

**REMEDIAL ACTION PLAN
FORMER BEAVER MOUNTAIN GUN RANGE
BEAVER COUNTY, UTAH
VOLUNTARY CLEANUP PROGRAM SITE C118**

Project No. 2649-001

Prepared for:

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1. INTRODUCTION

On behalf of the Utah State Institutional Trust Lands Administration (SITLA), the owner of the former Beaver Mountain Boy Scouts of America (BSA) Gun Range (Site) and the Applicant, Wasatch Environmental, Inc. (Wasatch), has prepared this Remedial Action Plan (RAP) for addressing gun range related metals and polycyclic aromatic hydrocarbon (PAH) impacts to soil that have been identified at the Site. This RAP is intended to be used in conjunction with the Quality Assurance Project Plan (QAPP), the Sampling and Analysis Plan (SAP), and individual work plans prepared for the Site.

The Applicant plans to sell the Site, potentially as residential lots, and wishes to remediate the Site to allow safe residential development. For the purposes of this RAP, the term "Site" is used to denote the approximately 2-acre former BSA gun range as shown on attached Figure 2.

1.1 Site Description

The former Beaver Mountain Gun Range (the Site) is an approximately 2-acre target and trap shooting area in forested mountain land in eastern Beaver County, Utah. The gun range is no longer used, but was part of a former Boy Scouts of America camp.



Figure 1: 2020 Aerial Photograph Showing the Site Location

The Beaver Mountain gun range includes an approximately one-half acre area in a forest clearing with a shelter at the north end (at the firing line) and with stationary targets to the east and south. Trap shooting occurred all around the gun range clearing and clay pigeon debris and shotgun casings are present throughout the Site, except near the entrance driveway. The shooting area, as well as the wooded area which surrounds it, is littered with gun related detritus such as clay pigeons, empty shot gun shells and bullet casings, pellets, and slugs. Trees and timber within this area also contain pellets and slugs. The total area impacted by the gun range is estimated to be two acres.

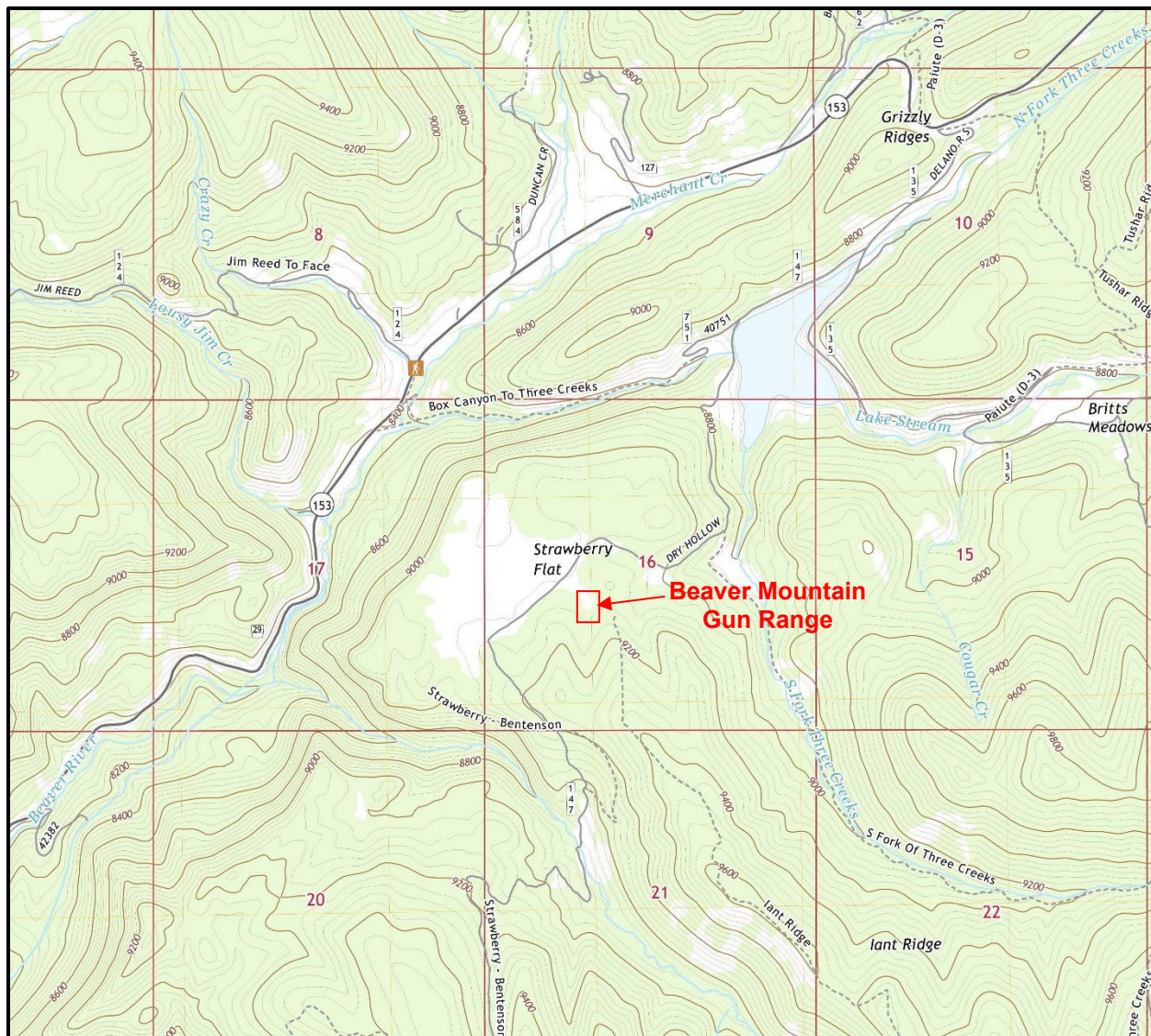


Figure 2: Site location map (from 2020 USGS 7.5-minute Shelly Baldy Peak, Utah topographic map)

1.2 Project Background

A 2021 Site survey (Barr Engineering 2021) and 2022 Site characterization (Wasatch Environmental, 2022) found elevated concentrations of lead, antimony, and polycyclic aromatic hydrocarbons (PAHs) in surface soils and timber on the gun range. The 2021 and 2022 investigations are summarized below.

2021 Site Survey

A 2021 X-Ray Fluorescence Analysis (XRF) survey of the gun range with soil sampling and laboratory analyses concluded:

- The area impacted by the old BSA Gun Range is approximately two acres and stretches from the gun range shelter and clearing into the surrounding wooded area. Gun and target shooting detritus can be found throughout the area including slugs and pellets, metal bullet casings, plastic and metal shotgun shell casings, and clay pigeon fragments.

- Based on the XRF survey of the gun range and surrounding area, an approximately 54,000 square foot area (1.2 acres) around the gun range contains surface soil with lead concentrations which exceed the U.S. Environmental Protection Agency (EPA) Regional Screening Level (RSL) for residential soil. An approximately 21,000 square foot area (0.5 acres) contains surface soil with lead concentrations that exceed the screening level for industrial soil.
- Depth of lead contamination appears to be less than three inches. Three inches of surface soil over the area exceeding industrial RSLs (18,000 ft²) amounts to approximately 167 cubic yards (in place); three inches of soil over the area exceeding residential RSLs (54,000 ft²) amounts to approximately 500 cubic yards.
- Toxicity Characteristic Leaching Procedure (TCLP) lead analysis was conducted on five soil samples that exceeded residential screening levels for total lead. TCLP results for each sample exceeded the threshold for characteristic hazardous waste, indicating that soils at the Site with total lead concentrations above the residential RSL are likely characteristic hazardous waste.
- In addition to the surface soil, live trees and timber within the area where soils exceed RSLs should be also be considered lead contaminated as they are embedded with pellets and slugs. As the tree dies and decays this material will also become part of the surface soil so that lead soil concentrations in the woods surrounding the Site should continue to increase until all effected trees are disintegrated. A plan to manage lead-impacted trees should be developed before removal of these trees.

On February 8, 2022, SITLA applied for acceptance into the Voluntary Cleanup Program (VCP). The Site was accepted into the VCP on March 31, 2022. The VCP Program required further Site characterization, which was completed in 2022.

2022 Site Characterization

Site characterization sampling efforts in 2022 included surface water sampling, a limited XRF survey, and soil sampling. Surface water is only present on the Site during spring snowmelt runoff or during storm events. Surface water was present during a Site visit on May 10, 2022, in a small snowmelt runoff stream in the drainage channel which crosses the Site from south to north. Two samples (Runoff Sample 1 and Runoff Sample 2) were collected from the same place in the stream, approximately ten minutes apart. Both samples were analyzed for antimony, copper, iron, lead, tin, and zinc using EPA Methods 6020A and 6010B/C/D. Runoff Sample 1 was also analyzed PAHs using EPA Method SW-8270E. Sample results, as shown in attached Table 3, indicated:

- Copper, iron, lead, and tin were detected in the surface water samples. Of these, only copper and lead have listed U.S. EPA Maximum Contaminant Levels (MCLs: 1.300 milligram per liter {mg/L} copper and 0.015 mg/L lead). The detected concentrations of copper (0.0023 and 0.0022 mg/L) and lead (0.0065 and 0.0060 mg/L) were well below the applicable U.S. EPA MCLs.
- No PAHs were detected in the Runoff Sample #1. Note that the laboratory detection limit for benzo(a)pyrene (0.0003 mg/L) slightly exceeded the MCL (0.0002 mg/L).

Soil sampling and a limited XRF survey were conducted on the Site on October 6, 2022, to delineate the extent of lead contamination detected during the 2021 Site investigation as well as to investigate and delineate other possible contaminants associated with gun ranges (zinc, copper, tin, antimony, iron, and PAHs). The investigation included an XRF survey at the south end of the former gun range in the area of July 2021 sample #61, where high lead concentrations were detected during an XRF survey. The

investigation also included collecting ten soil samples from eight locations and analyzing the samples for antimony, copper, iron, tin, zinc, lead, and PAHs. Two samples were collected from each of locations #74 and #77: one from the ground surface (0 to 2 inches depth) and one from three to five inches depth. Ground surface samples (0 to 2 inches depth) were collected from the remaining six locations. Survey and sampling results indicated:

- Wasatch has determined that the area around the 2021 survey location #61 (2022 locations #80, #80 12' E, #80 12' N, #80 12' W, and #80 12' S) has not been impacted at concentrations which require remediation. The high XRF reading from 2021 was not representative of this area, which is several hundred feet south of the main shooting area.
- An elevated XRF antimony reading at location #75, located just south of the range structure, indicates that the area south of the structure, where shooting occurred, should be added to the remediation area.
- PAHs were detected at the Site at concentrations which require remedial efforts. The PAHs seem to be associated with clay pigeon targets. The areas where the clay pigeon fragments are prevalent are within the areas which are already targeted for remediation and so the area of remediation need not be extended due to the presence of PAHs.
- Samples collected from 3 inches depth across the Site indicate that the impacts at the Site which require remediation are contained within the upper 3 inches of soil.

The Site Characterization Report was submitted to VCP on February 28, 2023, and was accepted by the VCP on March 7, 2023.

1.3 Conceptual Site Model

The Site is located high (approximately 9,100 feet above mean sea level) in the Tushar Mountain Range east of Beaver, Utah. The Site was formerly a gun range that was part of a larger BSA camp. The gun range included a central clearing surrounded by forest. During the autumn of 2022, timber was felled in the forested area surrounding the central clearing and the timber was burned, leaving an approximately 2-acre clearing where the gun range once operated. Surface soils at the Site are mafic gravels derived from lava flows (UGS 2005). Surface water is usually not present on and around the Site except for snow pack in winter, snow melt runoff in spring, and runoff during storm events in the spring through autumn. A small drainage channel, which collects runoff and directs it towards the south, crosses the gun range Site (see Figure 3). Depth to groundwater beneath the Site is not known but based on the Site elevation and topography it is expected to be very deep and not likely impacted by the former gun range. Contaminants identified on Site include metals and PAHs associated with gun ammunition and clay pigeons. The depth of soil impacts from the ammunition and clay pigeons was determined to be less than 3 inches during Site characterization investigations. Figures 1 and 2 illustrate and summarize the aerial extent of contamination on Site.

Wasatch expects that if Site Contaminants of Concern (COCs) can be decreased to concentrations below residential RSLs with a Carcinogenic Target Risk of 1E-06 and Noncancer Child Hazard Index of 1, that the risk to human health and the environment due to the metal and PAH contamination related to the former gun range would be in the acceptable range for unrestricted residential development of the property.

1.4 Objectives

The objective is to remediate impacted areas of the gun range area to residential screening levels, so that future residential development is possible. Because of the remoteness of the Site, the objective is to remediate the impacts *in-situ*, as much as possible.

2. REMEDIAL ACTION SELECTION

Based on the Site characterization, the Site's remote location, and proposed residential development, a remedial action consisting of sifting and removal of lead particles from Site soils and removal and disposal of surface soils containing target debris containing PAHs (clay pigeons) and metals could restore the land to residential usage requirements under Utah Voluntary Cleanup Program (VCP) oversight. In-situ mixing of contaminated soils with the stabilization additive Free Flow 200® will be used as a contingency to treat soils which do not meet the lead target cleanup level using physical soil processing. The use of Free Flow 200® would mitigate the leachability of lead in soils and possibly allow the soils to be disposed, or otherwise handled, as non-hazardous waste.

2.1 Contaminants of Concern (COCs)

COCs include the metals antimony, copper, iron, lead, tin, and zinc, and the PAH compounds benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, and pyrene. Due to their prevalence and low screening levels, lead and benzo(a)pyrene are the contaminants of most concern. Lead concentrations, in particular, which will be used to field guide remediation efforts, through the use of a handheld XRF analyzer. Though there is no handheld field instrument, such as an XRF analyzer, that can be used to detect PAHs, the presence of clay pigeon particles will be used for field guidance for PAH impacts, which are more localized than metal impacts on the Site.

2.2 Proposed Cleanup Levels

The project target cleanup levels are based on EPA RSLs for residential soils. Note that the PAHs listed below are those that exceeded 10% of the residential RSLs in Site characterization sampling. Any additional compounds identified in confirmation sampling will be compared their respective RSLs. The project target screening levels are:

Metals, U.S. EPA Method SW6020

*Antimony (Sb) = 3.1 milligrams per kilogram (mg/kg)

Copper (Cu) = 310 mg/kg

**Iron (Fe) = 5,500 mg/kg

Lead (Pb) = 400 mg/kg

Tin (Sn) = 4,700 mg/kg

Zinc (Zn) = 2,300 mg/kg

PAHs, U.S. EPA Method SW8270

Benzo(a)anthracene (BaA) = 1.1 mg/kg

Benzo(a)pyrene (BaP) = 0.57 mg/kg

Benzo(b)fluoranthene (BbF) = 1.1 mg/kg

Benzo(k)fluoranthene (BkF) = 11 mg/kg

Chrysene = 110 mg/kg

Dibenz(a,h)anthracene = 0.11 mg/kg

Fluoranthene = 240 mg/kg

Indeno(1,2,3-cd)pyrene = 1.1 mg/kg

Pyrene = 180 mg/kg

**Note 1: The laboratory reporting limit was above the project target cleanup level in all but one sample collected during Site characterization activities. Laboratory reporting limits below the cleanup level may not be attainable. Antimony was detected above laboratory reporting limits in only one sample collected during Site characterization activities.*

***Note 2: Iron was detected above the cleanup level in seemingly unimpacted samples collected during Site characterization, likely due to naturally occurring iron rich soils, and this cleanup level is probably not attainable.*

2.3 Proposed Remedial Action Measures

Based on the Site characterization, a remedial action consisting of sifting and removal of lead particles from Site soils has been identified as a remedial action which could restore the land to residential usage requirements under VCP oversight. In-situ mixing of contaminated soils with the stabilization additive Free Flow 200® would be used to treat soils that do not meet project cleanup levels for lead, if they occur. Details regarding these remedial action measures are provided in Section 3 of this RAP.

2.4 Proposed Engineering and Institutional Controls

It is expected that the chosen remediation methods will be able to mitigate risks of exposure to Site COCs without engineering and institutional controls. If portions of the Site cannot be remediated to target cleanup levels, the areas which do meet the cleanup levels will be carefully delineated and surrounded by silt fence to prevent downslope migration of the impacted soils until more permanent engineering and institutional controls can be determined and implemented. Because all surface soils will be moved to be processed by the mobile plant and processed soils will left in piles by the soil processing plant, it is possible to place soils which have not been mitigated to below target cleanup levels to a convenient area within the Site. Contaminated soils that are left in this manner (if any) will not be left within 20 feet of the drainage channel which crosses the Site.

2.4.1 Environmental Covenant (EC) and Site Management Plan (SMP)

If the planned remedial activities are not able to mitigate Site COCs to residential cleanup levels and impacted soils are left on Site in a repository area, an EC and SMP would be required for the site. The EC would describe land use restrictions to mitigate environmental risks and the SMP would detail how the restrictions are to be managed. VCP guidance and templates would be used to develop the EC and SMP.

3. REMEDIAL ACTION DESIGN AND CONSTRUCTION

The project area includes the gun range and surrounding impacted area as is shown on attached Figure 2. The areas of highest contaminant concentrations and the burn pile area are shown within the larger impacted area. The area shown on the figure is more generalized and slightly larger than the impacted areas shown in the Site characterization figure (attached Figure 1) because the surface has been disturbed by tree removal and burning efforts. The areas where soil will be processed will be determined by XRF field measurements as confirmed by laboratory analyses. Wasatch does not expect that the entire area demarked in Figure 2 as potentially containing lead greater than 400 mg/kg will be processed, but that the soils that will be processed will be from within the area. All planned remedial actions will occur within the impacted area depicted on the figure.

Soil processing will be divided into three areas: 1) the .22 range backstop area where the highest contaminant concentrations have been identified, 2) the timber burn area, and 3) the remaining areas where contamination concentrations are expected to be lowest. Soil processing will begin in area 3 at the north portion of the site and then move to area 2 (the burn area), before finishing in area 1 at the south end of the site, where contaminant concentrations are highest. Processed soil from each area will be kept separate to avoid the potential for cross contamination from higher contaminant areas (areas 1 and 2) to lower contaminant areas (area 3).

Processed soil will be placed in piles of approximately 25 cubic yards along the processing area. Piled processed soil will be analyzed to determine contaminant concentrations and when the soil is determined to have concentrations below the cleanup levels it will be replaced to the Site surface, generally in the area where it was collected for processing. Soil that does not meet the Site target cleanup level will be reprocessed and then re-tested. Soil that does not meet target screening levels after reprocessing will be treated with Free Flow 200® and re-tested to determine whether the treated soil meets cleanup levels so that it can be replaced on Site or doesn't meet target cleanup levels and would be disposed at a proper facility or repository area. Wasatch expects that the Free Flow 200® treatment would allow the soil to be disposed as non-hazardous waste if disposal is necessary. If contaminated materials are transported off Site, trucks will be covered with tarp to prevent the spread of contaminated materials during shipping.

Site Security

The project area is in a remote forested mountain area that was formerly a boy scout camp. Access to the Site is via an unpaved driveway from gravel and unpaved forest roads. There is no regular traffic to the Site and little on the road that provides access to the Site driveway. The driveway to the Site will be barricaded to prevent visitors from approaching the contaminated area. Signage will put in place to warn visitors not to use the driveway or approach the contaminated area.

Utility Clearances

Subsurface utility lines are not expected in the project area. However, prior to soil tilling the Blue Stakes of Utah Utility Notification Center will be contacted and subsurface utilities identified and marked in the vicinity of each proposed sampling location. If deemed necessary, a private utility contractor will be contracted to supplement Blue Stakes clearances. Proposed sampling locations may be adjusted, as needed, to clear subsurface obstructions.

3.1 Removal and Disposal of PAH Contaminated Soils

Prior to processing of soil for lead impacts, areas that have been identified as containing PAH impacts above residential screening levels (areas with significant clay pigeon debris) will be scraped into a pile or piles, sifted for lead, treated with Free Flow 200®, and disposed offsite at an appropriate disposal facility, likely as non-hazardous waste. The PAH impacted areas are shown on attached Figure 3. The burn area will also be considered a potential PAH contaminated area due to the potential for PAHs produced by partially burned wood. The areas where antimony was detected at concentrations exceeding the residential screening levels will also be included in this process (a small area at the south end of the shelter and the .22 range backstop area, shown on Figure 4).

3.2 Physical Soil Processing

All impacted soils will be processed with a mobile screening plant which has been patented and will be operated by Range Recovery Technologies. The processing plant has been designed to remove bullets and bullet fragments from soil. The processing plant screens and cleans recyclable lead without water or chemicals. The lead will be containerized sold, and shipped to a certified lead recycler.

The project area will first be tilled to loosen the upper 6 inches of soil. The upper 6 inches of soil will then be scraped from the surface using a small loader and the soil will be moved to the processing plant. The processing plant will be loaded using a small loader and sifted so that lead is separated from the soil. Confirmation samples will be collected from the surface of the scraped (excavated) area prior to replacing processed soil, to confirm that contaminated soils have been removed to below residential screening levels. One confirmation sample will be analyzed for every 2,000 square feet of scraped area.

Processed soil will be left in piles of approximately 25 cubic yards and sampled at a frequency of one composite sample per each 25 cubic yards (see Section 6.2). Sampled soil will be left in place until laboratory results are received which indicate the soil has met target cleanup levels. Because the impacts to soil are limited to the upper 3 inches, the removal of lead from the 3 to 6 inches depth interval

is expected to mitigate COC concentrations to below target cleanup levels. If target cleanup levels are not met, the soil will be processed further and then re-sampled. Once processed soil is shown to be below target cleanup levels for the project COCs, soil will be replaced as near as possible to the location from which it was removed.

Information regarding the soil processing plant and stabilization additive are included in Appendix D.

3.3 Chemical Stabilization of Lead Impacted Soils

If processed soils do not meet the Site cleanup levels for the project COCs, the stabilization additive Free Flow 200® will be mixed in the soil so that the soil can meet the requirements of disposal as non-hazardous waste. Free Flow 200® is a proprietary blend of stabilizing agents that fixate heavy metals in waste or soil using a combination of sulfate and hydroxyl anion fixation chemistry. When moisture comes into contact with soil or waste stabilized with Free Flow 200®, sulfates are immediately released to initiate fixation reactions.

Information regarding the soil processing plant and stabilization additive are included in Appendix D.

3.4 Soil Repository (contingency)

If physical soil processing is not able to mitigate contaminant concentrations to below residential screening levels for more than approximately 100 cubic yards of processed soil, the processed soil would be placed into an onsite repository pit. Note that groundwater is expected to be very deep at the Site and is not expected to be encountered in or near the repository pit. Processed soil will not be placed below the groundwater table. If, unexpectedly, water is encountered in the pit excavation, the depth and location of the pit will be reconsidered and changed so that processed soil is not placed within two feet of the water table. Prior to placement, the impacted soil would be stabilized with Free Flow 200® to minimize leachability.

The repository would consist of a pit excavated approximately in the burn area near the center of the site (see attached Figure 4). The repository would be excavated to the specific depth and area required to contain the contaminated soil to be placed, likely between 6 and 13 feet deep and 30 by 30 feet in area. Impacted soil would be placed from the bottom of the pit to no higher than 3 feet depth below ground surface. The repository cap would be placed from 3 feet depth to the ground surface. The purpose of the cap is to provide a barrier to prevent direct contact with impacted soils, establish a low maintenance system to enclose impacted soils, and minimize erosion and infiltration of precipitation into impacted soils. The cap would consist of:

- 0.5 feet of topsoil seeded with appropriate cover vegetation to mitigate erosion
- 1.5 feet of compacted clean native soil
- Orange construction fence marker
- 0.5 feet drainage layer of uncompacted pea gravel
- Geosynthetic Clay Liner (GCL) liner – *Bentomat ST* or equivalent
- 0.5 feet of compacted clean native soil with the soil surface free of sharp stones sticks or other debris which could compromise the GCL liner
- 3 to 10 feet of Impacted soil

If on-site or near-site soils are used as the repository cap, these soils will be sampled and analyzed for site COCs at a frequency of one sample per 25 yards. Only soils for which analyses show contaminant concentrations below residential screening levels will be used in the cap. The repository area will be surveyed and staked at the surface sufficiently to identify the repository. A native vegetative seed mix, chosen in consultation by SITLA range specialists, would be established at the ground surface to mitigate surface erosion. The surface of the repository area would be graded to direct flow away from the repository. Repository design details are shown on attached Figure 5. Maintenance of the repository would be detailed in an SMP.

3.5 General Demolition, Construction, and Decontamination Issues

The following best management practices would be employed during implementation of the remedies specified in this RAP:

- The soil processing plant subcontractors would be required to decontaminate their equipment prior to arrival at the Site, and prior to demobilization from the Site.
- Decontamination of field sampling equipment is described in SOP 7 of the SAP.

4. PERMITTING REQUIREMENTS

4.1 Blue Stakes Utility Clearance Request

A utility clearance request would be submitted to Blue Stakes at least two full business days prior to the commencement of the remediation work.

4.2 Storm Water Pollution Prevention Plan (SWPPP)

As the Site occupies more than one acre, a SWPPP is required for the work described in this RAP. Subcontractors will be required to use best management practices to prevent adverse impacts to storm water runoff. The SWPPP for this project is included as Appendix C.

4.3 Fugitive Dust Control

The soil processing proposed for this remedial action requires low soil moisture for optimum results. Because of this, as little water as possible will be used during the processing. Because the Site is so remote (approximately one mile from the nearest highway and more than one mile from the nearest residential and commercial properties) dust control should not be a great concern. Dust will be monitored periodically at the road and at the nearest residential or commercial structures to ensure that dust is not a problem at these properties. Because the site is not located in a non-attainment area for fugitive dust, a Fugitive Dust Control Plan is not required by the Utah Division of Air Quality.

4.4 Beaver County Health Department

The Beaver County Health Department would be notified at least 72 hours prior to commencement of field work related to the remediation activities at the Site.

5. PUBLIC NOTIFICATION AND PARTICIPATION

The Applicant, and Wasatch acting as an agent of the Applicant, would clearly convey to stakeholders a commitment to open an honest communication, a commitment to partnering with the UDEQ in matters of public involvement, and a commitment to being sensitive and responsive to the concerns of stakeholders. Stakeholders include not only the Applicant, Applicant's environmental attorney, Applicant's consultant, and UDEQ; but may also include the Beaver County Health Department, and Beaver County government. This list of stakeholders is not intended to be exclusive. Public comments having technical merit will be considered, regardless of the source of the comment.

In stakeholder communications, Wasatch would explain the nature of environmental investigations and complexities related to actual exposure risk. Stakeholders would be provided information on how they may obtain copies of complete project-related documents through the UDEQ webSite or by submitting a Government Records Access and Management Act (GRAMA) request. Wasatch would also offer to

facilitate meetings between concerned stakeholders, the UDEQ, Applicant, and Applicant's environmental attorney, as necessary.

Wasatch would submit drafts of any written public outreach materials to the VCP project manager for review and provide final copies for the VCP project file. Depending on the number of stakeholders that ultimately become affected by the investigation and remediation activities, Wasatch (in cooperation with the Applicant, Applicant's environmental attorney, and UDEQ) may need to conduct public meetings in order to facilitate effective communication with multiple stakeholders.

The Applicant, and Wasatch acting as an agent of the Applicant, would adhere to the VCP requirements regarding the public comment period required prior to implementing any remediation strategy. Prior to implementation of any remediation strategy, written notification would be provided to adjacent landowners and a notice would be placed in a local newspaper. Notification would be followed by a public comment period on the RAP of no less than 30 days. Any substantive public comments that are received would be responded to per VCP procedures prior to implementation of the Remedial Action Plan.

6. SAMPLING AND ANALYSIS

The sampling methods and laboratory analytical methods vary by environmental media. All soil and surface water samples would be analyzed for PAHs by method SW-846 8270C and selected metals (antimony, copper, iron, tin, zinc, lead) by method SW-846 6020/6010. Additional details regarding the sampling methods and the anticipated laboratory analytical methods are provided in the Sampling and Analysis Plan which is attached as Appendix B (Standard Operating Procedures 4 and 5).

6.1 Waste Characterization Sampling

Wasatch will perform waste characterization sampling in accordance with the SAP and complete the appropriate waste profiles to be approved by the facility receiving the waste based on the waste characterization sampling results. Wasatch would arrange for proper transport and disposal of the waste soil through appropriate transport, storage, and disposal facilities.

6.2 Soil Confirmation Sampling

All soil samples would be collected into laboratory-supplied jars and immediately placed in a cooler with ice. All soil samples would be delivered under chain-of-custody protocol to a Utah-Certified analytical laboratory for analysis. Soil samples would be analyzed at an expedited turnaround time, for the most part, to facilitate the timely completion of the remedial activities.

Soil confirmation samples would be collected from ground surface at the Site where contamination has been identified through Site characterization activities after approximately 6 inches of impacted surface soils are removed. These confirmation samples would be collected and analyzed at a frequency of 1 sample per approximately 2,000 square feet. These ground surface confirmation samples would be collected by dividing the area into approximate quarters, collecting a small amount of soil from each quarter, then mixing the quarter samples together into one composite sample for analyses.

Confirmation samples would also be collected from processed soils prior to being replaced on the Site. The processed soil confirmation samples would be collected at a frequency of one sample per approximately 25 cubic yards. The processed soil samples would be collected by dividing each approximately 25 cubic yard pile into quarters, collecting a small amount of soil from each quarter, then mixing the quarter samples together into one composite sample for analyses. Processed soils will remain in approximately 25 cubic yard piles until sampling and analyses confirm that the soil has met target cleanup concentrations.

Chain-of-custody documentation would be completed, and the samples would be delivered to the laboratory for the analysis of VOCs in accordance with the SAP. All samples would be analyzed on a

standard laboratory turn-around time unless expedited analysis is requested by the Applicant. Potential laboratories that may be used for sample analyses, including duplicate split analyses, include: Chemtech-Ford Laboratories, ALS Laboratories, and Pace Analytical Laboratories.

7. CONTINGENCY PLANNING

If target cleanup levels are not met in any particular processed 25 cubic yard soil pile after soil processing, soil will be mixed with the stabilization additive Free Flow 200[®] and the soil resampled and analyzed for waste characterization purposes. Wasatch expects physical soil processing to achieve target cleanup goals. Any soils which do not meet Site cleanup goals will be kept to a minimum to avoid disposal issues. Wasatch anticipates that the use of Free Flow 200[®] on soils which do not meet cleanup goals will at least meet requirements for disposal as non-hazardous waste.

Stabilized soils which do not meet cleanup levels but do meet the requirements of non-hazardous waste may be disposed off-Site at an appropriate regulated disposal facility. If the volume of soil that does not meet target cleanup levels is large, the soils will be covered with plastic and silt fence will be placed around the piles while disposal or potential placement on-Site in a demarcated repository area options are determined. If this occurs a separate planning document will be produced and submitted to the VCP Program for approval.

The proposed remedy at the Beaver Mountain Gun Range Site requires dry soil. If precipitation events cause soil to be saturated so that the remediation process is affected, processing of soils will be delayed until the soils dry. Any soil piled on site during weather delays will be covered with plastic sheeting until processes can be resumed.

8. REMEDIAL ACTION IMPLEMENTATION REPORT

Following completion of the remedial action, Wasatch would produce a remedial action implementation report documenting the results of the remedial action. The report would include:

- narrative text explaining objectives, methods, results, and presenting conclusions and recommendations, and documenting any deviations from the approved RAP;
- comprehensive data tables;
- figure(s) depicting the location of processed soil, confirmation samples, and other relevant Site features;
- photographs;
- laboratory analytical reports;
- data validation reports; and
- copies of permits and approvals.

9. HEALTH AND SAFETY

All remedial action activities at the Site would be performed by Wasatch in accordance with Wasatch's general health and safety policy and by SITLA subcontractors in accordance with their own health and safety policies. A Site-specific health and safety plan would be prepared by Wasatch and, separately, by the remediation contractors, to address specific health and safety concerns and establish protocols for conducting work related activities in a safe manner.

10. PROJECT SCHEDULE

Wasatch anticipates the remediation work to begin in early June and end by early July. Wasatch would communicate scheduling details with the DERR as the schedule develops.

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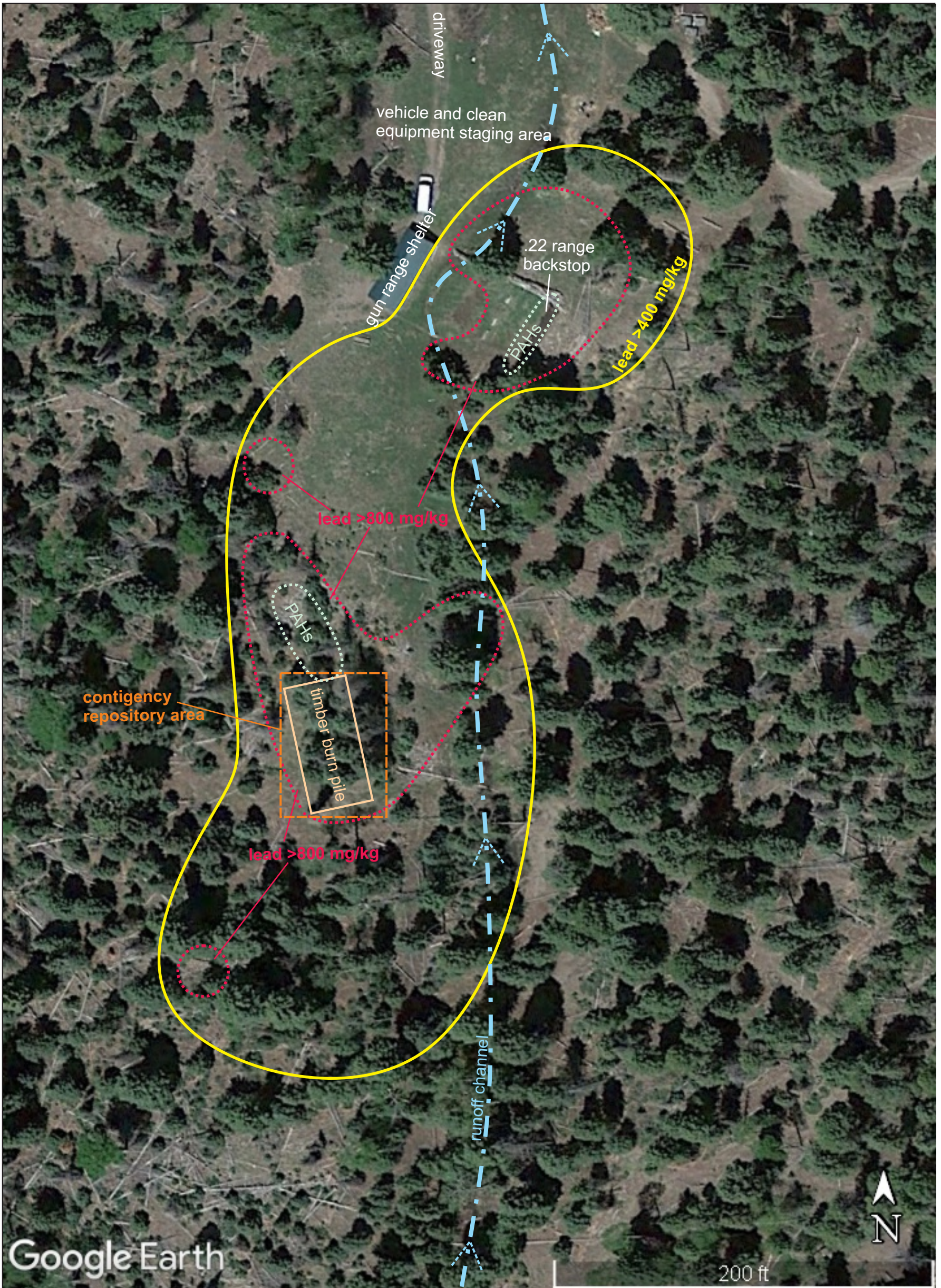
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Google Earth

200 ft

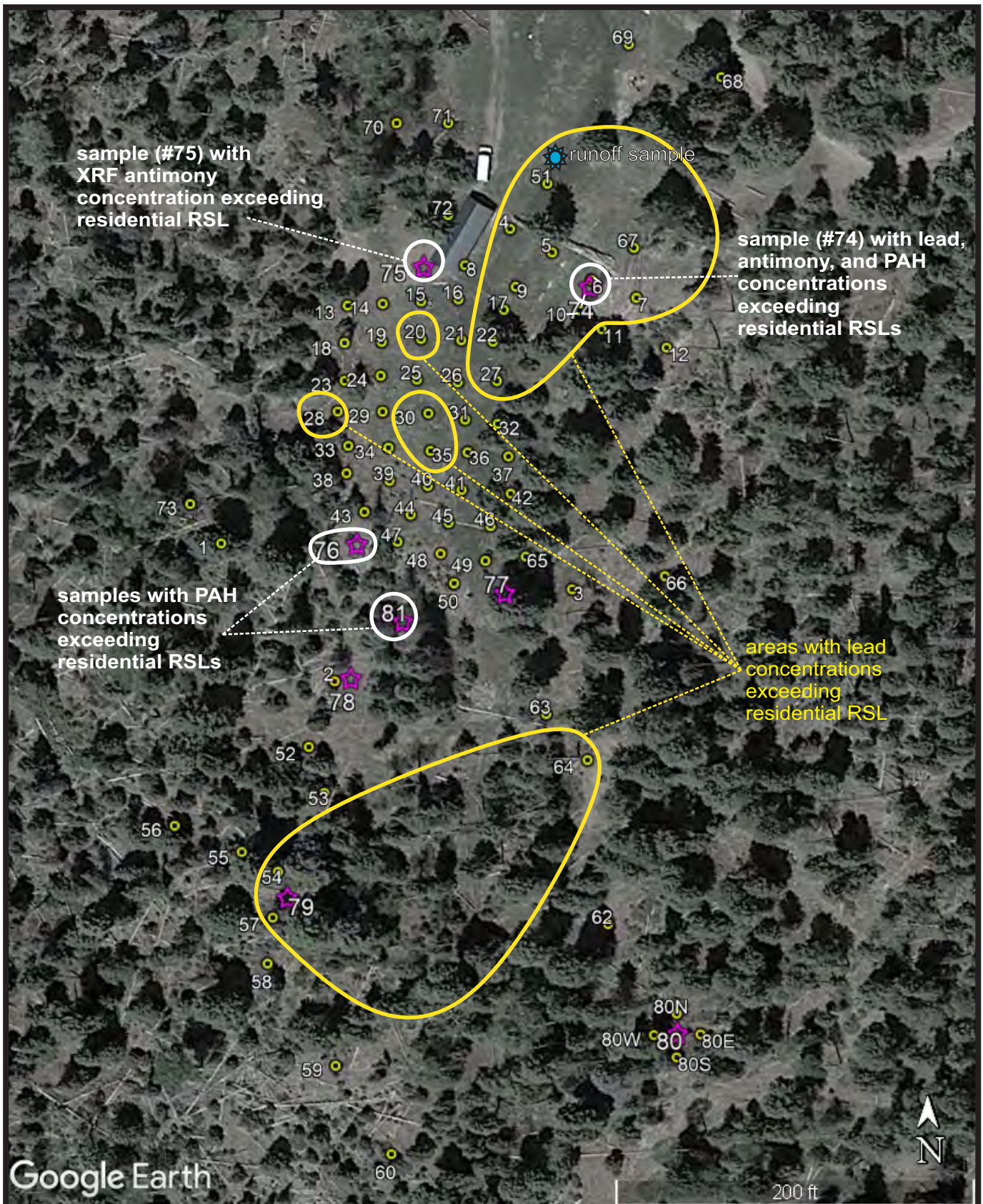
Legend:

-  Remedial Activities Area Boundary, area where COC concentrations potentially exceeds Residential RSL of 400 mg/kg
-  Area where PAHs exceeded Residential RSL
-  Area where Lead exceeded Industrial and Residential RSLs (>800 mg/kg)

 Approximate Contingency Repository Area

 Area where timber cleared from the site was burned in November 2021

**Figure 3: Site Conceptual Model
Former Beaver Mountain Gun Range**



Legend:

- ★ October 6, 2022 soil sample/XRF survey location
- July 8-9, 2021 soil sample/XRF survey location

- ☀ May 10, 2022 surface water runoff sample location

Figure 4: Areas of Metal and PAH impacts in exceedance of Residential RSLs



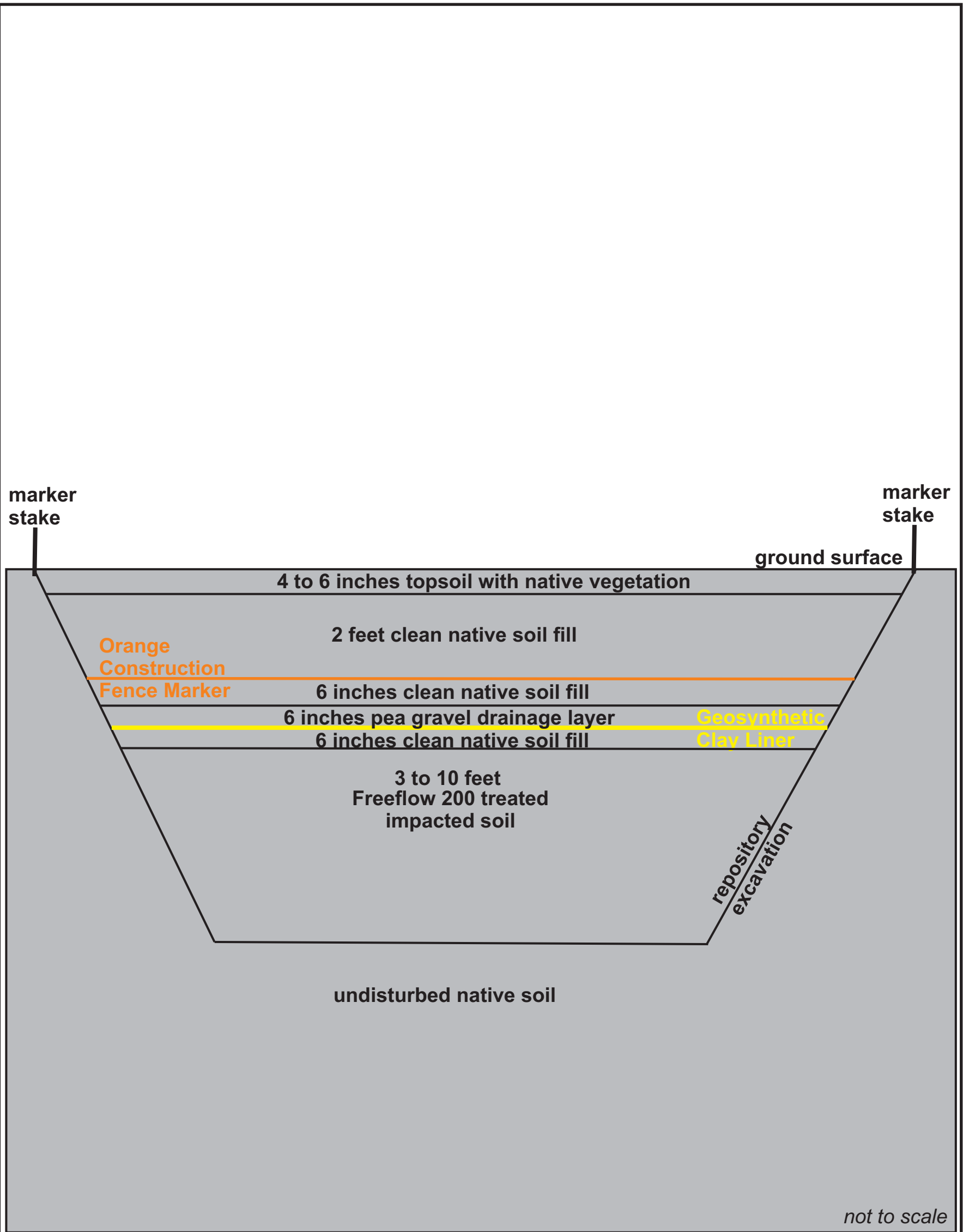


Figure 5: Contingency Soil Repository Plan
Former Beaver Mountain Gun Range

APPENDIX A

**QUALITY ASSURANCE PROJECT PLAN
BEAVER MOUNTAIN GUN RANGE REMEDIATION
BEAVER COUNTY, UTAH
VOLUNTARY CLEANUP PROGRAM SITE #118**

Project No. 2649-001

Prepared for:

**Utah Department of Environmental Quality
Division of Environmental Response and Remediation
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May 9, 2022

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**QUALITY ASSURANCE PROJECT PLAN
BEAVER MOUNTAIN GUN RANGE REMEDIATION
BEAVER COUNTY, UTAH
VOLUNTARY CLEANUP PROGRAM SITE #118**

1. INTRODUCTION

This Quality Assurance Project Plan (QAPP) describes the activities for collecting, handling, and analyzing representative environmental samples at the former Beaver Mountain Gun Range (Site). The Site has been accepted into the Utah Voluntary Cleanup Program (VCP) as VCP Site #118 to address environmental impacts identified at the Site.

All personnel involved with the collection and handling of environmental samples shall be required to read this plan, and a copy of this plan will be available in the field during all sampling activities.

2. QUALITY ASSURANCE/QUALITY CONTROL

Quality assurance (QA) is a management system for ensuring that all information, data, and decisions resulting from the investigation are technically sound and properly documented. Quality control (QC) is the functional mechanism through which quality assurance goals are achieved. All QA/QC procedures described in this QAPP are structured in accordance with applicable technical standards, agency requirements, regulations, and guidance. This QAPP is intended to be used in conjunction with Remedial Action Plans (RAP) and Sampling and Analysis Plans (SAP) to be prepared for the Beaver Mountain Gun Range VCP Site. The QAPP will serve as a controlling mechanism during the performance of the environmental sampling and analysis activities to ensure that the technical data gathered are precise, accurate, comparable, complete, and representative of actual field conditions, and meet the minimum QA/QC requirements for the project. The following information is presented to ensure that QA/QC procedures for environmental sampling and analysis are performed in accordance with the data quality objectives (DQOs) for environmental sampling and analysis at the Site.

3. PROJECT ORGANIZATION AND RESPONSIBILITIES

3.1 VCP/Utah Division of Environmental Response and Remediation (DERR) Project Manager

The VCP Project Manager is responsible for regulatory oversight of the project and regulatory review and approval of project planning documents and reports.

3.2 Project Manager

The Project Manager is responsible for implementing the project and has the authority to commit the resources necessary to meet project objectives and requirements. The Project Manager's primary function is to ensure that technical, financial, and scheduling objectives are achieved successfully. The Project Manager will serve as primary point of contact and control for all matters concerning the project. The Project Manager will:

- Define project objectives;
- Establish project policy and procedures to address the specific needs of the project as a whole;
- Acquire and apply resources as needed to ensure performance within budget and schedule constraints;
- Review the work performed on each task to ensure its quality, responsiveness, and timeliness;

- Review and analyze overall task performance with respect to planned requirements and authorization;
- Approve all reports prior to their submission to agency representatives;
- Ultimately be responsible for the preparation and quality of interim and final report; and
- Represent the project team at meetings and public hearings.

3.3 Field Staff

The Field Staff includes technicians, geologists, hydrogeologists, and environmental scientists reporting to, and working under the direction of, the Project Manager. The Field Staff are responsible for the execution of the field work and direct oversight of subcontractors performing field tasks such as drilling. The Field Staff are responsible for completing field work in accordance with RAP, SAP, QAPP, Site-Specific Health and Safety Plans, and work plans.

3.4 Health and Safety Manager

The project Health and Safety Manager will be responsible for the development of the Site-Specific Health and Safety Plan and related training of Field Staff. The Health and Safety Manager is also responsible for ensuring that health and safety procedures are understood and followed by all Field Staff and for reporting and correcting any violations of policy or regulation.

3.5 Laboratory QA Manager

The Laboratory QA Manager is responsible for validation of all laboratory analytical data prior to submission of the data to the Project Manager.

3.6 Third-Party Data Validator

The Third-Party Data Validator is responsible for validation of all laboratory analytical data, with respect to the stated data quality objectives and parameters, prior to use of the data in final reports.

4. DATA GENERATION/ACQUISITION OBJECTIVE

The data generation and acquisition objective of this project is to generate and acquire data in sufficient quantity and of sufficient quality to complete site characterization and to verify remedial actions with “confirmation” samples.

5. DATA QUALITY PARAMETERS AND OBJECTIVES

The overall QA/QC objective for this project is to develop and implement procedures for field sampling, chain-of-custody (COC), laboratory analyses, and reporting that will provide results which are valid and legally defensible in a court of law. The purpose of implementing these procedures is to assess the data obtained with respect to the data quality parameters of precision, representativeness, accuracy, completeness, and comparability for both the laboratory analytical program and field sample collection activities. The primary goal of the program is to ensure that the data generated are representative of environmental conditions at the Site. To achieve this goal, a combination of quantitative procedures and qualitative evaluations will be used to assess the data quality. Precision, accuracy, representativeness, completeness, and comparability (PARCC) will be computed in the manner described in the following paragraphs. A qualitative assessment of PARCC factors will be made and will be documented.

5.1 Precision

Precision is a measure of mutual agreement among individual measurements of the same site, usually under prescribed similar conditions, and typically expressed in terms of the standard deviation or relative percent difference (RPD).

5.1.1 Field Data Precision

Field precision will be assessed through the collection and analysis of field duplicates and comparing the analytical results of the field duplicates to the analytical results of the environmental samples.

5.1.2 Laboratory Data Precision

Laboratory precision will be assessed through the calculation of RPD and/or relative standard deviations (RSD) for duplicate samples. Analytical precision will be measured by comparing analytical results for matrix spike (MS) and matrix spike duplicate (MSD) samples and internal laboratory samples that may be analyzed according to analytical method or laboratory standard operating procedure requirements. Acceptance criteria for analytical precision will be based on established laboratory quality control limits for individual analytes. Applicable control limits are based on statistically valid historical data compiled by the laboratory which meet or exceed precision requirements specified by the analytical method. Standard operating procedures are on file with the selected project laboratory.

5.2 Accuracy

Accuracy is the degree of agreement of a measurement with an accepted reference or true value. The accuracy of the analytical data will be assessed by examining possible sources of error that may bias the analytical results.

5.2.1 Field Data Accuracy

Sources of the errors in the field can occur during sampling (i.e., cross contamination from sampling equipment, etc.), field handling, and transportation. Accuracy in the field will be assessed by documenting adherence to standard operating procedures for sample collection, preservation, and handling, and through preparation and analysis of trip blanks and equipment blanks.

5.2.2 Laboratory Data Accuracy

Sources of errors in the laboratory can occur during sample preparation and analysis, duplicate and control sample preparation, and due to instrument and quantification errors. Laboratory accuracy is assessed through the analysis of standard reference materials (SRMs) in laboratory control samples, MSs, MSDs, and surrogate compounds and the determination of their recoveries in terms of percentage. Control limits are established by the laboratory for each analyte based on statistically valid historical recovery results, which meet or exceed the requirements specified by the analytical method. In addition, the project laboratory will analyze method blanks to determine the potential for contamination introduced at any stage of sample preparation or analysis. Laboratory control limits and frequency for spike recovery and method blank analysis are specified in standard operating procedures for each analytical method, which are on file with the selected project laboratory.

5.3 Representativeness

Representativeness is a qualitative parameter that expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an

environmental condition. As such, representativeness requires the selection of appropriate analytical methods, sampling protocols, and sampling locations such that results are representative of the media being sampled and conditions being measured.

5.3.1 Field Data Representativeness

Representativeness is dependent upon the proper design of the sampling program and will be satisfied by ensuring that the SAP, and the specific procedures contained therein, is followed.

5.3.2 Laboratory Data Representativeness

Representativeness in the laboratory is ensured by carefully following standard laboratory analytical methods and procedures, meeting sample holding times, specifying detection limits that are at or below regulatory standards, and analyzing method blanks to check for laboratory contamination. Sample results will not be considered representative if contaminants are detected in the method blanks, or if the reporting limits are above the specified screening levels.

5.4 Completeness

Completeness is an assessment of the number of valid measurements obtained in relation to the total number of measurements planned for the successful achievement of the investigative objectives. Completeness will be expressed as the percentage of valid measurements to the total number of measurements. The closer the numbers, the more complete the measurement process.

5.4.1 Field Data Completeness

Field completeness evaluates the number of valid measurements obtained from all measurements taken in the project. The intent of this program is to attempt to achieve a goal of 100 percent field completeness. Realizing that under normal conditions this goal may not be achievable, the field completeness goal for this program is 90 percent. This completeness goal is considered adequate to meet the DQOs for this Site based on prior consideration of PARCC parameters, the sampling plan designs, and data collection activities proposed for each medium.

5.4.2 Laboratory Data Completeness

Laboratory completeness evaluates the number of valid measurements obtained from all the measurements taken in the project. The intent of this program is to attempt to achieve a goal of 100 percent laboratory completeness. Realizing that under normal conditions this goal may not be achievable, the laboratory completeness goal for this program is 90 percent.

5.5 Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set may be compared to another. Data sets will be compared only when precision and accuracy meet the specified acceptance criteria established in this section. Samples will be collected, and analytical results will be reported according to standard procedures and methods to ensure comparability with other similar data and results. The comparability goal will be achieved by following the SAP and the RAP, and the specific procedures contained therein, and by collecting and analyzing representative samples, specifying analysis by similar analytical procedures with comparable reporting limits and by reporting analytical results in appropriate and consistent units.

5.5.1 Field Data Comparability

Comparability is dependent upon the proper design of the sampling program and will be satisfied by ensuring that the SAP and RAP are followed and that proper sampling procedures are used.

5.5.2 Laboratory Data Comparability

Analytical data will be considered comparable when similar sampling and analytical methods are used and documented. Similar QA objectives will be used throughout the project to ensure comparability. At the discretion of the Utah DERR, split samples may be collected for submittal to a third-party analytical laboratory to assist in evaluation of comparability. The frequency at which split samples are collected and analyzed will be specified by the Utah DERR following the receipt and approval of individual work plans for the project.

5.6 Sensitivity

Sensitivity is the capability of a method or instrument to discriminate between measurement response(s) representing differing levels of the variable of interest. The analytical laboratory, as part of their standard operating procedures, follows published, approved analytical methods which validate the methods including an evaluation of sensitivity, precision, and accuracy to ensure that the equipment can operate properly prior to sample analysis.

5.7 Data Quality Objectives (DQOs)

DQOs are qualitative and quantitative statements that specify the quality of the data required to support decisions made during project activities and are based on the end uses of the data to be collected. The DQOs for samples collected for laboratory analysis are summarized in Table 1.

**Table 1
Summary of DQOs**

QC Parameter	DQO
Precision	Relative percent difference (RPD) of field and laboratory duplicate (MS/MSD) samples. For laboratory duplicates, the RPDs within established laboratory control limits for each analyte are acceptable. For soil and indoor air field duplicates, a calculated RPD of 50% will be deemed acceptable. For groundwater field duplicates, a calculated RPD of 20% will be deemed acceptable.
Accuracy	Spike recoveries from laboratory control samples (LCSs), MS/MSDs, and surrogates within established laboratory control limits for each analyte are acceptable.
Representativeness	Environmental samples will be collected from locations either reasonably believed to be, or established to be, representative to identify source areas, evaluate the nature of the release(s), and delineate the extent of contamination. Standard field operating procedures will be used, method blanks are to be free of target analytes, sample holding times are not to be exceeded, all samples are to be properly preserved, receiving temperatures are not to be exceeded, 90% of all field duplicates meet laboratory precision criteria, and laboratory method detection limits must be below the applicable screening levels.*
Completeness	An acceptable level of completeness will be defined as 90% of collected samples being deemed valid based on precision, accuracy, representativeness, and comparability acceptance criteria.
Comparability	Where feasible (where previous data exist as with monitoring wells), analytical results for environmental samples will be compared previous analyses for the respective location. Measures of comparability will include the use of standard analytical methods with standard units of measure and consistent reporting limits, and collection of field QC samples.
Sensitivity	Sensitivity is evaluated by the laboratory reporting detection limit (RDL). The acceptable level of sensitivity is 100% of RDLs are less than performance standards.

** The representativeness has been established requiring that 90% of all field duplicates meet the established precision criteria and detection limits will be below applicable screening levels. However, if sample dilution occurs because of elevated analyte concentrations, the results will not be rejected.*

6. QA/QC PROCEDURES

QC checks will be performed for both field sampling and laboratory analysis of the environmental samples to allow for the evaluation of data quality, documentation of data quality, and to help identify irregularities in the field sampling or laboratory analyses that may require correction.

6.1 Field QA/QC

A variety of QC samples will be collected to facilitate the evaluation of the data quality parameters. An explanation of each type of field QC sample is provided below. A summary of the quantity of each QC sample type to be collected for each environmental medium (matrix type) is presented as Table 2.

6.1.1 Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

MS/MSDs are QC samples collected in the field for use by the analytical laboratory. The MS/MSDs are selected to be representative of the environmental matrix at the Site. The laboratory spikes the MS/MSDs with a known quantity of the analyte of interest. The MS and MSD are then analyzed by the laboratory along with an un-spiked sample and the environmental samples from the Site to evaluate the accuracy and precision of the analytical method for that specific sample. One MS/MSD will be collected for each matrix (soil and water samples only) for each sample delivery group.

6.1.2 Field Duplicate

A field duplicate is a QC sample collected from the same location as an environmental sample, and collected simultaneously, or immediately following, the collection of the environmental sample. Field duplicates are collected, handled, and analyzed in an identical manner to the environmental samples. The sample labeling and COC documentation will not indicate that a sample is a field duplicate (they are blind duplicates) so the analytical laboratory is not aware that the field duplicate is a QC sample. Field duplicates are analyzed by the laboratory along with the environmental samples. The analytical results for the field duplicate are then compared to the analytical results for the environmental sample as an indicator of the overall sampling and analytical precision. One field duplicate will be collected for each matrix (soil, water, or air) for every 20 environmental samples for each matrix. A minimum of one field duplicate per matrix will be collected for each sampling event.

6.1.3 Equipment Blank

An equipment blank (also referred to as an equipment rinse blank) is a QC sample collected by pouring deionized water over sampling equipment after the sampling equipment has been completely decontaminated. Equipment blanks will only be collected when non-dedicated and non-disposable sampling equipment is used. Equipment blanks will be analyzed for the same analytes as the environmental samples. The analytical results for the equipment blanks are used to evaluate the adequacy of the decontamination procedures used to prevent cross-contamination between sampling locations. One equipment blank will be collected for each matrix (soil and groundwater only) for every 20 environmental samples for each matrix.

6.1.4 Trip Blank

A trip blank is a QC sample prepared by the laboratory consisting of a set of sample vials filled with deionized water. Trip blanks are transported and stored with environmental samples (soil and groundwater samples only) that are to be analyzed for volatile organic compounds (VOCs). Trip blanks are analyzed for VOCs only. Trip blanks are collected and analyzed to evaluate for cross-contamination of VOC samples due to diffusion that may occur during transport and storage of environmental samples. One trip blank will be included in each cooler used to transport VOC samples.

6.1.5 Spilt Samples

Split samples are transported and analyzed separately (and by a different analytical laboratory) than the environmental samples. The analytical results for the split sample are then compared to the analytical results for the environmental sample as an indicator of the overall analytical accuracy and precision. The DERR may collect splits of soil, groundwater, or air at their discretion. The DERR may use ALS Environmental, located at 960 West LeVoy Drive in Salt Lake City, for the analysis of spilt samples for soil and groundwater samples; and EMSL Analytical, Inc., located at 1010 Yuma Street in Denver, Colorado, for analysis of split samples of air.

Table 2
Summary of Field QC Sample Types and Quantities by Matrix

Environmental Media (Matrix)	MS/MSD	Field Duplicate	Equipment Blank	Trip Blank	Split Samples
Soil	A minimum of 1 per sample delivery group, all analytes, or 1 per 20 environmental samples, whichever is greater	1 per 20 environmental samples, all analytes, minimum of 1 per sampling event	1 per 20 environmental samples, all analytes, only if non-dedicated sampling equipment is used	1 in each cooler containing VOC samples	At discretion of DERR
Groundwater	A minimum of 1 per sample delivery group, all analytes, or 1 per 20 environmental samples, whichever is greater	1 per 20 environmental samples, all analytes, minimum of 1 per sampling event	1 per 20 environmental samples, all analytes, only if non-dedicated sampling equipment is used	1 in each cooler containing VOC samples	At discretion of DERR
Air	None	1 per 20 environmental samples, VOCs only, minimum of 1 per sampling event	None	None	At discretion of DERR

6.1.6 Field Quality Control Checks

Internal QC procedures are designed to ensure and document the overall quality of data. The QC checks represent system checks and controlled samples introduced into the sample analysis stream that are used to validate the data and calculate the accuracy and precision of the chemical analysis program. Field quality control will also be checked by equipment blanks and field duplicates.

6.1.7 Field Chain-of-Custody (COC) Procedures

Custody is one of several factors which is necessary for the admissibility of environmental data as evidence in a court of law. Custody procedures help to satisfy the two major requirements for

admissibility: relevance and authenticity. Sample custody is addressed in three parts: field sample collection, laboratory analysis, and final evidence files. Final evidence files, including all original laboratory reports, are maintained under document control in a secure area.

A sample or evidence file is under your custody if:

- the item is in actual possession of a person;
- the item is in the view of the person after being in actual possession of the person;
- the item was in actual physical possession, but is locked up to prevent tampering; or
- the item is in a designated and identified secure area.

A COC form will be completed to record the custody of every sample collected for laboratory analysis. A COC form will accompany every delivery of samples to the analytical laboratory in order to establish the documentation necessary to trace sample possession from the time of sample collection through sample analysis.

The sample portion of the COC form will include the following:

- project number, name, and location;
- sample identification;
- date and time of sample collection;
- sample type;
- number of containers;
- name of Project Manager, sampler, and recorder;
- sampling information (sampling area, depth, media type, type of sample, date, and time of collection, etc.);
- analysis requested and specific analytical method;
- preservatives used, if any;
- filtering used, if any;
- signatures of persons involved in the COC possession, including dates and time; and
- condition of samples and sample bottles received by the laboratory.

When a COC form is filled out, a copy is retained for the client file. The original form accompanies the sample(s) until completion of laboratory analysis. The laboratory copies the form and returns the original with the sample report. When the sample report is received, it is cross-checked with the COC file record and both COC pages and the laboratory report are placed in the client file.

6.1.8 Field Logbook Records

A field log of daily activities will be used to record sampling activities on a daily basis. This book will be bound and have consecutively numbered pages. Entries in the field logbook will be made in ink and will include:

- the project name/number;
- name of the author/sampling team;
- date and time of entry;
- location of activity;
- chronological record of field activities;
- names and affiliations of personnel on site;
- sample collection or measurement methods;
- number of samples collected;
- daily weather report;
- sample identification numbers;
- field observation and comments;
- sampling depth increment for field measurements;
- locations of photographs; and

- any deviations from the RAP, QAPP, or work plan.

All logbook entries will be signed, dated, and no erasures will be made. If an incorrect entry is made, the information will be crossed out with a single strike mark, initialed, and dated by the sampler. Each logbook will be assigned to a specific field team member and given a project specific project documentation number.

6.1.9 Sample Labeling

Sample labels are necessary to prevent misidentification of samples. Each label will contain space for the following information:

- name of the site,
- sample identification,
- date and time of sample collection,
- media sampled,
- name of sampler,
- type of preservative,
- type of filtering, and
- types of analyses to be performed.

6.1.10 Sample Handling and Transport

For transport, all soil and groundwater samples will be stored on ice or dry ice (depending on the sample type and cooling requirements) and packaged in such a manner as to prevent damage or breakage during handling and transport to the laboratory. Samples delivered to the laboratory will be delivered by sampling personnel. Sample containers will be labeled and placed into suitable shipping containers. If samples are to be shipped, the shipping containers (i.e., coolers) will be sealed with custody seals and taped closed. All sample holding times will be tracked and the COC form will accompany the samples in a sealed plastic bag.

Custody seals will be placed on each sample cooler or container used to transport and/or store samples that are shipped.

6.1.11 Field Maintenance

Logs or field notebooks will be used to record maintenance, service procedures and schedules for the field equipment. All maintenance records will be documented and traceable to the specific equipment, instruments, tools, and gauges. Any items found to be inoperable will be taken out of use. Records shall be reviewed and maintained by the Project Manager and field staff when equipment, instruments, tools, and gauges are used at the site.

6.2 Laboratory QA/QC Procedures

The laboratories which will be performing analyses of environmental samples for this project are certified by the State of Utah and/or have National Environmental Laboratory Accreditation Program (NELAP) accreditation.

6.2.1 Laboratory QC Reporting Packages

All laboratories will be required to provide Level 3 QC reporting packages (or their equivalent). For the purposes of this QAPP, a Level 3 QC package includes:

- Analytical results,
- COC records,
- Case narratives,

- Surrogate recoveries,
- Method blanks,
- Laboratory control samples (LCSs),
- Laboratory analysis of MS/MSDs collected from this project (not samples collected from other projects included in the analytical batch), and
- Chromatograms for organic analyses and logbooks.

6.2.2 Laboratory QC Checks

Laboratory QC checks are accomplished through the use of system checks and QC samples that are introduced into the same analysis stream as the environmental samples. Laboratory system checks and QC samples for the inductively coupled plasma/mass spectrometer and gas chromatograph/mass spectrometer are documented in the laboratory standard operating procedures (SOPs). An example of laboratory system checks and QC samples for inorganics are defined below.

- Calibration Blank - A volume of acidified deionized water.
- Continuing Calibration Blank - Analytical standard run every 10 analytical samples or every two hours, whichever is more frequent, to verify the calibration of the analytical system.
- Instrument Calibration - Analysis of analytical standards for a series of different specified concentrations; used to define the quantitative response, linearity, and dynamic range of the instrument to target compounds.
- Preparation Blank - An analytical control that contains deionized water and reagents, carried through the entire analytical procedures. An aqueous method blank is treated with the same reagents as a sample with a water matrix; a solid method blank is treated with the sample reagents as a soil sample.

Laboratory QC checks will be performed, and samples will be analyzed at a frequency established by appropriate SW-846 and NELAP protocols for inorganics, organics, and the SOPs for analytical methods used.

6.2.3 Laboratory Custody Procedures

Samples which are delivered by clients or received by courier are placed in locked sample control area immediately upon delivery. Coolers containing samples are unpacked within 1 hour of receipt or placed in the walk-in cooler until unpacked. The COC accompanying the samples will be signed by the Sample Custodian or their designee at the time of delivery by the client, or in the case of courier delivery, where the COC is sealed inside the cooler, at the time the samples are unpacked.

At the time of arrival and/or unpacking, coolers will be inspected for evidence of damage. They will be unpacked carefully, and samples will be organized on the lab bench in numerical order or by sample sets and assigned a laboratory job number. The condition of the cooler(s) and sample container(s) will be recorded on the COC form.

Information on the COC delivered with samples will be verified and recorded as to agreement or non-agreement. Labels will be checked for notation of proper preservation. If there is an apparent document non-agreement or incorrect preservation noted, the apparent problem will be recorded, and the Project Manager notified. The samples will then be marked or labeled with laboratory sample numbers. Laboratory project numbers are assigned serially, with each sample numbered as a subset of the project number.

Finally, samples will be placed in appropriate storage and/or secure areas and the location will be noted on the Service Request Form. Samples received for VOC analysis and samples known to be highly contaminated are stored separately.

Sample volumes, extracts, and digestates will be disposed of by the laboratory. The volumes are typically held for 30-60 days after the release of the final report. All samples are segregated by matrix and solvent used (if applicable), then placed in appropriate waste disposal bins for pickup.

6.2.4 Laboratory Preventative Maintenance

To minimize the occurrence of instrument failure and other system malfunction, a preventative maintenance program for laboratory instruments will be implemented. Equipment, instruments, tools, gauges, and other items requiring preventative maintenance will be serviced in accordance with the manufacturer's specified recommendations and written procedures developed by the operators.

6.2.5 Laboratory Equipment Maintenance

The laboratory will be responsible for performing routine maintenance and will have available tools and spare parts to conduct routine maintenance. Maintenance items that cannot be performed by the laboratory technician will be performed by a person certified to repair the instrument.

Manufacturer's procedures identify the schedule for servicing critical items in order to minimize the downtime for measurement system. It will be the responsibility of the laboratory to adhere to this maintenance schedule and arrange any necessary and prompt service. In the absence of any manufacturer recommended maintenance criteria, a maintenance procedure will be developed by the operator based upon experience and previous use of the equipment. Service to the equipment, instruments, tools, gauges, etc., shall be performed by qualified personnel. Records shall be reviewed, maintained, and filed by the operators at the laboratories and will be available upon request

7. DATA REDUCTION, VALIDATION AND REPORTING

All data collected will be reduced, managed, distributed, and preserved in a manner which substantiates and documents that data are of known quality. An outline of the QC data handling process for data collection, reduction, validation, transfer, reporting, and storage for both field and laboratory data is described below.

7.1 Data Reduction

7.1.1 Field Data Reduction

Field data collected with instruments such as pH, temperature, conductivity, specific conductivity, dissolved oxygen, X-ray fluorescence detection (XRF), and photoionization detection (PID) are direct read devices. The direct reading is recorded in the field logbook, or a groundwater/soil sampling form. No field data reduction is anticipated.

7.1.2 Laboratory Data Reduction

Raw laboratory data will be recorded in a laboratory notebook along with other pertinent information, such as the sample identification number. Other information to be recorded includes laboratory procedure used, name of analyst, date of analysis, matrix sampled, reagent concentrations, and instrument settings. Copies of any strip chart printouts, such as gas chromatograms, will be maintained on file. The laboratory QA Manager makes periodic reviews of these notebooks prior to final data reporting. Equations to be employed in the data reduction are those outlined in the approved method. Data from laboratory quality control samples will be

compared to the method acceptance criteria. Unacceptable data shall be appropriately qualified on the results report.

7.2 Data Validation

Technical data, including field data and results of laboratory sample analysis, will be validated to monitor the performance of the investigation activities. Procedures for validating field and laboratory data are described below.

7.2.1 Procedures Used to Validate Field Data

Validation of data obtained from field measurements will be performed by the Project Manager. Field data requiring validation includes the daily calibration of field instruments. Other field validation procedures include a review of logbooks and proofing data entered and imported into the computer database for transcription errors.

7.2.2 Procedures Used to Validate Laboratory Data

The Laboratory QA Manager will review all analytical data to ensure that sample results meet all method specified criteria.

The requirements to be checked in validation are:

- sample holding times,
- calibration,
- blanks,
- surrogate recovery,
- MS/MSDs,
- field duplicates,
- internal performance standards,
- target compound identification,
- interference check sample analysis,
- compound quantitation and reported detection limits,
- tentatively identified compounds,
- system performance,
- overall assessment of data,
- interference check sample analysis, and
- laboratory control sample analysis.

The Laboratory QA Manager will be responsible for assessing data quality and advising appropriate laboratory section supervisors of any data that are questionable or have notations that would caution the data user to possible unreliability.

Data reduction, validation, and reporting by the laboratory will be conducted as follows:

- Raw data produced by the analyst will be turned over to respective supervisor.
- The supervisor will review the data for attainment of QC criteria as outlined in method protocols and established United States Environmental Protection Agency (U.S. EPA) Methods.
- Upon acceptance of the raw data by the supervisor, a computerized report will be generated and sent to the QA Manager.
- The QA Manager will complete a thorough audit of all reports.

The Laboratory QA Manager will conduct an evaluation of data reduction and reporting by the laboratory. These evaluations will consider the finished data sheets, calculation sheets, document control forms, blank data, duplicate data, and recovery data for matrix and surrogate spikes. The material will be checked for legibility, completeness, and the presence of necessary

dates, initials, and signatures. The results of these checks will be assessed and reported, noted any discrepancies and their effect upon acceptability of the data. In addition, the Laboratory QA Manager will check for data consistency by assessing comparability of duplicate analyses, comparability to previous criteria, transmittal errors, and anomalously high or low parameter values.

The following is a description of the validation steps that will be used by the third-party data validator, if it is determined that one is needed to independently validate the laboratory data because of irregularities with the data. If performed, these validation results will be summarized in the final report. The validation steps are listed below:

- Compile a list of all samples;
- Compile a list of all QC samples;
- Review laboratory analytical procedures and instrument performance criteria;
- Review of COC documents for completeness and correctness;
- Review transcription, calculation, completeness, and accuracy;
- Review of laboratory analytical procedures, appropriateness, and instrument performance criteria;
- A data summary will be prepared and will include analytical results, media identification, sample location and description, appropriate concentration units, appropriate significant figures, data qualifiers, and definitions; and
- The laboratory data summary will be reviewed for potential data quality problems including unexpected results, common laboratory contaminants, samples for which dilution was necessary, and time and date of sample collection.

A sample data summary will be prepared to assess precision, accuracy, and completeness of the analytical data. Laboratory records and data package requirements will be checked to assess completeness of the data package. The validation will be performed by personnel qualified and experienced in the field of laboratory data validation.

Despite all efforts to achieve the objectives of the project, the potential for error exists in laboratory chemical analyses and in the data reporting process. Every reasonable effort will be made to compare and double-check data reported from the laboratory with data entered into the data management system.

7.3 Data Reporting

Data generated will be summarized in reports and included in the final report. The Project Manager will develop a data storage and information system to facilitate tracking, data calculations, and transfer of data to various forms and reports.

7.3.1 Field Data Reporting

Data reporting will be performed by the Project Manager. All data collected in the field will go through data validation procedures and be put into a data management system in an organized format so that intermittent and final summaries may be easily generated for data review and project approval.

7.3.2 Laboratory Data Reporting

The laboratories will submit the following reports to the Project Manager. The laboratory reports will also be included in the final sampling reports.

After laboratory data validation, the laboratory will prepare reports that will include at a minimum the following components:

- Sample identification,

- Laboratory cross-reference numbers,
- Date of issuance,
- Analysis method numbers performed,
- Results from any analysis,
- Notation of any data qualifiers, and
- Quality control documentation.

Data validation packages are to be prepared for all samples submitted for laboratory analysis. Sample results reported shall include:

- Summary page indicating dates of analyses for samples and laboratory QC checks;
- Cross referencing of laboratory sample to project sample identification numbers;
- Data qualifiers to be used should be adequately described;
- Sample preparation and analytical methods; and
- QC sample results including MS/MSD RPD, MS/MSD recoveries, laboratory control sample spike recoveries, method blank results, and surrogate recoveries.

7.3.3 Document and Data Retention

The standard document and data retention policy at Wasatch Environmental, Inc., is to retain all laboratory data and project deliverables indefinitely in both paper and electronic storage formats. During execution of projects, management of data and project deliverables is the responsibility of the Project Manager. Following completion of projects, the responsibility for long-term storage of data and deliverables shifts to an administrative assistant.

8. SPECIFIC PROCEDURES USED TO ASSESS DATA PRECISION, ACCURACY, COMPLETENESS, COMPARABILITY, AND SENSITIVITY

This section summarizes the QA/QC procedures used in assessing the quality of the chemical data and the format for presenting the results of the QA/QC evaluations. The data evaluation procedures will be used by the QA Manager for assessing duplicate and spike samples and checking blank samples that are submitted blind to the analytical laboratories from the field or generated internally by the laboratory. The purpose of implementing these procedures is to assess the chemical data generated with respect to the PARCC parameters for both the laboratory analytical program and field sample collection activities. The primary goal of the program is to ensure that the data generated are representative of environmental conditions at the Site. To meet this goal, a combination of statistical procedures and qualitative evaluations will be used to check the quality of data. Precision, accuracy, and completeness will be computed in the manner described in the following paragraphs. A qualitative assessment of representativeness and comparability will be made and will be documented. Complex statistical data verification and a significance evaluation will not be performed. If a problem arises and the data are found to deviate from previous analyses or surrounding conditions, the data will be annotated. Sample recollection and analysis will be used only in extreme cases where significant QC problems are identified.

Data will be evaluated with respect to the PARCC parameters for both the field sample collection activities and laboratory analytical programs. The QA/QC program will evaluate data based on QC sample types discussed in Section 5. Because the QC samples are generated for analysis both in the field and internally by the laboratories, a system of crosschecking has been established that provides independent evaluations of chemical data on the project level and the laboratory level.

8.1 Precision Assessment

Spiked samples are prepared by choosing a sample at random from each sample set submitted to the laboratory, dividing the sample into equal aliquots, and then spiking each of the aliquots with a known amount of analyte. The duplicate samples are then included in the analytical sample set. The splitting of the sample allows the analyst to determine the precision of the preparation and analytical techniques

associated with the duplicate sample. The RPD between the spike and the duplicate spike are calculated and plotted.

In addition, RPD will be calculated and reported for field duplicate samples.

The RPD is calculated according to the following formula:

$$\text{RPD} = \frac{|x - y|}{\left(\frac{|x + y|}{2}\right)} \times 100$$

Where:

x = First duplicate or analytical value

y = Second duplicate or analytical value

For the present program, a calculated relative percent difference is that below the control limits established by the laboratory will be deemed acceptable.

8.2 Accuracy Assessment

In order to ensure the accuracy of the analytical procedures, an environmental sample is randomly selected from each sample set submitted to the laboratory and spiked with a known amount of the analyte to be evaluated. In general, a sample spike should be included in every set of 10 samples tested on each instrument. The spike sample is then analyzed. The increase in concentration of the analyte observed in the spiked sample, due to the addition of a known quantity of the analyte, compared to the reported value of the same analyte in the unspiked sample determines the percent recovery. Daily control charts are plotted for each commonly analyzed compound and recorded. The percent recovery for a spiked sample is calculated according to the following formula:

$$\% \text{Recovery} = \frac{M_s - M}{S} \times 100$$

Where:

M_s = Amount (mass) of analyte recovered from the spikes sample

M = Amount (mass) of analyte recovered from the primary (non-spiked) sample

S = Known amount (mass) of analyte added to the spike sample

For the present program, control limits that have been established by the laboratory for individual spike recovery percentages will be deemed acceptable.

8.3 Representativeness Assessment

Representativeness is a qualitative parameter that expresses the degree to which sample data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, or an environmental condition. The design of and rationale for the sampling program (in terms of the purpose for sampling, selection of sampling locations, the number of samples to be collected, the ambient conditions for sample collection, the frequencies and timing for sampling, and the sampling techniques) ensure that environmental conditions have been sufficiently represented.

8.4 Completeness Assessment

Completeness is the ratio of the number of valid sample results to the total number of samples analyzed with a specific matrix and/or analysis. Following completion of the analytical testing, the percent completeness will be calculated by the following equation:

$$\text{Completeness} = \frac{Z_v}{Z_p} \times 100$$

Where:

Z_v = Number of valid measurements obtained

Z_p = Number of measurements planned

A calculated completeness of 85% or greater will be considered acceptable.

8.5 Comparability Assessment

Comparability is a qualitative parameter expressing the confidence with which one data set may be compared to another. Data sets will be compared only when precision and accuracy meet the specified acceptance criteria established in this section. Samples will be collected, and analytical sample results will be reported according to standard procedures and methods in order to be comparable with other similar measurement data and sample results. The comparability goal will be achieved through the use of standard procedures to collect and analyze representative samples, and by reporting analytical results in appropriate and consistent units. Comparability will be maintained by consistency in sampling conditions, selection of sampling procedures, sample preservation methods, analytical methods, and data reporting units.

8.6 Sensitivity Assessment

Sensitivity is the capability of a method or instrument to discriminate between measurement response(s) representing differing levels of the variable of interest. The analytical laboratory, as part of their standard operating procedures, follows published, approved analytical methods which validate the methods including an evaluation of sensitivity, precision, and accuracy to ensure that the equipment can operate properly prior to sample analysis. Sensitivity is evaluated by the laboratory reporting detection limit (RDL). The acceptable level of sensitivity for this project is 100% of RDLs below instrument internal performance standards.

9. CORRECTIVE ACTION

The following procedures have been established to ensure that conditions adverse to quality, such as malfunctions, deficiencies, deviations, and errors, are promptly investigated, documented, evaluated, and corrected. When a significant condition adverse to quality is noted at the site, laboratory, or subcontractor locations, the cause of the condition will be determined, and corrective action taken immediately. All project personnel have the responsibility to promptly identify, solicit approved correction, and report conditions adverse to quality. Conditions which warrant corrective action include:

- Predetermined acceptance standards are not attained,
- Procedures or data compiled are determined to be faulty,
- Equipment or instrumentation is found faulty,
- Samples and test results are questionably traceable,
- QA/QC requirements have been violated, and
- System and performance audits indicate problems.

The Project Manager is ultimately responsible for field and QA/QC corrective actions. Any associate has the authority to stop work if serious QA/QC or field related issues arise. The Laboratory QA Manager will be ultimately responsible for corrective actions concerning the laboratory.

9.1 Field Corrective Action

The need for corrective action will be identified as a result of field audits. If problems become apparent that are identified as originating in the field, immediate corrective action will take place. If immediate corrective action does not resolve the problem, appropriate personnel will be assigned to investigate and

evaluate the cause of the problem. When a corrective action is implemented, the effectiveness of the action will be verified such that the end result is elimination of the problem.

Corrective action in the field may be needed when the sample network is changed, or sampling procedures and field analytical procedures require modification due to unexpected conditions. In general, any project personnel may identify the need for corrective action. The field staff will recommend the corrective action. The Project Manager will approve the corrective measure which will be implemented by the field staff. It will be the responsibility of the Project Manager to verify that corrective action has been implemented.

If the corrective action will supplement the existing sampling plan using existing and approved procedures in the work plan, corrective action approved by the Project Manager will be documented. If a corrective action will result in fewer samples being collected than was planned, alternate sample locations, etc., which may result in deviations from the DQOs; the corrective action should be reviewed and approved by all levels of project management and the DERR Project Manager prior to implementation of the corrective action.

Corrective action resulting from internal field audits will be implemented immediately if data may be adversely affected due to unapproved methods or improper use of approved methods. The Project Manager will identify deficiencies and mandate corrective action. Implementation of corrective actions will be performed by the field staff. Corrective action will be documented in field notes and made available to the Project Manager.

Corrective actions implemented will be documented in the field notes. No staff member will initiate corrective action without prior communication with the Project Manager.

9.2 Laboratory Corrective Action

The need for corrective action resulting from QA audits will be initiated by the Laboratory QA Manager. The corrective actions will be performed prior to the release of data from the laboratory. The corrective action will be documented in the logbook and submitted to the data validator. If the corrective action does not rectify the problem, the laboratory will contact the Project Manager. If the nonconformance causes project objectives not to be achieved, it will be necessary to inform all levels of management. Corrective action may include, but is not limited to:

- Reanalyzing the samples, if holding time criteria permit;
- Evaluating and amending sampling and analytical procedures;
- Accepting data with an acknowledged level of uncertainty; and
- Resampling and analysis, if the completeness of the data set or intended use of the data is recognized during a preliminary review to be insufficient to meet program DQOs.

If the above corrective actions are deemed unacceptable, an alternate laboratory will be selected to perform necessary analyses.

9.3 Corrective Action During Data Validation and Data Assessment

The need for corrective action during either the data validation or data assessment may be identified. Potential types of corrective action may include re-sampling by the field staff or re-injection/re-analysis of samples by the laboratory. These actions are dependent upon the ability to mobilize the field staff, whether the data to be collected is necessary to meet the required quality assurance objectives (e.g. the holding time has not been exceeded, etc.). The Project Manager is responsible for identifying situations requiring corrective action, documenting the problem, determining the course of action, and implementing the corrective action.

9.4 Immediate Corrective Action

Any equipment and instrument malfunctions will require immediate corrective actions. The laboratory QC charts are working tools that identify appropriate immediate corrective actions to be taken when a control limit has been exceeded. They provide the framework for uniform actions as part of normal operating procedures. The actions taken should be noted in field or laboratory logbooks. A detailed description of method-specific corrective action limits is provided in the appropriate method. Any deviation from the prescribed control limits must be approved in writing by the Laboratory QA Manager (for laboratory problems) or Project Manager (for field problems).

9.5 Long-Term Corrective Action

The need for long-term corrective action may be identified by standard QC procedures, control charts, and system audits. Any procedural or data quality problem that cannot be solved by immediate corrective action becomes a long-term corrective action. The essential steps in a corrective action system are as follows:

- Identification and definition of the problem,
- Investigation and determination of the cause of the problem,
- Determination and implementation of a corrective action to eliminate the problem, and
- Verification that the corrective action has eliminated the problem.

Documentation of the problem is important in corrective action. The responsible person may be a laboratory analyst, Laboratory QA Manager, Project Manager, or field staff. The Project Manager will verify that the corrective action has been taken, appears effective, and that the problem has been resolved.

10. QUALITY ASSURANCE REPORTS TO MANAGEMENT

10.1 Contents of a Project QA Report

Analytical results of samples analyzed by the laboratory will be submitted to the Project Manager following a QA/QC review by the laboratory. The results will include a tabulation of the analytical data and an explanation of any field conditions or laboratory QA/QC problems and their effects on data quality. Proposed corrective action will be recommended in the event that QA problems are identified during review of data quality.

The final report prepared for the project will contain a discussion of QA/QC evaluations summarizing the quality of the data collected and/or used as appropriate to each activity of the project. The objective of the QA/QC summary will be to ensure that the data are representative of Site conditions and sufficient in quality and quantity to support the field activities. The QA/QC summary will include:

- Tabulated results of all field and analytical data;
- A report from the Laboratory QA Manager evaluating the validity of the analytical data with respect to accuracy, precision, completeness, and representativeness;
- A report from the Project Manager evaluating the results of field and office audits;
- A discussion of field and laboratory QA/QC including PARCC parameters and data usability; and
- The laboratory's Level 3 QC package (method blank results, surrogate recovery, laboratory control sample results, and MS/MSD results).

A quality assurance report will be prepared by the Laboratory QA Manager upon receipt of sufficient QA data from the laboratory. The report will be a summary of QA/QC results of the analytical work conducted and will be included as part of the final remedial action report.

APPENDIX B

**SAMPLING AND ANALYSIS PLAN
FORMER BEAVER MOUNTAIN GUN RANGE
BEAVER COUNTY, UTAH
VOLUNTARY CLEANUP PROGRAM SITE C118**

Project No. 2649-001

To:

**Utah Department of Environmental Quality
Division of Environmental Response and Remediation
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March 17, 2023

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TABLES

Table 1 – Summary of Laboratory Analytical Methods

Table 2 – Summary of Standard Laboratory Analytical Methods for Waste Characterization

ATTACHED FIGURES

Figure 1 Areas of Metal and PAH Impacts in Exceedance of RSLs

Figure 2 Conceptual Site Model Map

APPENDICES

- Appendix A – Standard Operating Procedures
 - SOP 1 – Site Access and Permits
 - SOP 2 – Equipment and Materials
 - SOP 3 – X-Ray Fluorescence (XRF) Analysis
 - SOP 4 – Confirmation Soil Sampling of the Ground Surface
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 - SOP 6 – Surface Water Sampling
 - SOP 7 – Decontamination
 - SOP 8 – Management of Investigation Derived Waste
 - SOP 9 – Site Restoration
 - SOP 10 – Documentation
 - SOP 11 – Surveying of Sample Locations
 - SOP 12 – Sample Documentation and Handling
 - SOP 13 – Chain of Custody Documentation

**SAMPLING AND ANALYSIS PLAN
FORMER BEAVER MOUNTAIN GUN RANGE
BEAVER COUNTY, UTAH
VOLUNTARY CLEANUP PROGRAM SITE C118**

1. INTRODUCTION

This Sampling and Analysis Plan (SAP) describes the methods and procedures for collecting, handling, and analyzing environmental samples from the former Beaver Mountain Gun Range (Site) located in Beaver County Utah. All personnel involved with the collection and handling of samples shall be required to read this plan, and a copy of this plan will be available in the field during all sampling activities. This SAP is intended to be used in conjunction with the Quality Assurance Project Plan (QAPP), the Remedial Action Plan (RAP), and individual work plans prepared for the Site and off-Site properties.

Utah State Institutional Trust Lands Administration (SITLA), the owner and applicant of the former Beaver Mountain Boy Scouts of America (BSA) Gun Range (Site) and the Applicant plans to sell the Site, potentially as residential lots, and wishes to remediate the Site to allow safe residential development. For the purposes of this SAP, the term "Site" is used to refer to the former Beaver Mountain Gun Range, an approximately 2-acre area which is depicted on attached Figure 2.

2. SITE DESCRIPTION

The former Beaver Mountain Gun Range (the site) is an approximately 2-acre target and trap shooting area in forested mountain land in eastern Beaver County, Utah. The gun range is no longer used, but was part of a former Boy Scouts of America camp. The Beaver Mountain gun range includes an approximately one-half acre area in a forest clearing with a shelter at the north end (at the firing line) and with stationary targets to the east and south. Trap shooting occurred all around the gun range clearing and clay pigeon debris and shotgun casings are present throughout the site, except near the entrance driveway. The shooting area, as well as the wooded area which surrounds it, is littered with gun related detritus such as clay pigeons, empty shot gun shells and bullet casings, pellets, and slugs. Trees and timber within this area also contain pellets and slugs. The total area impacted by the gun range is estimated to be two acres.

3. PROJECT OBJECTIVES

The objective is to remediate impacted areas of the gun range area to residential screening levels, so that future residential development is possible. Because of the remoteness of the site, the objective is to remediate the impacts in-situ, as much as possible.

4. SAMPLING ACTIVITIES

Sampling activities will be specified in the RAP, of which this SAP is an appendix. The RAP provides details regarding the specific objectives, methods, and sampling locations for each phase of work. Sampling activities will be planned so as to meet the project objectives detailed in Section 3 of this SAP.

Sampling as addressed in this SAP will be conducted in conjunction with:

- Soil confirmation sampling associated with the implementation of the selected remedy;
- Waste characterization sampling, if necessary.

Utility clearance will be requested through Blue Stakes of Utah prior to commencement of any sampling activities that will require drilling.

All necessary permits will be obtained prior to commencement of any sampling activities. All sampling activities will be conducted in accordance with the SAP, QAPP, RAP and approved work plans. Any deviations will be immediately communicated to both the applicant and VCP project manager and will be subject to their approvals.

5. SAMPLING METHODS

The sampling methods and field procedures Wasatch anticipates utilizing are presented as standard operating procedures (SOPs) contained in Appendix A of this SAP. The specific sampling methods to be utilized for each phase of work will be identified, and the appropriate SOPs will be referenced in the RAP and in each work plan that is submitted for review and approval. If sampling methods become beneficial or necessary that are not included in the SOPs, an SOP will be developed for such sampling methods. The new SOPs will be presented in the applicable work plan and amended to the SAP.

6. ANALYTICAL METHODS

The laboratory analytical methods Wasatch anticipates utilizing for most aspects of the project are summarized in Table 1. Additional laboratory analytical methods may be required for waste characterization. Laboratory analytical requirements for waste characterization will be dependent upon the waste media, analytes detected in the environmental samples associated with the waste, requirements stipulated by the receiving facility, and regulatory requirements. The standard laboratory analytical methods Wasatch anticipates utilizing are summarized in Table 2 (subject to modification at the request of the receiving facility).

**Table 1
Summary of Laboratory Analytical Methods**

Target Analytes	Environmental Media	Laboratory Analytical Methods
Metals: antimony (Sb), copper (Cu), lead (Pb), and zinc (Zn)	Soil	SW-846 6010B/C/D
	Surface Water	SW-846 6020A
Metals: iron (Fe) and tin (Sn)	Soil	SW-846 6010B/C/D
	Surface Water	SW-846 6010B/C/D
Polycyclic Aromatic Hydrocarbons (PAHs), full scan and single selected ion mode (SIM) ²	Soil	SW-846 8270E
	Surface Water	SW-846 8270E

**Table 2
Summary of Standard Laboratory Analytical Methods for Waste Characterization**

Waste Media	Target Analytes	Laboratory Analytical Methods
Soil	pH	U.S. EPA 9045D
	Ignitability	U.S. EPA 1010A
	Reactivity	Sec. 7.3.3, 7.3.4, and 8.3 (Delisted, no longer part of SW-846)
	RCRA F and D-List TCLP and Total VOCs	U.S. EPA 8260D
	RCRA F and D-List TCLP and Total SVOCs	U.S. EPA 8270E
	RCRA F and D-List TCLP and Total Metals	U.S. EPA 6020B and 7470A/7471B
Water	pH	U.S. EPA 9045D
	Ignitability	U.S. EPA 1010A
	Reactivity	Sec. 7.3.3, 7.3.4, and 8.3 (Delisted, no longer part of SW-846)
	RCRA F and D-List VOCs	U.S. EPA 8260D
	RCRA F and D-List SVOCs	U.S. EPA 8270E
	RCRA F and D-List Total Metals	U.S. EPA 6020B and 7470A/7471B

Notes:

RCRA – Resource Conservation and Recovery Act

TCLP – Toxicity Characteristic Leaching Procedure (preparation method 1311 or 1312)

7. QUALITY ASSURANCE AND QUALITY CONTROL

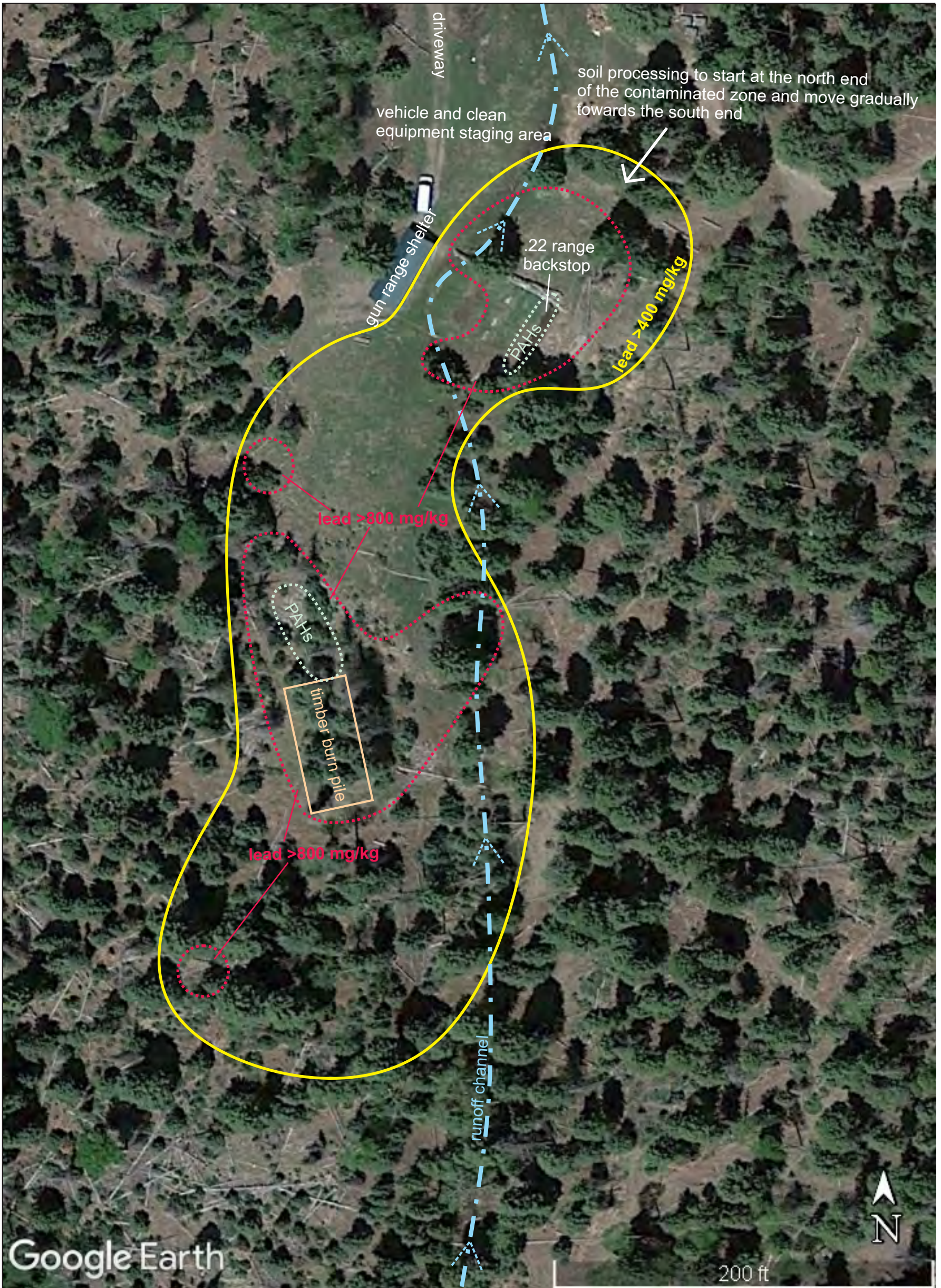
Quality assurance and quality control (QA/QC) procedures will be maintained throughout the duration of project. QA/QC procedures are specified in detail in the QAPP.

8. REPORTING



Reports will be submitted to the VCP project manager within 90 days following the receipt of the final laboratory data after the completion of each phase of work. Deadline extensions may be requested and approved in writing. Reporting requirements are discussed in detail in Section 7 of the QAPP and Section 8 of the RAP.



9. HEALTH AND SAFETY

Wasatch will author a site-specific health and safety plan (HASP) prior to the commencement of field work. A copy of the HASP will be on-Site at all times during field activities. Daily health and safety tailgate meetings will be conducted each morning during field activities.

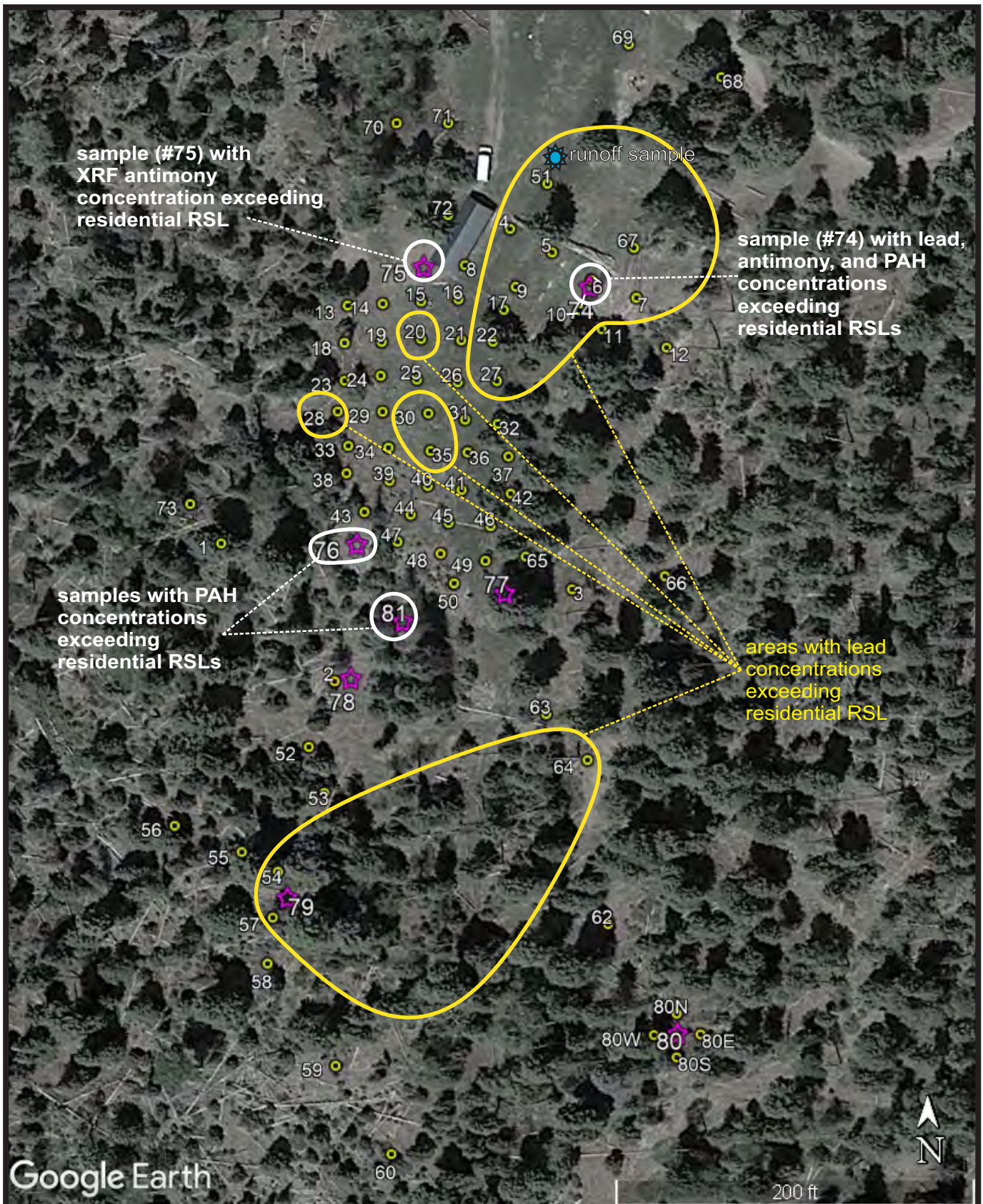


Legend:

-  Remedial Activities Area Boundary, area where COC concentrations potentially exceeds Residential RSL of 400 mg/kg
-  Area where PAHs exceeded Residential RSL

-  Area where Lead exceeded Industrial and Residential RSLs (>800 mg/kg)
-  Area where timber cleared from the site was burned in November 2021

**Figure 2: Site Conceptual Model
Former Beaver Mountain Gun Range**



Legend:

- ★ October 6, 2022 soil sample/XRF survey location
- July 8-9, 2021 soil sample/XRF survey location

- ☀ May 10, 2022 surface water runoff sample location

Figure 1: Areas of Metal and PAH impacts in exceedance of Residential RSLs



SOP 1. SITE ACCESS AND PERMITS

Prior to performing remediation activities, permission will be obtained from the Project Manager, Blue Stakes, and appropriate Utah State Institutional Trust Lands Administration (SITLA) personnel. No excavation work will be performed until proper clearances are obtained.

SOP 2. EQUIPMENT AND MATERIALS

Equipment used in field activities will be monitored by field personnel, who will inspect, maintain, and calibrate field equipment before and after use. In addition, project personnel will be trained in Environmental Protection Agency (EPA)-approved health and safety classes on the use and calibration of environmental monitoring equipment (i.e. the X-Ray Fluorescence Analyzer). They will maintain and calibrate field equipment in accordance with manufacturer's instructions. A copy of the manufacturer's reference manual for each piece of monitoring or testing equipment will be provided with each unit. Calibration parameters will be recorded in the field logbook and/or on an Equipment Calibration Form.

The following major equipment and materials will be used during the remedial activities:

- The XRF instrument will be used to survey site conditions and test soils (both processed and unprocessed) for metals concentrations.
- The mobile soils processing plant will be operated by the Remediation Contractor, Range Recovery Technologies. No unauthorized personnel will operate the processing plant or ancillary equipment (i.e. loaders, equipment transport vehicles, etc.) except in case of emergency (such as shutting down the equipment).
- Personal protective equipment will be used in accordance with the HASP. Project personnel will be outfitted, as appropriate, with protective clothing, hearing protection, safety glasses, hard hats, and respiratory devices as needed. Hard hats, safety glasses, and steel toe boots will be used during all field activities.
- Decontamination supplies, including buckets, brushes, potable water, analyte-free water, and Liquinox® detergent may be used for cleaning and decontaminating personnel and sampling equipment.

SOP 3. X-RAY FLUORESCENCE (XRF) ANALYSIS

Under this method, inorganic metals of interest in soil are identified and quantitated using a field-portable, energy-dispersive, x-ray fluorescence spectrometer. Radiation from one or more radioisotope sources or an electrically excited x-ray tube is used to generate characteristic x-ray emissions from elements in a sample. Up to three sources may be used to irradiate a sample. Each source emits a specific set of primary x-rays that excite a corresponding range of elements in a sample. When more than one source can excite the element of interest, the source is selected according to its excitation efficiency for the element of interest.

Wasatch will use a Niton XL2 950 GOLDD analyzer (or equivalent) following the U.S. EPA Method 6200 (Field Portable X-ray Fluorescence Spectrometry for the Determination of Elemental Concentrations in Soil and Sediment) for *in situ* soil screening. The handheld meter will be used to directly measure the concentrations of the metals of concern in soil. A 20-second measurement time will be used to screen the soil during soil removal activities.

The XRF will be checked each day of use for energy calibration, instrument blank, method blank and calibration checks.

The energy calibration check would be run at a frequency consistent with manufacturer's recommendations. The energy calibration check procedures are as follows:

1. Power up the XRF
2. Press "Yes" to proceed
3. Log on with the password: 1,2,3,4
4. From the "Take a Measurement" (home) screen, touch "System Check"
5. Touch "Perform a System Check"
6. XRF will perform 2 system checks. Please note that the amber active lights are on during this procedure. DO NOT POINT the XRF at yourself or anyone else during this procedure.

Generally, this would be at the beginning of each working day, after the batteries are changed or the instrument is shut off, at the end of each working day, and at any other time when the instrument operator believes that drift is occurring during analysis.

An instrument blank is used to verify that no contamination exists in the spectrometer or on the probe window. The instrument blank can be silicon dioxide, a polytetrafluoroethylene (PTFE) block, a quartz block, clean sand, or lithium carbonate. The instrument blank would be analyzed on each working day before and after analyses are conducted and once per every twenty samples. The instrument blank is labeled "SiO₂ 99.995% PP, 180-647".

A method blank is used to monitor for laboratory-induced contaminants or interferences. The method blank can be clean silica sand or lithium carbonate that undergoes the same preparation procedure as the samples. A method blank would be analyzed at least daily. The method blank is labeled "180-706, USGS SdAR-M2, control sample".

Calibration verification checks should be conducted at least three times per day. This would be the same timetable as the energy calibration check with additional checks for substantial ambient temperature changes. The samples are labeled "RCRApp, 1000Ba 500Ag, As, Cd, Cr, Pb, Se 180-661" or field samples labeled with known Pb and As values. A 30-second measurement time is used on the samples and analysis should be within +/- 20% of the listed values. The Niton XL2 950 GOLDD is only calibrated at the factory and this is only a check for drift during analysis.

XRF In Situ Field Operation for Soils and Sediments:

1. After beginning checks have been completed, select "Sample Type" from the "Take a Measurement" home screen.
2. Select "Soils and Minerals" and then select "Soils"
3. "Ready to Test" will be displayed along with a camera view of analysis area.
4. Prepare the surface to be tested by leveling the area to be tested with a trowel or shoe.
5. Place XRF directly against soil surface and pull the trigger to activate XRF
6. Use a 30-second measurement time to test the selected area. If it is not feasible to use a 30-second measurement time due to the excavation crew's work, a shorter measurement time can be used but the error range increases as measurement time decreases.
7. While analysis is underway, and the active amber lights are displayed, avoid placing hands or feet at the sides or above the XRF to minimize exposure to X-Rays.
8. Minerals will be displayed on the viewing screen with Lead and Arsenic listed first (if present) followed by minerals by concentration.
9. If required, record shot number, displayed on the top left-hand side of viewing screen, and the location.

XRF Composite Soil and Sediment Analysis:

1. Using a clean trowel, shovel or gloved hands, collect samples from composite area and place in a plastic ziplock freezer bag.
2. Mix the soil thoroughly in the bag and remove gravel or crush larger clumps of soil to achieve a semi-uniform grain size.
3. Distribute soil evenly throughout bag and place on a non-metal surface.
4. Analyze different sections of the bag for 30-seconds per shot and record the shot numbers. The thinner the plastic of the bag, the more accurate the XRF analysis.

Moisture content may affect the accuracy of XRF analysis of soil and sediments. When moisture content is below 20%, the overall error from moisture may be minimal. However, moisture content may be a major source of error when analyzing samples of surface soil or sediment that are saturated. Our experience has shown that moisture content inversely affects the analysis, the higher the moisture content the lower the analysis values. If soils are saturated, they can be brought back from the field and dried in a toaster oven, then analyzed per the composite soil and sediment instructions listed above.

Additional details are provided in the U.S. EPA method 6200 documentation.

SOP 4. CONFIRMATION SOIL SAMPLING OF THE GROUND SURFACE

Soil samples will be collected using gloved hands. The use of hand tools is not expected, however, if hand tools are required to break up the surface soils for collection, clean tools will be used. As an alternative new, clean wood stakes that will be used to mark the sample locations may be used to break up the surface soil to facilitate hand sampling. Once a stake is used it will be left to mark the sample location. Confirmation soil sampling will be conducted of the ground surface after the surface soils (~ the upper 6 inches) are removed and before processed soils are replaced. Confirmation soil sampling of the ground surface may also occur after the processed soil is replaced. One composite soil sample will be collected for every 2,000 square feet of surface area (2,000 square feet is approximately 45 x 45 feet). Each 2,000 square feet sample area will be divided into quarters and an approximately equal portion of soil will be collected from each quarter and placed into a ziplock bag where the soil will be mixed and then sampled into laboratory supplied two or four once glass jars.

The samples will be placed directly in sample jars and immediately sealed. As much material as possible will be placed into the jar to minimize potential aeration of the sample. All soil sampling locations, soil collection depth intervals, soil lithologic characteristics, XRF results, and qualitative observations will be noted by the sampler in the field log book.

Samples will be packed, sealed, and shipped in accordance with SOPs 12 and 13.

SOP 5. CONFIRMATION SOIL SAMPLING OF PROCESSED SOILS

Soil will be processed at the mobile soil plant, which will be moved gradually from south to north as the site soils are processed. Processed soil will be left in approximately 25 cubic yard piles until sample analyses indicate the soil has been processed to site screening levels. An XRF analyzer may be used to guide the process. Soil samples will be collected using gloved hands. Each soil pile will be divided into quarters and an approximately equal portion of soil will be collected from each quarter and placed into a ziplock bag where the soil will be mixed and then sampled into laboratory supplied two or four once glass jars.

The samples will be placed directly in sample jars and immediately sealed. As much material as possible will be placed into the jar to minimize potential aeration of the sample. All soil sampling locations, soil collection depth intervals, soil lithologic characteristics, XRF results, and qualitative observations will be noted by the sampler in the field log book.

Samples will be packed, sealed, and shipped in accordance with SOPs 12 and 13.

SOP 6. Surface Water Sampling

Surface water samples may be collected if surface water is observed in the drainage channel which passes through the site. One surface water sample will be collected for each week during which surface water is present. Surface water samples will be collected by dipping sample bottles directly into the water. In cases where the water depth does not permit direct sampling, the water will be collected with a decontaminated glass beaker and transferred into

the analytical sample bottles. In either case the water will be allowed to flow gently into the sample bottles to avoid aeration of the samples.

Samples will be placed in an iced cooler immediately, and will be packed, sealed, and shipped in accordance with SOPs 11 and 12.

SOP 7. Decontamination

Equipment used to obtain soil and groundwater samples will be decontaminated to avoid cross-contamination. Hand tools that contact analytical soil or groundwater samples, will be decontaminated before and between each sampling event. Equipment of this type will be decontaminated by using the following three-step procedure:

1. Laboratory-grade detergent and potable water wash.
2. Potable water rinse.
3. Triple rinse with distilled water or deionized water.

Spray bottles may be used to store and deliver the distilled water. If necessary, sampling equipment will be wrapped with aluminum foil to protect the equipment from dust or vapors between use. Liquids generated during the decontamination process will be handled according to SOP 8.

SOP 8. Management of Investigation-Derived Waste

Investigation-derived waste (IDW) generated during investigation operations will include sanitary waste (label backs, paper towels, etc.), used personal protection equipment (PPE), and decontamination water. Sanitary waste and used PPE will be collected into standard plastic garbage bags and disposed as municipal waste. Decontamination water is not expected to be produced, except occasionally, and will be collected in a steel drum. The drum(s) will be left on site until all remedial activities are completed and then sampled for waste characterization to determine disposal options.

SOP 9. Site Restoration

The remediation area will be restored, to the extent possible, to the previous existing condition. Processed soil, upon receipt of laboratory results which show the soil to have met site target cleanup levels, will be replaced and compacted. The site will be re-seeded with native grasses/plant species to mitigate erosion.

SOP 10. Documentation

Documentation guidelines are intended to ensure that complete and consistent written records are maintained throughout the field activities. The field documents will be reviewed for accuracy and will remain available to field personnel at the site, during field activities. In addition, photographs will be taken in the field to document activities and conditions.

All field activities will be recorded in logbooks. Logbooks will contain descriptions of daily field activities. Information to be included in logbooks includes the following, as appropriate:

- Site personnel
- Phone records
- Sample Records
- Chain-of-custody information
- Remediation Progress

Logbook entries will be made with graphite or waterproof ink. Corrections will be made by drawing a single line through the entry, initialing, and dating the revision. Some field data may be recorded on the specialized forms. These data will not be duplicated in the field logbooks; however, reference to the forms will be recorded in the logbooks, as appropriate.

SOP 11. Site Surveying of Sample Locations

The remediation areas, sample points, and other locations deemed important will be surveyed with the use of a hand held global positioning system instrument. Sample point location coordinates will be logged in the field logbook and marked on aerial photographs of the Site.

SOP 12. SAMPLE DOCUMENTATION AND HANDLING

Sample collection information will be entered into field notebooks. Prior to laboratory shipment, each sample will be logged on a Chain-of-Custody (COC) Form. The COC form will be kept with the samples will accompany the analytical samples during shipment or transport to the laboratory.

Once sealed, sample containers will be labeled and placed in an iced cooler. Coolers to be shipped via courier will be lined with a plastic bag and packed with packing material surrounding the bottles to prevent breakage during shipment. Additionally, the drain spout of the cooler will be taped shut. Ice will be sealed in plastic bags to prevent melted ice from soaking the packing material. A temperature blank may be included in each cooler. A COC form will be enclosed in sealed plastic bags and taped to the underside of the cooler lid. Coolers will be secured with strapping tape and custody seals. The custody seals will be affixed to each sample cooler (not each bottle). The coolers will be shipped or delivered to the appropriate laboratory, by the field technician or overnight courier, so they will arrive for analysis within 3 days of sample collection.

SOP 13 – CHAIN-OF-CUSTODY DOCUMENTATION

A required part of any sampling and analytical program is a system for sample control from collection to data reporting. This includes the ability to trace the possession and handling of samples from the time of collection through analysis and final deposition. This system also ensures against tampering or contamination of samples. The documentation of the sample's history is referred to as the chain of custody (COC). Initially after collection, a sample is considered to be under a person's custody if it fits the following criteria:

- In an individual's possession
- In view of the individual after that person has taken possession
- Secured by the person so that no one can tamper with the sample

The field technician will use COC forms that are equivalent to the U.S. EPA Office of Enforcement COC forms. The sequence for transferring samples from the possession of the sampler, as cited above, to the contract laboratory is as follows:

When the sample bottles are delivered from the laboratory, both the sender and receiver sign and date the COC form as well as specifying on the form what has changed hands. From that point on, every time the sample bottles change hands (whether empty or full) both parties sign and date the transfer. However, some sample bottles are stored at Wasatch and no COC is required for the acquisition of the sample bottles.

The following information is included on the COC:

- Project number
- Project name
- Sample ID number (as noted in the field log book) secured by that person so no one can tamper with the sample
- Signature of sampler
- Date and time of collection (time logged in field log book)
- Type and matrix of sample
- Number of containers
- Preservative
- Requested analyses
- Inclusive dates of possession
- Signature of receiver

In addition to the COC form, other components of the COC will include sample labels, custody seals (if shipping the samples to a laboratory), and field notebook, as summarized below:

Sample Label. A sample label will be affixed to each sample bottle to provide information regarding the sample ID, sampler's initials, analytical tests to be performed, preservative information, date, and time of sample collection.

Custody Seals. Two custody seals will be affixed to each sample shipping container (not each bottle or jar). These seals will show a sampler's (or person in possession of the samples) name, and date sealed. The seals will be taped onto the sample shipping container or lid of the shipping container prior to sample shipment, and will be broken at the laboratory under COC procedures.

APPENDIX C

Storm Water Pollution Prevention Plan

For:

Beaver Mountain Gun Range
Formerly Beaver High Adventure Base
Beaver County, UT 84713
Google Earth Coordinates: 38.284899, -112.429409

Operator(s):

Utah Trust Lands Administration
217 East Center Street, #230
Moab, UT 84532
435-259-7417

Primary SWPPP Contact:

Utah Trust Lands Administration
Bryan Torgerson
Project Manager
435-259-7417
bryantorgerson@utah.gov

SWPPP Preparation Date:

03/14/2023

UPDES Permit Tracking Number:

For SWPPPs being managed on compliance | **GO** the Authorization to Discharge Letter will be in the permits section in compliance | **GO**. The Notice of Intent (NOI) permit will be in the SWPPP section in compliance | **GO**. Please notify the contact person listed above in order to access this information if needed.

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SECTION 1: CONTACT INFORMATION/RESPONSIBLE PARTIES

1.1 Storm Water Team

All operators are required to put together a storm water team and list their individual responsibilities.

Owner:

Utah Trust Lands Administration

Bryan Torgerson

Property Owner Contact

435-259-7417

bryantorgerson@utah.gov

Responsibility: Oversees project development.

Operator:

Utah Trust Lands Administration

Bryan Torgerson

Project Manager

435-259-7417

bryantorgerson@utah.gov

Responsibility: Oversees the completion and management of: Construction, BMP installation and maintenance, site stabilization measures, spill response, inspections, and action items getting completed and marked off.

Utah Trust Lands Administration

Bryan Torgerson

Project Manager

435-259-7417

bryantorgerson@utah.gov

Responsibility: Installs & maintains stormwater & allowable non-stormwater BMPs

SWPPP Inspector

A qualified inspector from accenaGroup will conduct stormwater inspections.

Inspector certifications may be viewed here: <https://goo.gl/7SLEbW>

801-701-6188

support@accenagroup.com

Responsibility: Conducts stormwater inspections

SWPPP Preparation:

Compliance Specialists from accenaGroup

SWPPP Preparer certifications may be viewed here: <https://goo.gl/7SLEbW>

801-701-6188

support@accenagroup.com

Responsibility: Prepares SWPPP documents

Emergency Contact:

Bryan Torgerson | 435-259-7417

SECTION 2: SITE EVALUATION, ASSESSMENT, AND PLANNING

2.1 Construction Site Estimates

Note: The correct acreage should be reflected on the NOI. If there is a discrepancy, the SWPPP or NOI will need to be amended. The NOI can be amended by sending the changes to the Department of Environmental Quality Division of Water Quality.

The following are estimates of the Beaver Mountain Gun Range site:

Construction site area to be disturbed	2.55 Acres
Total project area	2.55 Acres
Rainfall Erosivity Factor R=	22.47

<https://www.epa.gov/npdes/rainfall-erosivity-factor-calculator-small-construction-sites>

2.2 Nature and Sequence of Construction Activity

Nature of Construction: Utah Trust Lands Administration will be removing lead/gun shot contaminated timber to an on-site burn area which will be bermed to prevent migration of contaminated soil. Burning of the timber in the bermed 30' x 30' burn area.

Development for a residential project: Grading, excavation, and remediation of soil to be done by Utah Trust Lands Administration.

A UPDES NOI permit is required for the site because more than an acre will be disturbed, or the site is part of a common plan of development.

BMPs for all the above activities will be applied to the site when necessary and monitored by the on-site inspector. Additional BMPs will be added if needed.

Off-Site Construction Support Activities

Are there any off-site construction support activities for this project: Yes No

On-Site Construction Support Activities

Are there any on-site construction support activities for this project (i.e. equipment storage areas): Yes No

Typical site business days and times

<input checked="" type="checkbox"/> Monday	Time: 7:00am-5:00pm	<input checked="" type="checkbox"/> Friday	Time: 7:00am-5:00pm
<input checked="" type="checkbox"/> Tuesday	Time: 7:00am-5:00pm	<input type="checkbox"/> Saturday	Time:
<input checked="" type="checkbox"/> Wednesday	Time: 7:00am-5:00pm	<input type="checkbox"/> Sunday	Time:
<input checked="" type="checkbox"/> Thursday	Time: 7:00am-5:00pm		

Is the project located in Indian country? Yes No

If yes, name of Reservation, or if not part of a Reservation, indicate "not applicable."

Not Applicable

Is this project considered a federal facility? Yes No

2.3 Phase/Sequence of Construction Activity

General Schedule of Construction Activities

Please refer to the inspections and the maps for details of current construction activities.

Beaver Mountain Gun Range

Stage I - Site Preparations: Perimeter Boundary Sediment Controls Installed

- BMPs associated with this Stage: Perimeter control(s): Earthen berm on the downslope (See SWPPP map in Appendix A for BMP locations)
- Stabilization methods for this stage: Any areas of exposed soil on site that are suspended from earth-disturbing activities, and will be undisturbed for more than fourteen days, to be temporarily stabilized within fourteen days with mulch or temporary seeding (alternative methods include, but are not limited to geotextiles, hydromulch, erosion control blankets, surface covers). Please refer to Section 5.1.12 for temporary stabilization.
- Estimated Start and End Dates for Stage I: 05/2023

Stage II - Clearing and Grading to Prepare for Construction Activities.

- BMPs associated with this Stage: Perimeter control(s), dust controls, track out controls, topsoil controls, soil compaction, and waste controls. (See SWPPP map in Appendix A for BMP locations)
- Stabilization methods for this stage: Any areas of exposed soil on site that are suspended from earth-disturbing activities, will be undisturbed for more than fourteen days, to be temporarily stabilized within fourteen days with mulch or temporary seeding (alternative methods include, but are not limited to geotextiles, hydromulch, erosion control blankets, surface covers). Please refer to Section 5.1.12 for temporary stabilization.
- Estimated Start and End Dates for Stage II: 05/2023 - 06/2023

Stage III - Development – Grading and Remediation of soil

- BMPs associated with this stage: All previous controls will remain in place. stockpiles, and material storage controls will be used as necessary. (See SWPPP map in Appendix A for BMP locations)
- Stabilization methods for this stage: Any areas of exposed soil on site that are suspended from earth-disturbing activities, will be undisturbed for more than fourteen days, to be temporarily stabilized within fourteen days with mulch or temporary seeding (alternative methods include, but are not limited to geotextiles, hydromulch, erosion control blankets, surface covers). Please refer to Section 5.1.12 for temporary stabilization.
- Estimated Start and End Dates for Stage III: 06/2023 - 11/2023

Stage IV - Cessation of Development Activities

- BMPs associated with this Stage: Controls will be removed during this stage. Development activities will cease and vehicles and equipment will be removed. Perimeter controls will remain in place until work is completed.
- Cessation of development activities for the site is estimated for: 11/2023
Temporary stabilization methods: Temporary stabilization is not expected to be needed since vertical construction is expected to begin within 14 days of development completion. However, if vertical construction doesn't begin within that time frame, then the site will be temporarily stabilized and the SWPPP updated. Please refer to Section 5.1.12 for temporary stabilization.

2.4 Site Features and Sensitive Areas to be Protected

Describe areas of sensitivity and unique site features including streams, stream buffers, wetlands, specimen trees, natural vegetation, steep slopes, or highly erodible soils that are to be preserved:

There are slopes that exceed 3% and will be monitored for erosion.

2.5 Maps

General Location Maps

In accordance with Part 3.5.1 e) – A general location map (e.g. portion of a city or county map or similar scale) is attached in Appendix A:

SWPPP BMP Maps

The SWPPP map is attached in Appendix A of this SWPPP.

For SWPPPs that are being managed on compliance|GO the site maps will be located in the documents section and site maps section of compliance|GO. On the map the inspectors record any changes to the BMPs. For BMP tracking purposes, they note and date when the BMP is installed or when a BMP is changed or removed. These notes and notes history stay with the individual icons on the site map and can be viewed on the map history report.

Please notify the contact person for the operator found on the NOI in order to access this information if needed.

SECTION 3: WATER QUALITY

3.1 Discharge Information

Description of storm sewer systems:

Does this site discharge Stormwater into a Municipal Separate Storm Sewer System (MS4)? Yes No

MS4 Operator that receives the discharge from the construction project: NA.

Does this site's stormwater system connect to a detention or retention basin owned by others?

Yes No

Wetlands:

Are there wetlands on site: Yes No

There are no wetlands on site according to site observations and the U.S. Fish and Wildlife website.

Resource: <http://www.fws.gov/nwi/>

3.2 Receiving Waters

Description of receiving waters:

The receiving water is Merchant Creek.

Please specify which tier your state or tribe has designated the receiving waters:

Category 1 Category 2 Category 3 Not Designated

Distance to receiving water:

The site is 4,200 feet from Merchant Creek.

Any Surface Water Crossings?

Yes No

List all waters of the state located within one mile downstream of the discharge point of the site:

Merchant Creek

3.3 Impaired Waters

Description of impaired waters or waters subject to TMDLs including waters within one mile of the site:

Is Merchant Creek impaired? Yes No

Resources:

<https://www.epa.gov/waterdata/surf-your-watershed>

Description of additional precautions taken to minimize pollution effects if discharging to sediment or nutrient impaired waters:

For sites that discharge to sediment or nutrient impaired waters then stabilization must be completed within 7 days of temporary or permanent cessation of earth disturbing activities. The site will also need to be inspected every 7 days and within 24 hours of a rainfall event of 0.5 inches or greater, or snowmelt runoff that is sufficient to cause a discharge.

3.4 High Water Quality

Is Merchant Creek designated as High Water Quality? Yes No

If yes, complete the following:

What category is the water designated? Category 1 Category 2

Pollutants for which there is a TMDL: NA

Resources:

<https://surface-water-quality.ugrc.utah.gov/>

Description of additional precautions taken to minimize pollution effects if discharging to high-quality waters:

For sites that discharge to a high-quality water, stabilization must be completed within 7 days of temporary or permanent cessation of earth disturbing activities. The site will also need to be inspected every 7 days and within 24 hours of a rainfall event of 0.5 inches or greater, or snowmelt runoff that is sufficient to cause a discharge.

SECTION 4: Pollution Prevention Standards

4.1 Potential Sources of Pollution

The following chart listing identifies any and all potential sources of sediment and pollutants that may reasonably be expected to affect the quality of storm water discharges from this construction site. Potential Pollutant, pollutant source, whether or not it is present on site, and the location of any and all pollutants are indicated on the chart below. The SWPPP map identifies pollutant sources of sediment, erosion, material storage, trash bins, concrete washout bin and waters, other washout waters, and vertical construction areas whereby building materials utilized by trades below will be present. It is understood that construction vehicles that carry pollutants such as street vehicles, forklifts, skid loaders, large trucks, and tractors will be on many parts of the working site. Best Management Practices to manage and control these pollutants are found and described with details in this SWPPP.

Activities	Check with an X the activities that apply	Sediment	Nutrients	Heavy Metals	pH (acids and bases)	Pesticides & Herbicides	Oil & Grease	Bacteria & Viruses	Trash, Debris, Solids	Other Pollutants
Clearing, grading, excavating, and un-stabilized areas	<input checked="" type="checkbox"/>	√							√	
Asphalt paving operations	<input type="checkbox"/>	√					√		√	
Concrete washout, stucco and cement waste	<input type="checkbox"/>			√	√				√	
Structure construction, painting, cleaning	<input type="checkbox"/>			√	√				√	√
Demolition and debris disposal	<input checked="" type="checkbox"/>	√							√	
Dewatering operations	<input type="checkbox"/>	√							√	
Waterline flushing	<input type="checkbox"/>	√	√		√				√	√
Material Delivery and storage	<input type="checkbox"/>	√	√	√	√		√		√	√
Material use during building process	<input type="checkbox"/>		√	√	√		√		√	√
Solid waste disposal	<input checked="" type="checkbox"/>								√	√
Hazardous Waste, contaminated spills	<input type="checkbox"/>			√	√	√	√			√
Sanitary waste	<input checked="" type="checkbox"/>		√		√			√		
Vehicle/equipment fueling, maintenance, use and storage	<input checked="" type="checkbox"/>						√		√	√
Landscaping operations	<input type="checkbox"/>	√	√			√			√	√
Describe others	<input type="checkbox"/>									

4.2 Allowable Non-Stormwater Discharge Management

All discharges authorized by the permit and covered by this SWPPP are composed entirely of storm water associated with construction activities or are an authorized Non-Storm Water Discharge. Allowable non-stormwater discharges and the measures used to eliminate or reduce them and to prevent them from becoming contaminated are as follows:

Type of Allowable Non-Stormwater Discharge	Likely to be Present at Your Site?
Discharges from emergency fire-fighting activities	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
Fire hydrant flushings	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
Landscape irrigation	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
Waters used to wash vehicles and equipment	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
Water used to control dust	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
Potable water including uncontaminated water line flushings	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
Routine external building wash down	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
Pavement wash waters	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
Uncontaminated air conditioning or compressor condensate	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
Uncontaminated, non-turbid discharges of ground water or spring water	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
Foundation or footing drains	<input type="checkbox"/> YES <input type="checkbox"/> NO

For all yes answers above describe:

4.2.1 Dust Control – Please refer to Section 5.

4.3 Dewatering Practices

De-watering

For dewatering off site or into a storm drain, a UPDES Dewatering Permit must be obtained. Also, the MS4 must be notified.

Will dewatering occur at the construction site? Yes No

4.4 Natural Buffers or Equivalent Sediment Controls

Natural Buffers (Within 50 feet of the project's earth disturbance)

Are there surface waters within 50 feet of earth disturbance? Yes No

SECTION 5: EROSION AND SEDIMENT CONTROLS

The following categories of BMP activity are BMPs that will be implemented to control pollutants in storm water discharges as details are provided in each area. The SWPPP map will include the BMPs that are located on site. The maps will be updated according to what is on site at the current time along with the notes about the specific BMPs.

For SWPPPs that are being managed on compliance | **GO** the site maps will be updated with the appropriate BMPs. The site maps are located in the site maps section in compliance | **GO**.

Please notify the contact person for the operator found on the NOI in order to access this information if needed.

5.1 Minimize Area of Disturbance

CGP Requirement	Example BMPs	BMPs Selected (Name and Reference Number if applicable)
Preserve vegetation where possible and direct storm water to vegetated areas when feasible (CGP 2.2.2.)	Phasing to minimize disturbance, signs/fences to protect areas not being disturbed.	5.1.1.a Minimize Area of Disturbance, 5.1.1.b Minimize Exposed Soils Through Phasing, 5.1.1.c Preservation of Natural Vegetation
Install sediment controls along perimeter areas that receive pollutant discharges (CGP 2.2.3.).	Silt fence, fiber rolls, earth berms	5.1.2.a Compacted Earthen Berm
Minimize sediment track-out (CGP 2.2.4.)	Restrict access, stabilize exits, track-out pads, tire washing station, clean-up sediments	NA
Manage stockpiles with perimeter controls and locate away from storm water conveyances (CGP 2.2.5.)	Sediment barriers downgradient, proper location, covered stockpiles, diverting storm water from stockpiles	5.1.4.a Stockpile Containment
Minimize dust (CGP 2.2.6.)	Water application, mulching, chemical dust suppression techniques	5.1.5.a Wetting with Water
Minimize steep slope disturbance (CGP 2.2.7.)	Erosion control blankets, tackifiers, protect slopes from disturbance	5.1.6.a Monitor for Erosion, 5.1.6.b Preservation of Vegetation,
Preserve topsoil (CGP 2.2.8.)	Stockpile topsoil	5.1.7.a Topsoil Stockpiling
Minimize soil compaction where final cover is vegetation (CGP 2.2.9.)	Restrict vehicle access, recondition soils before seeding	5.1.8.a Remediation of Soils Prior to Landscaping
Protect storm drain inlets (CGP 2.2.10.)	Inserts, rock-filled bags, covers	NA
Slow down runoff with erosion controls and velocity dissipation devices (CGP 2.2.11.)	Check dams, riprap	NA

Appropriately design any sediment basins or impoundments (CGP 2.2.12.)	Design to 2-year 24-hour storm or 3,600 cubic feet per acre drained, include design specifications	NA
Follow requirements for any treatment chemicals (polymers, flocculants, coagulants, etc.)	Store in leak proof containers and cover, proper training, minimize use	NA
Stabilize exposed portions of site with 14 days of inactivity (CGP 2.2.14).	Seeding, erosion control blankets, gravel, hydromulch	NA

Minimize Area of Disturbance

5.1.1.a Minimize Area of Disturbance

Phase of Construction/Timing of Installation: Throughout construction

Describe: The majority of the site will need to be disturbed for construction purposes. The SWPPP map(s) in Appendix A will show where the limit of disturbance is, and any areas of the site that will be preserved and protected.

Removal of vegetation will only progress in areas that will be disturbed as needed. The other areas outside of these limits will be left undisturbed.

How to Maintain: Put up perimeter controls and/or other barriers to prevent construction exceeding its limits.

Design Specifications and Drawings: Please refer to Appendix H.

5.1.1.b Minimize Exposed Soils Through Phasing

Phase of Construction/Timing of Installation: Throughout construction

Describe: Disturbance of any part of the site will only occur as needed. All other areas of the site will be left undisturbed. Construction will progress in this manner minimizing the exposed soils until disturbance is absolutely needed.

How to Maintain: Leave vegetation in place wherever possible.

Design Specifications and Drawings: Please refer to Appendix H.

5.1.1.c Preservation of Natural Vegetation

Phase of Construction/Timing of Installation: Throughout construction

Describe: The majority of natural vegetation will be removed for construction purposes. The areas of vegetation will be preserved where possible around the perimeters of the site.

How to Maintain: Leave vegetation in place wherever possible.

Design Specifications and Drawings: Please refer to Appendix H.

Perimeter Controls

5.1.2.a Compacted Earthen Berm

Phase of Construction/Timing of Installation: Prior to construction.

Describe: The compacted berm prevents unfiltered stormwater from running off the site and into the surface waters.

How to Maintain: Berms need to be compacted and stabilized. The Earth Berm need to be maintained when it starts to erode away, has been knocked over, or disturbed in any way. Inspect after rain events for breaks or erosion. Remove sediment blockage that prevents drainage. Maintain a positive grade. Check outlets for erosion.

Design Specifications and Drawings: Please refer to Appendix H.

Minimize Sediment Track-Out

NA

Manage Stockpiles

5.1.4.a Stockpile Containment

Phase of Construction/Timing of Installation: During excavation and grading

Describe: Stockpiles must be placed outside of natural buffers and away from any concentrated storm water flow such as storm water conveyances, storm drain inlets, and areas where storm water flows are concentrated. There must be a perimeter control placed along down-gradient areas from the stockpile. If stockpiles are not expected to be disturbed for more than 14 days, they will be covered or seeded.

How to Maintain: Provide cover or appropriate temporary stabilization for stockpiles that will be unused for 14 or more days and are stored in areas being inspected at a reduced frequency due to temporary stabilization or frozen conditions. Maintain the perimeter controls. Hosing down or sweeping soil or sediment from impervious surfaces into any storm water conveyance, storm drain inlet, or water of the state is prohibited. Contain and securely protect stockpiles from wind. Water the stockpiles to form a crust in order to prevent dust.

Design Specifications and Drawings: Please refer to Appendix H.

Minimize Dust

5.1.5.a Wetting with Water

Phase of Construction/Timing of Installation: As needed, throughout the length of the project.

Describe: Either a water truck or water hose will be brought on site as needed

and used to help minimize dust on site.

How to Maintain: If using a water truck, make sure water tank has adequate amounts of water. If using a water hose, make sure that the hose is firmly secured and does not have any leaks or holes.

Design Specifications and Drawings: Please refer to Appendix H.

Minimize Steep Slope Disturbance

Slope protection is required in areas of the site that have steep slopes:

Does this site have steep slopes?

No >3% >15%

5.1.6.a Monitor for Erosion

Phase of Construction/Timing of Installation: Throughout construction activities.

Describe: The site will need to be monitored for erosion.

How to Maintain: If erosion occurs then the spot will be smoothed over and cat tracked.

Design Specifications and Drawings: Please refer to Appendix H.

5.1.6.b Preservation of Vegetation

Phase of Construction/Timing of Installation: Throughout construction activities.

If needed, install highly-visible temporary fencing prior to soil disturbance activities. If fencing is installed for protected trees/plants, remove it last after all construction activities are completed.

Describe: Preserve existing vegetation as much as practicable where no construction activity will take place, or where future activity will occur at a later date. Sites with existing natural vegetation designed for preservation may include those with steep slopes, wooded areas, etc.

How to Maintain: Clearly define limits of disturbance with applicable employees and contractors. If temporary fencing was installed to identify the limit of disturbance, inspect regularly and repair or replace as needed. Construction equipment, stockpiles, and materials storage areas should be located where they will not cause damage to the vegetation to be preserved.

Design Specifications and Drawings: Please refer to Appendix H.

Preserve Topsoil

5.1.7.a Topsoil Stockpiling

Phase of Construction/Timing of Installation: During excavation and grading

Describe: Topsoil will be stockpiled and saved. Please see above for stockpiling controls. Topsoil will be replaced in areas to be landscaped. If additional topsoil is needed then it will be hauled in.

How to Maintain: Water the stockpiles to form a crust in order to prevent dust.

Maintain the perimeter controls.

Design Specifications and Drawings: Please refer to Appendix H.

Minimize Soil Compaction

5.1.8.a Remediation of Soils Prior to Landscaping

Phase of Construction/Timing of Installation: Prior to landscaping

Describe: The soils will have remediation prior to landscaping to allow for infiltration of water following construction. Remediation will include rototilling the soil to break up the soil compaction and allow for better water infiltration.

Also, topsoil will be added to the landscape areas to increase the infiltration rate.

How to Maintain: Rototill the soil during the landscaping phase in areas where the soil has been compacted.

Design Specifications and Drawings: Please refer to Appendix H.

Protect Storm Drain Inlets

NA

Slow Down Runoff with Erosion Controls and Velocity Dissipation Devices

NA

Sediment Basins or Impoundments

NA

Treatment Chemicals

NA

Inactivity Stabilization

The extent necessary to prevent erosion in arid and semi-arid areas means for visually flat areas, temporary non-vegetative stabilization is not required (roughly from 0 percent up to 5 percent) unless an erosion concern exists. Areas with slopes roughly 5 percent to 20 percent must have, at minimum, controls to reduce storm water velocities to a point that erosion is controlled. Over a 20 percent slope requires soil surface stabilization. The amount of stabilization provided must increase commensurately with increasingly steeper slopes.

Is temporary non-vegetative stabilization required for this site (to qualify for no stabilization, slopes must be below 5% with no erosion concerns)?

Yes

No

5.2 Linear Site Perimeter Control Exemption

Linear Activities

Is this project a linear project? Yes No

5.3 Final Stabilization

Stabilization requirements

The description of procedures for final stabilization is listed below for areas not covered by permanent structures). If final cover is vegetation, a uniform perennial vegetation that provides 70% or more of the vegetative cover that existed prior to earth-disturbing activities will be provided. Initiate the installation of stabilization measures on any areas of exposed soil on site that are permanently suspended from earth-disturbing activities, and will be undisturbed for more than fourteen days, prior to the end of the 14th day of inactivity. Complete the installation of stabilization measures as soon as practicable, but no later than 14 calendar days after the start of initial installation. Exception: Arid, semi-arid, and drought-stricken areas are required to be seeded/planted so that the before mentioned vegetative requirement is expected to be met within 3 years. Establishment of vegetation is not required; however, additional erosion controls may be needed. Both vegetative and non-vegetative stabilization techniques must be described.

Sensitive or High-Quality Waters:

For sites that discharge to high-quality waters or to sediment or nutrient impaired waters: Stabilization must be completed within 7 days after stabilization has been initiated.

Does this site discharge to sediment or nutrient impaired waters? Yes No

Insert or describe the detailed plan for site stabilization:

Pervious surfaces will not be permanently stabilized with vegetation at this time. The site will be handed over to the vertical construction contractor. Temporary stabilization is not expected to be needed, however, if vertical construction is not expected to begin within 14 days then the site will be hydroseeded and tackifier will be used on slopes that exceed 5% incline. The SWPPP will be updated at that time if needed.

For SWPPPs that are being managed on compliance | **GO** the site maps will be updated with implemented stabilization measures, and are located in the documents section and the site maps section of compliance | **GO**.

If available, the landscaping plan for this site will be in Appendix A.

SECTION 6: POLLUTION PREVENTION

6.1 Spill Prevention and Response

Spill Response Prevention and Control Plan

- Describe the spill prevention and control plan to include ways to reduce the chance of spills, stop the source of spills, contain and clean up spills, dispose of materials contaminated by spills, and train personnel responsible for spill prevention and control. (For more information, see *SWPPP Guide*, Chapter 5, P2 Principle 6.)
- Some projects/site may be required to develop a Spill Prevention Control and Countermeasure (SPCC) plan under a separate regulatory program (40 CFR 112). If you are required to develop an SPCC plan, or you already have one, you should include references to the relevant requirements from your plan.
- Also, see EPA's *Spill Prevention and Control Plan BMP Fact sheet* at <https://www.epa.gov/npdes/national-menu-best-management-practices-bmps-stormwater#constr>
- Spill controls must contain spills, and be mobilized at the moment of need. The plan must include the materials and method of containment and for flowing liquid, cleanup, disposal and follow the minimum spill controls below.

Any discharges in 24 hours equal to or in excess of the reportable quantities listed in 40 CFR 117, 40 CFR 110, and 40 CFR 302, will be reported to the National Response Center and the Division of Water Quality (DWQ) as soon as practical after knowledge of the spill is known to the permittees. The permittee shall submit within 14 calendar days of knowledge of the release a written description of: the release (including the type and estimate of the amount of material released), the date that such release occurred, the circumstances leading to the release, and measures taken and/or planned to be taken to the Division of Water Quality (DWQ), 288 North 1460 West, P.O. Box 144870, Salt Lake City, Utah 84114-4870. The Storm Water Pollution Prevention Plan must be modified within 14 calendar days of knowledge of the release to provide a description of the release, the circumstances leading to the release, and the date of the release. In addition, the plan must be reviewed to identify measures to prevent the reoccurrence of such releases and to respond to such releases, and the plan must be modified where appropriate.

Other than the below procedures and specifications for management of hazardous spill, absorbent/oil dry, sealable containers, plastic bags, and shovels/brooms are suggested minimum spill response items that should be at this location.

Designated Person on Site for Spill Clean-up and Response:

Bryan Torgerson
Project Manager
Utah Trust Lands Administration
435-259-7417
bryantorgerson@utah.gov

EMERGENCY NUMBERS

Utah's Division of Water Quality	801-538-6146
24-hour DWQ answering service	801-536-4123
Utah Hazmat Response Officer (24-hour)	801-538-3745
Reportable Quantity	
EPA National Response Center	800-424-8802
Beaver County Storm Water Contact/Public Works	435-438-6464
Beaver County Fire Department	435-438-5218
Beaver County Sherrif Department	435-438-2862
Emergency	911

A list of hazardous material spill response companies is listed on the following pages.

Hazardous Material	Location of Spill	Reportable Quantity
Oils, fuel, hydraulic, brake fluid	Land/Water	25 gallons/ Visible Sheen
Refrigerant	Air	1 lb.
Antifreeze	Land/Water	13 gallons
Battery Acid	Land/Water	100 lbs.
Engine Degreaser Products	Land/Water	100 lbs.
Gasoline/Diesel Fuels	Land/Water	100 lbs.

1. Utah Code Annotated (UCA) 19-5-107(1)(a): it is unlawful for any person to discharge a pollutant into waters of the state or to cause pollution which constitutes a menace to public health and welfare.

2. Utah Administrative Code (UAC) R317-2-7.2: It shall be unlawful, and a violation of these regulations, for any person to discharge or place any waste or other substance in such a way as will be or may become offensive, such as unnatural deposits, floating debris, oil, scum, or other nuisances such as color, odor or taste; or cause conditions which produce undesirable aquatic life or which produce objectionable tastes in edible aquatic organisms; or result in concentrations or combinations of substances which produce undesirable physiological responses in desirable resident fish, or other desirable aquatic life, or undesirable human health effects, as determined by bioassay or other tests performed in accordance with standard procedures.

SPILL RESPONSE PLAN

Spills require action. Ensure your people are safe, then on-site equipment and property, then the environment.

- 1st Priority: Protect all People
- 2nd Priority: Protect Equipment and Property
- 3rd Priority: Protect the Environment

1. Make sure the spill area is safe to enter and that it does not pose an immediate threat to health or safety of any person.
2. Stop the spill source. Refer to MSDS sheets so that the spilled material can be handled properly.
3. Check for hazards (flammable material, noxious fumes, cause of spill) - If flammable liquid, turn off engines and nearby electrical equipment. If serious hazards are present leave area and call 911. LARGE SPILLS ARE LIKELY TO PRESENT A HAZARD.
4. Call co-workers and supervisor for assistance and to make them aware of the spill and potential dangers.
5. If possible, stop spill from entering storm drain (use absorbent or other material as necessary, close valve to drain, cover or plug drain)
6. Stop spill from spreading (use absorbent or containment materials)
7. If spilled material has entered a storm drain then check oil/water interceptor or catch basins then notify the local city. Clean out the storm drain if possible. Do not spray spilled materials down the storm drain.
8. Clean up spilled material/absorbent (do not flush area with water) - If outside clean-up service is required, phone numbers of qualified clean up companies is available on following pages.
9. Properly dispose of cleaned material/absorbent into secure container for disposal as hazardous waste
10. Make sure cleaned area is not slippery (if slippery, put down no-slip material or mark area with a "slippery when wet" sign)

Spill Kit Information:

Is there a spill kit on site? Yes No

Describe the spill kit: The spill kit will consist of absorbent pads, granular absorbents, socks, gloves, disposal bags, scoop or shovel, and a broom.

The information below is to assist in obtaining the correct materials and equipment for spill response and spill clean-up.

Absorbents – pads, pillows, booms, socks, dikes, rolls, and loose or particulate sorbents

1. Universal – absorbs – oils, water-based fluids, water, coolants, solvents, and most non-hazardous liquids.
2. Oil Only – Absorbs oils and repels water
3. Hazmat – Absorbs most fluids including corrosive liquids

Containment:

1. Spill Berm – A mobile containment boom – designed to contain a spill or protect an inlet
2. Drain Seals – Designed to seal an inlet to prevent any liquid from entering the inlet to allow for clean-up of the spill
3. Drain absorbents – designed to absorb oils while allowing water to pass through

Tools (Non-sparking, chemical and corrosion resistant):

1. Shovel – A shovel that does not produce sparks
2. Scoops – to clean up absorbents
3. Broom – sweep up absorbents
4. Squeegee
5. Plastic bags
6. Container – to hold the spill cleaned-up debris

Personal Protective Equipment:

1. Heavy Duty Gloves made of nitrile or neoprene
2. Safety Glasses or goggles that are chemical resistant
3. Disposable lab coat or apron
4. Boot covers

Other Supplies (May be needed):

1. Warning Tape or signs
2. Labels – to mark the cleaned-up equipment for disposal
3. Markers
4. MSDS

Hazardous Material Spill Reporting Sheet

This Report must be submitted to the Utah Department of Environmental Quality Division of Water Quality within 14 days of the hazardous material release that meets or exceeds a reportable quantity. A copy of this form must also be included in this SWPPP.

Hazardous Material Spill Reporting Sheet	
Hazardous material released.	
Estimated amount of release.	
Was the release reported to the appropriate authorities? If reported then to whom? (Reportable quantities are listed in section 4.1 of the SWPPP)	
Date that the release occurred.	
Circumstances leading to the release.	
Measures taken or planned to clean up the release.	
Steps taken to prevent a future release.	

Please send the report to the address below within 14 days of the hazardous material release.

Department of Environmental Quality
 Division of Water Quality
 195 North 1950 West
 PO Box 144870
 Salt Lake City, Utah 84114-4870

6.2 Pollution Prevention Controls

CGP Requirements	Example BMPs	BMPs Selected (Name and Reference Number if applicable)
Equipment and vehicle fueling (CGP 2.3.1)	Spill kits, SPCCP, drip pans, locate activities away from conveyances, use secondary containment	6.2.1.a Mobile Fueling
Equipment and vehicle washing (CGP 2.3.2.)	Locating away from surface waters and storm water conveyances, directing wash waters to a sediment basin or sediment trap, using filtration devices	NA
Storage, handling, and disposal of building products and waste (CGP 2.3.3.)	Cover (plastic sheeting / temporary roofs), secondary containment, leakproof containers, proper dumpsters, secured portable toilets, locate away from storm water conveyances	6.2.2.a Leakproof Dumpsters, 6.2.2.b Covered Cans or Bagging of Trash, 6.2.2.c Portable Toilets, 6.2.2.d Construction Materials Storage
Washing of stucco, paint, concrete, form release oils, curing compounds, etc. (CGP 2.3.4.)	Leak proof containers, lined pits, locate away from storm water conveyances	NA
Properly apply fertilizer (CGP 2.3.5)	Follow manufacture specifications, document deviations in applications, avoid applications to frozen ground, before heavy rains, or to storm water conveyances	NA

Equipment and Vehicle Fueling

6.2.1.a Mobile Fueling

Phase of Construction/Timing of Installation: Throughout construction as needed

Describe: Vehicles may be fueled on site using a mobile fueler. Wheels will be chocked during fueling activities, a drip pan provided, and fueling activities will be manned at all times. Vehicles will not be topped off.

How to Maintain: Properly dispose of fuel drippings. Clean up spills immediately.

Design Specifications and Drawings: Please refer to Appendix H.

Equipment and Vehicle Washing

NA

Storage, Handling, and Disposal of Building Products and Waste

6.2.2.a Leakproof Dumpsters

Phase of Construction/Timing of Installation: Beginning of construction

Describe: Dumpsters will be put into place for construction waste on site.

How to Maintain: Dumpster must be emptied prior to trash and debris going above the rim of the dumpster.

Design Specifications and Drawings: Please refer to Appendix H.

6.2.2.b Covered Cans or Bagging of Trash

Phase of Construction/Timing of Installation: Beginning of construction

Describe: All blowable trash or pollutant producing waste must be bagged for containment. Liquid or leachable waste must be bagged to prevent leaks from the container.

How to Maintain: Blowable trash must be contained and picked up when found on the ground in the construction site. Liquid or leachable waste must be contained, and if leak-proof dumpster used, repairs made if needed.

Design Specifications and Drawings: Please refer to Appendix H.

6.2.2.c Portable Toilets

Phase of Construction/Timing of Installation: Beginning of construction

Describe: Portable toilets will be placed in designated areas minimum of 10 feet from the street.

How to Maintain: Must be staked and 10 feet from the street to prevent spillage that could run into the storm drains.

Design Specifications and Drawings: Please refer to Appendix H.

6.2.2.d Construction Materials Storage

Phase of Construction/Timing of Installation: Prior to bringing construction materials on site.

Describe: A materials storage area will be designated on site and will be placed away from storm water conveyances. Liquid materials will be sealed properly and placed in secondary containment.

How to Maintain: All materials will be returned to designated area at the end of each day if not being used. Clean up any spills (please refer to Section 6.1) if necessary.

Design Specifications and Drawings: Please refer to Appendix H.

Washing of Stucco, Paint, Concrete, Form Release Oils, Curing Compounds, Etc.

NA

Properly Apply Fertilizer

NA

SECTION 7: SPECIAL CONDITIONS

7.1 Emergency Related Projects

Is this an emergency related project? Yes No

7.2 UIC Class 5 Injection Wells

No underground injection controls are to be installed on site.

7.3 Chemical Treatment

Will treatment chemicals be used at this construction site? Yes No

Soil Types

List all the soil types (including soil types expected to be found in fill material) that are expected to be exposed during construction and that will be discharged to locations where chemicals will be applied: No Data Available in Web Soil Survey for this area. See Appendix G for overview of project.

Treatment Chemicals

In order to use treatment chemicals an approval letter from the Department of Environmental Quality is required. Erosion and Sediment controls must be used before and after the use of treatment chemicals. The chemicals must be properly stored. The MS4 must be notified and approve of the use of treatment chemicals. Proper documentation needs to be inserted into the SWPPP whenever treatment chemicals are used.

If received, the approval letter from the DWQ will be located in Appendix G.

List all treatment chemicals that will be used at the site and explain why these chemicals are suited to the soil characteristics: Free Flow 200 Heavy Metals Treatment Product

Describe the dosage of all treatment chemicals you will use at the site or the methodology you will use to determine dosage: A mobile screen plant, designed specifically for this type of remediation will be used to regulate the chemical used. See information in Appendix G

Provide information from any applicable Material Safety Data Sheets (MSDS): See Appendix G

Describe how each of the chemicals will be stored: Chemical will be stored in a trailer onsite.

Include references to applicable state or local requirements affecting the use of treatment chemicals, and copies of applicable manufacturer's specifications regarding the use of your specific treatment chemicals and/or chemical treatment systems:
Appendix G

Special Controls for Cationic Treatment Chemicals (if applicable)

If you have been authorized by DWQ to use cationic treatment chemicals, identify the specific controls and implementation procedures you are required to implement to ensure that your use of cationic treatment chemicals will not lead to a violation of water quality standards or harm aquatic life: NA

Schematic Drawings of Storm Water Controls/Chemical Treatment Systems

Provide schematic drawings of any chemically enhanced storm water controls or chemical treatment systems to be used for application of treatment chemicals: NA

Training

Describe the training that personnel have received prior to permit coverage, who handle and apply chemicals, or will receive, prior to the use of treatment chemicals: Contractor is a professional business specializing in Lead Reclamation Projects.

SECTION 8: INSPECTIONS & CORRECTIVE ACTIONS

8.1 Inspections

Inspection Schedule and Procedures

Standard Frequency:

- At least once every 7 calendar days
- At least once every 14 calendar days and within 24 hours* of the initial 0.5 inches of rain and at the end of the storm event.

Increased Frequency (if applicable):

- At least once every 7 calendar days and within 24 hours* of the initial 0.5 inches of rain and within 24 hours after the end of the storm event. Increased frequency due to site discharging to a high-quality water or impaired receiving water.

Decreased Frequency (if applicable):

- At least once every 14 calendar days for the first month, then once a month. Decreased frequency due to the site having met temporary stabilization requirements (see part 2.2.14.a. of the Construction General Permit (CGP)). List beginning and ending dates of the period. Once construction activity resumes at a later date, the inspection frequency increases to the applicable requirements in Parts 4.2 and 4.3 of the CGP.
- At least once a month and within 24 hours* of the initial 0.5 inches of rain and at the end of the storm event. Decreased frequency due to the site being in an arid area.
- At least once a month and within 24 hours* of the initial 0.5 inches of rain and at the end of the storm event during the dry season: List months for dry season (Along the Wasatch Front: June, July, & August). Decreased frequency due to the site being in a semi-arid area.
- No inspections due to frozen conditions with land disturbance suspended (and where possible, having met stabilization requirements applicable to Part 2.2.14.a. of the CGP). Must have 3 months of continuous expected frozen conditions based on historical averages: List months of suspended inspections. If thawing conditions start to occur (as defined in Part 10 of the CGP), or if weather conditions make discharges likely, the regular inspection frequency applicable for the site (as described in Parts 4.2 and 4.3 of the CGP) must be resumed.
- Once per month due to frozen conditions with continued activities (and except for areas of the site where there are active construction activities, disturbed areas have met stabilization requirements applicable to Part 2.2.14.a.). Must have 3 months of continuous expected frozen conditions based on historical averages: List months of frozen conditions. If thawing conditions start to occur (as defined in Part 10 of the CGP), or if weather conditions make discharges likely, the regular inspection frequency applicable for the site (as described in Parts 4.2 and 4.3 of the CGP) must be resumed.

Other:

Other (i.e., different city/county requirements): _____

For SWPPPs that are being managed on compliance|GO all inspections will be located in the inspection history section of compliance|GO.

Please notify the contact person for the operator found on the NOI in order to access this information if needed.

Inspections will be conducted on this project in accordance with applicable governing UPDES regulations, and individual municipal regulations. Inspections will be conducted by qualified inspectors from accenaGroup. Where sites have been finally or temporarily stabilized, runoff is unlikely due to winter conditions (e.g. site covered with snow, ice, or frozen ground) inspections may be conducted monthly.

*Inspections are only required during the project's normal working hours; however, a rainfall event can happen after business hours. If a regular inspection is scheduled to occur on a holiday, the inspection will occur within two days of the holiday. If a rain event occurs after hours on Friday it does not need to be inspected until Monday.

** "Within 24 hours of the occurrence of a storm event" means that you are required to conduct an inspection within 24 hours once a storm event has produced 0.5 inches, even if the storm event is still continuing. Thus, if you have elected to inspect bi-weekly in accordance with Part 4.1.2.b. and there is a storm event at your site that continues for multiple days, and each day of the storm produces 0.5 inches or more of rain, you are required to conduct an inspection within 24 hours of the first day of the storm and within 24 hours of after the end of the storm. Again, inspections are only required during the project's normal working hours.

For inspections that occur during rain that is causing a discharge from the site, a visual sample will be taken. Following the visual sample being taken at the discharge point, a Visual Monitoring Form will be filled out and kept with the inspection history. The Visual Monitoring Form will be used to drive action items if the water does not appear cleaned.

3. Weather Program Information

For inspection being conducted on complianceGO:

WEATHER PROGRAM INFORMATION: The complianceGO weather program is a cutting-edge approach to meeting stormwater permit requirements for rain event inspections due to precipitation and forecasts. We are utilizing the National Oceanic and Atmospheric Administration (NOAA) database.

Our RemoteSense weather technology uses NOAA's weather technology to pinpoint precipitation values down to 1 meter. We have automated NOAA data to notify users when

forecast and precipitation thresholds have been reached to ensure ultimate stormwater compliance.

Whenever you perform an inspection in complianceGO, complianceGO goes to NOAA and grabs the current precipitation, showing the amount of precipitation for the past 24 hours. The historical precipitation shown on the inspection form is a 24-hour precipitation accumulation for the site for that date.

For inspections not being conducted on complianceGO a rain gauge will be located on site or tracking data will be utilized and reported in the inspection.

8.2 Corrective Actions

Corrective Actions must take place to address observed noncompliance conditions, such as: repair or replacement needed for stormwater controls (beyond normal maintenance requirements), installation of a stormwater control that was never installed, or was installed incorrectly, discharges from the site that exceed water quality standards, or the occurrence of a prohibited discharge (*CGP, Part 5*).

Responsive (Corrective) action item conditions will be identified in the inspection report and action log. Once identified and reported, responsible parties in section 1 will correct problems according to the construction general permit.

- The corrective action log should describe the repair, replacement, and maintenance of BMPs undertaken as a result of the inspections and maintenance procedures described above. Actions related to the findings of inspections should reference the specific inspection report.
- This log should also describe actions taken, date completed, and note the person that completed the work.

For SWPPPs that are being managed on compliance|GO the corrective action logs will be located in the inspection history section of compliance|GO.

Please notify the contact person for the operator found on the NOI in order to access this information if needed.

8.3 Delegation of Authority

For SWPPPs that are being managed on compliance|**GO** the Delegation of Authority will be located in the documents section in compliance|**GO**.

Please notify the contact person for the operator found on the NOI in order to access this information if needed.

SECTION 9: RECORDKEEPING

9.1 *Recordkeeping*

The following is a list of records that need to be kept with the SWPPP document for your project site available for inspectors to review during and for at least 3 years after completion of the project:

- Dates of grading, construction activity (covered in Section 2)
- Dates when major grading activities occur
- A copy of the construction general permit (weblink attached in Appendix I)
- The signed and certified NOI form or permit application form (attached in Appendix B)
- Inspection reports
- Records relating to endangered species and historic preservation
- Delineation of Responsibilities
- Delegation Letter
- Responsive (Corrective) Action Logs
- SWPPP Certification
- Updated site SWPPP map
- Dates when construction activities temporarily or permanently cease on a portion of the site
- Dates when an area is either temporarily or permanently stabilized.

For SWPPPs that are being managed on compliance|**GO** all records will be located in the documents/permits tab, or inspection history section of compliance|**GO**. The method for documenting will be done by updating the SWPPP Map located in the Site Maps section of complianceGO. On the map the inspectors record any changes to the BMPs. They note and date when the BMP is installed or when a BMP is changed or removed. These notes and notes history stay with the individual icons on the site map and can be viewed on the map history report.

Please notify the contact person for the operator found on the NOI in order to access this information if needed.

9.2 Log of Changes to the SWPPP

The amendment log will record changes and updates to the SWPPP. These changes and updates will include additions of new BMPs, replacement of failed BMPs, significant changes in the activities or their timing on the project, changes in personnel, changes in inspection and maintenance procedures, updates to site maps, and so on.

For SWPPPs that are being managed on compliance|GO the SWPPP Amendment Log will be located in the documents section in compliance|GO.

Please notify the contact person for the operator found on the NOI in order to access this information if needed.

SWPPP Amendment Log

The SWPPP Map updates and amendments are noted and dated on the SWPPP Map. All other amendments to the SWPPP document will be noted on this log.

Project Name: _____

Project Location: _____

Date	Description of the Amendment	SWPPP Section	Amendment Requested By	Amendment Prepared By

SECTION 10: CERTIFICATION

For SWPPPs that are being managed on compliance|**GO** the Certification Pages, Agreements, Delegation of Authority, or other signed SWPPP pages will be located in the documents section in compliance|**GO**.

Please notify the contact person for the operator found on the NOI in order to access this information if needed.

SECTION 11: SWPPP PREPARER CERTIFICATION

For SWPPPs that are being managed on compliance | **GO**, the signed SWPPP Preparer Certification will be located in the documents section in compliance | **GO** (the certification is only required for projects that meet conditions as listed in the CGP part 7.2).

Please notify the contact person for the operator found on the NOI in order to access this information if needed.

SWPPP Preparer certifications may be viewed here: <https://goo.gl/7SLEbW>

SWPPP APPENDICES

For SWPPPs that are being managed on compliance|**GO** any additional SWPPP documentation that is needed or required will be in the documents and permits sections of compliance|**GO**.

Please notify the contact person for the operator found on the NOI in order to access this information if needed.

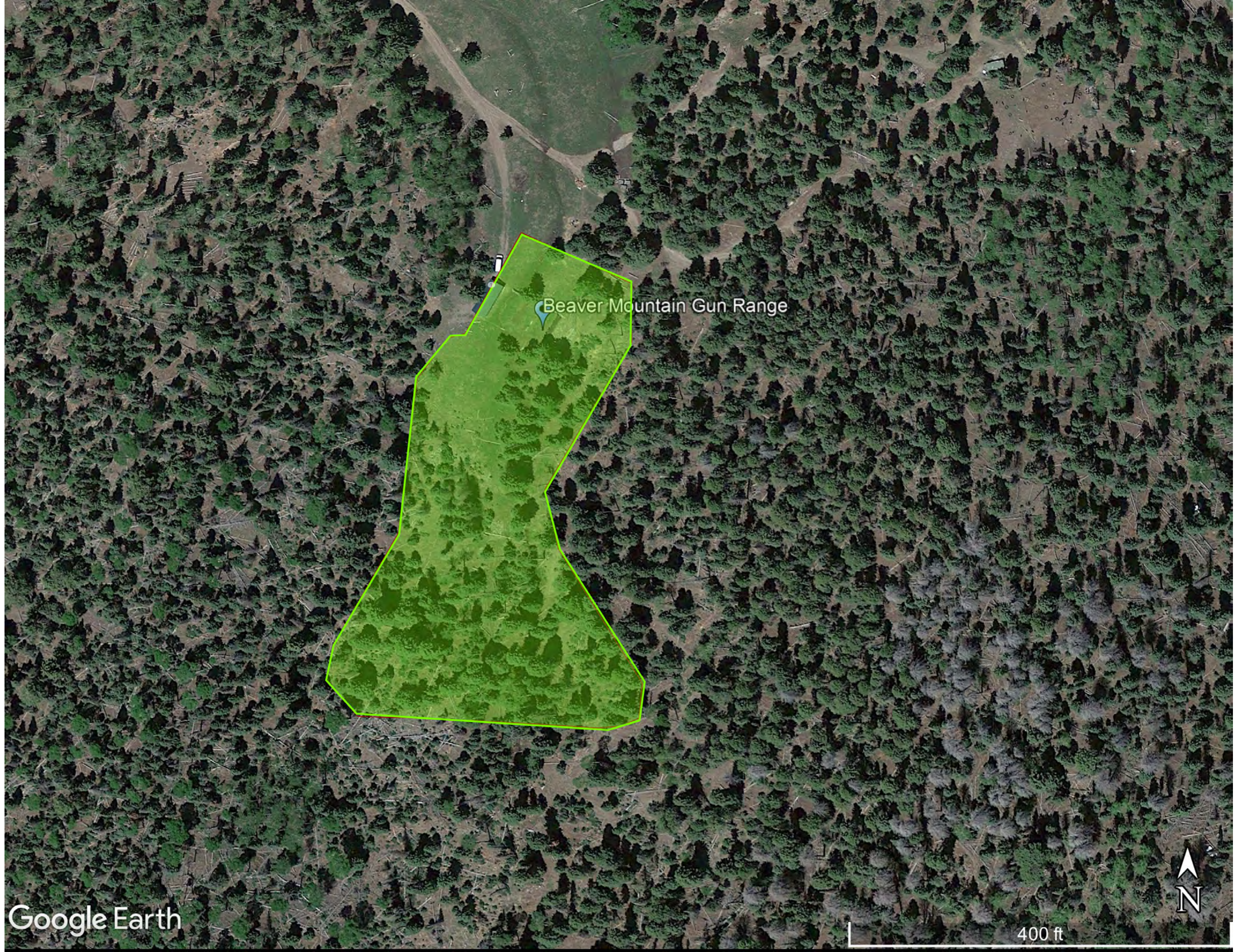
Appendix A – Site Maps

Preconstruction Existing Vegetation Map

Beaver Mountain Gun Range



400 ft



LEGEND



 Existing Weeds, Grasses, and Trees (1)

Latitude: 38.284899

Longitude: -112.429409

Waters Within One Mile Downstream of the Site Map



Beneficial Uses and Water Quality Assessment Map




utah automated geographic
reference center 5/11/2022



Assessment Unit Name: Beaver River-3
Unit ID: UT16030007-003_00
Unit Description: Beaver River and tributaries from USFS boundary to headwaters
Beneficial Uses: Use Class 2B = Infrequent Primary Contact Recreation (e.g. wading, fishing); Class 3A = Cold Water Fishery/Aquatic Life; Use Class 4 = Agriculture (crop irrigation, stock watering)
RIVER_MILE: 180.9877
Watershed Management Unit: Cedar-Beaver
PROTECTED: Use Class 2B = Infrequent Primary Contact Recreation (e.g. wading, fishing), Use Class 3A = Cold Water Fishery/Aquatic Life, Use Class 4 = Agriculture (crop irrigation, stock watering)
BLU_Ribbon: null
TMDL Information: null
Anti-Degradation Category: Category 1 = No point discharges allowed within U.S. Forest Service outer boundary or to other specified waters of R317-2-12
Perimeter: null
Area_m2: 500338368.58820415
GIS_Acres: 123636.19413278541
New_AUID: null
2016 Assessment: 2: Supports all assessed uses
Beneficial Use: Cause of Impairment: none
TMDL Required: 303d Cause of Impairment: none
TMDL Approved: Cause of Impairment: none
Aquatic Habitat Impairment: none
Shape_Length: 162373.37675803847
Shape_Area: 814312872.3340741

LEGEND



-  Water Flow (1)
-  Receiving Water - Merchant Creek (1)
-  Site (1)

Latitude: 38.284899

Longitude: -112.429409

SWPPP BMP Maps

*Note: Original civil files were used as a reference only. Modifications made by accenaGroup based on information provided by the operator and site conditions. This SWPPP Map is a living document subject to change based on site needs. BMPs that are no longer necessary will be deactivated and shown in gray on the maps. Please refer to the Site Maps section in complianceGO for the most up-to-date maps. For residential sites, individual lots will be updated with track out, waste collection, and materials storage BMPs as construction begins on each lot.

For SWPPPs that are being managed on compliance|GO the site maps will be located in the documents section and the site maps section of compliance|GO.

Please notify the contact person for the operator found on the NOI in order to access this information if needed.

Map Notes:

BMPs will be installed according to the phase of construction, and the BMP specifications found in Appendix H of the SWPPP. BMPs will be monitored and may change throughout construction. Any changes to the BMPs need to be shown on the site maps. Any additional BMPs that are needed will be determined during regular inspections and installed according to specifications.

The locations of the NOI permit, portable toilets, trash bins, concrete washout, and other BMPs may change throughout the duration of construction. Their location will be updated on the SWPPP map when necessary.

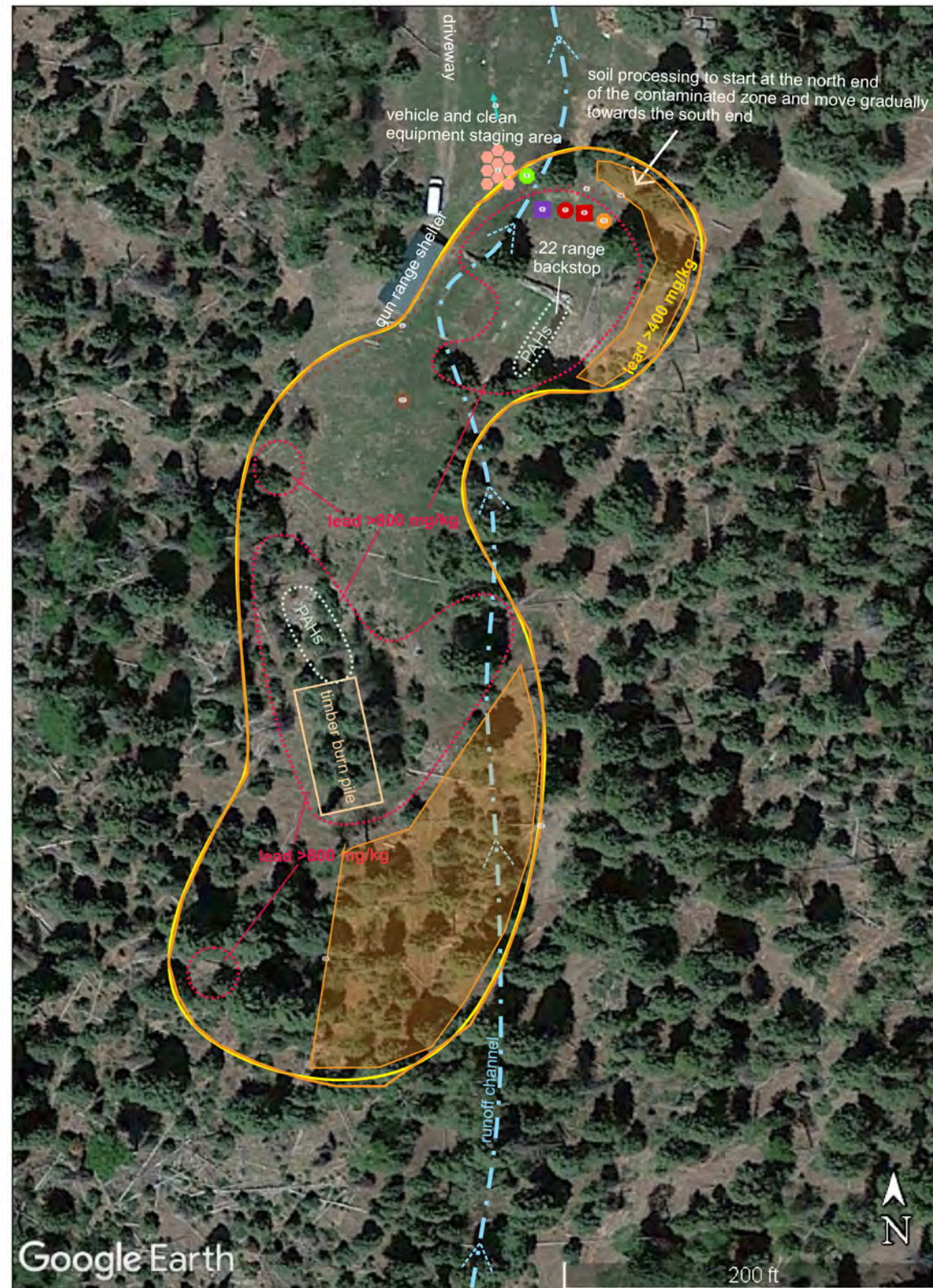
Upon project completion and confirmed termination of the permit, temporary measures will be removed and the site properly cleaned prior to release of the site to the owner.

BMPs Utilized, But Not Shown

Monitor Slopes and Soils for Erosion

Preserve Topsoil

Minimize Soil Compaction












Legend:

- Remedial Activities Area Boundary, area where COC concentrations potentially exceeds Residential RSL of 400 mg/kg
- Area where Lead exceeded Industrial and Residential RSLs (>800 mg/kg)
- Area where PAHs exceeded Residential RSL
- Area where timber cleared from the site was burned in November 2021

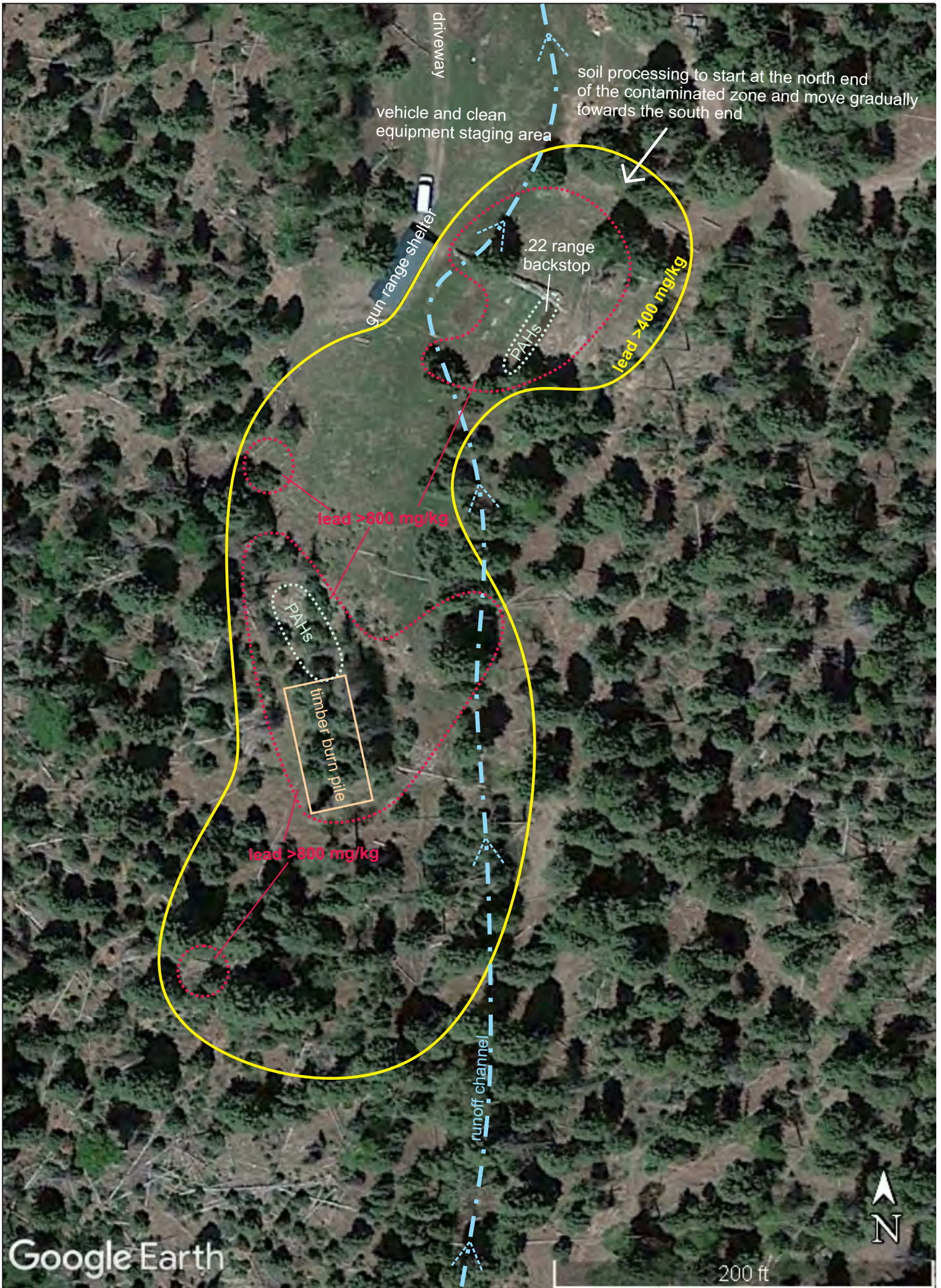
**Figure 2: Site Conceptual Model
Former Beaver Mountain Gun Range**



-  Preserve Vegetation (2)
-  Compacted Earthen Berm (2)
-  Limit of Disturbance (1)
-  Pre & Post Construction Water Flow (1)
-  Materials Storage (1)
-  Stabilized Construction Exit (1)
-  Dumpster (1)
-  SWPPP Sign (1)
-  Stockpiles (1)
-  Spill Kit (1)
-  Portable Toilet (1)

Latitude: 38.284899
Longitude: -112.429409

Site Plan(s) and Details



Legend:



Remedial Activities Area Boundary, area where COC concentrations potentially exceeds Residential RSL of 400 mg/kg



Area where PAHs exceeded Residential RSL



Area where Lead exceeded Industrial and Residential RSLs (>800 mg/kg)



Area where timber cleared from the site was burned in November 2021

**Figure 2: Site Conceptual Model
Former Beaver Mountain Gun Range**

Appendix B – NOI Permit and Authorization to Discharge Letter

UPDES NOI and NOT Permit

For SWPPPs that are being managed on compliance | **GO** the Notice of Intent (NOI) permit will be in the permits section in compliance | **GO**. Please notify the contact person for the operator found on the NOI in order to access this information if needed.

The NOI permit must be filed with the state either by accessing the following website:

<https://deq.utah.gov/water-quality/updes-ereporting-fugitive-dust>

Or by sending the appropriate forms to the following address:

Department of Environmental Quality
Division of Water Quality
PO Box 144870
Salt Lake City, Utah 84114-4870

For SWPPPs that are being managed on compliance | **GO** the Notice of Termination (NOT) will be located in the permits section in compliance | **GO**. Please notify the contact person for the operator found on the NOI in order to access this information if needed.

The NOT can be filed by completing the form electronically on the NeT Storm Water Database <https://cdx.epa.gov/> or by sending the appropriate form to the main Division of Water Quality website waterquality.utah.gov or email a PDF to wqinfodata@utah.gov.

Department of Environmental Quality
Division of Water Quality
PO Box 144870
Salt Lake City, Utah 84114-4870

For SWPPPs that are being managed on compliance | **GO** all permits will be in the permits or documents section of compliance | **GO**. Please notify the contact person for the operator found on the NOI in order to access this information if needed.

Authorization to Discharge Letter

For SWPPPs that are being managed on compliance|**GO** the Authorization to Discharge Letter once received will be in the permits section in compliance|**GO**.

Please notify the contact person for the operator found on the NOI in order to access this information if needed.

Appendix C – Inspection Report

Inspection Reports

For SWPPPs that are being managed on compliance | **GO** all inspections will be in the inspection history section of compliance | **GO**.

Please notify the contact person for the operator found on the NOI in order to access this information if needed.

A copy of the Inspection and Visual Monitoring form can be accessed via the following link:

https://drive.google.com/file/d/0Bx_Y1vgmRG3UVEF2Q09nTDF3LUE/view?usp=sharing

Appendix D – Corrective Action Report

Maintenance of Controls

Responsive (Corrective) action items will be identified in the inspection report and action log. Once identified and reported, responsible parties in Section 1 will correct problems according to the construction general permit.

For SWPPPs that are being managed on compliance | **GO** the corrective action logs will be located in the inspection history section of compliance | **GO**.

Please notify the contact person for the operator found on the NOI in order to access this information if needed.

Appendix E – Subcontractor Certifications, Agreements, and Delegation of Authority

For SWPPPs that are being managed on compliance|GO the subcontractor certification pages, agreements, delegation of authority, or other signed SWPPP pages will be located in the documents section in compliance|GO.

Please notify the contact person for the operator found on the NOI in order to access this information if needed.

SUBCONTRACTOR CERTIFICATION
STORMWATER POLLUTION PREVENTION PLAN

Project Number: _____

Project Title: _____

Operator(s): _____

As a subcontractor, you are required to comply with the Stormwater Pollution Prevention Plan (SWPPP) for any work that you perform on-site. Any person or group who violates any condition of the SWPPP may be subject to substantial penalties or loss of contract. You are encouraged to advise each of your employees working on this project of the requirements of the SWPPP. A copy of the SWPPP is available for your review at the office trailer.

Each subcontractor engaged in activities at the construction site that could impact stormwater must be identified and sign the following certification statement:

I certify under the penalty of law that I have read and understand the terms and conditions of the SWPPP for the above designated project and agree to follow the BMPs and practices described in the SWPPP.

This certification is hereby signed in reference to the above-named project:

Company: _____

Address: _____

Telephone Number: _____

Type of construction service to be provided: _____

Signature: _____

Title: _____

Date: _____

Appendix F – Training Logs and Certifications

STAFF TRAINING REQUIREMENTS.

Prior to the commencement of earth-disturbing activities or pollutant-generating activities, whichever occurs first, the individual responsible for training must ensure and document that the Stormwater Team listed in Section 1.1 of the SWPPP and onsite personnel understand the requirements of the permit and their specific responsibilities with respect to the following:

- The permit deadlines associated with installation, maintenance, and removal of storm water controls and with stabilization;
- The location of all storm water controls on the site required by the Construction General Permit and how they are to be maintained;
- The proper procedures to follow with respect to the Construction General Permit's pollution prevention requirements; and
- When and how to conduct inspections, record applicable findings, and take corrective actions.

For SWPPPs that are being managed on compliance | **GO** the training log will be located in the documents section of compliance | **GO**.

Please notify the contact person for the operator found on the NOI in order to access this information if needed.

Training Log

Project Name: _____

Project Location: _____

Date	Name of Attendee	Company	Training Topic	Instructor

Inspector Qualifications

The UPDES construction general permit requires that an inspector has one of the following qualifications or the equivalent as determined by the State: RSI, CPESC, CPSWQ, CESSWI, CISEC, NICET, or UDOT ECS.

A qualified inspector from accenaGroup will conduct stormwater inspections.

Inspector certifications can be viewed here: <https://goo.gl/7SLEbW>

Please notify the contact person for the operator found on the NOI in order to access this information if needed.

Appendix G – Additional Information

Appendix G includes:

- Additional Permits
- Endangered Species Certification
- Historic Preservation
- Permit Regulations-Applicable Federal, Tribal, State, or Local Programs
- MS4 Stormwater Ordinance
- Fugitive Dust Plan
- Soil Report
- Correspondence
- Out of Date SWPPP documents

Additional Permits

For SWPPPs that are being managed on compliance | **GO** any additional permits will be located in the documents and/or permits sections in compliance | **GO**.

Please notify the contact person for the operator found on the NOI in order to access this information if needed.

- a. Will the site have a Stream Alteration Permit? Yes No
- b. Will the site have a 404 d wetland permits? Yes No
- c. Does the site have an SPCC? Yes No
- d. Will the Site have a Dewatering Permit? Yes No
- e. Does the site have a Land Disturbance Permit or other city stormwater permit? Yes No



Range Recovery specializes in Lead Reclamation Projects. We utilize patented equipment, engineered and developed specifically for lead reclamation. Our processes safely and efficiently remove bullets, shot, and fragments from the earth; while also reducing the completion time and project footprint. Our processes help keep shooting ranges across the country in compliance with the EPA's "Best Management Practices (docs/bestmangprac.pdf)".

Outdoor Firing Ranges

Trap & Skeet Fields

Outdoor Firing Ranges



Range Recovery's patented mobile screening plant, is designed specifically to remove bullets and bullet fragments from outdoor earthen shooting berms. The size and mobility of this unit, almost always allows it to be set up adjacent to the shooting berm; minimizing the footprint and the time needed to complete the project. The plant screens and cleans the lead all in one cycle, without the use of water or chemicals. The cleaned, recyclable, lead is then containerized, sold, and shipped by Range Recovery to a certified lead recycler. The soil is generally replaced on the berm after the project, leveled and packed in accordance with the Range Master's specifications. Range Recovery also has the capabilities to treat the screened soil in order to gain compliance with any testing agency if needed.

Benefits of the Range Recovery Program

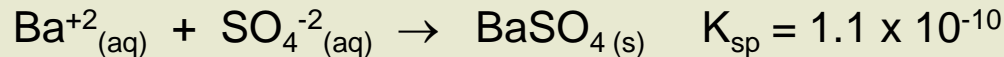
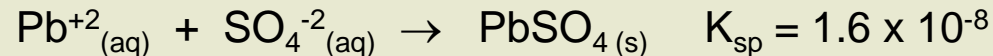
- Diminishes the potential of lead exposure to humans, animals, and the environment.
- Reduces the source of lead migration in soil, surface water, and groundwater.
- Decreases liability with regard to potential agency or citizen lawsuits.
- Lessens the risk of potential injury due to ricochet.
- Presents a clean and well maintained facility.
- Results in an improved public image.

Request Information

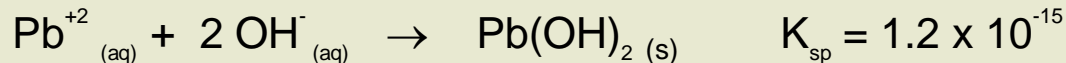
If you would like more information on how Range Recovery Technologies can assist you and your shooting range with Best Management Practices, please provide your name and email with the following form, or contact us toll free at (605) 350-4622.

Summary of FF-200 Chemistry

Free Flow 200® is a proprietary blend of stabilizing reagents that fixate heavy metals in waste or soil across of wide range of pH values using a combination of sulfate and hydroxyl anion fixation chemistry. When moisture comes into contact with soil or waste stabilized with Free Flow 200®, sulfates are immediately released to initiate fixation reactions with lead and barium by the following reactions:



The sulfate reaction is a preliminary sweep reaction that fixates the most soluble lead with the sulfate anion. Fixation of remaining lead and other heavy metals proceeds by slow-release alkaline components that react with acidity and heavy metals to further bind the metals as shown for lead in the example below:



Although the above reactions are described for lead, the reagent performs similar for fixation of other heavy metals such as cadmium, trivalent chromium, cobalt, copper, nickel, silver, and zinc. Through a combination of the chemical reactions described above, Free Flow 200® is able to stabilize heavy metals in soil and waste across a wide range of pH values to meet the objectives of the SPLP or TCLP in remediation applications.

SAFETY DATA SHEET (SDS)

OSHA Hazard Communication Standard 29 CFR 1910.1200. Prepared to GHS

SECTION 1 – PRODUCT AND COMPANY IDENTIFICATION

Trade Name: **Free Flow 100[®], Free Flow 200[®], Free Flow 300[®]**
Product CAS: None

Recommended use: Stabilize RCRA Metals

Company Identification:

Free Flow Technologies, Inc.
4920 Forest Hills Rd, Suite 200
Loves Park, Illinois 61111

For information call: (815) 636-0166
Emergency Contact: Timothy Danzer
Fax: (815) 636-0560

SECTION 2 – HAZARD(S) IDENTIFICATION

GHS07 Acute Toxicity

Classification of the substance:

- H303 Acute Toxicity, category 5 (oral)
- H313 Acute Toxicity, category 5 (dermal)
- H332 Acute Toxicity, category 4 (inhalation)
- H315 Skin, eye irritation, category 2
- H317 Skin sensitization, category 1
- H335 Specific Target Organ Toxicity, category 3 (single exposure, respiratory tract irritation)



WARNING

Hazard Statements:

- H303 May be harmful if swallowed
- H313 May be harmful in contact with skin
- H332 Harmful if inhaled
- H315 Causes skin irritation
- H317 May cause an allergic skin reaction
- H335 May cause respiratory irritation

Precautionary Statements:

Prevention

- P261 Avoid breathing dust.
- P264 Wash hands thoroughly after handling.
- P271 Use only outdoors or in a well-ventilated area.
- P272 Contaminated work clothing should not be allowed out of the workplace.

SECTION 2 – HAZARD(S) IDENTIFICATION (CONT.)

Prevention cont.	P280 Wear protective gloves, safety glasses, and protective clothing such as long sleeves and pant cuffs over shoes to minimize skin contact.
Response	<p>P302+P352 IF ON SKIN: Wash with plenty of soap and water.</p> <p>P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.</p> <p>P312 Call a POISON CENTER or doctor/physician if you feel unwell.</p> <p>P321 Specific treatment, see supplemental first aid information.</p> <p>P332+P313 If skin irritation occurs: Get medical advice/attention.</p> <p>P362+P364 Take off contaminated clothing and wash it before reuse.</p>
Storage/Disposal	<p>P403+P233 Store in a well-ventilated place. Keep container tightly closed.</p> <p>P501 Dispose of container in accordance with local, regional, national, and/or international regulations.</p>

Hazards Ratings HMIS

HEALTH	1
FLAMMABILITY	0
REACTIVITY	1
PERSONAL PROTECTION	0

SECTION 3 – COMPOSITION, INFORMATION ON INGREDIENTS

Chemical Name	CAS	Approx. % (w/w)	LD50	LC50
Phosphate Compounds	7758-23-8	0 - 80	Not Available	Not Available
Calcium Oxide	1305-78-8	10 - 70	Not Available	Not Available
Sulfur Trioxide	7446-11-9	0 - 40	Not Available	Not Available
Silicon Dioxide	60676-86-0	2.5 – 15	Not Available	Not Available
Aluminum Oxide – Non-fibrous	1344-28-1	0.5 - 5	Not Available	Not Available
Iron Oxide	1309-37-1	0.5 - 5	Rat, oral, >5000 mg/kg	Not Available
Sodium Bicarbonate	144-55-8	0 - 70	Mouse, oral, 3360 mg/kg	Not Available
Magnesium Oxide	1309-48-4	0 - 60	Not Available	Not Available

SECTION 4 – FIRST AID MEASURES

- After Eye Contact:** Flush eyes with water while lifting lids. Seek medical attention.
- After Skin Contact:** Wash skin with soap and water, remove contaminated clothing and shoes. If irritation develops, seek medical attention.
- After Ingestion:** Dilute with water, fruit juice or vinegar. Seek medical attention.
- After Inhalation:** Remove to fresh air, if irritation develops, seek medical attention.

Most important symptoms and effects, both acute and delayed.

Refer to Section 11 – Toxicological Information

Indication of any immediate medical attention and special treatment needed.

All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

SECTION 5 – FIRE FIGHTING MEASURES

Suitable extinguishing equipment:

This material is noncombustible.

Extinguishing equipment that is not appropriate for a particular situation:

Do not use water on adjacent fires. Extinguish adjacent fires with dry chemical or CO₂.

Specific hazards that develop from the chemical during the fire:

No specific hazards are identified.

Protective equipment or precautions for firefighters:

No special measures required.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:

Wear protective equipment to prevent skin exposure and inhalation. Keep unprotected persons away.

Environmental Precautions:

Avoid runoff to waterways and sewers.

Methods and materials used for containment and cleanup:

Use appropriate protective equipment while using dry cleanup methods (sweep/shovel) which minimize dusting. Reclaim in watertight containers. Small amounts may be flushed with water to drain.

SECTION 7 – HANDLING AND STORAGE

Precautions for safe handling:

Swells when wet, may expand the container. Keep eyewash bottles available throughout work area.

Conditions for safe storage, including any incompatibilities:

Store away from water or acids.

SECTION 8 – EXPOSURE CONTROLS AND PERSONAL PROTECTION

Control Parameters

Component	Formula	CAS	PEL	TLV
Phosphate Compounds	Ca(H ₂ PO ₄) ₂ H ₂ O	7758-23-8	Not established	Not established
Calcium Oxide	CaO	1305-78-8	5 mg/m ³	2 mg/m ³
Sulfur Trioxide	SO ₃	7446-11-9	1 mg/m ³	0.2 mg/m ³
Silicon Dioxide**	SiO ₂	60676-86-0	0.1 mg/m ³ *	0.1 mg/m ³ *
Aluminum Oxide	Al ₂ O ₃	1344-28-1	10 mg/m ³ +	10 mg/m ³ +
Iron Oxide**	Fe ₂ O ₃	1309-37-1	15 mg/m ³	5 mg/m ³
Sodium Bicarbonate	NaHCO ₃	144-55-8	15 mg/m ³ *	10 mg/m ³ *
Magnesium Oxide	MgO	1309-48-4	15 mg/m ³ *	10 mg/m ³ *

* Respirable Dust

+ 5 mg/M³ as Respirable Fraction

**Silicon Dioxide and Iron Oxide are listed by IARC as potential carcinogens.

Exposure Controls

Engineering Controls:

Use general and local exhaust to keep dust levels within acceptable limits.

Personal Protective Equipment Pictograms:



Breathing Protection:

Use NIOSH approved dust respirator when exposure limits exceeded.

Hand Protection:

Wear gloves to minimize skin contact.

Eye Protection:

Wear tight fitting goggles.

Skin Protection:

Wear long sleeves, gloves, and pant cuffs over shoes to minimize skin contact.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	White-gray powder.	Boiling Point:	N/A
Odor:	Odorless	Flammable, Lower Limit:	N/A
Odor Threshold:	N/A	Flammable, Upper Limit:	N/A
Solubility:	N/A	Flash Point:	N/A
Partition Coefficient:	Not determined.	Auto Ignition Temperature:	N/A
pH:	6.0 – 12.0	Freezing/Melting Point:	N/A
Density:	80 – 85 lbs/ft ³	Viscosity:	N/A
Vapor Pressure:	N/A	Decomposition Temp.:	N/A
Vapor Density:	N/A	Evaporation Rate:	N/A
Molecular Formula:	Mixture		

SECTION 10 – STABILITY AND REACTIVITY

Reactivity:

No dangerous reactions known under conditions of normal use.

Chemical Stability:

Stable, keep dry.

Thermal decomposition/conditions to be avoided:

Avoid extreme temperatures.

Possibility of hazardous reactions:

Contains calcium oxide and may react with water or acid to produce heat.

Incompatible materials:

Water, strong acids.

SECTION 11 – TOXICOLOGICAL INFORMATION

Toxicological Effects

Component	Formula	LD50	LC50
Phosphate Compounds	Ca(H ₂ PO ₄) ₂ H ₂ O	Not Available	Not Available
Calcium Oxide	CaO	Not Available	Not Available
Sulfur Trioxide	SO ₃	Not Available	Not Available
Silicon Dioxide**	SiO ₂	Not Available	Not Available
Aluminum Oxide	Al ₂ O ₃	Not Available	Not Available
Iron Oxide**	Fe ₂ O ₃	rat, oral, >5000 mg/kg	Not Available
Sodium Bicarbonate	NaHCO ₃	mouse, oral, 3360 mg/kg	Not Available
Magnesium Oxide	MgO	Not Available	Not Available

**Silicon Dioxide and Iron Oxide are listed by IARC as potential carcinogens.

SECTION 11 – TOXICOLOGICAL INFORMATION (CONT.)

Routes of exposure

Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

Potential health effects

Eye: Acute: May cause mild eye irritation
Chronic: No data available

Skin: Acute: Causes skin irritation
Chronic: Repeated and prolonged exposure may cause dermatitis

Ingestion: Acute: May cause irritation
Chronic: No data available

Inhalation: Acute: May cause respiratory irritation
Chronic: No data available

Symptoms from exposure

Target Organs: Eyes, respiratory passages, skin, digestive tract. Pre-existing respiratory diseases including asthma and emphysema may also be aggravated.

Eye: May cause irritation/inflammation and tissue damage.

Skin: May cause irritation to moist skin.

Ingestion: May cause ulceration to the digestive tract.

Inhalation: May cause irritation/inflammation to nasal and upper respiratory passages.

SECTION 12 – ECOLOGICAL INFORMATION

Toxicity:

No further relevant information available.

Persistence and degradability:

No further relevant information available.

Bioaccumulative potential:

No further relevant information available.

Mobility in soil:

No further relevant information available.

SECTION 13 – DISPOSAL CONSIDERATIONS

Recommended Waste Treatment Methods:

No treatment necessary.

Recommended Package Disposal:

Dispose of in container in accordance with local, regional, national, and/or international regulations.

SECTION 14 – TRANSPORT INFORMATION

UN Number:	N/A
UN proper shipping name:	N/A
Transport Hazard class:	N/A
Packing group number:	N/A
Environmental hazards:	N/A
Special Precautions:	To prevent dust, cover product with tarp if not in bulk bag container.

SECTION 15 – REGULATORY INFORMATION

SARA Title III - Section 302 Extremely Hazardous Material - None

SARA Title III – Section 31/312 – Hazard Categories:

Fire Hazard – No
Sudden Release of Pressure – No
Reactivity Hazard – Yes
Immediate Health Hazard – Yes
Delayed Health Hazard - Yes

SARA Title III – Section 313 - This material is not subject to the toxic chemical reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

SECTION 16 – ADDITIONAL INFORMATION

Information herein is based on data believed to be accurate at the time of the preparation. No warranty or representation, express or implied, is made to the accuracy or completeness of the SDS. No responsibility can be assumed by vendor for any damage or injury resulting from misuse, failure to follow recommended practices, or from any hazards inherent in the nature of the product.

SECTION 16 – ADDITIONAL INFORMATION (CONT.)

SDS Effective: 12/1/2014



**REMEDIAL ACTION PLAN
FORMER BEAVER MOUNTAIN GUN RANGE
BEAVER COUNTY, UTAH
VOLUNTARY CLEANUP PROGRAM SITE C118**

1. INTRODUCTION

On behalf of the Utah State Institutional Trust Lands Administration (SITLA), the owner of the former Beaver Mountain Boy Scouts of America (BSA) Gun Range (Site) and the Applicant, Wasatch Environmental, Inc. (Wasatch), has prepared this Remedial Action Plan (RAP) for addressing gun range related metals and polycyclic aromatic hydrocarbon (PAH) impacts to soil that have been identified at the Site. This RAP is intended to be used in conjunction with the Quality Assurance Project Plan (QAPP), the Sampling and Analysis Plan (SAP), and individual work plans prepared for the Site.

The Applicant plans to sell the Site, potentially as residential lots, and wishes to remediate the Site to allow safe residential development. For the purposes of this RAP, the term "Site" is used to denote the approximately 2-acre former BSA gun range as shown on attached Figure 2. The term "on-Site" is used to refer to features or issues located on, or pertaining to, the former gun range. The term "off-Site" is used to refer to features or issues neither located on, nor pertaining to, the former gun range, regardless of whether the feature or issue pertains to a property controlled or owned by the Applicant.

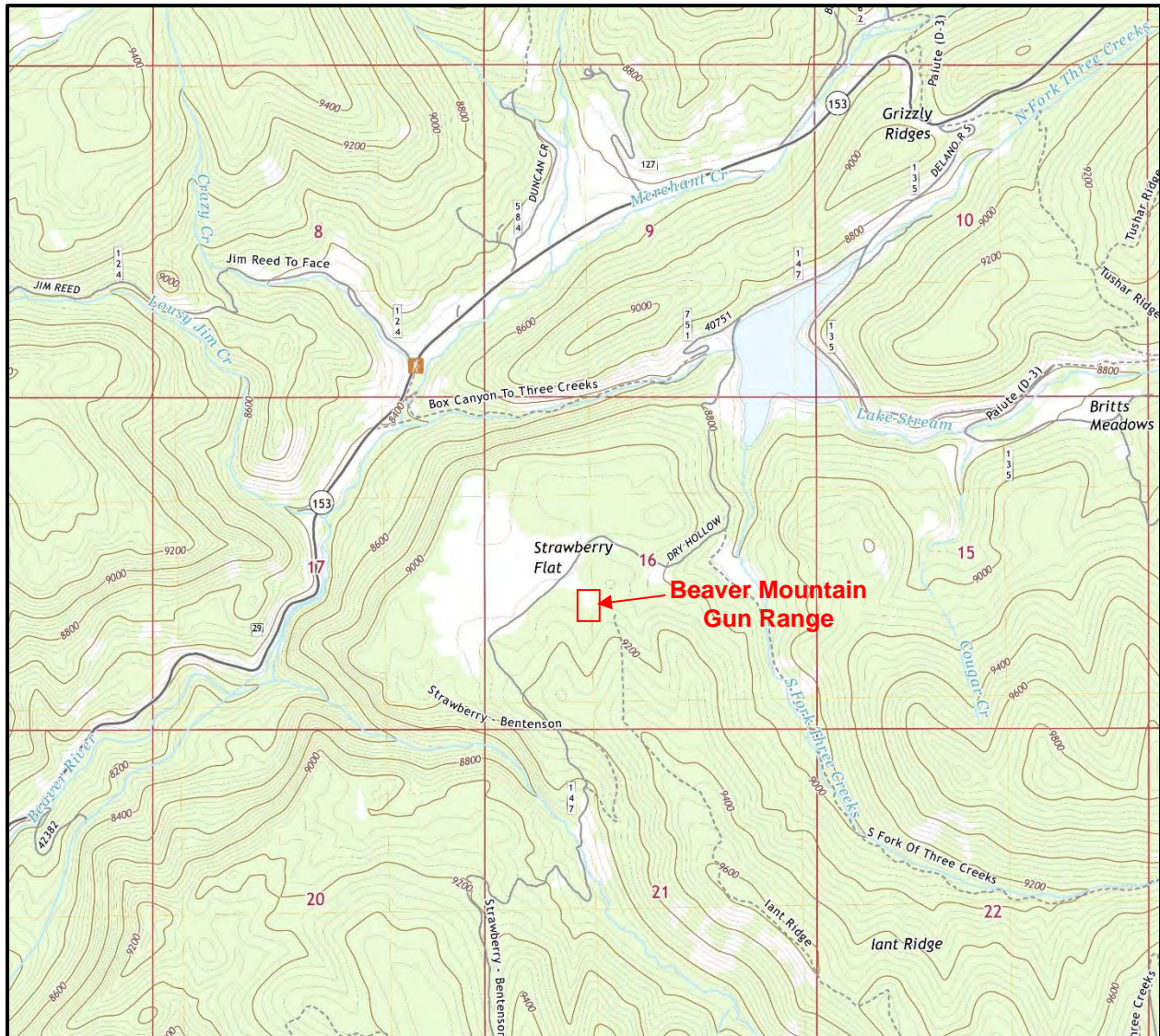
1.1 Site Description

The former Beaver Mountain Gun Range (the site) is an approximately 2-acre target and trap shooting area in forested mountain land in eastern Beaver County, Utah. The gun range is no longer used, but was part of a former Boy Scouts of America camp.



The Beaver Mountain gun range includes an approximately one-half acre area in a forest clearing with a shelter at the north end (at the firing line) and with stationary targets to the east and south. Trap shooting occurred all around the gun range clearing and clay pigeon debris and shotgun casings are present throughout the site, except near the entrance driveway. The shooting area, as well as the wooded area which surrounds it, is littered with gun related detritus such as clay pigeons, empty shotgun shells and

bullet casings, pellets, and slugs. Trees and timber within this area also contain pellets and slugs. The total area impacted by the gun range is estimated to be two acres.



Site location map (from 2020 USGS 7.5-minute Shelly Baldy Peak, Utah topographic map).

1.2 Project Background

A 2021 site survey (Barr Engineering 2021) and 2022 site characterization (Wasatch Environmental, 2022) found elevated concentrations of lead, antimony, and polycyclic aromatic hydrocarbons (PAHs) in surface soils and timber on the gun range. The 2021 and 2022 investigations are summarized below.

2021 Site Survey

A 2021 X-Ray Fluorescence Analysis (XRF) survey of the gun range with soil sampling and laboratory analyses concluded:

- The area impacted by the old Boy Scouts of America (BSA) Gun Range is approximately two acres and stretches from the gun range shelter and clearing into the surrounding wooded area.

Endangered Species Certification

The US Fish and Wildlife Service has available a list of endangered species by state. The list for Utah was found at the below website and is also listed on the following page.

<http://criticalhabitat.fws.gov/>

<http://ecos.fws.gov/ecos/indexPublic.do>

1. Are endangered or threatened species present on or near project.

Yes No

Describe:

2. Determine whether or not the construction storm water discharges or discharge related activities could negatively affect listed Threatened/ Endangered Species or Designated Critical Habitat near this project.

Describe:

3. Determine if measures can be implemented to avoid adverse effects.

Describe:

4. Determine if eligibility contact with the Utah Division of Wildlife or the US Fish and Wildlife is required for this project.

Describe:

Contacts:

Utah Department of Natural Resources Division of Wildlife Resources

Habitat: 801-538-4700

US Fish and Wildlife Service: 801-975-3330 Ext.126



Utah Division of Wildlife Resources
Utah Natural Heritage Program
1594 W. North Temple
PO Box 146301
Salt Lake City, UT 84116

Utah Natural Heritage Program Online Species Search Report

Project Information

Project Name

1

Project Description

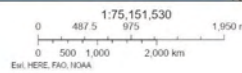
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Location Description

1



March 15, 2023



Animals within a 1/2 mile radius

Common Name	Scientific Name	State Status	U.S. ESA Status	Last Observation Year
No Species Found				

Plants within a 1/2 mile radius

Common Name	Scientific Name	State Status	U.S. ESA Status	Last Observation Year
No Species Found				

Animals within a 2 mile radius

Common Name	Scientific Name	State Status	U.S. ESA Status	Last Observation Year
American Pika	Ochotona princeps	SGCN		2005
Arizona Mountain Kingsnake	Lampropeltis pyromelana	SGCN		2002
Bonneville Cutthroat Trout	Oncorhynchus clarkii utah	SGCN		1974
Least Chub	lotichthys phlegethontis	SGCN		1963
Little Brown Myotis	Myotis lucifugus	SGCN		1995
Long-eared Myotis	Myotis evotis	SGCN		1995
Long-legged Myotis	Myotis volans	SGCN		1995
Northern Leopard Frog	Lithobates pipiens	SGCN		2005

Plants within a 2 mile radius

Common Name	Scientific Name	State Status	U.S. ESA Status	Last Observation Year
-------------	-----------------	--------------	-----------------	-----------------------

No Species Found

Definitions

State Status

SGCN	Species of greatest conservation need listed in the Utah Wildlife Action Plan
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U.S. Endangered Species Act

LE	A taxon that is listed by the U.S. Fish and Wildlife Service as "endangered" with the probability of worldwide extinction
LT	A taxon that is listed by the U.S. Fish and Wildlife Service as "threatened" with becoming endangered
LE;XN	An "endangered" taxon that is considered by the U.S. Fish and Wildlife Service to be "experimental and nonessential" in its designated use areas in Utah
C	A taxon for which the U.S. Fish and Wildlife Service has on file sufficient information on biological vulnerability and threats to justify it being a "candidate" for listing as endangered or threatened
PT/PE	A taxon "proposed" to be listed as "endangered" or "threatened" by the U.S. Fish and Wildlife Service

Disclaimer

The information provided in this report is based on data existing in the Utah Division of Wildlife Resources' central database at the time of the request. It should not be regarded as a final statement on the occurrence of any species on or near the designated site, nor should it be considered a substitute for on-the-ground biological surveys. Moreover, because the Utah Division of Wildlife Resources' central database is continually updated, any given response is only appropriate for its respective request.

The UDWR provides no warranty, nor accepts any liability, occurring from any incorrect, incomplete, or misleading data, or from any incorrect, incomplete, or misleading use of these data.

The results are a query of species tracked by the Utah Natural Heritage Program, which includes all species listed under the U.S. Endangered Species Act and species on the Utah Wildlife Action Plan. Other significant wildlife values might also be present on the designated site. Please [contact](#) UDWR's regional habitat manager if you have any questions.

For additional information about species listed under the Endangered Species Act and their Critical Habitats that may be affected by activities in this area or for information about Section 7 consultation under the Endangered Species Act, please visit <https://ecos.fws.gov/ipac/> or contact the [U.S. Fish and Wildlife Service Utah Ecological Services Field Office](#) at (801) 975-3330 or utahfieldoffice_esa@fws.gov.

Please contact our office at (801) 538-4759 or habitat@utah.gov if you require further assistance.

Your project is located in the following UDWR region(s): Southern region

Report generated for:

Bruce Henriksen
accenaGroup
487 W 1400 N
Orem, UT 84057
(801) 701-6188
accounting@accenagroup.com



Endangered and Threatened Species in Beaver County as listed by the US Fish and Wildlife Service.

The following list is of endangered and threatened species in Beaver County. The list also includes species of concern, and species receiving special management to keep them off of the federal threatened and endangered species list.

Beaver County

Group	Name	Status
Insects	Monarch butterfly (<i>Danaus plexippus</i>)	Candidate
Flowering Plants	Ute ladies'-tresses (<i>Spiranthes diluvialis</i>)	Threatened
Mammals	Little brown bat (<i>Myotis lucifugus</i>)	Under Review
Birds	Yellow-billed Cuckoo (<i>Coccyzus americanus</i>)	Threatened
Birds	Greater sage-grouse (<i>Centrocercus urophasianus</i>)	Resolved Taxon
Flowering Plants	Frisco Clover (<i>Trifolium firscanum</i>)	Resolved Taxon
Flowering Plants	Fisco buckwheat (<i>Eriogonum soledium</i>)	Resolved Taxon
Snails	Hamlin Valley pyrg (<i>Pyrgulopsis hamlinensis</i>)	Resolved Taxon
Birds	California Condor (<i>Gymnogyps californianus</i>)	Experimental Population, Non-Essential

Historic Preservation

Are there any historic sites on or near the construction site?

Yes No

Describe how this determination was made:

- If any registered historic properties are present on or near the facility, they will be marked with a purple circle on the map below.
- There are no historic properties on or near the site.

This project will not have a negative environmental impact on a federally listed historic site as certified in the Historic Preservation Report. A list of State and Nationally Registered Historic Sites is included as part of this section. See the following websites:

<http://nrhp.focus.nps.gov/natreg/docs/Download.html>

<http://www.nationalregisterofhistoricplaces.com/state.html>



Permit Regulations-Applicable Federal, Tribal, State, or Local Programs

Specific requirements that are different or unique from the State of Utah UPDES permit are outlined below.

State of Utah Requirements:

https://le.utah.gov/Documents/code_const.htm

State of Utah Requirements

For SWPPPs that are being managed on compliance | **GO** the local MS4 Regulations will be in the documents section of compliance | **GO**.

Please notify the contact person for the operator found on the NOI in order to access this information if needed.

Go to the following link to access the MS4 stormwater ordinance:

https://le.utah.gov/Documents/code_const.htm

Fugitive Dust Plan

For SWPPPs that are being managed on compliance|**GO** the Fugitive Dust Plan (if required) will be located in the documents section in compliance|**GO**.

Please notify the contact person for the operator found on the NOI in order to access this information if needed.

Soil Report

No Data Available in Web Soil Survey for your Area of Interest

Data Availability is indicated for each soil survey area in your AOI, in the *Soil Data Available from Web Soil Survey* section of the **AOI Properties** pane in the **Area of Interest** panel.

•Fishlake National Forest - Tushar-Pavant Division - Parts of Sevier, Millard, Beaver and Piute Counties, Utah (UT649)

Data Availability	Survey Area Boundary only
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Spatial Data	Version 2, Sep 16, 2019
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For more information about the soil data available in Web Soil Survey, view help (click the [button](#)) in the *Soil Data Available from Web Soil Survey* section.

For more information about the data available for the soil survey areas in your AOI, contact the local or state office of the NRCS listed in the **Contact Us** link.

Correspondence

Out of Date Documentation (Site Maps, Expired Permits, Other)

Appendix H – BMP Instruction and Detail Specifications

BMP Specifications that will be used on the site are inserted in this section.



Wind Erosion Control

WEC-1 Dust Control

Definition	Dust control is a practice used to reduce the air transport of dust during construction activities by stabilizing exposed surfaces and minimizing activities that suspend or track dust particles.
Purpose	Control dust so dust does not infiltrate into stormwater and does not cause discomfort or nuisance to occupants of the Project site or neighboring properties.
Conditions Where the Practice Applies	<p>Wind erosion control BMPs should be applied to all construction earth disturbing activities, including the following construction activities:</p> <ul style="list-style-type: none"> • Construction vehicle traffic on unpaved surfaces. • Drilling and blasting activities. • Sediment tracking onto paved roads. • Soils and debris storage piles. • Batch drop from front-end loaders. • Areas with unstabilized soil. • Final grading/site stabilization.
Specifications: Design and Installation	<p><u>Preventive Measures:</u></p> <ul style="list-style-type: none"> • Schedule construction activities to minimize exposed area. • Quickly stabilize exposed soils. • Identify and stabilize key access points prior to construction. • Minimize the impact of dust by anticipating the direction of prevailing winds. • Direct most construction traffic to stabilized roadways within the Project site. • Water should be applied by means of pressure-type distributors or pipelines equipped with a spray system or hoses and nozzles that will ensure even distribution. • All distribution equipment should be equipped with a positive means of shutoff. • Unless water is applied by means of pipelines, at least one mobile unit should be available at all times to apply water or dust palliative to the Project. • Pave or chemically stabilize access points where unpaved traffic surfaces adjoin paved roads. • Provide covers for haul trucks transporting materials that contribute to dust. • Provide for wet suppression or chemical stabilization of exposed soils. • Provide for rapid clean up of sediments deposited on paved roads. Furnish stabilized construction road entrances. • Stabilize inactive construction sites using BMPs such as vegetation. • Limit the amount of areas disturbed by clearing and earth moving operations by scheduling these activities in phases. • Cover stockpiles with plastics and make sure they are secure.

Sources include EPA, SWRCB, Caltrans, CASQA

Wind Erosion Control

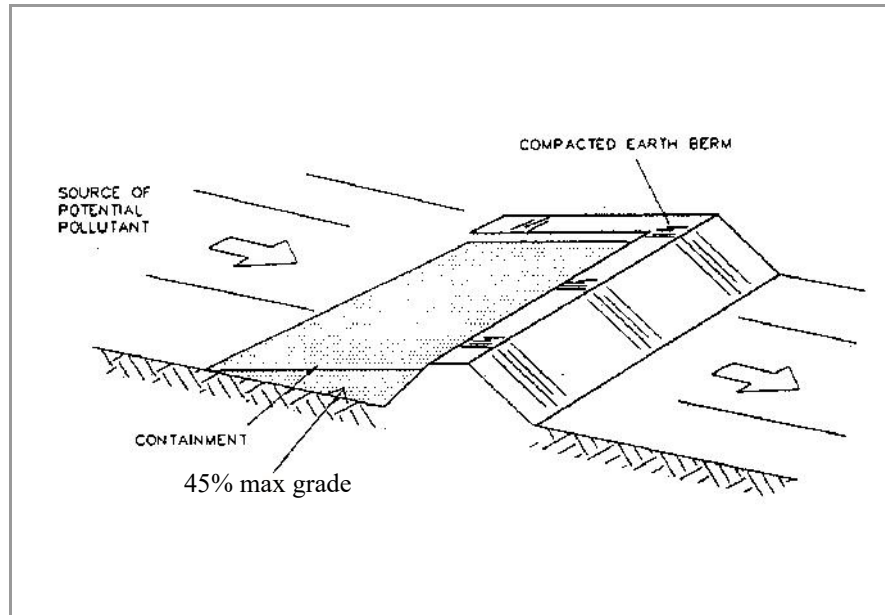


Wind Erosion Control

WEC-1 Dust Control

Maintenance & Inspection

- Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, and weekly throughout the life of the Project.
- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities.
- Check areas protected to ensure coverage.
- Most dust control measures require frequent, often daily, or multiple times per day attention.

**DESCRIPTION:**

A temporary containment control constructed of compacted soil.

APPLICATION:

- ◆ Construct around waste and materials storage area.
- ◆ Construct around staging and maintenance areas.
- ◆ Construct around vehicle parking and servicing areas.

INSTALLATION/APPLICATION CRITERIA:

- ◆ Construct an earthen berm down hill of the area to be controlled. The berm should surround fueling facilities and maintenance areas on three sides to provide containment.
- ◆ Berm needs to be a minimum of 1 foot tall by 1 foot wide and be compacted by earth moving equipment.

LIMITATIONS:

- ◆ Not effective on steep slopes.
- ◆ Limits access to controlled area.
- ◆ Personnel need to quickly respond to spills with remedial actions.

MAINTENANCE:

- ◆ Observe daily for any non-stormwater discharge.
- ◆ Look for runoff bypassing ends of berms or undercutting berms.
- ◆ Repair or replace damaged areas of the berm and remove accumulated sediment.
- ◆ Recompact soil around berm as necessary to prevent piping.

**DESCRIPTION:**

Employee training, like equipment maintenance, is a method by which to implement BMPs. Employee training should be used in conjunction with all other BMPs as part of the facility's SWPPP.

The specific employee training aspects of each of the source controls are highlighted in the individual information sheets. The focus of this information sheet is more general, and includes the overall objectives and approach for assuring employee training in stormwater pollution prevention. Accordingly, the organization of this information sheet differs somewhat from the other information sheets in this chapter.

OBJECTIVES:

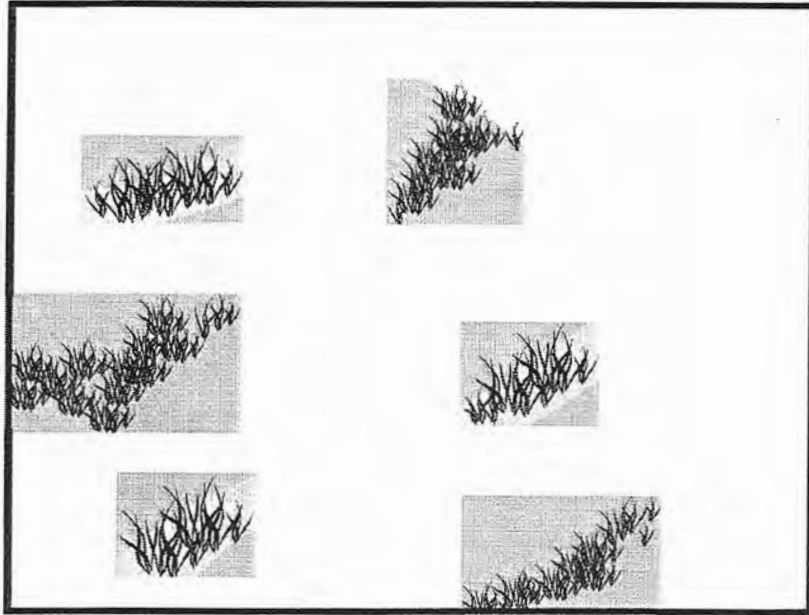
Employee training should be based on four objectives:

- ◆ Promote a clear identification and understanding of the problem, including activities with the potential to pollute stormwater;
- ◆ Identify solutions (BMPs);
- ◆ Promote employee ownership of the problems and the solutions; and
- ◆ Integrate employee feedback into training and BMP implementation.

APPROACH:

- ◆ Integrate training regarding stormwater quality management with existing training programs that may be required for your business by other regulations.
- ◆ Businesses that are not regulated in Federal, State, or local regulations, may use the information in this handbook to develop a training program to reduce their potential to pollute stormwater.
- ◆ Employee training is a vital component of many of the individual source control BMPs included in this manual.

Hydroseeding



Description and Purpose

Hydroseeding typically consists of applying a mixture of wood fiber, seed, fertilizer, and stabilizing emulsion with hydro-mulch equipment, to temporarily protect exposed soils from erosion by water and wind.

Suitable Applications

Hydroseeding is suitable for soil disturbed areas requiring temporary protection until permanent stabilization is established, and disturbed areas that will be re-disturbed following an extended period of inactivity.

Limitations

- Hydroseeding may be used alone only when there is sufficient time in the season to ensure adequate vegetation establishment and coverage to provide adequate erosion control. Otherwise, hydroseeding must be used in conjunction with mulching (i.e., straw mulch).
- Steep slopes are difficult to protect with temporary seeding.
- Temporary seeding may not be appropriate in dry periods without supplemental irrigation.
- Temporary vegetation may have to be removed before permanent vegetation is applied.
- Temporary vegetation is not appropriate for short term inactivity.

Objectives

EC	Erosion Control	
SE	Sediment Control	
TR	Tracking Control	
WE	Wind Erosion Control	!K
NS	Non-Stormwater Management Control	
WM	Waste Management and Material Pollution Control	

Legend:

- Primary Objective
- !K Secondary Objective

Targeted Constituents

- Sediment
- Nutrients
- Trash
- Metals
- Bacteria
- Oil and Grease
- Organics

Potential Alternatives

- EC-3 Hydraulic Mulch
- EC-5 Soil Binders
- EC-6 Straw Mulch
- EC-7 Geotextiles and Mats
- EC-8 Wood Mulching



Implementation

In order to select appropriate hydroseeding mixtures, an evaluation of site conditions shall be performed with respect to:

Soil conditions	Maintenance requirements
Site topography	Sensitive adjacent areas
Season and climate	Water availability
Vegetation types	Plans for permanent vegetation

The local office of the U.S.D.A Natural Resources Conservation Service (NRCS) is an excellent source of information on appropriate seed mixes.

The following steps shall be followed for implementation:

- Avoid use of hydroseeding in areas where the BMP would be incompatible with future earthwork activities and would have to be removed.
- Hydroseeding can be accomplished using a multiple step or one step process. The multiple step process ensures maximum direct contact of the seeds to soil. When the one step process is used to apply the mixture of fiber, seed, etc., the seed rate shall be increased to compensate for all seeds not having direct contact with the soil.
- Prior to application, roughen the area to be seeded with the furrows trending along the contours.
- Apply a straw mulch to keep seeds in place and to moderate soil moisture and temperature until the seeds germinate and grow.
- All seeds shall be in conformance with the California State Seed Law of the Department of Agriculture. Each seed bag shall be delivered to the site sealed and clearly marked as to species, purity, percent germination, dealer's guarantee, and dates of test. The container shall be labeled to clearly reflect the amount of Pure Live Seed (PLS) contained. All legume seed shall be pellet inoculated. Inoculant sources shall be species specific and shall be applied at a rate of 2 lb of inoculant per 100 lb seed.
- Commercial fertilizer shall conform to the requirements of the California Food and Agricultural Code. Fertilizer shall be pelleted or granular form.
- Follow up applications shall be made as needed to cover weak spots and to maintain adequate soil protection.
- Avoid over spray onto roads, sidewalks, drainage channels, existing vegetation, etc.

Costs

Average cost for installation and maintenance may vary from as low as \$300 per acre for flat slopes and stable soils, to \$1600 per acre for moderate to steep slopes and/or erosive soils.

Hydroseeding		Installed Cost per Acre
High Density	Ornamentals	\$400 - \$1600
	Timf Species	\$350
	Bunch Grasses	\$300 - \$]300
Fast Growing	Annual	\$350 - \$650
	Perennial	\$300-\$800
Non-Competing	Native	\$300-\$1600
	Non-Native	\$400-\$500
Sterile	Cereal Grain	\$500

Source: CalTrans Guidance for Soil Stabilization for Temporary Slopes, Nov. 1999

Inspection and Maintenance

- Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.
- Areas where erosion is evident shall be repaired and BMPs re-applied as soon as possible. Care should be exercised to minimize the damage to protected areas while making repairs, as any area damaged will require re-application of BMPs.
- Where seeds fail to germinate, or they germinate and die, the area must be re-seeded, fertilized, and mulched within the planting season, using not less than half the original application rates.
- Irrigation systems, if applicable, should be inspected daily while in use to identify system malfunctions and line breaks. When line breaks are detected, the system must be shut down immediately and breaks repaired before the system is put back into operation.
- Irrigation systems shall be inspected for complete coverage and adjusted as needed to maintain complete coverage.

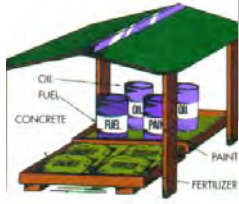
References

Stormwater Quality Handbooks Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Guidance Document: Soil Stabilization for Temporary Slopes, State of California Department of Transportation (Caltrans), November 1999.

Additional Instructions:

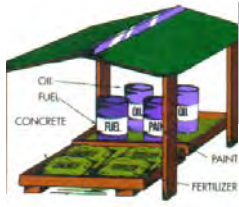
Hydro-seed will be sprayed on the site to temporarily stabilize the site. The hydro-seed will also include tackifier to hold the seed to the soil and prevent erosion. Application rate is 1½ lbs per 1,000 Sq. ft. or about 60 lbs per acre.



Waste Management

WM-1 Material Delivery and Storage

Definition	Prevent, reduce, or eliminate the discharge of pollutants from material delivery and storage to the stormwater system or watercourses by minimizing the storage of hazardous materials onsite, storing materials in a designated area, installing secondary containment, conducting regular inspections, and training employees and subcontractors.
Purpose	Minimize or eliminate the exposure of stormwater to construction materials to prevent pollution of the stormwater system.
Conditions Where the Practice Applies	<p>These procedures are suitable for use at all construction sites with delivery and storage of the following materials:</p> <ul style="list-style-type: none"> • Soil stabilizers and binders • Pesticides and herbicides • Fertilizers • Detergents • Plaster • Petroleum products such as fuel, oil, and grease • Asphalt and concrete components • Hazardous chemicals such as acids, lime, glues, adhesives, paints, solvents, and curing compounds • Concrete compounds • Other materials that may be detrimental if released to the environment
Specifications: Design and Installation	<p>The following steps should be taken to minimize risk:</p> <ul style="list-style-type: none"> • Material Safety Data Sheets (MSDS) should be supplied for all materials stored. • Construction site areas should be designated for material delivery and storage. • Temporary storage area should be located close to the entrance of the site but away from vehicular traffic to prevent accidents. Also locate storage areas away from the Project perimeter, waterways, and stormdrains. <ul style="list-style-type: none"> • Avoid transport near drainage paths or waterways. • Surround with earth berms. • Material storage areas shall be covered. Store materials in secondary containment including non-reactive materials such as detergents, oil, grease, and paints. • Do not store chemicals, drums, or bagged materials directly on the ground. Place these items in secondary containment. • Storage of reactive, ignitable, or flammable liquids must comply with the fire codes of your area. Contact the Fire Marshal at the UCSB Environmental Health & Safety department on campus to review site materials, quantities, and proposed storage area to determine specific requirements. See the Flammable Sources include EPA, SWRCB, Caltrans, CASQA



Waste Management

WM-1 Material Delivery and Storage

and Combustible Liquid Code, NFPA30.

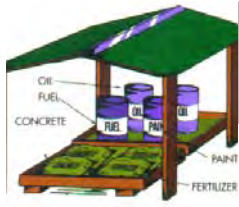
- Keep an up to date inventory of materials delivered and stored onsite.
- Hazardous materials storage onsite should be minimized.
- Hazardous materials should be handled as infrequently as possible.
- Chemicals should be kept in their original labeled containers.
- Employees and subcontractors should be trained on the proper material delivery and storage practices.
- Employees trained in emergency spill cleanup procedures must be present when dangerous materials or liquid chemicals are unloaded.
- If residual materials remain on the ground after construction is complete, properly remove materials and any contaminated soil. See WM – 8 Contaminated Soil Management. If the area is to be paved, pave as soon as materials are removed to stabilize the soil.

Material Storage Areas and Practices

- All temporary containment facilities and material storage areas shall be covered and have secondary containment.
- A temporary containment facility should provide for a spill containment volume able to contain precipitation from a 25 year storm event, plus the greater of 10% of the aggregate volume of all containers or 100% of the capacity of the largest container within its boundary, whichever is greater.
- A temporary containment facility should be impervious to the materials stored therein for a minimum contact time of 72 hours.
- A temporary containment facility should be maintained free of accumulated rainwater and spills. In the event of spills or leaks, accumulated rainwater and spills should be collected and placed into drums. These liquids should be handled as hazardous waste unless testing determines them to be non-hazardous. All collected liquids or non-hazardous liquids should be sent to an approved disposal site.
- Proper storage instructions should be posted at all times in an open and conspicuous location.
- Sufficient separation should be provided between stored containers to allow for spill cleanup and emergency response access.
- Incompatible materials, such as chlorine and ammonia, should not be stored in the same temporary containment facility.
- Materials should be stored in their original containers and the original product labels should be maintained in place in a legible condition. Damaged or otherwise illegible labels should be replaced immediately.
- Liquids, petroleum products, and substances listed in 40 CFR Parts 110, 117, or 302 should be stored in approved containers and drums and should not be overfilled. Containers and drums should be placed in temporary containment

Sources include EPA, SWRCB, Caltrans, CASQA

Waste Management



Waste Management

WM-1 Material Delivery and Storage

facilities for storage.

- Bagged and boxed materials should be stored on pallets and should not be allowed to accumulate on the ground. To provide protection from wind and rain throughout the rainy season, bagged and boxed materials should be covered during non-working days and prior to and during rain events.
- Stockpiles should be protected in accordance with WM – 5 Stockpile Management.
- Materials should be stored indoors within existing structures or sheds when available.
- An ample supply of appropriate spill clean up material should be kept near storage areas.

Material Delivery Practices

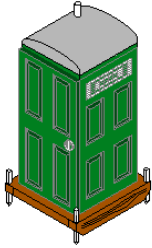
- Keep an accurate, up-to-date inventory of material delivered and stored onsite.
- Arrange for employees trained in emergency spill cleanup procedures to be present when dangerous materials or liquid chemicals are unloaded.

Spill Cleanup

- Contain and clean up any and all spills immediately.
- Properly remove and dispose of any hazardous materials or contaminated soil if significant residual materials remain on the ground after construction is complete. See BMP Contaminated Soil Management.

Maintenance & Inspection

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities.
- Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, and weekly throughout the life of the Project.
- Keep an ample supply of spill cleanup materials near the storage area.
- Keep storage areas clean, well organized, and equipped with ample cleanup supplies as appropriate for the materials being stored.
- Repair or replace perimeter controls, containment structures, covers, and liners as needed to maintain proper function.



Waste Management

WM-4 Sanitary Waste Management

Definition	Practices and procedures such as providing convenient, well-maintained facilities, and arranging for regular service and disposal prevents the discharge of pollutants to stormwater from sanitary and septic waste.
Purpose	Proper sanitary and septic waste management prevent the discharge of pollutants to stormwater from sanitary and septic waste.
Conditions Where the Practice Applies	Sanitary septic waste management practices are suitable for use at all construction sites that use temporary or portable sanitary and septic waste systems.
Specifications: Design and Installation	Sanitary or septic wastes should be treated or disposed of in accordance with state and local requirements. In many cases, one contract with a local facility supplier will be all that it takes to make sure sanitary wastes are properly disposed.

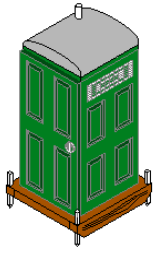
Storage and Disposal Procedures

- Temporary sanitary facilities should be located away from drainage facilities, watercourses, the Project perimeter, and from traffic circulation. When there is a risk of high winds, temporary sanitary facilities should be secured (staked down or tied to a sturdy structure) to prevent overturning.
- Temporary sanitary facilities should be located on a permeable surface at all times. If a temporary sanitary facility needs to be placed on an impermeable surface than it must be placed in an overflow pan or bin.
- Wastewater should not be discharged or buried within the Project site.
- Only reputable, licensed sanitary and septic waste haulers should be used.
- Sanitary facilities should be located in a convenient location.
- Untreated raw wastewater should never be discharged or buried.
- Temporary septic systems should treat wastes to appropriate levels before discharging.
- Sanitary and septic facilities should be maintained in good working order by a licensed service.
- Regular waste collection by a licensed hauler should be arranged before facilities are full. Sanitary and septic facilities should never overflow.

Education

- Educate employees, subcontractors, and suppliers on sanitary and septic waste storage and disposal procedures.
- Educate employees, subcontractors, and suppliers of potential dangers to humans and the environment from sanitary and septic wastes.
- Instruct employees, subcontractors, and suppliers in identification of sanitary and

Sources include EPA, SWRCB, Caltrans, CASQA
Waste Management



Waste Management

WM-4 Sanitary Waste Management

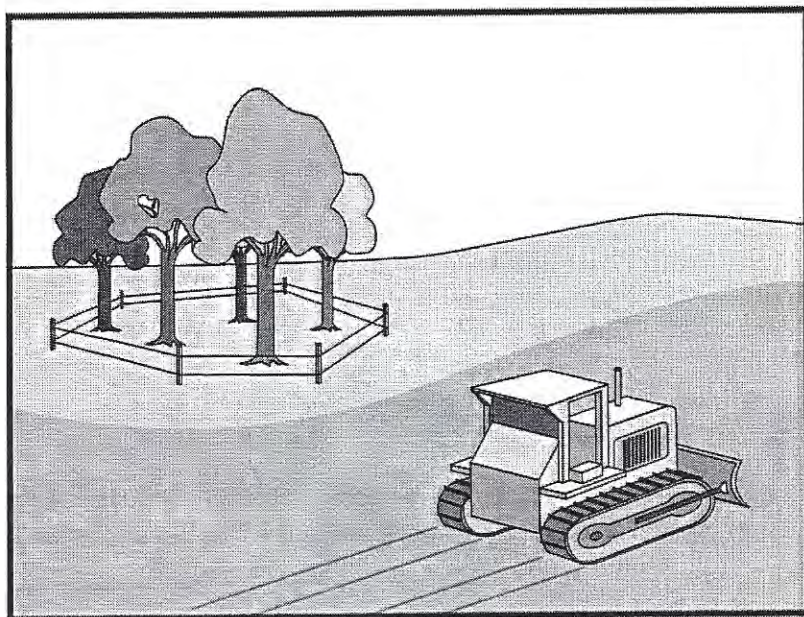
septic waste.

- Hold regular meetings to discuss and reinforce disposal procedures (incorporate into regular safety meetings).
- Establish a continuing education program to indoctrinate new employees.

Maintenance & Inspection

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities.
- Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, and weekly throughout the life of the Project.
- Arrange for regular waste collection.
- If high winds are expected, portable sanitary facilities must be secured with spikes to prevent over turning.

Preservation Of Existing Vegetation EC-2



Description and Purpose

Carefully planned preservation of existing vegetation minimizes the potential of removing or injuring existing trees, vines, shrubs, and grasses that protect soil from erosion.

Suitable Applications

Preservation of existing vegetation is suitable for use on most projects. Large project sites often provide the greatest opportunity for use of this BMP. Suitable applications include the following:

- Areas within the site where no construction activity occurs, or occurs at a later date. This BMP is especially suitable to multi year projects where grading can be phased.
- Areas where natural vegetation exists and is designated for preservation. Such areas often include steep slopes, watercourse, and building sites in wooded areas.
- Areas where local, state, and federal government require preservation, such as vernal pools, wetlands, marshes, certain oak trees, etc. These areas are usually designated on the plans, or in the specifications, permits, or environmental documents.
- Where vegetation designated for ultimate removal can be temporarily preserved and be utilized for erosion control and sediment control.

Objectives

- EC Erosion Control
- SE Sediment Control
- TR Tracking Control
- WE Wind Erosion Control
- NS Non-Stormwater Management Control
- WM Waste Management and Materials Pollution Control

Legend:

- O Primary Objective
- !KI Secondary Objective

Targeted Constituents

- Sediment
- Nutrients
- Trash
- Metals
- Bacteria
- Oil and Grease
- Organics

Potential Alternatives

None



EC-2 Preservation Of Existing Vegetation

Limitations

- Requires forward planning by the owner/developer, contractor, and design staff.
- Limited opportunities for use when project plans do not incorporate existing vegetation into the site design.
- For sites with diverse topography, it is often difficult and expensive to save existing trees while grading the site satisfactory for the planned development.

Implementation

The best way to prevent erosion is to not disturb the land. In order to reduce the impacts of new development and redevelopment, projects may be designed to avoid disturbing land in sensitive areas of the site (e.g., natural watercourses, steep slopes), and to incorporate unique or desirable existing vegetation into the site's landscaping plan. Clearly marking and leaving a buffer area around these unique areas during construction will help to preserve these areas as well as take advantage of natural erosion prevention and sediment trapping.

Existing vegetation to be preserved on the site must be protected from mechanical and other injury while the land is being developed. The purpose of protecting existing vegetation is to ensure the survival of desirable vegetation for shade, beautification, and erosion control. Mature vegetation has extensive root systems that help to hold soil in place, thus reducing erosion. In addition, vegetation helps keep soil from drying rapidly and becoming susceptible to erosion. To effectively save existing vegetation, no disturbances of any kind should be allowed within a defined area around the vegetation. For trees, no construction activity should occur within the drip line of the tree.

Timing

- Provide for preservation of existing vegetation prior to the commencement of clearing and grubbing operations or other soil disturbing activities in areas where no construction activity is planned or will occur at a later date.

Design and Layout

- Mark areas to be preserved with temporary fencing. Include sufficient setback to protect roots.

Orange colored plastic mesh fencing works well.

Use appropriate fence posts and adequate post spacing and depth to completely support the fence in an upright position.

- Locate temporary roadways, stockpiles, and layout areas to avoid stands of trees, shrubs, and grass.
- Consider the impact of grade changes to existing vegetation and the root zone.
- Maintain existing irrigation systems where feasible. Temporary irrigation may be required.
- Instruct employees and subcontractors to honor protective devices. Prohibit heavy equipment, vehicular traffic, or storage of construction materials within the protected area.

Preservation Of Existing Vegetation EC-2

Costs

There is little cost associated with preserving existing vegetation if properly planned during the project design, and these costs may be offset by aesthetic benefits that enhance property values. During construction, the cost for preserving existing vegetation will likely be less than the cost of applying erosion and sediment controls to the disturbed area. Replacing vegetation inadvertently destroyed during construction can be extremely expensive, sometimes in excess of \$10,000 per tree.

Inspection and Maintenance

During construction, the limits of disturbance should remain clearly marked at all times. Irrigation or maintenance of existing vegetation should be described in the landscaping plan. If damage to protected trees still occurs, maintenance guidelines described below should be followed:

- Verify that protective measures remain in place. Restore damaged protection measures immediately.
- Serious tree injuries shall be attended to by an arborist.
- Damage to the crown, trunk, or root system of a retained tree shall be repaired immediately.
- Trench as far from tree trunks as possible, usually outside of the tree drip line or canopy. Curve trenches around trees to avoid large roots or root concentrations. If roots are encountered, consider tunneling under them. When trenching or tunneling near or under trees to be retained, place tunnels at least 18 in. below the ground surface, and not below the tree center to minimize impact on the roots.
- Do not leave tree roots exposed to air. Cover exposed roots with soil as soon as possible. If soil covering is not practical, protect exposed roots with wet burlap or peat moss until the tunnel or trench is ready for backfill.
- Cleanly remove the ends of damaged roots with a smooth cut.
- Fill trenches and tunnels as soon as possible. Careful filling and tamping will eliminate air spaces in the soil, which can damage roots.
- If bark damage occurs, cut back all loosened bark into the undamaged area, with the cut tapered at the top and bottom and drainage provided at the base of the wood. Limit cutting the undamaged area as much as possible.
- Aerate soil that has been compacted over a tree's root zone by punching holes 12 in. deep with an iron bar, and moving the bar back and forth until the soil is loosened. Place holes 18 in. apart throughout the area of compacted soil under the tree crown.
- Fertilization

Fertilize stressed or damaged broadleaf trees to aid recovery.

Fertilize trees in the late fall or early spring.

EC-2 Preservation Of Existing Vegetation

Apply fertilizer to the soil over the feeder roots and in accordance with label instructions, but never closer than 3 ft to the trunk. Increase the fertilized area by one-fourth of the crown area for conifers that have extended root systems.

- Retain protective measures until all other construction activity is complete to avoid damage during site cleanup and stabilization.

References

County of Sacramento Tree Preservation Ordinance, September 1981.

Stormwater Quality Handbooks Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management of the Puget Sound Basin, Technical Manual, Publication #91-75, Washington State Department of Ecology, February 1992.

Water Quality Management Plan for The Lake Tahoe Region, Volume II, Handbook of Management Practices, Tahoe Regional Planning Agency, November 1988.

Secondary Containment

Minimum Measure: Prevent accidental releases or spills

Subcategory: Fuels and Oils / Hazardous Materials



Secondary Containment

Secondary containment is a safeguard measure used to prevent accidental releases or spills of toxic or hazardous substances to the environment (water, soil & air). Secondary containment can be a structure that is chemically compatible to hold a release and remain liquid tight until clean up occurs. Secondary containment can also be an engineered means to redirect a spill away from water or other sensitive receptor to a temporary diversion system.

I. What is required?

Fuel tanks stored on site must have secondary containment and all other spill sources that may be a threat to human health or the environment must have secondary containment. The phrase “may be a threat” is subjective, and without prescriptive regulatory guidance, PEs and Ecology inspectors use professional judgment to determine the necessary and reasonable secondary containment requirements that fit each individual circumstance.

Permit or specification language does not have exemption language that allows projects to deviate from the requirements when secondary containment is impractical. However, PEs has the authority to modify Standard

Specification requirements as reasonably necessary, whether to allow for deviations or to increase protection measures in high risk situations.

II. What needs secondary containment?

Requirements

Secondary containment requirements are not straightforward and regulatory guidance is not black and white. This is a good thing, because secondary containment should be adjusted to match site specific conditions without unnecessarily increasing project costs.

The NPDES Permit **requires** secondary containment for:

1. On-site fueling tanks (except double walled tanks)
NOTE: Even though “Doubled-walled tanks do not require additional secondary containment,” extra preventative measures may still be necessary with high risk construction activities in environmentally sensitive areas.
2. Chemicals, liquid products, petroleum products, and other materials that **have the potential** to pose a threat to human health or the environment. (*This is a **subjective and left to interpretation** based on Other Factors described below*).

The 401 or HPA Permits **may require more stringent** secondary containment for in water or over water work activities.

Regulatory inspectors in the Northwest Region typically expect the following materials and work activities to always have secondary containment:

- Fuel tanks (single walled)
- Fuel transfer activities, for both mobile and stationary areas
- Volumes of stored or used liquid located adjacent/up gradient to water, where there is a reasonable potential of a worst case scenario spill could reach water. Examples such as:
 - Large volumes stored in drums and tanks
 - Large volumes used in large generators and pumps, hydraulic power packs
 - Moderate volumes located directly near water (within 5-10 ft) or unprotected drainage system that directly discharges to water
- Storage of material that may potentially pose a threat to

Single Walled Fuel Tanks



Material Storage



Fuel Transfers



human health or the environment that is not in constant or regular daily use (i.e., general good housekeeping practices following Ecology's BMPs)

Other Factors

Multiple other factors must be considered when deciding what needs secondary containment. To assess spill risks, evaluate the project and the surrounding environment and consider worst case scenarios.

Consider how things could fail and how to prevent or protect in event of a failure.

Consider the location, type and quantity of stored materials or any risky construction activities (e.g., fueling) and take into account the topography (slope and gradient) and the proximity to water or other environmentally sensitive areas. Could a worst case scenario spill reach water?

Apply practicality and use common sense when enforcing secondary containment requirements. Use "worst case" to assess risk, but apply the knowledge listed below to establish reasonable means to manage the risk. Recognize that there is only so much energy, time, and money to expend to achieve full compliance on a project. Make a good faith effort to control pollution sources and require what is reasonable based on the project specific circumstances and environmental conditions.

Consider the following factors when making a judgment call pertaining to secondary containment:

1. Surrounding environment
2. Timeframe in use
3. Condition of equipment
4. Security and vandalism
5. Weather
6. Available manpower
7. Equipment and materials

Surrounding Environment

1. Is the work located over water, or below the Ordinary High Water Line?
2. Is the work or storage area located near environmentally sensitive areas, such as
 - a) stormwater systems and ditches that discharge directly to water or wetlands?
 - b) shallow groundwater or protected drinking water aquifers?
3. What is the distance of the nearest waterway or drainage system?
4. Will rain/stormwater come in contact with chemicals, fuels, or other hazardous materials used or stored on the project

Spill + Water = BIG/MULTIPLE FINES

If the project is near water or other sensitive receptor, you may need to apply increased protections. It is not *only* about secondary containment, because other measures like using pristine equipment, increased maintenance and inspection, enhanced security, and increased man power should also be considered in lieu of or together with varied levels of secondary containment needs.

Timeframe in Use

1. Will the spill source be on the project for a long period of time?
2. Would the containment structure become susceptible to wear and tear?

Long Term Project = Increased Risk

Depending on the project location, increased security of the project, storage and staging areas (i.e., fencing & lightening) may be needed. Don't forget the IFC requirements for fittings, devices and padlocks that prevent malicious tampering or siphoning.

Consider increasing the robustness of containment to increase the durability and resistance of wear and tear and exposure to weather elements over time. Or, ensure regular inspection, maintenance and replacement of containment throughout the entire project.

Condition of Equipment

1. Is equipment relatively new and/or in good condition?
2. Based on experience, is there a reasonable potential for equipment failure?
3. Does the equipment have unprotected high pressure hoses and valves?
4. Could high vibrations or friction cause increase wear and tear on containment structure?

Portable Pump



Equipment Must Be Maintained

Secondary containment is not an option for leaking equipment. Equipment should always be inspected and maintained; otherwise it should be removed from the job site. Leaking equipment usually results in violations.

Many spills are a result of sprays from hydraulic hoses due to damage, chaffing, sharp bend points, broken fittings or maintenance /testing. Hoses should be protected from damage. Some hydraulic power packs have built in secondary containment.

Inspections, tests, maintenance and repair are the first lines of defense against spills. If these are not performed appropriately, or the nature of the work is in environmentally sensitive areas, add or increase secondary containment protection measures. Otherwise, if the first lines of defense are faithfully carried out, secondary containment of equipment may not be necessary.

Security and Vandalism

1. Is the project located in an area easily accessible by pedestrians?
2. Is there a high rate of crime in the project area?
3. Does the project and designated areas have adequate fencing and lighting?
4. Does equipment and storage tanks have protection measures, such as
 - a) devices, such as Power Cord and Plug Locks, oil pump starters
 - b) padlocks on pumps or hoses to secure to hanger
 - c) anti-siphoning device
 - d) self closing nozzles
 - e) automatic shut off valves
 - f) locks on drain or other valves

Fencing



Electrical Locks



AST Fill Port Lock



Alarm Systems



Cap Lock



Emergency Shut-Off Valve



Locking Container



Weather

1. Is construction work occurring during the raining season?
2. Could extreme hot or cold temperatures cause plastic or structures to become brittle or fracture

Weathered Plastic



Plastic Cover



Cover with Containment Pallet



How's the Weather?

Increase protection measures to prevent storm water from coming in contact with hazardous substances stored or used on the project. Otherwise, storm water polluted with chemicals must be diverted with drainage controls, contained, and sampled to determine proper disposal (See Ecology BMP C153, page 4-46).

Ecology BMP C153, page 4-46 directs that during the wet weather season (Oct 1 – April 30), each secondary containment facility shall be covered during non-working days, prior to and during rain events.

Areas with [increased rainfalls](#) (e.g., Quillayute & Quinault) must consider whether the 110% containment capacity can adequately hold a spill plus precipitation. A cover system may be a more effective means of protection.

Extreme cold or hot temperatures may cause some plastics to crack or melt. If unexpected extreme weather conditions occur, increase the frequency of inspections, maintenance, repair and replacement of plastic secondary containment systems. If extreme conditions are typical for the project area (i.e., summer months in Yakima or winter months in Spokane), then contact product manufactures for recommendations on materials that are capable of withstanding those conditions. Learn the minimum and maximum temperatures the material can tolerate.

Available Manpower

1. Is there a commitment of man power to conduct regular frequent inspections?
2. Is there staff on hand who are trained and experienced in spill response?

Trained staff on hand?

Increase protective measures if there is a lack of staff or expertise to conduct inspections, maintenance, documentation, and spill response actions. Consider stronger durability, increased capacity, fail safe diversions, cover, added spill kits, and increased security.

Equipment and Materials

1. Is there an adequate supply of equipment and materials to quickly control and remove any quantity of spills?
2. Is the equipment and materials located where they are immediately available?

Enough materials on hand?

Equipment available?

Secondary containment methods must be added or enhanced to compensate for the lack of equipment or materials that are used to immediately control, contain, and/or remove spilled product and associated contaminated media.

Secondary containment should be appropriately constructed based on the surrounding environment and specific project circumstances. Sometimes, other preventative measures can be used in lieu of secondary containment, as approved by the PE. Following the same rationale described in the IFC Section 3404.2.10, secondary containment can be altered or even waived based on site specific circumstances. For example, secondary containment can be avoided all together if materials are not stored on the project and only brought on site for immediate use on an as needed basis (e.g., mobile fuel trucks instead of temporary above ground tanks). On the other hand, although not required, secondary containment may be reasonable for double-walled fuel tanks, such as a tank located in a high construction traffic zone, with little or no security and placed immediately up gradient and adjacent to a water body.

PEs and inspectors must rely on their professional judgment and use their discretion to determine what is reasonable. HazMat Specialists are available to assess spill risks and provide recommendations. If the PE determines that secondary containment is not practical or necessary, the PE should be prepared to present a rational argument that demonstrates the PE is aware of the circumstance and has considered the predicted flow direction, rate of flow, and total quantity and whether the worst case scenario spill could reasonably be expected to reach a water body; And/or describe alternative measures that provide equivalent environmental protection.

III. How should secondary containment be built and maintained?

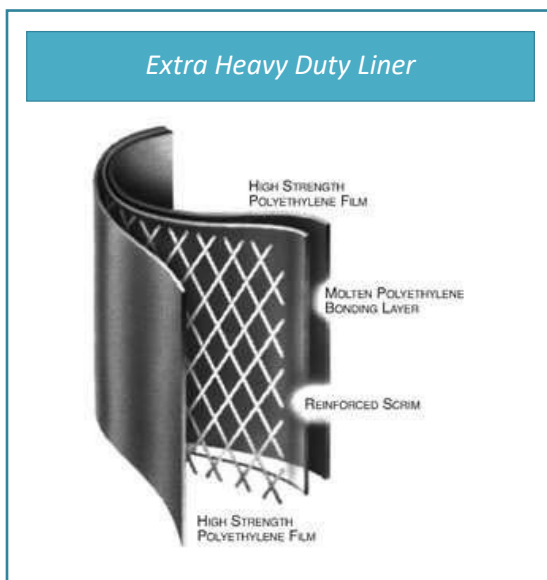
It isn't always easy to assess whether secondary containment is adequate. The proper method of secondary containment is a matter of good engineering practice, thus there is no approved specific method. A few pointers are provided to help evaluate a containment system's ability to effectively hold a spill for at least 72 hours. Types of secondary containment are driven by the following primary variables:

1. Chemical Type
2. 72 Hour Spill Holding Timeframe
3. Quantity
4. Surface Topography
5. Vibration Damage
6. Frequency of Inspection and Maintenance

Chemical Type

The type of chemical dictates what material is chemically compatible to hold a spill without disintegrating or breaking through, thus being considered "impervious." Vendors of spill response and containment equipment can help determine products that will properly contain various chemical substances.

Petroleum products (gasoline, diesel, hydraulic oil, etc.) are the primary chemicals stored or used on most projects. Typical products used to contain petroleum spills include temporary structures such as pop-up pools or materials like plastic sheeting used as a liner in containment systems.



Plastic sheeting is made in various thicknesses. A thickness of 20-25 mil is recommended for temporary containment liners that is expected to last one to two years. A 6 mil thickness punctures or tears easily, but it may be effective for short term durations, with little wear and tear and not exposed to extreme hot or cold environments.

Polyvinyl Chloride (PVC) plastic sheeting liners can be made to resist oils, alcohols, hydrocarbons, waste products and other corrosive liquids. PVC liners are lightweight, flexible and best used where soil conditions are stable with minimal amount of sharp rocks. PVC's flexibility allows for stretching to help prevent stress cracking, which may occur with High Density Polyethylene (HDPE). PVC has a wide range of thicknesses available, from 6 to 45 mils or more.

High Density Polyethylene (HDPE) essentially does the same as PVC, but is slightly stiffer which may provide increased durability and resistance properties.

72-Hour Spill Holding Timeframe

[Ecology's BMP C153](#) requires that containment must hold a spill for at least **72 hours** in order to be considered "sufficiently impervious." The 72 hour standard first came from EPA's attempt to define "sufficiently impervious" in [40 CFR Part 112](#) (Oil Pollution Prevention regulation). The rationale was that a containment system that is impervious to oil for 72 hours would allow time for discovery and removal of an oil discharge in most cases. In the 2002 rule revisions the proposed EPA 72 hour standard was withdrawn; however Ecology continues to maintain the 72 hour standard per BMP C153. Ecology expects spill cleanup work to start immediately once a spill is discovered and in most cases be completely cleaned up within 72 hours.

For storage of large quantities of chemicals other than petroleum, consider asking the product supplier to specify in writing that the containment system meets Ecology's 72 hour impermeability standard. If there is a justifiable reason that clean up cannot feasibly occur within 72 hours of a spill (highly uncommon), provide additional protection measures (i.e., increased inspections, limit quantities stored, etc.) and then consider more robust products that exceed the 72 hour standard.

Quantity

The NPDES permit and amended Specification 1-07.15(1) requires the capacity to equal 110% of the volume contained in the largest tank (or container) within the containment structure. The extra 10% is intended to accommodate precipitation and a safeguard against miscalculations.

Ecology's Spill Prevention, Preparedness and Response Program began creating a new Excel tool to help calculate containment volumes. For more information or a copy of this calculation tool, contact the Ecology Spills Program at 360-407-6458. For area calculations, see EPA example at: <http://www.epa.gov/region6/6sf/sfsites/oil/samppln.htm>

BMP C153

"Secondary containment facilities shall be impervious to the materials stored therein for a minimum contact time of 72 hours"

EPA Example Calculation

Formula: **(volume of single largest tank + 10%) x 0.1337 cubic feet/gallon**

Question: **What is the area of the minimum containment volume for a 25,000 gallon fuel tank?**

Calculation:
25,000 gal + 10% = 27,500

27,500 x 0.1337 = 3676.75

IV. What encourages compliance?

Good communication is the best means to encourage compliance. When a regulatory inspector is assigned to a project, increase your chances of a positive outcome by clarifying gray areas in advance with respect to how the inspector might interpret the permit conditions. Ask for clarifications. Inspections are designed to help and the Contractor maintain legal compliance. Do not be afraid to ask for technical assistance, whether it be from Ecology or your HazMat Specialist. Working together is important and discussions to improve the situation are encouraged.

To prevent the most common spill violations, projects should

- i) follow their Spill Prevention, Control and Countermeasures (SPCC) Plan,
- ii) give more attention to secondary containment needs, and
- iii) encourage better housekeeping practices.

Unfortunately sometimes, there is a lack of resources or commitment to comply with the requirements. Some projects lack the manpower, equipment and material to expeditiously follow the SPCC plan or permit requirements. When a contractor fails to comply with a PE's repeated attempts to correct a problem, here are a few suggestions.

- i) Remind staff and Contractors about the significant costs and fines associated with spills. In addition to construction delays and clean up costs, there are significant fines. Under water quality regulations, a spill to water is \$10,000 to \$100,000 per day **per violation**. Damage to habitat may also result in a Natural Resource Damage Assessment fine. For habitat protected under the Endangered Species Act, damage or "taking" of habitat may result in civil penalties up to \$25,000 per violation. There can be many violations in a single spill incident.
- ii) Call the HazMat Specialist to conduct an internal assessment, where the specialist works directly with the PE and then the PE uses the report to communicate and encourage compliance
- iii) Call local fire marshal, who enforces the International Fire Code
- iv) Call Ecology's spill prevention program to request an informal assessment
- v) Utilize some of the following Standard Specification "hammers" to contractually force compliance:
 - vi) **1-05.1 Authority of the Engineer** – The Engineer and Project Engineer can suspend all or part of the Contract Work. can also use other resources to complete the Work.
 - vii) **1-05.2 Authority of Assistants and Inspectors** – Inspectors are not authorized to accept or approve any Work not meeting the intent of the Contract. Inspectors have the authority to reject defective material and suspend Work that is being done improperly, subject to the final decision of the PE.
 - Compliance with environmental laws and regulations is part of the Contract.



- viii) **1-05.6 Inspection of Work and Materials** – The Engineer can order the Contractor to remove and replace materials used without inspection. The Contractor shall correct any substandard Work or materials. The Engineer will reject unsuitable Work or materials or materials even though previously inspected or paid for.
- This condition allows to reject secondary containment structures, systems or BMPs that are not installed properly.
- ix) **1-05.7 Removal of Defective and Unauthorized Work** – will not pay for unauthorized or defective Work. This is anything that doesn't conform to the Contract, Work done beyond the lines and grades set by the Plans or Engineer, or extra Work and materials furnished without the Engineer's approval.
- This applies to improper secondary containment structures, systems or BMPs.
- x) **1-05.13 Superintendents, Labor, and Equipment of Contractor** – The Engineer can, with written statement, remove a superintendent from the project for failing repeatedly to follow the Engineers written or oral orders, directions, instructions, or determinations. This also applies to other employees of the Contractor.
- Poor environmental performance caused by the Contractor, whether chronic or acute, does not have to be tolerated.
- xi) **1-08.1 Subcontracting** – Approval to subcontract shall not relieve the Contractor's responsibility to carry out the Contract or to relieve the Contractor of any obligation or liability under the Contract. In addition, the Engineer can request the Subcontractor to be removed from the project.
- xii) **1-08.6 Suspension of Work** – The Engineer may suspend all or any part of the Work if unsuitable weather prevents satisfactory and timely performance of the Work, if the Contractor does not comply with the Contract, or it is in the public interest.

Suspending work is usually a last resort effort, but it does catch the Contractor's attention because they are responsible for any lost working days.

*Information obtained from Washington State Department of Transportation

**DESCRIPTION:**

Practices to clean-up leakage/spillage of on-site materials that may be harmful to receiving waters.

APPLICATION:

All sites

GENERAL:

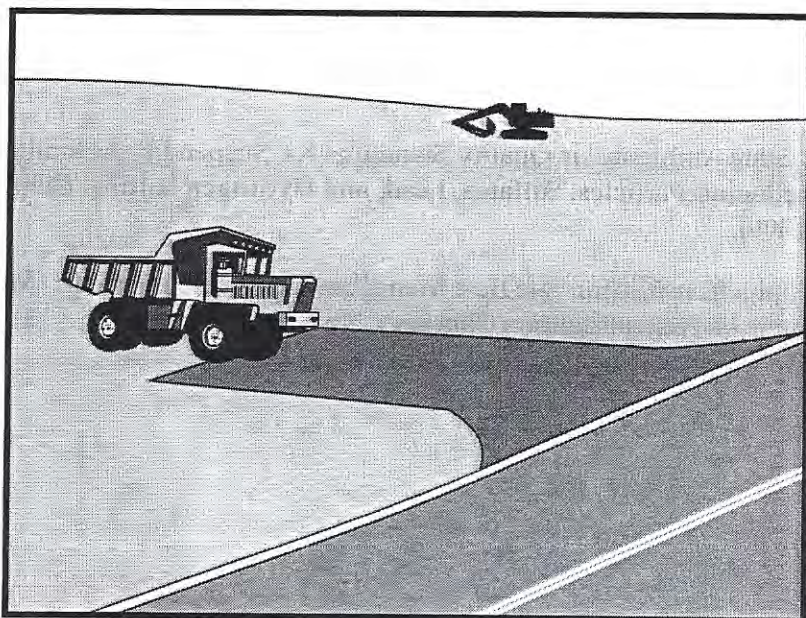
- ◆ Store controlled materials within a storage area.
- ◆ Educate personnel on prevention and clean-up techniques.
- ◆ Designate an Emergency Coordinator responsible for employing preventative practices and for providing spill response.
- ◆ Maintain a supply of clean-up equipment on-site and post a list of local response agencies with phone numbers.

METHODS:

- ◆ Clean-up spills/leaks immediately and remediate cause.
- ◆ Use as little water as possible. **NEVER HOSE DOWN OR BURY SPILL CONTAMINATED MATERIAL.**
- ◆ Use rags or absorbent material for clean-up. Excavate contaminated soils. Dispose of clean-up material and soil as hazardous waste.
- ◆ Document all spills with date, location, substance, volume, actions taken and other pertinent data.
- ◆ Contact the Salt Lake County Health Department (313-6700) for any spill of reportable quantity.

Utah RSI Manual

Stabilized Construction Entrance/Exit TC-1



Description and Purpose

A stabilized construction access is defined by a point of entrance/exit to a construction site that is stabilized to reduce the tracking of mud and dirt onto public roads by construction vehicles.

Suitable Applications

Use at construction sites:

- Where dirt or mud can be tracked onto public roads.
- Adjacent to water bodies.
- Where poor soils are encountered.
- Where dust is a problem during dry weather conditions.

Limitations

- Entrances and exits require periodic top dressing with additional stones.
- This BMP should be used in conjunction with street sweeping on adjacent public right of way.
- Entrances and exits should be constructed on level ground only.
- Stabilized construction entrances are rather expensive to construct and when a wash rack is included, a sediment trap of some kind must also be provided to collect wash water runoff.

Objectives

EC	Erosion Control	!KI
SE	Sediment Control	!KI
TC	Tracking Control	O
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

O Primary Objective

!KI Secondary Objective

Targeted Constituents

Sediment
Nutrients
Trash
Metals
Bacteria
Oil and Grease
Organics

Potential Alternatives

None



Implementation***General***

A stabilized construction entrance is a pad of aggregate underlain with filter cloth located at any point where traffic will be entering or leaving a construction site to or from a public right of way, street, alley, sidewalk, or parking area. The purpose of a stabilized construction entrance is to reduce or eliminate the tracking of sediment onto public rights of way or streets. Reducing tracking of sediments and other pollutants onto paved roads helps prevent deposition of sediments into local storm drains and production of airborne dust.

Where traffic will be entering or leaving the construction site, a stabilized construction entrance should be used. NPDES permits require that appropriate measures be implemented to prevent tracking of sediments onto paved roadways, where a significant source of sediments is derived from mud and dirt carried out from unpaved roads and construction sites.

Stabilized construction entrances are moderately effective in removing sediment from equipment leaving a construction site. The entrance should be built on level ground. Advantages of the Stabilized Construction Entrance/Exit is that it does remove some sediment from equipment and serves to channel construction traffic in and out of the site at specified locations. Efficiency is greatly increased when a washing rack is included as part of a stabilized construction entrance/exit.

Design and Layout

- Construct on level ground where possible.
- Select 3 to 6 in. diameter stones.
- Use minimum depth of stones of 12 in. or as recommended by soils engineer.
- Construct length of 50 ft minimum, and 30 ft minimum width.
- Rumble racks constructed of steel panels with ridges and installed in the stabilized entrance/exit will help remove additional sediment and to keep adjacent streets clean.
- Provide ample turning radii as part of the entrance.
- Limit the points of entrance/exit to the construction site.
- Limit speed of vehicles to control dust.
- Properly grade each construction entrance/exit to prevent runoff from leaving the construction site.
- Route runoff from stabilized entrances/exits through a sediment trapping device before discharge.
- Design stabilized entrance/exit to support heaviest vehicles and equipment that will use it.
- Select construction access stabilization (aggregate, asphaltic concrete, concrete) based on longevity, required performance, and site conditions. Do not use asphalt concrete (AC) grindings for stabilized construction access/roadway.

Utah RSI Manual

Stabilized Construction Entrance/Exit TC-1

- If aggregate is selected, place crushed aggregate over geotextile fabric to at least 12 in. depth, or place aggregate to a depth recommended by a geotechnical engineer. A crushed aggregate greater than 3 in. but smaller than 6 in. should be used.
- Designate combination or single purpose entrances and exits to the construction site.
- Require that all employees, subcontractors, and suppliers utilize the stabilized construction access.
- Implement SE-7, Street Sweeping and Vacuuming, as needed.
- All exit locations intended to be used for more than a two-week period should have stabilized construction entrance/exit BMPs.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMPs are under way, inspect weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect local roads adjacent to the site daily. Sweep or vacuum to remove visible accumulated sediment.
- Remove aggregate, separate and dispose of sediment if construction entrance/exit is clogged with sediment.
- Keep all temporary roadway ditches clear.
- Check for damage and repair as needed.
- Replace gravel material when surface voids are visible.
- Remove all sediment deposited on paved roadways within 24 hours.
- Remove gravel and filter fabric at completion of construction

Costs

Average annual cost for installation and maintenance may vary from \$1,200 to \$4,800 each, averaging \$2,400 per entrance. Costs will increase with addition of washing rack, and sediment trap. With wash rack, costs range from \$1,200 - \$6,000 each, averaging \$3,600 per entrance.

References

Manual of Standards of Erosion and Sediment Control Measures, Association of Bay Area Governments, May 1995.

National Management Measures to Control Nonpoint Source Pollution from Urban Areas, USEPA Agency, 2002.

Proposed Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, Work Group Working Paper, USEPA, April 1992.

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Stormwater Quality Handbooks Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

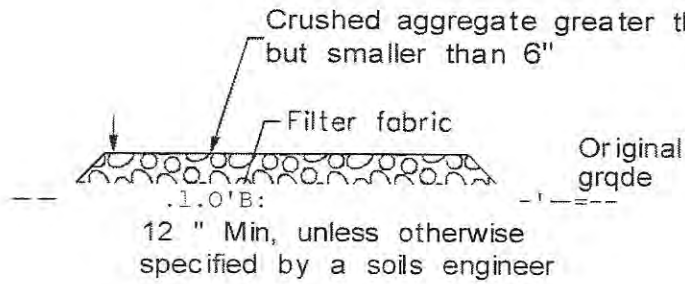
Stormwater Management of the Puget Sound Basin, Technical Manual, Publication #91-75, Washington State Department of Ecology, February 1992.

Virginia Erosion and Sedimentation Control Handbook, Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation, 1991.

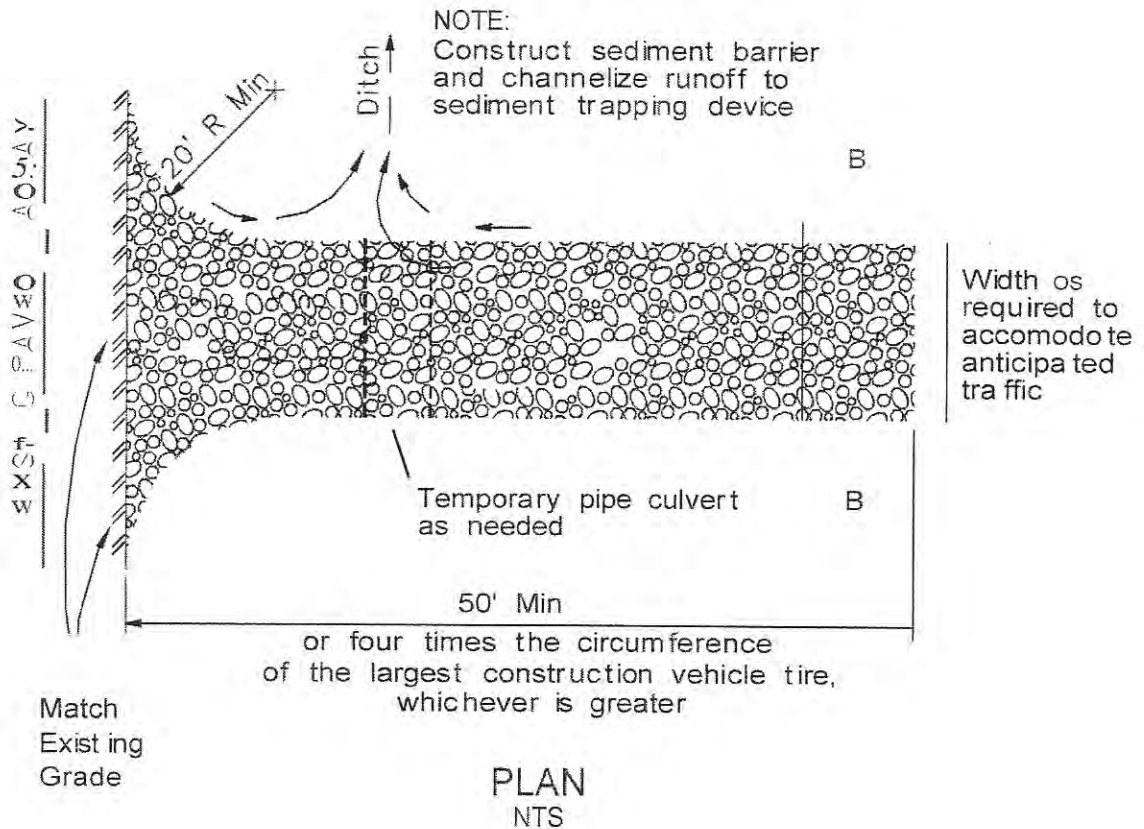
Guidance Specifying Management Measures for Nonpoint Pollution in Coastal Waters, EPA 840-B-9-002, USEPA, Office of Water, Washington, DC, 1993.

Water Quality Management Plan for the Lake Tahoe Region, Volume II, Handbook of Management Practices, Tahoe Regional Planning Agency, November 1988.

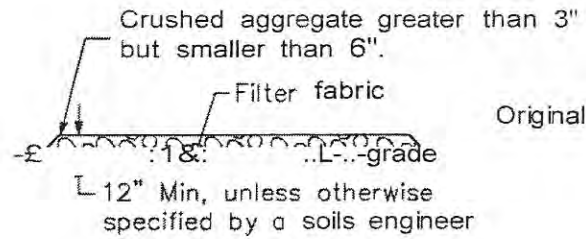
Utah RSI Manual
Stabilized Construction Entrance/Exit TC-1



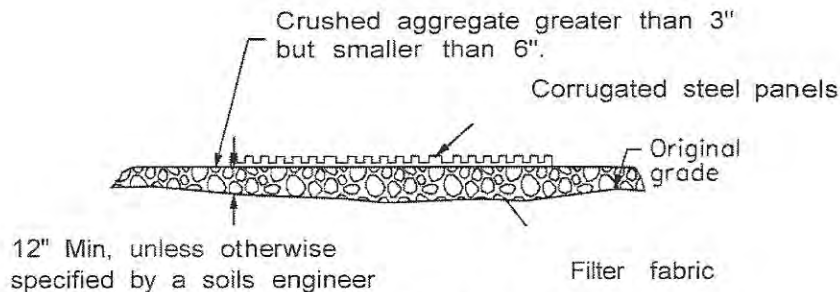
SECTION B-B
 NTS



Stabilized Construction Entrance/Exit TC-1

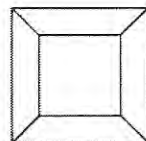


SECTION B-B
NTS

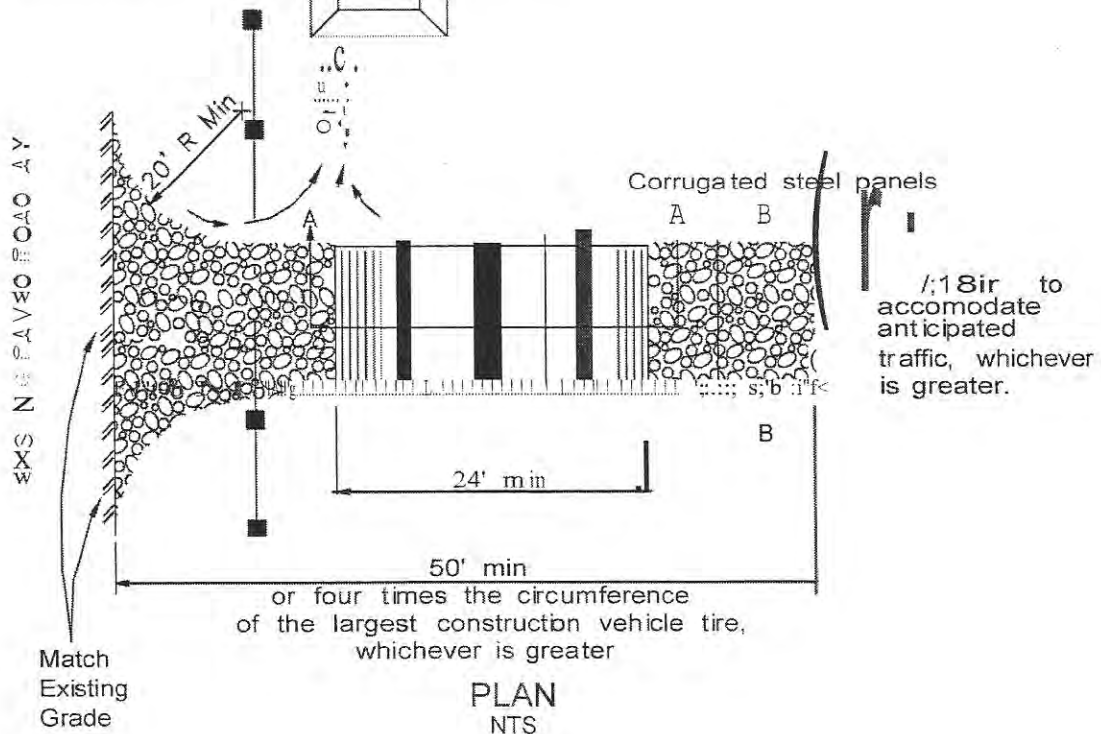


SECTION A-A
NOT TO SCALE

NOTE:
Construct sediment barrier and channelize runoff to sediment trapping device



Sediment trapping device



PLAN
NTS



Waste Management

WM-5 Stockpile Management

Definition	Stockpile Management procedures and practices are designed to reduce or eliminate air and stormwater pollution from stockpiles of soil, paving materials such as Portland Cement Concrete (PCC) rubble, Asphalt Concrete (AC), asphalt concrete rubble, aggregate base, aggregate sub base or pre-mixed aggregate, asphalt minder (so called “cold mix” asphalt), and pressure treated wood.
Purpose	To prevent air and stormwater pollution from stockpiles of various construction materials.
Conditions Where the Practice Applies	Implement in all Projects that stockpile soil and other materials.
Specifications: Design and Installation	<p>Protection of stockpiles is a year-round requirement. To properly manage stockpiles:</p> <ul style="list-style-type: none"> • Locate stockpiles a minimum of 50 feet away from concentrated flows of stormwater, stormdrain inlets, and the site perimeter. • Protect all stockpiles from stormwater runoff using a temporary perimeter sediment barrier such as gravel bags, fiber rolls, or cutback curb. • Protect all stockpiles from stormwater and wind erosion by completely covering with some type of tarp or covering. Secure the tarp with stakes or gravel bags to ensure the tarp does not blow off or expose any portion of the stockpile. Stockpiles must be covered at all times. • Implement wind erosion control practices as appropriate on all stockpiled material. For specific information, see WEC – 1 Dust Control. • Manage stockpiles of contaminated soil in accordance with WM – 8 Contaminated Soil Management. • Place bagged materials in the material storage area, in secondary containment, and under cover.

Protection of Non-Active Stockpiles

Non-active stockpiles of the identified materials should be protected further as follows:

Soil Stockpiles

- Soil stockpiles should be covered or protected with soil stabilization measures and a temporary perimeter sediment barrier at all times.

Stockpiles of Portland Cement Concrete Rubble, Asphalt Concrete, Asphalt Concrete Rubble, Aggregate Base, or Aggregate Sub Base

- The stockpiles should be covered or protected with soil stabilization measures and a temporary perimeter sediment barrier at all times.

Stockpiles of “Cold Mix”

- Soil stockpiles should be placed on and covered with plastic or comparable

Sources include EPA, SWRCB, Caltrans, CASQA

Waste Management



Waste Management

WM-5 Stockpile Management

material at all times.

Stockpiles/Storage of Pressure Treated Wood with Copper, Chromium, and Arsenic or Ammonical, Copper, Zinc, and Arsenate

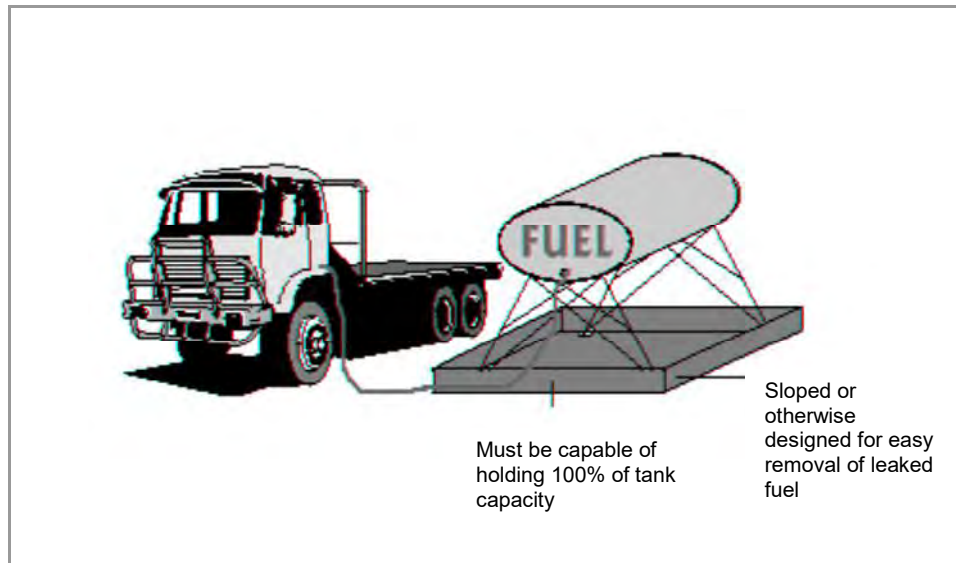
- Treated wood should be covered with plastic or comparable material at all times.

Protection of Active Stockpiles

- All stockpiles should be covered and protected with a temporary linear sediment barrier prior to the onset of precipitation.
- Stockpiles of “cold mix” should be placed on and covered with plastic or comparable material prior to the onset of precipitation.

Maintenance & Inspection

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities.
- Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, and weekly throughout the life of the Project.
- Repair and/or replace perimeter controls and covers as needed to keep them functioning properly. Ensure stockpiles are covered at all times and that the covers are properly secured or weighted down.

**DESCRIPTION:**

Prevent fuel spills and leaks, and reduce their impacts to storm water by using off-site facilities, fueling in designated areas only, enclosing or covering stored fuel, implementing spill controls, and training employees and subcontractors.

INSTALLATION/APPLICATION:

- ◆ Use off-site fueling stations as much as possible. Fueling vehicles and equipment outdoors or in areas where fuel may spill/leak onto paved surfaces or into drainage pathways can pollute storm water. If you fuel a large number of vehicles or pieces of equipment, consider using an off-site fueling station. These areas are better equipped to handle fuel and spills properly. Performing this work off-site can also be economical by eliminating the need for a separate fueling area at your site.
- ◆ If fueling must occur on-site, use designated areas, located away from drainage courses, to prevent the runoff of storm water and the runoff of spills. Discourage topping-off of fuel tanks.
- ◆ Always use secondary containment, such as a drain pan or drop cloth, when fueling to catch spills/leaks. Place a stockpile of spill cleanup materials where it will be readily accessible. Use adsorbent materials on small spills rather than hosing down or burying the spill. Remove the adsorbent materials promptly and dispose of properly.
- ◆ Carry out all Federal and State requirements regarding stationary above ground storage tanks. (40 CF Sub. J) Avoid mobile fueling of mobile construction equipment around the site; rather, transport the equipment to designated fueling areas. With the exception of tracked equipment such as bulldozers and perhaps forklifts, most vehicles should be able to travel to a designated area with little lost time. Train employees and subcontractors in proper fueling and cleanup procedures.

LIMITATIONS:

Sending vehicles/equipment off-site should be done in conjunction with Stabilized Construction Entrance.

MAINTENANCE:

- ◆ Keep ample supplies of spill cleanup materials on-site.
- ◆ Inspect fueling areas and storage tanks on a regular schedule.

Waste Management

Definition	Provide designated waste collection areas and containers, arranging for regular disposal, and training employees and subcontractors.
Purpose	Prevent or reduce the discharge of pollutants to stormwater from solid, leachable, or construction waste.

Conditions Where the Practice Applies

This BMP is suitable for construction sites where the following wastes are generated or stored:

- Solid waste generated from trees and shrubs removed during land clearing, demolition of existing structures (rubble), and building construction.
- Packaging materials including wood, paper, and plastic.
- Scrap or surplus building materials including scrap metals, rubber, plastic, glass pieces, and masonry products.
- Domestic wastes including food containers such as beverage cans, coffee cups, paper bags, plastic wrappers, and cigarettes.
- Construction wastes including brick, mortar, timber, steel and metal scraps, pipe and electrical cuttings, non-hazardous equipment parts, Styrofoam and other materials used to transport and package construction materials.
- Planting wastes, including vegetative material, plant containers, and packaging materials.

Specifications: Design and Installation

The following steps will help keep a clean site and reduce stormwater pollution:

- Select designated waste collection areas onsite.
- Provide an adequate number of containers to prevent loss of wastes when it is windy.
- Plan for additional containers and more frequent pickup during the demolition phase of construction.
- Arrange for regular waste collection. Do not allow containers to overflow.
- Make sure that toxic liquid wastes (used oils, solvents, and paints) and chemicals (acids, pesticides, additives, curing compounds) are not disposed of in dumpsters designated for construction debris.
- Trash receptacles should be provided in the Contractor's yard, field trailer areas, and at locations where workers congregate for lunch and break periods.
- Dumpsters of sufficient size and number should be provided to contain the solid waste generated by the Project.

Sources include EPA, SWRCB, Caltrans, CASQA,
University of California, Santa Barbara

Waste Management

- Stormwater run-on should be prevented from contacting stored solid waste through the use of berms, dikes, or other temporary diversion structures or through the use of measures to elevate waste from site surfaces.
- Solid waste storage areas should be, where possible, located at least 50 feet from drainage facilities and watercourses and should not be located in areas prone to flooding or ponding.

Education

- Have the Contractor's superintendent or representative oversee and enforce proper solid waste management procedures and practices.
- Instruct employees and subcontractors on identification of solid waste and hazardous waste. Hazardous waste must not be disposed of in dumpsters.
- Educate employees and subcontractors on solid waste storage and disposal procedures. Include bagging of blowable trash.
- Hold regular meetings to discuss and reinforce disposal procedures.
- Require that employees and subcontractors follow solid waste handling and storage procedures.
- Prohibit littering by employees, subcontractors, and visitors.
- Minimize production of solid waste materials whenever possible.

Collection, Storage, and Disposal

- Littering on the Project site is prohibited.
- To prevent clogging of the stormwater drainage system, litter and debris removal from drain gates, trash racks, and ditch lines should be a priority.
- Trash receptacles from work areas within the construction limits of the Project site should be collected, regardless of whether the litter was generated by the Contractor, the public, or others. Collected litter and debris shall not be placed in or next to storm drain inlets, stormwater drainage systems, watercourses, or near the site perimeter.
- Full dumpsters should be removed from the Project site and the contents should be disposed of properly by trash hauling contractor.
- Construction material visible to the public should be stored or stacked in an orderly manner.
- Dispose of planting waste in dumpsters.
- Segregate potentially hazardous waste from non-hazardous construction site waste.
- Make sure that toxic liquid wastes (used oils, solvents, and paints) and chemicals (acids, pesticides, additives, curing compounds) are NOT disposed of in dumpsters designated for construction debris.
- Make sure that demolition materials containing hazardous wastes are NOT disposed of in dumpsters designated for construction debris.
- For disposal of hazardous waste, have hazardous waste hauled to an appropriate disposal and/or recycling facility.
- Salvage or recycle useful vegetation debris, packaging and surplus building materials when

Sources include EPA, SWRCB, Caltrans, CASQA,
University of California, Santa Barbara

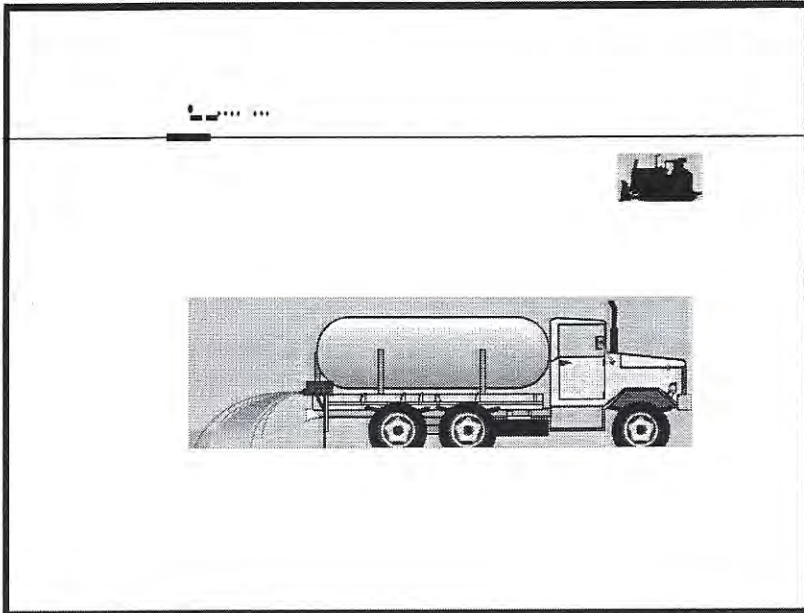
Waste Management

practical. For example, trees and shrubs from land clearing can be used as a brush barrier or converted into wood chips, then used as mulch on graded areas. Wood pallets, cardboard boxes, and construction scraps can also be recycled.

- Collect site trash daily and dispose in the dumpster, throughout the life of the Project, especially during the rainy and windy conditions.
- Make sure that construction waste is collected, removed, and disposed of only at authorized disposal areas.
- Remove solid waste promptly since erosion and sediment control devices tend to collect litter.
- Bag any waste that can leak out of the dumpster.
- Bag all blowable trash so that it is contained within the dumpster.
- Arrange for regular waste collection.

Maintenance & Inspection

- Inspect and verify that activity based BMPs are in place prior to the commencement of associated activities.
- Inspect BMPs daily during extended rain events, after rain events, and weekly throughout the life of the Project.
- Inspect construction waste area regularly.
- Monitor employees, subcontractors, and visitors and ensure no littering.
- Check erosion and sediment controls for the accumulation of trash or debris.
- Inspect dumpsters to be sure that blowable trash is bagged.
- Inspect the dumpsters for leaks or signs of liquid waste in the dumpsters.
- Do not hose out dumpsters on the construction site. Leave dumpster cleaning to the trash hauling Contractor.
- Clean up immediately if a container does spill.



Description and Purpose

Wind erosion or dust control consists of applying water or other dust palliatives as necessary to prevent or alleviate dust nuisance generated by construction activities. Covering small stockpiles or areas is an alternative to applying water or other dust palliatives.

Suitable Applications

Wind erosion control BMPs are suitable during the following construction activities:

- Construction vehicle traffic on unpaved roads
- Drilling and blasting activities
- Sediment tracking onto paved roads
- Soils and debris storage piles
- Batch drop from front-end loaders
- Areas with unstabilized soil
- Final grading/site stabilization

Limitations

- Watering prevents dust only for a short period and should be applied daily (or more often) to be effective.
- Over watering may cause erosion.

Objectives

EC	Erosion Control	
SE	Sediment Control	!K!
TC	Tracking Control	
WE	Wind Erosion Control	O
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

- O** Primary Objective
- !K!** Secondary Objective

Targeted Constituents

- Sediment
- Nutrients
- Trash
- Metals
- Bacteria
- Oil and Grease
- Organics

Potential Alternatives

None



- Oil or oil-treated subgrade should not be used for dust control because the oil may migrate into drainageways and/or seep into the soil.
- Effectiveness depends on soil, temperature, humidity, and wind velocity.
- Chemically treated sub grades may make the soil water repellent, interfering with long-term infiltration and the vegetation/re-vegetation of the site. Some chemical dust suppressants may be subject to freezing and may contain solvents and should be handled properly.
- Asphalt, as a mulch tack or chemical mulch, requires a 24-hour curing time to avoid adherence to equipment, worker shoes, etc. Application should be limited because asphalt surfacing may eventually migrate into the drainage system.
- In compacted areas, watering and other liquid dust control measures may wash sediment or other constituents into the drainage system.

Implementation

General

California's Mediterranean climate, with short wet seasons and long hot dry seasons, allows the soils to thoroughly dry out. During these dry seasons, construction activities are at their peak, and disturbed and exposed areas are increasingly subject to wind erosion, sediment tracking and dust generated by construction equipment.

Dust control, as a BMP, is a practice that is already in place for many construction activities. Los Angeles, the North Coast, and Sacramento, among others, have enacted dust control ordinances for construction activities that cause dust to be transported beyond the construction project property line.

Recently, the State Air Resources Control Board has, under the authority of the Clean Air Act, started to address air quality in relation to inhalable particulate matter less than 10 microns (PM-10). Approximately 90 percent of these small particles are considered to be dust. Existing dust control regulations by local agencies, municipal departments, public works department, and public health departments are in place in some regions within California.

Many local agencies require dust control in order to comply with local nuisance laws, opacity laws (visibility impairment) and the requirements of the Clean Air Act. The following are measures that local agencies may have already implemented as requirements for dust control from contractors:

- Construction and Grading Permits: Require provisions for dust control plans.
- Opacity Emission Limits: Enforce compliance with California air pollution control laws.
- Increase Overall Enforcement Activities: Priority given to cases involving citizen complaints.
- Maintain Field Application Records: Require records of dust control measures from contractor;
- Stormwater Pollution Prevention Plan: (SWPPP): Integrate dust control measures into SWPPP.

Dust Control Practices

Dust control BMPs generally stabilize exposed surfaces and minimize activities that suspend or track dust particles. The following table shows dust control practices that can be applied to site conditions that cause dust. For heavily traveled and disturbed areas, wet suppression (watering), chemical dust suppression, gravel asphalt surfacing, temporary gravel construction entrances, equipment wash-out areas, and haul truck covers can be employed as dust control applications. Permanent or temporary vegetation and mulching can be employed for areas of occasional or no construction traffic. Preventive measures would include minimizing surface areas to be disturbed, limiting onsite vehicle traffic to 15 mph, and controlling the number and activity of vehicles on a site at any given time.

SITE CONDITION	DUST CONTROL PRACTICES								
	Permanent Vegetation	Mulching	Wet Suppression (Watering)	Chemical Dust Suppression	Gravel or Asphalt	Silt Fences	Temporary Gravel Construction Entrances/Equipment Wash Down	Haul Truck Covers	Minimize Extent of Disturbed Area
Disturbed Areas not Subject to Traffic	X	X	X	X	X				X
Disturbed Areas Subject to Traffic			X	X	X		X		X
Material Stock Pile Stabilization			X	X		X			X
Demolition			X				X	X	
Clearing/Excavation			X	X		X			X
Truck Traffic on Unpaved Roads			X	X	X		X	X	
Mud/Dirt Carry Out					X		X		

Additional preventive measures include:

- Schedule construction activities to minimize exposed area (EC-1, Scheduling).
- Quickly stabilize exposed soils using vegetation, mulching, spray-on adhesives, calcium chloride, sprinkling, and stone/gravel layering.
- Identify and stabilize key access points prior to commencement of construction.
- Minimize the impact of dust by anticipating the direction of prevailing winds.
- Direct most construction traffic to stabilized roadways within the project site.
- Water should be applied by means of pressure-type distributors or pipelines equipped with a spray system or hoses and nozzles that will ensure even distribution.
- All distribution equipment should be equipped with a positive means of shutoff.
- Unless water is applied by means of pipelines, at least one mobile unit should be available at all times to apply water or dust palliative to the project.

- If reclaimed waste water is used, the sources and discharge must meet California Department of Health Services water reclamation criteria and the Regional Water Quality Control Board requirements. Non-potable water should not be conveyed in tanks or drain pipes that will be used to convey potable water and there should be no connection between potable and non-potable supplies. Non-potable tanks, pipes, and other conveyances should be marked, "NON-POTABLE WATER-DONOT DRINK"
- Materials applied as temporary soil stabilizers and soil binders also generally provide wind erosion control benefits.
- Pave or chemically stabilize access points where unpaved traffic surfaces adjoin paved roads.
- Provide covers for haul trucks transporting materials that contribute to dust.
- Provide for wet suppression or chemical stabilization of exposed soils.
- Provide for rapid clean up of sediments deposited on paved roads. Furnish stabilized construction road entrances and vehicle wash down areas.
- Stabilize inactive construction sites using vegetation or chemical stabilization methods.
- Limit the amount of areas disturbed by clearing and earth moving operations by scheduling these activities in phases.

For chemical stabilization, there are many products available for chemically stabilizing gravel roadways and stockpiles. If chemical stabilization is used, the chemicals should not create any adverse effects on stormwater, plant life, or groundwater.

Costs

Installation costs for water and chemical dust suppression are low, but annual costs may be quite high since these measures are effective for only a few hours to a few days.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season to verify continued BMP implementation.
- Check areas protected to ensure coverage.
- Most dust control measures require frequent, often daily, or multiple times per day attention.

References

Best Management Practices and Erosion Control Manual for Construction Sites, Flood Control District of Maricopa County, Arizona, September 1992.

California Air Pollution Control Laws, California Air Resources Board, 1992.

Caltrans, Standard Specifications, Sections 10, "Dust Control"; Section 17, "Watering"; and Section 18, "Dust Palliative".

Prospects for Attaining the State Ambient Air Quality Standards for Suspended Particulate Matter (PM10), Visibility Reducing Particles, Sulfates, Lead, and Hydrogen Sulfide, California Air Resources Board, April 1991.

Stormwater Quality Handbooks Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Appendix I – Construction General Permit

UPDES Permit Regulations

The UPDES Construction General Permit can be viewed here:

<https://deq.utah.gov/water-quality/general-construction-storm-water-updes-permits>

APPENDIX D



Range Recovery specializes in Lead Reclamation Projects. We utilize patented equipment, engineered and developed specifically for lead reclamation. Our processes safely and efficiently remove bullets, shot, and fragments from the earth; while also reducing the completion time and project footprint. Our processes help keep shooting ranges across the country in compliance with the EPA's "Best Management Practices (docs/bestmangprac.pdf)".

Outdoor Firing Ranges

Trap & Skeet Fields

Outdoor Firing Ranges



Range Recovery's patented mobile screening plant, is designed specifically to remove bullets and bullet fragments from outdoor earthen shooting berms. The size and mobility of this unit, almost always allows it to be set up adjacent to the shooting berm; minimizing the footprint and the time needed to complete the project. The plant screens and cleans the lead all in one cycle, without the use of water or chemicals. The cleaned, recyclable, lead is then containerized, sold, and shipped by Range Recovery to a certified lead recycler. The soil is generally replaced on the berm after the project, leveled and packed in accordance with the Range Master's specifications. Range Recovery also has the capabilities to treat the screened soil in order to gain compliance with any testing agency if needed.

Benefits of the Range Recovery Program

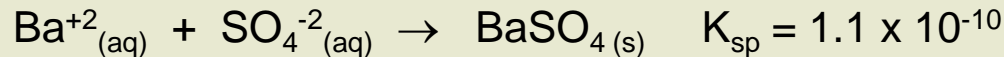
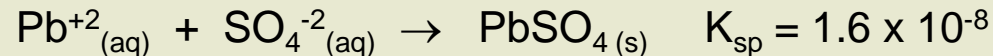
- Diminishes the potential of lead exposure to humans, animals, and the environment.
- Reduces the source of lead migration in soil, surface water, and groundwater.
- Decreases liability with regard to potential agency or citizen lawsuits.
- Lessens the risk of potential injury due to ricochet.
- Presents a clean and well maintained facility.
- Results in an improved public image.

Request Information

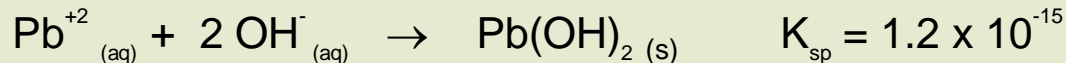
If you would like more information on how Range Recovery Technologies can assist you and your shooting range with Best Management Practices, please provide your name and email with the following form, or contact us toll free at (605) 350-4622.

Summary of FF-200 Chemistry

Free Flow 200® is a proprietary blend of stabilizing reagents that fixate heavy metals in waste or soil across of wide range of pH values using a combination of sulfate and hydroxyl anion fixation chemistry. When moisture comes into contact with soil or waste stabilized with Free Flow 200®, sulfates are immediately released to initiate fixation reactions with lead and barium by the following reactions:



The sulfate reaction is a preliminary sweep reaction that fixates the most soluble lead with the sulfate anion. Fixation of remaining lead and other heavy metals proceeds by slow-release alkaline components that react with acidity and heavy metals to further bind the metals as shown for lead in the example below:



Although the above reactions are described for lead, the reagent performs similar for fixation of other heavy metals such as cadmium, trivalent chromium, cobalt, copper, nickel, silver, and zinc. Through a combination of the chemical reactions described above, Free Flow 200® is able to stabilize heavy metals in soil and waste across a wide range of pH values to meet the objectives of the SPLP or TCLP in remediation applications.

SAFETY DATA SHEET (SDS)

OSHA Hazard Communication Standard 29 CFR 1910.1200. Prepared to GHS

SECTION 1 – PRODUCT AND COMPANY IDENTIFICATION

Trade Name: **Free Flow 100[®], Free Flow 200[®], Free Flow 300[®]**
Product CAS: None

Recommended use: Stabilize RCRA Metals

Company Identification:

Free Flow Technologies, Inc.
4920 Forest Hills Rd, Suite 200
Loves Park, Illinois 61111

For information call: (815) 636-0166
Emergency Contact: Timothy Danzer
Fax: (815) 636-0560

SECTION 2 – HAZARD(S) IDENTIFICATION

GHS07 Acute Toxicity

Classification of the substance:

- H303 Acute Toxicity, category 5 (oral)
- H313 Acute Toxicity, category 5 (dermal)
- H332 Acute Toxicity, category 4 (inhalation)
- H315 Skin, eye irritation, category 2
- H317 Skin sensitization, category 1
- H335 Specific Target Organ Toxicity, category 3 (single exposure, respiratory tract irritation)



WARNING

Hazard Statements:

- H303 May be harmful if swallowed
- H313 May be harmful in contact with skin
- H332 Harmful if inhaled
- H315 Causes skin irritation
- H317 May cause an allergic skin reaction
- H335 May cause respiratory irritation

Precautionary Statements:

Prevention

- P261 Avoid breathing dust.
- P264 Wash hands thoroughly after handling.
- P271 Use only outdoors or in a well-ventilated area.
- P272 Contaminated work clothing should not be allowed out of the workplace.

SECTION 2 – HAZARD(S) IDENTIFICATION (CONT.)

Prevention cont.	P280 Wear protective gloves, safety glasses, and protective clothing such as long sleeves and pant cuffs over shoes to minimize skin contact.
Response	<p>P302+P352 IF ON SKIN: Wash with plenty of soap and water.</p> <p>P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.</p> <p>P312 Call a POISON CENTER or doctor/physician if you feel unwell.</p> <p>P321 Specific treatment, see supplemental first aid information.</p> <p>P332+P313 If skin irritation occurs: Get medical advice/attention.</p> <p>P362+P364 Take off contaminated clothing and wash it before reuse.</p>
Storage/Disposal	<p>P403+P233 Store in a well-ventilated place. Keep container tightly closed.</p> <p>P501 Dispose of container in accordance with local, regional, national, and/or international regulations.</p>

Hazards Ratings HMIS

HEALTH	1
FLAMMABILITY	0
REACTIVITY	1
PERSONAL PROTECTION	0

SECTION 3 – COMPOSITION, INFORMATION ON INGREDIENTS

Chemical Name	CAS	Approx. % (w/w)	LD50	LC50
Phosphate Compounds	7758-23-8	0 - 80	Not Available	Not Available
Calcium Oxide	1305-78-8	10 - 70	Not Available	Not Available
Sulfur Trioxide	7446-11-9	0 - 40	Not Available	Not Available
Silicon Dioxide	60676-86-0	2.5 – 15	Not Available	Not Available
Aluminum Oxide – Non-fibrous	1344-28-1	0.5 - 5	Not Available	Not Available
Iron Oxide	1309-37-1	0.5 - 5	Rat, oral, >5000 mg/kg	Not Available
Sodium Bicarbonate	144-55-8	0 - 70	Mouse, oral, 3360 mg/kg	Not Available
Magnesium Oxide	1309-48-4	0 - 60	Not Available	Not Available

SECTION 4 – FIRST AID MEASURES

- After Eye Contact:** Flush eyes with water while lifting lids. Seek medical attention.
- After Skin Contact:** Wash skin with soap and water, remove contaminated clothing and shoes. If irritation develops, seek medical attention.
- After Ingestion:** Dilute with water, fruit juice or vinegar. Seek medical attention.
- After Inhalation:** Remove to fresh air, if irritation develops, seek medical attention.

Most important symptoms and effects, both acute and delayed.

Refer to Section 11 – Toxicological Information

Indication of any immediate medical attention and special treatment needed.

All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

SECTION 5 – FIRE FIGHTING MEASURES

Suitable extinguishing equipment:

This material is noncombustible.

Extinguishing equipment that is not appropriate for a particular situation:

Do not use water on adjacent fires. Extinguish adjacent fires with dry chemical or CO₂.

Specific hazards that develop from the chemical during the fire:

No specific hazards are identified.

Protective equipment or precautions for firefighters:

No special measures required.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:

Wear protective equipment to prevent skin exposure and inhalation. Keep unprotected persons away.

Environmental Precautions:

Avoid runoff to waterways and sewers.

Methods and materials used for containment and cleanup:

Use appropriate protective equipment while using dry cleanup methods (sweep/shovel) which minimize dusting. Reclaim in watertight containers. Small amounts may be flushed with water to drain.

SECTION 7 – HANDLING AND STORAGE

Precautions for safe handling:

Swells when wet, may expand the container. Keep eyewash bottles available throughout work area.

Conditions for safe storage, including any incompatibilities:

Store away from water or acids.

SECTION 8 – EXPOSURE CONTROLS AND PERSONAL PROTECTION

Control Parameters

Component	Formula	CAS	PEL	TLV
Phosphate Compounds	Ca(H ₂ PO ₄) ₂ H ₂ O	7758-23-8	Not established	Not established
Calcium Oxide	CaO	1305-78-8	5 mg/m ³	2 mg/m ³
Sulfur Trioxide	SO ₃	7446-11-9	1 mg/m ³	0.2 mg/m ³
Silicon Dioxide**	SiO ₂	60676-86-0	0.1 mg/m ³ *	0.1 mg/m ³ *
Aluminum Oxide	Al ₂ O ₃	1344-28-1	10 mg/m ³ +	10 mg/m ³ +
Iron Oxide**	Fe ₂ O ₃	1309-37-1	15 mg/m ³	5 mg/m ³
Sodium Bicarbonate	NaHCO ₃	144-55-8	15 mg/m ³ *	10 mg/m ³ *
Magnesium Oxide	MgO	1309-48-4	15 mg/m ³ *	10 mg/m ³ *

* Respirable Dust

+ 5 mg/M³ as Respirable Fraction

**Silicon Dioxide and Iron Oxide are listed by IARC as potential carcinogens.

Exposure Controls

Engineering Controls:

Use general and local exhaust to keep dust levels within acceptable limits.

Personal Protective Equipment Pictograms:



Breathing Protection:

Use NIOSH approved dust respirator when exposure limits exceeded.

Hand Protection:

Wear gloves to minimize skin contact.

Eye Protection:

Wear tight fitting goggles.

Skin Protection:

Wear long sleeves, gloves, and pant cuffs over shoes to minimize skin contact.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	White-gray powder.	Boiling Point:	N/A
Odor:	Odorless	Flammable, Lower Limit:	N/A
Odor Threshold:	N/A	Flammable, Upper Limit:	N/A
Solubility:	N/A	Flash Point:	N/A
Partition Coefficient:	Not determined.	Auto Ignition Temperature:	N/A
pH:	6.0 – 12.0	Freezing/Melting Point:	N/A
Density:	80 – 85 lbs/ft ³	Viscosity:	N/A
Vapor Pressure:	N/A	Decomposition Temp.:	N/A
Vapor Density:	N/A	Evaporation Rate:	N/A
Molecular Formula:	Mixture		

SECTION 10 – STABILITY AND REACTIVITY

Reactivity:

No dangerous reactions known under conditions of normal use.

Chemical Stability:

Stable, keep dry.

Thermal decomposition/conditions to be avoided:

Avoid extreme temperatures.

Possibility of hazardous reactions:

Contains calcium oxide and may react with water or acid to produce heat.

Incompatible materials:

Water, strong acids.

SECTION 11 – TOXICOLOGICAL INFORMATION

Toxicological Effects

Component	Formula	LD50	LC50
Phosphate Compounds	Ca(H ₂ PO ₄) ₂ H ₂ O	Not Available	Not Available
Calcium Oxide	CaO	Not Available	Not Available
Sulfur Trioxide	SO ₃	Not Available	Not Available
Silicon Dioxide**	SiO ₂	Not Available	Not Available
Aluminum Oxide	Al ₂ O ₃	Not Available	Not Available
Iron Oxide**	Fe ₂ O ₃	rat, oral, >5000 mg/kg	Not Available
Sodium Bicarbonate	NaHCO ₃	mouse, oral, 3360 mg/kg	Not Available
Magnesium Oxide	MgO	Not Available	Not Available

**Silicon Dioxide and Iron Oxide are listed by IARC as potential carcinogens.

SECTION 11 – TOXICOLOGICAL INFORMATION (CONT.)

Routes of exposure

Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

Potential health effects

Eye: Acute: May cause mild eye irritation
Chronic: No data available

Skin: Acute: Causes skin irritation
Chronic: Repeated and prolonged exposure may cause dermatitis

Ingestion: Acute: May cause irritation
Chronic: No data available

Inhalation: Acute: May cause respiratory irritation
Chronic: No data available

Symptoms from exposure

Target Organs: Eyes, respiratory passages, skin, digestive tract. Pre-existing respiratory diseases including asthma and emphysema may also be aggravated.

Eye: May cause irritation/inflammation and tissue damage.

Skin: May cause irritation to moist skin.

Ingestion: May cause ulceration to the digestive tract.

Inhalation: May cause irritation/inflammation to nasal and upper respiratory passages.

SECTION 12 – ECOLOGICAL INFORMATION

Toxicity:

No further relevant information available.

Persistence and degradability:

No further relevant information available.

Bioaccumulative potential:

No further relevant information available.

Mobility in soil:

No further relevant information available.

SECTION 13 – DISPOSAL CONSIDERATIONS

Recommended Waste Treatment Methods:

No treatment necessary.

Recommended Package Disposal:

Dispose of in container in accordance with local, regional, national, and/or international regulations.

SECTION 14 – TRANSPORT INFORMATION

UN Number:	N/A
UN proper shipping name:	N/A
Transport Hazard class:	N/A
Packing group number:	N/A
Environmental hazards:	N/A
Special Precautions:	To prevent dust, cover product with tarp if not in bulk bag container.

SECTION 15 – REGULATORY INFORMATION

SARA Title III - Section 302 Extremely Hazardous Material - None

SARA Title III – Section 31/312 – Hazard Categories:

Fire Hazard – No
Sudden Release of Pressure – No
Reactivity Hazard – Yes
Immediate Health Hazard – Yes
Delayed Health Hazard - Yes

SARA Title III – Section 313 - This material is not subject to the toxic chemical reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

SECTION 16 – ADDITIONAL INFORMATION

Information herein is based on data believed to be accurate at the time of the preparation. No warranty or representation, express or implied, is made to the accuracy or completeness of the SDS. No responsibility can be assumed by vendor for any damage or injury resulting from misuse, failure to follow recommended practices, or from any hazards inherent in the nature of the product.

SECTION 16 – ADDITIONAL INFORMATION (CONT.)

SDS Effective: 12/1/2014

APPENDIX E

PUBLIC NOTICE

Former Beaver Mountain Gun Range Remediation Beaver County, Utah

Utah School and Institutional Trust Lands Administration (SITLA) is seeking public comment on a Remedial Action Plan detailing remedial activities at the former Boy Scouts of America gun range located approximately twelve miles east of Beaver Utah. Investigations of the former gun range have indicated elevated concentrations of lead, antimony, and polycyclic aromatic hydrocarbons (PAH) are present in surface soils on the gun range at concentrations exceeding U.S. Environmental Protection Agency (EPA) Regional Screening Levels (RSLs) for residential soils. The remedial action involves the physical removal of lead and mixing of surface soils in an effort to decrease metal and PAH concentrations to levels which would allow unrestricted use of the property. This work is being performed under regulatory oversight from the Division of Environmental Response (DERR) and Remediation Voluntary Cleanup Program (VCP).

A 30-day public comment period to receive comments on the Remedial Action Plan (RAP) will commence on **June 14, 2023** and end at 5 p.m. on **July 14, 2023**. A copy of the RAP can be reviewed at the Utah DERR and Remediation Public Notices website at: <https://deq.utah.gov/environmental-response-and-remediation/public-notice-utah-division-of-environmental-response-and-remediation>. Comments should be directed to:

Lincoln Grevengoed, Project Manager
Division of Environmental Response and Remediation
Department of Environmental Quality
P.O. Box 144840
195 North 1950 West
Salt Lake City, Utah 84114-4840
(801) 536-4100

Site Description

The former Beaver Mountain Gun Range (the Site) is an approximately 2-acre target and trap shooting area in forested mountain land in eastern Beaver County, Utah, within the northeast corner of the southwest corner of Section 16, Township 29 South, Range 5 West of the Salt Lake Baseline and Meridian. The gun range is no longer used, but was part of a former Boy Scouts of America camp. The total area impacted by the gun range is estimated to be two acres.

Cleanup Measures

The proposed cleanup measures include the mixing, sifting, and removal of lead particles from the upper six inches of site soils and then replacing the processed soils on the site. Proposed cleanup levels are based on the EPA RSLs for residential soils.

Tentative Schedule

The proposed remedial action is planned for June 2023 and will require approximately 4 to 6 weeks to complete. The tentative start date is June 1, 2023, but will depend on snow and moisture conditions at the site.

For More Information

Please contact:

John Rezac, Wasatch Environmental Project Manager, (801) 972-8400.

or

Bryan Torgerson, SITLA Deputy Associate Director, (435) 259-7417.

or

Lincoln Grevengoed, Utah DERR VCP Project Manager, (801) 536-4100.