, or any other means which may disperse materials into the air is prohibited
- As appropriate, equipment on-site shall be bonded and grounded, spark-proof, and explosion resistant
- Personnel on site should be cautioned to inform each other of subjective symptoms of chemical exposure such as headache, dizziness, nausea and irritation of the respiratory tract, eyes or skin
- Work areas for support, contamination reduction, and exclusion will be established as appropriate for the specific field activities and as allowed by site conditions.
- Any skin contact with contaminated or potentially contaminated surface and/or materials shall be avoided
- Personal protective equipment shall be worn on site at all times, unless specifically approved by the TSO or PSO
- Ambient temperature and humidity may be monitored at the discretion of the PSO or TSO, and necessary engineering and procedural controls to reduce temperature-related stress will be implemented if needed

6.8 Decontamination Procedures

Equipment used for drilling in contaminated areas will be brushed off prior to moving to the next location, and after the final borehole is completed. Any contaminated material generated during the drilling will be deposited in drums that will left on-site for disposal by VLI after completion of the exploration.

Personnel will remove and discard any contaminated PPE or sampling equipment (rubber gloves, sampling trowels, Tyvek suits, etc.) in a plastic trash bag prior to entering non-contaminated areas. Employees must wash their hands with water and soap prior to leaving the site and prior to ingesting food and water during lunch periods.

If radioactive materials are encountered during the course of the investigation, after PPE is removed, workers will be scanned with the Ludlum instrument to ensure that radioactive particles have not adhered to clothing.

7.0 PROJECT EMERGENCY RESPONSE PLAN

The PSO will address those emergency procedures that might be necessary during the course of activities undertaken in the field investigation, and the TSO will implement said procedures through daily discussions. Such procedures will address the following emergencies:

- First aid and medical treatment
- Fire
- Emergency communications
- Site evacuation procedures and routes

7.1 Emergency Equipment Needs

The following equipment must be available at each borehole location:

- Portable emergency eyewash with potable water
- ABC-rated fire extinguisher
- One standard first aid kit and first aid instruction manual

7.2 General First Aid Procedures

Medical problems that may occur during the field investigation will need to be handled competently and quickly. All field personnel shall be aware of the instructions and information given below and must also know the location and contents of the first aid kit available to them.

- Become familiar with the emergency telephone numbers and routes to the nearest emergency medical care facilities provided in Appendix A of this health and safety plan
- Seek immediate first aid and/or CPR attention for personnel who are not breathing, who are bleeding severely, experiencing intense pain, are in shock or unconscious. Also seek immediate professional medical attention for these symptoms. Each member of the field personnel team must know how to call for an ambulance and supply directions to the site of illness or injury
- If a person experiences ocular discomfort from chemicals, or dust in the eyes, flush them with water for 15 minutes. Any exception to these instructions for specific chemical exposures will be supplied in advance by the PSO
- Do not attempt to remove an object which becomes stuck in the eye. Always seek immediate professional medical attention for eye injuries

- All burns (chemical or thermal) will be treated by running cold potable water over the affected area, followed by medical review
- Report all injuries to the TSO and PSO

7.3 Fire Response Procedures

Fires at the work site can be started by natural occurrence, or by unsafe work practices. A 10 pound multipurpose ABC-rated fire extinguisher will be available at all times. The procedure for using a fire extinguisher is to pull the safety pin, point the extinguisher at the base of the flames and discharge the extinguisher by sweeping the flames from a distance of about six feet. The extinguisher operator should move in as the flames are being put out.

- Never use water on an electrical fire or a solvent fire. All extinguishers should be of the dry chemical variety and labeled "Class A, B, C"
- Keep engine fuels and all other flammable or explosive materials well away from any sources of ignitions, including sparks

The TSO will notify the fire department immediately of the location of any fires which occur (even if extinguished) in order to minimize the fire risk to the surrounding neighborhoods. If a large fire should develop, all personnel will leave the area or site immediately and move to a secure position upwind of the fire, as designated by the TSO.

7.4 Emergency Communications

All emergencies will be immediately communicated to the PSO. At least one portable telephone will be available for emergency use at all times during this project. Important emergency telephone numbers are listed in Appendix A of this Site Health and Safety Plan.

7.5 Munitions/Unexploded Ordnance (UXO)

All suspect munitions or UXO encountered on the jobsite shall be treated as extremely dangerous. Identification guidelines are included in Appendix B. If encountered, follow the 3R's: **RECOGNIZE, RETREAT, REPORT** and take the following actions:

- **RECOGNIZE**: Do not touch, disturb or move the item (munitions can become very unstable over time). They can detonate with movement or sometimes due to ground vibration. Munitions come in all shapes, sizes, and color but exposure to weather and time can alter or remove these markings.
- **RETREAT:** Mark the general location of the UXO hazard with tape, colored cloth, or colored ribbon. If available, attach the marker to a branch, structure or other existing object so that it is about 3ft (0.9m) off the ground and visible from all approaches. Place the marker no closer than the point where you first recognized the UXO hazard and do not drive stakes into the ground or otherwise disturb the surface.

- Leave by the same route you entered the area if possible. Clear site of all workers and secure from unauthorized entry.
- Do not transmit on any radio frequencies. Do not talk on a cell phone near suspected UXO. Signals transmitted from items such as cell phones, short-wave radios, single side-band radios or other communications and navigation devices may detonate UXO.
- Note the location where suspect munitions is found, the direction, any landmarks or other features that would aid others in locating the munitions.
- **REPORT:** Once area has been evacuated, notification shall be made immediately. Provide as much information as possible, including location, approximate size, shape, color, and any other distinguishing features such as nomenclature or writing, fins, etc.
    - **Anytime suspected UXO is encountered, immediately call the local emergency response authority (e.g., local police, or 911).**

7.6 Explosion Response Procedures

An explosion requires the immediate termination of work activities and evacuation from the area or site. The cause of the explosion shall be determined, and prevented from reoccurring, before activities will be permitted to resume. The PSO will be informed immediately if an explosion occurs.

7.7 Suspension of Operations

Operations may be suspended for several reasons. The following criteria will be used to determine under which conditions operations must be ceased:

- A fire at, or within 100 yards of the work site
- An explosion on site
- UXO materials are discovered in the work area
- Radioactive materials are found with gamma radiation greater than 2mR/hr
- High winds or an electrical storm in the vicinity
- A major earthquake
- A severe illness or injury to personnel at the work site
- Reduction of project personnel for any reason to an unsafe number for drilling and sampling activities
- Temporary inability to notify the PSO or TSO of unsafe working conditions

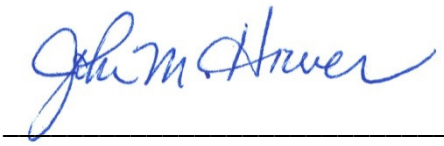
All other criteria under which operations must cease, which are related to site-specific emergencies or conditions, will be discussed by the TSO in project safety meetings.

8.0 CLOSURE

GLA cannot guarantee the health or safety of any person entering this site. Due to the potentially hazardous nature of this site, and the activities occurring thereon, it is not possible to discover, evaluate, and provide protection for all possible hazards which may be encountered. Strict adherence to the health and safety guidelines set forth herein will reduce, but not eliminate, the potential for injury at this site. The health and safety guidelines in this plan were prepared specifically for this site and project, and should not be used on any other site without prior research and evaluation by trained health and safety specialists.

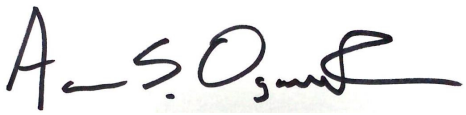
9.0 APPROVALS

The undersigned personnel certify that this health and safety plan will be utilized for the protection of the health and safety of workers during the field investigation of the Coffin Butte old military landfill/burn dump.



_____ 6/12/2017

John Hower, PG, CEG — Date
Project Safety Officer



_____ 6/12/2017

Aaron Ogorzalek, PE — Date
Project Manager

The undersigned personnel have reviewed and approved this health and safety plan on behalf of VLI.

_____ _____

Ian Macnab — Date
Environmental Manager

The undersigned field personnel have read and been briefed about the contents of this health and safety plan, and intend to comply with its provisions:

Signature	Name	Date
_____	_____	_____
_____	_____	_____
_____	_____	_____
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GRAPHIC SCALE

300' 0' 150' 300' 600' 1,200'

LEGEND

- LIMITS OF BURN DUMP
- PROPERTY LIMIT
- FUTURE LANDFILL FOOTPRINT

NOTES:

1. EXISTING TOPOGRAPHY BASED ON AERIAL SURVEY BY COOPER AERIAL SURVEYS CO. ON MARCH 4, 2015.

REV. NO.	DATE	DESCRIPTION	DRAWN BY	DESIGNED BY	CHECKED BY	APPROVED BY
A	02/24/16	ISSUED FOR REVIEW	BGA	–	JVR	AO

DATE OF ISSUE: 02/24/2016
DESIGNED BY: –
DRAWN BY: BGA
CHECKED BY: AO
APPROVED BY: AO

Geo-Logic ASSOCIATES
143E Spring Hill Dr, Grass Valley, California 95945
geo-logic.com | 530.272.2448

VALLEY LANDFILLS, INC.

COFFIN BUTTE LANDFILL
PROPOSAL FOR BURN DUMP CHARACTERIZATION STUDY
BENTON COUNTY, OREGON

APPROXIMATE BURN DUMP LIMITS

FIGURE NO. 1

This drawing has not been published but rather has been prepared by Geo-Logic Associates, Inc. for use by the client named in the title block, solely in respect of the construction operation, and maintenance of the facility named in the title block. Geo-Logic Associates, Inc. shall not be liable for the use of this drawing on any other facility or for any other purpose.

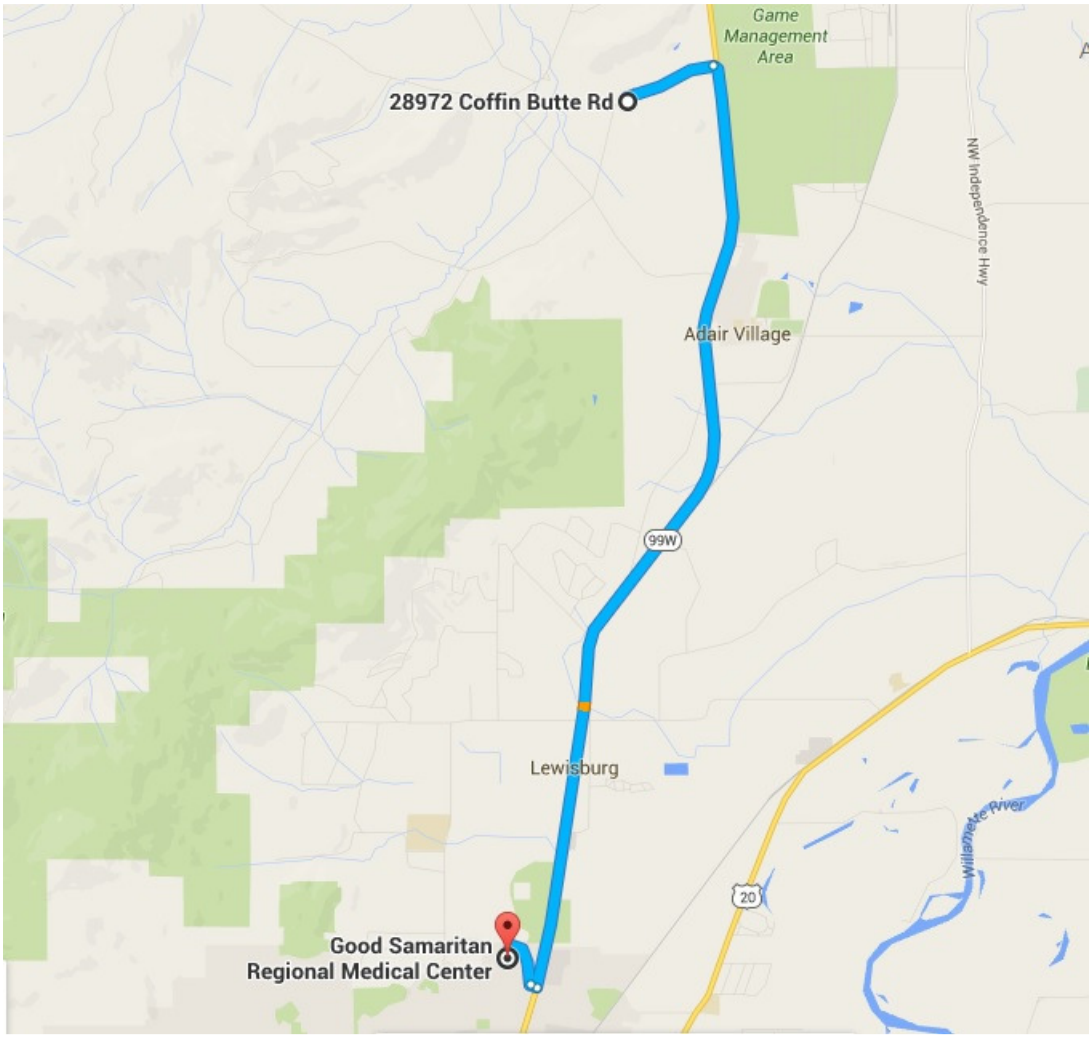
ISSUED FOR REVIEW

LOCATION: M:\Projects\Landfills\Coffin Butte\Burn Dump\SITE PLAN.dgn DATE: 2/24/2016 3:08 PM PLOT SCALE = 1.0' PLOTTED BY: MATT ANDERSON

Appendix A
Emergency Contact Numbers and Locations

Hospital
Good Samaritan Regional Medical Center
Address: 3600 NW Samaritan Dr
Corvallis, OR 97330
Telephone: (541) 768-5111 – or – 911

From the work area:
Head east on Coffin Butte Rd (0.7 mi)
Turn right onto OR-99W/Pacific Hwy W (7.3 mi)
Turn right onto NW Elks Dr (275 ft)
Turn right onto NW Samaritan Dr (0.5 mi)



Fire Departments
Corvallis Fire Department
Telephone: (541) 766-6900

Adair RFPD Station 1401
Telephone: (541) 745-7212

Munitions/Unexploded Ordnance (UXO)
Call 911, or
US Army Technical Center for Explosives Safety
Telephone: (918) 420-8919

Appendix B
Department of Defense Explosives Safety Guide (Construction Industry)

3Rs Explosives Safety Guide

Construction Industry

Recognize
Retreat
Report

THE UNITED STATES HAS ALWAYS MAINTAINED A HIGHLY TRAINED AND READY FORCE TO PROTECT ITS NATIONAL INTERESTS.

After both world wars and recently with force realignment and modernization efforts, the Department of Defense (DoD) closed a number of military installations and training areas, and returned other lands previously used for military-related activities to public use. Because of the live-fire training and testing required to maintain this force, millions of acres in the United States are known or suspected to contain military munitions in the form of unexploded ordnance (UXO), or discarded military munitions (DMM). In some cases, munitions constituents (e.g., TNT) may also exist in high enough concentrations to present an explosive (detonation) hazard. Although DoD routinely made an effort to remove any explosive hazards present before releasing land from its control, some may remain. These explosive hazards may be found on the surface or in the subsurface.

Munitions are designed to injure, maim or kill people, or to destroy equipment or structures. Consider any encounter with a known or suspected munition as an extremely dangerous situation.

During construction work (e.g. clearing vegetation, grubbing, grading, or excavation), munitions may be encountered. This is particularly true for areas known to have once been used by the military for munitions-related activities (e.g., live-fire training and testing, and munitions demilitarization).

Military munitions operating buildings (e.g., munitions production and demilitarization facilities) and any installed equipment may contain explosives residue in high enough concetrations to present an explosive hazard. Building features (e.g., floors, walls, drains, internal and external piping, and ventilation systems), in which explosives residues could accumulate and present an explosive hazard, are of particular concern. Industrial equipment, particularly equipment with internal cavities, from facilities used in munitions production or demilitarization operations (e.g., cast loading, milling, or steam-out) that generated explosive residues (e.g., dust or vapors) is also of concern.

WILL YOU KNOW WHAT TO DO IF YOU ENCOUNTER A MUNITION?

Areas at which DoD conducted munitions-related activities include, but are not limited to operational and former ranges, and areas used for munitions demilitarization. The types of explosive hazards present may differ between areas. As an example, a former impact area may contain UXO, while a former maneuver area may only contain DMM.

Munitions can also be found in areas where combat operations once occurred. Even cannon balls found on Civil War battlefields present a potential explosive hazard. However, for a variety of reasons (unauthorized disposals, discarded souvenirs) munitions may be encountered almost anywhere.

Prior to working in areas with a history of military use, even areas where DoD has completed an environmental response to remove any hazards detected, it is important to familiarize yourself with the site history and potential hazards. This can be provided through site-specific safety training. In some cases, safety officials may determine that on-site or on-call construction support by UXO-qualified personnel is necessary to help ensure the safety of construction workers, particularly during ground disturbing or intrusive activities.

MUNITIONS ARE DESIGNED TO BE DANGEROUS

Remember that munitions:

- Come in many shapes and sizes.
  - They could look like a:
    - Pointed pipe
    - Soda can
    - Baseball
    - Car muffler
  - They may:
    - Look new or old
    - Be found alone or in clusters
- Should be considered extremely dangerous regardless of size or age
- Munitions often become more dangerous with age, not safer

Munitions may be:

- Found almost anywhere
- Clearly visible on the surface
- Buried at depths of inches to many feet
- Partially or completely hidden by dirt or vegetation
- Found under paved areas (roads, parking lots) or building slabs
- Underwater, in lakes, streams, or the ocean
- Exposed by natural phenomena (e.g., tides)
- Easy or difficult to recognize

While munitions are most likely to be encountered during construction in areas where DoD conducted munitions-related activities, they may be encountered anywhere. To protect yourself and your co-workers, know whether munitions-related activities ever occurred at your work site, and learn to follow the 3Rs: Recognize, Retreat, Report.

ORecognize
ORetreat
OReport

Recognize

Recognizing that you may have encountered a munition is one of the most important steps in reducing the potential risk of injury or death. Because munitions pose a potential explosive hazard, they should never be touched, moved or disturbed (handled).

WILL YOU DO THE RIGHT THING WHEN THE TIME COMES?

In 1993, a construction worker digging a trench unearthed what looked like large bullets. He recognized the potential danger, stopped digging and notified his supervisor. Local authorities were called. As a result of this worker's actions, nearly 150 high explosive tank shells were recovered from a former WWI training area.

Remember, whether complete or in pieces, any munition or suspect munition encountered should be considered extremely dangerous. Do the right thing! immediately stop all operations in the area; do not touch, move or disturb it, and notify your supervisor or local authorities.

Retreat

If you encounter or suspect you may have encountered a munition, do not touch, move or disturb it. Instead, carefully retreat from the area by retracing your steps.

- Immediately stop all construction activities in the area, warning others of the potential danger.
- Do not approach the munition or a suspect munition. (Some fuzes are sensitive to changes in temperature, movement or pressure.)
- Move away from the area and keep others away from it!

Unfortunately, munitions are often popular, but potentially deadly souvenirs. Taking a munition for a keepsake presents an immediate and real danger to you. Bringing one home endangers your family, your friends, and your community. Don't be tempted.

Report

If you encounter or suspect you have encountered a munition, do not touch, move or disturb it. Instead, immediately stop construction activities and move away from the area and report what you saw.

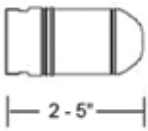
Protect yourself, your co-workers, and the public by immediately reporting any munitions or suspect munitions encountered to your foreman, site supervisor, or by calling 911.

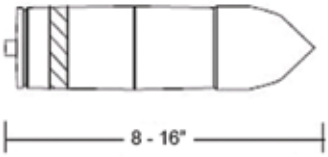
Provide as much information as possible about what you saw and where you saw it. This will help the police and explosive ordnance disposal personnel (usually referred to as EOD personnel) find, evaluate and address the situation.

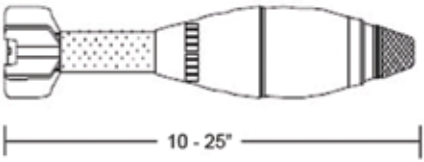
If you believe you may have encountered a munition, report the following:

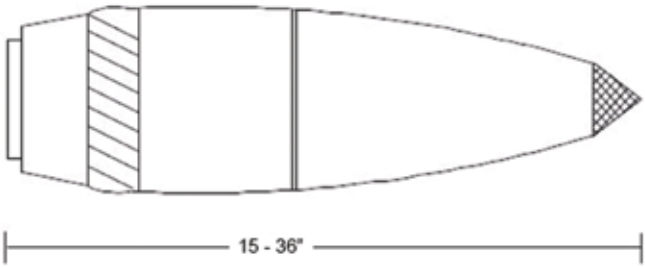
- The area where you encountered it.
- A general description of the munition, to include:
  - Its size
  - Its shape
  - Any readily visible markings--do not approach or handle the munition to see the markings

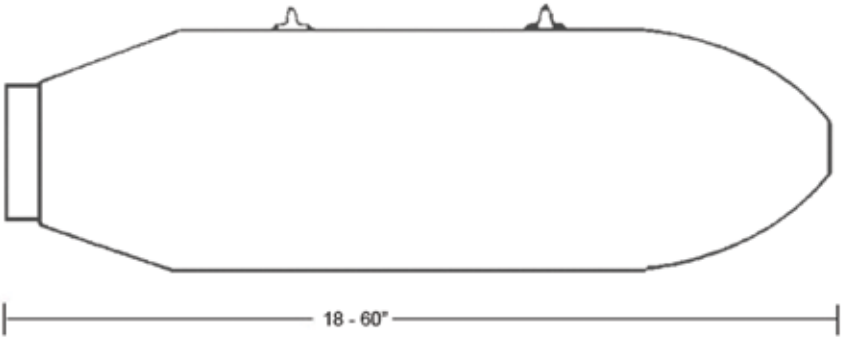
MUNITIONS COMMON SIZE AND SHAPE PROFILES











Don't Forget

- Munitions are dangerous and may not be easily recognizable!
- The history of your work site--know when you are working on a former military range or disposal area!
- Never touch, move or disturb a munition!

Follow the 3Rs

Recognize

When you may have encountered a munition.

Retreat

Do not touch, move or disturb it, but carefully leave the area.

Report

Immediately notify the police if on land,
or the U.S. Coast Guard if at sea.

Emergency contacts:

- On land: Call 911
- At sea: Use Channel 16 (156.800 MHz)

For additional information call
U.S. Army Technical Center for Explosives Safety
at (918) 420-8919
or see

the US Army's UXO Safety Education website
https://www.denix.osd.mil/uxosafety

FEBRUARY 2010