
Voluntary Cleanup Program Application

Marble Wetlands Preserve

Town of Marble | Gunnison County, Colorado

Prepared For:

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Section 1 – Executive Summary

Trout Unlimited has prepared the Voluntary Cleanup (VCUP) Program Application on behalf of The Trust for Land Restoration for remediation of the Marble Wetland Preserve, formerly known as the Hepola Wetland. The 54-acre Marble Wetlands Preserve (Wetland or Site) was acquired by the Trust for Land Restoration on December 30, 2021, from the former landowner and grantee of the property, Pamela Hepola. Ms. Hepola wished to donate the 54-acre landholding to an entity that would restore and protect the property in perpetuity. Upon acquisition of the Site, the Trust for Land Restoration (TLR) continued the Sites legacy of collaboration with CDPHE, the Crystal Valley Environmental Protection Association (CVEPA), the Aspen Valley Land Trust (AVLT), and Trout Unlimited (TU) to remediate any potentially hazardous material on-site.

The Town of Marble is an interested party and is a collaborator with TLR and TU on the project. The Town is using its legal authority as a municipal government to enter into an Intergovernmental Agreement (IGA) with the State of Colorado to serve as the fiscal agent and contracting entity between the State and TU to accomplish the project, and will certify that the project is complete, and as may be required by the IGA.

The subject property includes a small mine-waste/slag pile left over from a smelter operation that ceased operation over 100 years ago. Aspen Valley Land Trust (AVLT) had considered accepting donation of the fee-title interest in the property provided the liability issues associated with the slag pile could be mitigated. Based on the Phase 1 assessment report completed by CDPHE on August 12, 2021, the material associated with the slag pile on-site contains soils with elevated concentrations of arsenic and lead that exceed the Bureau of Land Management (BLM) recreational screening levels (RSL). The AVLT decided to forego involvement in the project until environmental remediation of the site was complete. The Trust for Land Restoration then stepped in to receive donation of the property in order to expedite its cleanup.

The VCUP proposes a remedial design to address soils associated with the historic smelter and the resulting slag pile. Materials containing elevated arsenic and lead will be removed from its current footprint and consolidated into an on-site repository. This repository will be situated upslope of the existing slag pile and will house all the slag material identified in the Phase 1 Target Brownfield Assessment and subsequent site visits. TLR has designated Trout Unlimited as the Marble Wetlands Preserve project manager for the design and oversight of the voluntary cleanup. This VCUP will result in the removal of on-site exposure pathways and a site suitable for its intended use.

Section 2 – Introduction

On behalf of the Trust for Land Restoration, Trout Unlimited (TU) prepared this Voluntary Cleanup (VCUP) Program Application for remediation of impacts soils at the Hepola Wetland site. TLR took ownership of the Site in December 2021, intending to foster on-site remediation actions and subsequent donation of the site to a municipality, state agency or local conservation organization. The acquisition of

this land was solely to facilitate site remediation and subsequent donation to an entity that would allow the site to be conserved as a natural area, accessed by the public for passive recreation and preserved in perpetuity.

TU presents this VCUP Application to describe the site history (Section 3), environmental site assessments performed (Section 5), establish proposed remediation action levels for proposed site uses following completion of the remediation project (Section 6), describe the remediation design TU prepared for the Site (Section 7), and describe proposed land-use restrictions and long-term maintenance and monitoring requirements for the soil repository to be constructed on-site during remediation activities.

Pending CDPHE approval of the Marble Wetlands Preserve VCUP, Trout Unlimited will prepare and solicit a focused request for proposal to a set number of qualified contractors with the intention of completing the VCUP site actions in the summer of 2022. Within 45 days of completing the Hepola Wetland VCUP, TU and TLR will submit the associated completion report and no-action determination request to CDPHE. Once TLR receives the no-action determination by CDPHE, TLR will donate the 54-acre property to its chosen recipient, subject to provisions of a conservation easement that will restrict development, protect natural values, and allow continued passive public use.

The contents of this VCUP application retain content present in the 2021 Phase 1 Brownfields Target Assessment, as well as supporting documents provided by CDPHE and the TLR.

Section 3 – Voluntary Cleanup Program Requirements

The Colorado Voluntary Cleanup and Redevelopment Act [HB 94-1299] authorized the creation of the VCUP Program to support voluntary cleanups of existing and/or previously contaminated properties by providing determination guidance and regulatory specifications for site-specific cleanup responsibilities. Per the CDPHE VCUP Application requirements, information pertaining to *General Project Information & Determination of Inclusion in the Program* is included in the following subsections.

3.1 – Project Stakeholders

Property Owner and Address:

The Trust for Land Restoration
133 N Lena St #3
Ridgway, CO 81432

Technical Consultant/Project Manager(s):

Trout Unlimited
Tanner Banks – Abandoned Mine Land Project Manager
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Colorado Department of Public Health and Environment
Mark Rudolph – Superfund & Brownfields Program
4300 Cherry Creek Drive South, Denver, CO 80246-1530

3.2 – General Project Information

The Site is located 0.35-miles southeast of the Town of Marble in Gunnison County, Colorado. The Site is accessed via County Road 3C at a latitude of 39.06855° and longitude of -107.18559° and sits adjacent to wetland habitat of the Crystal River. Figure 1 depicts the slag pile (Site) within the property boundary.

The Hepola Wetland landholding was historically comprised of three parcels; 3.18 acres, 26.82 acres, and 20.73 acres. According to the most recent (2022) Gunnison County Assessor, the parcels are combined and total 55.67-acres and are under the ownership of the Trust for Land Restoration. There are no dwellings on-site. Several historic mining implements remain but will not be relocated or damaged due to this VCUP.



Figure 1. Identifies the Hepola Wetland property boundary (red polygon) and the Site (blue icon).

3.2.1 – Program Status

The objectives of the activities presented in this VCUP Program Application are **a)** to remove the risk of exposure to impacted soils and support future recreational use, and **b)** to receive a No Action Determination (NAD) from the CDPHE following the submission of a VCUP completion report.

The Phase 1 Targeted Brownfield Assessment for the Site identified arsenic and lead exceedances according to BLM risk criteria for a worker or surveyor. Additionally, both analytes of concern exceed the BLM recreational screening level. The Phase 1 assessment explains that the exceedances at the Site are from the weathering of material associated with the Hoffman Smelter slag pile.

3.2.2 – Current Land Use

The Marble Wetlands Preserve is an undeveloped 54-acre parcel of land containing approximately 30 acres of high-quality wetlands/riparian complex bordering about ½ mile of the Crystal River and over 600 linear feet of Yule Creek. The Town of Marble borders the property on the northwest; Colorado Parks and Wildlife (CPW) 's popular Beaver Lake Wildlife Area borders the property on the northeast; another CPW parcel borders the property to the west, USFS land borders on the north, and private land borders on the east.

The property hosts a year-round population of beavers and seasonal populations of migrating elk, deer and moose. Beavers are designated by the Colorado Division of Parks and Wildlife (CPW) as wetland/riparian priority species.

Current and previous owners have allowed passive public use of the property, including cross-country skiing, hiking, fishing and birdwatching, for at least the past fifty years. A public-fishing-access easement was granted to the State of Colorado in the 1950s and it is still in place.

Pamela Hepola granted a private-access easement to the neighboring landowner to the east, who utilizes and maintains about ½ mile of road through the property as that neighboring landowner's principal access driveway. A portion of the road borders and impacts the smelter/slag pile that is the subject of this proposed VCUP. Use and periodic maintenance of the road are causing erosion of the slag heap on its west and north sides and spreading slag material down the road beyond the immediate interface with the pile itself. Cleanup of the slag pile as proposed by this VCUP would mitigate and Eliminate the existing impacts of the road to the slag pile.

3.2.3 – Proposed Land Use

It is the goal of the Trust for Land Restoration (TLR), as the current owners of the subject property, to oversee the Voluntary Cleanup of the Hoffman Smelter site so that the property can be conserved as a natural area; accessed by the public for passive recreation such as fishing, hiking, picnicking, birdwatching, snowshoeing and cross-country skiing; and preserved in perpetuity.

TLR, in cooperation with the non-profit Crystal Valley Environmental Protective Association (CVEPA), is currently in discussion with CPW to secure permanent public access to the property across State land to the west; is actively pursuing the donation of a conservation easement to the Aspen Valley Land Trust (AVLT) restricting future development, protecting wildlife and riparian/wetlands values, and guaranteeing public access in perpetuity; and working with the Town of Marble to devise a long-term ownership scenario that compliments the goals of the conservation easement. All the above are dependent upon the successful completion of a State of Colorado-approved Voluntary Cleanup of the Hoffman Smelter Site.

3.3 – Voluntary Cleanup Program Inclusion

The following statements demonstrate that this VCUP application meets the Voluntary Cleanup and Redevelopment Act [HB 94-1299] eligibility criteria.

1. *Is the applicant the owner, or the owner's designated representative, of the property?*

Yes.

2. Is the property listed or proposed for listing on the National Priorities List of Superfund sites established under the federal act (CERCLA)?

No.

3. Is the property the subject of corrective action under orders or agreements issued pursuant to the provisions of Part 3 of Article 15 of this Title or the federal "Resource Conservation and Recovery Act of 1976," as amended?

No.

4. Is the property subject to an order issued by or an agreement (including permits) with the Water Quality Control Division pursuant to Part 6 of Article 8 of this Title? If yes, please list order or permit number.

No.

5. Is the property a facility that has or should have a permit or interim status pursuant to part 3 of Article 15 of this Title (RCRA Subtitle C) for treatment, storage, or disposal of hazardous waste?

No.

6. Is the property subject to the provisions of Colorado Revised Statutes, Part 5, Article 20 of Title 8 (Underground Storage Tank (UST) – State Oil Inspector)?

No.

Section 4 – Historic Land Use

The Site was previously the location of a historical smelter, known as the Hoffman Smelter Site, which operated in the early 1900s and has been abandoned for approximately 100 years. The smelter occupied approximately 1/8-acre of the site, and a residual slag pile from the smelter operations remains to this day. Outside the extents of the slag pile itself, the remainder of the site does not have any visual indications of contamination and healthy and abundant vegetation has been noted to surround the slag pile and the wetlands which predominate the majority of the area on Site. Adjacent areas to the site were and have remained vacant unimproved forested lands.

Section 5 – Existing Site Conditions

The Site consists of three parcels totaling approximately 54 acres, which borders the Crystal River and is located in Gunnison County, Colorado. A substantial part of the property consists of wetland and riparian lands along the Crystal River, varying grades from moderate to steep slopes and both wooded and small meadows. The property's western border is shared with land owned by CPW. Access to and from the Site can be made from Gunnison County Road (CR) 3C, which connects to a historic road that closely parallels the Crystal River (Figure 1).

To the north of the Marble Wetlands Preserve is the Crystal River and associated wetland and beyond that sits the Town of Marble. The Beaver Lake State Wildlife Area is situated to both the northeast and western margins of the Site. The landholding immediately east of the Hepola Wetland is the Snowbound Association, which is the landholding that retains the road easement through the Site. To the South of the Site is the Yule Creek Lodge, which supports popular trailheads to the National Forest Lands situated immediately to the south of that landholding.

5.2 – Topography

The Crystal River and its associated wetland flow less than 100 feet from the toe of the slag pile, at an elevation of roughly 7,943 feet, while the slag pile and focus area of the VCUP sits at 7,961 feet of elevation, which results in an approximate difference of 20 vertical feet. The slag pile sits along a ridged contour with natural drainages to the east and west. The site's topography where remedial actions are to take place is relatively flat, a derivative of the site's historic land use. The site's high point is located at 8,168 feet of elevation above County Road 3C and is an area outside the scope of the VCUP.

5.3 – Geology

The main soil type found on and around the Site is WETOPA clay loam, which generally consists of well-drained soils with an intermediate water holding capacity and moderately fine or fine textures. The geology of the underlying bedrock is interpreted to be stratified sequences part of the Cretaceous member of the Mesozoic Era, which consists of the Mesa Verde and Mancos formations (Phase 1 Assessment). The Mancos generally consists of large, dark gray, laminated, silty shale and the Mesa Verde formation consists of interbedded sandstone, shale, and coal beds of varying thicknesses. Unconsolidated deposits of the Pleistocene era and young glacial drift consisting of young gravels and unsorted boulder glacial deposits (till) and associated sand and gravel deposits occur in localized areas on the Site (Phase 1 Assessment).

5.4 – Hydrology

The Site is located within the Crystal River drainage basin. The Crystal River drainage basin is comprised of numerous ridgeline basin divides, hill slopes, and channel courses. The drainage basin is controlled by a series hydrogeological processes which include erosion, movement, and deposition of sediment which is moved both by gravity and surface water discharge. Within the Site area, surface hydrology features include both confluence points and alluvial deposition areas for the Crystal River. The wetlands within the Site serves as a sediment deposition area for the upland drainage basins. The wetlands within the Site and the area just to the north of the Site, which includes Beaver Lake Reservoir swerves as a groundwater recharge area (Phase 1 Assessment).

Based on information from Environmental Data Resources, Inc. (EDR), the estimated depth to groundwater near the Site vicinity ranges between 7 to 156 feet below ground surface (bgs) based on static water level data obtained from the Colorado Division of Water Resources (CDWR) and United States Geological Survey (USGS). Groundwater predominantly occurs in the surficial deposits on the Site and surrounding areas. The deposits in stream valleys and wetlands are saturated to stream level during snowmelt and spring run-off with groundwater levels gradually dropping during the remainder of the year. Swamps and springs, which constitute a wetlands area, occur when the groundwater levels exceed the topographic surface elevation and when groundwater flow is forced to the surface, respectively (Phase 1 Assessment).

Section 6 – Site Environmental Conditions

Initial site reconnaissance was conducted by CDPHE personnel on July 21, 2021 with a subsequent Phase 1 Environmental Site Assessment being conducted on behalf of the Trust for Land Restoration, Inc. (TLR) in partnership with Crystal Valley Environmental Protection Association (CVEPA) at the Marble Wetlands Preserve site located in Gunnison County, Colorado (Site). The Site resides in the headwaters of the Crystal River between Beaver Lake and Yule Creek Falls and contains approximately 54 acres of wetlands, previously known as the Hepola Wetlands. Property boundaries about the Crystal River for approximately one mile between Beaver Lake at the upstream extent, and down to the bridge at Quarry Road on the downstream end. Within this footprint is an old smelter and associated slag pile that requires environmental remediation given elevated levels of lead and arsenic. Given these elevated screening levels (SLs), the intent of this project will be to reduce the exposure pathways of contaminated material to environmental and human receptor groups. Lands associated with this Site will be transferred to a permanent land holder for eventual easement for public access and usage as detailed in previous sections. Therefore, ensuring safe public usage of the site will be the focus of this project.

6.1 – Nature and Extent of Contamination

While most of the 54 acre site consists of wetland and riparian lands along the Crystal River with various fluctuations in topography between small meadows and steep slopes, 0.40 acres contains a 1900-era smelter and associated slag pile within 100 linear feet from the Crystal River. Part of the original Hoffman Smelter site, this feature has been abandoned for over 100 years with minimal erosion or visual mobilization of material from the site footprint. While the original Phase 1 designated the smelter site at 1/8th of an acre, this project assumes an area of 0.40 acres given associated slag material on the access road and future repository location.

During Phase 1 investigations, no evidence of environmental concerns or recognized environmental conditions were found on the Site aside from the residual slag pile and slag material on the access road. No other hazardous substances or materials were present, and surrounding healthy vegetation appeared to not be affected by the slag pile and its contents. During a November 6, 2020, site visit by CDPHE, two samples were collected from the top and toe of the slag pile to evaluate total metals concentrations. Subsequent analysis was performed by RTI Laboratories in Livonia, Michigan for a standard suite of analytes that included aluminum (Al), Arsenic (As), Barium (Ba), Cadmium (Cd), Chromium (Cr), Lead (Pb), Mercury (Hg), Selenium (Se), Silver (Ag), and Zinc (Zn). These results were then compared to Bureau of Land Management (BLM) SLs for worker and surveyor scenarios during the Phase 1 evaluation (Table 1). Of the results, concentrations at the toe of the slag pile equaled As SLs (100 mg/kg) and exceeded the Pb SL by 600 mg/kg (2,600 mg/kg). All other analytes fell below SLs and are therefore not considered a risk factor.

Table 1. Soil chemistry results were taken from the Site on 11/6/20 at the top and toe of the slag pile. Results are compared to BLM worker or surveyor screening levels (SLs). *This table only lists exceedances specific in Table 1 of the Phase 1 assessment.

Sample ID		Slag Top Pile	Slag Toe Pile
Sampling Date		11/6/2020	11/6/2020
Analytes	BLM Risk Criteria for worker or surveyor scenario	Total Metals	Total Metals
Units	mg/kg	mg/kg	mg/kg
Arsenic	100	50	100
Lead	2,000	1,500	2,600
	Exceeds BLM Risk Criteria for Worker or Surveyor		

Section 7 – Remediation Standards

The VCUP Program requires that cleanup levels of identified contaminants in site soils be established based on state standards and/or evaluation of potential current/future risks to human health and the environment depending on final site usage. Past Phase 1 ESA investigations have identified the presence of arsenic and lead at or above BLM worker/surveyor SLs. The slightly elevated lead concentrations at the toe of the slag pile (2,600 mg/kg) are likely the result of past historic smelting/mining activities at the Hoffman Smelter site (Figure 2).



Figure 2. The former Hoffman Smelter Site and remaining slag pile at the Site. The Crystal River can be seen in the background of the photo showing the close proximity of this site to riverine and riparian habitats.

The goal of this VCUP and associated actions to reduce exposure to contaminated slag material through the construction of an on-site repository. Therefore, the remediation standard associated with this project will be more of a visual evaluation rather than attaining a State/BLM standard or screening level. Site waste is visually different from any other material in the region and appears as black glass debris to black sandy material as opposed to the native brown soils present in the area. Remediation will be considered complete by the removal of contaminated material and eventual placement of material in a constructed on-site repository, thus reducing the exposure to human health and the environment.

7.1 – Human Health Risk Assessment

The Phase 1 ESA references arsenic and lead concentrations with respect to BLM worker/surveyor screening levels, which were considered the basis of human health risk at the Site. The elevated concentrations of arsenic (100 mg/kg) and lead (2,600 mg/kg) found on the Site are even more of a risk driver when compared to BLM Human Health SLs for Chemicals in Soil at HazMat/AML sites (Table 1). The BLM Recreational SL for arsenic (30.6 mg/kg) and lead (800 mg/kg) provide even more justification for the proposed cleanup since this SL assumes recreational usage of 14 days/year over the course of 26 years for an adult/child (BLM, 2017). Therefore, this VCUP application will reference these Recreational SLs given the future proposed land-use of the Site as a public easement for recreational use. To fully ensure that final site conditions are safe for public access, all contaminated material will be excavated, scraped, and consolidated in an on-site repository, thus reducing the human health exposure pathways of ingestion, dermal contact and inhalation that typically are associated with soils containing arsenic and lead. No overnight camping or fires will be allowed at the Marble Wetlands Preserve.

7.2 – Potential Receptors

7.2.1 – Exposure Pathways During Remediation

Potential exposure to contaminants of concern (COC) exists during remediation activities. Contractors have the greatest risk of becoming exposed mainly through inhalation of dust and associated contaminated air when excavating and consolidating material. Dermal exposure and ingestion are also pathways but limited, given the buffer of heavy equipment. In-cabin air filters of heavy equipment, combined with properly working windows, will ensure contractor safety during the removal of contaminated materials. Prior to beginning work, the Contractor will prepare a site-specific health and safety plan (HASP) detailing knowledge of COCs and proper personal protective equipment (PPE) to remain safe throughout the reclamation. If visible dust is observed during reclamation activities, dust suppression will be employed using water suppression.

7.2.2 – Post-Remediation Exposure Pathways

Once proposed reclamation actions are completed on-site, potential exposure to COCs (As and Pb) will be mitigated through the construction of an on-site repository combining 1-foot of clean fill, soil amendments, native slash, seed and mulch. An eventual vegetated buffer will complement the 1-foot clean cap of the repository to ensure a long-term solution to contaminated material storage. While the main goal of this VCUP will be to eliminate exposure pathways to local human and ecological communities, a secondary aspect will be to blend the constructed repository into the existing native landscape.

This Site is located within 100 linear feet from the Crystal River on an upland terrace out of the riparian and flood corridor. Limited investigations were performed during Phase 1 ESA actions into groundwater pathways or levels. During the construction of the proposed repository, the Contractor will excavate several test pits to ensure groundwater is not encountered and the repository location is considered "high and dry". If groundwater is discovered during excavation, the Contractor and Project Manager will notify the CDPHE contact to amend remediation plans. Potential alternatives if groundwater is observed would include amending the waste materials to further limit leachability or to line the repository with an impermeable membrane to prevent contact with site groundwater.

7.3 – Remedial Action Levels

It is discussed above that BLM Recreational SLs are the driving factors for remediation of the Site. However, the Site will be considered fully remediated upon the construction of the on-site repository that will house consolidated slag material from the former Hoffman Smelter. Therefore, all exposure pathways will be reduced, and remedial action levels met by constructing the repository. In addition, any areas where contaminated slag is being removed will be capped with clean fill and revegetated with soil amendments and native seed, thus rendering any residual contaminated slag unavailable to receptor groups.

Section 8 – Remediation Plan

The remediation plan will mainly focus on constructing an on-site repository with approximate dimensions of 75' x 36' x 2' that will house up to 85 cubic yards (CY) of contaminated slag material currently on the Site. Specific areas of slag removal will be from the former smelter/gob pile, access road, and toe of the pile (Figure 3). These materials will be consolidated and placed in the on-site repository, capped with 1-foot of clean, locally sourced soil. The 1-foot of soil will be amended with 4-6-2 Richlawn Soilworks, Triganics, Lot 125, native seed, and wood straw to support the establishment of a vegetative cap that maintains long-term exposure pathway reduction. In addition to repository construction, soil amendments will be applied to the remaining soil at the toe of the smelter pile and any other disturbed areas to ensure native vegetation success upon demobilization. In areas of the slag pile and access road where contaminated material is removed, approximately 45 tons of road base will be imported to cover exposed soils and any residual contamination that may remain. These lenses of three to five inches of road base will further help reduce long-term exposure to future recreational users of the Site. If applicable once conditions are assessed on-site, TU may recommend capping the slag pile with local clean-cap material once contaminated slag material is removed. This option may reduce the long-term operation and maintenance (O&M) by establishing native short-rooted forbes and other species that would propagate over time. Both options should be considered viable during the reclamation process and will be communicated to CDPHE while on-site.

Once contaminated material is consolidated in the on-site repository and revegetation, and capping of removal areas has taken place, installation of 450 linear feet of buck and rail fence will further help safeguard reclaimed areas. A combination of fencing and boulders will line the access road from the edge of the constructed repository down past the toe of the smelter pile, effectively reducing vehicular and recreational user access to sensitive areas. The fencing alignment will, however, allow for safe user

interpretation of the site, which will ultimately include interpretative signage describing the past Site usage and historical significance.

To effectively manage Site stormwater, a 15" culvert will be installed upslope of the site beneath the access road to route any substantial surface flows around the reclaimed site footprint. Installation of this culvert will route stormwater or snowmelt associated flows to the west of the Site into a densely vegetated area that will help dissipate elevated velocities. The culvert outlet and immediate area downslope will consist of local material or imported boulders to attenuate velocities before entering the vegetated area. In addition to managing Site stormwater flows, work is proposed on a sizeable head-cut east of the smelter site that conveys large amounts of sediment into the Crystal River. While this aspect of the project does not involve currently identified contamination associated with the Hoffman Smelter, it is being incorporated into the Remediation Plan to reduce sedimentation while providing a long-term stabilization mechanism for an active head-cut and will reduce future potential of impacts to this proposed site reclamation. Work associated with this part of the VCUP will involve excavation and grading techniques while utilizing local trees and imported boulders to lay back steep slopes and stabilize the drainage notch. These actions will effectively stop the advancement of the head-cut upslope and establish a stable outlet for stormflows across the current access road.

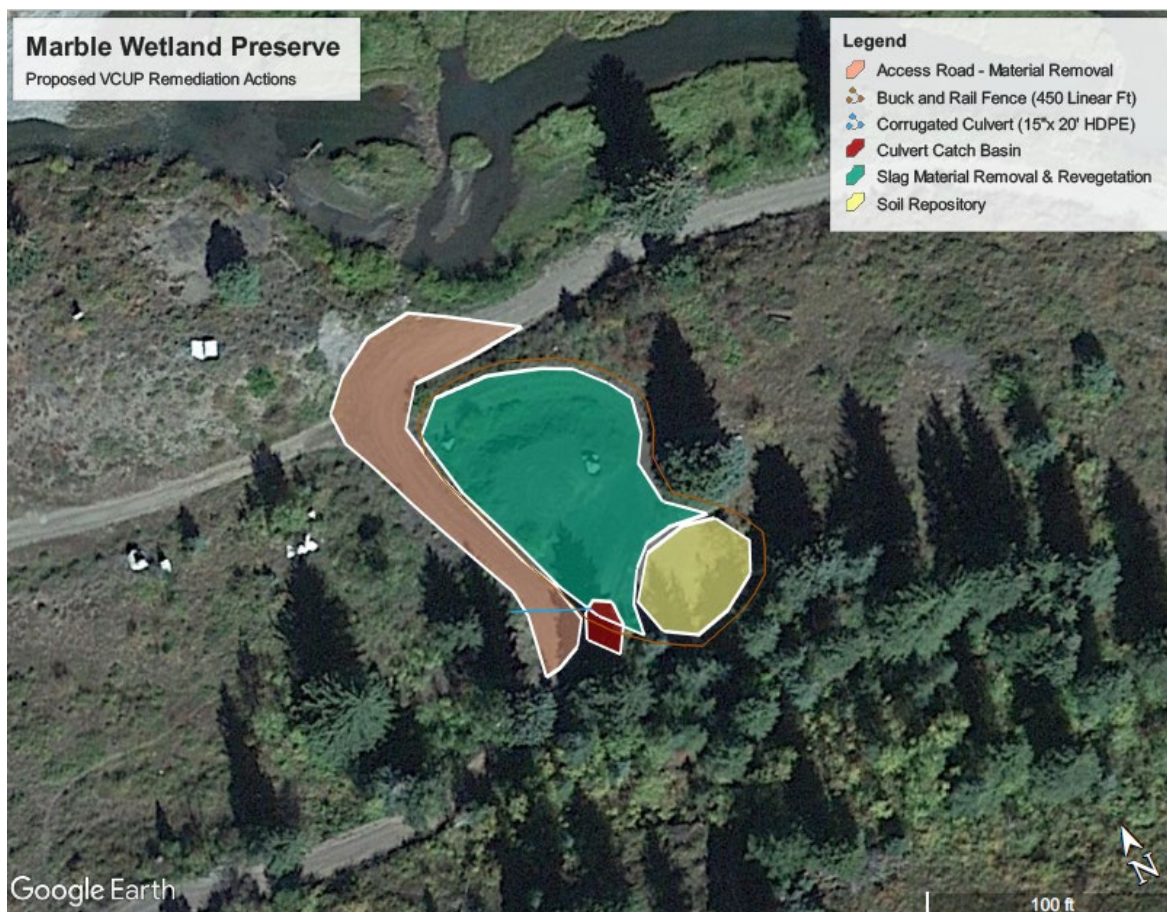


Figure 3. Illustrates the remediation actions proposed as part of the Marble Wetland Preserve VCUP application. The polygons and surface areas depicted were used to derive material quantities and verify the viability of remediation actions.

8.1 – Excavation of Impacted Soils

Based on a May 26, 2022, site visit and investigation, the depth and extent of impacted soils were estimated around a quarter-foot (0.25 ft) across the smelter/gob pile, access road, and toe of the pile. These estimates of depth, combined with the aerial footprint shown in Figure 3, resulted in volumetric removal approximations of 16, 35, and 34 CY for the smelter/gob pile, access road, and toe of the pile, respectively. Therefore, up to 85 CY will be stored and consolidated in a repository with a potentially available volume of 101 CY. In addition, the extensive and healthy surrounding soils and vegetation present on-site make excavation and removal of contaminated slag material very straightforward. These visual indicators of contamination (black, glassy, coarse material) will be used throughout the excavation of impacted soils, which should allow for full mitigation of any arsenic and lead contamination on the Site.

8.2 – Excavated Soil Handling

Upon removal of contaminated soils, best management practices (BMPs) will be incorporated by the Contractor to ensure exposure pathways are minimized while tracking and transporting materials to the repository. Up to 85 CY of contaminated soils will be placed in an on-site repository with the capacity to hold 101 CY of material. Approximately 1-foot of clean soil will be generated during construction of the repository to cap consolidated wastes. Road base or soil amendments will also be placed where contaminated material has been removed to ensure a buffer and long-term exposure pathway reduction.

As part of excavation and construction activities, various BMPs and engineering controls will be instituted as reclamation work. For example, dust will be mitigated if necessary to moisten the soil before and during removal actions. Erosion controls, such as silt fence, will be installed prior to commencing site reclamation activities. As the repository is constructed, the management of clean and contaminated soils will be paramount for project success. Any clean material generated after repository excavation would be stockpiled and effectively surrounded with wattles to minimize erosion if a large storm or precipitation event were to occur during construction. A similar approach will be taken while excavating and handling contaminated material from its origin to the repository. Wattles and/or other erosion control devices will be incorporated into immediate areas of disturbance. During final site grading and revegetation of reclaimed slopes will be performed to aid in long-term erosion control in combination with biodegradable blankets or wattles. Under CDPHE Colorado Discharge Permit Systems (CDPS) COR400000 Part 1A.1i, the WQCD does not require a Construction Stormwater Discharge Permit for a mining facility that does not comingle with process water from the facility and with a footprint of disturbance of less than one acre. In addition to other construction BMPs, site access controls such as temporary fencing or signage will be installed over the length of the project. These will be posted at the intersection of the upper access road and the Quarry Road, as well as the lower walking trail traversing the site's bottom portion.

8.3 – Soil Repository

A volumetric estimate of contaminated soils based on initial site investigations yielded an amount of up to 85 CY that could potentially be consolidated in an on-site repository. This estimate reflects the upper

volume that could be placed into the repository, but will ultimately be determined in the field based on visual characterization with the Contractor. Given the thin vernier of material present during past site investigations, it is anticipated that depths do not extend past an average of 0.25 feet below ground surface (bgs). The current conceptual design recommends a 75-ft x 36-ft by 2-ft repository, which could change in the field given groundwater interactions, the volume of contaminated material generated, or minimization of existing vegetation disturbance.

Before placing contaminated soils in the repository, a subgrade will be established using heavy equipment before placement of a Mirafi 180 geotextile liner that will act as a filter fabric on the repository bottom. Impacted soils will be placed on the geotextile in lifts determined in the field based on the volume of material and repository size. Compaction will occur with an excavator followed by at least 1-foot of locally harvested clean, which will be amended and revegetated. Regardless of size, shape, and location, final grades of cap surface will be constructed as a convex shape to promote positive drainage and prevent ponding from stormwater or snowmelt. Hummocking or roughening of the repository surface will also be factored into the revegetation of the repository to ensure this positive drainage. The culvert and road crossing proposed for the access road will reroute any stormwater or snowmelt flows away from the reclaimed site footprint. A large wooded and well-vegetated area exists upslope of the proposed repository location, which will aid in run-on/run-off control of the repository surface.

8.4 – Verification Sampling

Because the Site is being remediated to a visual standard as opposed to the obtainment of metals concentrations below BLM screening levels. TU will plan to provide CDPHE and the TLR with post-project monitoring and associated photos that document **a.)** the institutional controls installed as part of the approved VCUP SOW are operating as intended, and **b.)** the vegetated portions of the Site are performing to what is expected for the elevation and abbreviated growing season at the Site. Verification of these aspects will be provided by TU through photos and a summary report.

8.5 – Institutional Controls

A conservation easement granted to the Aspen Valley Land Trust or other qualified land trust or governmental entity, and an environmental covenant between the State of Colorado and the Trust for Land Restoration, binding upon future owners of the property, will serve as the primary institutional controls assuring long-term monitoring and maintenance of the remediated site, restricting and assuring human use to those activities deemed compatible with the VCUP goals. The remedial scope of work of the Site includes an on-site repository upslope of any prominent drainages, which will house soil and particles that contain elevated concentrations of arsenic and lead. The repository will have a geotextile liner at its base to act as a filter and limit migration of any contaminants to nearby groundwater, while also being capped with clean fill and revegetated. Additionally, drainage controls will be constructed as part of the remedial action to convey water around the repository and Site, this includes an earthen berm at the toe of the slag pile to catch any mobilized material from the slag pile. A road base cap on the slag pile will reduce surface water infiltration and exposure of the historic feature. Revegetation of relevant areas of the Site will further support remediation and long-term health of the Site.

The remedial design includes relocating soils that contain lead and arsenic concentrations in excess of the residential RALs to a repository that will be constructed on-site. In accordance with CDPHE regulations, land use restrictions will be established for the 0.4-acre portion of the Marble Wetlands Preserve site which will restrict activities that may compromise the integrity of the repository cap or may result in uncontrolled exposure to the impacted soils contained in the repository. Additional institutional controls such as buck and rail fencing will also help prohibit access and potential exposure to the reclaimed portion of the site over time.

An environmental covenant between the State of Colorado and the Trust for Land Restoration for the Hoffman Smelter site located within the Marble Wetlands Preserve will be a condition of final closeout of the VCUP and of a subsequent "No Further Action Determination" by the State of Colorado. The language of the environmental covenant will be developed and finalized upon completion of the site reclamation to meet State of Colorado standards by TLR and CDPHE. It will be recorded in Gunnison County and will be permanently attached to the title of the property, and as such will be the responsibility of whomever owns the property in the future to abide by and maintain. It will be enforceable by the State of Colorado and by the Aspen Valley Land Trust or whomever the grantee and/or holder of the conservation easement may be.

8.6 – Completion Report

A VCUP Completion Report will be submitted to CDPHE within 45 days of completion of the remedial activities detailed in this VCUP Application. The completion report submission will be accompanied by a request for a 'No Further Action Determination' (NAD) from CDPHE.

Section 9 – Maintenance and Monitoring

The maintenance and monitoring requirements associated with this remediation project are limited to monitoring and occasional maintenance of the engineered soil cap to be constructed over impacted soils that will be placed in the repository constructed upslope of the slag pile. For three years following completion of the proposed 2022 VCUP, TU will perform annual site inspections to monitor the condition of the earthen and vegetative repository cap. Maintenance will be completed as necessary.

Long-term monitoring and necessary routine maintenance of the site beyond the three years by TU as prescribed in the VCUP will be the responsibility of the fee-title owner of the property. Likewise, long-term monitoring and maintenance of the site by the fee-title owner of the property will be a condition of both the conservation easement and the environmental covenant as described in 8.5 *Institutional Controls*, above, and will be enforceable by either or both the conservation easement holder and the State of Colorado.

9.1 – Monitoring and Maintenance Parameters

All repairs to the Site will be in accordance with the VCUP plan. The work to be completed at the large head cut in the prominent drainage at the eastern margin of the Site will not be subject to future maintenance. Monitoring and maintenance will focus on the footprint surrounding the slag pile; the culvert that will convey flow across the access road, the buck and rail fence, the soil repository, and the vegetative health of the site.

9.2 – Groundwater monitoring

Because groundwater monitoring was not addressed in the Phase 1 Assessment, future groundwater monitoring will not occur as part of this VCUP.