Revised: 5/12/2021 310 Form 270 and Instructions may be downloaded from: http://dnrc.mt.gov/licenses-and-permits/stream-permitting	**CD/AGENCY USE ONLY** Application # Click to enter text.	Date Received Date
	Date Accepted Date Initials Initials	Date FW: to FWP Date

This space is for all Department of Transportation and SPA 124 permits (government projects).

Project Name Click to enter text.

Control Number Click to enter text. Contract Letting Date Date

MEPA/NEPA Compliance ☐Yes ☐No If yes, #C5 of this application does not apply.

JOINT APPLICATION FOR PROPOSED WORK IN MONTANA'S STREAMS, WETLANDS, FLOODPLAINS & OTHER WATER BODIES

This is a standardized application to apply for one or all local, state, or federal permits listed below.

- Refer to instructions to determine which permits apply and submit a signed application to each applicable agency.
- Incomplete applications will result in the delay of the application process.
- The applicant is responsible for obtaining all necessary permits and landowner permission before beginning work.
- **Other laws may apply.**

	PERMIT	AGENCY	FILL OUT SECTIONS	FEE
	310 Permit	Local Conservation District	A - E and G	Inquire locally
X	SPA 124 Permit	Department of Fish, Wildlife and Parks	A - E and G	No fee
	318 Authorization 401 Certification	Department of Environmental Quality	A - E and G	$250 (318); $400 - $20,000 (401)
	Navigable Rivers Land Use License, Lease, or Easement	Department of Natural Resources and Conservation, Trust Lands Management Division	A - E and G	$50, plus additional fee
X	Section 404 Permit, Section 10 Permit	U. S. Army Corps of Engineers (USACE)	A - G F1-8	Varies ($0 - $100)
	Floodplain Permit	Local Floodplain Administrator	A - G	Varies by city/county ($25 - $500+)

A. APPLICANT INFORMATION

APPLICANT NAME (person responsible for project): Ruby Valley Conservation District
Has the landowner consented to this project? ☒ Yes ☐ No
Mailing Address: PO Box 295 Sheridan, MT 59749
Physical Address: 402 S Main Street Sheridan, MT 59749
Cellphone:(406) 842-5741 Home Phone: N/A E-Mail:info@rvcd.org

LANDOWNER NAME (if different from applicant): Raisland Revocable Trust
Mailing Address: 468 E Shanks Basin Road, Reed Point, Montana 59069
Physical Address: Click here to enter physical address or N/A.
Cellphone: Click here to enter or N/A. Home Phone:Click here to enter or N/A. E-Mail:Click here to enter or N/A.

LANDOWNER NAME (if different from applicant): Central City LLC
Mailing Address: 1680 NE 135th St, North Miami, Florida 33181-1725
Physical Address: Click here to enter physical address or N/A.
Cellphone: Click here to enter or N/A. Home Phone:Click here to enter or N/A. E-Mail:Click here to enter or N/A.

CONTRACTOR/COMPANY NAME (if applicable): Great West Engineering
PRIMARY CONTACT NAME: Jeremiah Theys, P.E.
Mailing Address: PO Box 4817, Helena, MT 59604
Physical Address: 2501 Belt View Drive, Helena, MT 59604
Cellphone:(406) 495-6193 Home Phone:Click here to enter or N/A. E-Mail: jtheys@greatwesteng.com

B. PROJECT SITE INFORMATION

1. NAME OF **STREAM** or **WATER BODY** at project location Granite Creek and Alder Gulch
   Project Address/Location: Granite Creek near confluence with Alder Gulch Nearest Town Virginia City
   County Madison Geocode: Click here to enter text.
   Choose.1/4 of the Choose. 1/4 of, Section 08 Township 06S, Range 03W
   Latitude 45.324692° N Longitude-112.001404° W Refer to section B1 in the instructions.

2. Is the proposed activity within **SAGE GROUSE** areas designated as general, connected, or core habitat?
   Yes ☒ No ☐ Attach consultation letter if required. Refer to section B2 in the instructions.
   The project is located in designated General Habitat for Greater Sage Grouse. Consultation was pursued by MDT for a related project within the MDT ROW, but no consultation has been pursued on private land. The surrounding landscape is not very conducive to being suitable habitat for sage grouse due to extensive rock piles among dense shrub with no grassland or sage habitat within project limits. The area to the north of the highway within the project boundary consists of wet irrigated meadow and dense willow. Sage grouse have been reported a few miles away in the sage uplands that border the meadow/pasture area but are not within the project limits.
3. Is this a **STATE NAVIGABLE WATERWAY**? The state owns beds of certain navigable waterways.
   Yes ☐ No☒ If yes, send a copy of this application to the appropriate DNRC land office. Refer to section B3 in the instructions.

4. **WHAT IS THE CURRENT CONDITION** of the proposed project site? Describe the existing bank condition, bank slope, height, nearby structures, and wetlands. What vegetation is present? Refer to section B4 in the instructions.

The project site is located within a rural area of Madison County. Land in the vicinity of the project consists primarily of privately held undeveloped agricultural land. Two of the parcels have private residences near the project extent. The project area is located within an area heavily impacted by historic dredge mining and contains multiple large piles of gravel and cobble dredge tailings near and within the project boundary.

The Granite Creek channel was previously altered immediately upstream and downstream of the highway bridge crossing, due to recent beaver activity, channel straightening, and excavation to lower the channel back down through beaver dam deposits and prevent flooding at the crossing. The streambanks range in slope from 20% to 100% with an average of 55%. The bank height ranges from 2 feet to 5 feet. Vegetation in the area comprises a blend of pasture grasses, emergent wetland species, such as sedge, rush, broadleaf cattail, and reed canarygrsss, and riparian shrubs such as Booth willow, Bebbs willow, sandbar willow, red-osier dogwood and others.

The Alder Gulch channel has been previously altered in the project extents because of extensive and historic dredge mining activities. The streambanks range in slope from 15% to 33% with an average of around 25%. The bank height ranges from 7.5 feet to 4 feet. Vegetation in the area comprises of riparian shrubs such as Salix exigua and Ribes lacustre and emergent wetland species such as Phalaris arundinacea, Carex utriculate, Juncus balticus, Agrtostis stolonifera, and Carex aquatiliis.

Great West Engineering completed wetland delineations in 2018, 2021, and 2022 within the RVCD, Grantie Creek Ranch, and MDT Project Limits. The RVCDs' – Upper Alder Gulch Restoration and Granite Creek Restoration Projects have four wetlands in total occurring within their combined project limits. Wetlands within the Granite Creek Restoration project area total 1.12 acres while the Upper Alder Gulch Restoration contains 0.67 acres of wetlands within the project limits. The primary sources of hydrology for wetlands north of MT-287 (wetlands 1 and 2) are surface water (overflow) and ground water originating from Granite Creek and potential seepage and irrigation from a nearby ditch, and groundwater and seasonal surface runoff entering the Granite Creek floodplain from side slopes. Wetland 3, south of MT-287, is influenced by floodplain groundwater from both Granite Creek and Alder Creek and is in the area impacted by historic dredge mining within Alder Gulch. Wetland 4 is limited to the margins of ponds formed from historical dredge mining activities or within shallow grown-in ponds, and narrow wetlands along the margin of Alder Creek near the confluence of Granite Creek all with surface and groundwater from Alder Creek as the primary hydrology source.

C. PROPOSED PROJECT OR ACTIVITY INFORMATION

1. **TYPE OF PROJECT** (check all that apply) Refer to section C1 in the instructions.

☐ **Agricultural and Irrigation Projects:** Diversions, Headgates, Flumes, Riparian fencing, Ditches, etc.

☐ **Buildings/Structures:** Accessory Structures, Manufactured Homes, Residential or Commercial Buildings, etc.

☒ **Channel/Bank Projects:** Stabilization, Restoration, Alteration, Dredging, Fish Habitat, Vegetation or Tree Removal, or any other work that modifies existing channels or banks.

☐ **Crossings/Roads:** Bridge, Culvert, Fords, Road Work, Temporary Access, or any project that crosses over or under a stream or channel.

☐ **Mining Projects:** All mining related activity, including; Placer Mining, Aggregate Mining, etc.

☐ **Recreation related Projects:** Boat Ramps, Docks, Marinas, etc.

☐ **Other Projects:** Cistern, Debris Removal, Excavation/Pit/Pond, Placement of Fill, drilling or directional boring, Utilities, Wetland Alteration. Other project type not listed here _____

2. **IS THIS APPLICATION FOR** an annual maintenance permit? ☐ Yes ☒ No
(If yes attach annual plan of operation to this application) – Refer to section C2 in the instructions.

3. **WHY IS THIS PROJECT NECESSARY? STATE THE PURPOSE OR GOAL** of the proposed project. Refer to section C3 in the instructions.

The purpose of the Granite Creek Channel Restoration Project is to realign and restore Granite Creek while the purpose of the Upper Alder Gulch Restoration Project is to restore Alder Gulch. Historic mining on Granite Creek and Alder Gulch has altered the natural form and function of the creek and surrounding riparian corridor, impacting the confluence of Granite Creek and Alder Gulch, preventing the development of new channel paths, impounding surface water, inhibiting lateral channel movement, degrading the nearby riparian habitat, disconnecting sections of Granite Creek and Alder Creek preventing fish movement through the area, and disrupting the natural recruitment and transport of bedload and sediment. Subsequent stream channelization and dredging have further degraded the channel and riparian habitat. The goal for these restoration projects is to restore 1230 feet of Granite Creek and 960 feet of Alder Gulch to stable and functional stream channels and riparian corridors near the MT-287 highway crossing over Granite Creek. These projects are integrally connected to the bridge replacement being done by the Montana Department of Transportation (MDT), which aims to replace the existing highway 287 bridge over Granite Creek and relocate it over the new proposed Granite Creek alignment and to other restoration projects being done by the Granite Creek Ranch on Alder Gulch downstream. The stream restoration projects will tie into the bridge replacement project to ensure channel connectivity as well as returning its natural form and function and promote a healthier floodplain, wetland, and riparian habitat.

4. **PROVIDE A BRIEF DESCRIPTION** of the proposed project plan and how it will be accomplished. Refer to section C4 in the instructions.

Both channel restoration projects are located approximately 3 miles northwest of Virginia City, Madison County, Montana. The proposed Granite Creek Channel Restoration project would relocate and restore approximately 1230 linear feet of Granite Creek. The project limits extend approximately for 700 feet southwest and 700 feet northeast of the proposed bridge crossing and includes a 150-foot section that is 1300 feet upstream of the crossing. The proposed Upper Alder Gulch Restoration project would restore approximately 960 linear feet of Alder Creek. The project limits extend approximately for 410 feet downstream and 550 feet upstream of an existing private bridge crossing located over Alder Creek.

The stream restoration project is integrally connected to a road and bridge project sponsored by the Montana Department of Transportation (MDT) and will tie into the new bridge location. RVCD completed an alternatives analysis to evaluate several stream alignment alternatives. The preferred stream alignment resulted in the stream alignment being moved from its current location. The RVCD and MDT project will be constructed relatively concurrently and coordinated through a sequence of operations.

The proposed Granite Creek channel will consist of restoring the heavily degraded stream with a stream consisting of alternating pool and riffle sections with a sinusoidal horizontal alignment. The design also includes bioengineered low and high shear banks with 20-foot floodplain benches on both sides. The banks will be built with topsoil, willow cuttings, and fascines made from willow and conifer bundles to stabilize the banks and encourage natural vegetation growth. The floodplain benches will be replanted with existing sod mats and vegetation. Areas that are not replanted will be seeded utilizing a native seed mix. The total floodplain width measures approximately 57' with a 17' channel width and a 6' low-flow channel width in the riffle sections and a 9'-6" channel width in the pools.

The proposed Alder Gulch Channel will consist of restoring Alder Creek with a stream consisting of alternating pools and riffle sections with a sinusoidal horizontal alignment. The design also includes bioengineered low and high shear banks with 30-foot floodplain benches on both sides. The banks will be built with topsoil, willow cuttings, and fascines made from willow and conifer bundles to stabilize the banks and encourage natural vegetation growth. The floodplain benches will be replanted with existing sod mats and vegetation. Areas that are not replanted will be seeded utilizing a native seed mix. The total

floodplain width measures approximately 90' with a 30' bankfull width and a 19' low-flow channel width in the riffle sections and a 24'; channel width in the pools.

5. **WHAT OTHER ALTERNATIVES were considered to accomplish the stated purpose of the project?** Why was the proposed alternative selected? Refer to section C5 in the instructions.

Granite Creek Restoration Project

Alternative 1: Dredge Sediment and Re-Align Stream Channel

Alternative 2: Increase Road Grade, Bridge Height, and Install Culvert Relief

Alternative 3: Move Bridge Location, Install Culvert Relief, Remove Dredge Piles, and Re-Align Channel

With alternative 1, the stream channel would be excavated to remove excess sediment under and around the bridge. Additionally, the stream would be realigned to reactive the now abandoned stream channel in order to provide additional sediment transport capacity under the bridge. This alternative would have returned mush of the lost pasture ground to a more productive state. However, it does not adequately address the downstream sediment deposition at the root of the problem and would only provide a temporary solution. Additionally, since \ the stream could migrate to other channels, the risk of failure would be high.

Alternative 2 would result in the increase of the bridge height as well as an increase road fill/grade to allow more water to pass underneath the bridge. This alternative would more of a long-term solution than alternative 1, but sediment deposition would still occur downstream of the bridge. The continued deposition could mean that the problem may simply move upstream.

Ultimately, Alternative 3 was chosen as it would deal with the underlying issues driving sediment deposition. With this alternative, the location of the bridge would be moved to accommodate the new channel alignment. Dredge piles would be excavated to allow for additional stream movement and the development of a defined channel.

Alder Gulch Restoration Project

Throughout the preliminary design phase of the project, onsite meetings were conducted with Montana Fish Wildlife & Parks biologists and RVCD to discuss the locations of the proposed alignment and any possible alterations. The proposed alignment location was based on matching the existing alignment, when possible, to accommodate the existing private bridge as well as to connect to the proposed work to be done on Granite Creek. Its final location was also verified with both FWP and RVCD. A no work alternative would mean that the current degraded Alder Gulch would remain as is, and improvements would not be made to the existing riparian habitat.

6. **NATURAL RESOURCE BENEFITS OR POTENTIAL IMPACTS. Please complete the information below to the best of your ability.**

* Explain any temporary or permanent changes in erosion, sedimentation, turbidity, or increases of potential contaminants. What will be done to minimize those impacts?

These projects will be constructed in accordance with Best Management Practices (BMPs) to control erosion and sedimentation. To minimize erosion and sedimentation and to re-establish permanent vegetation, disturbed areas will be seeded with a native seed mix as soon as possible as well as plantings and riparian vegetation transplanted during construction.. Sedimentation barriers will be installed to control the release of sediments to the stream.

Streambanks will be stabilized with a bioengineered bank consisting of topsoil, willow cuttings, and coir logs. This will promote the re-establishment of vegetation along the channel banks that would be present under a natural condition. This also will allow the stream channel and adjacent riparian areas to function as a natural channel and provide bank stabilization. Banks have also been designed specifically for high and low shear areas to improve the banks' resistivity to erosion.

Relocating and restoring the stream will reduce the need for channel dredging and will allow the stream to establish a stable channel and banks, reducing sediment inputs to Granite Creek and Alder Creek.

- Will the project cause temporary or permanent impacts to fish and/or aquatic habitat? What will be done to protect the fisheries?

The projects will cause short- and long-term impacts to fish and aquatic habitat. Impacts to individual fish are possible during the dewatering and rewatering phases of the project but would be short-term. Construction of the new channel would be conducted in the dry. Ultimately, impacts to fish and aquatic in the long term will be beneficial by providing improved water quality, more natural stream functionality including improved bedload and sediment transport, improved aquatic habitat and better stream connectivity through this reach. Unavoidable impacts are anticipated to Granite Creek, associated with the fill of the abandoned channel and the restoration of the existing channel. Fill would be placed slowly to avoid harming any fish that have not already moved away from construction activity. Any habitat provided by the abandoned channel, which has been straightened and dredged, will be replaced by more structurally diverse habitat within the new channel alignment.

Implementation of standard BMPs and revegetation efforts will minimize potential for adverse effects to fish and aquatic habitat. Both projects will require installation of temporary erosion control measures along the stream banks to isolate flow and prevent silt and construction debris from entering the streambed.

- What will be done to minimize temporary or permanent impacts to the floodplain, wetlands, or riparian habitat?

Wetland impacts will only be limited to those within the projects' construction limits. Banks will be stabilized with a bioengineered bank consisting of topsoil and seed, willow cuttings, and fascine. This design will promote re-establishment of vegetation along the channel banks. This design will also allow the stream channel, floodplain benches, and adjacent riparian areas to function as a natural channel, provide improved bank stabilization, and restore sediment and bedload transport to the system. As the willows grow and mature, they will provide shade and woody vegetation that will improve the quality of the riparian habitat. All of these efforts will go into greatly improving the health and extent of the floodplains, wetlands, and riparian habitat by re-elevating incised and dredged segments of stream channel and re-establishing stable riparian vegetation for the length of the channel within the project area.

- What efforts will be made to decrease flooding potential upstream and downstream of project?

Professional engineers have designed the proposed project to avoid or to minimize flooding problems upstream or downstream. The Granite Creek channel has been designed with a 20' floodplain bench on either side of the channel while the Alder Gulch channel has been designed with a 30' floodplain bench on either side of the channel. These large floodplains will decrease the flooding potential by being able to handle larger amounts of water during high flow events.

- Explain potential temporary or permanent changes to the water flow or to the bed and banks of the waterbody. What will be done to minimize those changes?

Both projects involve changing the flow path of a section of stream from the already heavily altered existing channel to a more natural alignment and restoring sections of the altered existing channel for Alder and Granite Creeks. Permanent impacts will come from both the abandonment of Granite Creek and restoration of the existing channels and their floodplain benches. Relocating and restoring the existing Granite Creek channel and restoring Alder Creek channel will allow for a more natural and continuous water flow. Streambanks in both the restored and relocated sections of the streams will be stabilized with a bioengineered bank consisting of topsoil and seed, willow cuttings, and fascines. This design will have the benefits of promoting the establishment of native riparian vegetation along the new banks, allowing the stream channels to accommodate natural stream processes, and preventing excessive bank erosion.

The projects require contractors to follow standard BMPs for construction site, including installing temporary erosion control measures along the stream banks to prevent silt and construction debris from entering the streambeds.

- How will existing vegetation be protected and its removal minimized? Explain how the site will be revegetated. Include weed control plans.

Historic dredge mining has heavily impacted and degraded the existing vegetation south of Hwy MT-287. Clearing for agriculture and livestock grazing has reduced riparian vegetation north of the highway, although a narrow band of riparian shrubs remains along the streambanks of Granite Creek in that portion of the project. Efforts will be made to preserve the existing vegetation and limit vegetation disturbances to that strictly necessary for project implementation. Best management practices (BMPs) (including equipment inspection and/or cleaning) will be used to prevent the introduction or spread of weeds during construction. As part of the restoration of the stream, floodplain benches along the relocated and restored stream reaches will be replanted with existing sod mats and revegetated. Willow cuttings along with willow and conifer fascines will be utilized to stabilize the banks of the restored channel. These cuttings and fascines will also improve habitat complexity along the banks and increase the cover of riparian shrubs on low banks. Any areas that are not replanted will be reseeded with a native seed mix which will be certified weed free. The unavoidable losses of any vegetation will be offset by the re-establishment of vegetation within the project area.

D. CONSTRUCTION DETAILS

1. PROPOSED CONSTRUCTION DATES. Include a project timeline. Start date 3/3/2023
Finish date 11/30/2023 How long will it take to complete the project? Approximately 90 days Is any portion of the work already completed? ☐ Yes ☒ No (If yes, describe previously completed work.)
Refer to section D1 in the instructions.

Since the Granite Creek Channel restoration project is being done in conjunction with the MDT Bridge Replacement project over Granite Creek, there is a sequence of events scheduled to ensure a smooth construction process. The sequence of events is laid out below.

1. RVCD Contractor is to divert the Granite Creek channel into a temporary channel prior to April 1, 2023 so construction may occur entirely in the dry.
2. Contract will complete the channel work in the dry.
3. Contract will come back in October of 2023 to complete vegetation plantings and connect the channel through the new MDT bridge.

2. PROJECT DIMENSIONS. Describe length and width of the project. Refer to section D2 in the instructions.

The Upper Alder Gulch Restoration project limits extend approximately for 410 feet downstream and 550 feet upstream of an existing private bridge crossing located over Alder Creek. The proposed project would restore approximately 960 linear feet of Alder Creek. The project width is approximately 90 feet centered on the proposed channel thalweg, that generally follows the same direction and is located near the existing thalweg, until the end of the project where it separates to match future work to be done downstream on Alder Gulch.

The Granite Creek channel restoration project limits extend approximately 550 feet southwest and 550 feet northeast of the proposed bridge crossing and includes a 130-foot section that is 1350 feet upstream of the crossing. It would consist of restoring around 1230 linear feet of Granite Creek.

Permanent impacts are expected to the bed and banks of the abandoned Granite Creek channel waterbody due to placing fill resulting in a ***permanent impact of approximately 300 LF*** *to the abandoned Granite Creek channel location. Anticipated impacts to the abandoned channel of Granite Creek, which already has been impacted by recent dredging and channelization, would be offset in part by construction of a new, stable channel, bioengineered banks and floodplain benches throughout, and restoration/relocation of the stream channel and bank habitat in a more ideal location.*

3. EQUIPMENT. List all equipment that will be used for this project. How will the equipment be used on the bank and/or in the water? Note: All equipment used in the water must be clean, drained and dry. Refer to section D3 in the instructions.

Standard construction equipment will be used. Equipment will likely include a variety of tracked and heavy construction equipment including but not limited to excavators, loaders, and dump trucks. The contractor will provide the equipment that will be used to construct the proposed project. Equipment entry into the stream will be minimized. The proposed alignment construction will take place entirely in the dry.

Will equipment from out of state be used? YES ☐ NO ☐ UNKNOWN ☒
Will the equipment cross west over the continental divide to the project site? YES ☐ NO ☐ UNKNOWN ☒
Will equipment enter the Flathead Basin? YES ☐ NO ☐ UNKNOWN ☒

4. MATERIALS. Provide the total quantity and source of materials proposed to be used or removed. Note: This may be modified during the permitting process therefore it is **recommended you do not purchase materials until all permits are issued.** List soil/fill type, cubic yards and source, culvert size, rip-rap size, any other materials to be used or removed on the project. Refer to section D4 in the instructions.

Cubic yards/Linear feet	Size and Type	Source
Granite Creek		
2576 CY	*Channel Excavation*	*N/A*
1767 CY	*Channel Embankment*	*Onsite Excavation*
255 CY	*Riffle Streambed Material*	*Commercial*

417 CY	*Pool Streambed Material*	*Commercial*
769 CY	*Topsoil*	*Salvaged Onsite*

Alder Gulch

14118 CY	*Channel Excavation*	*N/A*
258 CY	*Channel Embankment*	*Onsite Excavation*
229 CY	*Riffle Streambed Material*	*Commercial*
794 CY	*Pool Streambed Material*	*Commercial*
1432 CY	*Topsoil*	*Salvaged Onsite*

E. REQUIRED ATTACHMENTS

1. **PLANS AND/OR DRAWINGS** of the proposed project. **Include:**
   - Plan/Aerial view
   - an elevation or cross section view
   - dimensions of the project (height, width, depth in feet)
   - location of storage or stockpile materials dimensions and location of fill or excavation sites
   - drainage facilities
   - location of existing/proposed structures, such as buildings, utilities, roads, or bridges
   - an arrow indicating north
   - Site photos

2. **ATTACH A VICINITY MAP OR A SKETCH** which includes: The water body where the project is located, roads, tributaries, other landmarks. Place an "X" on the project location. Provide written directions to the site. This is a plan view (looking at the project from above).

3. **ATTACH ANNUAL PLAN OF OPERATION if requesting a Maintenance 310 Permit.**

4. **ATTACH AQUATIC RESOURCE MAP.** Document the location and boundary of all waters of the U.S. in the project vicinity, including wetlands and other special aquatic sites. Show the location of the ordinary high-water mark of streams or waterbodies. **if requesting a Section 404 or Section 10 Permit.** Ordinary high-water mark delineation included on plan or drawings and/or a separate wetland delineation.

F. ADDITIONAL INFORMATION FOR U.S. ARMY CORPS OF ENGINEERS (USACE) SECTION 404, SECTION 10 AND FLOODPLAIN PERMITS.

Section F should only be filled out by those needing Section 404, Section 10, and/or Floodplain permits. Applicants applying for Section 404 and/or Section 10 permits complete F 1- 8. Applicants applying for Floodplain permits, complete all of Section F. Refer to section F in the instructions.

FOR QUESTIONS RELATING TO SECTION F, QUESTIONS 1-8 PLEASE CONTACT THE USACE BY TELEPHONE AT 406-441-1375 OR BY E-MAIL MONTANA.REG@USACE.ARMY.MIL.

1. Identify the specific **Nationwide Permit(s)** that you want to use to authorize the proposed activity. Refer to section F1 in the instructions.

Nationwide Permit No. 27 is proposed to authorize the proposed activity. The proposed project will create a net increase in aquatic resource functions and services as sections of the stream will be entirely relocated and restored. The restoration will greatly improve the stream's natural form and function as well as the aquatic habitat and riparian corridor.

2. Provide the **quantity of materials** proposed to be used in waters of the United States. What is the length and width (or square footage or acreage) of impacts that are occurring within waters of the United States? How many cubic yards of fill material will be placed below the ordinary high-water mark, in a wetland, stream, or other waters of the United States? Note: Delineations are required of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site. Refer to section F2 in the instructions.

Cubic yards/Linear feet	*Size and Type*	*Source*
Granite Creek		
255 CY	*Riffle Streambed Material*	*Commercial*
417 CY	*Pool Streambed Material*	*Commercial*
1153 CY	*Embankment Material*	*Onsite Excavation*
1373 LF	*Low Shear Bank*	*Onsite/Commercial*
709 LF	*High Shear Bank*	*Onsite/Commercial*
Alder Gulch		
229 CY	*Riffle Streambed Material*	*Commercial*
794 CY	*Pool Streambed Material*	*Commercial*
1295 LF	*Low Shear Bank*	*Onsite/Commercial*
566 LF	*High Shear Bank*	*Onsite/Commercial*

Table F.1: Unavoidable Wetland Impacts

Wetland	Approximate Project Station	Proposed Action	Latitude	Longitude	Category	Approximate Permanent Impacted Area (acres)	Associated Jurisdictional Water of the US
WL-1	14+50 to 16+25	Channel Restoration	45.328314° N	-111.9942007° W	III	0.06	Granite Creek
WL-2	25+00 to 26+50 12+50 to 16+50	Channel Restoration/ Realignment	45.324565° N	-112.000611° W	III	0.70	Granite Creek
WL-3	9+20 to 9+40 & 10+00 to 10+40	Channel Realignment	45.323949° N	-112.000439° W	III	0.17	Granite Creek/ Alder Creek
WL-4	5+00 to 7+00 & 7+50 to 8+60	Channel Realignment	45.3220306° N	-111.9962729° W	III	0.86	Granite Creek/ Alder Creek
	Total					**1.79**	

3. How will the proposed project avoid or minimize **impacts to waters of the United States?** Attach additional sheets if necessary. Refer to section F3 in the instructions.

Professional engineers have designed the proposed project to avoid or minimize risks of flooding problems upstream or downstream.

Construction of the new channel alignment as well as restoration of the existing channel will result in impacts to waters of the United States. However, these impacts will be a net benefit in the long term. Streambanks at the new channel alignments will be stabilized with a bioengineered bank consisting of topsoil, willow cuttings, and coir logs. This design will promote the re-establishment of vegetation along the channel banks that would be present under a natural condition. This design also will allow the stream channels and adjacent riparian areas to function as natural channels and provide bank stabilization. As the willows grow and mature, they will provide shade and woody vegetation that will improve the quality of riparian habitat. These efforts will ensure the new and restored channel will promote a healthier floodplain, wetland, and riparian habitat than what currently exists.

4. Will the project impact greater than 0.10-acre of wetland and/or more than 300 linear feet of stream or other waters? If yes, describe how the applicant is going to **compensate (mitigation bank, in-lieu fee program, or permittee responsible)** for these unavoidable impacts to waters of the United States. Refer to section F4 in the instructions.

The project will impact greater than 0.1 acres of wetland and more than 300 linear feet of stream. Since NWP 27 is being pursued, compensatory actions are not necessary because the proposed project will create a net increase in aquatic resource functions and services through improving stream connectivity and natural function, riparian habitat, and aquatic habitat.

5. Is the activity proposed within any component of the **National Wild and Scenic River System**, or a river that has been officially designated by Congress as a **"study river"**? Refer to section F5 in the instructions.

☐ Yes ☒ No

6. Does this activity require permission from the USACE because it will alter or temporarily or permanently occupy or use a **USACE authorized civil works project? (Examples include USACE owned levees, Fort Peck Dam, and others)**? Refer to section F6 in the instructions.

☐ Yes ☒ No

7. List the **ENDANGERED AND THREATENED SPECIES** and **CRITICAL HABITAT(s)** that might be present in the project location. Refer to section F7 in the instructions.

From a query of the US Fish and Wildlife Service's Information for Planning and Consultation, IPAC, the Endangered and Threatened Species that might be located in the project location include the listed Threatened Canada lynx (Lynx canadensis), grizzly bear (Ursus arctos horribilis), proposed Threatened North American Wolverine (Gulo gulo luscus) and the candidate monarch (Danaus plexippus). The project is expected to have No Effect on Canada Lynx, grizzly bear, and wolverine and is not likely to jeopardize the continued existence of monarch. No ESA-listed critical habitat overlaps the proposed project area. An environmental analysis was completed for the MDT project. Since this analysis was done though, the Wolvernine was put back into the list. However, the IPaC results are very generalized and reported by county. The proposed project area contains no suitable habitat for wolverine.

8. List any **HISTORIC PROPERTY(S)** that are listed, determined to be eligible or are potentially eligible (over 50 years old) for listing on the National Register of Historic Places." Refer to section F8 in the instructions.

As part of MDT's bridge replacement project, a Cultural Resource Inventory and Assessment was done to determine eligibility for listing. The Vigilante Trail and the Alder Gulch Dredge Tailings were both determined to be eligible for listing. However, impacts to these historic properties are not expected. Impacts will be limited to within the construction limits and will not extend beyond these limits.

9. List **all applicable local, state, and federal** permits and indicate whether they were issued, waived, denied, or pending. Note: All required local, state, and federal permits, or proof of waiver must be issued prior to the issuance of a floodplain permit. Refer to section F9 in the instructions.

Section 404 Permit (Pending)
124 Permit (Pending)

10. List the **NAMES AND ADDRESSES OF LANDOWNERS** adjacent to the project site. This includes properties adjacent to and across from the project site. (Some floodplain communities require certified adjoining landowner lists).
NAME OF **Adjacent Landowner**: *USDI Bureau of Land Management; Montana State Office, Billings, MT 59101-4669*
NAME OF **Adjacent Landowner**: *Central City LLC 1680 NE 135th ST North Miami, FL 33181-1725*
NAME OF **Adjacent Landowner**: *Raisland Revocable Trust 468 E Shanks Basin Rd, Reed Point, MT 59069*
NAME OF **Adjacent Landowner**: *Richard Feskanin & Alde G Feskanin PO Box 783, Ennis, MT 59729-0783*
NAME OF **Adjacent Landowner**: *John G Benedict PO Box 294, Virginia City, MT 59755-0294*

11. **Floodplain Map Number** N/A Refer to section F11 in the instructions.

12. Does this project comply with **local planning or zoning regulations**? Refer to section F12 in the instructions.
☒ Yes ☐ No

G. SIGNATURES/AUTHORIZATIONS

Some agencies require original signatures. **After completing the form**, make the required number of copies and **then sign each copy.** Send the copies with original signatures and additional information required directly to each applicable agency.

The statements contained in this application are true and correct. The applicant possess' the authority to undertake the work described herein or is acting as the duly authorized agent of the landowner. The applicant understands that the granting of a permit does not include landowner permission to access land or construct a project. Inspections of the project site after notice by inspection authorities are hereby authorized. Refer to section G in the instructions.

APPLICANT:
Print Name: RVCD: Gary Giem

Gary Giem 1/4/2023
Signature of Applicant Date

LANDOWNER:
Print Name: ~~Central City LLC~~

[signature] BM 1/10/23
Signature of Landowner Date

LANDOWNER:
Print Name: Raisland Revocable Trust

Barbara Raisland 12/28/2022
Signature of Landowner Date

*CONTRACTOR'S PRIMARY CONTACT (if applicable):
Print Name: Jeremiah Theys

11-11-22
Signature of Contractor/Agent Date
*Contact agency to determine if contractor signature is required.

GRANITE CREEK RECLAMATION AND REALIGNMENT
2022 SOIL SAMPLING REPORT

Prepared for:

Ruby Valley Conservation District
P.O. Box 295
Sheridan, Montana 597

Prepared by:

Hydrometrics, Inc.
3020 Bozeman Avenue
Helena, MT 59601

June 2022

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GRANITE CREEK RECLAMATION AND REALIGNMENT
2022 SOIL SAMPLING REPORT

1.0 INTRODUCTION

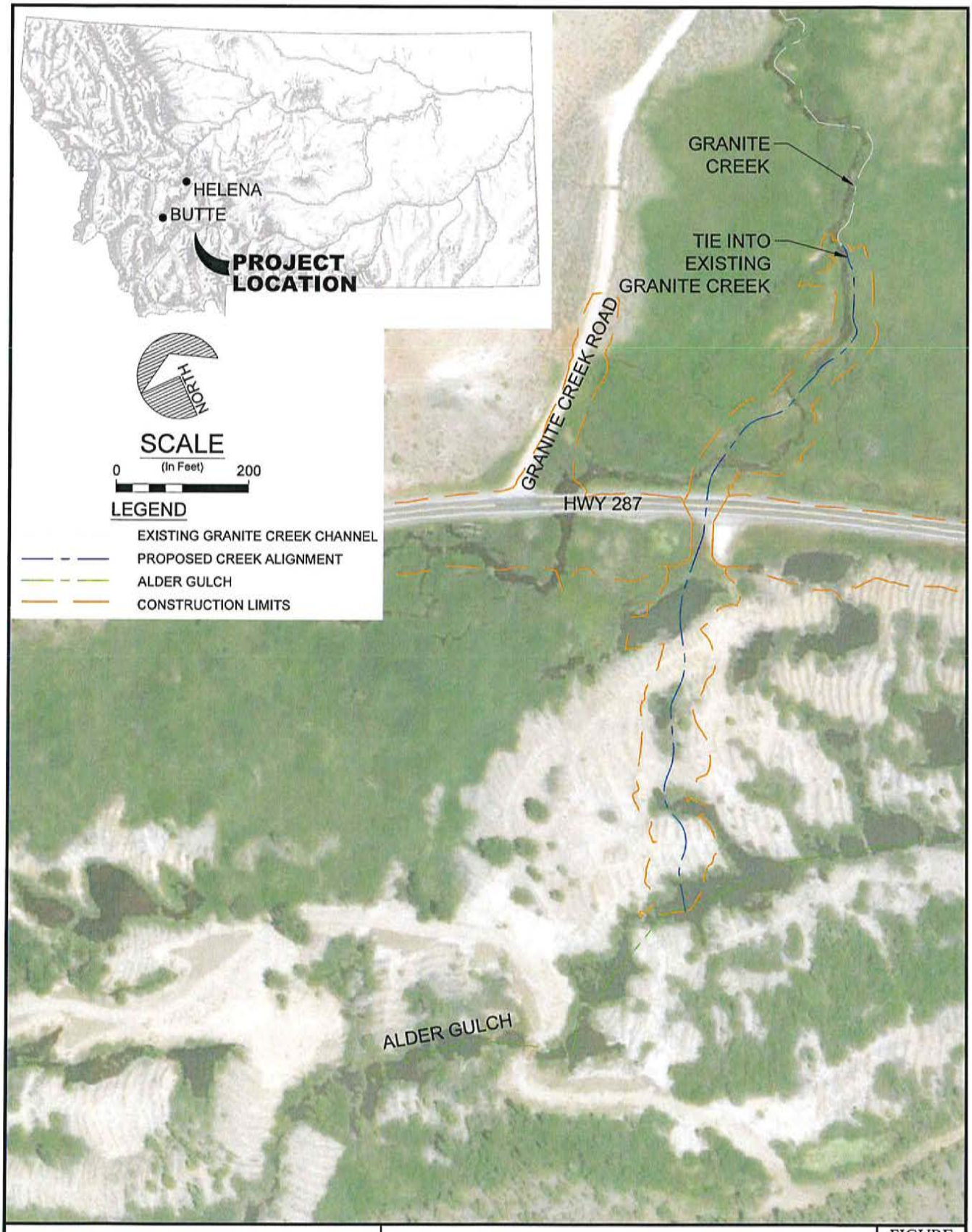
The Granite Creek Realignment Project is located to the east of the intersection of Granite Creek Road with Montana Highway 287 in Junction, MT; approximately 13 miles southeast of Sheridan, MT (Figure 1). Hydrometrics completed soil sampling of existing site soils in April 2022 as part of the reclamation and realignment project.

1.1 PROJECT BACKGROUND

The Granite Creek project area contains many large dredge piles of cobbles and boulders located within the floodplain area as a result of historic mining for gold deposits. Several of the remaining dredge piles inhibit the flow of Granite Creek into Alder Gulch Creek and as a result, Granite Creek has deposited a large quantity of sediment around the Highway 287 bridge structure recent years, reducing the volume of stream flow that can pass under the bridge. Water has begun to pass over the bridge and roadway in high-flow events and during ice buildup leading to dangerous road conditions, road closures, and an increased potential for the stream to undermine the road and bridge structure. In 2016, an initial stakeholder group was convened to identify solutions to the public safety concerns described above. The group decided the best alternative was to remove and rework the dredge piles in order to create a new, defined channel by which Granite Creek can enter Alder Gulch Creek. The Ruby Valley Conservation District (RVCD) has received multiple reclamation and development planning grants to finalize the project design.

1.2 HISTORICAL SOIL DATA

In 2003, the Montana Department of Environmental Quality (DEQ) collected soil/sediment samples in the vicinity of the Granite Creek Realignment Project, within the Alder Gulch Creek drainage near the confluence with Granite Creek. Sampling results showed elevated mercury concentrations within the project area (see Appendix A).



GRANITE CREEK RECLAMATION AND REALIGNMENT 2022 SOIL SAMPLING REPORT	FACILITY LOCATION AND VICINITY MAP	FIGURE 1

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Hydrometrics, Inc.
Consulting Scientists and Engineers

1.3 PROJECT SCOPE

Due to the potential for elevated metals concentrations in soils throughout the project area due to historic mining practices and soil disturbances, as indicated by the soil/sediment sampling conducted by DEQ, a Sampling and Analysis Plan (SAP) was developed to characterize metals concentrations in soils (Hydrometrics, 2022). The SAP outlined collection of approximately 20 soil samples throughout the project area, to be analyzed for total metals concentrations, to help determine whether remedial actions should be conducted as part of realignment construction activities.

2.0 SOIL COMPARATIVE VALUES

2.1 BACKGROUND SOIL VALUES

2.1.1 Site Background Concentrations

Four samples were collected upstream of Highway 287 and the dredge piles which provide insight into the unimpacted, background soil concentrations for the Granite Creek area. Sample set statistical data for each metal based on the background samples is shown below in Table 1.

TABLE 1. SITE BACKGROUND CONCENTRATIONS

	Arsenic	Barium	Cadmium	Chromium	Chromium III	Chromium VI	Copper	Lead	Mercury	Selenium	Silver
Min	1	37	<1	18	18	<1	8	2	0.011	<1	<1
Max	4	185	<1	71	71	<1	26	9	0.027	<1	<1
Average	2	132	<1	55	55	<1	19	6	0.019	<1	<1

Note: Concentrations in mg/kg.

2.1.2 Montana Background Threshold Values (BTVs)

Default background concentrations of inorganic constituents in Montana surface soils have been established through a statewide sampling program and statistical analysis of the resulting data set (Hydrometrics, 2013). Montana BTVs were developed based on the fine-fraction (defined as <250 µm, or the soil fraction passing a 60-mesh sieve) soil concentrations. The samples collected for this project are considered "bulk" samples as they were not sieved prior to analytical testing, and thus may not be directly comparable to the statewide BTVs. The statistical analyses from the 2012-2013 investigation showed either no significant difference in bulk and fine fraction concentrations (arsenic, iron, manganese, nickel, selenium, thallium, and vanadium) or significantly higher fine fraction concentrations (aluminum, barium, beryllium, cadmium, chromium, chromium (III), copper, lead, zinc). Although some of the constituents in the background investigation exhibited statistically significant differences in concentration, in many cases the median concentrations were similar. When comparing the bulk soil concentrations collected during this investigation to the Montana BTVs, the findings described above should be taken into consideration. The BTVs are shown in Table 2.

TABLE 2. SOIL CONCENTRATION STANDARDS

	Montana Background Threshold Values (mg/kg)[1]	Composite Worker Soil SSL (mg/kg)[2]	Residential Soil (mg/kg)[4]	Metals Concentrations in Sediment to Protect Aquatic Life (mg/kg)[6]
Arsenic	22.5	3[3]	0.68[5]	33
Barium	429	22,000	1,500	
Cadmium	0.7	10	0.71	3.9
Chromium, Total	41.7			
Chromium III	41.7	180,000	12,000	
Chromium VI	<0.29	6.3[3]	0.3[5]	
Copper	165	4,700	310	78
Lead	29.8	800	400	62
Mercury	<0.05	4.6	1.1	0.2
Selenium	0.7	580	39	
Silver	0.3	580	39	

[1]Background Concentrations of Inorganic Constituents in Montana Surface Soils, September 2013.
[2]Composite Worker Soil, non-cancer hazard index, From EPA Regional Screening Levels Summary Table. November 2021 values based on target hazard quotient (THQ) of 0.1)
[3]Composite Worker Soil, carcinogenic target risk, From EPA Regional Screening Levels Summary Table. November 2021 values based on target hazard quotient (THQ) of 0.1)
[4]Residential Soil, non-cancer hazard index, From EPA Regional Screening Levels Summary Table. November 2021 values based on target hazard quotient (THQ) of 0.1)
[5]Residential Soil, carcinogenic target risk, From EPA Regional Screening Levels Summary Table. November 2021 values based on target hazard quotient (THQ) of 0.1)
[6]Ruby River Watershed Total Maximum Daily Loads and Framework for a Water Quality Restoration Plan, December 2006.

2.2 REGULATORY SOIL STANDARDS

2.2.1 EPA Regional Screening Levels (RSLs)

The EPA has developed generic RSL tables to provide a screening level calculation tool to assist risk assessors, remedial project managers, and others involved with risk assessment and decision-making at CERCLA sites in developing or refining screening levels. For this project, the composite worker soil RSL and the residential soil RSL were referenced in order to assess site soil concentrations relative to generic risk-based screening levels. The RSLs for composite worker and residential soils are shown in Table 2.

Composite Worker Soils

The RSLs for composite worker soils assumes that the worker is a full-time employee working on-site and spends most of the workday conducting maintenance activities such as moderate digging and/or landscaping which would expose the individual to surface soils.

Residential Soils

The RSLs for residential soils assume that adults or children may be exposed to surface soils via ingestion, inhalation, and/or dermal contact in a residential setting.

2.2.2 Ruby River Watershed Total Maximum Daily Loads (TMDLs)

A water quality and habitat restoration plan (WQHRP) that included total maximum daily loads (TMDLs) was developed in 2006 for the Ruby Watershed area (Kron, 2006). This document focuses on sediment, temperature, habitat, metals, and nutrient related water quality impairments in the Ruby TMDL Planning Area. As part of the water quality plan, guidelines for metals concentrations in sediment to protect aquatic life were developed for the Ruby Watershed using guidance from USEPA, 2001; Maret and Skinner, 2000; Buchman, 1999. The sediment metal concentration values are shown in Table 2.

3.0 SOIL SAMPLING

3.1 SOIL REMOVAL

An initial soil removal effort was completed in April 2022 to clear some of the existing dredge piles from within the floodplain boundary of Granite Creek. The extent of this soil removal effort is shown in Appendix B. Sample collection was completed after the bulk of these soil removal efforts were complete, which allowed for samples to be collected at and/or below the proposed stream realignment thalweg elevation where previously existing dredge piles would have made access very difficult.

3.2 SAMPLE LOCATIONS

Soil sampling was performed on April 13, 2022. Due to access constraints and existing field conditions, the final sampling locations varied slightly from the proposed sampling locations and sample depth intervals. Sampling locations were recorded using a survey grade GPS. Soil sampling locations are shown on Figure 1, Appendix B. Final soil sample locations and depths are summarized in Table 3. A photo log and sampling field notes are located in Appendix C.

Locations 101 through 104 are located within proposed construction limits north of Highway 287; Locations 101 and 103 were collected from within the existing creek channel. The samples collected from these locations provide insight for the background concentrations in the area as historical dredging occurred downstream of this area. Locations 105 through 118 are located within proposed construction limits south of Highway 287; the bulk of the dredge piles were located within this area. Locations 119-120 are located downstream of the proposed new confluence of Granite Creek with Alder Gulch Creek. It is likely that the RVCD will perform some remediation work in this area in the future. In several locations, multiple depth intervals were sampled (i.e., locations 10 and 11, 12 and 13, 17 and 18, and 19 and 20) to provide information on any concentration trends with depth throughout the Project area.

TABLE 3. SAMPLE LOCATIONS

Sample #	Sample ID	Northing (FT)	Easting (FT)	Final Elevation Range (FT)		Sample Interval (FT)	Proposed Thalweg Elev. (FT)
101	GCRV-2204-101	402337.406	1325784.331	5421.1	5419.1	0-2	5419.1
102	GCRV-2204-102	402166.25	1325569.916	5418.5	5416.5	0-2	5415.3
103	GCRV-2204-103	402159.858	1325646.756	5418.5	5416.5	0-2	5414.7
104	GCRV-2204-104	402117.157	1325457.582	5418.1	5416.1	0-2	5413.8
105	GCRV-2204-105	402027.186	1325385.237	5414.5	5411.5	0-3	5412.4
106	GCRV-2204-106	402019.016	1325386.963	5414.8	5411.8	0-3	5412.3
107	GCRV-2204-107	401942.948	1325364.285	5414.6	5410.6	0-4	5411.8
108	GCRV-2204-108	401920.555	1325343.937	5415.3	5411.3	0-4	5411.6
109	GCRV-2204-109	401904.413	1325306.701	5415.2	5411.2	0-4	5411.3
110	GCRV-2204-110	401881.382	1325318.509	5414.7	5410.7	0-4	5411.2
111	GCRV-2204-111	401881.382	1325318.509	5410.7	5408.7	4-6	5411.2
112	GCRV-2204-112	401875.905	1325289.625	5414.7	5410.7	0-4	5410.8
113	GCRV-2204-113	401875.905	1325289.625	5410.7	5408.7	4-6	5410.8
114	GCRV-2204-114	401792.58	1325206.911	5415.1	5411.1	0-4	5409.5
115	GCRV-2204-115	401766.129	1325229.36	5414.6	5408.6	0-6	5409.5
116	GCRV-2204-116	401758.375	1325229.73	5414.7	5410.7	0-4	5409.5
117	GCRV-2204-117	401628.858	1325211.796	5413.6	5409.6	0-4	5408.5
118	GCRV-2204-118	401632.872	1325211.817	5409.6	5407.6	4-6	5408.5
119	GCRV-2204-119	401548.155	1324812.806	5410.4	5404.4	0-6	5407
120	GCRV-2204-120	401548.155	1324812.806	5404.4	5401.4	6-9	5407
Duplicates							
121	GCRV-2204-121	401766.129	1325229.36	Duplicate of sample location 115			
122	GCRV-2204-122	402159.858	1325646.756	Duplicate of sample location 103			

3.3 SAMPLING METHODS

The general procedure for collection of each composite sample is outlined below:

1. Test pits were excavated using an excavator to target depth (Table 3). Soils were placed from the target interval into a discrete pile. Due to shallow groundwater conditions and unstable soils, the depth was approximated using a measuring tape or an excavator bucket. Shallow groundwater conditions prevented access to most of the excavations and the surrounding soils made it difficult to stand on the edges of the excavation due to the likelihood of the sidewalls sloughing into the pit.

2. Using a clean plastic trowel, five grab samples were collected randomly throughout the soil pile representative of the complete target depth interval. Cobbles and larger material were not included within the composite samples. A new plastic trowel was used for each proposed sampling interval, eliminating the need for equipment decontamination between samples.

3. All five grab samples were placed in a large clean plastic sample bag to form one composite sample of the target depth interval, leaving sufficient room in the sample bag to ensure thorough mixing of the sample within the bag. Once all grab samples were collected, the sample was thoroughly mixed so that the analysis was representative of the full depth interval.

4. Each test pit was photographed. The date and time, depth of samples, soil description, and sample identification, etc. were recorded on the field form.

5. Composite samples were placed in a cooler on ice until they could be transferred to a refrigerator and subsequently delivered to the lab for analytical testing.

Due to equipment access constraints, the test pits for samples 101-103 were excavated using a shovel to dig to the desired depth interval.

3.4 FIELD QUALITY CONTROL SAMPLES

Field Quality Control (QC) requirements included collection of one field duplicate per 10 field samples collected. Field duplicate samples are replicate samples from a single sampling location submitted to a laboratory for the same set of analyses. Soil duplicate samples were collected by filling two sample containers consecutively from the sampling location. Duplicates were sent to the same laboratory but were identified with different sample numbers. Based on an estimated total of 20 samples, two laboratory duplicates were collected. Field QC sample collection mirrored the Sampling Methods described above. Field duplicate soil samples were analyzed for the same parameter set as routine soil samples.

3.5 LABORATORY ANALYTICAL PROCEDURES AND REPORTING

Laboratory analyses were conducted by Energy Laboratories in Helena, Montana. Energy Laboratories is certified by EPA Region 8 and the State of Montana. All laboratory analyses were conducted in accordance with EPA approved and/or industry standard analytical methods. The soil analytical parameters, analytical methods, and reporting limits (RLs) are included in Table 4.

TABLE 4. SOIL SAMPLE ANALYTICAL PARAMETER LIST

Parameter	Digestion Method	Analytical Method	Required Reporting Limit (mg/kg)
Arsenic	3050B	6010B/6020	1
Barium	3050B	6010B/6020	1
Cadmium	3050B	6010B/6020	1
Chromium, Total	3050B	6010B/6020	1
Chromium III	Calculated		
Chromium VI	3060A	7196A	1
Copper	3050B	6010B/6020	1
Lead	3050B	6010B/6020	1
Mercury	7471B	7471B	0.01
Selenium	3050B	6010B/6020	1
Silver	3050B	6010B/6020	1

3.6 SAMPLE RESULTS

A total of 22 samples were collected and submitted for analytical testing; two of the 22 samples were field duplicates. The samples were analyzed for total arsenic, barium, cadmium, chromium, chromium VI, copper, lead, mercury, selenium, and silver. The results of this sampling effort are summarized below and shown in Table 5. Appendix B includes summary figures for each analyte and Appendix D contains the laboratory analytical reports.

Arsenic

Arsenic concentrations in the soil samples ranged from <1 mg/kg to 16 mg/kg with the maximum concentration, 16 mg/kg, occurring at sample location 107. Of the samples collected, 64% of the samples exceeded the EPA RSLs for Composite worker soils and 95% exceeded the RSL for residential soils. It should be noted that the Montana background level for arsenic, 22.5 mg/kg, exceeds both the composite worker and residential soils RSLs. All arsenic concentrations were below the BTV, as well as the standard for metals concentrations in sediment to protect aquatic life.

Barium

Barium concentrations in the soil samples ranged from 37 mg/kg to 475 mg/kg with the maximum concentration, 475 mg/kg occurring at sample location 115. There is not a standard concentration to protect aquatic life for barium and the concentrations were well below the RSLs for composite worker soils and residential soils. Most barium concentrations were also below the 429 mg/kg BTV.

Cadmium

Cadmium concentrations in the soil samples ranged from <1 mg/kg to 2 mg/kg with the maximum concentration, 2 mg/kg, occurring at sample location 119. All samples had concentrations below 3.9 mg/kg, the sediment standard to protect aquatic fish, and below the RSLs for composite worker soils. Due to the RL of 1 mg/kg, it is unknown how many samples exceed the residential soils RSL or the 0.7 mg/kg BTV.

TABLE 5. SAMPLE RESULTS

Sample ID	Arsenic	Barium	Cadmium	Total Chromium	Chromium III	Chromium VI	Copper	Lead	Mercury	Selenium	Silver
GCRV-2204-101	1	37	<1	18	18	<1	8	2	0.019	<1	<1
GCRV-2204-102	1	124	<1	61	61	<1	21	5	0.02	<1	<1
GCRV-2204-103	2	185	<1	69	69	<1	22	7	0.027	<1	<1
GCRV-2204-104	4	180	<1	71	71	<1	26	9	0.011	<1	<1
GCRV-2204-105	14	196	<1	47	47	<1	49	74	20	<1	<1
GCRV-2204-106	3	239	<1	72	72	<1	53	78	15	<1	<1
GCRV-2204-107	16	434	1	102	102	<1	79	82	3.4	<1	<1
GCRV-2204-108	11	338	<1	87	87	<1	66	90	13	1	3
GCRV-2204-109	3	199	<1	98	98	<1	41	13	0.25	<1	<1
GCRV-2204-110	9	336	<1	80	80	<1	58	63	7.1	<1	2
GCRV-2204-111	2	60	<1	26	26	<1	17	10	1.7	<1	<1
GCRV-2204-112	11	441	<1	77	75.5	1.5	68	83	9.4	<1	3
GCRV-2204-113	6	409	<1	116	116	<1	44	23	1	<1	<1
GCRV-2204-114	10	255	<1	69	69	<1	42	19	0.097	<1	<1
GCRV-2204-115	10	475	<1	64	64	<1	41	41	0.4	<1	1
GCRV-2204-116	5	244	<1	63	63	<1	44	18	0.3	<1	<1
GCRV-2204-117	3	62	<1	33	33	<1	14	6	0.15	<1	<1
GCRV-2204-118	4	86	<1	41	41	<1	16	7	0.15	<1	<1
GCRV-2204-119	9	249	2	47	47	<1	64	187	1.3	<1	<1
GCRV-2204-120	5	97	<1	18	18	<1	14	12	0.16	<1	<1
GCRV-2204-121	4	97	<1	35	35	<1	21	14	0.15	<1	<1
GCRV-2204-122	<1	55	<1	26	26	<1	12	3	<0.01	<1	<1
% of Samples Exceeding Composite Worker RSL	64%	0%	0%		0%	0%	0%	0%	23%	0%	0%
% of Samples Exceeding Residential Soil RSL	95%	0%	9%		0%	5%	0%	0%	36%	0%	0%
% of Samples Exceeding Metals Concentrations to Protect Aquatic Life	0%		0%				5%	32%	55%		

Chromium, Total

Total chromium concentrations ranged from 18 mg/kg to 116 mg/kg with the maximum concentration, 116 mg/kg, occurring at sample location 113. There are not currently any RSLs for total chromium for composite worker soils or residential soils. The majority of the total chromium concentrations were above the 41.7 mg/kg BTV.

Chromium III

Chromium III concentrations were calculated by subtracting the chromium VI concentrations from the total chromium concentrations. Chromium III concentrations were consistent with the total chromium concentrations except for sample location 112, where the chromium III concentration was 1.5 mg/kg less than the total chromium concentration. total chromium concentrations ranged from 18 mg/kg to 116 mg/kg with the maximum concentration, 116 mg/kg, occurring at the sample location 113. Chromium III concentrations were well below the RSLs for composite worker soils and residential soils. Most of the chromium III concentrations were above the 41.7 mg/kg BTV.

Chromium VI

Chromium VI concentrations ranged from <1 mg/kg to 1.5 mg/kg with the maximum concentration, 1.5 mg/kg, occurring at the sample location 112. All samples were well below the composite worker soil RSL and the majority of the samples were comparable to the residential soil RSL. Due to the RL of 1 mg/kg, it is unknown how many samples exceed the <0.29 mg/kg BTV.

Copper

Copper concentrations ranged from 8 mg/kg to 79 mg/kg with the maximum concentration, 79 mg/kg, occurring at sample location 107. Copper concentrations were well below the RSLs for composite worker soils and residential soils. All copper concentrations were well below the 165 mg/kg BTV and all samples, with the exception of sample 107, had concentrations less than the metals concentration to protect aquatic life.

Lead

Lead concentrations ranged from 2 mg/kg to 187 mg/kg with the maximum concentration, 187 mg/kg, occurring at sample location 119. All samples had concentrations below the RSLs for composite worker soils and residential soils. Approximately 32% of the samples had concentrations above the metals concentrations to protect aquatic life. Nearly half of the samples exceeded the 29.8 mg/kg BTV.

Mercury

Mercury concentrations ranged from <0.01 mg/kg to 20 mg/kg with the maximum concentration, 20 mg/kg, occurring at sample location 105. Approximately 23% of the samples had concentrations that exceeded the composite worker soils RSL and nearly 41% of the samples had concentrations that exceeded the RSL for residential soils. Almost all of the samples had concentrations exceeding the metals concentration standard to protect aquatic life. Almost all mercury concentrations were greater than the <0.05 mg/kg BTV.

Selenium

Selenium concentrations ranged from <1 mg/kg to 1 mg/kg with the maximum concentration, 1 mg/kg, occurring at sample location 108. All samples had concentrations well below the RSLs for composite worker soils and residential soils. Due to the RL of 1 mg/kg, it is unknown how many samples exceed the 0.7 mg/kg BTV.

Silver

Silver concentrations ranged from <1 mg/kg to 3 mg/kg with the maximum concentration, 3 mg/kg, occurring at sample location 108. All samples had concentrations well below the RSLs for composite worker soils and residential soils. Due to the RL of 1 mg/kg, it is unknown how many samples exceed the 0.3 mg/kg BTV.

4.0 SUMMARY AND RECOMMENDATIONS

- As described above, the majority of the soil concentrations within the area pose little risk to human health or the environment assuming the area continues to be used recreationally.
- Soils with higher metals concentrations were generally located near the larger pond, just south of Highway 287.
- Sample concentrations from 110-111, 112-113, and 119-120 illustrated that metals concentrations are higher near the ground surface and decrease with depth.
- At a minimum, soils with mercury concentrations greater than 4.6 mg/kg and/or lead concentrations greater than 62 mg/kg should be over excavated and removed from within the proposed floodplain channel.
- Additional sampling efforts should be conducted downstream of the Alder Gulch-Granite Creek confluence prior to remediation work in that area due to the elevated lead concentrations reported at sample location 119.

5.0 REFERENCES

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Hydrometrics, Inc., 2013. Background Concentrations of Inorganic Constituents in Montana Surface Soils. September 2013.

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Kron, Darrin, 2006. Ruby River Watershed Total Maximum Daily Loads and Framework for a Water Quality Restoration Plan. December 2006.

Maret, T.R.; Skinner, K.D., 2000. Concentrations of Selected Trace Elements in Fish Tissue and Streambed Sediment in the Clark Fork-Pend Oreille and Spokane River Basins, Washington, Idaho, Montana, 1998. Water-Resources Investigations Report 00-4159. Boise Idaho, U.S. Geological Survey. 18 p.

U.S. Environmental Protection (USEPA), 2001. National Sediment Quality Survey Database: 1980-1999. Appendix D, Screening Values for Chemicals Evaluated.

APPENDIX A

HISTORICAL SAMPLING DATA

Alder Gulch Creek near Granite Creek 2003 Sediment Hg Sampling Results and Sampling Locations

Service Layer Credits: USGS, MSL
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the

Alder Gulch Creek near Granite Creek 2003 Sediment Hg Sampling by David Stout, Ruby Valley Conservation District, (406) 842-5741 x105 using public information available from the Montana Natural Resource Information System at

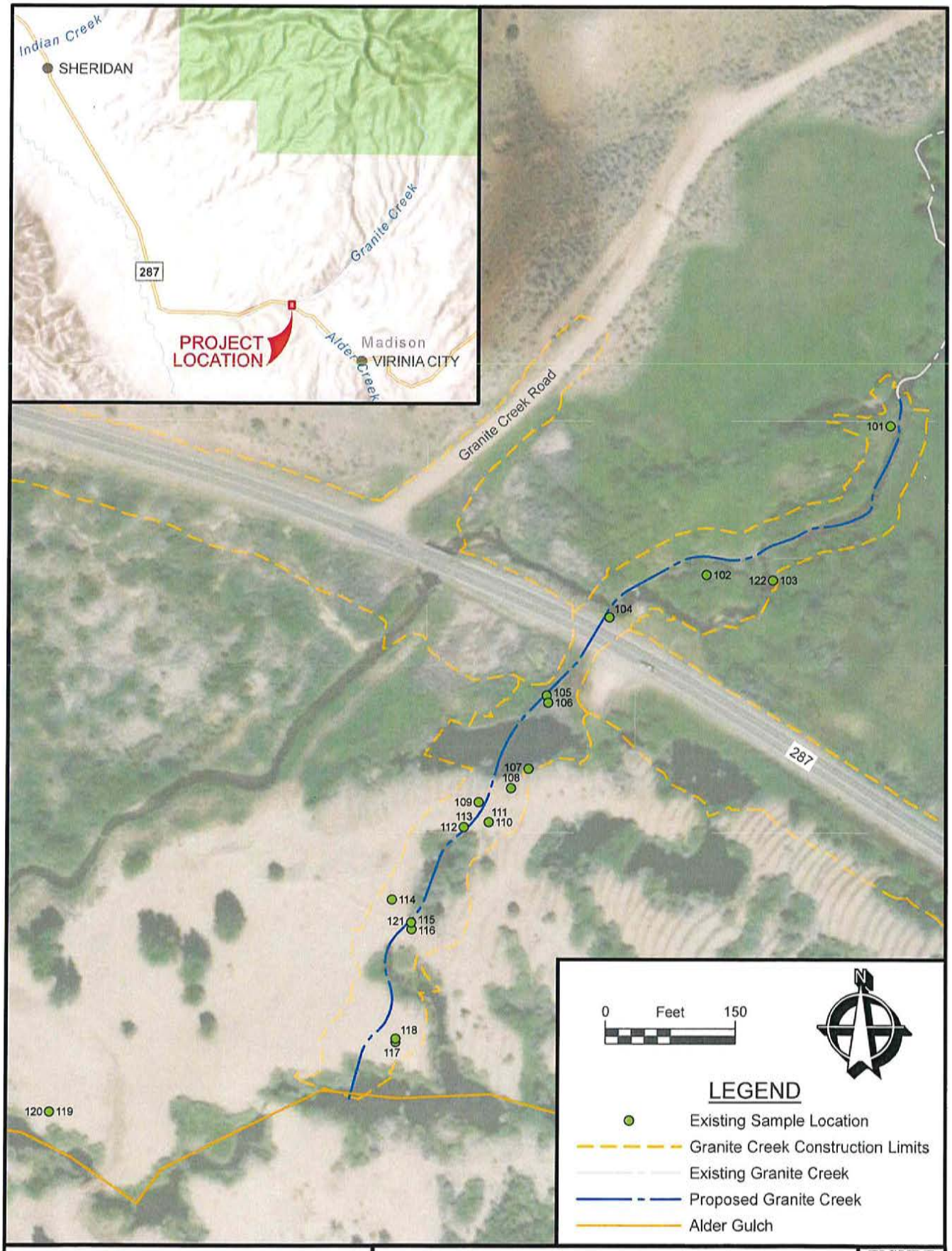
0 0.05 0.1 0.2 0.3 0.4 Miles

N

APPENDIX B

FIGURES

SAMPLE SUMMARY FIGURES



GRANITE CREEK RECLAMATION AND REALIGNMENT	SAMPLE LOCATIONS	FIGURE 1

Updated by: splettenberg 5/26/2022 9:29 AM
G:\PROJECT\22001\Granite Creek\Granite Creek.aprx [: 2200101H003]

Hydrometrics, Inc.
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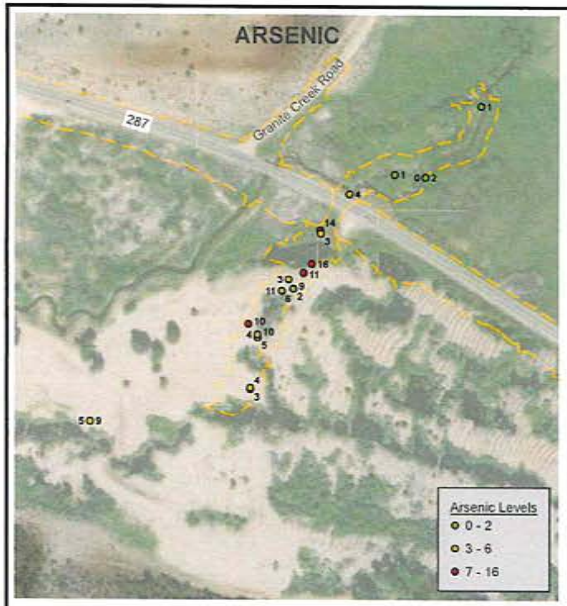

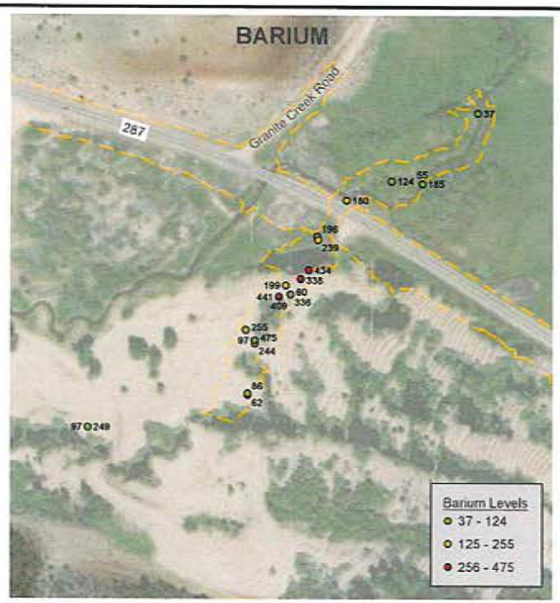

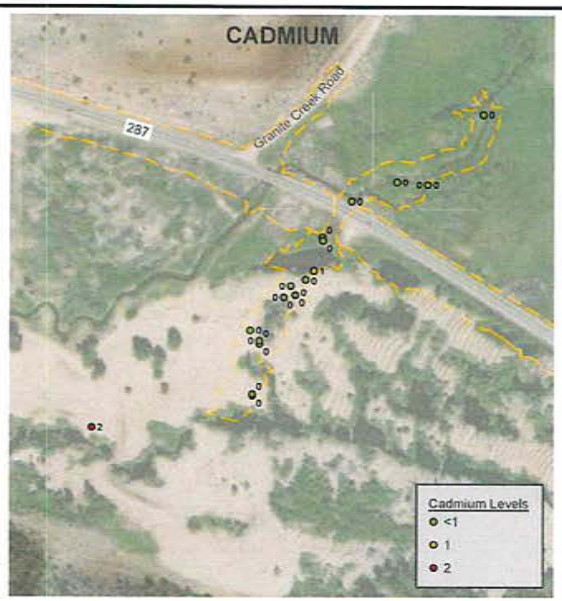

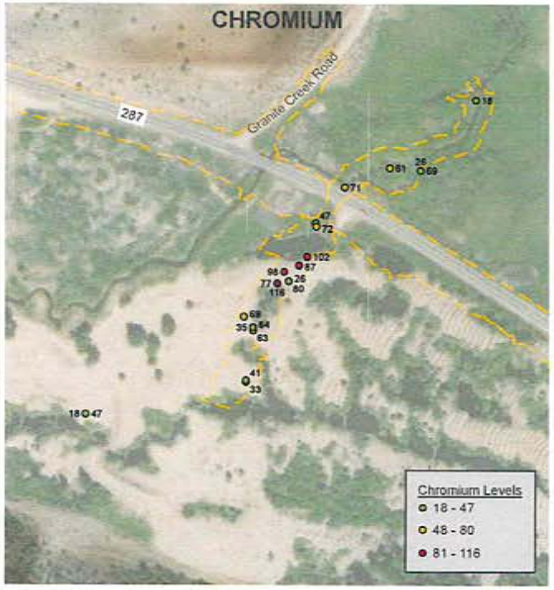

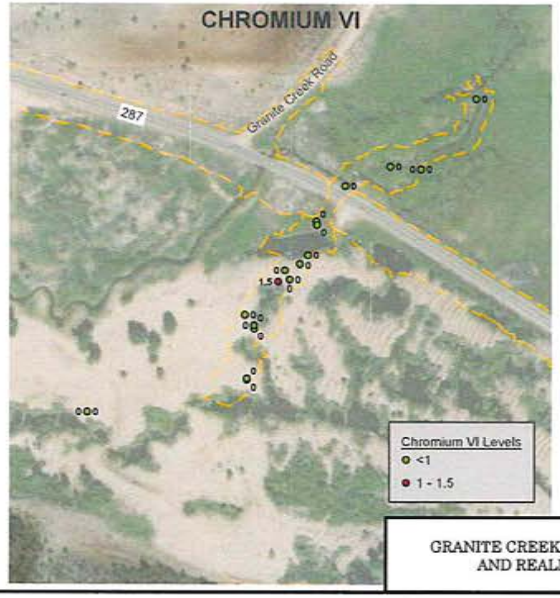

GRANITE CREEK RECLAMATION AND REALIGNMENT	SEDIMENT CONCENTRATIONS	FIGURE 2

Updated by: spiellenberg 5/26/2022 9:27 AM
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Hydrometrics, Inc.
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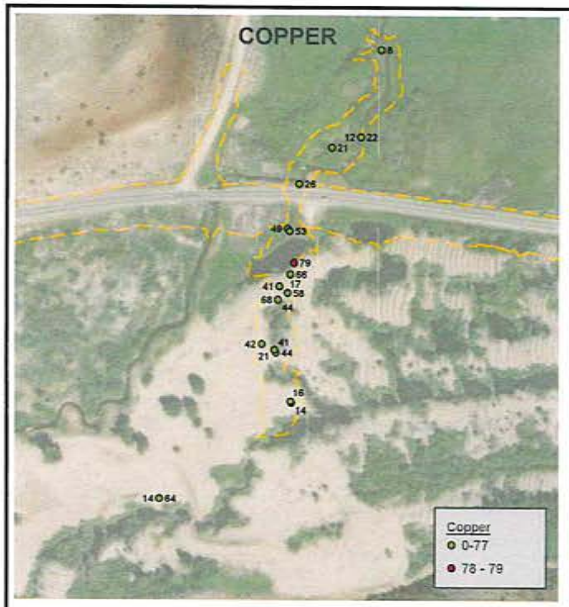

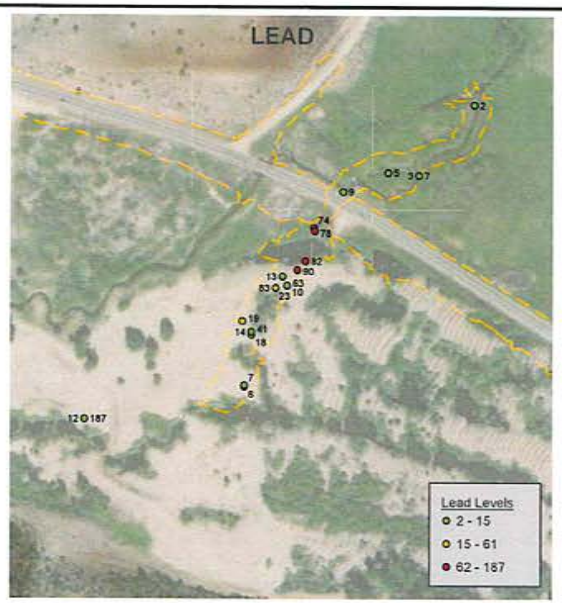

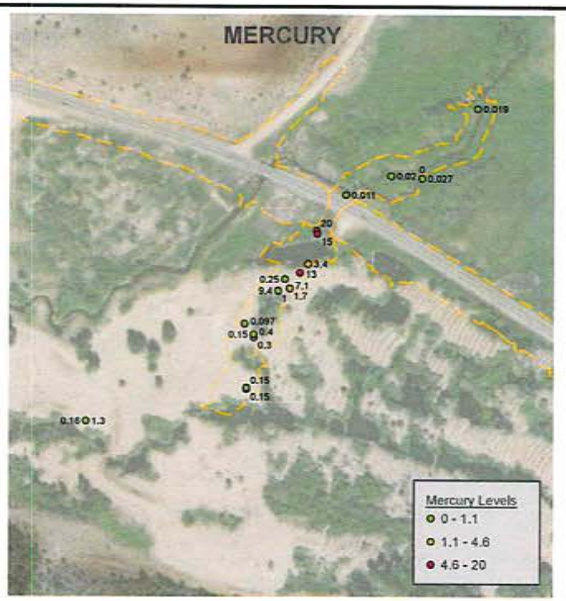

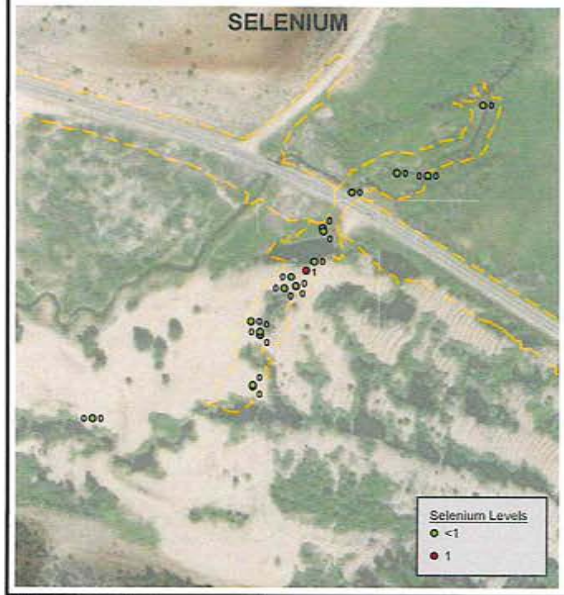

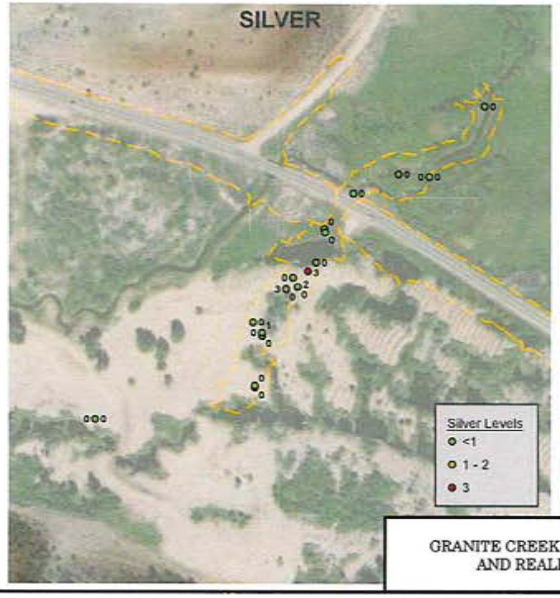

0 Feet 300

GRANITE CREEK RECLAMATION AND REALIGNMENT	SEDIMENT CONCENTRATIONS	FIGURE 3

Updated by: spiebenberg 5/26/2022 9:28 AM
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Hydrometrics, Inc.
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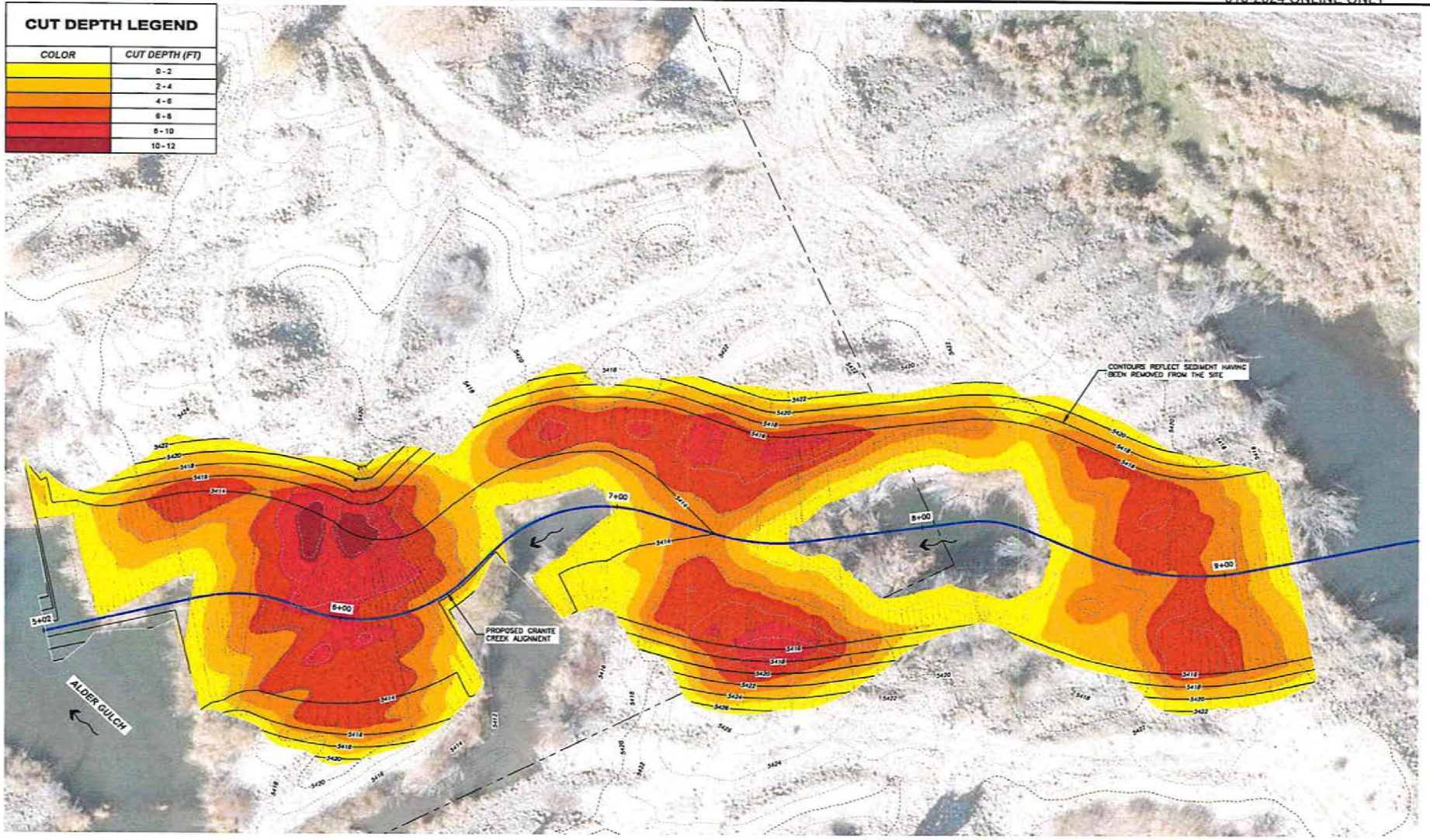
SOIL REMOVAL FIGURES

CUT DEPTH LEGEND	
COLOR	CUT DEPTH (FT)
	0 - 2
	2 - 4
	4 - 6
	6 - 8
	8 - 10
	10 - 12



0 15 30
SCALE IN FEET

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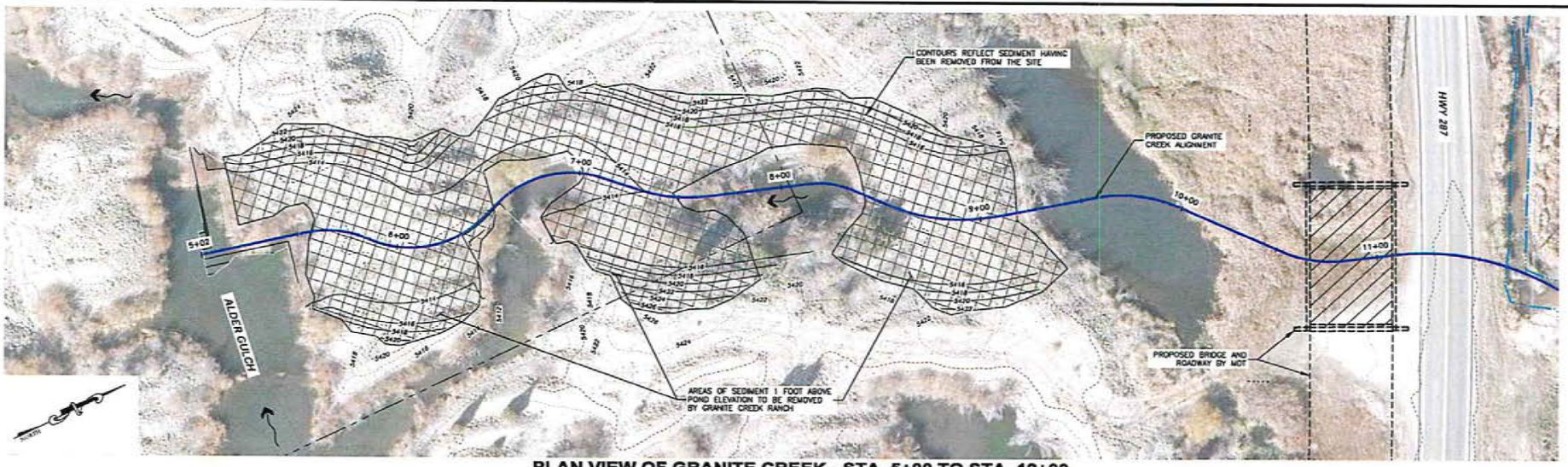
SEDIMENT REMOVAL CUT DEPTHS

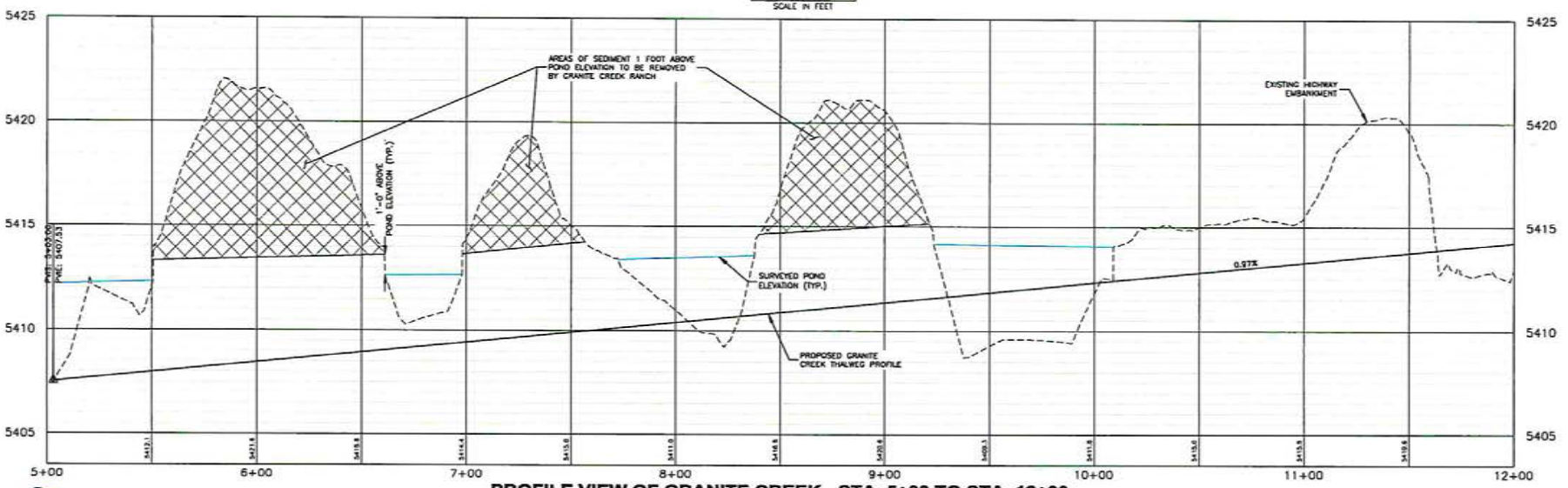
RUBY VALLEY CONSERVATION DISTRICT & GRANITE CREEK RANCH
GRANITE CREEK IMPROVEMENTS

Y:\Shared\Active Projects\1-21179-Alder Gulch Improvements\CADD 1-21179\Exhibits\1-21179-Granite Cr-Sediment Removal Figure.dwg



PLAN VIEW OF GRANITE CREEK - STA. 5+00 TO STA. 12+00

0 25 50
SCALE IN FEET



PROFILE VIEW OF GRANITE CREEK - STA. 5+00 TO STA. 12+00

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'

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SEDIMENT REMOVAL AREAS

RUBY VALLEY CONSERVATION DISTRICT & GRANITE CREEK RANCH
GRANITE CREEK IMPROVEMENTS

P:\Shared\Yellers Projects\1-21179-Alder Gulch Improvements\2400 1-21179\Exhibits\1-21179-Granite Cr-Sediment Removal Figure.dwg

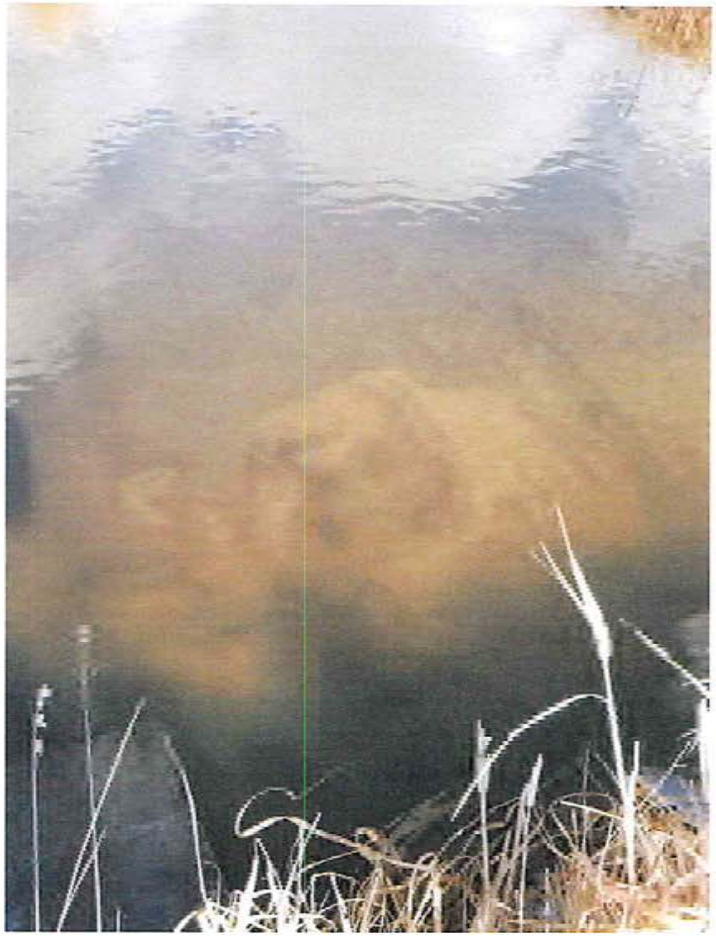
APPENDIX C

PHOTO LOG AND FIELD NOTES

Granite Creek Soil Sampling

4/13/2022

Sample 101



Sample 101, collected from channel bottom

Sample 102

Sample 102, after backfill

Sample 103

Sample 103, collected from bottom of channel bank

Sample 104

Sample 104

Sample 105

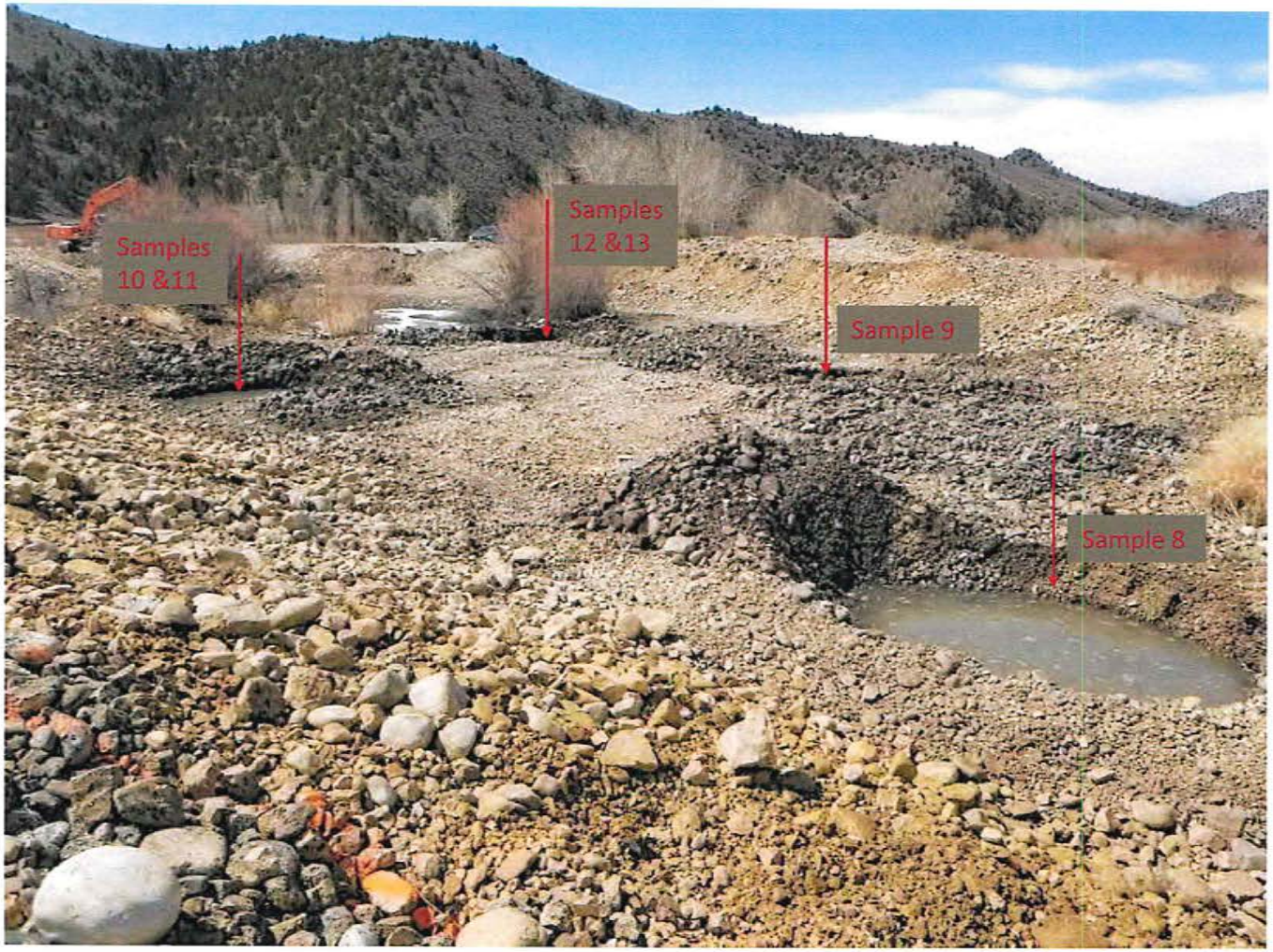
Sample 106, just north of pond

Sample 106

Sample 106

Sample 107, collected from pond bottom

Sample 107



Samples 8 thru 13

Sample 8

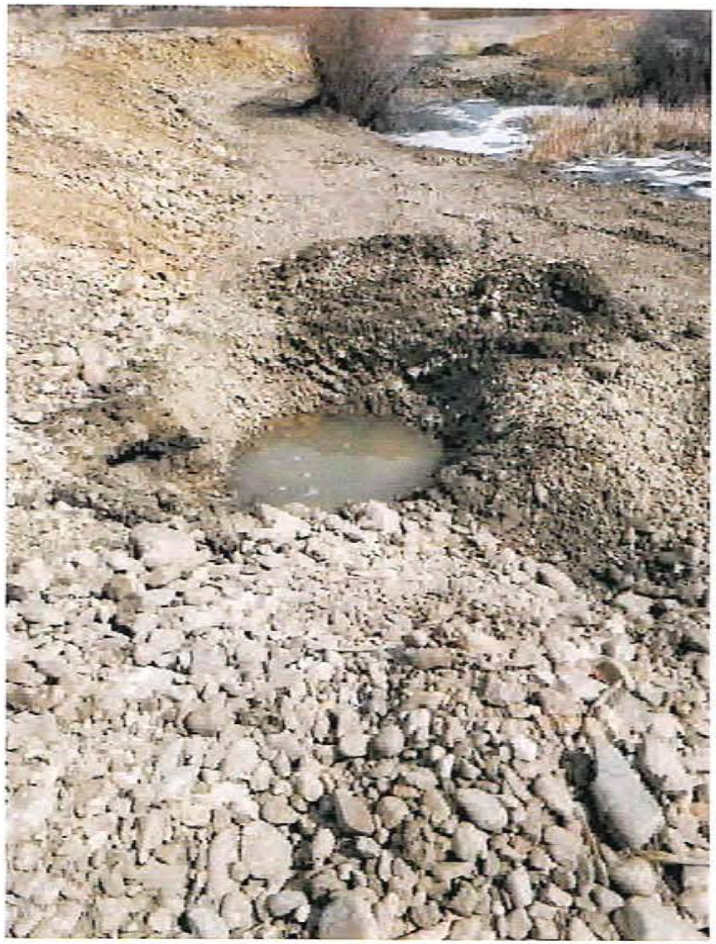
Sample 9

Sample 10 & 11

Sample 10, 0-4 feet

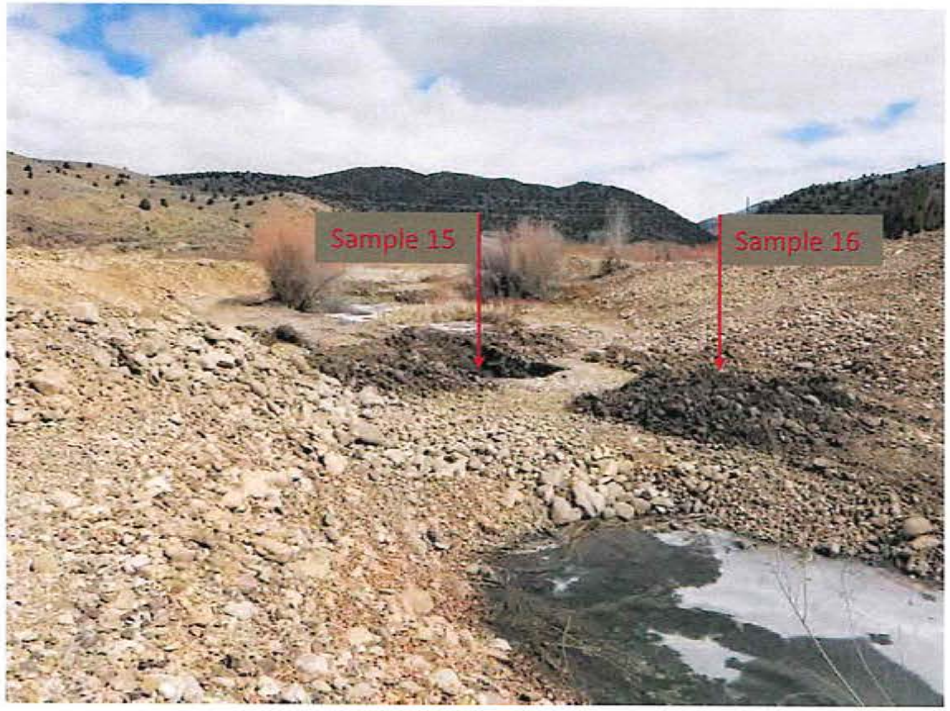
Sample 11, 4-6 feet

Samples 14 & 15



Sample 14

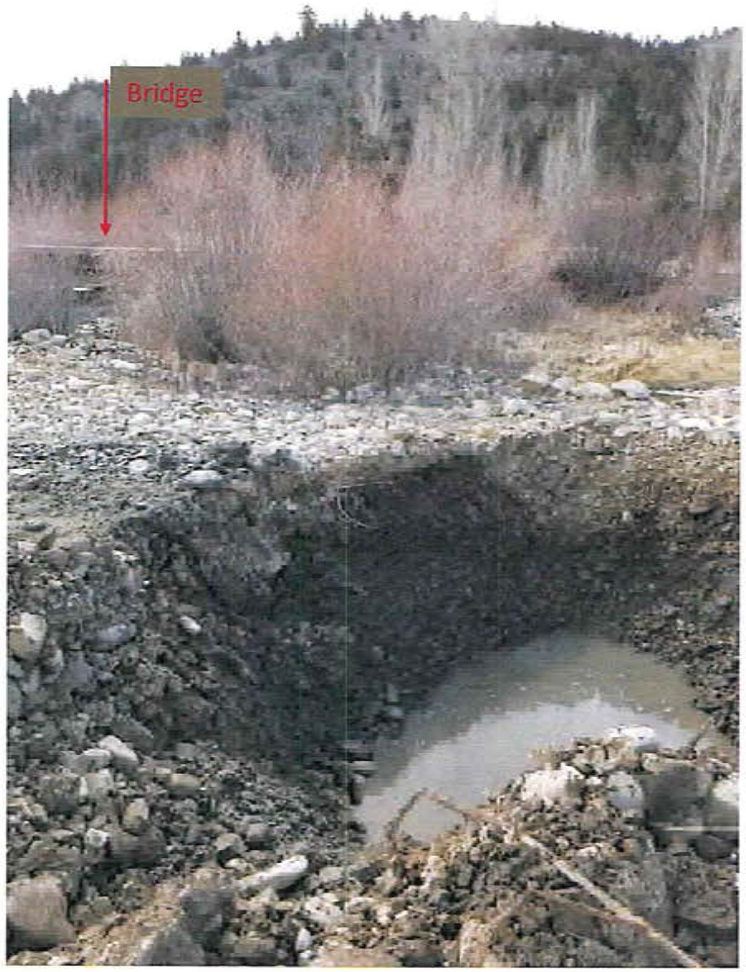
Sample 15



Samples 15 & 16

Sample 16

Samples 17 & 18



Samples 19 & 20

Sample 19, 0-6 feet

Sample 20, 6-9 feet