April 20, 2023

Via Email

Mark Rudolph
Superfund and Brownfields Unit Project Manager
Colorado Department of Public Health & Environment
4300 Cherry Creek Drive South
Denver, CO 80246-1530

Re: Rico Townsite Soils VCUP Application

Dear Mark:

The Town of Rico and Atlantic Richfield Company (the "Applicants") are submitting the enclosed final Rico Townsite Soils Voluntary Cleanup Program ("VCUP") Application for approval by the Colorado Department of Public Health & Environment ("CDPHE") pursuant to the Colorado Voluntary Cleanup and Redevelopment Act, C.R.S. § 25-16-301 *et seq.*

This Application follows an earlier Rico Townsite Soils VCUP Application submitted to CDPHE on June 24, 2004. The 2004 VCUP Application proposed a phased investigation and cleanup approach to address lead-contaminated soil within the Town of Rico. The additional cleanup work proposed in this Application will be performed to complete the work initiated in 2004 and will address certain additional properties within the Town boundaries where soil-lead concentrations exceed site-specific lead action levels.

Appendix B to this Application includes the VCUP Work Plan, which contains details on the work Atlantic Richfield will carry out in Phase I of the VCUP project, including soil testing and removal and replacement of surface soils on developed lots and roads where lead concentrations exceed the applicable action level. Appendix F includes the environmental Overlay Zone Regulations that the Town intends to consider for adoption as part of the VCUP, and which will govern the administration of a development permit system in Rico to ensure that VCUP soil remediation efforts remain protective. Atlantic Richfield and the Town are currently negotiating a VCUP Implementation, Funding, and Settlement Agreement ("Funding Agreement"), which, once complete and executed, will establish the governing framework for the Applicants' performance, funding, and enforcement obligations. The VCUP also requires that the Town and CDPHE enter into an intergovernmental agreement (IGA) pursuant to C.R.S. § 25-15-320(3) and C.R.S. § 29-1-203, which the Town will consider at a future Board meeting. The VCUP will not be effective until CDPHE approves the application, the Overlay Zone Regulations go into effect, the Town and Atlantic Richfield have considered, approved and executed the Funding Agreement and the Town and CDPHE have executed the IGA.

The Applicants appreciate CDPHE's input to the preparation of this final Application. We're confident that the prior submittals of agency-review drafts, subsequent revisions to address the State's comments, participation at public meetings in Rico, and several rounds of discussions will ensure the Application meets the applicable statutory requirements of C.R.S. § 25-16-301 and the State's expectations for this VCUP project.

Please contact Mr. McAnulty and Mr. McCarthy if you have any questions regarding this submittal.

Sincerely,

____
Mike McAnulty, Project Manager, for Atlantic Richfield Company
317 Anaconda Rd
Butte, MT 59701
(907) 355-3914
mcanumc@bp.com

And

____
Chauncey McCarthy, Town Manager, for the Town of Rico, CO
PO Box 9
2 Commercial Street
Rico, CO 81332
(970) 967-2863
townmanager@ricocolorado.gov

Enclosures

cc: Lukas Staks, Colorado Attorney General's Office
Nicole Pieterse, Town of Rico
Joe Croke, Town of Rico
Adam Cohen, Davis Graham & Stubbs LLP
Lucas Satterlee, Davis Graham & Stubbs LLP
Nathan Bock, Atlantic Richfield Company
Steve Ferry, Atlantic Richfield Company
Thomas Bloomfield, Kaplan Kirsch & Rockwell LLP
Sam Caravello, Kaplan Kirsch & Rockwell LLP
Amelia Piggott, U.S. EPA Region 8

RICO TOWNSITE SOILS

April 2023

VOLUNTARY CLEANUP PROGRAM (VCUP) APPLICATION

Submitted to:
Colorado Department of Public Health and Environment

Submitted by:
Atlantic Richfield Company
Town of Rico, Colorado

Version 1.7

RICO TOWNSITE SOILS
VOLUNTARY CLEANUP PROGRAM (VCUP) APPLICATION
Rico, Colorado

Submitted to:
Colorado Department of Public Health and Environment

Submitted by:
Atlantic Richfield Company
and
Town of Rico

Prepared by:

Formation Environmental, LLC
2500 55th Street, Suite 200
Boulder, Colorado 80301

and

Alloy Group
406 E. Park Ave.
Anaconda, MT 59711

APRIL 2023

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LIST OF ACRONYMS AND ABBREVIATIONS

AMSL	above mean sea level
AR	Atlantic Richfield Company
bgs	below ground surface
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
cfs	cubic feet per second
cy	cubic yards
EPA	US Environmental Protection Agency
EROZ	Environmental Remediation Overlay Zone
ESA	Environmental Site Assessment
FAQ	Frequently Asked Question
GCL	Geo-composite Liner
GIS	Geographic Information System
gpm	Gallons per minute
ICP	Inductively Coupled Plasma
ICs	Institutional Controls
ISWP	Individual Site Work Plan
LAL	Lead Action Level
mg/kg	milligrams per kilogram
NA	Not Applicable
NAD	No Action Determination
NFA	No Further Action
O&M	Operation and Maintenance
PUD	Planned Unit Development
PVC	Polyvinyl Chloride
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RLUC	Rico Land Use Code
RSOZ	Rico Soils Overlay Zone
SAP	Sampling and Analysis Plan
TEC	Titan Environmental Corporation
VCUP	Voluntary Cleanup Program
XRF	X-Ray Fluorescence

1 PREFACE

This Rico Townsite Soils Voluntary Cleanup Program (VCUP) Application is submitted for review under the State of Colorado Voluntary Cleanup Program. The Applicants submitting this VCUP Application are:

- Atlantic Richfield Company (AR) and
- Town of Rico, a current landowner.

This application follows an earlier Rico Townsite Soils VCUP Application (AR 2004a) submitted to the Colorado Department of Public Health and Environment (CDPHE) on June 24, 2004. The 2004 VCUP Application proposed a phased investigation and cleanup approach to address lead-contaminated soil within the Town of Rico, Dolores County, Colorado. The additional cleanup work proposed in this Application will be performed to complete the work initiated in 2004 and will address certain additional properties within the current Town boundaries where soil-lead concentrations exceed the applicable site-specific lead action levels (LAL).

This VCUP will use three site-specific LALs. The Residential LAL will be 761 milligrams of lead per kilogram of soil (mg/kg), and it will apply at properties where zoning allows residential use (except for recreational trails on Town-owned properties) and on unpaved roads and alleys. The Public Facilities LAL will be 967 mg/kg, and it will apply at properties zoned for Public Facilities use. The Open Space LAL will be 4,010 mg/kg, and it will apply at properties zoned for Open Space use and portions of Town-owned properties where recreational trails are constructed. The LALs were selected by the Town and AR based on recommended values developed by CDPHE and determined by CDPHE to be protective of human health. In developing the recommended LALs, CDPHE considered multiple data sources, including past investigations of background soil lead concentrations in the mineralized Rico mining district (e.g., Walsh, 1995; Atlantic Richfield, 1996; and Titan Environmental Corporation [TEC], 1996; Walker (CDPHE), 1996; and TREC, 2015) as appropriate. The Town and AR have agreed to these LALs.

The Town's and AR's participation in the VCUP program will be conditioned on the Town and AR reaching agreement on the terms of the VCUP Implementation, Funding, and Settlement Agreement. Each Applicant reserves the right to unilaterally withdraw this application if a funding agreement acceptable to the Applicants cannot be secured.

1.1 SUMMARY OF WORK PERFORMED SINCE 2004 VCUP APPLICATION

The Town of Rico ("the Town") is located in southwestern Colorado, as shown on Figure 1, "Rico Townsite Location Map." The Town boundary is depicted on Figure 2, "Town of Rico Boundary and Parcels (January 2020)."

Investigations, cleanup activities, and document submittals completed under the 2004 VCUP Application were performed by AR with the cooperation of the Town of Rico. Since June 2004, AR has conducted the following VCUP activities:

- Assessment of known environmental conditions, and sampling and analysis of soil within the Town of Rico, including soil sampling at over 400 individual properties, to document the concentrations of lead in soil.
- Determination of human health risk and development of site-specific, risk-based action levels for lead in soil in cooperation with CDPHE.
- Completion of the following phased remedial actions:
  - Construction of the Rico Soil Lead Repository in 2005 for disposal of soil removed from Town properties and having lead concentrations above a site-specific action level;
  - Cleanup of 75 properties, each consisting of one or more parcels, that were determined by VCUP sampling activities to have soil that contained lead above the applicable, CDPHE-accepted, risk-based action level; and
  - Reclamation of the Van Winkle Mine site in 2008.
- Results of VCUP investigation activities and the site-specific risk assessment were provided in the following reports that were prepared for and accepted by CDPHE:
  - Phase I Work Plan and Preliminary Data Report (September 23, 2004)
  - Phase II Work Plan (May 25, 2005)
  - Lead Health Risk Assessment for Rico Townsite Soils (April 6, 2006)
  - Blood Lead and Environmental Monitoring Study for Rico Townsite, Phase 1 Data Summary Report (September 15, 2006)
  - Final Data Report and Data Evaluation (June 7, 2006)
  - Rico Railroad Corridor Sampling and Analysis Report (February 2, 2007)
  - Blood Lead and Environmental Monitoring Study for Rico Townsite, Phase II Data Summary Report and Trend Analysis (February 13, 2007)
  - Alley Sampling Results (October 7, 2008)
  - Sampling and Analysis Plan, Rico Soils Voluntary Cleanup Program, Rico, Colorado, including Appendix A – Evaluation of Background Lead Concentrations (Revision 1, July 2014)
  - Rico Town Soil Sampling Project, 2014–2015 Data Summary Report (December 11, 2015).

As documented in the reports listed above, AR conducted soil sampling in the Town of Rico at various times beginning in 2004 and continuing to 2015. Soil sampling was performed at both developed and undeveloped properties, as allowed by access agreements with the property owners. In total, soil samples were collected for analyses of lead from 348 residential parcels (216 developed and 132 undeveloped), 73 non-residential parcels, unpaved roads and alleys, proposed sewer-line corridors, and the Dolores River corridor. Soil samples were analyzed for lead concentration. Pre-2006 soil sampling data were used to support a site-specific, human health risk assessment that evaluated residents' exposures to lead in soil and identified levels of lead in soil of potential health concern.

Based on information provided by the risk assessment, two risk-based action levels were identified for lead in soil: a residential-soil action level of 1,100 milligrams per kilogram (mg/kg) and a non-residential soil action level of 1,700 mg/kg. These action levels were selected and adopted by CDPHE, in consultation with the U.S. Environmental Protection Agency (EPA), in 2006 and 2007 for soil remediation performed as part of this VCUP project.

In 2005, AR constructed the Rico Soil Lead Repository, located approximately one mile north of the Town limit on property now owned by AR, for disposal of soil removed from locations within the Town of Rico with elevated lead levels. The location of the repository is shown on Figure 2. AR has continued to maintain the repository since that time in accordance with the repository's Operations and Maintenance Plan (SEH 2004) and a Certificate of Designation issued by Dolores County. The soil repository remains available for future disposal of soil with elevated lead levels. As of October 2021, the repository has a remaining capacity of approximately 20,000 cubic yards (cy), or 50 percent of the original capacity.

AR conducted soil remediation at 75 individual properties in the Town of Rico from 2005 to 2007. The details of that work are summarized in Appendix A. The locations of previously sampled and remediated parcels are shown on a map of the Town in Figure 3 and lists of those properties are attached (refer to Attachments 1 and 2). At the properties remediated by AR, soil with lead concentrations exceeding the applicable action levels was removed to a depth of approximately 12 inches, a landscape fabric layer was placed at the bottom of the excavation to mark the extent of soil replacement, and then clean soil (e.g., soil with lead concentrations less than 100 mg/kg) was used to backfill the excavated area. The excavated soil was transported from each parcel to the Rico Soil Lead Repository. AR conducted remediation of the waste rock pile at the Van Winkle Mine site in 2008. Soil removed from that site was also disposed of in the Rico Soil Lead Repository.

1.2 CURRENT STATUS OF VCUP SOIL SAMPLING AND REMEDIATION

Most of the parcels sampled in 2004-2005 with soil lead concentrations above the VCUP action levels adopted by CDPHE in 2006 and 2007 were remediated in 2005-2007 (refer to Appendix A for additional information regarding past work under the VCUP). Most of the remediated parcels were developed properties with an existing residential use. Parcels sampled in 2014 and 2015 that were found to have soil lead concentrations above the soil action levels adopted by CDPHE in 2006 and 2007 have not been remediated at this time. Unpaved roads with lead concentrations previously measured in surface soil above 1,700 mg/kg also have not been addressed. In addition, approximately 100 remaining parcels within the Town limits, most of which are undeveloped, have not been sampled to characterize lead concentrations in soil.

1.3 SUMMARY OF ADDITIONAL PROPOSED WORK

Soil removal to a depth of approximately 12 inches and replacement with clean soil is the response action that will be taken at locations where lead concentrations in soil are greater than the applicable site-specific action level. This approach is consistent with the VCUP soil remediation that has already been conducted as part of the Rico Townsite Soils VCUP project, with CDPHE's oversight. In addition, Institutional Controls (ICs) will be implemented to protect remediated areas from disturbance during future development within the Town of Rico.

AR and the Town of Rico (the "Applicants") propose to complete the following additional VCUP tasks:

- Characterize soil lead concentrations at parcels that remain to be sampled (approximately 100 total) in the Town of Rico where an access agreement can be obtained from the property owner.
- Complete soil remediation at developed properties where residential use is allowed by the Rico Land Use Code and where lead concentrations in surface soil exceed the Residential LAL. For the purpose of the Rico Townsite Soils VCUP project, a developed property is defined as an improved property with a structure that is in a condition suitable for commercial or residential use and occupation.
- Complete soil remediation at developed properties zoned for Public Facilities use where lead concentrations in surface soil exceed the Public Facilities LAL.
- Perform surface soil remediation on unpaved road and alley segments where lead concentrations exceed the Residential LAL.
- Establish ICs to (a) preserve and protect remediated soil conditions, (b) provide protocols for managing soil disturbed during future development activities, and (c) provide community outreach and education.
- Provide for a soil management program consistent with the ICs Program.
- Provide for community outreach and education.
- Obtain No Action Determinations (NADs) from CDPHE for the individual properties where lead in soil does not exceed the applicable site-specific action level.
- Submit property-specific Cleanup Completion Reports to obtain No Further Action (NFA) determinations from CDPHE for the properties where soil remediation has been performed.

These tasks would be implemented in accordance with specifications included in Section 6 of this Application and the 2023 Phase 1 VCUP Work Plan (Appendix B). The projected schedule for implementation and completion of the proposed work is included in Section 7.

Soil remediation is not expected to occur on the eight parcels zoned for Open Space in the initial phase of the VCUP. Available sampling results indicate soil lead concentrations within these parcels are below the Open Space LAL, and there are currently no developments or areas of intensive public use on these parcels. Any future development at these locations will proceed in accordance with the Overlay Zone Regulations.

1.4 ORGANIZATION OF VCUP APPLICATION

The Colorado VCUP requirements and CDPHE's online VCUP Checklist were consulted in the preparation of this VCUP Application (CDPHE 2008). Because this VCUP Application is for a site that has no current industrial operations, certain requirements on the VCUP checklist are not applicable. The completed VCUP Checklist is included as Appendix C. Information requirements that are not applicable (NA) to the Rico Townsite Soils VCUP project are designated as such in the checklist.

2 GENERAL INFORMATION

2.1 OWNER OF SITE PROPERTY

Property ownership within the VCUP project area is indicated on Figure 4, "Town of Rico Boundary and Property Ownership Map."

As listed in Attachment 3, AR owns multiple parcels within and surrounding the Town of Rico, including the land to north in the vicinity of the St. Louis Tunnel on which the Rico Soil Lead Repository is located. The Town of Rico also owns multiple parcels within the Town boundary (as listed in Attachment 3 and shown on the parcel-ownership map in Figure 4), but most of the land in the Town of Rico is privately owned by others.

Properties owned by the Applicants and various other individuals and private entities are to be addressed under this VCUP Application. For properties not owned by the Applicants, authorization for the Applicants to proceed with the work described in this VCUP Application and to request a NFA after the work is completed will be obtained from the owner of each individual parcel through an access agreement or as part of the Institutional Controls program (refer to Section 6.2). When AR performs soil sampling or soil cleanup, the access agreement entered into by the property owner will establish that AR is acting as the property owner's designated VCUP representative. Where the property owner or developer acting on behalf of the owner performs future soil cleanup (*i.e.*, on currently undeveloped parcels), the property owner has the option of opting in to the VCUP program at the time of remediation, including the potential for AR to obtain authorization at the time a development permit is issued to act on the property owner's behalf in obtaining an NAD or NFA when the cleanup is complete.

2.2 APPLICANT CONTACT PERSONS, ADDRESSES, AND PHONE NUMBERS

Atlantic Richfield: Mike McAnulty, Project Manager
317 Anaconda Rd
Butte, MT 59701
(907) 355-3914
mcanumc@bp.com

Town of Rico: Town Manager
PO Box 9
2 Commercial Street
Rico, CO 81332
(970) 967-2863
townmanager@ricocolorado.gov

2.3 LOCATION OF PROPERTY

The Rico Townsite Soils VCUP project area (the "Site") is located in southwestern Colorado and consists of lands within the present boundaries of the Town of Rico. Figure 1, "Rico Townsite Location Map," indicates the general location of the Town of Rico, and Figure 4, “Town of Rico Boundary and Property Ownership Map,” identifies the area within the current Town limits, which comprises the VCUP project area.

The parcels identified on Figure 4 (and listed on Attachment 3) are the individual lots existing as of April 2022, and are the properties addressed by this VCUP Application.

2.4 TYPE AND SOURCE OF CONTAMINATION

The contamination to be addressed under the VCUP is lead in soil. The source of the lead in soil may be attributable to mining and mineral processing activities, lead-based paint, other anthropogenic sources, or high naturally occurring levels of lead associated with local bedrock. A site-specific risk assessment completed in 2006 (Integral 2006a) supported development of a risk-based cleanup approach for Rico Townsite Soils.

Most of the data available to characterize lead concentrations in soil originate from the 2004 VCUP investigations. These data typically characterize the lead content of surface soil (i.e., top 0 to 2 inches of soil cover) with additional data collected to characterize lead concentrations in soil at greater depth. Additional lead-concentration data are available from soil sampling and analyses conducted within the Site by others, including EPA, CDPHE, and environmental consultants working on behalf of individual landowners (e.g., Walsh 1995).

Figure 5, “Pre-Remediation Spatial Distribution of Lead in Soil,” is a map of lead concentrations in soil samples collected from depths of 0 to 2 inches. The lead concentrations mapped on Figure 5 were obtained from samples collected in advance of any soil remediation activities, and therefore, Figure 5 represents the pre-remediation distribution of lead in surface soil. In general, the highest lead concentrations were present in the river corridor and in the northeast part of Rico along the Silver Creek drainage.

Potential human exposures to other metals, including arsenic, cadmium, copper, manganese, silver, and zinc, in Rico Townsite soils were evaluated in the 1996 human health risk assessment summarized in Chapter 3.0 of the Grand View Smelter VCUP Application (AR et al., 1996d). The 1996 assessment evaluated soil metals concentrations for multiple Town areas (North Rico, South Rico, East Rico, West Rico, Silver Creek Fan, Grand View Smelter, Dolores River Corridor, Waste Rock Areas, and Road Fill Areas) and exposure scenarios (residential, recreational, and dirt bike rider). Comparison of metals concentrations in Rico soils to State and EPA screening levels in effect at that time and to current screening levels indicate that arsenic and manganese exceed at least one of the screening levels but are below background concentrations. Soil concentrations of cadmium, copper, zinc, and silver did not exceed previous State or EPA screening levels, and a review of current screening levels confirms that these conclusions remain valid. Although cadmium concentrations measured in 1996 in North Rico and in South Rico residential soils exceed the current EPA regional screening level (RSL), background cadmium concentrations measured in these areas were similar to residential soil values and also exceed the current RSL. Risk characterization for arsenic and manganese found that carcinogenic risks due to soil and dust ingestion of arsenic from residential and recreational exposures and inhalation of dust by dirt bike riders were within EPA's acceptable risk range for all exposures evaluated. Noncarcinogenic risks due to soil ingestion of arsenic and manganese for recreational and residential exposures were below EPA's acceptable non-cancer hazard level of 1.0. The conclusions of the risk assessment supported a no-action decision for the existing residential areas located on bedrock, colluvium, and alluvium materials, future residential areas located on talus/slopewash material, and the open-space river corridor area.

2.5 VOLUNTARY CLEANUP OR NO ACTION DETERMINATION

This application is being submitted for a Voluntary Cleanup pursuant to Colorado's Voluntary Cleanup and Redevelopment Act. C.R.S. § 25-16-301 et seq.

2.6 CURRENT AND PROPOSED LAND USES

The Town of Rico has adopted its Rico Land Use Code (RLUC) to guide regulation and management of land use and development within and around Rico. The Town's land-use zones are depicted in Figure 6, "Town of Rico Official Zoning Map." Most of the Town is zoned for residential use with commercial use allowed at some locations along State Highway 145, the main road passing through Rico (Glasgow Avenue). Residential uses are currently allowed in all zoning districts except for "Public Facilities" and "Open Space." Since adoption of the zoning shown in Figure 6, the reclaimed Van Winkle Mine site (see Figure 3 for location) was rezoned to allow for residential, open space, and historical preservation uses following the Town's approval of the Van Winkle Subdivision.

Land along the river corridor is a mix of Town-owned and private parcels. This area is currently zoned for residential uses. The expected future uses of land within the river corridor include limited recreational, residential, commercial, and public facilities. For the Town-owned land parcels within the river corridor that are subject to floodplain, avalanche, steep slope, or other hazardous risk (see Figure 11) and which have value for open space use and recreation, the Town plans to protect such areas for future recreational use and preservation as open space.

In general, future land uses are expected to be consistent with existing zoning; however, the Town has the authority to modify zoning and related land uses.

3 PROGRAM INCLUSION

Based on criteria identified in CDPHE's VCUP Application Guidance Document (CDPHE 2019), the Rico Townsite Soils Site is eligible for inclusion in the Colorado VCUP Program under the Voluntary Clean-Up and Redevelopment Act, C.R.S. § 25-16-301 et seq., as follows:

- The Town of Rico and AR own certain properties within the Town's boundaries, and the Town has municipal jurisdiction over other properties addressed under this VCUP Application.
- By agreement with individual property owners, AR serves or will serve as the designated VCUP representative for soil characterization and soil cleanup work on parcels not owned by the Town. For properties where AR has not obtained VCUP representation via agreements with individual property owners, VCUP representation will be requested when development occurs under the ICs program. If the property owner does not so consent, the property will remain subject to the requirements of the ICs program as set forth in the RLUC.
- The properties addressed under this VCUP Application are not the subject of corrective action under orders or agreements issued pursuant to provisions of C.R.S. § 25-15-301 et seq. or the federal Resource Conservation and Recovery Act of 1976 (RCRA), as amended.
- The properties addressed under this VCUP Application are not subject to an order issued by or an agreement with the Water Quality Control Division pursuant to C.R.S. § 25-8-601 et seq.
- The properties addressed under this VCUP Application do not have or should not have a permit or interim status pursuant to C.R.S. § 25-15-301 et seq. (RCRA Subtitle C) for treatment, storage, or disposal of hazardous waste.
- The properties addressed under this VCUP Application are not subject to the provisions of C.R.S. § 8-20.5-201 et seq. (Underground Storage Tanks).
- The properties addressed under this VCUP Application are not listed or proposed for listing on the National Priorities List of Superfund sites established under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

4 ENVIRONMENTAL ASSESSMENT

This environmental assessment was prepared by qualified environmental professionals from Formation Environmental, L.L.C. (Formation) in Boulder, Colorado and Alloy Group in Anaconda, Montana. A Statement of Qualifications for each firm is provided as Appendix D.

4.1 LEGAL DESCRIPTION OF SITE

The Site covers an area of approximately 450 acres in the S½SW¼ Section 25 T40N R11W, SE¼SE¼ Section 26 T40N R11W, W½ Section 36 T40N R11W, E½ Section 35 T40N R11W, NW¼NW¼ Section 1 T39N R11W, and NE¼NE¼ Section 2 T39N R11W, as shown on Figure 7 "Location and Size of Site with Township and Range."

4.2 HISTORY OF MINING ACTIVITIES IN RICO

The following information on the operational history of the Site that resulted in the release of lead to the environment is based on descriptions of mining history in Ransome (1901) and McKnight (1974). Figure 8, "Historical Mines and Smelters in the Town of Rico" shows the locations of historical mining features in the vicinity of the Town of Rico.

Mining-related operations started in and around the Rico Mining District in the 1860s, and sporadic surface and near-surface exploration followed, with limited success, until 1879, when high-grade silver ores were discovered. That same year, the Town of Rico was incorporated, and a 320-acre townsite with streets and alleys was platted. Much of the high-grade silver mined during this period was processed through milling and smelting operations at the Grand View Smelter, constructed at the north end of town in 1880, and the Pasadena Smelter, constructed at the south end of town in approximately 1882.

During this same period, the Rio Grande Southern Railroad operated facilities within the Town, including a station house, fueling areas, a turnaround spur, a water tower (still standing), and side spurs up Silver Creek and to Newman Hill (Enterprise Mine). The railroad's presence is primarily evidenced today by the old railroad grade along the Dolores River, which remains as a dirt road and trail.

The Pro Patria Mill was constructed near the center of Rico (see Figure 8) in 1900 and began operations in 1902. An aerial tram transported ore down from the Newman Hill area to the Pro Patria Mill. In addition, a small mill using magnetic separation technology was developed at the nearby Atlantic Cable Mine. The Pro Patria Mill was converted to a 250-ton per day flotation mill in 1926 and processed most of the ore produced in the Rico Mining District between November 1926 and July 1928. The mill was permanently closed in 1928. The major mining areas active at this time included the Shamrock and Atlantic Cable Mines. Tailings from the Pro Patria Mill are thought to be impounded mostly at the Columbia Tailings site. Major in-town mine operations from this era came to an end in 1929.

In 1939, the Rico Argentine Mining Company built a 135-ton per day flotation mill up the Silver Creek drainage, northeast of Rico, and ore from most mines in the area was processed there in subsequent years. The Rico Argentine Mining Company sunk the Van Winkle mine shaft in 1942, which provided significant ore to the Argentine Mill for several years. Most lead production in the district occurred during the period from 1939 to 1971, and production came to a close in 1971 when the Rico Argentine mines and mill were shut down. Significant mining activity in the area has not occurred since that time.

As summarized in the 2004 VCUP Application, the Anaconda Company (Anaconda) entered into an agreement in June 1978 with Rico Argentine Mining Company, a division of Crystal Exploration and Production Company, under which Anaconda obtained exclusive possession of Rico Argentine Mining Company's mineral properties in the Rico vicinity for exploration purposes. Pursuant to a June 1980 Letter Agreement and an August 1980 Closing Agreement with Crystal Exploration and Production Company, a subsidiary of Crystal Oil Company, Anaconda acquired Rico Argentine Mining Company's surface and mineral properties in the Rico area. The Atlantic Richfield Company, a successor to Anaconda, subsequently sold these properties to Rico Development Corporation under a Purchase and Sale Agreement executed in May 1988.

4.3 MINE SITE CLEANUP PROJECTS

Between 1995 and 1997, AR completed the following mine-site cleanup projects in the Town of Rico in accordance with the State of Colorado's VCUP:

- Silver Swan Mine Area
- Columbia and Old Pro Patria Mill Tailings and Silver Swan East Waste Rock Pile
- Santa Cruz Mine Area
- Grand View Smelter Site

The locations of each of these sites are indicated on Figure 3. Each of these remediation projects was completed under an individual VCUP Application (AR et al. 1996a, 1996b, 1996c, 1996d).

An engineering evaluation/cost analysis was conducted to evaluate removal action alternatives for tailings, waste rock, and other mining-related materials at these sites (AR 1996). Remediation work was performed by AR, and the cleanup approach for each site was similar and included: regrading, waste consolidation, treatment with lime, capping of waste rock and/or tailings with growth media, and protection from erosion through construction of run-on and run-off controls. Confirmation soil samples were collected following remediation (ESA 1996). AR received NFAs from CDPHE for these VCUP projects on December 10, 1999. Inspections of these VCUP projects have recently occurred and will continue. Maintenance necessary to maintain the NFAs will occur in accordance with plans submitted to and approved by CDPHE independently of the VCUP project addressed by this VCUP Application.

Additional details for cleanup conducted at the separate mine sites are as follows:

<u>Silver Swan Mine Area</u> – The Silver Swan Mine area is located on the west side of the Dolores River at the south end of Rico (see Figure 3). The mine features present include a rock-filled adit, a 2.3-acre waste rock pile adjacent to the Silver Swan Mine on the west bank of the Dolores River, and 1.5-acre

wetlands. Prior to cleanup, the adit drainage flowed over and through the waste rock pile before reaching the Dolores River. Under the VCUP, the waste rock pile was treated with lime and covered with 1 foot of soil and revegetated (AR et al. 1996b). Nearby slopes were covered with riprap to prevent erosion by the river during periods of high flow. The adit discharge (50 gallons per minute [gpm]) was redirected to a lined pond at the head end of the wetlands area. The natural wetlands were enhanced by addition of an aerobic treatment step (the pond).

Columbia and Old Pro Patria Mill Tailings and Silver Swan East Waste Rock Pile – Both the Columbia tailings and Pro Patria tailings were produced by the Pro Patria mill (Falcon mill) in Rico. The Silver Swan Mine was the source of the Silver Swan East waste rock pile. The mine waste cleanup involved removal of tailings and waste rock from two areas on the east bank and floodplain of the Dolores River -- the Silver Swan East (600 cy) and Pro Patria sites (3,300 cy) -- and consolidation with the regraded Columbia Tailings (45,000 cy) in a single repository at the Columbia Tailings location. The consolidated tailings and waste rock were surface graded, compacted, treated with lime, covered with 2 feet of growth material to minimize infiltration, and run-on and run-off controls were installed (AR et al. 1996a).

Santa Cruz Mine Area – The Santa Cruz Mine area, on the west boundary of Rico and west of the Dolores River (see Figure 3), included patented mining claims covering the Santa Cruz, Iron Clad, and Rico Boy mines. Cleanup under the VCUP consisted of consolidating an estimated 6,000 cy of material with the remainder of the waste rock, regrading and compaction of waste rock to reduce infiltration and impacts to surface water, treating the pile with lime, covering the waste rock with 12 inches of growth media, and revegetating (AR et al. 1996c). Combined flows from four adits were conveyed in lined channels around the waste rock pile to a wetlands complex.

Grand View Smelter Site – Soil sampling at the former Grand View Smelter location showed elevated lead and other metals concentrations, along with some exposed slag. The VCUP cleanup included placement of growth media and revegetation over approximately 1 acre of disturbed slopes and mine waste, installation of run-on and run-off controls, and stabilization of an area adjacent to the Dolores River by covering with riprap (AR et al. 1996d).

4.4 PHYSICAL CHARACTERISTICS OF SITE

4.4.1 TOPOGRAPHY

Rico is located in the southwest part of the San Juan Mountains where very steep to steep mountain slopes and steep to moderate sloping tributary stream valleys abruptly descend upon the gently to moderately sloping and relatively narrow Dolores River valley. Many of the steep draws and gulches formed on the hillsides on both sides of the Dolores River, and its Silver Creek tributary, are snow avalanche chutes. Elevations in the Rico area generally range from over 12,000 feet above mean sea level (AMSL) at the crest of surrounding mountain peaks, such as Telescope Mountain (12,201 feet AMSL) and Dolores Mountain (12,112 feet AMSL), to approximately 8,700 feet AMSL in the Dolores River valley. The intersection of Glasgow Avenue (State Highway 145) and Mantz Street in the Town of Rico is at an elevation of about 8,800 feet AMSL.

Most of present-day Rico is built on moderate to low slopes developed where tributaries to the Dolores River deposit alluvial fans on the river's flood plain. These low slopes continue to be preferred for development, but because of their limited area, future residential development may expand onto steeper slopes rising above the river valley.

4.4.2 Surface Water Bodies and Wastewater Discharge Points

The Dolores River below the Town of Rico has a mean annual flow of 129 cubic feet per second (cfs) with a typical seasonal flow range between approximately 15 and 650 cfs, depending on annual precipitation and snowmelt patterns. [1] Annual high flows occur during late spring and early summer snowmelt runoff. The annual low-flow period occurs in November through March, with February having the lowest average monthly flow of 18 cfs. The 100-year-flood peak flow for the Dolores River is estimated at approximately 2,700 cfs (Dames and Moore 1981).

Silver Creek is the principal tributary to the Dolores River in this area. Silver Creek flows through the northern part of Rico before entering the river. The gradient of the relatively narrow cobble- and boulder-lined channel is moderate where it passes through Town. Historical instantaneous measurements of Silver Creek flow below the Argentine Tailings ponds (located to the northeast and upstream of the Site) ranged from about 0.06 cfs to 23 cfs. Most annual high flows occur during snowmelt runoff in the spring and early summer months (April–July). Infrequent floods result from high-intensity rainfall during the summer months. The 100-year-flood peak flow for Silver Creek is estimated at 525 cfs (Dames and Moore 1981). In Rico, the channel is locally incised and confined by flood control banks.

4.4.3 Groundwater Monitoring and Supply Wells

The Town of Rico obtains drinking water from a water supply located upgradient of the Town of Rico and VCUP project area. There are no known groundwater monitoring or supply wells within the Town of Rico.

Colorado Division of Water Resources records were searched for all registered water-supply wells in the eastern end of Dolores County. Most of the wells on record are in the Dunton area within the West Dolores River Basin. There are three registered supply wells in the vicinity of Rico, but none of these wells currently supplies water used within the project area. Two of the wells supply water for private domestic use and are located one mile upstream of Town. The third well was used historically by the Colorado Department of Transportation. This well has been plugged and abandoned.

Three piezometers constructed of perforated polyvinyl chloride (PVC) pipe were installed within the Town of Rico in 1995. The piezometers were used to determine the depth to water in alluvium on the perimeter of the Columbia Tailings pile. These piezometers have since been abandoned. At present,

[1] https://waterdata.usgs.gov/nwis/inventory/?site_no=09165000&agency_cd=USGS

there are no known unregistered water wells within the townsite or along the Dolores River in the immediate vicinity of the Site.

Several groundwater samples were collected in the fall of 2002 as part of a CDPHE Brownfields study (CDPHE 2003). These samples were collected at the Dolores County Maintenance Barn site, which is located within the Town boundary. Lead concentrations in these groundwater samples were not detectable.

4.5 CHEMICAL NATURE AND EXTENT

The distribution and concentrations of metals, including lead, in the exposed bedrock and surface soil in the Town of Rico reflect the influence of the area's geologic setting and the presence of hydrothermally altered and metals-enriched bedrock, as well as mining, milling, and metals-processing activities. The bedrock in the Townsite has the highest overall metal content (AECOM 2014), and the colluvium derived from weathering and erosion of this bedrock is nearly as high. The Townsite was developed on these natural materials. Fugitive emissions and other releases related to historical mining activities resulted in elevated metals concentrations in some surface and near-surface soils. Subsequent development activities in the Town likely reduced lead concentrations in surface soils on some properties to some extent. However, development of the Town did not eliminate the spatial distribution of natural and anthropogenic lead and other metals in surface soil (AR et al. 1996d). A map of the pre-remediation soil lead concentrations (see Figure 5) indicates relatively high lead in areas of natural colluvial and alluvial deposits, such as the Silver Creek drainage. Specific areas of mining-related impacts, such as waste rock and tailings piles, can be readily identified from the shape of these features and the distinctive color and texture of mine wastes compared to surrounding natural soil (AR 2006).

4.5.1 SITE GROUNDWATER CONDITIONS

Based on the groundwater data from a 2002 Brownfields study (CDPHE 2003), the potential for transport of lead from soil to groundwater appears low. Lead values from five groundwater sampling locations in the vicinity of the County Maintenance Barn were all reported as non-detects. These groundwater sampling locations were in the same area as four surficial soil sampling sites for which lead values were reported to range from 620 to 4,500 mg/kg, with an average concentration of 2,580 mg/kg. There are no known water supply wells within the Town of Rico.

Groundwater Depth - No existing groundwater monitoring or water supply wells are known to be located within the Town of Rico. Therefore, no data exist to document water table elevations or groundwater movement across the Townsite. Short-term measurement of the piezometers at the Columbia Tailings site indicated a local groundwater gradient downstream and toward the Dolores River, as would be expected in the shallow alluvial aquifer being monitored. A generally similar pattern of downslope (toward the Dolores River) and downstream groundwater flow would be expected within the alluvial and colluvial deposits underlying much of the Town of Rico.

Hydraulic Tests - No hydraulic tests of aquifers are known to have been performed within the Town of Rico.

4.5.2 SITE SOIL CONDITIONS

4.5.2.1 PREVIOUS INVESTIGATIONS

The prior Rico Townsite Soils VCUP investigations have included extensive soil characterization efforts, and the results of those investigations have been reported to CDPHE previously (refer to list of reports provided in Section 1.1). Appendix A of this Application also provides a summary of the past VCUP activities. In addition, several other investigations in the Rico area have included the sampling and analysis of soil for lead, and those other investigations are briefly described below.

Walsh (1995) – Walsh Environmental Scientists and Engineers, Inc. conducted Phase I and Phase II Environmental Site Assessments (ESAs) for Rico Renaissance, the owner of several parcels in and around the Town of Rico. The Phase II ESA included limited sampling of waste rock piles, mine tailings, and fill material. Forty-eight samples were collected, targeting areas of interest to Rico Renaissance. Thirteen of the samples were in commercial/residential areas and seven were from locations where soil was considered representative of natural background by Walsh. Samples were generally collected from depths of 0 to 2 inches, but in some cases, samples were collected to depths of up to 8 inches.

AR (1996e) – As part of the VCUP Application for the Grand View Smelter Site, AR incorporated data from the PTI Environmental Services sampling performed in 1995. The PTI study included 73 soil sampling locations. Of those, 32 were residential surface samples, 20 were identified as background surface samples, and 20 characterized residential soil at greater depth (PTI 1995). One sample was also collected from mine waste at the Van Winkle Mine Site.

TEC (1996) – Titan Environmental Corporation (TEC) contracted with Michael Russ to perform geological and geochemical mapping of soils in the Town of Rico to characterize metals concentrations in relation to the mineralogy of the source material and historical mining and processing operations. As part of this study, 24 rock outcrops and 22 surficial deposits (alluvium, colluvium, and slope wash) were sampled and analyzed for metals. The TEC study concluded that concentrations of selected metals (including lead) in surficial deposits are derived predominantly from geologic processes acting on natural sources.

Walker (CDPHE 1996) – Following submittal of the Grand View Smelter VCUP Application (AR et al. 1996d), CDPHE collaborated with AR in a study to "confirm or refute" the conclusions in the Grand View Smelter VCUP Application. Thirty-one soil samples were collected for lead analysis from various depths, and several samples were submitted for mineral speciation. The study concluded that both natural and anthropogenic sources of lead were present at the Site. Natural sources of lead are related to exposure and weathering of mineralized bedrock. Anthropogenic sources of lead include mine waste rock, mill tailings, and smelter slag, which can be observed at the ground surface at locations of historical mining, milling, and smelter operations.

State of Colorado Brownfields (2003) – The CDPHE conducted limited groundwater and surface soil sampling as part of Brownfields assessment fieldwork in late 2002. Four surface soil samples were collected at the Dolores County Maintenance Barn site within the Town of Rico. Lead concentrations in these samples ranged from 620 to 4,500 mg/kg and averaged 2,580 mg/kg.

EPA (2004) – The EPA sampled soil at numerous locations within the Town of Rico in October 2003. Data from this sampling event were included in the 2004 VCUP Application for Rico Townsite Soils.

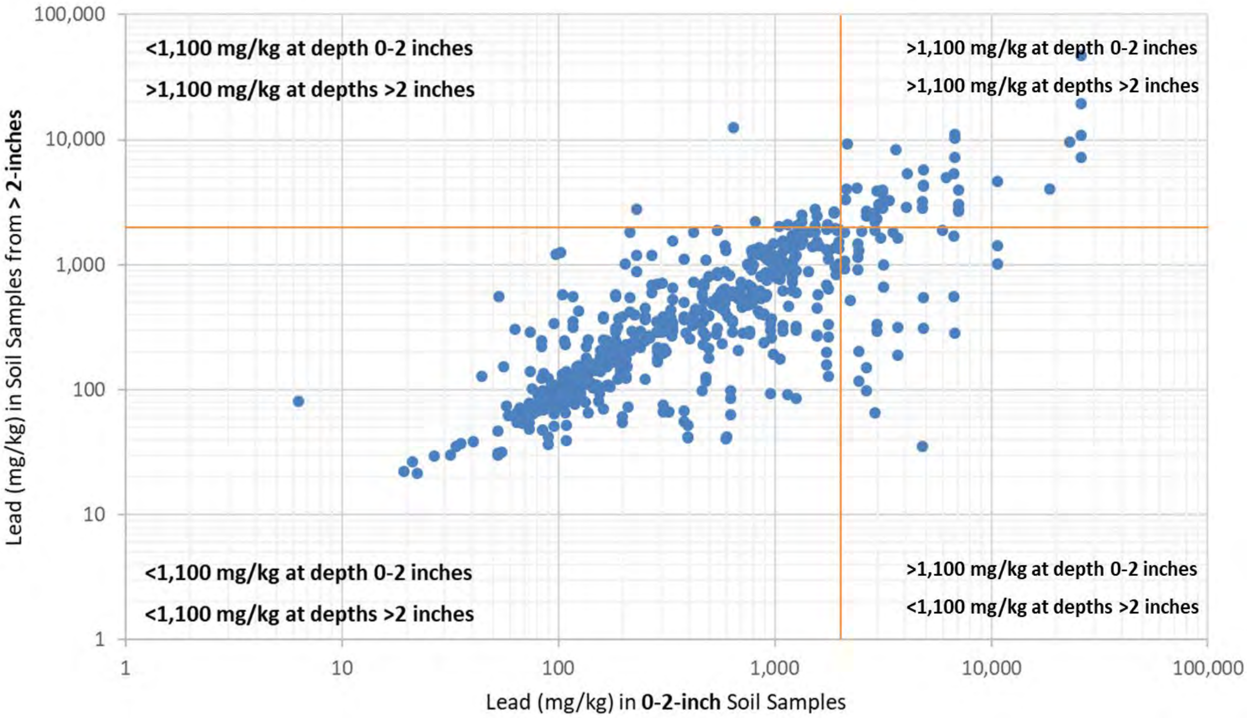
4.5.2.2 KNOWN SOIL-LEAD CONDITIONS

This VCUP Application addresses the presence of lead in soil within the Town of Rico. Table 1 provides a summary of the lead concentrations measured in the top 2 inches of soil during past sampling activities associated with the 2004 VCUP Application. For each of the different parcel types listed, the soil-lead concentrations vary widely.

Table 1 SUMMARY OF SOIL LEAD CONCENTRATIONS (Depth = 0-2 inches) MEASURED IN THE TOWN OF RICO

Parcel Type	Number of Samples	Lead Concentrations (mg/kg) in Samples Collected from Top 2 Inches of Soil			
		Minimum	Maximum	Median	Geometric Mean
Residential – Developed	864	7.8	86,600	640	573
Residential - Undeveloped	941	6.3	70,329	465	513
Non-Residential – Developed and Undeveloped	159	44	11,100	647	648

The spatial distribution of lead in near-surface soil samples (i.e., soil from depths of 0 to 2 inches below the ground surface [bgs]) from the Town of Rico is shown in a map view on Figure 5. The lead concentrations presented in Figure 5 include the lead data available from previous studies as well as soil data collected for the 2004 VCUP project; collectively, these data represent the near-surface distribution of lead before any of the VCUP remediation projects were conducted. As shown in Figure 5, the lead concentrations appear highly variable across the Site, with relatively higher concentrations in the northeast part of Town, especially north of Silver Creek and east of Highway 145. Colluvial and alluvial deposits were shown (AR 2006) to have relatively higher lead concentrations than other natural geologic materials, and these types of deposits are present in the areas of Rico with the highest lead concentrations in soil. Relatively higher lead concentrations also appear in the vicinity of the Pro Patria Mill site, Van Winkle Mine, Grand View Smelter, and some other localized areas west of the highway and north of Mantz Street.



Soil-lead data collected by AR during prior VCUP soil investigations are also useful for evaluating the vertical distribution of lead in soil. Soil samples were collected from more than one depth at 581 different sample locations in the project area. The lead concentrations reported for samples collected at distinct depths are compared on the x-y plot above. Each data point on the plot represents a pair of samples collected at the same location: one sample collected at a depth of 0-2 inches (lead concentration plotted on the x axis) and one collected at a depth greater than 2 inches (lead concentration plotted on the y axis). As shown in the figure, lead concentrations in soil collected from 0-2 inches generally correlate with lead concentrations in deeper soil.

4.5.3 Environmental Sampling Methods - 2004 VCUP

The rationale and methods for sampling and analysis of soil and other materials during characterization efforts related to the 2004 VCUP Application are summarized below.

Investigation Boundaries – The 2004 VCUP soil investigation was limited to areas within and immediately contiguous to the Town of Rico. Emphasis was given to residential, commercial, public and open space (recreational) parcels in the existing developed portions of Town.

Types of Properties – The Town of Rico official zoning map (Figure 6) identifies a number of different land uses, each of which presents its own considerations for exposure and abatement that was considered in formulating the sampling plan. Sampling of any parcel was subject to obtaining access from the owner. The current zoning in the areas sampled included: Residential, Residential Planned Unit Development (PUD), Commercial, Historic Commercial, Commercial PUD, Mixed Use, and Open Space/Public Facilities.

Soil Sampling Protocols – Soil sampling protocols applicable to properties in currently developed areas (Zone 1) versus areas of potential future development and/or open space/recreational use (Zone 2) and the specific sampling protocols applied to each of the property types previously identified were specified in the Sampling and Analysis Plan (SAP) in Appendix C of the 2004 VCUP Application.

In summary, at each property in currently developed areas (and at any dispersed developed residential or commercial properties that fell outside the Zone 1 boundaries) the property was subdivided into yard areas, and within each yard area soil samples were collected from a depth of 0 to 2 inches at five randomly selected locations at each of up to several sampling sections on each property (i.e., a parcel or contiguous parcels combined under the same ownership). These five samples were composited into a single sample representing the soil in the yard area. Additional samples were collected in driveways, vegetable gardens, and bare play areas on residential parcels, and on properties zoned as open space/public facilities (including playgrounds).

Surface soil in undeveloped areas of potential future development and areas designated for future open space/recreational use contiguous to the current Town limits (i.e., within what is designated as Sampling Zone 2) was also sampled. Approximately one discrete grab sample was collected per 10-acre area. The specific location and density of samples was based upon the availability and quality of previous sampling data (described in Section 4.5.2), geology/geomorphology, and near-term future land use plans.

Approximately 30 discrete-depth sampling locations were selected to characterize lead distribution in soil with depth. Sampling at each location involved collecting 2 composite samples over depth intervals of 2 to 12 inches and 12 to 18 inches.

Additional sampling intended to target identifiable mine waste deposits and soils in the Dolores River east overbank corridor, background soil and bedrock, unpaved roads, and locations along the planned sanitary sewer system within the Site (AR 2006). The rationale for these additional sampling efforts can be summarized as follows:

> *Mine Waste Deposits* – Additional data were obtained to confirm that mine waste is visually identifiable and typically has elevated lead concentrations compared to surrounding soil.
>
> *Dolores River east overbank corridor* - Sampling at and between the historical Pro Patria mill/tailings site and the Columbia Tailings site (including both sampling of discrete, identifiable mine waste as well as semi-random sampling) was performed to more fully characterize lead levels in this area. The higher density of sampling in the east overbank area was undertaken to support decisions regarding cleanup for proposed future open space/recreational use areas.
>
> *Background soil and rock* – Previous studies indicated that naturally occurring (i.e., background) lead levels in both bedrock and surficial deposits were locally elevated in the Rico Townsite and adjacent areas. These locally elevated lead levels reflect the geologic processes that formed the shallow to outcropping ore bodies in the townsite and subsequent alteration and weathering. This sampling and associated geologic mapping and mineral speciation analyses were intended to identify soils at the Site with naturally occurring versus mining-impacted elevated lead levels

(AR, 2006). This information was used, along with health risk information, to set action levels for cleanup. The sewer sampling involved sampling at depths up to a maximum of 4 feet.

Unpaved roads - Sampling of surficial soil on unpaved Town streets supported evaluation of the potential for exposure by children playing in the streets in residential neighborhoods characterized by low traffic volumes (Integral, 2010). These results were also used to assess the potential for recontamination of remediated yards from dust and/or stormwater run on-runoff.

Sanitary sewer system – Subsurface sampling of the sewer system alignment (primarily along streets in Town) was performed to evaluate the potential for encountering elevated lead levels in excavated soil during construction of a sewer system. The sewer system sampling involved sampling to a maximum depth of 4 feet.

<u>Analytical Procedures</u> – All soil samples collected in support of the 2004 Rico Townsite Soils VCUP were dried and sieved through the U.S. Standard No. 10 sieve per standard protocols and analyzed for lead using laboratory-grade x-ray fluorescence (XRF) (AR 2006). A subset of these samples (minimum of 20%) was also submitted for laboratory analysis of lead using inductively coupled plasma (ICP) mass spectrometry to establish a valid correlation between the results of the two methods.

5 APPLICABLE STANDARDS/RISK DETERMINATION

EPA and CDPHE assess the health risk from lead in soil on a site-specific basis and identify lead concentrations that will protect the health of the populations potentially exposed. These "risk-based action levels" are derived by determining the acceptable dose of lead from the soil, and then calculating the soil concentration of lead that will ensure that people do not receive a dose higher than the acceptable dose. Regulatory agencies such as EPA also calculate generic risk-based action levels that are very conservative. The generic risk-based levels are based on much higher exposures than are likely to occur in a community. Regulatory agencies recognize that the factors contributing to exposures for each individual community are variable and should be relied upon to derive site-specific or community-specific action levels.

5.1 RICO TOWNSITE SOILS LEAD HEALTH RISK ASSESSMENT

The primary goal of Rico Townsite VCUP investigations and cleanup actions is to reduce the community's exposure to lead in soil to levels that are protective of public health. Understanding health risk from metals such as lead in soil first requires an understanding of the potential dose of lead for people who may contact the soil. The potential dose from exposure to lead from soil is then compared to acceptable, health protective exposure doses. People may be exposed to lead in soil by dermal contact, ingestion, or inhalation of lead in dust. Some of the lead in the soil may then be absorbed into their bodies. It is the absorbed dose of lead that is estimated to assess potential health risks.

Potential lead doses in Rico were estimated using methods and assumptions developed by EPA for human health risk assessment, the details of which were provided in the Lead Health Risk Assessment prepared for the Rico Townsite Soils Site (Integral 2006a). Based on the Lead Health Risk Assessment and related studies, AR concluded that "[w]ith the use of action levels and the Rico blood lead study, . . . the Rico community is not being exposed to unacceptable risk from lead in soil, even where lead in soil in locations around town exceeds the residential or commercial action levels" (Integral, 2010). Development of the site-specific, risk-based action levels recommended by CDPHE, and reviewed by EPA, for use at the Site is explained below.

5.2 SITE-SPECIFIC VCUP ACTION LEVELS FOR LEAD IN SOIL

Of primary concern in selecting risk-based action levels is protection of young children, who are defined by risk assessment scientists as children ages six and under. Young children are both the most sensitive to the effects of lead and the most likely to have substantial exposure to soil. Very young children are assumed to spend most of their outdoor time playing in residential yards around homes. Consequently, derivation of appropriate risk-based action levels for residential soil was based on potential exposures for children playing regularly in the soil of the home where they live or spend the day. For areas where children are not likely to regularly play in the soil, exposure estimates for adults were used.

Risk-based action levels are based on a series of assumptions about exposures. Site-specific exposure assumptions for different land uses and laboratory testing performed to characterize the bioavailability of lead in Rico soil were considered in the development of risk-based action levels for the Rico Townsite

Soils VCUP project area. In 2006-2007, CDPHE approved two risk-based action levels for Rico: an action level of 1,100 mg/kg for residential yards and an action level of 1,700 mg/kg for non-residential (e.g., commercial) sites. These action levels were determined to be protective by CDPHE in 2006 and 2007, respectively, and adopted for future VCUP soil remediation. The 1,100 mg/kg action level approved by the State with input provided by EPA for residential soil was intended to be protective for young children, including exposure to soil in their yard and other locations where lead may exist. Similarly, the 1,700 mg/kg action level for non-residential sites was intended to be protective for exposures to soil in areas where someone works.

CDPHE re-evaluated the LALs adopted in 2006 and 2007 in light of recent changes to the underlying risk-based assumptions and scientific model inputs and in consideration of background soil lead concentrations in the mineralized Rico mining district as appropriate. To ensure the continued protectiveness of the LALs used in the VCUP, CDPHE provided a range of updated LALs and recommended a residential LAL of 761 mg/kg (referred to in this Application as the “Residential LAL”), a non-residential LAL of 967 mg/kg (referred to in this Application as the “Public Facilities LAL”), and a recreational LAL of 4,010 mg/kg (referred to in this Application as the “Open Space LAL”). The State’s Technical Memorandum on *Risk-based Screening Levels for Lead in Soil at the Rico Townsite, Voluntary Cleanup Site*, prepared CDPHE’s Toxicology and Environmental Epidemiology Office (TEEO) is included herein as Appendix E.

These LALs will be used to guide the cleanup of soil at properties in Rico, and selection of the applicable LAL for any property in the project area is based on the allowed land uses defined by the Town’s zoning designations and the Overlay Zone Regulations incorporated into the RLUC (“Overlay Zone Regulations”) (included as Appendix F to this Application). The Residential LAL will guide cleanup of soil at any developed property where current Town zoning allows residential use, as well as cleanup of soil on unpaved roads and alleys, and at portions of Public Facilities and Open Space properties where active play areas frequented by young children (as identified by the Town) are present or are developed in the future. The Public Facilities LAL will guide cleanup of soil at all other portions of developed Public Facilities properties. The Open Space LAL will guide cleanup of soil at all other portions of Open Space properties and the future construction of public-use recreational trails on Town-owned properties.

5.3 RICO BLOOD LEAD STUDY

Independent of the process used to develop risk-based action levels for Rico soil, AR commissioned a blood lead study to more directly measure lead exposures in the community (Integral 2006b, 2007). For lead, actual exposure can be assessed directly by measuring the amount of lead in the blood. The Rico blood lead study included both children and adults. The study was performed in 2006, prior to AR’s completion of many of the yard cleanups. The study was conducted in two phases, during the spring and during late summer when exposure to soil was expected to be greatest due to lack of snow cover and potentially drier soil conditions.

The study conducted in Rico found that residents’ blood lead levels were comparable to average blood lead levels nationwide. Blood lead levels for all of the young children (0 to 6 years old) tested were below the Centers for Disease Control and CDPHE level of concern in place at the time of testing (Integral 2007).[2] The findings of the blood lead study supported the conclusion that the risk-based action levels selected by CDPHE are health protective for Rico residents.

5.4 Residual Risk Analysis

In 2010, AR completed a follow-up evaluation (Integral 2010) to evaluate whether the residual risk for residents living next to non-remediated vacant properties is likely to exceed the risk-based residential action level for the site if remediation decisions for those existing vacant parcels are deferred until further development takes place on neighboring parcels in the future. An updated residual risk analysis report was prepared in 2011 (ENVIRON 2011) to reflect certain discussions and changes that occurred since the original analysis was prepared. Potential exposures to areas along the Dolores River corridor that are visited for recreational purposes (e.g., walking or fishing) were also considered, as were influences of soil on surrounding undeveloped property (i.e., Forest Service land), unpaved streets and alleys, and non-remediated vegetated rights-of-way.

This analysis was accomplished by selecting a subset of properties judged to have the greatest exposure potential and compiling data for lead in surface materials on these properties. A weighted-average concentration for each subject property and adjacent off-property areas was then calculated. The sum of these weighted-average concentrations (i.e., the final weighted-average concentration for each subject property) was then compared to risk-based action levels.

The analysis identified one location in the Town that could pose potential residual risk (Lot 45) due to the presence of mine wastes on the adjacent Forest Service land and in the right-of way for the road adjacent to this lot. Mine wastes within the road right-of-way adjacent to this property will be removed as part of the Phase 1 remediation work. In addition, the residual risk assessment indicated that children spending an unusual amount of time (i.e., 50%) on a vacant lot adjacent to two parcels designated as VCUP Lots 35 and 53 (now within the Van Winkle Subdivision approved by the Town in 2007) could potentially be exposed to weighted average lead concentrations greater than the residential action level. However, this conclusion did not account for the completion of soil capping and other remediation work on the adjacent "vacant lot" (Van Winkle Subdivision Lot 2) under the Van Winkle Subdivision VCUP project.

The Residual Risk Analysis (Integral 2010) also demonstrated that the possible future recreational use of the Dolores River corridor open space areas by Rico residents is not expected to result in unacceptable residual risks due to exposure to lead in soil in that area.

[2] That blood lead level was 10 micrograms per deciliter but has since been decreased to 5 micrograms per deciliter. https://www.cdc.gov/nceh/lead/prevention/blood-lead-levels.htm

6 CLEANUP PROPOSAL

The 2004 VCUP project involved extensive site characterization and follow-up soil remediation that was conducted over a multi-year period beginning in 2004 and ending in 2015. Figure 10 "VCUP Project Remediation Status" is a parcel map that indicates the current soil-sampling and soil-remediation status for each individual parcel within the Town boundaries. The following VCUP proposal focuses on completion of the soil sampling and soil remediation tasks initiated by the Applicants in 2004 and subsequent, long-term maintenance of the remediated soil conditions within the VCUP project area.

This cleanup proposal is designed to be implemented in three phases.

Phase 1 addresses the need for (a) soil sampling and analysis at individual properties, as needed to define the scope of remaining soil remediation; (b) soil remediation at developed properties where the soil lead concentration is greater than the Residential LAL and current zoning allows for residential use; (c) soil remediation at developed properties where the soil lead concentration is greater than the Public Facilities LAL and current zoning allows for Public Facilities use; and (d) remediation of soil on unpaved roads and alleys where the soil lead concentration is greater than the Residential LAL, including the adjacent Town-owned, unvegetated, right-of-way areas that also have surface-soil lead contents greater than the Residential LAL. Phase 1 will begin following CDPHE's acceptance of this Application and when the proposed Institutional Controls have been established through the Town of Rico's adoption of the Overlay Zone Regulations that establish two overlay zoning districts into the RLUC.[3] The anticipated duration of Phase 1 is 3 to 4 years for soil sampling and analysis and soil remediation at developed properties and somewhat longer for road remediation. The separate tasks that will be performed to complete Phase 1 are described in Section 6.1. Phase 1 will conclude once AR has (a) remediated all developed properties where the soil lead concentration exceeds the applicable LAL and (b) completed sampling as specified in this Application, except for properties where, by May 30, 2026, the property owner has not authorized such remediation or sampling.

Phase 2 is to be initiated upon adoption of the Overlay Zone Regulations, which will establish two new overlay zoning districts – the Rico Soils Overlay Zone District (RSOZ) and the Environmental Remediation Overlay Zone District (EROZ), and related requirements for the management of soil disturbed by excavation or other property-development activities. During Phase 2, AR will establish and implement the VCUP project's ICs program, which is referred to herein as the "Rico Soils Management Program." Phase 2 will continue for at least 3 years or until fifteen (15) previously undeveloped properties have been processed through the VCUP program as part of Phase 2, whichever period is longer. Phase 2 will commence concurrently with Phase 1.

[3] Throughout this Application, reference to the Town's adoption of the Overlay Zone Regulations shall mean the Effective Date of the Overlay Zone Regulations.

The Town of Rico will implement the Rico Soils Management Program during **Phase 3**. The Rico Soils Management Program, which will be implemented during both Phases 2 and 3, is described in greater detail in Section 6.2.

Cleanup work conducted during Phases 2 and 3 will be subject to the Overlay Zone Regulations. Property development within the EROZ is not addressed directly by this VCUP Application. Under the Overlay Zone Regulations, development within the EROZ will be prohibited unless approved by CDPHE pursuant to the State VCUP program or other written approval from CDPHE in accordance with applicable state or federal requirements. A draft of the proposed Overlay Zone Regulations that defines the new zoning overlay districts and specifies related soil-management requirements is included herein as Appendix F.

The existing Rico Soil Lead Repository will be utilized for disposal of qualifying soil removed from locations within the VCUP project area during Phases 1, 2, and 3. The Rico Soil Lead Repository is operated by AR in accordance with the Certificate of Designation issued by Dolores County (SEH 2004). Section 6.3 of this Application provides additional information about the Rico Soil Lead Repository. If the capacity of the existing Rico Soil Lead Repository is exhausted, AR will, in consultation with the Town, determine how to continue to manage such action-level soils and mine waste in accordance with applicable state and federal law, including expansion of the Soil Lead Repository, construction of a new repository, beneficial use of the material, and/or off-site transport and disposal. If a new repository is constructed or other off-site disposal option is used, it will either be located a similar driving distance from the Town as the existing repository, or delivery of action-level soils to the existing repository will continue and AR will transport the delivered soil and mine waste to the new repository or off-site location.

6.1 PHASE– 1 - SOIL CHARACTERIZATION AND SOIL REMEDIATION

Responsibility for implementing the following Phase 1 tasks is allocated between AR and the Town of Rico in a separate agreement:

- ensuring consistency with past VCUP work;
- community outreach and education;
- soil sampling, and analysis of soil for lead, at the parcels that remain to be sampled in the Town of Rico;
- verification of clean soil cover by resampling surface soil at previously remediated properties that have been more recently disturbed by Town-permitted excavation or building activities; and five additional properties (one of which will be the Town Park and adjacent roadway to the west) where the clean soil cover appears undisturbed, with resampling locations to be jointly identified by the Town and AR;
- soil remediation of <u>developed</u> properties in the Town of Rico with soil-lead concentrations above the applicable LAL for the allowed land uses associated with each property, which

typically include residential use (for the purpose of the VCUP project, a developed property is an improved property with a structure that is in a condition suitable for commercial or residential use and occupation; contiguous parcels/lots owned by the same person or entity will be remediated as a single "property");

- soil remediation along unpaved road and alley segments where lead concentrations are above the Residential LAL, including the adjacent Town-owned, unvegetated right-of-way areas that also have surface-soil lead contents greater than the Residential LAL;
- operation and maintenance (O&M) of the Rico Soil Lead Repository; and
- data management and record keeping to support the project's Institutional Controls program.

Each of the proposed Phase 1 VCUP tasks is described below. More detailed specifications for soil sampling and analysis and performance of soil remediation during Phase 1 are provided in Appendix B, the 2023 Phase 1 VCUP Work Plan.

Remediation of properties that are undeveloped at the time the Overlay Zone Regulations go into effect will be addressed in Phases 2 and 3. Remediation of these properties is therefore not addressed in this Section 6.1 concerning Phase 1.

6.1.1 Consistency with Past VCUP Work

Phase 1 is intended to complete several cleanup tasks that were initiated with the 2004 VCUP Application. As such, the proposed work in Phase 1 adopts the procedures previously used to:

- perform soil sampling at individual parcels (or adjacent parcels under the same ownership) and along unpaved roads and alleys,
- identify parcels, and the areas within parcels, where soil remediation is warranted,
- perform soil removal and replacement where soil lead concentrations are above the applicable, site-specific action level,
- handle and dispose of soil removed from remediated parcels, and
- communicate with property owners and community members.

A high priority for the original (2004) VCUP soil investigation and cleanup efforts was to obtain access to a high percentage of Rico properties for soil sampling and soil remediation. To achieve this goal, the following general communication and coordination protocols were followed to ensure that owners and residents were well informed about the VCUP investigation and cleanup efforts. Similar notification practices and communications with property owners will be adopted for the proposed Phase 1 VCUP tasks.

- Identification of Property Ownership – Using Town and/or County records, a map was prepared identifying ownership of all parcels within the Site boundaries for use in planning of sampling and cleanup activities.

- Notification of Property Owners – General information was provided to all property owners regarding Rico's mining history; exposure to lead in soil; the role of the Applicants, including the Town, in VCUP activities; the proposed sampling program; possible remedial actions; and the project's schedule.

- Access Agreements – Signed access agreements were obtained from property owners prior to collection of samples or performance of cleanup activities.

- Notification of Sampling – Property owners were pre-notified of the estimated date and time of sampling.

- Notification of Results –Owners of properties with soil lead above an action level were individually notified of the results for their properties.

- Development of Property-Specific Cleanup Activities – Representatives of the Applicants met with each property owner to discuss the specific cleanup actions for their property. Individual Site Work Plans (ISWPs) were developed to document the cleanup plan designed for each specific property.

- Public Information – The Applicants provided regular progress updates to the community and other interested parties.

6.1.2 COMMUNITY OUTREACH AND EDUCATION

A community outreach program and informational materials will be developed by the Applicants to explain and communicate the purpose of the VCUP soil-sampling and soil-remediation efforts. This information will be made available to targeted property owners and Rico residents using several different approaches:

1. An informational website will be established by the Applicants for the Rico Townsite Soils VCUP Project. The website will provide general information about the objectives of the Rico VCUP project, descriptions of the VCUP soil sampling and remediation activities, explanation of the potential health risks from exposure to lead in soil and ways to reduce exposure to lead (with links to relevant websites for additional public health information), and explanation of the benefits for property owners who participate in the project by granting the Applicants access to their properties for soil sampling and/or remediation work. The address of the project website will be included on mailings to property owners (refer to item 3 below), and the Town of Rico website will also include a direct link to the Rico Townsite Soils VCUP website.

2. "Fact Sheets" summarizing the information on the Rico Townsite Soils VCUP Project website will be made available to local property owners and residents from the Rico Town Manager's office and at Rico's Town Library.

3. Informational materials and requests for access will be mailed to the owners of the individual properties identified for soil sampling and/or soil remediation during Phase 1. Requests for property access will be supplemented with phone calls and/or electronic mail, whenever possible, and may be followed up with in-person meetings with owners residing in Rico (refer to 2023 Phase 1 VCUP Work Plan, Appendix B, for additional details regarding requests for property access).

4. In-person information sessions may be organized in Rico to provide property owners and residents an opportunity to address questions or concerns directly to VCUP project representatives.

Community outreach efforts will begin with acceptance of this VCUP Application by CDPHE. Community outreach and education efforts will continue for the duration of the Phase 1 cleanup activities and will be coordinated with similar outreach activities related to the ICs program that is implemented as Phase 2 (refer to Section 6.2.2).

6.1.3 Soil Sampling and Analysis

Approximately 100 parcels located within the Town boundaries, most of those undeveloped, remain to be sampled in order to characterize lead concentrations in soil. A list of those parcels is attached to this Application (Attachment 4). Locations of the parcels that remain to be sampled are indicated on Figure 11. Attachment 4 does not include the undeveloped parcels in high avalanche areas or flood zones that will not be sampled as part of the initial sampling program in Phase 1. However, if an owner of such a parcel obtains approval to develop the parcel, sampling of the area of the proposed disturbance will occur in accordance with the requirements of the Overlay Zone Regulations.

Proposed soil-characterization tasks that will be completed in Phase 1 include:

- Requesting new or modified access agreements from owners of the parcels where AR plans to collect soil samples. Access agreements will be sent to the address on record for the property owner as listed in the Dolores County Assessor's records.

- Collecting soil samples at parcels where access has been granted to AR.

- Collecting soil samples at previously remediated properties where the clean soil cover may have been more recently disturbed by later excavation or construction activities, and at five additional properties (one of which will be the Town Park and adjacent roadway to the west) with existing clean soil covers that do not appear disturbed, for quality control purposes, with resampling locations to be jointly identified by the Town and AR. If the resampling results show lead concentrations less than 400 mg/kg (the clean soil criterion from the 2004 Rico Townsite Soils VCUP Application), no further remediation work will be required. If the resampling results show lead concentrations exceeding 400 mg/kg but less than the applicable LAL, the results will be evaluated in consultation with CDPHE on a case-by-case basis to determine if any additional actions are warranted. If resampling results show lead concentrations exceeding the applicable LAL, the property will be re-remediated.

- Collecting soil samples on unpaved roads to better define the extent of soil remediation for roads and alleys.
- Analyzing all soil samples for lead concentration.
- Reporting soil data to property owners and compiling and managing soil data and records of VCUP soil remediation to support the ICs program implemented during Phases 2 and 3 (as explained in Section 6.2).

In addition to soil sampling at the estimated 100 parcels for which soil sampling has not been performed, Phase 1 will also include soil sampling at a number of the properties that were remediated before 2008. The purpose of sampling at these properties is to evaluate whether more recent soil disturbance, by excavations or other property improvement, has reduced or eliminated the clean soil cover that was placed during VCUP soil remediation. The Town of Rico has issued permits for excavations and/or construction projects on some of the previously remediated properties, and those properties have been identified through a review of the building permits issued by the Town from 2008 through 2019. Twenty previously remediated properties of this type have been identified, and those properties are listed in Attachment 5, and their locations are shown on the parcel map in Figure 12. The Applicants believe these 20 properties represent all of the previously remediated/subsequently disturbed properties, but if the Applicants subsequently learn of additional properties of this type, those properties will be evaluated for resampling and analysis of soil in accordance with this section.

For these 20 properties, the Applicants propose to review the location and extent of soil disturbance since 2008 relative to the previously remediated areas of the property, and based on the results of that review, the Applicants would identify the properties warranting resampling and analysis of soil. At a minimum, the Applicants will identify for resampling and analysis those properties where review indicates that previously remediated areas were disturbed (or likely disturbed) to depths of more than 12 inches below the ground surface (bgs), that the disturbance penetrated the fabric marker, and/or that soil from below the fabric marker may have been brought to the surface. Properties for which no documentation of the disturbance is available will also be resampled. For the properties where resampling is needed to confirm soil-lead concentrations, soil samples would be collected during Phase 1, provided access agreements are obtained from the property owners. In addition, for quality control purposes, cover soil at five previously remediated properties where the soil cover appears to be undisturbed (including the Town Park and adjacent roadway surface) will be sampled and analyzed for lead concentrations. The resampling results for both disturbed and undisturbed properties would be relied on to decide whether additional soil remediation needs to be performed to improve or replace the soil cover to achieve 12 inches of clean cover over the remediated area.

The overall approach and methods to be applied for collection and analysis of soil samples from the parcels sampled in Phase 1 will be consistent with those adopted for the 2004 VCUP (as described in AR 2004b and Section 4.5.3). The 2023 Phase 1 VCUP Work Plan (Appendix B) provides specific field and laboratory procedures for the collection and analysis of soil samples.

AR will request that property owners grant AR access to their property for the collection of soil samples; those requests will be made during the first 3 years of Phase 1. If an owner does not provide AR with access to the property during Phase 1, the VCUP ICs program (Section 6.2) may later require that the owner collect soil samples for lead analysis in order to receive the necessary permit for proposed development activities under the Overlay Zone Regulations.

6.1.4 Soil Remediation at Developed Properties

Soil remediation will be performed during Phase 1 at the individual developed properties where soil lead concentrations are greater than the applicable, site-specific action level and for which the property owner provides AR access to the property for that work.

The proposed tasks associated with soil remediation at individual properties during Phase 1 include:

- Requesting and obtaining access for soil remediation from owners of the targeted properties.
- Soil removal and replacement at developed parcels where residential use is allowed, lead in soil exceeds the Residential LAL, and access for remediation has been provided by the owner. Contiguous parcels/lots owned by the same person or entity may, at the discretion of the owner, be remediated as a single "property."
- Soil removal and replacement at previously remediated, developed parcels where the soil cap has since been disturbed and Phase 1 soil data indicate lead in surface soil exceeds the Residential LAL, and where access for remediation has been provided by the owner. The disturbed and undisturbed areas will be sampled prior to remediation to confirm the area warranting remediation. Based on this confirmation, soil remediation may generally be limited to areas of a parcel that have been affected by the disturbance.
- Soil removal and replacement on unpaved roads and alleys, including the non-vegetated portion of the right-of-way owned by the Town (Section 6.1.5) (including existing ditches present within the right-of-way), where lead in soil exceeds the Residential LAL.
- Soil removal and replacement to address lead-containing soil in the Town-owned right of way adjacent to VCUP lot 45, as identified and recommended through the Residual Risk Analysis (Integral 2010; also refer to Section 5.4).
- Maintenance and operation of the Rico Soil Lead Repository for disposal of soil containing lead above the Residential LAL (refer to Section 6.3), or alternative means for managing action-level soils if the capacity of the existing Rico Soil Lead Repository is exhausted. If the latter occurs, AR will, in consultation with the Town, determine how to continue to manage such action-level soils

and mine waste in accordance with applicable state and federal law, including expansion of the Soil Lead Repository, construction of a new repository, beneficial use of the material, and/or off-site transport and disposal. If a new repository is constructed or other off-site disposal option is used, it will either be located a similar driving distance from the Town as the existing repository, or delivery of action-level soils to the existing repository will continue and AR will transport the delivered soil to the new repository or off-site location.

6.1.4.1 Scope of Work

Fifty-two (52) previously sampled, developed properties (i.e., improved properties where a structure is present and in a condition suitable for commercial or residential use and occupation) with soil lead concentrations greater than the applicable LAL have been identified, to date, for soil remediation during Phase 1; this includes parcels where the current zoning is commercial but residential use is allowed. A list of the previously sampled, developed properties that have already been identified for remediation is attached to this Application (Attachment 6). The locations of these properties are indicated on the parcel map in Figure 13.

Additional properties will be identified for remediation on the basis of the soil-lead data collected during the following Phase 1 soil sampling efforts:

- Soil sampling at the approximately 100 parcels that remain to be sampled (refer to Attachment 4 for a list of the properties that will be sampled during Phase 1).
- Soil sampling at previously remediated properties where soil has since been disturbed by excavations and/or new construction permitted by the Town since 2008. The need for re-remediation of a more recently disturbed property will be verified on a case-by-case basis, as indicated through resampling and reanalysis of soil and other site-specific factors (Section 6.1.3). Previously remediated properties to be resampled will be jointly identified by the Town and AR.
- Sampling of cover soil at the Town Park (and adjacent roadway to the west) and four previously remediated properties where the soil cover appears to be undisturbed for quality control purposes. Previously remediated properties to be resampled will be jointly identified by the Town and AR.

The Applicants will request that property owners grant AR access to their developed property for soil remediation; those requests will be made during the first 3 years of Phase 1.

Phase 1 soil remediation will be completed during the summer months (roughly June through mid-September) over a 3- to 4-year period. Thereafter, soil remediation (removal/replacement) will be an element of the VCUP ICs program, and properties where remediation is performed will be identified in accordance with the new Overlay Zone Regulations adopted by the Town, as explained in Section 6.2.

6.1.4.2 Soil Remediation Plan

Soil remediation during Phase 1 will follow the same basic design as the VCUP soil remediation performed in 2005-2007. In the areas of the parcel where the 0-2-inch soil lead concentrations exceed the applicable action levels, soil will be removed to a depth of approximately 12 inches bgs and then an identification barrier will be placed followed by clean soil to backfill the excavated area and restore the original surface grade. For properties with a total area of less than or equal to 5,000 sq ft, sampling areas that exceed the action level will be remediated to the property boundary (excluding areas that are paved or covered by structures or other permanent cover materials). For properties larger than 5,000 sq ft, soil remediation will be performed within a 100-foot radius of the primary occupied structure in sampling sectors where the action level is exceeded. Active play areas identified outside the 100-foot radius may also be included in remediation where appropriate based on the individual sample results associated with each such area. Before backfilling, a barrier/marker material will be placed at the bottom of the excavation (i.e., typically 12 inches bgs) to mark depth of soil replacement. The excavated soil will be transported to the Rico Soil Lead Repository for disposal.

Before initiating cleanup activities at any individual property, AR will request that the owner provide an access agreement for the work, and AR will develop an Individual Site Work Plan (ISWP) for review by the property owner. The ISWP will include a brief narrative and an annotated map that presents a description of the areas where soil will be removed, an estimate of the volume of soil to be removed, the final cover type (e.g., native species, sod, aggregate, or rock mulch), a list of features (e.g., trees, shrubs, fences), that will remain, if any, and steps that will be taken to minimize damage to other features at the property. The map or site-plan drawing will show the property boundaries, key features present in the parcel area, and any features that will be disturbed or modified by soil removal. The ISWP will also identify AR's contractor(s) and key personnel responsible for on-site construction activities, with their contact information. Finally, the ISWP will include photographic documentation of the condition of the property prior to remediation, including structures and any concrete pads, fencing, or other landscaping improvements. The ISWP will be completed under consultation with the property owners.

AR will prepare the ISWPs in accordance with the remedial design and construction specifications included in the 2023 Phase 1 VCUP Work Plan (Appendix B). The 2023 Phase 1 VCUP Work Plan also provides geotechnical, nutrient, and lead concentration specifications for the clean soil used to backfill the areas where soil was removed.

6.1.5 Remediation of Road and Alley Segments

Previous sampling of surface soil on unpaved roads and alleys in the Town of Rico indicates that certain road segments have lead concentrations greater than the Residential LAL. Those segments are the roads and alleys that are targeted for VCUP remediation during Phase 1. Figure 9, "Lead Concentrations in Unpaved Road and Alley Samples 0-2" Depth," indicates lead concentrations in samples collected from the surface materials of roadways and alleys.

Lead concentrations in road surface materials may have changed since the time that some of these samples were collected due to water-line replacement or other utilities and road-maintenance work. To address uncertainty regarding the current lead concentrations on road surfaces in areas disturbed since sampling, the Town of Rico will assist AR in a review of road-disturbing activities since 2004 and, based on this, AR will identify road segments where additional soil characterization is needed to finalize the scope of work for road remediation. Soil sampling will also be performed during Phase 1 to better define the final scope of work for remediation of unpaved roads and alleys.

Sampling and analysis of soil from unpaved roads will be conducted in accordance with procedures in the 2023 Phase 1 VCUP Work Plan, and the lead concentrations from the additional samples will be considered with older road/alley soil data collected for the VCUP project to identify the final road segments for remediation. A soil sampling and analysis report will be prepared by AR summarizing the results of testing for each of the road segments, including a figure showing areas above the action level.

Road remediation will be focused on unpaved roads within the Town of Rico that experience regular vehicular traffic, such as roads that service the Town's existing residential neighborhoods. The project area does not include former mining-claim access roads, roads currently used only for recreation (mountain biking, hiking, skiing, etc.), or any other roads that do not currently serve developed residential parcels. The Town of Rico will conduct the road-remediation work proposed under this VCUP Application, pursuant to a road remediation work plan. The Town intends to initiate this work as soon as possible and complete the road remediation during Phase 1.

The proposed road remediation work includes:

- Removal of up to the top 12 inches of the surface/bedding materials on the road segments with lead concentrations greater than the Residential LAL and capping with clean road base and gravel surface cover. Depending on the existing surface elevation and grade, less than 12 inches of material may be removed from some road/alley segments prior to placement of the 12-inch clean cover. Within each road/alley segment identified for remediation, the extent of removal and replacement will include the traveled road surface and adjacent, unvegetated, Town-owned right of way.

- The surface of existing drainage features along the remediated road segments will be remediated and, if necessary, replaced in kind to the substantially pre-remediated condition, and drainage improvements will be constructed where necessary to protect the integrity of remediated road segments from uncontrolled stormwater flows.

- Testing for the lead concentration of the road base materials and gravel used to cover surface materials along the remediated road segments.

- Development of specifications for future surface maintenance of unpaved roads by the Town; specifications will be developed to limit exposure of the materials containing lead that underlie cover materials placed during VCUP remediation.

- Development of procedures that the Town of Rico may use to control dust generated by vehicle traffic along the Town's unpaved roads.

The 2023 Phase 1 VCUP Work Plan (Appendix B) provides additional details regarding the planned Phase 1 roadway sampling and the remediation design for unpaved roads and alleys.

6.1.6 Record Keeping and Data Management

The soil sampling and soil remediation records generated during Phase 1 cleanup tasks will be maintained for use by the ICs program that is implemented as Phases 2 and 3 of the proposed cleanup. The records to be maintained include:

- Property-owner access agreements for soil sampling and soil remediation by AR;
- Soil sample collection and analysis records and Soil Sampling Reports provided to property owners;
- ISWPs prepared for each of the remediated properties, including records documenting any changes made during remediation;
- Statements of completion from owners of properties where soil was remediated;
- Photographs and any other documentation of the property condition before and after soil remediation; and
- Property-specific documentation of CDPHE’s VCUP determination, as described in Section 6.1.7.

In addition, AR will maintain the existing Rico Townsite Soils VCUP database by incorporating the Phase 1 soil-sample information and results of soil-sample analyses for lead. The database also stores data describing the development status and VCUP sampling and remediation status of each property. The VCUP database will be routinely updated and continuously maintained by AR during the cleanup work to complete Phases 1 and 2. During Phase 3, the Rico Soils Management Program will maintain the database.

6.1.7 Completion of VCUP Actions, By Property

6.1.7.1 Soil Sampling Reports and VCUP No Action Determinations (VCUP NADs)

A soil sampling and analysis report will be prepared by AR for each of the sampled properties within the VCUP project area. The sampling and analysis report will be provided to the property owner for their records, and a copy of the report will also be included in the Rico Townsite Soils VCUP records maintained for reference during the ICs program implemented in Phases 2 and 3.

The sampling and analysis report prepared for each property will document the sample locations, depths, and lead concentrations. The report will also include a copy of the access agreement signed by the property owner and by AR’s representative, and that agreement will indicate that AR received the property owner’s permission to act as their agent under the VCUP to investigate soil conditions on the property and report those results to CDPHE in accordance with requirements of Colorado’s VCUP.

For the properties where the lead in soil concentrations were reported less than the Residential LAL, the sampling and analysis report will also be provided by AR to CDPHE with a formal request for a VCUP NAD. The VCUP NAD will be addressed to the property owner and AR with a copy for the property records maintained by the VCUP ICs Program (refer to 2023 Phase 1 VCUP Work Plan for additional details). AR will inform the property owner of the option to record a deed notice (Title Notice) in the Office of the Dolores County Clerk and Recorder that identifies the existence of the Soil Sampling Report and VCUP NFA in property records maintained by the VCUP ICs program (refer to 2023 Phase 1 VCUP Work Plan for additional details regarding the program's record keeping practices).

6.1.7.2 CLEANUP COMPLETION REPORTS AND VCUP NO FURTHER ACTION DETERMINATIONS (VCUP NFAS)

A Cleanup Completion Report will be prepared by AR upon completion of VCUP soil remediation at each property addressed during Phase 1 as well as for each of the properties where soil remediation was performed under the original 2004 VCUP Application (2005-2007 VCUP soil remediation). Each Cleanup Completion Report will document the work performed and demonstrate compliance with all applicable VCUP requirements. The report will include a copy of the soil-remediation access agreement, signed by the property owner and AR, indicating that AR received the property owner's permission to act as their agent under the VCUP in the performance of soil remediation and to request a VCUP NFA from CDPHE. Each Cleanup Completion Report will also include a copy of the ISWP prepared for the property, with any changes to that plan identified, and a statement of completion signed by the property owner and AR's representative. The Cleanup Completion Report will be submitted to CDPHE with a request for a VCUP NFA.

The VCUP NFA will be addressed to the property owner and AR with a copy for the property records maintained by the VCUP ICs Program (refer to 2023 Phase 1 VCUP Work Plan for additional details). AR will inform the property owner of the option to record a deed notice (Title Notice) in the Office of Dolores County Clerk and Recorder to identify the existence of the Cleanup Completion Report and VCUP NFA in property records maintained by the VCUP ICs program (refer to 2023 Phase 1 VCUP Work Plan for additional details regarding the program's record keeping practices). The VCUP NFA will state that future development activities on the property must comply with the Overlay Zone Regulations.

For each of the road and alley segments and ditches remediated under Phase 1, the Town will complete a Cleanup Completion Report. The Town and AR will jointly submit these Cleanup Completion Reports to CDPHE with a request for a VCUP NFA.

6.2 PHASES 2 AND 3 – INSTITUTIONAL CONTROLS

ICs are non-engineered administrative and/or legal controls that either achieve or support attainment of environmental cleanup objectives. ICs will be implemented at this Site to maintain the protectiveness of VCUP soil remediation completed by AR. The Rico Townsite Soils VCUP ICs are designed to ensure appropriate long-term management of lead-containing soil by providing enforceable soil-handling and soil-disposal requirements for future excavations, new construction, and road maintenance and utilities work. The ICs selected for the Site include (1) governmental controls, in the form of new land-use regulations and a related permitting process for development activities (i.e., the Overlay Zone Regulations), and (2) informational resources such as a soil sampling-and-analysis database, a map-based property-remediation tracking system, and community outreach and education. The proposed governmental controls developed for the Rico Townsite Soils VCUP project include additions to the RLUC, subject to formal adoption by the Town Board of Trustees.

The objectives of the VCUP ICs are to:

- Ensure long-term protection of clean soil covers placed on remediated properties;
- Ensure clean soil covers are placed on properties developed in the future where applicable LALs are exceeded;
- Specify requirements for managing and/or remediating soil when soil covers are disturbed during future development activities; and
- Require appropriate handling and disposal of soil with elevated lead concentrations when such soil is removed from a location of potential environmental concern.

The planned elements of the ICs program include:

- The Town of Rico will establish two new overlay zoning districts, the RSOZ and EROZ, in the RLUC.
- The Town of Rico will adopt, administer, and enforce the Overlay Zone Regulations as part of the RLUC to specify soil-management requirements, including permit requirements, for development activities that will disturb soil within the RSOZ and require CDPHE approval for any development activity within the EROZ.
- AR will operate and maintain a local disposal facility, the Rico Soil Lead Repository, for soil originating from the RSOZ with lead concentrations greater than the Residential, Public Facilities, or Open Space LAL.
- AR will establish a source of clean replacement soil that can be used, as needed, to establish a clean soil cover over areas where soil-lead concentrations are greater than the applicable, site-specific action level.
- Proper handling (and if needed, disposal) of excavated soil during routine maintenance of unpaved roads and subsurface-utility installation and maintenance.
- AR and the Town will engage in community outreach and education.
- AR and the Town will maintain data management systems and record keeping by an electronic database with linked, GIS-based spatial information.

6.2.1 GOVERNMENTAL CONTROLS – OVERLAY ZONE REGULATIONS

The Town will adopt, by a Town ordinance, the Overlay Zone Regulations into the RLUC that establish two overlay zoning districts within the current Town boundaries as defined areas of environmental concern. A draft of the proposed Town ordinance and the Overlay Zone Regulations is provided in

Appendix F for reference. The proposed Overlay Zone Regulations (Appendix F) specify the requirements for soil testing, handling, stockpiling, remediation, and disposal when soil that contains lead above an action level or a soil cover on previously remediated properties is disturbed by excavations, construction, or other development activities. Properties in the EROZ (formerly remediated VCUP mine sites) and properties within the RSOZ (all other properties) are managed differently under the proposed regulations.

The Overlay Zone Regulations will be enforceable by both the Town and CDPHE. Simultaneously with or shortly after the Town's adoption of the Overlay Zone Regulations, the Town and CDPHE will enter into an intergovernmental agreement (IGA) pursuant to C.R.S. § 25-15-320(3) and C.R.S. § 29-1-203. The IGA will authorize CDPHE to oversee the Town's implementation of the Overlay Zone Regulations and to enforce the regulations separately.

6.2.1.1 Rico Soils Overlay Zone (RSOZ)

The RSOZ is defined as the area within the current Town boundaries, excluding the area delineated as the EROZ.

Once the proposed Overlay Zone Regulations have been adopted into the RLUC, the Town will administer and enforce the requirements of those regulations by issuing Soils Excavation Permits for excavation and construction projects that will disturb soil at locations within the RSOZ. Soils Excavation Permits issued for work at properties where VCUP soil remediation was performed will include property-specific requirements for managing and disposing excavated soil and instructions to preserve and/or replace the original clean soil cover in areas of the property where soil-lead concentrations are above the applicable site-specific action level. The RSOZ requirements for soil sampling and analysis, soil remediation by removal and replacement, and disposal of soil with lead concentrations above the LALs are generally consistent with the procedures specified for Phase 1 of the VCUP project (refer to Section 6.1). However, for remediation of any Open Space parcels in Phases 2 and 3, only the area that will be disturbed by the development activity (e.g., trail) will be remediated, and not the full sampling area or sector of the individual lot or lots.

6.2.1.2 Environmental Remediation Overlay Zone (EROZ)

The EROZ covers certain properties within the Town boundaries that have been remediated by AR and other parties pursuant to separate VCUP plans and NFAs approved by CDPHE, or that have been otherwise remediated under the oversight of CDPHE. Development activities within the EROZ which are not covered under this VCUP will be conducted by the landowner entering into a separate VCUP with CDPHE, as specified in the Overlay Zone Regulations. The Town is not responsible for overseeing or managing development in the EROZ, other than directing owners who intend to conduct development activities to CDPHE and enforcing the prohibition in the Town Land Use Code. EROZ sites include (see Figure 1 of Appendix F, Draft Town of Rico Overlay Zone Regulations):

- Grand View Smelter
- Van Winkle Mine

- East Shamrock Mine Waste Rock Pile
- Pro Patria Mill Tailings
- Santa Cruz, Iron Clad, and Rico Boy Mines
- Columbia Tailings
- Silver Swan Mine
- Silver Swan Mine East Waste Rock Pile

6.2.2 Rico Soils Management Program

Upon adoption of the Overlay Zone Regulations pertaining to the RSOZ, AR will establish an administrative program, the "Rico Soils Management Program," to assist the Town of Rico in its management and enforcement of the new governmental controls. The Rico Soils Management Program (the "Program") will provide qualified personnel, information, and technical resources to ensure that the ICs are effectively implemented.

The primary functions of the Rico Soils Management Program are to:

- **Provide information resources** for community members and for tracking the soil-lead concentrations and soil-cleanup status of individual properties. The Rico Soils Management Program will be tasked with –
  - Preparing and distributing information to community members regarding the potential health risks from lead exposure and how to reduce exposure to lead, requirements associated with the new overlay zone districts, and the rationale for those requirements, and assistance available from the Rico Soils Management Program when applying for a Soils Excavation Permit.
  - Managing and maintaining property-specific soil-testing data, soil-remediation records, and VCUP NADs and NFAs, as available, in a searchable environmental database and Geographic Information System (GIS).
- **Provide technical resources** to assist the Town and community in meeting the requirements of the RSOZ, including –
  - Evaluating soil testing results, as available for individual properties, and any conditions indicating the presence of mine waste, to identify the need for remediation on a property-by-property basis.
  - Preparing soil handling and disposal procedures and soil remediation plans for individual properties and reviewing plans for consistency with VCUP project objectives.

  - Reviewing excavation, soil handling, and soil removal/disposal/replacement plans prepared for utilities installations and maintenance in public and Town right of ways for consistency with VCUP project objectives.
  - Providing technical consultation on excavation, soil handling, and soil removal/disposal/replacement as needed to ensure proper segregation of soils and determine whether soils are eligible for disposal at the Rico Soil Lead Repository.
  - Coordinating with AR, as the owner and operator of the Rico Soil Lead Repository, for disposal of soil with lead concentrations above the applicable LAL.

- **Provide materials** to assist the community in meeting the requirements of the RSOZ, including–
  - Maintaining a clean soil stockpile (includes soil testing to confirm soil-lead concentrations <100 mg/kg) suitable for use in the performance of soil remediation.
  - Maintaining a supply of geotextile, which includes landscape fabric or other appropriate commercial-grade marker barrier fabric, to be used by the property owner/developer as a marker for soils covers, plastic sheeting, and suitable containers for soil management and transport.

VCUP Phase 2 will start when the Town adopts the Overlay Zone Regulations into the RLUC. During Phase 2, AR will be responsible for implementing the Rico Soils Management Program, in coordination with the Town. AR will implement the program until fifteen (15) previously undeveloped properties have been processed through the VCUP program or at least 3 years following completion of VCUP Phase 1, whichever is longer, and until the various protocols put in place to manage Program operations have been demonstrated as fully functional.

VCUP Phase 3 will start when the Town of Rico takes over the Rico Soils Management Program when Phase 2 terminates, and the Town will be responsible for operating the Program throughout Phase 3. During Phase 3, AR will provide financial support, in accordance with a legally binding funding agreement, as necessary to the Town to ensure that the Program continues as intended.

Key elements of the proposed Rico Soils Management Program are described separately below.

6.2.2.1 Information Resources

Community Outreach and Education

The purpose of the community outreach program is to increase awareness of requirements associated with the new overlay zone districts and provide educational information to explain the rationale for those requirements. This program will target property owners, real estate professionals, construction contractors, and real estate developers. The notification methods and education materials will be designed to reach these target groups. A combination of direct and passive outreach methods will be utilized, including:

- Annual mailings for the first 5 years of the Rico Soils Management Program that provide summary information about and instructions for compliance with the overlay zone regulations. These materials will also provide internet addresses for additional information resources provided on the Rico Townsite Soils VCUP Project website (see Section 6.1.2).

- Presentations during public meetings and open information sessions convened by either the Town of Rico and/or the Rico Soils Management Program and advertised to the local community.

- Explanatory materials and forms/checklists to guide users through the steps needed to obtain a Soils Excavation Permit for work within the RSOZ. These materials would be available to download from the Rico Townsite Soils VCUP Project/Rico Soils Management Program website but also in paper copy at the local office for Rico Soils Management Program personnel, the Town Manager's office, and Rico Public Library.

- Answers to Frequently Asked Questions (FAQs) would be available at the Rico Townsite Soils VCUP Project/Rico Soils Management Program website and in hard-copy format from the Town of Rico at the Town Manager's office, Rico Public Library, and a local business office for AR on-site personnel.

- The Soils Management Program will provide written materials and coordinate with CDPHE to provide information and the appropriate training (if requested by the Town in response to interest from local contractors) to contractors and developers about handling lead contaminated soils, including safe handling practices, dust minimization measures, and transportation safety practices.

Data Management and Record Keeping

The Rico Soils Management Program will maintain an internet-accessible database and map-based user-interface (GIS) for up-to-date, property-specific, soil-sampling results and soil-remediation status. The Program will utilize the same database as maintained by AR during Phase 1 of the VCUP project (refer to Section 6.1.6). VCUP soil and property data compiled prior to the start of Phase 1 for the historical VCUP activities (2004-2015) and data collected, compiled, and maintained during Phase 1 will be included in the database transferred to the Rico Soils Management Program at the end of Phase 1. The database will be maintained by the Rico Soils Management Program through Phases 2 and 3. The Program will periodically update the database's property ownership information using records maintained by Dolores County. Any changes in the Town's zoning classifications and land uses will also be captured in routine updates to the database's property information and GIS layers.

The scope of the property records available through this system will be limited to properties within the RSOZ and the EROZ. For each property in the overlay district, the Program will maintain the following records, as is applicable and relevant for any individual parcel:

- Dated VCUP correspondence with property owner(s), including property access agreements and letters transmitting soil sampling result reports;
- Soil sample-collection records (e.g., location coordinates, sample depth, sample type [composite/grab]) and the results from analyses of the soil samples for lead;
- Soil Sampling Report;
- Individual Site Work Plan(s) prepared to guide soil remediation on a map of the property, including any photographs associated with remediation at the property and records indicating any changes made during construction activities;
- Documentation of CDPHE-issued NAD or NFA;
- Soils Excavation Permit application materials and Soils Excavation Permit(s) issued by the Town of Rico;
- The Cleanup Completion Report filed with the Rico Soils Management Program and the Cleanup Completion Certification issued by the program upon satisfactory completion of work performed in accordance with a Soils Excavation Permit; and
- Documentation of Town-issued Residential, Public Facilities, or Open Space No Action Confirmation, issued pursuant to the Town's Overlay Zone Regulations to document that a property has lead soil concentrations below the applicable LAL.

These records will be maintained in electronic format, and they will be hyperlinked to the parcel record in the VCUP project GIS to allow searching and viewing records associated with any individual property. With ongoing updates and maintenance of the database, GIS, and VCUP records, the Rico Soils Management Program will be able to provide soil sampling and analysis results and other information related to VCUP property remediation to current and future property owners (or their authorized representatives).

The 2023 Phase 1 VCUP Work Plan provides additional information about the VCUP database and GIS and maintenance of those systems.

6.2.2.2 Technical Resources

The Rico Soils Management Program is designed to assist members of the community, including property owners, contractors, and developers, in meeting the various requirements adopted for the RSOZ. The technical resources that the Program would provide during each stage of a development project are explained in the following paragraphs.

<u>Pre-Disturbance Soil Sampling and Analysis</u>

Most of the parcels located in the RSOZ will have already had soil sampling and analysis performed, either during the original VCUP sampling activities or during Phase 1 of the work proposed in this application. The VCUP soil sampling results for any parcel will be available to the parcel's owner from the electronic database maintained by the Rico Soils Management Program.

If development is planned on a property for which VCUP soil lead data are not available, due to a failure of the property owner (past or current owner) to provide AR with access for sampling in the past, then soil sampling will be required. In these cases, the permit applicant will be responsible for hiring a qualified contractor to collect the soil samples and submit them to a laboratory for analysis of lead content. The Rico Soil Management Program will assist the permit applicant with identifying contractors who are qualified (based on qualification specifications in the Overlay Zone Regulations) to conduct this work. The required soil sample collection and analysis procedures will be consistent with those included the 2023 Phase 1 VCUP Work Plan (Appendix B) as well as any additional relevant requirements included in the RLUC.

Preparation and Review of Soils Excavation Permit Applications

The Rico Soils Management Program will review lead concentrations reported from the pre-disturbance soil samples to determine whether planned development activities are subject to the requirements of the RSOZ. If the property has a VCUP NAD on record or if lead concentrations in samples collected in accordance with the VCUP procedures are all less than the Residential LAL and the Town has issued a Town-specific Residential No Action Confirmation (as defined in the Overlay Zone Regulations), then the overlay district requirements will not apply and a Soils Excavation Permit will not be necessary.

When development activities are planned at properties within the overlay district where either soil lead concentrations are greater than the Residential LAL or VCUP soil remediation was performed in the past, the Town will require an application for a Soils Excavation Permit. The Rico Soils Management Program will be available to assist the permit applicants by identifying the documents and information needed for the permit application and assisting with the Town's review of the application.

Identification, Handling, and Disposal of Mine Waste

Mine wastes are distinct in color and texture from the surrounding soil, and they may be present at the ground surface or within shallow subsurface soil at various locations in Rico. When mine waste is suspected at a property and a Soils Excavation Permit has been issued, the Rico Soils Management Program can confirm the presence or absence of such material through a visual inspection and/or XRF testing for lead concentrations by the Rico Soils Management Program.

In accordance with the Overlay Zone Regulations that pertain to the RSOZ, when mine waste is confirmed present, any mine waste removed from a depth of 0 to 12 inches bgs and excess mine waste that cannot be returned to the planned excavation (as defined in a Soils Excavation Permit) below 12 inches as backfill will be eligible for disposal in the Rico Soil Lead Repository.

Soil Management and Soil Remediation

Applicants for Soils Excavation Permits will need to prepare and provide plans for soil management and possible soil remediation activities for review by the Rico Soils Management Program and Town. The

Rico Soils Management Program will provide guidance for plan development, as appropriate. Depending on the soil characteristics at the subject property and the scope of the proposed work, a soil-management plan and/or an ISWP will be prepared. Both the soil management plan and the ISWP are property-specific planning documents that explain how the applicant intends to comply with RLUC requirements for the RSOZ. The purpose of a soil management plan is to identify how soil disturbed by the permitted project will be stockpiled and managed on site. The Overlay Zone Regulations will specify certain required practices for development activities in the RSOZ, and the soil management plan will be consistent with those practices. The purpose of an ISWP is to clearly identify where soil with lead concentrations above the applicable action level are to be excavated, stored, and disposed and where clean soil cover material will be used to limit people's exposure to lead once the permitted project has been completed. The soil management plan and ISWP should be integrated into the same document.

In cases where soil-lead concentrations are above the applicable action level, a 12-inch-thick cover of clean soil will be placed over that soil during final regrading of the site. Placement of soil covers will follow procedures consistent with those used during Phase 1 soil remediation. A barrier/marker material would be placed at a depth of 12 inches and 12 inches of clean soil would be placed directly over that barrier/marker. The clean soil and barrier material would be supplied by the Rico Soils Management Program, if requested by the permit holder.

Analyses of Excess Soil Before Disposal

Excess soil typically remains following excavation and backfilling. The Overlay Zone Regulations specify how excess soil is to be disposed when the total volume exceeds 3 cy and the soil-lead concentration is greater than the Residential LAL. In accordance with the regulations, soil containing lead at concentrations above the Residential LAL that has been removed from a depth of 0 to 12 inches bgs can be transported to the Rico Soil Lead Repository for disposal without the need for further testing. Additional soil excavated from depths greater than 12 inches is to be returned to the excavation, if possible, and then covered with 12 inches of clean soil. If the permitted project generates more than 3 cubic yards of excess soil from depths greater than 12 inches bgs (*i.e*, not including any soil removed to accommodate the 12-inch cap) that cannot be used for backfill at depth, that soil must be tested for lead concentration before transport to the repository for disposal. The excess soil will be allowed at the Rico Soil Lead Repository only if an analysis of representative samples from the stockpile indicates lead concentrations greater than the Residential LAL. If the excess soil that cannot be used for backfill is 3 cubic yards or less in volume, it may be disposed of at the repository without testing.

The Rico Soils Management Program will assist with soil testing to determine appropriate disposal options. The Program will provide field XRF analysis of lead in representative samples from a soil stockpile or excavation area and report those results to the permit holder.

Preparation and Transport of Excavated Soil for Disposal in Repository

The Rico Soils Management Program will not provide transport of excavated soil to the repository, but it will support sampling and analysis of soil to confirm its soil lead content, if needed, and oversee loading of soil at locations of soil excavation and unloading of soil at the repository. Only soil with lead concentrations exceeding the applicable LAL and mine wastes qualify for disposal at the repository. Lead concentration must be confirmed by sampling and analysis in accordance with the Overlay Zone Regulations as described in the preceding subsection, and mine wastes must be confirmed by the Rico Soils Management Program before transport to the repository. Disposal of materials other than soil will not be allowed at the repository, and such materials (e.g., tree roots, large boulders, trash) should not be loaded onto vehicles transporting soil to the repository.

Cleanup Completion Reports

At the completion of the permitted scope of work, the Applicant, with support from the Rico Soils Management Program, will prepare a Cleanup Completion Report to document that soil management and/or soil remediation specified in the permit application was performed and to record soil-lead conditions existing at the end of the project. The Town will issue a Cleanup Completion Certification when the soil management and/or soil remediation has been adequately performed. The Report and Certification will become part of the property record maintained by the Rico Soils Management Program for future reference.

6.2.2.3 Clean Soil Supply

The Rico Soils Management Program will be responsible for maintaining a local supply of soil that can be used as clean soil cover at locations where soil-lead concentrations are greater than the applicable site-specific action level. The clean soil supply will be material suitable for revegetation. Detailed geotechnical, nutrient, and lead-content specifications for the clean soil supply are presented in the 2023 Phase 1 VCUP Work Plan (Appendix B). The Program will arrange for testing of the clean soil supply, as needed to demonstrate that it meets the specifications included in the 2023 Phase 1 VCUP Work Plan.

The Program will also be responsible for arranging the transport of clean soil to a secure stockpile location within or proximal to the Town of Rico. The clean-soil stockpile will serve as supply for property owners and their contractors when a clean soil cover is specified in an ISWP prepared and submitted with applications for Soils Excavation Permits. In such cases, the Rico Soils Management Program will provide access to the stockpile for loading and transport of clean soil to the subject property.

6.2.3 Town Maintenance of Remediated Road Segments

The Town will plan, manage, and perform all road and alley maintenance along the segments remediated during Phase 1. The Town will perform the work in accordance with the materials and construction specifications prepared for the Town by AR during Phase 1 (refer to Section 6.1.5). AR will provide financial support to the Town for maintaining road and alley segments remediated in Phase 1, but AR will not have other involvement in the Town's management, contracting, or performance of remediated roadway and alley maintenance.

6.3 RICO SOIL LEAD REPOSITORY OPERATIONS, MAINTENANCE, AND CLOSURE

Throughout the VCUP project (i.e., Phases 1, 2, and 3) AR will operate and maintain the Rico Soil Lead Repository to provide an appropriate location for disposal of soil with lead concentrations above the applicable LAL. AR holds a Certificate of Designation issued by Dolores County for operation of the repository, and the Certificate of Designation permits soil removed from locations within the Town of Rico to be disposed in the repository. As the owner and operator of the repository, AR accepts soil for disposal when the soil-lead concentration is greater than the Residential LAL and that soil has been excavated within the Town of Rico.

The 2004 Engineering Design and Operations Report (SEH 2004) identifies AR's operations and maintenance tasks, which include:

- Controlling access to the repository to prevent vehicular traffic over disposed soil.
- Designing, constructing, and maintaining any drainage controls needed to limit erosion and transport of disposed soil from the repository via surface runoff.

These tasks are currently performed by AR, as needed, and AR will continue routine operations and necessary maintenance tasks for as long as the Rico Soil Lead Repository supports the Rico Soils Management Program.

When the repository is no longer needed or reaches its capacity, AR will complete the closure activities required by the Certificate of Designation, including placement of a permanent cover consisting of an infiltration layer and growth media. The repository closure plan is presented in greater detail in the 2004 Engineering Design and Operations Report (SEH 2004).

After completing soil sampling and analysis in Phase 1 of the VCUP, AR shall provide the Town with an estimate of the remaining capacity in the Repository and whether that capacity is sufficient to accept reasonably anticipated volumes of soil with lead concentration greater than the Residential LAL. If the capacity of the existing Rico Soil Lead Repository is exhausted, AR will, in consultation with the Town, determine how to continue to manage such action-level soils and mine waste in accordance with applicable state and federal law, including expansion of the Soil Lead Repository, construction of a new repository (including potentially at the location of the Columbia Tailings VCUP site), beneficial use of the material, and/or off-site transport and disposal. If a new repository is constructed or other off-site disposal option is used, it will either be located a similar driving distance from the Town as the existing repository, or delivery of action-level soils to the existing repository will continue and AR will transport the delivered soil to the new repository or off-site location.

7 SCHEDULE FOR COMPLETION OF VCUP ACTIVITIES

The planned duration of the proposed Rico Townsite Soils VCUP is longer than 2 years. The Applicants are requesting that CDPHE grant a 15-year extension to allow for completion of the proposed cleanup through Phases 1 and 2. The VCUP ICs program operating in Phase 3 would provide continued, long-term maintenance of the cleanup work performed during Phases 1 and 2.

Table 2 indicates the projected schedule for Phase 1. The Phase 1 field activities (i.e., soil sampling, verification XRF screening, soil remediation, soil disposal at repository) will be scheduled during summer months, and the rate at which field activities can safely proceed will depend in part on factors that are beyond the Applicants' control. The Town of Rico sits at an elevation of approximately 8,800 feet, and the field season in Rico is short (early June through mid-October) with highly variable weather conditions. In addition, on-site soil sampling and remediation activities are contingent on obtaining written access agreements from property owners, and the process of obtaining access agreements may delay work at some properties. Given these potential scheduling issues, the projected timelines for field work are in Table 2 extending over one or more years.

TABLE 2 PROJECTED SCHEDULE[1] FOR VCUP PHASE 1

ITEM	DATE
Submit Revised 2023 VCUP Application	2nd Quarter 2023
VCUP Application Approval by CDPHE	60 days from submittal
Public Outreach	2ND Quarter 2023 through 2ND Quarter 2026 (3 years)
Obtain Access Agreements	3RD Quarter 2023 through 3RD Quarter 2026 (3 years)
Town adopts Overlay Zone Regulations	2ND Quarter 2023
Soil Sampling and Analysis for Lead	2023 - 2025 (2-3 summers)
Remediation of Developed Parcels	2024 - 2026 (2-3 summers)
Remediation of Unpaved Road Segments	2024 - 2026 (2 summers)
Prepare sampling and analysis reports and request **No Action** determinations, by property	2023 – 2026
Prepare Cleanup Completion Reports and request **No Further Action** determinations, by property	2023 – 2026

[1] This schedule is based on the assumption that the VCUP Application will be accepted and work can begin in summer 2023.

The anticipated schedule for implementing Phases 2 and 3 is presented in Table 3. Phase 2 begins at the same time as Phase 1 but will extend for at least 3 years after the start of Phase 2 and will continue until at least fifteen (15) previously undeveloped properties have been processed through the VCUP program as part of Phase 2, whichever time period is longer. As such, the anticipated duration of Phase 2 is at least 7 years. At the end of Phase 2, AR would transfer the management responsibilities associated with the Rico Soils Management Program to the Town. This transfer will take place when AR and the Town agree that the management tools and other resources that the Town will need are in place and have been tested and optimized to achieve an effective and efficient Program for the Town's operation.

TABLE 3 ANTICIPATED SCHEDULE[1] FOR INSTITUTIONAL CONTROLS PROGRAM – VCUP PHASES 2 AND 3

ITEM	DATE
Submit Revised 2023 VCUP Application	2nd Quarter 2023
VCUP Application Approval by CDPHE	60 days from submittal
Town adopts Overlay Zone Regulations	2ND Quarter 2023
Start of VCUP Phase 2 - Rico Soils Management Program implementation by Atlantic Richfield	Upon Town's adoption of the Overlay Zone Regulations (expected in 2ND Quarter 2023).
End of VCUP Phase 2 and Start of VCUP Phase 3 - Rico Soils Management Program implementation by Town of Rico	No less than 3 years after the start of Phase 2 or no sooner than 15 previously properties have been remediated during Phase 2, whichever is longer, at a time to be agreed upon by AR and Town of Rico.

[1] This schedule is based on the assumption that the VCUP Application will be accepted and work can begin in summer 2023.

8 REFERENCES

AECOM. 2014. Evaluation of Background Lead Concentrations, Rico Townsite, Appendix A of the Sampling and Analysis Plan, Revision 1, Rico Soils Voluntary Cleanup Program, Rico, Colorado. Prepared for Atlantic Richfield Company, July 2014.

Atlantic Richfield Company (AR), Rico Properties, L.L.C., Town of Rico (AR et al.). 1996a. Voluntary Cleanup and Redevelopment Act Application for Columbia and Old Pro Patria Mill Tailings and Silver Swan East Wasterock Pile. Submitted to Colorado Department of Public Health & Environment (CDPHE). Prepared by ESA Consultants, Inc. January 1996.

AR, Rico Properties, L.L.C., Town of Rico (AR et al.). 1996b. Voluntary Cleanup and Redevelopment Act Application for Silver Swan Mine Area. Submitted to CDPHE. Prepared by ESA Consultants, Inc. February 1996.

AR, Rico Properties, L.L.C., Town of Rico (AR et al.). 1996c. Voluntary Cleanup and Redevelopment Act Application for Santa Cruz Mine Area. Submitted to CDPHE. Prepared by ESA Consultants, Inc. March 1996.

AR, Rico Properties, L.L.C., Town of Rico (AR et al.). 1996d. Voluntary Cleanup and Redevelopment Act Application for Grand View Smelter Site. Submitted to CDPHE. Prepared by ESA Consultants, Inc. April 1996.

AR. 1996. Engineering Evaluation/Cost Analysis for The Santa Cruz Mine area, Columbia Tailings Site, Argentine Tailings Site, Silver Swan Mine Area, and The Grand View Smelter Site. Prepared by Titan Environmental Corporation. May 1996.

AR. 2004a. Rico Townsite Soils VCUP Application, Rico, Colorado. Submitted to CDPHE. Submitted by Atlantic Richfield Company, Rico Renaissance, LLC, Rico Properties, LLC, Town of Rico. Prepared by Short Elliott Hendrickson Inc. June 24, 2004.

AR. 2004b. Rico Townsite Soils Phase I Work Plan and Preliminary Data Report, Rico, Colorado. Submitted to CDPHE. Submitted by Atlantic Richfield Company, Rico Renaissance, LLC, Rico Properties, LLC, Town of Rico. Prepared by Short Elliott Hendrickson Inc. September 23, 2004.

AR. 2006. Volume I Rico Townsite Soils VCUP Project Final Data Report and Data Evaluation, Rico, Colorado. Submitted to CDPHE. Submitted by Atlantic Richfield Company, Rico Renaissance, LLC, Rico Properties, LLC, Town of Rico. Prepared by Short Elliott Hendrickson Inc. June 7, 2006.

AR. 2007. Letter from Chuck Stillwell, Environmental Manager, Atlantic Richfield Company to Mark Walker, Voluntary Cleanup Program, CDPHE, dated February 2, 2007 RE: Rico Railroad Corridor Sampling and Analysis Report.

Colorado Department of Public Health and Environment (CDPHE). 2003. Targeted Brownfields Assessment, Analytical Results Report and Appendix C - Data Validation Report, North Rico Light Industrial Park and County Maintenance Barn Sites, Rico, Colorado. Prepared by EMC2. April 2003.

CDPHE. 2019. Colorado Voluntary Cleanup and Redevelopment Program Roadmap. https://oitco.hylandcloud.com/CDPHERMPop/docpop/docpop.aspx Prepared by the Hazardous

Materials and Waste Management Division, Colorado Department of Public Health and Environment. November 2019.

Dames and Moore. 1981. Flood hazard areas, Anaconda mining sites, Dolores River and Silver Creek, Rico, Colorado. Prepared for the Anaconda Copper Company. January 1981.

ENVIRON International Corporation. 2011. ENVIRON International Corporation. Updated Rico Soils Residual Risk Analysis, Rico, Colorado. Prepared for Atlantic Richfield Company. June 2011.

ESA Consultants Inc. 1996. Technical Memorandum on Confirmation Soil Sampling Analytical Results for Rico Site Remediation Project. Prepared for Atlantic Richfield Company. November 7, 1996.

Integral Consulting Inc. (Integral). 2006a. Integral Consulting Inc. Lead Health Risk Assessment for Rico Townsite Soils. Submitted to CDPHE. Submitted by Atlantic Richfield Company, Rico Renaissance, LLC, Rico Properties, LLC, and Town of Rico. April 6, 2006.

Integral. 2006b. Blood Lead and Environmental Monitoring for Rico Townsite Phase I Data Summary Report. Prepared for Atlantic Richfield Company. September 15, 2006.

Integral. 2007. Blood Lead and Environmental Monitoring Study for Rico, Colorado, Phase II Data Summary Report and Trend Analysis. Prepared for Atlantic Richfield Company. February 13, 2007.

Integral. 2010. Integral Consulting Inc. Rico Soils Residual Risk Analysis, Rico, Colorado. Prepared for Atlantic Richfield Company. February 4, 2010.

McKnight, E.T. 1974. Geology and Ore Deposits of the Rico District, Colorado. US Geological Survey Professional Paper 723.

PTI Environmental Services. 1995. Summary of Townsite Soils Data for Rico, Colorado. Prepared for Atlantic Richfield Company and ESA Consultants. November 1995

Ransome, F.L. 1901. The Ore Deposits of the Rico Mountains, Colorado. U.S. Geological Survey Annual Report, 22nd, Part 2: 229-398.

Short Elliott Hendrickson (SEH). 2004. Engineering Design and Operations Report to accompany Application for Certificate of Designation for Soil Lead repository, North Rico (St. Louis Ponds) Site in Rico (Dolores County), Colorado. Prepared for Rico Properties, LLC, as a representative of Rico Renaissance, LLC by Short Elliott Hendrickson Inc. December 22, 2004.

Titan Environmental Corporation (TEC). 1996. Titan Environmental Corporation (TEC). Geologic Mapping and Geochemical Sampling at Rico, Colorado, October 1996. Prepared by Michael D. Russ for Titan Environmental Corporation, Englewood, Colorado. January 1996.

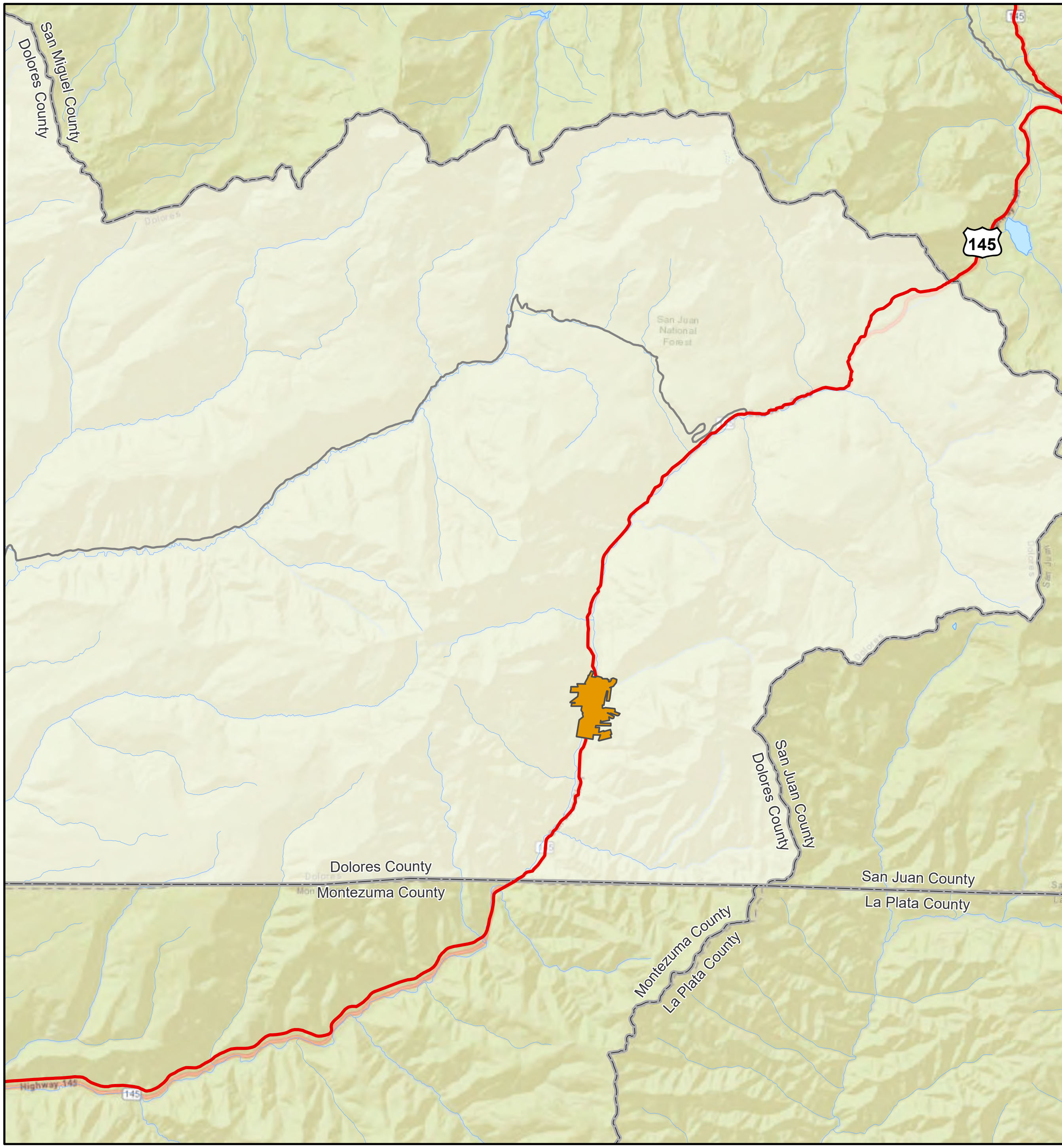
TREC, Inc. 2015. Rico Town Soil Sampling Project Rico (Dolores County) Colorado, 2014-2015 Data Summary Report. Prepared for Atlantic Richfield Company.

Walker (CDPHE), 1996. Soils Study, Rico, Colorado. August.

Walsh Environmental Scientists and Engineers (Walsh). 1995. Walsh Environmental Scientists and Engineers. Phase I and Phase II Environmental Site Assessment, Rico, Colorado. Prepared for

Davis, Graham, and Stubbs, Denver, Colorado. Prepared by Walsh Environmental Scientists and Engineers, Boulder, Colorado. May 1995.

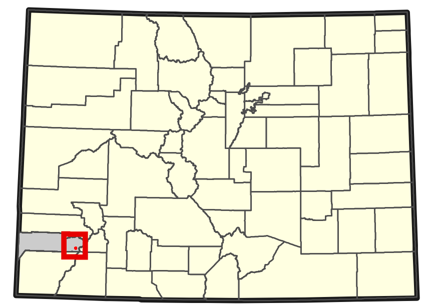
FIGURES



Legend

- Rico, CO
- Highways
- Counties
- Roads

Location of Rico
In Dolores County, Colorado



Basemap Sources: World_Street_Map: Bureau of Land Management, Esri, HERE, Garmin, NGA, USGS, NPS

0 10,000 20,000
Feet

N

RICO, COLORADO

FIGURE 1

RICO TOWNSITE LOCATION MAP

DATE: OCT 29, 2021		FORMATION ENVIRONMENTAL
BY: DKG	FOR: BGH	

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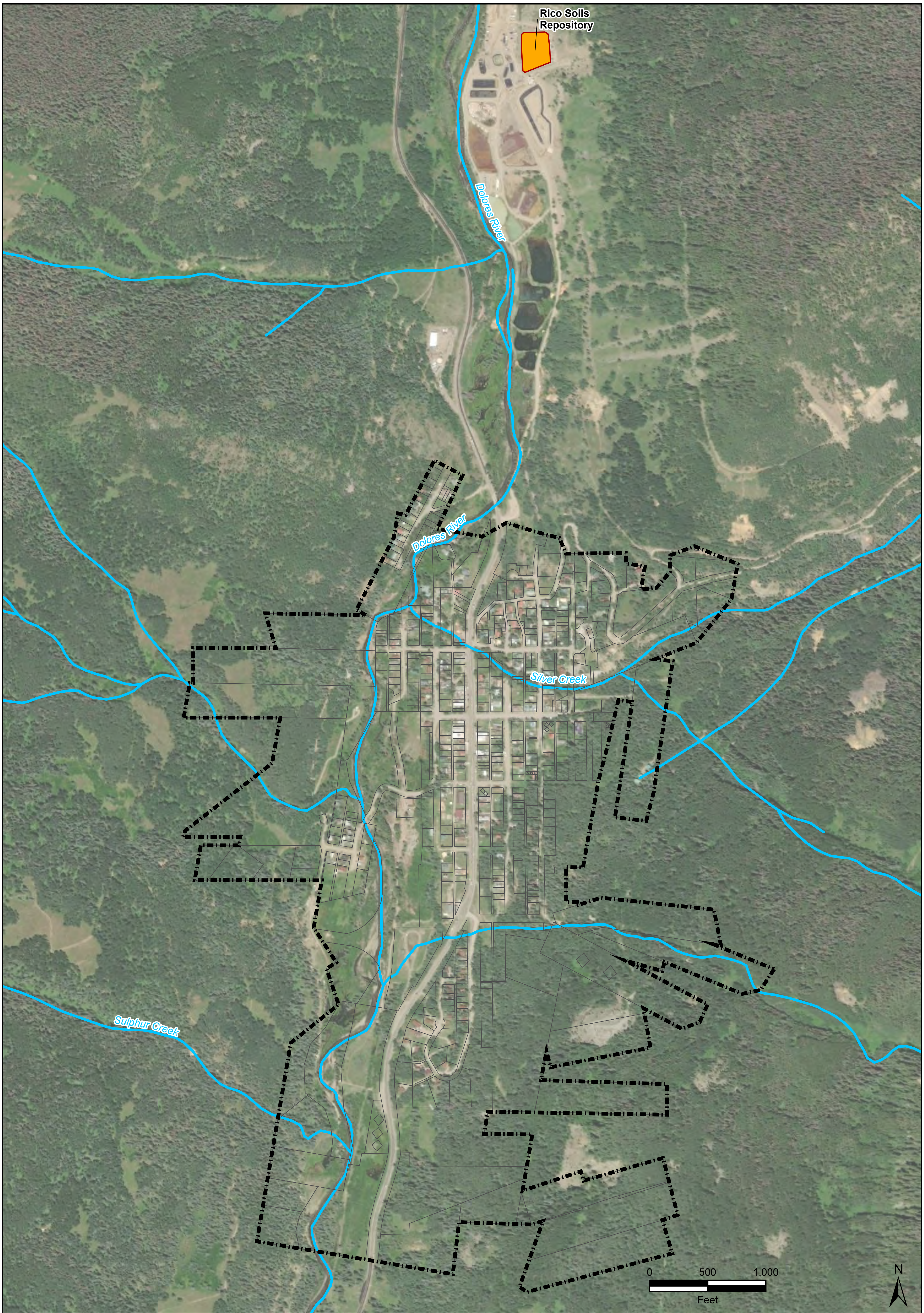

Legend

- Rico Soils Repository
- Land Parcels Recorded by Dolores County (January, 2020)
- River/Stream
- Town of Rico Boundary

Service Layer Credits: World Imagery: Maxar

RICO, COLORADO

FIGURE 2

TOWN OF RICO BOUNDARY AND PARCELS (JANUARY 2020)

DATE: OCT 29, 2021		FORMATION ENVIRONMENTAL
BY: DKG	FOR: BGH	

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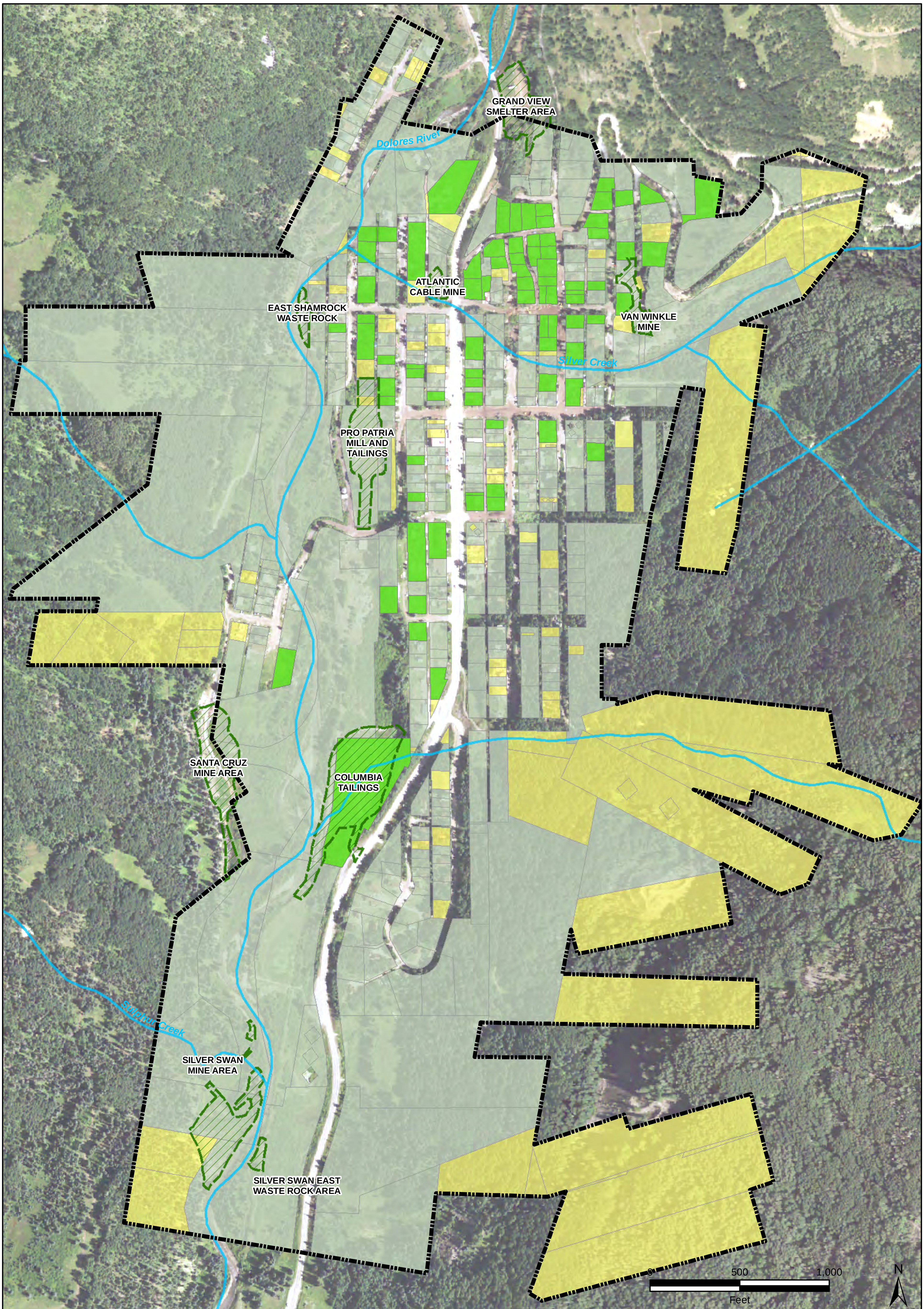

Legend

- Parcel Boundaries
- Parcels Without VCUP Soil Lead Data
- Remediated Parcels
- VCUP Mine Sites
- Parcels Where VCUP Soil Sampling Was Performed (2005-2015)
- Rivers and Streams
- Town of Rico Boundary (Source: Town of Rico, 2019)

Basemap: 2015 NAIP Imagery

RICO, COLORADO

FIGURE 3

PREVIOUSLY SAMPLED AND REMEDIATED PARCELS

DATE: OCT 28, 2022

BY: DKG | FOR: BGH

FORMATION ENVIRONMENTAL

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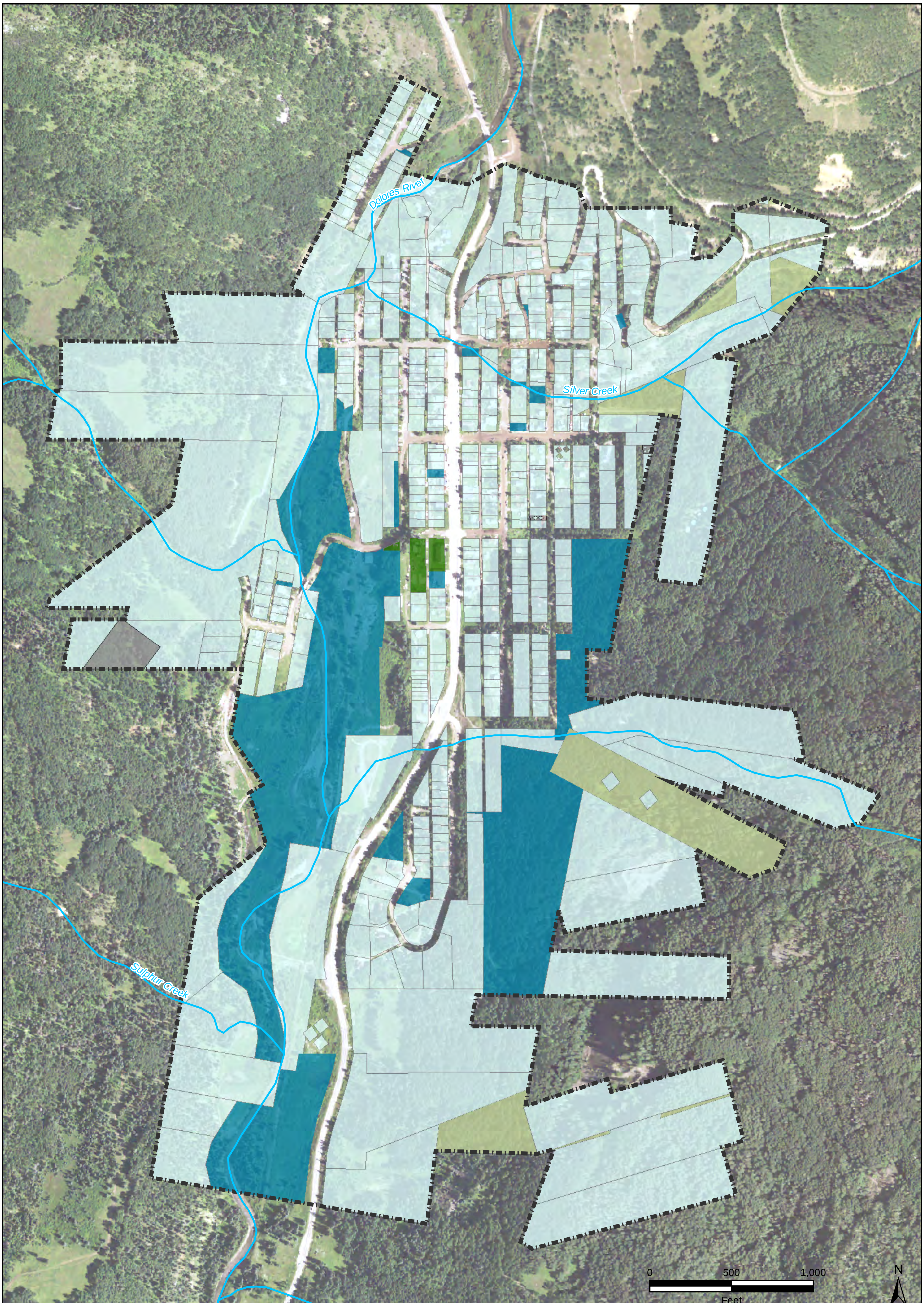

Legend

Land Ownership

- No Owner Listed In Dolores County Assessors Database
- Private
- Dolores County
- San Juan National Forest
- Town of Rico
- River/Stream
- Town of Rico Boundary

RICO, COLORADO

FIGURE 4

TOWN OF RICO BOUNDARY AND PROPERTY OWNERSHIP MAP (FEB 2023)

DATE: MAR 06, 2023	
BY: DKG	FOR: BGH

FORMATION ENVIRONMENTAL

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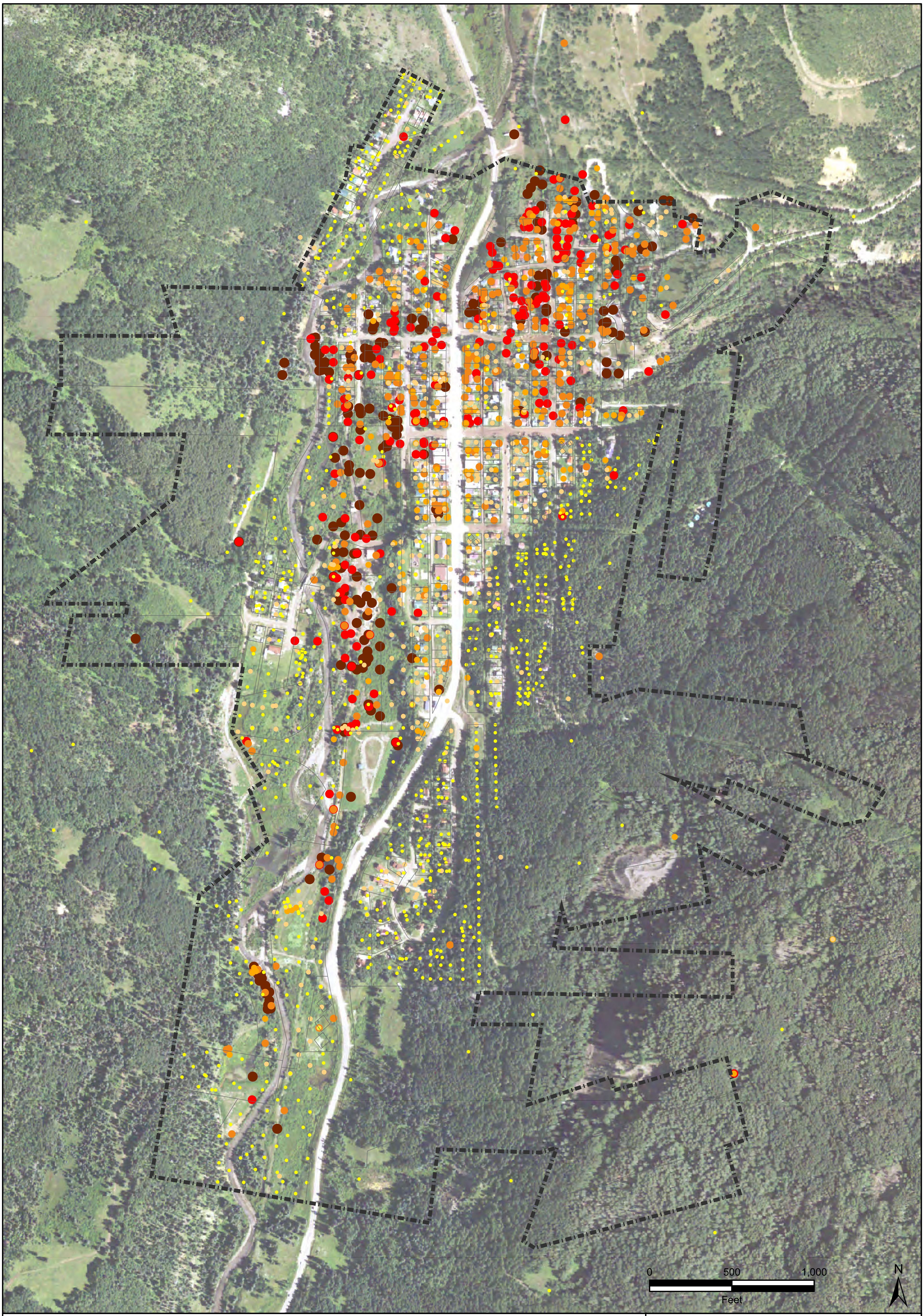

Lead Concentrations in Soil 0-2in (mg/kg)

- < 400
- 400 - 800
- 800 - 1100
- 1100 - 1700
- 1700 - 3000
- > 3000

Parcels (Dolores County January, 2020)

Town of Rico Boundary

Basemap: 2015 NAIP Imagery

RICO, COLORADO

FIGURE 5

PRE-REMEDIATION SPATIAL DISTRIBUTION OF LEAD IN SOIL (0 - 2 INCHES)

DATE: OCT 29, 2021	
BY: DKG	FOR: BGH

FORMATION ENVIRONMENTAL

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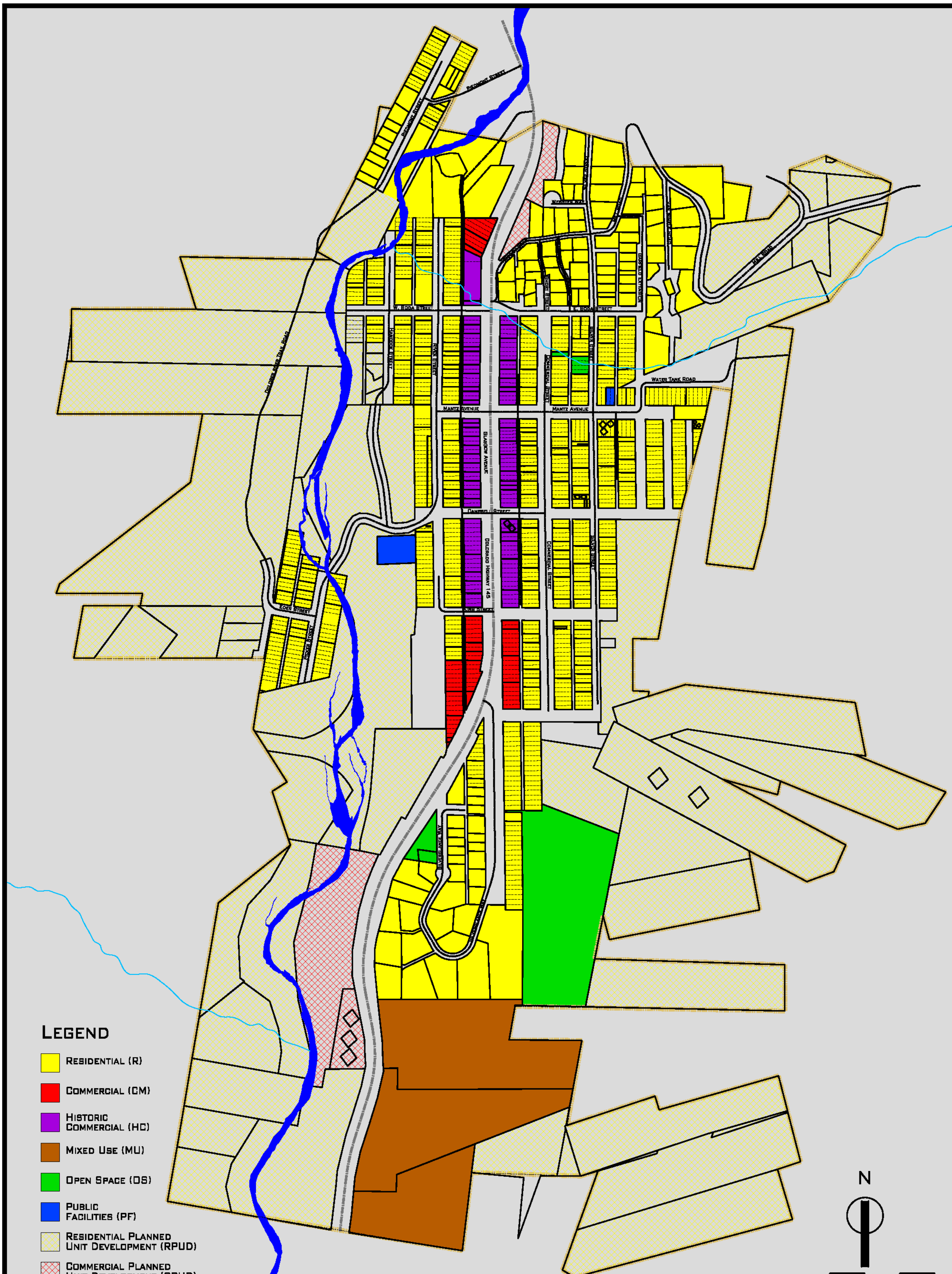
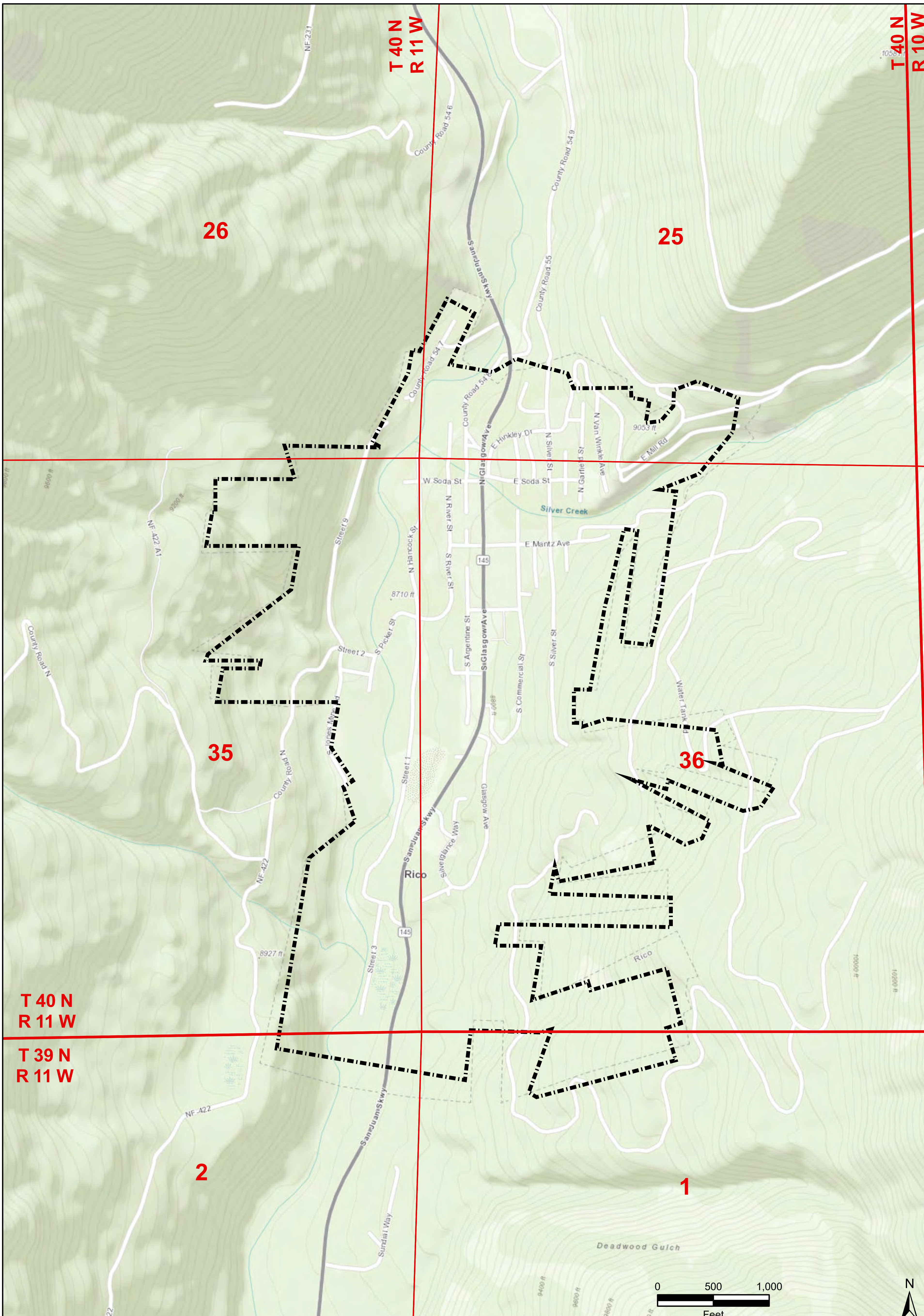


FIGURE 6

Town of Rico
Official Zoning Map



Legend

Township/Range

Section

Town of Rico Boundary (~ 453 acres)

Base Layer Credits: World Topographic Map: Bureau of Land Management, Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA, EPA, USDA

RICO, COLORADO

FIGURE 7

LOCATION AND SIZE OF SITE WITH TOWNSHIP AND RANGE

DATE: OCT 29, 2021

BY: DKG

FOR: BGH

FORMATION ENVIRONMENTAL

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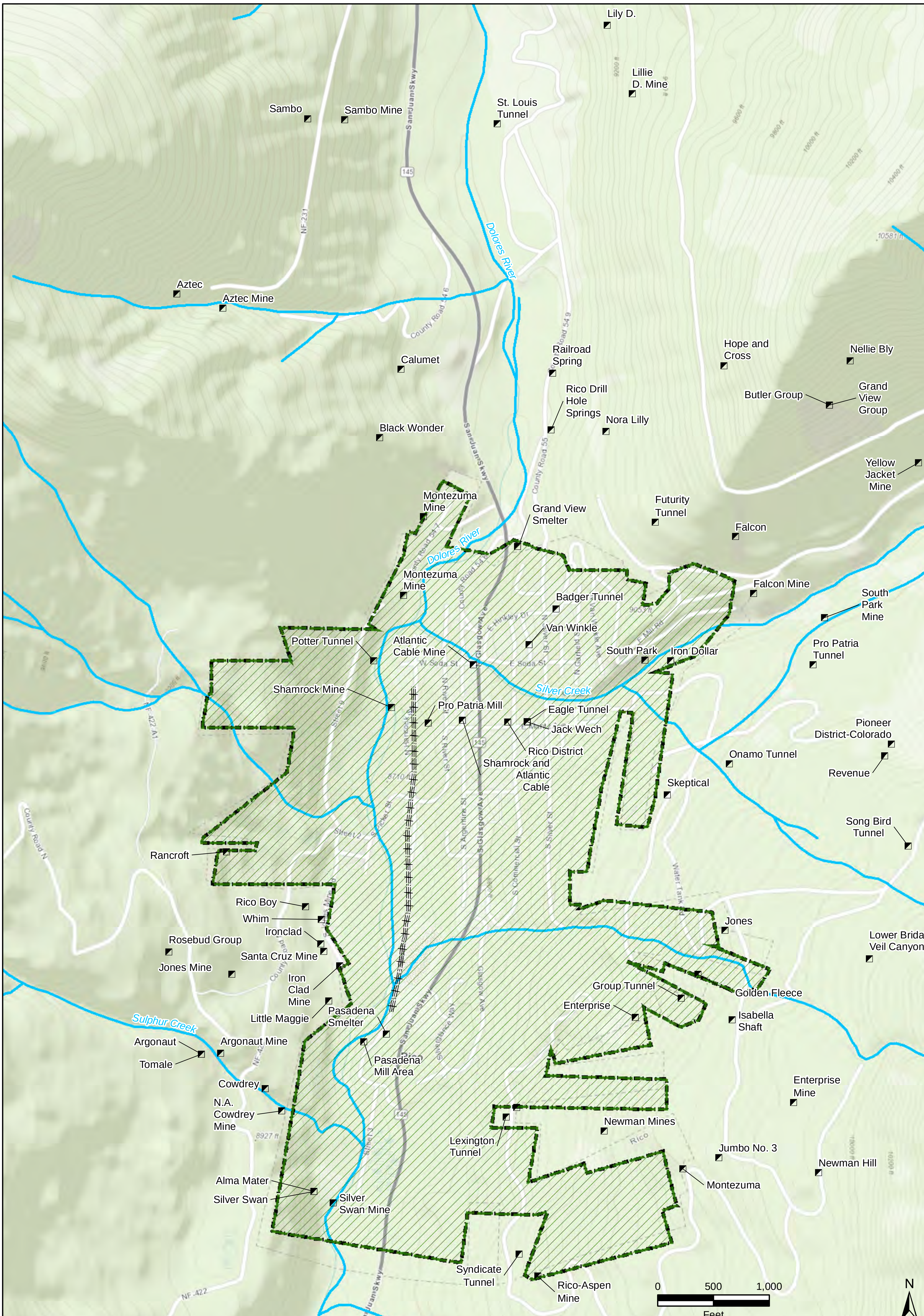

Legend

- Mines and Smelters
- Abandoned Railroad
- Town of Rico Boundary
- Town of Rico Boundary (~ 453 acres)
- River/Stream

Base Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL,

RICO, COLORADO

FIGURE 8

HISTORICAL MINES AND SMELTERS IN THE TOWN OF RICO

DATE: SEP 14, 2022

BY: DKG | FOR: BGH

FORMATION ENVIRONMENTAL

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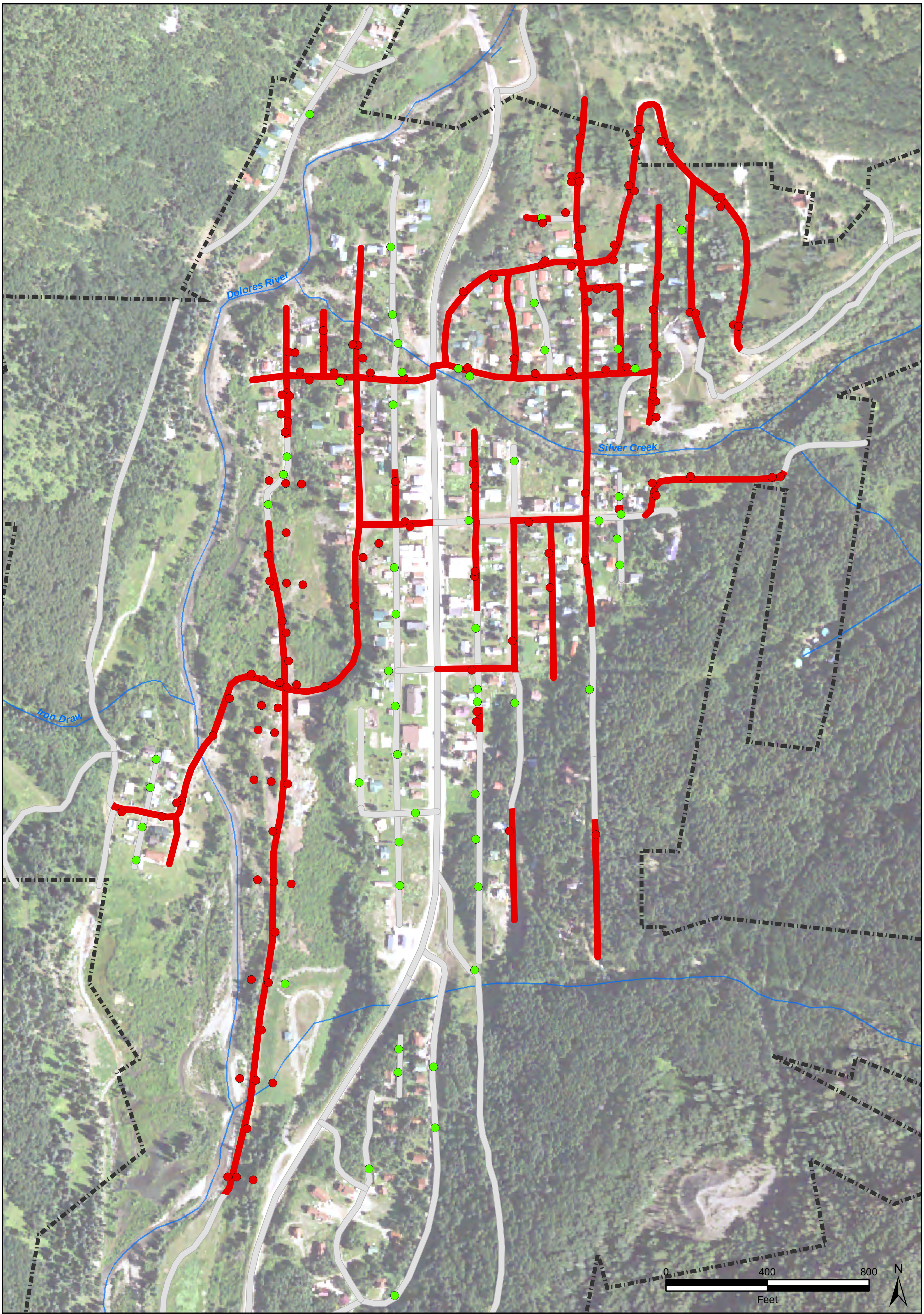


Legend

Road/Alley Lead Results 0 - 2"

- <= 761mg/kg Lead
- > 761 mg/kg Lead

Roads and Alleys

- >= 761 mg/kg Lead

Rivers and Streams

Town of Rico Boundary

Sources:
1. Anderson Engineering, Railroad Corridor and Alley Samples, 2008.
2. Short Elliott Hendrickson Inc. (SEH), Collected 2 subsamples that were taken at locations approximately equally spaced from the center of each block then compostied, 2004.
3. Trec Inc., 2014

Total length of road segments > 761 mg/kg/ Lead = ~ 21530 Feet

RICO, COLORADO

FIGURE 9

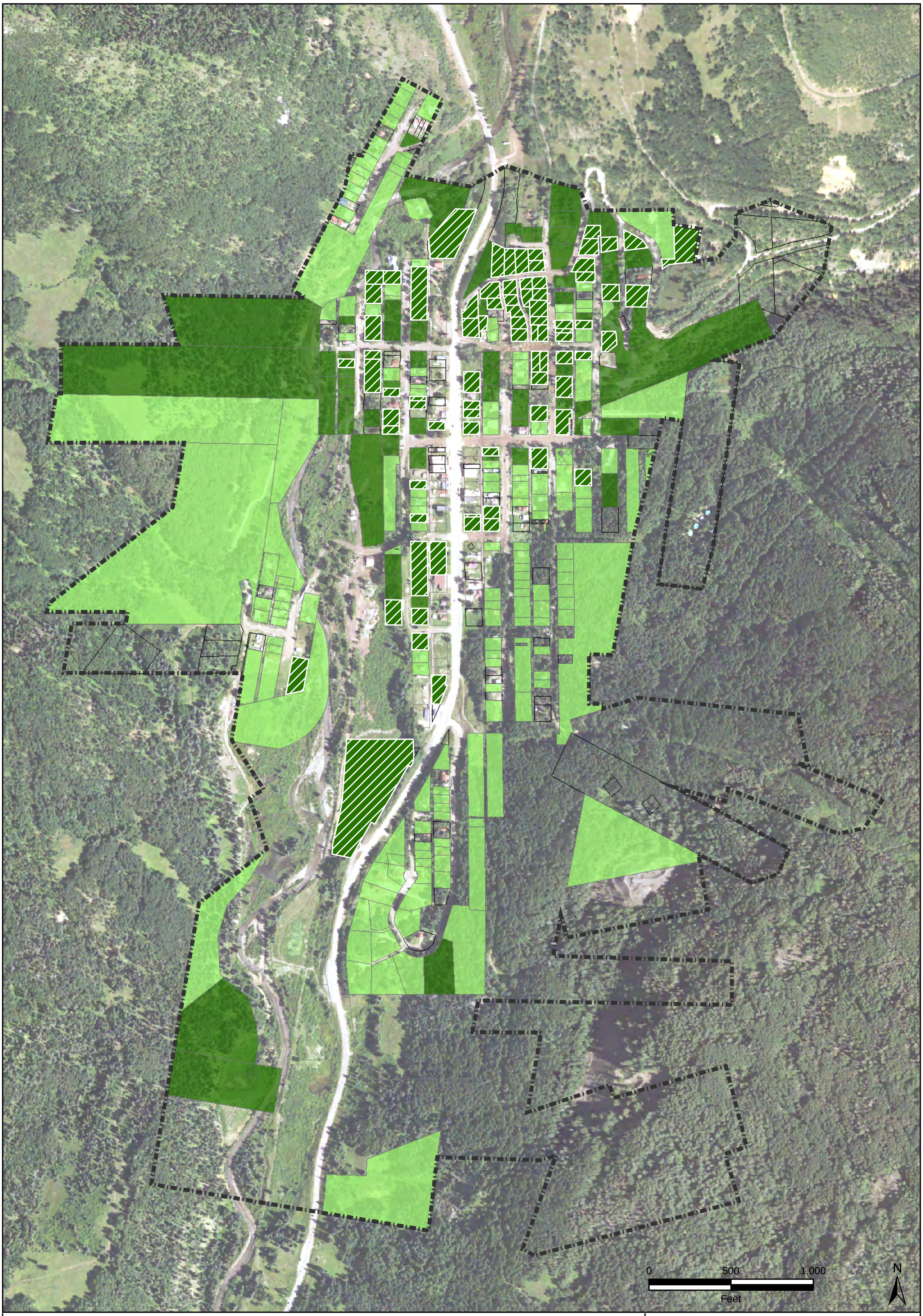
LEAD CONCENTRATIONS IN UNPAVED ROAD AND ALLEY SAMPLES 0 - 2" DEPTH

DATE: NOV 10, 2022

BY: DKG | FOR: BGH

FORMATION ENVIRONMENTAL

S:\GIS\a5\Rico\plt\VCUP_application_2022\Fig09_RoadAlleyAbove761.mxd



Legend

Parcels Not Sampled (2022)

Parcels Not Sampled (2022)

Lead In Soil (0-2 inches) at Sampled Parcels, Not Remediated (2022)

<= 1100

> 1100

Remediated Parcels

Town of Rico Boundary (VCUP Project

Basemap: 2015 NAIP Imagery

RICO, COLORADO

FIGURE 10

VCUP PROJECT REMEDIATION STATUS

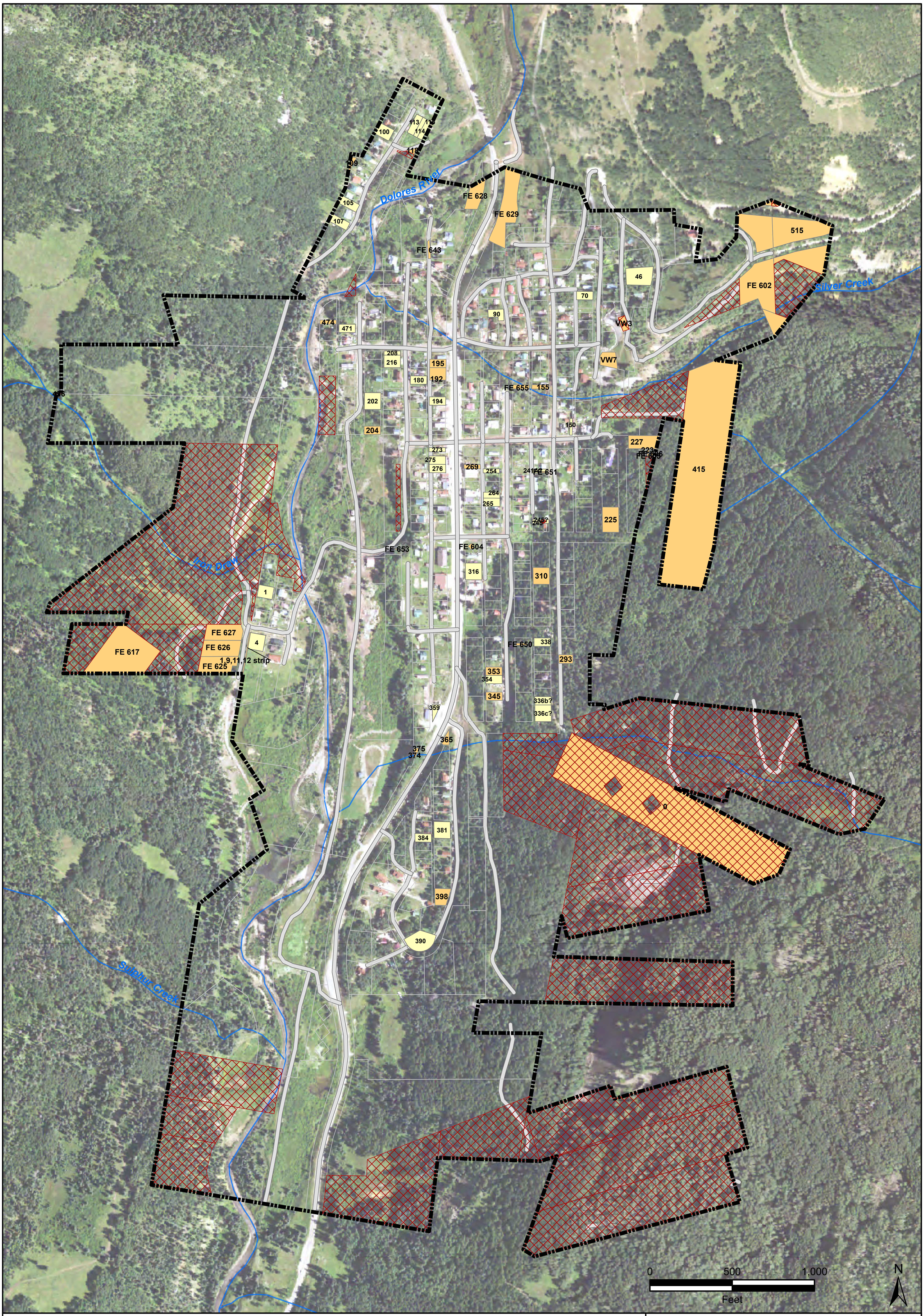
DATE: SEP 07, 2022

BY: DKG

FOR: BGH

FORMATION ENVIRONMENTAL

S:\GIS\a5\Rico\plt\VCUP_application_2021\Fig10_ParcelsSampledResidential.mxd



Legend

- Developed Parcels To Be Sampled (VCUP Property Number)
- Undeveloped Parcels To Be Sampled (VCUP Property Number)
- Parcels
- Parcels Subject to Hazardous Risk
- Rivers and Streams
- Town of Rico Boundary

Basemap: 2015 NAIP Imagery

RICO, COLORADO

FIGURE 11

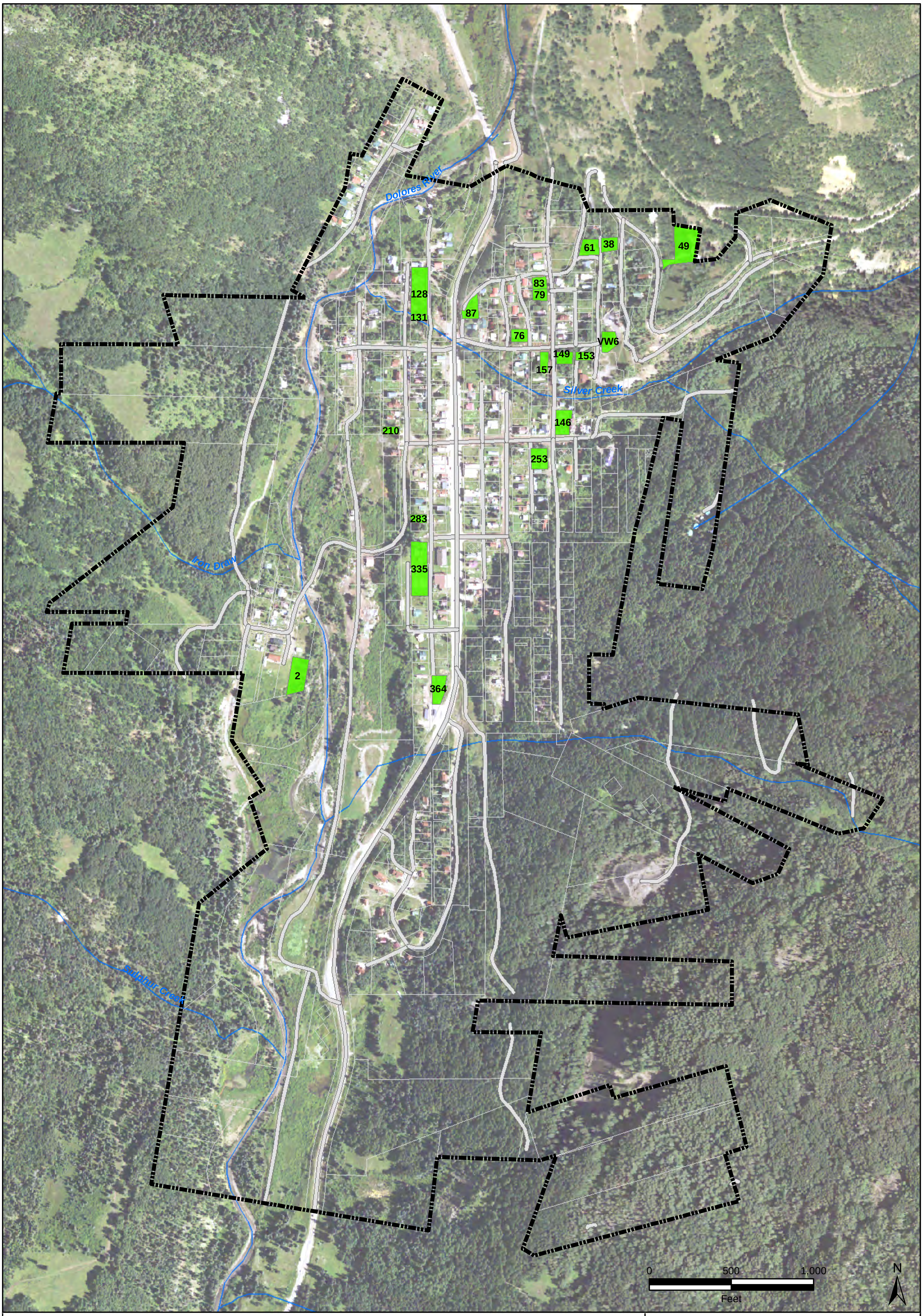
PROPERTIES TO BE SAMPLED

DATE: OCT 29, 2021

BY: DKG | FOR: BGH

FORMATION ENVIRONMENTAL

S:\GIS\a5\Rico\pt\VCUP_application_2021\VCUP_application_2021.aprx



Legend

Remediated Parcels Disturbed Since 2008 [1] (Associated VCUP Property Number)

Parcels

Rivers and Streams

Town of Rico Boundary

[1] Based on Town of Rico records for building and septic permits (2008-2018).

Basemap: 2015 NAIP Imagery

RICO, COLORADO

FIGURE 12

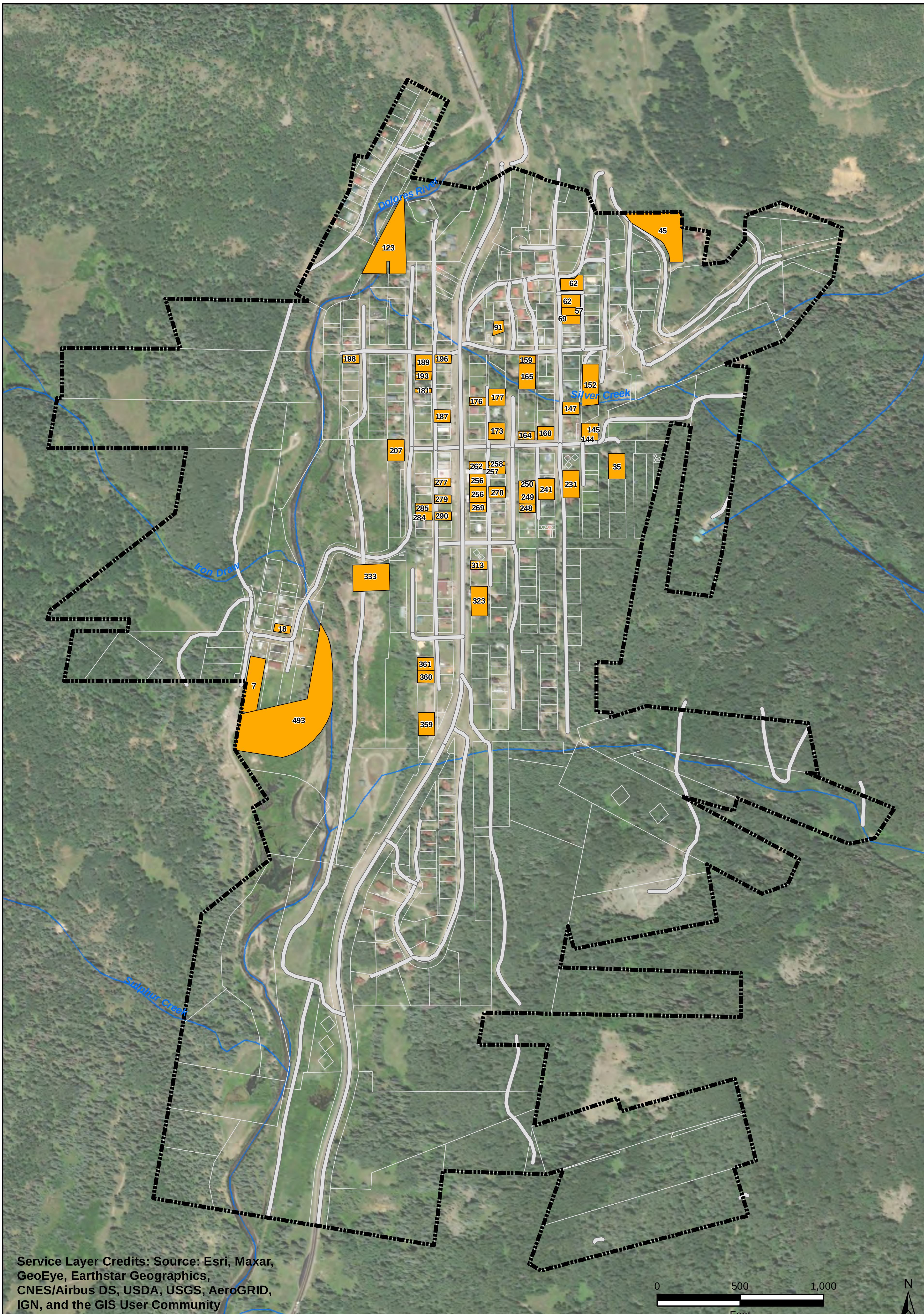
REMEDIATED PROPERTIES POTENTIALLY DISTURBED SINCE REMEDIATION[1]

DATE: SEP 12, 2022

BY: DKG | FOR: BGH

FORMATION ENVIRONMENTAL

S:\GIS\a5\Rico\plt\VCUP_application_2021\Fig12_DisturbedRemProp.mxd



S:\GIS\a5\Rico\plt\VCUP_application_2022\Fig13_Sampled_Developed.mxd

Legend

Soil Lead Results >= 761 mg/kg Where Developed Property Has Not Been Remediated

Parcels

Streets and Alleys Within Rico

Rivers and Streams

Town of Rico Boundary

Note: The following properties refused remediation in 2007: 62, 138, 144, 147, 177, 189 and 258

RICO, COLORADO

FIGURE 13

SAMPLED AND DEVELOPED PROPERTIES WITH LEAD >761 MG/KG

DATE: OCT 21, 2022

BY: DKG

FOR: BGH

FORMATION ENVIRONMENTAL

ATTACHMENTS 1-6

Attachment 1
Rico Townsite Soils VCUP - Previously Sampled Properties

VCUP Lot No.	Dolores County PIN	Street Address	Developed? Y/N	Year of VCUP Sampling	Soil Remediated? Y/N	Soil Remediation Recorded Date
2	504735105013		Y	2004, 2014	Y	
2	504735108002	PICKER ST.	N	2004, 2014	N	2006-08-29
2A?	504735105014	144 S. PICKER ST.		2004	N	
3	504735105001	134 S. PICKER ST.	N	2014	N	
5	504735107001	203 S. PICKER ST.	Y	2004	N	
6	504735107005	205 S. PICKER STREET	Y	2004	N	
7	504735107006	209 S. PICKER STREET	Y	2004, 2014	N	
8	504735100010	COLUMBIA SITE	N	2004, 2006, 2014	N	
9	504735106002	114 S. DOLORES RIVER TRAIL	Y	2004	N	
10	504735106007	131 S. PICKER ST.	Y	2004	N	
11	504735106013	132 S. DOLORES RIVER TRAIL	Y	2004	N	
12	504735106014	312 W. EDER STREET	Y	2004	N	
13	504735106001	117 S. PICKER STREET	N	2004, 2014	N	
14	504735106010	121 S. PICKER ST.	N	2004, 2014	N	
15	504735106015	125 S. PICKER ST.	Y	2004	N	
16	504735106006	135 S. PICKER STREET	Y	2004	N	
18	504735106005	302 W. EDER ST. / 4 PICKER STREET	Y	2004	N	
19	504725300056	ELLIOT	N	2004	N	
20	504725300103	ALTANTIC CABLE SUBDIV PHASE 3	N	2004	N	
21	504725300104	204 WEBSTER WAY	N	2004	N	
22	504725300105	202 WEBSTER WAY	N	2014	N	
23	504725300108	210 N. SILVER STREET	N	2004, 2014	N	
24	504725300107	208 N. SILVER STREET	N	2004, 2014	N	
25	504725300106	206 N. SILVER STREET	N	2004, 2014, 2015	N	
26	504725300028	204 N. SILVER STREET	N	2014	N	
27	504725300150	202 MILL ROAD	N	2004, 2015	N	
29	504725300002	102 E. HINKLEY DRIVE	N	2004	N	
30	504725300160	110 E. HINKLEY DRIVE	Y	2004	Y	2006-06-15
31	504725300157	106 EAST HINKLEY	Y	2004	Y	2006-06-15
31	504725300159	106 EAST HINCKLEY	N	2004	Y	2006-06-15
32	504725300155a	104 E. HINCKLEY DRIVE	Y	2004	Y	2005-08-15
33	504725300025	101 WEBSTER WAY	Y	2004	Y	2006-06-28
34	504725300155	104 E. HINCKLEY DRIVE	Y	2004	Y	2005-08-15
35	504736200011	116 N. GARFIELD	Y	2004	N	
36	504725300161	134 N. GARFIELD STREET	N	2014	N	
37	504725300034	136 N. VAN WINKLE AVE	N	2004, 2014	N	
38	504725300147	207 MILL ROAD	Y	2004	Y	2006-07-11
39	504725300032	211 MILL ROAD	N	2014	N	
40	504725300031	209 EAST MILL ROAD	Y	2004	Y	2006-08-23
41	504725300036	213 MILL ROAD	N	2004, 2015	N	
42	504736201001	122 N. GARFIELD ST.	N	2004	Y	2007-07-18
44	504736200119	131 N. VAN WINKLE AVENUE	Y	2004	Y	2006-08-25
45	504725300148	214 MILL ROAD	Y	2004	N	
47	504725300039	135 N. VAN WINKLE AVE	N	2004, 2014	N	
48	504725300040	137 NORTH VAN WINKLE AVENUE	Y	2004	Y	2007-05-05
49	504725300144	220 MILL ROAD	Y	2004	Y	2006-08-25
52	504736200012	110 N. GARFIELD STREET	N	2004	N	
52	504736200014		N	2004	N	
53	504736200016	102 N. GARFIELD STREET	Y	2004	Y	
54	504725300128	131 N. GARFIELD STREET	Y	2004	Y	2007-06-14
56	504736202017	107 N. GARFIELD	Y	2004	Y	2005-08-18
57	504736202003	118 N. SILVER STREET	Y	2004	N	
58	504736202012	110 N. SILVER STREET	Y	2004	Y	2005-08-24
60	504736202006	104 N. SILVER STREET	Y	2004	Y	2005-09-01
61	504725300147a	207 MILL ROAD	Y	2004	Y	2006-07-11
62	504725300149	132 N. SILVER STREET	Y	2004, 2015	N	

63	504725300029	205 MILL ROAD	Y	2004	Y	2005-07-21
64	504736202016	103 N. GARFIELD STREET	Y	2004	N	
65	504736202008	111 N. GARFIELD ST.	Y	2004	N	
66	504736202009	115 N. GARFIELD STREET	N	2004	N	
67	504736202010	117 N. GARFIELD ST.	N	2004	N	
69	504736202004	112 N. SILVER STREET	Y	2004	N	
70	504736202015	125 N. GARFIELD STREET	Y	2004	N	
71	504736200115	466 SILVERGLANCE WAY	N	2004, 2014	N	
72	504736200114	116 N. SHORT ST.	Y	2004	Y	2005-08-16
73	504736200113	114 N. SHORT STREET	Y	2004	Y	2006-06-30
74	504736200112	112 N. SHORT STREET	Y	2004	Y	2005-08-26
75	504736200110	110 N. SHORT STREET	Y	2004	Y	2005-08-16
76	504736203003	102 N. SHORT STREET	Y	2004	Y	2005-07-26
77	504725300017	123 YELLOWMAN AVENUE	Y	2004	Y	2006-08-11
78	504736200116	121 N. YELLOWMAN ALLEY	Y	2004	Y	2005-09-25
79	504736200118	121 NORTH SILVER STREET	Y	2004	Y	2005-07-21
80	504736203007	115 N. SILVER STREET	Y	2004	Y	2005-07-21
81	504736203013	112 E. SODA STREET	Y	2004	Y	2005-08-19
82	504736203005	116 E. SODA STREET	Y	2004	Y	2005-08-16
83	504725300019	123 N. SILVER STREET	Y	2004	Y	2005-07-21
84	504736203006	111 N. SILVER STREET	Y	2004	Y	2005-07-21
85	504736200103	4 E. SODA STREET	Y	2004	Y	2006-08-22
86	504736200104	103 E. HINKLEY DRIVE	N	2004, 2014	N	
87	504736200101	101 SOUTH HINCKLEY	Y	2004	Y	2005-09-13
88	504736200105	115 N. SHORT STREET	Y	2004	Y	2006-08-22
89	504736200109	113 N. SHORT STREET	Y	2004	Y	2006-09-04
91	504736200107	6 E. SODA STREET	Y	2004	N	
92	504736200106	8 EAST SODA STREET	Y	2004	N	
93	504736204003		N	2004	N	
94	504736200111	1 SODA ST	Y	2004	Y	2006-07-27
95	504726401003	305 N. PIEDMONT ST.	Y	2004	N	
96	504725301016	N. PIED.	N	2004, 2014	N	
97	504725302001	337 N. PIEDMONT	N	2004, 2014	N	
98	504725302002	333 N. PIEDMONT ST.	N	2004	Y	
98	504726401002	323 N. PIEDMONT STREET	Y	2004	N	
99	504726401006	319 N. PIEDMONT STREET	Y	2004	N	
101	504726401019	235 N. PIEDMONT ST.	Y	2004	N	
102	504726401020	229 N. PIEDMONT STREET	Y	2004	N	
103	504726401007	221 N. PIEDMONT ST.	Y	2004	N	
104	504726401008	215 N. PIEDMONT STREET	Y	2004	N	
106	504725301007		N	2014	N	
108	504726401014	225 N. PIEDMONT STREET	Y	2004	N	
110	504725301014	N. PIEDMONT	N	2004	N	
111	504726401010	207 N. PIEDMONT ST.	Y	2004	N	
116	504725301019	340 N. PIEDMONT STREET	N	2004	N	
118	504725301018	314 N. PIED.	N	2014	N	
119	504725300045	141 N. RIVER STREET	Y	2004	N	
120	504725300041	141 NORTH ARGENTINE	Y	2004	Y	2008-07-01
121	504725300053		N	2004	N	
122	504726401018	RIVERSIDE LODE	N	2004, 2014	N	
123	504726402007	137 N. RIVER STREET	Y	2004, 2014	N	
124	504736205011	102 N. RIVER STREET	N		N	
125	504725304008	135 N. ARGENTINE STREET	N	2015	N	
126	504736205010	123 N. ARGENTINE STREET	N	2014	N	
127	504736205001	ATLANTIC CABLE	N	2004	N	
128	504725304010	134 N. ARGENTINE, 136 RIVER	Y	2004	Y	2006-07-22
129	504736205007	101 N. GLASGOW AVE.	N	2004, 2014	N	
130	504725304002	138 N. RIVER STREET	Y	2004	N	
133	504735101001	102 N. HANCOCK	Y	2004	Y	2005-06-14
134	504725303007	131 N. RIVER STREET	N	2004	Y	2006-07-15
134	504725303008	201 N. RIVER STREET	Y	2004	Y	
136	504736206002	119 N. RIVER STREET	N	2004, 2014	N	
138	504735102014	117 N. HANCOCK ST.	N	2004	N	
139	504735101002	116 N. HANCOCK ST.	N	2004	N	
140	504736206001	RIVER ST.	N	2004, 2014	N	
141	504736200019	LOT 9 VAN WINKLE	N	2004	N	

142	504736200018	LOT 8 VAN WINKLE SUB-DIV	N	2014	N	
143	504736211019	GARFIELD STREET	N	2004	N	
144	504736211011	212 E. MANTZ AVE.	Y	2004	N	
145	504736211012	214 E. MANTZ AVE.	Y	2004	N	
146	504736211027	204 E. MANTZ AVE	Y	2004	Y	2005-06-02
147	504736211015	16 N. SILVER STREET	Y	2004	N	
148	504736211025	20 N. SILVER STREET	Y	2004	Y	2005-07-19
149	504736211014	38 N. SILVER STREET	Y	2004	Y	2006-07-10
151	504736211026	32 N. SILVER STREET	N	2004, 2014	N	
152	504736211023	35 N. GARFIELD STREET	Y	2004	N	
153	504736211020	37 N. GARFIELD STREET	Y	2004	Y	2005-07-21
154	504736210025	18 N. COMMERCIAL ST.	N	2004	N	
156	504736210019	27 N. SILVER ST.	Y	2004	Y	2005-07-20
157	504736210001	37 N. SILVER STREET	Y	2004	Y	2005-07-19
158	504736210002	111 S. SODA ST.	Y	2004	Y	2005-07-19
159	504736210003	103 E. SODA STREET	Y	2004	N	
160	504736210011	110 E. MANTZ AVE	Y	2004	N	
161	504736210024	NORTH COMMERCIAL	N	2004, 2014	N	
162	504736210014	17 N. SILVER STREET	N	2004, 2014	N	
163	504736210021	9 N. SILVER STREET	Y	2004	Y	2007-06-20
164	504736210009	2 N. COMMERCIAL STREET	Y	2004	N	
165	504736210022	32 N. COMMERCIAL ST.	Y	2004	N	
166	504736209011	9 E. SODA STREET	N	2004	N	
167	504736209012	27 N. COMMERCIAL ST.	N	2004, 2014	N	
168	504736209021	34 N. GLASGOW AVE	N	2004, 2014	N	
169	504736209022	40 N. GLASGOW AVE	N	2004, 2014	N	
170	504736209013	26 N. GLASGOW AVE	Y	2004	Y	2006-07-11
171	504736209002	11 N. COMMERCIAL STREET	Y	2004	N	
172	504736209018	12 N. GLASGOW AVE	N	2004	Y	
173	504736209003	1 N. COMMERCIAL STREET	Y	2004	N	
174	504736209020	2 N. GLASGOW AVE	Y	2004	Y	2007-06-04
175	504736209019	8 N. GLASGOW AVE	N	2004, 2014	Y	
176	504736209006	20 N. GLASGOW	Y	2004	N	
177	504736209010	19 N. COMMERCIAL STREET	Y	2004	N	
178	504736209017	14 N. GLASGOW AVE	Y	2004	Y	2006-01-01
179	504736208016	25 N. GLASGOW AVE.	N	2004	N	
181	504736208006	24 N. RIVER STREET	Y	2004	N	
182	504736208023	20 N. RIVER ST.	Y	2004	N	
183	504736208019	18 N. RIVER STREET	Y	2004	Y	2006-08-29
184	504736208009	14 N. RIVER ST.	Y	2004	Y	
185	504736208010	2 N. RIVER ST.	N	2004, 2014	N	
186	504736208011	1 N. GLASGOW AVE	N	2004, 2014	N	
187	504736208025	11 N. GLASGOW AVE	Y	2004	N	
188	504736208012	3 N GLASGOW AVE ENTERPRISE BAR	Y	2004	Y	2007-06-25
189	504736208026	34 N. RIVER STREET	Y	2004	N	
190	504736208013	7 N. GLASGOW AVE LIQUOR STORE	Y	2004	N	
193	504736208021	32 N. RIVER STREET	Y	2004	N	
196	504736208001	39 N. GLASGOW AVE.	Y	2004	N	
197	504736208015	21 N. GLASGOW AVE	N	2004, 2014	N	
198	504735103006	39 N. HANCOCK STREET	Y	2004	N	
199	504735103007	33 N. HANCOCK ST.	Y	2004	Y	2005-06-14
200	504735104012	HANCOCK STREET	Y	2004, 2019	Y	2007-08-15
201	504735104015	28 N. HANCOCK STREET	Y	2004, 2014	Y	2006-01-01
203	504735104006	8 N. HANCOCK STREET	N	2004, 2006	N	
206	504735103004	29 N. HANCOCK ST.	N	2004	N	
207	504736220003	1 S. RIVER STREET	Y	2004	N	
209	504735103008	25 NORTH HANCOCK	N	2004, 2015	N	
209	504735103009	21 NORTH HANCOCK	N	2014	N	
209	504735103010	17 NORTH HANCOCK	N	2004, 2014	N	
209	504735103011	1 N. HANCOCK STREET	N	2004, 2006, 2014	N	
210	504736207015	5 N. RIVER STREET	Y	2004	Y	2005-06-17
212	504736207014	11 N. RIVER STREET	Y	2004	Y	2005-06-17
213	504736207018	15 N. RIVER STREET		2004	Y	
214	504736207013	23 N. RIVER ST.	Y	2004	Y	2005-06-08
215	504736207003	29 N. RIVER STREET	Y	2004	N	

218	504736213999	401 E. MANTZ AVE.	N	2004, 2014	N	
219	504736212001	324 E. MANTZ AVE	N	2004	N	
220	504736212004	302 E. MANTZ AVE	N	2004, 2015	N	
221	504736213003	NO STREET ACCESS	N	2004	N	
224	504736214002	309 E. MANTZ AVE	N	2004	N	
228	504736214004	NO STREET ACCESS	N	2004, 2014	N	
229	504736216048	209 E. MANTZ AVE	Y	2004	N	
230	504736216036	201 E. MANTZ AVE.	N	2004	N	
230	504736216041	201 E. MANTZ AVE.	N	2004	N	
230	504736216042	201 E. MANTZ AVE.	N	2004	N	
230	504736216999	201 E. MANTZ AVE.	N	2004	N	
231	504736216044	16 S. SILVER STREET	Y	2004	N	
233	504736216045	24 S. SILVER ST.	Y	2004	N	
235	504736216046	34 S. SILVER STREET	N	2004, 2014	N	
236	504736216008	39 E. MANTZ AVE	N	2004, 2014	N	
237	504736216023	25.S. GARFIELD STREET	N	2004, 2014	N	
238	504736216033	15 S.GARFIELD ST.	Y	2004	Y	2007-08-06
239	504736216022	21 S. GARFIELD ST	N	2004	N	
241	504736217030	15 S. SILVER ST.	Y	2004	N	
242	504736217015	25 S. SILVER STREET	Y	2004	N	
243	504736217017	31 S. SILVER STREET	N	2004	N	
246	009500000462	39 S. SILVER ST	Y	2004	N	
247	504736217021	32 S. COMMERICAL STREET	Y	2004	N	
248	504736217005	28 S. COMMERICAL STREET	Y	2004	N	
249	504736217004	20 S. COMMERCIAL STREET	Y	2004	N	
250	504736217025	16 S. COMMERCIAL ST.	Y	2004	N	
251	504736217024	12 S. COMMERCIAL ST.	N	2004	N	
252	504736217002	2 S. COMMERCIAL STREET	N	2004, 2014	N	
253	504736217001	3 S. SILVER STREET	Y	2004	Y	2005-06-28
255	504736218008	37 S. COMMERICAL STREET	Y	2004	Y	2006-08-25
256	504736218020	20 S. GLASGOW AVE MINE SHAFT	Y	2004, 2014	N	
257	504736218015	7 SOUTH COMMERCIAL ST.	Y	2004	N	
258	504736218016	5 S. COMMERCIAL ST	Y	2004	N	
259	504736218001	1 S. COMMERCIAL STREET	Y	2004	Y	2006-07-17
260	504736218024	14 S. GLASGOW AVE	Y	2004	N	
261	504736218002	2 S. GLASGOW AVE	N	2014	N	
262	504736218003	8 S. GLASGOW AVE.	Y	2004, 2014	N	
266	504736218030	38 S. GLASGOW AVE	Y	2004	N	
267	504736218033	29 S. COMMERCIAL STREET	Y	2004	Y	2006-08-03
269	504736218025	GLASGOW	N	2004	N	
270	504736218031	S. COMMERCIAL ST.	N	2004	N	
270	504736218032	17 S. COMMERCIAL ST.	Y	2004	N	
271	504736218029	S. GLASGOW AVE	N	2004	N	
272	504736218030a	38 S. GLASGOW AVE	Y	2004	N	
274	504736219015	3 S. GLASGOW AVE	N	2004, 2014	N	
277	504736219013	13 S. GLASGOW AVE MUSEUM &	Y	2004	N	
279	504736219032	21 S. GLASGOW AVE GALLOPING GOOSE	Y	2004	N	
280	504736219030	39 S. GLASGOW AVE	N	2004	N	
281	504736219031	25 S. GLASGOW AVE	N	2004, 2014	N	
282	504736219006	40 S. RIVER STREET	N	2014	N	
283	504736219025	34 S. ARGENTINE STREET	Y	2004	Y	2006-08-03
284	504736219026	30 S. ARGENTINE STREET	Y	2004	N	
285	504736219037	26 S. ARGENTINE STREET	Y	2004	N	
286	504736219034	22 S. ARGENTINE STREET	N	2004	N	
287	504736219004	18 S. ARGENTINE STREET	Y	2004	Y	2006-07-26
288	000000992200	14 S. ARGENTINE STREET		2004	N	
289	504736219019	2 S. ARGENTINE ST.	N	2004, 2014, 2015	N	
290	504736219008	31 S. GLASGOW	Y	2004	N	
291	504736219029	33 S. GLASGOW AVE	N	2004, 2014	N	
292	504736200008		N	2004	N	
294	504736225010	140 S. SILVER STREET	N	2004, 2014	N	
295	504736225011	S. SILVER ST.	N	2004	N	
295	504736225013	S. SILVER ST.	N	2004	N	
295	504736225014	130 SOUTH SILVER ST.	N	2004	N	

296	504736225001	SILVER ST.	N	2004	N	
297	504736225005	102 S. SILVER STREET	N	2004	N	
298	504736224034	39 S. SILVER STREET	Y	2004, 2014	N	
299	504736224029	129 & 133 S. SILVER STREET	Y	2004	N	
301	504736224008	139 S. SILVER STREET	N	2004	N	
303	504736224030	132 S. COMMERCIAL ST.	Y	2004	N	
304	504736224002	102 S. COMMERCIAL STREET	N	2004	N	
306	504736224033	112 S. COMMERCIAL ST.	N	2004, 2014	N	
307	504736224033a	112 S. COMMERCIAL ST.	N	2004, 2014	N	
308	504736224006	116 S. COMMERCIAL STREET	N	2004	N	
309	504736224020	120 S. COMMERCIAL STREET	N	2004	N	
310	504736224031	S. SILVER STREET	N	2015	N	
311	504736224026	124 S. COMMERCIAL STREET	N	2004	N	
312	504736224024	140 S. COMMERCIAL STREET	N	2004, 2015	N	
313	504736223004	110 S. GLASGOW AVE.	Y	2004	N	
314	504736223009	140 S. GLASGOW AVE.	N	2004	N	
315	504736223008	134 S. GLASGOW AVE.	Y	2004	N	
317	504736223017	102 S. GLASGOW STREET	N	2014	N	
317	504736223018	102 S. GLASGOW STREET	N	2014	N	
317	504736223999	102 S. GLASGOW AVE	N	2014	N	
318	504736223010	139 S. COMMERCIAL ST.	Y	2004	N	
319	504736223011	129 S. COMMERCIAL STREET	N	2014	N	
320	504736223012	125 S. COMMERCIAL ST.	Y	2004	N	
321	504736223019	115 S. COMMERCIAL ST.		2004	N	
321	504736223020	COMMERCIAL ST.		2004	N	
322	504736223016	101 S. COMMERCIAL ST.	Y	2004	N	
323	504736223007	124 S. GLASGOW AVE	Y	2004	N	
324	504736222005	137 S. GLASGOW AVENUE	Y	2004	N	
325	504736222003	130 S. RIVER STREET	N	2004	N	
326	504736222001	101 S. GLASGOW AVENUE	Y	2004	Y	2006-09-17
327	504736222009	119 S. GLASGOW AVE	Y	2004	N	
328	504736222014	131 S. GLASGOW AVE	Y	2004	N	
329	504736222004	136 S. ARGENTINE STREET	Y	2004	Y	2006-08-16
330	504736221003	137 S. RIVER STREET	Y	2004, 2014	Y	2006-08-16
331	504736221002	RIVERVIEW DR.	N	2004, 2014	N	
332	504736221001	101 S. RIVER STREET	N	2014	N	
333	504735100005		Y	2004, 2006, 2014	N	
334	504736222013	125 S. GLASGOW AVE	N	2004	N	
335	504736222002	16 W. CAMPBELL STREET	Y	2004	Y	2006-09-17
336	504736226001	SOUTH SILVER STREET	Y	2004	N	
336	504736226002	239 SOUTH SILVER STREET	Y	2004	N	
336a?	504736226007	SILVER ST.		2004	N	
338	504736226046	205 S. SILVER STREET	N	2004	N	
339	504736226040	216 S. COMMERCIAL STREET	Y	2004	N	
341	504736226043	COMMERCIAL ST	N	2004, 2014	N	
344	504736227007	239 S. COMMERCIAL STREET	N	2004, 2014	N	
345	504736227012	227 S. COMMERCIAL STREET	N	2004	N	
347	504736227009	240 S. GLASGOW AVE.	N	2004	N	
348	504736227010	218 S. GLASGOW AVE.	N	2004	N	
349	504736227003	206 S. GLASGOW AVE	N	2004	N	
350	504736227001	203 S. COMMERCIAL STREET	Y	2004	N	
352	504736227013	211 S. COMMERICAL STREET	Y	2004	N	
353	504736227017	225 SOUTH COMMERCIAL STREET	N	2004	N	
355	504736227002	202 S. GLASGOW AVE	N	2004	N	
357	504736228029	201 S. GLASGOW AVE		2004	N	

358	504736228027	213 S. GLASGOW AVE COFFEE SHOP		2004	N	
358a?	504736228020	217 S. GLASGOW AVE		2004	N	
359	504736228016	235 S. GLASGOW AVE.	Y	2004	N	
360	504736228010	220 S. ARGENTINE STREET	Y	2004	N	
361	504736228011	212 S. ARGENTINE STREET	Y	2004	N	
362	504736228012	204 S. ARGENTINE STREET	Y	2004	Y	2006-07-27
363	504736228028			2004	N	
364	504736228004	225 S. GLASGOW AVE.	N	2004	Y	
365	504736303001	302 SILVERGLANCE WAY	N	2004	N	
366	504736303007	340 SILVERGLANCE WAY	Y	2004	N	
367	504736303011	337 SILVERGLANCE WAY	Y	2004	N	
368	504736303010	333 S. GLASGOW	Y	2004	N	
369	504736303013	331 SILVERGLANCE WAY	Y	2004	N	
371	504736302001	302 S. GLASGOW AVE	N	2004	N	
372	504736303002	309 SILVERGLANCE WAY	N	2004	N	
373	504736303014	339 SILVERGLANCE WAY	Y	2004	N	
374	504736303003	316 S. GLASGOW AVE	N	2004	N	
375	504736302002	312 S. ARGENTINE STREET	N	2014	N	
376	504736303015	325 S. SILVERGLANCE WAY	Y	2004	N	
382	504736304027	469 SILVERGLANCE WAY	N	2004	N	
383	504736304025	459 SILVERGLANCE WAY	Y	2004	N	
385	504736304019	481 SILVERGLANCE WAY	Y	2004	N	
386	504736304021	423 SILVERGLANCE WAY	Y	2004, 2014	N	
387	504736304026	417 SILVERGLANCE WAY	Y	2004	N	
388	504736304008		N	2004	N	
390	504736306003	441 SILVERGLANCE WAY	Y	2004	N	
391	504736306004	446 SILVERGLANCE AVE	Y	2004	N	
392	504736306005	448 SILVERGLANCE WAY	Y	2004	N	
393	504736306002	444 SILVERGLANCE WAY	N	2004, 2014	N	
394	504736306009	456 SILVERGLANCE WAY	Y	2004	N	
395	504736306011	443 SILVERGLANCE WAY	Y	2004	N	
396	504735406006	450 SILVERGLANCE WAY	Y	2004	N	
397	504735406007	452 SILVERGLANCE WAY	N	2004	N	
398	504736306022	445 SILVERGLANCE WAY LOT 12	Y	2004	N	
399	504736306001	442 SILVERGLANCE WAY	N	2004, 2014	N	
400	504735406008	458 SILVERGLANCE WAY	Y	2004	N	
401	504736306020	447 SILVERGLANCE WAY	N	2004, 2014	N	
402	504736306018	462 SILVERGLANCE WAY	Y	2004	N	
403	504736306010	454 SILVERGLANCE WAY	Y	2004	N	
404	504736306017	464 SILVERGLANCE WAY	Y	2004	N	
405	504736306019	460 SILVERGLANCE WAY	Y	2004	N	
420	504735100517	SHAMROCK	N	2004, 2006	N	
429	504726400019	STAR ROUTE		2004	N	
432	504735100518	SMUGGLER	N	2004, 2006	N	
447	504736300606	CHESTNUT	N	2004	N	
456	504736300621	GROUP MILLSITE	N	2004	N	
465	504736301006	END COMMERCIAL ST.	N	2014	N	
467	504735103013	213 W. SODA STREET	N	2014	N	
468	504735103003	NO STREET ACCESS	N	2004, 2006, 2014	N	
469	504735100011	RIVER CORRIDOR	N	2004, 2006, 2014, 2015	Y	
470	504735102010	109 N. HANCOCK STREET	N	2004	N	
472	504735102008	131 N. HANCOCK STREET	Y	2004	N	
473	504735102002	NO STREET ACCESS	N	2015	N	
475	504735102017	216 W. SODA STREET	Y	2004	N	
477	504735100009	RIVER LODGE SITE	N	2004, 2006	N	
479	504736305001	402 SILVERGLANCE WAY	N	2014	N	
484	504735400023	PORTION AE ARMS NORTH		2004	N	
485	504735400018		N	2004, 2006, 2014	N	
487	504735400022	PORTION OF MAX BOEHMER TRACT	N	2004	N	
489	504736300011	S. HWY 145	N	2004	N	
490	504736306016		N	2014	N	
491	504736306015	466 SILVERGLANCE WAY	N	2004	N	
496	504701100002	SAN JUAN NATIONAL FOREST	N	2004	N	
509	504725300052	102 E. HINKLEY DRIVE	N	2004	N	

518	504736306014	442 SILVERGLANCE WAY	N	2004	N	
522	504735100524	YANKY BOY	N	2004	N	
524	504735100006	W. RICO	N	2004	N	
FE 601 (123?)	504726402008	RIVER STREET	N	2004, 2014	N	
FE 608	504735400020	HWY 145	N	2014	N	
FE 619	504735400006	A & E ARMS TRACT	N	2004, 2014	N	
FE 620	504736300008	GRAVEYARD TRACT LESS HWY ALL MINERAL RIGHTS	N	2004	N	
FE 621	504735100507	HILLSIDE	N	2004, 2006, 2014	N	
FE 629	504725300046	COLUMBIA MILLSITE	N	2004	N	
FE 638	504736300013	LITTLE ADA SOUTH	N	2004	N	
FE 648	504736226047	213 S. SILVER STREET	N	2004	N	

Attachment 2
Rico Townsite Soils VCUP - Previously Remediated Parcels

VCUP Lot No.	Dolores County PIN	Street Address	Developed? Y/N	Soil Remediated? Y/N	Soil Remediation Recorded Date
2	504735108002	PICKER ST.	Y	Y	2006-08-29
8 or 23	504735100010	COLUMBIA MILL SITE	N	Y	
30	504725300160	110 E. HINKLEY DRIVE	Y	Y	2006-06-15
31	504725300157	106 EAST HINKLEY	Y	Y	2006-06-15
31	504725300159	106 EAST HINCKLEY	N	Y	2006-06-15
32	504725300155a	104 E. HINCKLEY DRIVE	Y	Y	2005-08-15
33	504725300025	101 WEBSTER WAY	Y	Y	2006-06-28
34	504725300155	104 E. HINCKLEY DRIVE	Y	Y	2005-08-15
38	504725300147	207 MILL ROAD	Y	Y	2006-07-11
40	504725300031	209 EAST MILL ROAD	Y	Y	2006-08-23
42	504736201001	122 N. GARFIELD ST.	N	Y	2007-07-18
44	504736200119	131 N. VAN WINKLE AVENUE	Y	Y	2006-08-25
48	504725300040	137 NORTH VAN WINKLE AVENUE	Y	Y	2007-05-05
49	504725300144	220 MILL ROAD	Y	Y	2006-08-25
54	504725300128	131 N. GARFIELD STREET	Y	Y	2007-06-14
56	504736202017	107 N. GARFIELD	Y	Y	2005-08-18
58	504736202012	110 N. SILVER STREET	Y	Y	2005-08-24
59	504736202005	106 N. SILVER STREET	Y	Y	2005-08-23
60	504736202006	104 N. SILVER STREET	Y	Y	2005-09-01
61	504725300147a	207 MILL ROAD	Y	Y	2006-07-11
63	504725300029	205 MILL ROAD	Y	Y	2005-07-21
72	504736200114	116 N. SHORT ST.	Y	Y	2005-08-16
73	504736200113	114 N. SHORT STREET	Y	Y	2006-06-30
74	504736200112	112 N. SHORT STREET	Y	Y	2005-08-26
75	504736200110	110 N. SHORT STREET	Y	Y	2005-08-16
76	504736203003	102 N. SHORT STREET	Y	Y	2005-07-26
77	504725300017	123 YELLOWMAN AVENUE	Y	Y	2006-08-11
78	504736200116	121 N. YELLOWMAN ALLEY	Y	Y	2005-09-25
79	504736200118	121 NORTH SILVER STREET	Y	Y	2005-07-21
80	504736203007	115 N. SILVER STREET	Y	Y	2005-07-21
81	504736203013	112 E. SODA STREET	Y	Y	2005-08-19
82	504736203005	116 E. SODA STREET	Y	Y	2005-08-16
83	504725300019	123 N. SILVER STREET	Y	Y	2005-07-21
84	504736203006	111 N. SILVER STREET	Y	Y	2005-07-21
85	504736200103	4 E. SODA STREET	Y	Y	2006-08-22
87	504736200101	101 SOUTH HINCKLEY	Y	Y	2005-09-13
88	504736200105	115 N. SHORT STREET	Y	Y	2006-08-22
89	504736200109	113 N. SHORT STREET	Y	Y	2006-09-04
94	504736200111	1 SODA ST	Y	Y	2006-07-27
120	504725300041	141 NORTH ARGENTINE	Y	Y	2008-07-01
128 and 131	504725304010	134 N. ARGENTINE, 136 RIVER	Y	Y	2006-07-22
133	504735101001	102 N. HANCOCK	Y	Y	2005-06-14
134	504725303007	131 N. RIVER STREET	N	Y	2006-07-15
146	504736211027	204 E. MANTZ AVE	Y	Y	2005-06-02
148	504736211025	20 N. SILVER STREET	Y	Y	2005-07-19
149	504736211014	38 N. SILVER STREET	Y	Y	2006-07-10
153	504736211020	37 N. GARFIELD STREET	Y	Y	2005-07-21
156	504736210019	27 N. SILVER ST.	Y	Y	2005-07-20
157	504736210001	37 N. SILVER STREET	Y	Y	2005-07-19
158	504736210002	111 S. SODA ST.	Y	Y	2005-07-19
163	504736210021	9 N. SILVER STREET	Y	Y	2007-06-20

170	504736209013	26 N. GLASGOW AVE	Y	Y	2006-07-11
172	504736209018	12 N. GLASGOW AVE	N	Y	
174	504736209020	2 N. GLASGOW AVE	Y	Y	2007-06-04
178	504736209017	14 N. GLASGOW AVE	Y	Y	2006-01-01
183	504736208019	18 N. RIVER STREET	Y	Y	2006-08-29
184	504736208027	14 N. RIVER ST.		Y	2006-08-21
188	504736208012	3 N GLASGOW AVE ENTERPRISE BAR	Y	Y	2007-06-25
199	504735103007	33 N. HANCOCK ST.	Y	Y	2005-06-14
200	504735104012	135 W. SODA ST.	Y	Y	2007-08-15
201	504735104015	28 N. HANCOCK STREET	Y	Y	2006-01-01
210	504736207015	5 N. RIVER STREET	Y	Y	2005-06-17
211	504736207014	11 N. RIVER STREET	Y	Y	2005-06-17
213	504736207013	23 N. RIVER ST.	Y	Y	2005-06-08
238	504736216033	15 S.GARFIELD ST.	Y	Y	2007-08-06
253	504736217001	3 S. SILVER STREET	Y	Y	2005-06-28
255	504736218008	37 S. COMMERICAL STREET	Y	Y	2006-08-25
266	504736218030	38 S. GLASGOW AVE	Y	Y	2008-09-10
259	504736218001	1 S. COMMERCIAL STREET	Y	Y	2006-07-17
267	504736218033	29 S. COMMERCIAL STREET	Y	Y	2006-08-03
272	504736218030	38 S. GLASGOW AVE	Y	Y	2008-09-10
283	504736219025	34 S. ARGENTINE STREET	Y	Y	2006-08-03
287	504736219004	18 S. ARGENTINE STREET	Y	Y	2006-07-26
326	504736222001	101 S. GLASGOW AVENUE	Y	Y	2006-09-17
329	504736222004	136 S. ARGENTINE STREET	Y	Y	2006-08-16
330	504736221003	137 S. RIVER STREET	Y	Y	2006-08-16
335	504736222002	16 W. CAMPBELL STREET	Y	Y	2006-09-17
362	504736228012	204 S. ARGENTINE STREET	Y	Y	2006-07-27
364	504736228004	225 S. GLASGOW AVE.	N	Y	2007-08-02
VW6	504736200016	102 N. GARFIELD STREET	Y	Y	2008-10-22

Attachment 3
Parcel Ownership in Town of Rico
(Updated April 2023)

VCUP Lot No.	Dolores County PIN	Property Address	Owner Name April 2023	Ownership Status
			BRD, LLC	Private
	504736223025		PALMER JOHN H.	Private
	504736223024		MORRIS REVOCABLE LIVING TRUST	Private
1	504735106011	126 SOUTH DOLORES RIVER TRAIL	CARVER LARRY D. & JILL CARVER	Private
1,9,11,12 strip	504735107999			Private
10	504735106007	131 S. PICKER ST.	DREW PATRICK W. & DEANNA J. DREW	Private
100	504726401017	313 N. PIEDMONT STREET	SPILLMAN CRAIG G. & SANDRA L. JT	Private
101	504726401019	235 N. PIEDMONT ST.	SPIELMAN ROGER & MEGAN SPIELMAN	Private
102	504726401020	229 N. PIEDMONT STREET	SMITH THOMAS NEIL	Private
103	504726401007	221 N. PIEDMONT ST.	HETRICK CLINTON N. & KAREN L.	Private
104	504726401008	215 N. PIEDMONT STREET	BONEWITZ ROLAND F., JR. ET AL	Private
105	504726401009	211 N. PIEDMONT ST.	STEINMANN TRUST, U/A DATED JAN	Private
106	504725301007		RICO TOWN OF	Town of Rico
107	504726401021	201 N. PIEDMONT STREET	GASS ELIZA	Private
108	504726401014	225 N. PIEDMONT STREET	CARR JORDAN & TEAL E. STETSON-	Private
109	504726402003	305 N. PIEDMONT ST.	CARR JORDAN & TEAL STETSON-LEE	Private
11	504735106013	132 S. DOLORES RIVER TRAIL	CARVER JILL & LARRY D. CARVER	Private
110	504725301014	N. PIEDMONT	HAGAN CARL M. & MARY O. (JT)	Private
111	504726401010	207 N. PIEDMONT ST.	BUBOLO DEAN	Private
113	504725301012	324 N. PIEDMONT, APT A	MATHIESON REBECCA	Private
114	504725301017	324 N. PIEDMONT AVE., APT B	CAIPEN ANNA ROBIN & TERRY LEE	Private
115	504725301009	324 N. PIEDMONT, APT C	STEELE LARRY & SUSAN STEELE (JT)	Private
116	504725301019	340 N. PIEDMONT STREET	PARLOW BROOK D. ET AL (JT)	Private
118	504725301018	314 N. PIED.	MATHIESON REBECCA	Private
118	504725301018	314 N. PIED.	MATHIESON REBECCA	Private
119	504725300045	141 N. RIVER STREET	FERANDO JAMES R. & KEVIN J.	Private
12	504735106014	312 W. EDER STREET	CLARK THOMAS A.	Private
120	504725300041	141 NORTH ARGENTINE	DAVIS GARY LYNN & YOLANDA LOU	Private
121	504725300053		DAVIS GARY L. & YOLANDA L. DAVIS	Private
122	504726401018	RIVERSIDE LODE	STACK VINCENT J. & HUDELSON,	Private
122	504726401018	RIVERSIDE LODE	STACK VINCENT J. & HUDELSON,	Private
123	504726402010	RIVER STREET	CUMMINGS ROBERT E. & NICOLE Y.	Private
123	504726402007	137 N. RIVER STREET	KELLY NICHOLAS G. & CATHERINE G.	Private
123	504726402009	RIVER STREET	FERANDO JAMES R. & KEVIN J.	Private
124	504736205011	102 N. RIVER STREET	RANDALL LYNN ORTIZ	Private
125	504725304008	135 N. ARGENTINE STREET	BRICKHAUS HOLDING COMPANY LLC	Private
126	504736205010	123 N. ARGENTINE STREET	BRICKHAUS HOLDING COMPANY LLC	Private
127	504736205001	ATLANTIC CABLE	ENDLESS POSSIBILITIES LLC	Private
128	504725304010	134 N. ARGENTINE, 136 RIVER	HAGAN MIKE & MARY	Private
129	504736205007	101 N. GLASGOW AVE.	ENGEL PATRICIA A.	Private
13	504735106001	117 S. PICKER STREET	TANGUAY KYLE DAVID & MADELINE	Private
130	504725304002	138 N. RIVER STREET	CUMMINGS ROBERT E. &	Private
132	504725304009	135 N. ARGENTINE STREET	ALLEN MARK	Private
133	504735101001	102 N. HANCOCK	SMITH KIPLYNN	Private
134	504725303008	201 N. RIVER STREET	BAIN JUSTIN & JULIE BAIN (JT)	Private
134	504725303008	201 N. RIVER STREET	BAIN JUSTIN & JULIE BAIN (JT)	Private
134	504725303007	131 N. RIVER STREET	ROBERTS MARIA G.	Private
135	504725303007	131 N. RIVER STREET	ROBERTS MARIA G.	Private
136	504736206002	119 N. RIVER STREET	DOW FAMILY TRUST & CORNELIUS	Private
138	504735102014	117 N. HANCOCK ST.	MILSTEAD JAY & MARY LOU MILSTEAD	Private
139	504735101002	116 N. HANCOCK ST.	ROBERTSON DYLAN J.	Private
14	504735106010	121 S. PICKER ST.	RICO TOWN OF, COLORADO A	Town of Rico
140	504736206001	RIVER ST.	MULDOON CORNELIUS F. & BARBARA D	Private
141	504736200017	LOT 7 VAN WINKLE	LAUB LAUREN LYNN & STEPHEN HENRY	Private
141	504736200019	LOT 9 VAN WINKLE	GULLEDGE DEE C. & GERRISH WILLIS	Private
142	504736200018	LOT 8 VAN WINKLE SUB-DIV	POTTER COVEY & REBECCA POTTER	Private
143	504736211019		ENRIQUEZ MICHAEL PETER	Private
144	504736211011		ENRIQUEZ MICHAEL PETER	Private
145	504736211012	214 E. MANTZ AVE.	FOX BRADLEY T. & KRISTINA T. FOX	Private
146	504736211027	204 E. MANTZ AVE	LITTLETON JOY & JORDAN R.	Private
147	504736211015	16 N. SILVER STREET	MILLER KAREL A.	Private
148	504736211025	20 N. SILVER STREET	HACKLETON LYNDA & O'HARA	Private
149	504736211014	38 N. SILVER STREET	RICO HOUSE LLC	Private
15	504735106015	125 S. PICKER ST.	TANGUAY KYLE DAVID & MADELINE	Private
150	504736211010	208 E. MANTZ AVE	RICO HISTORICAL SOCIETY	Private
151	504736211026	32 N. SILVER STREET	STRAMEL ENTERPRISES	Private

Attachment 3
Parcel Ownership in Town of Rico
(Updated April 2023)

152	504736211023	35 N. GARFILED STREET	HOLT FAMILY TRUST	Private
153	504736211020	37 N. GARFIELD STREET	HAY JONATHAN	Private
154	504736210025	18 N. COMMERCIAL ST.	CISLO TODD J. & STACEY REED (JT)	Private
155	504736210026	23 N. SILVER STREET	ACFH PROPERTIES, LLC	Private
156	504736210026	27 N. SILVER ST.	ACFH PROPERTIES, LLC	Private
157	504736210001	37 N. SILVER STREET	OSTREM-JONDROW FAMILY TRUST	Private
158	504736210002	111 S. SODA ST.	MILSTEAD JAY & MARY LOU MILSTEAD	Private
159	504736210003	103 E. SODA STREET	BERRY DAVID W.	Private
16	504735106006	135 S. PICKER STREET	FRAME DOLORES ETHEL TRUST NO.	Private
160	504736210011	116 E MANTZ AVE CHURCH	UNITED PRESBYTERIAN CHURCH	Private
161	504736210024	NORTH COMMERCIAL	ENGEL PATRICIA ANN	Private
162	504736210014	17 N. SILVER STREET	RICO TOWN OF	Town of Rico
163	504736210021	9 N. SILVER STREET	HOUSTON ALAN F. LIVING TRUST	Private
164	504736210009	2 N. COMMERCIAL STREET	RICO TOWN OF	Town of Rico
165	504736210022	32 N. COMMERCIAL ST.	GUTHRIDGE DAVID LEE &	Private
166	504736209011	9 E. SODA STREET	CALI-CO PROPERTIES	Private
167	504736209012	27 N. COMMERCIAL ST.	FLOYD SARAH WIGHT	Private
168	504736209021	34 N. GLASGOW AVE	LYONS DEN CONSTRUCTION, INC.	Private
169	504736209022	40 N. GLASGOW AVE	RICO TOWN OF	Town of Rico
17	504735107007	209 S. PICKER STREET	MATZICK HELEN M. MATZICK HELEN M.	Private
17	504735107008 504735107008	209 S. PICKER STREET	PRICE LUCAS C. & LINDSY A. PRICE	Private
170	504736209013	26 N. GLASGOW AVE	LYONS SARAH & CRAIG LYONS (JT)	Private
171	504736209002	11 N. COMMERCIAL STREET	HUNT SUSAN R. LIVING TRUST	Private
172	504736209018	12 N. GLASGOW AVE	MOTHER LODE ENTERPRISES, LLC	Private
173	504736209003	1 N. COMMERCIAL STREET	MILLER JUSTIN JHON & CHRISTINE	Private
174	504736209020	2 N. GLASGOW AVE	JACOBS SCOTT P.	Private
175	504736209019	8 N. GLASGOW AVE	MOTHER LODE ENTERPRISES, LLC	Private
176	504736209006	20 N. GLASGOW	DOUGHERTY MICHAEL	Private
177	504736209010	19 N. COMMERCIAL STREET	FALLON PATRICK G.	Private
178	504736209017	14 N. GLASGOW AVE	YASEEN RYAN C.	Private
179	504736208016	25 N. GLASGOW AVE.	ROTHSCHILD C. DESIREE & KARIN H.	Private
18	504735106005	302 W. EDER ST. / 4 PICKER STREET	HAGAN CARL MICHAEL & MARY HAGAN	Private
180	504736208005	26 N. RIVER STREET	PERKINS S. GREGORY &	Private
181	504736208006	24 N. RIVER STREET	GETTER RANDAL G. & AIMEE GETTER	Private
182	504736208023	20 N. RIVER ST.	FABIAN DAVID	Private
183	504736208019	18 N. RIVER STREET	HEIL ERIC JAMES & JOLYNN	Private
184	504736208027	14 N. RIVER ST.	OLSON TARYN & RONALD CLAY HALL	Private
184A?	504736208028	RIVER ST.	UNGER GEOFFREY	Private
186	504736208011	1 N. GLASGOW AVE	LAWLESS RICO, LLC	Private
187	504736208025	11 N. GLASGOW AVE	GREEN ROOM LTD., THE	Private
188	504736208012	3 N GLASGOW AVE ENTERPRISE BAR	LAWLESS RICO, LLC	Private
189	504736208026	34 N. RIVER STREET	GASS GARY & CHRISTINE	Private
19	504725300056	ELLIOT	BRD, LLC	Private
19	504725300056	ELLIOT	BRD, LLC	Private
19	504725300056	ELLIOT	BRD, LLC	Private
19	504725300056	ELLIOT	BRD, LLC	Private
19	504725300056	ELLIOT	BRD, LLC	Private
19	504725300056	ELLIOT	BRD, LLC	Private
190	504736208013	7 N. GLASGOW AVE LIQUOR STORE	FABIAN ROBERT	Private
191	504736208010	2 N. RIVER ST.	EJG-HLG FAMILY TRUST	Private
192	504736208017	31 N. GLASGOW AVE.	MOORE CARMA, FAHRION JACK E., &	Private
193	504736208021	32 N. RIVER STREET	BELASCO MARIA (NORA) L. &	Private
194	504736208024	15 N. GLASGOW AVE	GREEN ROOM LTD., THE	Private
195	504736208018	33 N. GLASGOW AVE	TIO RICO, LLC	Private
196	504736208001	39 N. GLASGOW AVE.	STEWART JIMMY KERMIT	Private
197	504736208015	21 N. GLASGOW AVE	HEIL ERIC JAMES & JOLYNN H (JT)	Private
198	504735103006	39 N. HANCOCK STREET	ANDERSON GREGORY E. & BENSETT,	Private
199	504735103007	33 N. HANCOCK ST.	REESER ERIC T.	Private
2	504735108002	PICKER ST.	MATZICK HELEN M.	Private
20	504725300103	ALTANTIC CABLE SUBDIV PHASE 3	SOULES JASON	Private
200	504735104012	135 W. SODA ST.	ELLEASE RAEGAN	Private
201	504735104015	28 N. HANCOCK STREET	KUNZ DAVID P.	Private
201	504735104015	28 N. HANCOCK STREET	KUNZ DAVID P.	Private
202	504736207017	15 N. RIVER STREET	JOHNSON BENJAMIN D. & REBECCA B.	Private

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203	504735104006	8 N. HANCOCK STREET	ATLANTIC RICHFIELD COMPANY	Private
204	504735104007	2 N. HANCOCK ST.	PYLE BLAIR W. & CLEVELAND,	Private
206	504735103004	29 N. HANCOCK ST.	RICO LAND & CATTLE COMPANY, LLC	Private
207	504736220003	1 S. RIVER STREET	LOCHTE WILL & SANDRA K. (JT)	Private
208	504736207001	39 N. RIVER ST.	DAY CASSANDRA ANN, DANIEL Z. DAY	Private
209	504735103010	17 NORTH HANCOCK	REGAN TIMOTHY	Private
209	504735103009	21 NORTH HANCOCK	SANDS JOSHUA M.	Private
209	504735103008	25 NORTH HANCOCK	KIRSCH CARL R.	Private
209	504735103012		RICO TOWN OF	Town of Rico
209S	504735103011		RICO TOWN OF	Town of Rico
21	504725300104	204 WEBSTER WAY	GLAZE TAYLOR	Private
210	504736207015	5 N. RIVER STREET	CONDON CHRISTOPHER & TRACY	Private
211	504736207014	11 N. RIVER STREET	BENNETT THOMAS W. & GORDON R.,JR	Private
212	504736207018	15 N. RIVER STREET	NOLAN WILLIAM III & EMILY JEAN	Private
213	504736207013	23 N. RIVER ST.	GILBERT KELSEY MC CREEDY & SCOTT	Private
215	504736207003	29 N. RIVER STREET	LIVESAY W. SCOTT	Private
216	504736207002	35 N. RIVER STREET	WILLIAMS STEVEN E. REVOCABLE	Private
218	504736213999	401 E. MANTZ AVE.		Private
219	504736212001	324 E. MANTZ AVE	HOPKINS LARRY W. TRUST DATED	Private
22	504725300105	202 WEBSTER WAY	SPELLBRING LEONARD "TEX" &	Private
220	504736212004	302 E. MANTZ AVE	THC HOLDINGS LLC	Private
221	504736213003	NO STREET ACCESS	ATLANTIC RICHFIELD COMPANY	Private
223	504736213001	401 E. MANTZ AVE.	PYLE BLAIR W. & CLEVELAND,	Private
224	504736214002	309 E. MANTZ AVE	JONES GREGG W.	Private
225	504736215005	NO STREET ACCESS	CLICK ALLAN	Private
226	504736215001	301 E. MANTZ AVE	O'NEAL MICHAEL L. & JANICE M.	Private
227	504736212005		AALLRED HOLDINGS, LLC	Private
228	504736214004	NO STREET ACCESS	JONES GREGG W.	Private
229	504736216049	209 E. MANTZ AVE	HEIL JOLYNN H. & ERIC J. HEIL(JT	Private
230	504736216050 504736216050		DILLSWORTH JANET & JOSEPH	Private
231	504736216044	16 S. SILVER STREET	OFF LIVING TRUST HAROLD C. &	Private
233	504736216045	24 S. SILVER ST.	SCHWAB MARK R. & DEBI A. (JT)	Private
234	504736216046	34 S. SILVER STREET	DOW FAMILY TRUST	Private
236	504736216008	39 E. MANTZ AVE	MOORES TERRY A.	Private
237	504736216023	25.S. GARFIELD STREET	BALTZER TRUDIE LYNNE	Private
238	504736216033	15 S.GARFIELD ST.	STRACHAN FRANK G. & MADELINE	Private
238A?	504736216047	S.GARFIELD ST.	HEIL JOLYNN H.	Private
239	504736216022	21 S. GARFIELD ST	MOORE PETER M.	Private
24	504725300107	208 N. SILVER STREET	DOW FAMILY TRUST	Private
241	504736217030	15 S. SILVER ST.	FOLSOM ROBERT STANLEY	Private
241A?	504736217029	11 S. SILVER ST.	FOLSOM ROBERT STANLEY	Private
242	504736217015	25 S. SILVER STREET	NESIS DAVID A.	Private
243	504736217017	31 S. SILVER STREET	DOW FAMILY TRUST	Private
244	504736217019	35 S. SILVER STREET	MULDOON BARBARA D.	Private
245	504736217018	35 S. SILVER STREET	KEEP AUDREY M.	Private
245?	504736217999	35 S. SILVER STREET		Private
246	504736224034	39 S. SILVER STREET	DOW FAMILY TRUST	Private
247	504736217031	32 S. COMMERICAL STREET	BOYER JACOB T.	Private
247A?	504736217032	COMMERICAL STREET	BOYER JACOB T., JASON P. BOYER,	Private
248	504736217005	28 S. COMMERICAL STREET	BLAIR BARBARA LYNN (BEN D)	Private
249	504736217004	20 S. COMMERCIAL STREET	EZELL FLORENCE W. (BEN D)	Private
25	504725300106	206 N. SILVER STREET	DOW FAMILY TRUST	Private
250	504736217025	16 S. COMMERCIAL ST.	DONOFRIO BENEDICT A.	Private
251	504736217024	12 S. COMMERCIAL ST.	KAHN JAMES S.	Private
252	504736217002	2 S. COMMERCIAL STREET	HARRAH DARLA JOANNE	Private
253	504736217001	3 S. SILVER STREET	OFF-LIMITS, LLC	Private
254	504736218014	11 S. COMMERCIAL ST.	HARBAR JUSTIN L.	Private
255	504736218008	37 S. COMMERICAL STREET	KAWALICK MELISSA	Private
256	504736218020	20 S. GLASGOW AVE MINE SHAFT	MINESHAFT INN, LLC	Private
257	504736218015	7 SOUTH COMMERCIAL ST.	ELEISON J.& S. REVOCABLE TRUST	Private
258	504736218016	5 S. COMMERCIAL ST	ADAMS LAURIE	Private
259	504736218001	1 S. COMMERCIAL STREET	PEDAL STRIKE LLC	Private
26	504725300028	204 N. SILVER STREET	JORDAN JILL & ANDREW JORDAN (JT)	Private
260	504736218024	14 S. GLASGOW AVE	LIVESAY W. SCOTT	Private
261	504736218002	2 S. GLASGOW AVE	TRUELSEN DEANNA E.	Private
262	504736218024	14 S. GLASGOW AVE	LIVESAY W. SCOTT	Private
262	504736218035	GLASGOW AVE.	RICO BANK BUILDING, LLC	Private

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263	504736218006	28 S. GLASGOW AVE. POST OFFICE	MBNH LLC	Private
264	504736218011	23 S. COMMERCIAL STREET	RIEDMANN AGNES C., TRUSTEE OF	Private
265	504736218010	25 S. COMMERCIAL STREET	LARSE PETER M., GEORGE L. &	Private
266	504736218030	38 S. GLASGOW AVE	ETCHISON REBECCA A. & JAMES	Private
267	504736218033	29 S. COMMERCIAL STREET	BAER ALFRED VON AKA ALFRED V.	Private
269	504736218025	GLASGOW	SPRING YOUR MIRACLE, LLC	Private
27	504725300150	202 MILL ROAD	ENGEL PATRICIA ANN	Private
270	504736218031	S. COMMERCIAL ST.	MARKEY STEPHEN A	Private
270	504736218032	17 S. COMMERCIAL ST.	MARKEY KEVIN M.	Private
271	504736218029	S. GLASGOW AVE	STERLING TRUST CO. CUST,	Private
272	504736218030a	38 S. GLASGOW AVE	ETCHISON REBECCA A. & JAMES	Private
273	504736219001	1 S. GLASGOW AVE	EVERS RONALD P.	Private
274	504736219015	3 S. GLASGOW AVE	MULDOON CORNELIUS F. & BARBARA D	Private
275	504736219020	5 SOUTH GLASGOW AVE. "THEATRE"	TRANSCENDENTAL CAPITALISM, LLC	Private
276	504736219021	9 S. GLASGOW AVE	BURLEY JW & CO., LLC	Private
277	504736219013	13 S. GLASGOW AVE MUSEUM &	RICO TOWN OF	Town of Rico
278	000000992200		RICO TELEPHONE COMPANY, INC	Private
279	504736219032	21 S. GLASGOW AVE GALLOPING GOOSE	GUERTIN MATTHEW J. & CHELSEY	Private
28	504725300108	210 N. SILVER STREET	LANNING ROARK C TRUST & LINDSAY	Private
280	504736219030	39 S. GLASGOW AVE	CETIN MESUT	Private
281	504736219031	25 S. GLASGOW AVE	WEISBROD DALE CHARLES	Private
282	504736219006	40 S. RIVER STREET	GABARRON THOMAS	Private
283	504736219025	34 S. ARGENTINE STREET	FARNY CINDY	Private
284	504736219026	30 S. ARGENTINE STREET	BUTTON BRETT M.	Private
285	504736219037	26 S. ARGENTINE STREET	WILLMARTH DARYL	Private
286	504736219034	22 S. ARGENTINE STREET	SINGLETON FAMILY IRREVOCABLE	Private
287	504736219004	18 S. ARGENTINE STREET	CLARK NITA	Private
288	000000992200		RICO TELEPHONE COMPANY, INC	Private
289	504736219019	2 S. ARGENTINE ST.	BURLEY JW & CO, LLC	Private
29	504725300002	102 E. HINKLEY DRIVE	BRD, LLC	Private
290	504736219008	31 S. GLASGOW	RICO MASONIC TEMPLE ASSOCIATION	Private
291	504736219029	33 S. GLASGOW AVE	VANDERGRIFF GARY L. & DEBRA K.	Private
292	504736200008		RICO TOWN OF	Town of Rico
293	504736200007	208 SOUTH SILVER STREET	DOW FAMILY TRUST	Private
294	504736225010	140 S. SILVER STREET	O'HARA EAMONN J. & HACKLETOM	Private
295	504736225013	S. SILVER ST.	KENNEDY MICHAEL G. & ANN R.(JT)	Private
295	504736225014	130 SOUTH SILVER ST.	BODNAR JAY K. & MARGARET A.	Private
296	504736225001	SILVER ST.	GREEN HARRIS	Private
296	504736225011	S. SILVER ST.	RICO LAND & CATTLE COMPANY, LLC	Private
297	504736225005	102 S. SILVER STREET	TIERRA VERDE INVESTMENTS CORP.	Private
298	504736224034	39 S. SILVER STREET	DOW FAMILY TRUST	Private
299	504736224029	129 & 133 S. SILVER STREET	FOSNOT GERALD G. & VERINIA	Private
2A?	504735105014	144 S. PICKER ST.	FRUNK ANDREW MICHAEL & ANNE	Private
3	504735105001	134 S. PICKER ST.	TRALLER PEGGY MARIE REVOCABLE	Private
30	504725300160	110 E. HINKLEY DRIVE	CURRAN FAMILY TRUST NO. JMC-1	Private
301	504736224008	139 S. SILVER STREET	EDGEWORTH CHRISTOPHER	Private
303	504736224030	132 S. COMMERCIAL ST.	HALE MCKINLEY A.	Private
304	504736224002	102 S. COMMERCIAL STREET	HARRISON SAMUEL H.	Private
305	504736224027	108 S. COMMERCIAL ST.	HARRISON SAMUEL H. ET AL	Private
306	504736224033	112 S. COMMERCIAL ST.	MILENSKI EMERSON J. TRUST NO. 1	Private
307	504736224033a	112 S. COMMERCIAL ST.	MILENSKI EMERSON J. TRUST NO. 1	Private
308	504736224006	116 S. COMMERCIAL STREET	NOETZEL STEVEN J.	Private
309	504736224020	120 S. COMMERCIAL STREET	LAW GREGORY E. & MARIE H. (JT) &	Private
31	504725300157	106 EAST HINKLEY	MOTHER LODE ENTERPRISES, LLC	Private
31	504725300159	106 EAST HINCKLEY	MOTHER LODE ENTERPRISES, LLC	Private
310	504736224035	S. SILVER STREET	KRAUSE ELIZABETH & CHRISTOPHER	Private
310	504736224031	S. SILVER STREET	GRAHAM VIRGINIA	Private
310	504736224032	S. SILVER STREET	DAWSON EILEEN	Private
311	504736224026	124 S. COMMERCIAL STREET	YAGER MARK EVANS	Private
312	504736224024	140 S. COMMERCIAL STREET	WYATT HEIDI	Private
313	504736223004	110 S. GLASGOW AVE.	MORRIS ROBERT J. & JEAN ANN	Private
314	504736223023	134 S. GLASGOW AVE.	PROCTOR CORD K.	Private
314	504736223022	134 S. GLASGOW AVE.	MILLS ANNA LYNNE	Private
316	504736223015	116 S. GLASGOW AVENUE	OLD RICO HOME LLC	Private
317	504736223025		PALMER JOHN H.	Private
318	504736223010	139 S. COMMERCIAL ST.	BAILEY PATRICK N. & DEBORAH L.	Private

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319	504736223011	129 S. COMMERCIAL STREET	FRANCK CARISA AMES & RUSSELL	Private
32	504725300155a	104 E. HINCKLEY DRIVE	VERNADAKIS BENN J.	Private
320	504736223012	125 S. COMMERCIAL ST.	FRANCK CARISA AMES & AARON	Private
320a?	504736223020	COMMERCIAL ST.	FRANCK CARISA AMES & AARON	Private
321	504736223019	115 S. COMMERCIAL ST.	DAY DANIEL Z.,CASSANDRA ANN DAY,	Private
322	504736223016	101 S. COMMERCIAL ST.	DOWNER MATTHEW T.	Private
323	504736223007	124 S. GLASGOW AVE	RICO HOTEL, LLC, A DELAWARE LLC	Private
324	504736222005	137 S. GLASGOW AVENUE	YELLOWMAN LINDA & GENEVIEVE	Private
325	504736222003	130 S. RIVER STREET	RANDALL INVESTMENT GROUP LLC	Private
326	504736222001	101 S. GLASGOW AVENUE	DOLORES COUNTY SCHOOL DIST RE-2	Dolores County
327	504736222009	119 S. GLASGOW AVE	RICO TOWN OF	Town of Rico
328	504736222015 504736222015	131 S. GLASGOW AVE	RICO FIRE PROTECTION DISTRICT	Private
329	504736222004	136 S. ARGENTINE STREET	HASLER JORY	Private
33	504725300025	101 WEBSTER WAY	RUUD PAUL G. JR.& STACY SHERIDAN	Private
330	504736221003	137 S. RIVER STREET	HASLER JORY & ELIZABETH A.	Private
331	504736221002	RIVERVIEW DR.	RICO TOWN OF	Town of Rico
332	504736221001	101 S. RIVER STREET	DOLORES COUNTY SCHOOL DIST RE-2	Dolores County
333	504735100005		RICO TOWN OF	Town of Rico
334	504736222015	125 S. GLASGOW AVE	RICO FIRE PROTECTION DISTRICT	Private
335	504736222002	16 W. CAMPBELL STREET	DOLORES COUNTY SCHOOL DIST RE-2	Dolores County
336	504736226002	239 SOUTH SILVER STREET	HAGGART ROBERT	Private
336a?	504736226007	S. SILVER ST.	HAGGART ROBERT & AMY HAGGART	Private
336b?	504736226006	SILVER ST.	GOODHART MATTHEW	Private
336c?	504736326005	335 S. SILVER ST.	RICO LEGACY, LLC	Private
337	504736226046	205 S. SILVER STREET	TURRIN BARBARA J.	Private
338	504736226045	203 S. SILVER STREET	EDGEWORTH CHRISTOPHER	Private
339	504736226040	216 S. COMMERCIAL STREET	FLATT FAMILY LLP	Private
34	504725300155	104 E. HINCKLEY DRIVE	VERNADAKIS BENN J.	Private
342	504736226001	SOUTH SILVER STREET	MONTGOMERY VICKIE BRINER	Private
342	504736226047	213 S. SILVER STREET	JOHNSON DAVID & JENNIFER JOHNSON	Private
343	504736226043	COMMERCIAL ST	BROWN DAWN MICHELLE & GREGORY S.	Private
344	504736227007	239 S. COMMERCIAL STREET	LIVESAY W. SCOTT	Private
345	504736227012	227 S. COMMERCIAL STREET	GILBERT SUE ELLEN (BEN DEED)	Private
346	504736227016	223 S. COMMERICAL STREET	WHEATON JOHN	Private
347	504736227009	240 S. GLASGOW AVE.	LIVESAY W SCOTT	Private
348	504736227010	218 S. GLASGOW AVE.	RICO SUAVE, LLC	Private
349	504736227003	206 S. GLASGOW AVE	CAMELS GARDEN PARTNERS	Private
35	504736200011	116 N. GARFIELD	ROGERS STEPHANIE D.	Private
350	504736227001	203 S. COMMERCIAL STREET	HUBER ROBIN A.	Private
351	504736227005	207 S. COMMERCIAL STREET	DANNER HEATHER MARIE	Private
352	504736227019	211 S. COMMERICAL STREET	JONES TODD & KIMBERLY JONES (JT) JONES TODD & KIMBERLY JONES (JT) JONES TODD & KIMBERLY JONES (JT)	Private
354	504736227020	219 S. COMMERCIAL ST.	RADICKE MARY & SHREVE MARANTO	Private
355	504736227002	202 S. GLASGOW AVE	LAMPRECHT LIVING TRUST	Private
357	504736228029	201 S. GLASGOW AVE	CAMELS GARDEN PARTNERS	Private
358	504736228027	213 S. GLASGOW AVE COFFEE SHOP	CAMELS GARDEN LLC	Private
358a?	504736228020	217 S. GLASGOW AVE	RED YANKEE, LLC	Private
359	504736228016	235 S. GLASGOW AVE.	LAUBSTER PROPERTIES, LLC	Private
359	504736228016	235 S. GLASGOW AVE.	LAUBSTER PROPERTIES, LLC	Private
36	504725300161	134 N. GARFIELD STREET	TRUELSEN DEANNA E. & DUVALL (JT)	Private
360	504736228010	220 S. ARGENTINE STREET	FERGUSON RONALD PRESTON & TIA	Private
361	504736228011	212 S. ARGENTINE STREET	BRANNON CHARLES A. & CINDY	Private
362	504736228012	204 S. ARGENTINE STREET	MYERS KATHRYN A. (BENE DEED)	Private
363	504736228037		MC CROKE VENTURES, LLC	Private
363	504736228032		CONDON CHRISTOPHER & TRACY	Private
363	504736228034		SMITH SHERWOOD & LAUREN MULLINS	Private
363	504736228036		FREED DOUGLAS M. & SHANNON M.	Private
363	504736228035		TAYRIEN TRAVIS & JENIFER H.	Private
363	504736228030		HOGE ELIJAH & MORGAN HOGE (JT)	Private
363	504736228031		STOGNER SEAN P.	Private
364	504736228004	225 S. GLASGOW AVE.	RICO SUAVE, LLC	Private
365	504736303001	302 SILVERGLANCE WAY	ATLANTIC RICHFIELD COMPANY	Private
366	504736303007	340 SILVERGLANCE WAY	WALKER RONALD A. & DIANE S.	Private
367	504736303011	337 SILVERGLANCE WAY	CASANOVA COLIN & MARIA CASANOVA	Private

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368	504736303010	333 SILVERGLANCE WAY	QUARLES DIANE T. & RONALD L.	Private
369	504736303013	331 SILVERGLANCE WAY	KEMPER KAREN C.	Private
37	504725300034	136 N. VAN WINKLE AVE	LIBERTY LAND GROUP, LLC	Private
370	504736303015	325 S. SILVERGLANCE WAY	MORRISON EDWIN, ELEANOR &	Private
371	504736302001	302 S. GLASGOW AVE	STEELE LARRY & SUSAN STEELE	Private
372	504736303002	309 SILVERGLANCE WAY	LIVESAY W. SCOTT	Private
373	504736303014	339 SILVERGLANCE WAY	WATERS MAUREEN	Private
374	504736303003	316 S. GLASGOW AVE	BOREN JOSH	Private
375	504736302002	312 S. ARGENTINE STREET	LITTON TOMMY D.	Private
377	504736304032	409 SILVERGLANCE WAY	SCARBOROUGH JOHN L. & NANCY L. SCARBOROUGH JOHN L. & NANCY L.	Private
378	504736304021	423 SILVERGLANCE WAY	LARSON ERIC & KATHLEEN KELLY(JT)	Private
379	504736304032	473 SILVERGLANCE WAY	SCARBOROUGH JOHN L. & NANCY L.	Private
38	504725300147	207 MILL ROAD	TAYLOR TRACY E. & JENNIFER I.	Private
381	504736304031	405 SILVERGLANCE WAY	SCHRECKENGOST BRETT P. & CORINNE	Private
381	504736304030	405 SILVERGLANCE WAY	MC MANUS ZACH	Private
382	504736304027	469 SILVERGLANCE WAY	LEWIS VIRGINIA P.	Private
383	504736304025	459 SILVERGLANCE WAY	RIDGE JAMES F., JR.	Private
384	504736304023	477 SILVERGLANCE WAY	DALLAS DIVIDE DEVELOPMENT, LLC	Private
385	504736304019	481 SILVERGLANCE WAY	SVOBODA ALLYN C.	Private
386	504736304026	417 SILVERGLANCE WAY	POQUITO RICO, LTD.	Private
388	504736304008		LEWIS DONALD K. & VIRGINIA P.	Private
389	504736304018	465 SILVERGLANCE WAY	LEWIS VIRGINIA P.	Private
39	504725300032	211 MILL ROAD	HUBER DARRALL	Private
390	504736306003	441 SILVERGLANCE WAY	ADAMS LAURIE A.	Private
391	504736306004	446 SILVERGLANCE AVE	LANGER ANNA L. & JOHN T. KEATING	Private
392	504736306005	448 SILVERGLANCE WAY	MARTIN ROD	Private
393	504736306002	444 SILVERGLANCE WAY	CURRAN KEVIN S. &	Private
394	504736306009	456 SILVERGLANCE WAY	EBERT MICHAEL & BETTS, BARBARA	Private
395	504736306011	443 SILVERGLANCE WAY	PUTNAM DOUG & CINDY	Private
396	504735406006	450 SILVERGLANCE WAY	O'NEAL KEVIN M. & MONICA M.	Private
397	504735406007	452 SILVERGLANCE WAY	O'NEAL KEVIN	Private
398	504736306022	445 SILVERGLANCE WAY LOT 12	POSTON SCOTT L.	Private
398	504736304028	SILVERGLANCE WAY	POSTON SCOTT L.	Private
399	504736306001	442 SILVERGLANCE WAY	THOMAS KELLY G.	Private
4	504735107002	311 W. EDER STREET	GASS GARY P. & CHRISTINA L. GASS	Private
40	504725300031	209 EAST MILL ROAD	HUBER DARRALL	Private
400	504735406008	458 SILVERGLANCE WAY	KRZYMOWSKI WILLIAM W. M.D. &	Private
401	504736306020	447 SILVERGLANCE WAY	RICO TOWN OF	Town of Rico
402	504736306018	462 SILVERGLANCE WAY	ERICKSON FAMILY TRUST DATED	Private
403	504736306010	454 SILVERGLANCE WAY	ROLFS JULIE G. & THEODORE R.	Private
404	504736306017	464 SILVERGLANCE WAY	TURRIN MICHAEL J.	Private
405	504736306019	460 SILVERGLANCE WAY	GUSKEA MICHAEL L. & KYRIAKAKIS,	Private
41	504725300036	213 MILL ROAD	EVERS RONALD P.	Private
415	504736200614	EVENING CALL	ATLANTIC RICHFIELD COMPANY	Private
416	504736200620	GOLDEN FLEECE	ATLANTIC RICHFIELD COMPANY	Private
417	504736400624	ISABELLE	ATLANTIC RICHFIELD COMPANY	Private
42	504736201001	122 N. GARFIELD ST.	JOHNSON ERIN J.	Private
420	504735100517	SHAMROCK	DSS LLC	Private
432	504735100518	SMUGGLER	DSS LLC	Private
433	504736100604	BED ROCK	OUTLOOK RESOURCES, INC.	Private
44	504736200119	131 N. VAN WINKLE AVENUE	IALEGGIO MICHAEL & BEUALAH	Private
45	504725300148	214 MILL ROAD	SMITH SCOTT ? (was blank for 2023)	Private
451	504736300603	APEX	ATLANTIC RICHFIELD COMPANY	Private
452	504701100002	FRANKLIN	SAN JUAN NATIONAL FOREST	Private
456	504736300621	GROUP MILLSITE	ATLANTIC RICHFIELD COMPANY	Private
459	504736300631	LUCY	ATLANTIC RICHFIELD COMPANY	Private
46	504725300038	219 MILL ROAD	WILCOX CLAIRE, LLC	Private
465	504736301006	END COMMERCIAL ST.	SILVER CREEK LAND COMPANY LLC	Private
467	504735103013	213 W. SODA STREET	RICO TOWN OF	Town of Rico
468	504735103003	NO STREET ACCESS	KIRSCH CARL R.	Private
469	504735100011	RIVER CORRIDOR	RICO TOWN OF	Town of Rico
469	504735100011	RIVER CORRIDOR	RICO TOWN OF	Town of Rico
469	504735100011	RIVER CORRIDOR	RICO TOWN OF	Town of Rico
469	504735100011	RIVER CORRIDOR	RICO TOWN OF	Town of Rico
47	504725300039	135 N. VAN WINKLE AVE	GILLMAN TODD A.	Private
470	504735102010	109 N. HANCOCK STREET	CHMIELEWSKI LEAH FELICE	Private
471	504735102007	107 N. HANCOCK STREET	BRITTON JAMES W.	Private
472	504735102008	131 N. HANCOCK STREET	ROBERTSON DYLAN J. & JESSE S.	Private

473	504735102002	NO STREET ACCESS	CHMIELEWSKI LEAH FELICE	Private
474	504735102003	NO STREET ACCESS	KENDRICK GARY	Private
475	504735102017	216 W. SODA STREET	MC JOYNT KATHLEEN A. & JOSEPH V.	Private
477	504735100009	RIVER LODGE SITE	ATLANTIC RICHFIELD COMPANY	Private
479	504736305001	402 SILVERGLANCE WAY	SILVER CREEK LAND COMPANY LLC	Private
48	504725300040	137 NORTH VAN WINKLE AVENUE	CONDON CHRISTOPHER JOHN & TRACY	Private
481	504736301006	END COMMERCIAL ST.	SILVER CREEK LAND COMPANY LLC	Private
483	504735105013		RICO TOWN OF	Town of Rico
484	504735400023	PORTION AE ARMS NORTH	ATLANTIC RICHFIELD COMPANY	Private
485	504735400018		TSG SKI & GOLF, LLC	Private
487	504735400022	PORTION OF MAX BOEHMER TRACT	ATLANTIC RICHFIELD COMPANY	Private
488	504736300008		RICO DEVELOPMENT, LLC	Private
489	504736300011	S. HWY 145	HOUGHTON DEVELOPMENT CO LLC	Private
49	504725300144	220 MILL ROAD	TURRIN BARBARA J.	Private
490	504736306016		RICO TOWN OF	Town of Rico
491	504736306015	466 SILVERGLANCE WAY	RICO TOWN OF	Town of Rico
492	504736305002		CLICK ALLAN	Private
493(?) or 2	504735105013		RICO TOWN OF	Town of Rico
495	504735100015	SAM PATCH	ADAMS REBECCA & GORDON MORTENSEN	Private
495	504735100015	SAM PATCH	ADAMS REBECCA & GORDON MORTENSEN	Private
496	504701100002	48540 HWY 145	SAN JUAN NATIONAL FOREST	USFS
496	504701100002	48540 HWY 145	SAN JUAN NATIONAL FOREST	USFS
496	504701100002	48540 HWY 145	SAN JUAN NATIONAL FOREST	USFS
496	504701100002	48540 HWY 145	SAN JUAN NATIONAL FOREST	USFS
496	504701100002	48540 HWY 145	SAN JUAN NATIONAL FOREST	USFS
496	504701100002	48540 HWY 145	SAN JUAN NATIONAL FOREST	USFS
496	504701100002	48540 HWY 145	SAN JUAN NATIONAL FOREST	USFS
496	504701100002	48540 HWY 145	SAN JUAN NATIONAL FOREST	USFS
496	504701100002	48540 HWY 145	SAN JUAN NATIONAL FOREST	USFS
496	504701100002	48540 HWY 145	SAN JUAN NATIONAL FOREST	USFS
5	504735107001	203 S. PICKER ST.	MILSTEAD JAY & MARY LOU MILSTEAD	Private
509	504725300052		ENGEL PATRICIA A. & EVERS,	Private
51	504736200012		ATLANTIC RICHFIELD COMPANY	Private
513	504736220004	5 S. RIVER STREET	ATLANTIC RICHFIELD COMPANY	Private
514	504736220002		RICO TOWN OF	Town of Rico
515	504725300051	EIGHTY-EIGHTY	ATLANTIC RICHFIELD COMPANY	Private
518	504736306014	442 SILVERGLANCE WAY	RICO TOWN OF	Town of Rico
519	504736300001		RICO TOWN OF	Town of Rico
520	504736300013	LITTLE ADA SOUTH	RICO DEVELOPMENT, LLC	Private
522	504735100524	YANKY BOY	ADAMS REBECCA & GORDON MORTENSEN	Private
524	504735100006		MERRITT SHERYL H. LIVING TRUST	Private
54	504725300128	131 N. GARFIELD STREET	EVERS RONALD P.	Private
54	504736202015	125 N. GARFIELD STREET	KENWORTHY NICHOLAS B.	Private
56	504736202017	107 N. GARFIELD	ROBERTS CHRISTY KOPASZ	Private
57	504736202003	118 N. SILVER STREET	RYCHTARIK CAROLE L. (BEN DEED)	Private
58	504736202012	110 N. SILVER STREET	BELASKA ANNE M.	Private
59	504736202005	106 N. SILVER STREET	OWEN JUDITH ANDERSON, ET AL	Private
6	504735107005	205 S. PICKER STREET	AUSTIN MICHAEL DEAN (BEN DEED)	Private
60	504736202006	104 N. SILVER STREET	BARON JAMES H.	Private
61	504725300147	207 MILL ROAD	TAYLOR TRACY E. & JENNIFER I.	Private
62	504725300149	132 N. SILVER STREET	EVERS RONALD P. & PATRICIA A.	Private
63	504725300029	205 MILL ROAD	CURRAN FAMILY TRUST NO. JMC-1	Private
64	504736202016	103 N. GARFIELD STREET	GASS ANDREA J. & ELIZA JANE GASS	Private
65	504736202018	111 N. GARFIELD ST.	WOLF ANNA CAITLIN & TRAVIS	Private
66	504736202018	115 N. GARFIELD STREET	WOLF ANNA CAITLIN & TRAVIS	Private
67	504736202010	117 N. GARFIELD ST.	VERNADAKIS BENN J.	Private
68	504725300149	132 N. SILVER STREET	EVERS RONALD P. & PATRICIA A.	Private
69	504736202004	112 N. SILVER STREET	HOT ROD LINCOLN, LLC	Private
7	504735107007	209 S. PICKER STREET	MATZICK HELEN M.	Private
70	504736202011	121 N. GARFIELD ST.	T & B HOLDINGS, LLC	Private
71	504736200115		RICO TOWN OF	Town of Rico
72	504736200114	116 N. SHORT ST.	GRIGG KALIN L.	Private
73	504736200113	114 N. SHORT STREET	BAKER ELIZABETH A. LIVING TRUST	Private
74	504736200112	112 N. SHORT STREET	HIBBARD CRISTAL & ALEXANDRE WING	Private
75	504736200110	110 N. SHORT STREET	TREADWELL GRETCHEN	Private

Attachment 3
Parcel Ownership in Town of Rico
(Updated April 2023)

76	504736203003	102 N. SHORT STREET	VANDERGRIFF GARY L. & DEBRA K.	Private
77	504725300017	123 YELLOWMAN AVENUE	CONE PATRICIA S. REVOCABLE TRUST	Private
78	504736200116	121 N. YELLOWMAN ALLEY	SANDOVAL LYNNE RENEE	Private
79	504736200118	121 NORTH SILVER STREET	SLOAN DYLAN	Private
8 or 23	504735100010	COLUMBIA MILL SITE	ATLANTIC RICHFIELD COMPANY	Private
80	504736203007	115 N. SILVER STREET	SEELEY NATHANIEL K. & ANGLELA A.	Private
81	504736203013	112 E. SODA STREET	BROWN LUKE & KATHRYN PARNELLO	Private
82	504736203005	116 E. SODA STREET	SWANK DENNIS E	Private
83	504725300019	123 N. SILVER STREET	VANDERMAST DANIEL A.	Private
84	504736203006	111 N. SILVER STREET	BIG DUBS VENTURES, LLC	Private
85	504736200103	4 E. SODA STREET	PREJS JULIA & JOSEPH DILLSWORTH	Private
86	504736200104	103 E. HINKLEY DRIVE	BERNARDO BRYANT & JESSICA	Private
87	504736200101	101 SOUTH HINCKLEY	CONTILLO MICHAEL E. & KATELYN S.	Private
88	504736200105	115 N. SHORT STREET	TURRIN MACKENZIE R.	Private
89	504736200109	113 N. SHORT STREET	HART JESSICA A. & FLORENTINA	Private
9	504735106002	114 S. DOLORES RIVER TRAIL	ZELLER SKIP	Private
90	504736200108	111 N. SHORT STREET	JACOBSEN PAUL	Private
91	504736200107	6 E. SODA STREET	HODSON JULIE	Private
92	504736200106	8 EAST SODA STREET	MANGAN-DIMUZIO GARAN	Private
93	504736204003		Not a parcel in 2023	Private
94	504736200111	1 SODA ST	HERSHEY CATHERINE M. & LLOYD G.	Private
95	504726401003	305 N. PIEDMONT ST.	SHOWERS GARY L. & DONNA F.	Private
96	504725301016	N. PIED.	TICE EMY A & SEAN A (JT)	Private
97	504725302001	337 N. PIEDMONT	TIO RICO, LLC	Private
98	504725302002	333 N. PIEDMONT ST.	TIO RICO, LLC	Private
98	504726401002	323 N. PIEDMONT STREET	ROBERTS STEPHEN	Private
99	504726401006	319 N. PIEDMONT STREET	SMITH THOMAS WILLIAM & MCNALLY,	Private
FE 602	504725300022	GEM OF BEAUTY	ASHER HILLS 80, LLC(AZ LLC) &	Private
FE 602	504725300022	GEM OF BEAUTY	ASHER HILLS 80, LLC(AZ LLC) &	Private
FE 602	504725300022	GEM OF BEAUTY	ASHER HILLS 80, LLC(AZ LLC) &	Private
FE 605	504736213005	401 E. MANTZ AVE.	RICO LAND DEVELOPMENT L.L.C.	Private
FE 606	504736213004	401 E. MANTZ AVE.	LINCOLN RICHARD & KAREN	Private
FE 608	504735400020	HWY 145	RICO LAND DEVELOPMENT, LLC	Private
FE 609	504735400019	HWY 145	LINCOLN RICHARD & KAREN	Private
FE 610	504735400021	HWY 145	PYLE BLAIR W. &	Private
FE 617	504735400999			Private
FE 617	504735400999			Private
FE 618	504735400025	PORTION OF AE ARMS TRACT SOUTH	ATLANTIC RICHFIELD COMPANY	Private
FE 619	504735400006	A & E ARMS TRACT	O'GRADY KEVIN & LINDA BURNETTE	Private
FE 620	504736300008		RICO DEVELOPMENT, LLC	Private
FE 620	504736300008		RICO DEVELOPMENT, LLC	Private
FE 621	504735100507	HILLSIDE, HILLSIDE 2	ADAMS REBECCA & GORDON MORTENSEN	Private
FE 621	504735100507	HILLSIDE, HILLSIDE 2	ADAMS REBECCA & GORDON MORTENSEN	Private
FE 625	504735100018	LOT 3 SAM PATCH SUBDIVISION	KYLE DONNA L.	Private
FE 626	504735100017	LOT 2 SAM PATCH SUBDIVISION	KYLE DONNA L.	Private
FE 627	504735100016	LOT 1 SAM PATCH SUBDIVISION	KYLE DONNA L.	Private
FE 630	508501200029	TELEGRAPH	ATLANTIC RICHFIELD COMPANY	Private
FE 631	508501200031	W.L. STEPHANS	ATLANTIC RICHFIELD COMPANY	Private
FE 632	504736300606	CHESTNUT	ATLANTIC RICHFIELD COMPANY	Private
FE 635	504736300618	FRANKLIN	ATLANTIC RICHFIELD COMPANY	Private
FE 636	504736300617	FRANKLIN	FINLEY DAVID D.	Private
FE 639	504735400024	PORTION FG DAY	ATLANTIC RICHFIELD COMPANY	Private
FE 643	504725300055		ATLANTIC RICHFIELD COMPANY	Private
FE 646	009500000462	39 S. SILVER ST	DOW PAUL R. & MARGARET K.	Private
FE 650	009500000572	216 S. COMMERCIAL STREET	FLATT FAMILY LLP	Private
FE 651	009500000865	15 SOUTH SILVER STREET	JHS LLC	Private
FE 653	009500004400	RIVER ST.	DOLORES COUNTY SCHOOL DISTRICT	Dolores County
FE 655	504736210006	24 N. COMMERCIAL ST.	RICO TOWN OF	Town of Rico
VW3	504736200013	110 N GARFIELD ST/VAN WINKLE MINE	RICO TOWN OF	Town of Rico
VW4	504736200014		AALLRED HOLDINGS, LLC	Private
VW5	504736200015	106 N. GARFIELD ST.	GULICK TIMOTHY B.	Private
VW6	504736200016	102 N. GARFIELD STREET	LAUB LAUREN LYNN & STEPHEN HENRY	Private

Attachment 4

Rico Townsite Soils VCUP - Properties to be Sampled*

VCUP Lot No.	Dolores County PIN	Street Address	Developed? Y/N
1	504735106011	126 SOUTH DOLORES RIVER TRAIL	Y
1,9,11,12 strip	504735107999		N
4	504735107002	311 W. EDER STREET	Y
46	504725300038	219 MILL ROAD	Y
59	504736202005	106 N. SILVER STREET	Y
70	504736202011	121 N. GARFIELD ST.	Y
90	504736200108	111 N. SHORT STREET	Y
100	504726401017	313 N. PIEDMONT STREET	Y
105	504726401009	211 N. PIEDMONT ST.	Y
107	504726401021	201 N. PIEDMONT STREET	Y
109	504726402003	305 N. PIEDMONT ST.	N
113	504725301012	324 N. PIEDMONT, APT A	Y
114	504725301017	324 N. PIEDMONT AVE., APT B	Y
115	504725301009	324 N. PIEDMONT, APT C	Y
118	504725301018	314 N. PIED.	N
132	504725304009	135 N. ARGENTINE STREET	Y
141	504736200017	LOT 7 VAN WINKLE	N
150	504736211010	208 E. MANTZ AVE	Y
155	504736210015	23 N. SILVER STREET	N
180	504736208005	26 N. RIVER STREET	Y
192	504736208017	31 N. GLASGOW AVE.	N
194	504736208024	15 N. GLASGOW AVE	Y
195	504736208018	33 N. GLASGOW AVE	N
202	504736207017	15 N. RIVER STREET	N
204	504735104007	2 N. HANCOCK ST.	N
208	504736207001	39 N. RIVER ST.	Y
216	504736207002	35 N. RIVER STREET	Y
223	504736213001	401 E. MANTZ AVE.	N
225	504736215005	NO STREET ACCESS	N
227	504736212005		N
241A?	504736217029	11 S. SILVER ST.	Y
245	504736217018	35 S. SILVER STREET	Y
245?	504736217999	35 S. SILVER STREET	Y
254	504736218014	11 S. COMMERCIAL ST.	Y
262	504736218035	GLASGOW AVE.	N
264	504736218011	23 S. COMMERCIAL STREET	Y
265	504736218010	25 S. COMMERCIAL STREET	Y
273	504736219001	1 S. GLASGOW AVE	Y
275	504736219020	5 SOUTH GLASGOW AVE. "THEATRE"	Y
276	504736219021	9 S. GLASGOW AVE	Y
293	504736200007	208 SOUTH SILVER STREET	N
305	504736224027	108 S. COMMERCIAL ST.	Y
310	504736224032	S. SILVER STREET	N
316	504736223015	116 S. GLASGOW AVENUE	Y

Attachment 4

Rico Townsite Soils VCUP - Properties to be Sampled*

336b?	504736226006	SILVER ST.	Y
336c?	504736326005	335 S. SILVER ST.	Y
338	504736226045	203 S. SILVER STREET	Y
345	504736227012	227 S. COMMERCIAL STREET	N
353	504736227017	225 SOUTH COMMERCIAL STREET	N
354	504736227018	219 S. COMMERCIAL ST.	Y
359	504736228016	235 S. GLASGOW AVE.	Y
365	504736303001	302 SILVERGLANCE WAY	N
370	504736303015	325 S. SILVERGLANCE WAY	Y
374	504736303003	316 S. GLASGOW AVE	N
375	504736302002	312 S. ARGENTINE STREET	N
381	504736304029	405 SILVERGLANCE WAY	Y
384	504736304023	477 SILVERGLANCE WAY	Y
390	504736306003	441 SILVERGLANCE WAY	Y
398	504736304028	SILVERGLANCE WAY	N
415	504736200614	EVENING CALL	N
417	504736400624	ISABELLE	N
433	504736100604	BED ROCK	N
471	504735102007	107 N. HANCOCK STREET	Y
474	504735102003	NO STREET ACCESS	N
515	504725300051	EIGHTY-EIGHTY	N
FE 602	504725300022	GEM OF BEAUTY	N
FE 604	504736223017	102 S. GLASGOW STREET	N
FE 605	504736213005	401 E. MANTZ AVE.	N
FE 606	504736213004	401 E. MANTZ AVE.	N
FE 608	504735400020	HWY 145	N
FE 609	504735400019	HWY 145	N
FE 610	504735400021	HWY 145	N
FE 617	504735400999		N
FE 625	504735100018	LOT 3 SAM PATCH SUBDIVISION	N
FE 626	504735100017	LOT 2 SAM PATCH SUBDIVISION	N
FE 627	504735100016	LOT 1 SAM PATCH SUBDIVISION	N
FE 643	504725300055		N
FE 650	009500000572	216 S. COMMERCIAL STREET	N
FE 651	009500000865	15 SOUTH SILVER STREET	N
FE 653	009500004400	RIVER ST.	N
FE 654	504736216036	201 E. MANTZ AVE.	N
FE 655	504736210006	24 N. COMMERCIAL ST.	N

Note: *Table includes parcels that were not sampled for lead during any VCUP sampling event in the 0-2" depth interval.

Attachment 5

Previously Remediated Parcels, Since Disturbed and Identified for Possible Re-Sampling

VCUP Lot No.	Dolores County PIN	Street Addess	Developed? Y/N	ISWP Date
2	504735108002	144 S. PICKER ST.	Y	8/29/2006
38	504725300147	207 MILL ROAD	Y	7/11/2006
49	504725300144	220 MILL ROAD	Y	8/25/2006
61	504725300147	207 MILL ROAD	Y	7/11/2006
76	504736203003	102 N. SHORT STREET	Y	7/26/2005
79	504736200118	121 NORTH SILVER STREET	Y	7/21/2005
83	504725300019	123 N. SILVER STREET	Y	7/21/2005
87	504736200101	101 SOUTH HINCKLEY	Y	9/13/2005
128	504725304010	134 N.N. ARGENTINE STREET	Y	7/22/2006
131	504725304010	136 RIVER STREET	Y	7/22/2006
146	504736211027	204 E. MANTZ AVE	Y	6/2/2005
149	504736211014	38 N. SILVER STREET	Y	7/10/2006
153	504736211020	37 N. GARFIELD STREET	Y	7/21/2005
157	504736210001	37 N. SILVER STREET	Y	7/19/2005
210	504736207015	5 N. RIVER STREET	Y	11/14/2005
253	504736217001	3 S. SILVER STREET	Y	6/28/2005
283	504736219025	34 S. ARGENTINE STREET	Y	8/3/2006
335	504736222002	16 W. CAMPBELL STREET	Y	9/17/2006
364	504736228004	225 S. GLASGOW AVE.	N	8/7/2007
VW6 (53)	504736200016	102 N. GARFIELD STREET	Y	5/11/2006

Attachment 6
Rico Townsite Soils VCUP - Developed Parcels Identified for Soil Remediation (Preliminary)

VCUP Lot No.	Dolores County PIN	Street Address	Developed? Y/N	Year of VCUP Sampling	Soil Remediated?
17	504735107006	209 S. PICKER STREET	Y	2014	N
18	504735106005	302 W. EDER ST. / 4 PICKER STREET	Y	2004	N
45	504725300148	214 MILL ROAD	Y	2004	N
57	504736202003	118 N. SILVER STREET	Y	2004	N
62	504725300149	132 N. SILVER STREET	Y	2004	N
68	504725300149	132 N. SILVER STREET	Y	2015	N
69	504736202004	112 N. SILVER STREET	Y	2004	N
91	504736200107	6 E. SODA STREET	Y	2004	N
123	504726402007	137 N. RIVER STREET	Y	2004	N
144	504736211011	212 E. MANTZ AVE.	Y	2004	N
145	504736211012	214 E. MANTZ AVE.	Y	2004	N
147	504736211015	16 N. SILVER STREET	Y	2004	N
152	504736211023	35 N. GARFIELD STREET	Y	2004	N
159	504736210003	103 E. SODA STREET	Y	2004	N
160	504736210011	110 E. MANTZ AVE	Y	2004	N
164	504736210009	2 N. COMMERCIAL STREET	Y	2004	N
165	504736210022	32 N. COMMERCIAL ST.	Y	2004	N
173	504736209003	1 N. COMMERCIAL STREET	Y	2004	N
176	504736209006	20 N. GLASGOW	Y	2004	N
177	504736209010	19 N. COMMERCIAL STREET	Y	2004	N
181	504736208006	24 N. RIVER STREET	Y	2004	N
187	504736208025	11 N. GLASGOW AVE	Y	2004	N
189	504736208026	34 N. RIVER STREET	Y	2004	N
193	504736208021	32 N. RIVER STREET	Y	2004	N
196	504736208001	39 N. GLASGOW AVE.	Y	2004	N
198	504735103006	39 N. HANCOCK STREET	Y	2004	N
207	504736220003	1 S. RIVER STREET	Y	2004	N
226	504736215001	116 N. GARFIELD	Y	2004	N
231	504736216044	16 S. SILVER STREET	Y	2004	N
241	504736217030	15 S. SILVER ST.	Y	2004	N
248	504736217005	28 S. COMMERICAL STREET	Y	2004	N
249	504736217004	20 S. COMMERCIAL STREET	Y	2004	N
250	504736217025	16 S. COMMERCIAL ST.	Y	2004	N
256	504736218020	20 S. GLASGOW AVE MINE SHAFT	Y	2004	N
257	504736218015	7 SOUTH COMMERCIAL ST.	Y	2004	N
258	504736218016	5 S. COMMERCIAL ST	Y	2004	N
260	504736218024	20 S. GLASGOW AVE MINE SHAFT	Y	2004	N
262	504736218024	8 S. GLASGOW AVE.	Y	2014	N
263	504736218006	GLASGOW	Y	2004	N
270	504736218032	17 S. COMMERCIAL ST.	Y	2004	N
277	504736219013	13 S. GLASGOW AVE MUSEUM &	Y	2004	N
279	504736219032	21 S. GLASGOW AVE GALLOPING GOOSE	Y	2004	N
284	504736219026	30 S. ARGENTINE STREET	Y	2004	N
285	504736219037	26 S. ARGENTINE STREET	Y	2004	N
290	504736219008	31 S. GLASGOW	Y	2004	N
313	504736223004	110 S. GLASGOW AVE.	Y	2004	N
323	504736223007	124 S. GLASGOW AVE	Y	2004	N
333	504735100005	STREET 1	Y	2014	N
359	504736228016	235 S. GLASGOW AVE.	Y	2004	N
360	504736228010	220 S. ARGENTINE STREET	Y	2004	N
361	504736228011	212 S. ARGENTINE STREET	Y	2004	N
493	504735105013	144 S. PICKER ST.	Y	2004	N

APPENDIX A – SUMMARY OF WORK COMPLETED UNDER 2004 VCUP APPLICATION

APPENDIX A – SUMMARY OF WORK COMPLETED UNDER 2004 VCUP APPLICATION

1 SOIL SAMPLING AND ANALYSIS FOR LEAD

The Atlantic Richfield Company (AR) conducted soil sampling at various times from 2004 through 2015, as described in the 2004 Voluntary Cleanup Program (VCUP) Application (AR 2004a). Soil sampling was completed at most of the parcels within the Town boundary, including parcels on undeveloped land in the Dolores River corridor. Access agreements between AR and the property owner were signed prior to implementing the proposed sampling at each property.

For sampling on developed residential parcels, different soil sample types were established based on specific uses and the nature of the material being sampled:

- Yards
- Driveways
- Vegetable gardens
- Play areas.

These sample types were recorded during sample collection, and they are identified in sample-data files. Results of lead analyses from these samples were relied on to identify locations for soil remediation under the VCUP.

Additionally, exposed soil on unpaved streets, alleys, and along proposed sewer-line corridors were sampled. All of the roads in the Town, except for the paved highway, are unpaved, and many are covered with gravel. Sample types were defined and identified based on the nature of material.

Open space areas in the Dolores River floodplain were also sampled. The Dolores River east overbank (floodplain) area was specifically broken out as an area for targeted sampling based on the proximity to historical ore-processing operations (Pro Patria mill and tailings disposal area; Columbia tailings area) and former railroad facilities and operations. Most of the Dolores River floodplain sample locations were intentionally focused on areas of visually discernible mine waste and/or areas known to have been disturbed by historical mining- and/or railroad-related activity that could have introduced lead to soil.

The Final Data Report (ARCO 2006) and Data Summary Report (TREC 2015) prepared following soil investigations in 2004-2005 and 2014-2015, respectively, provide detailed descriptions of data collection activities and findings. In total, soil samples were collected for analyses of lead from 348 residential parcels (216 developed and 132 undeveloped) and 73 non-residential parcels.

<u>2004-2006 Soil Sampling and Analysis</u> – In general, soil samples were collected from the near-surface (0 to 2 inches below ground surface [bgs]) to best represent potential human exposures (AR 2004b, 2005). Residential yard-soil samples consisted of a composite of five sub-samples located randomly within a yard segment (e.g., back yard). Each sampled yard segment was approximately 2,500 to 5,000 square feet in area. Driveway samples consisted of composites of two randomly selected locations. Street samples comprised a composite of two samples taken at locations approximately equally spaced from the center of each block within Zone 1 (developed areas in the Town of Rico). One discrete surface soil grab sample was collected from play areas present on residential parcels. Zone 2 (undeveloped areas) samples were collected as discrete samples from individual locations and were not composited.

Samples were also collected from areas in Zone 1 identified by the sampling crews as possible or likely mine waste or mining/ore processing source material; these samples were collected from a depth of 0 to 2 inches. A minimum of two sub-samples were composited into a single sample for analysis. Sub-samples were collected at a rate of one sub-sample per 100 to 1000 square feet. Samples of waste rock piles and/or other mine waste or ore piles in Zone 2 were collected as discrete grab samples at a frequency of at least one sample per acre, with a minimum of two samples per area or pile.

Discrete-depth samples were collected at various Zone 1 sites at a frequency of one depth sample location per every other block consistent with the Sampling and Analysis Plan (SAP) criterion of a total of approximately 15-20 depth sample locations in Zone 1. Depth samples were also taken at approximately every third Zone 2 surface sampling location to meet the SAP criterion of approximately 10-15 Zone 2 depth sample locations. Depth samples were collected 2 to 12 inches bgs and 12 to 18 inches bgs at one of the five subsample locations at the selected depth sample site. Thus, a surficial sample taken at 0 to 2 inches bgs is also available at each depth sample site. Garden samples were collected over a depth of 0 to 12 inches to represent typical tilling depths. Samples collected along the proposed sewer lines were collected at depth intervals of approximately 0 to 2 feet bgs and 2 to 4 feet bgs to represent typical excavation depths.

<u>2006 River Corridor Soil Sampling and Analysis</u> – After discussions with CDPHE in June 2006, AR performed additional soil sampling of specific river corridor locations to characterize uncertainties related to soil lead exposure (AR 2007). Thirty-five samples were collected along the historical railroad bed, 11 at the East Shamrock Mine waste rock pile, and 11 in the overbank waste area (Anderson 2007). Five samples were also collected at each of two locations identified as background in the river corridor. Soil lead concentrations were measured with a portable XRF and 10 percent of the samples were submitted for laboratory analysis for quality control (QC) purposes.

Soil lead concentrations ranged from 573 to 12,294 milligrams per kilogram (mg/kg) and averaged 3,740 mg/kg along a former rail line within the river corridor. The highest concentrations were in the vicinity of the Rico City yard at River Street and southward, at a location believed to have served as a historical rail equipment work yard. Lead concentrations in samples collected across the East Shamrock Mine waste rock pile ranged from 1,960 to 8,589 mg/kg and averaged 4,988 mg/kg. West Overbank area waste rock samples were collected on the west side of the Dolores River between the Santa Cruz and

Silver Swan reclamation areas and had lead concentrations that ranged from 3,219 to 6,490 mg/kg and averaged 4,908 mg/kg.

The area identified as Background Area #1 was located in an open meadow on the west bank of the Dolores River on the southwest side of Rico. The area identified as Background Area #2 was located in a small meadow on the north side of Rico near the CO Hwy 145 bridge. Samples were collected along a north-south transect every 50 feet. Soil lead concentrations for locations identified as background ranged from 84 to 244 mg/kg, with an average of 102 mg/kg, at Area #1, and from 75 to 296 mg/kg, with an average of 199 mg/kg, at Area #2.

<u>2008 Soil Sampling Along Town Streets</u> – Some unpaved alleys in the Town of Rico were sampled again in 2008 (Anderson 2008, SEH 2008). Samples were collected from 0 to 2 inches at two locations approximately equal distance from the center of the alley segment. Soil lead concentrations were measured with a portable XRF, and 10 percent of the samples were submitted for confirmation analysis by a laboratory. A total of 43 samples were collected. Soil lead concentrations ranged from 158 to 68,400 mg/kg (Mean concentration = 3,080 mg/kg).

<u>2014-2015 Soil Sampling and Analysis</u> – Soil samples were collected in and around the Town of Rico in fall 2014 and spring 2015 at undeveloped residential properties, unpaved roadways, the Dolores River corridor, and at locations identified as background (AECOM 2014). A total of 1,509 soil samples were collected and were either submitted to a laboratory for lead analysis or analyzed by field portable XRF.

- Of these, 924 soil samples were collected within undeveloped properties (vacant parcels) from four depth intervals (0-2, 2-12, 12-24, 24-36 inches).
- Twelve surface soil samples were collected at 12 new locations along unpaved roadways (0-2 inches). A total of 73 samples were collected along previously sampled unpaved roadways at two depth intervals (2-12, 12-24 inches).
- A total of 139 discrete soil samples were collected from previously sampled locations within the Dolores River corridor from the 0 to 2- and 2 to 12-inch depth intervals; 25 percent of the step out locations were sampled from 12 to 24 and 24 to 36 inches. A total of 259 XRF samples were collected within the Dolores River corridor.
- A total of 1-2 samples were collected at locations identified as background from four different geologic material types (undisturbed colluvium, undisturbed talus, undisturbed fan deposits, and undisturbed recent alluvial deposits).

2 CONSTRUCTION OF THE RICO SOIL LEAD REPOSITORY

The Rico Soil Lead Repository (the Repository) was constructed pursuant to a Certificate of Designation issued by Dolores County, and approved by CDPHE, in October 2005 for the disposal and management of soil removed during VCUP cleanup (AR 2004c). The Repository was constructed adjacent to the St.

Louis Tunnel portal, approximately one mile north of Rico (see Figure 2) on the Martha and Mervin patent claims, and the repository has a total capacity of approximately 40,000 cy.

Design considerations included (1) selection of liner materials to provide adequate protection of groundwater from repository effluent, (2) proper grading of the repository subgrade and final grade to provide adequate slope stability and drainage of the effluent, (3) selection and placement of adequate cover materials to minimize long-term infiltration and erosion, and (4) surface water controls (ARCO 2004c). The liner consists of graded and compacted subgrade, a 6-inch thick cushion layer, a geo-composite liner (GCL), and a minimally compacted 12-inch thick drainage layer. Soil placed in the repository for permanent disposal is compacted. When the repository has been filled to capacity, disposed soil will be covered with a permanent cap consisting of an infiltration layer and growth media.

The total volume of lead-containing soil disposed in the Repository through 2019 is listed in Table C-1. The soil repository remains available for future disposal of soil with elevated lead levels. As of October 2021, the repository has a remaining capacity of approximately 20,000 cubic yards (cy), or 50 percent of the original capacity. To ensure future capacity and avoid other complications, the repository is intended solely for use to support Rico Townsite Soil VCUP projects.

AR currently manages the Repository in compliance with the Certificate of Designation and applicable State of Colorado regulations. Currently, run-on-runoff controls are maintained to prevent erosion and dispersal of disposed soils. Recent inspection and maintenance reports have been provided to CDPHE.

TABLE C-1. SOIL VOLUME CURRENTLY DISPOSED IN RICO SOIL LEAD REPOSITORY

YEAR	QUANTITY OF SOIL (cy)	SOURCE OF SOIL
2005	3,787	Residential yards
2006	2,653	Residential yards
2007	1,561	Residential yards
2008	565	Van Winkle Mine site
2019	662	Residential Yards
TOTAL	**9,228**	**Town of Rico**

Notes: cy = cubic yards

3 REMEDIATION OF INDIVIDUAL PARCELS

An Individual Site Work Plan (ISWP) was developed to guide soil remediation at each of the sampled residential parcels (and including one school property) where soil contained lead above the action level for residential land use (1,100 mg/kg) and at each of the sampled non-residential parcels where soil lead was above the action level for commercial land use (1,700 mg/kg). A key specification for each of the ISWPs was the establishment of a minimum of 12 inches of clean surface soil at the subject property. This specification was addressed through a combination of existing-soil removal, as needed from the individually sampled areas within the property (e.g., yard area, driveway, etc.) followed by placement of clean soil over the excavated area(s).

The soil removed from each property was transported to the Rico Soil Lead Repository for final disposal. Borrow areas used as a source of clean soils were first sampled to verify low metals concentrations (all were below 100 mg/kg). Final reclamation of the clean soil surface depended on the pre-disturbance nature of the original surface and cover. The final surface was comprised mainly of revegetated soil consistent with the original conditions. Existing lawns were replaced with sod. Lawn watering and maintenance following sod placement were the responsibilities of the property owner. Properties with pre-existing native vegetation were seeded with native vegetation species, fertilized, and mulched. Unpaved driveways and any erosion-prone areas of the yard were capped with gravel or rock mulch.

Special consideration was given to protection of septic systems, propane tanks and service lines, other utilities, fences, retaining walls, concrete features (e.g., patios, sidewalks) and sub-surface irrigation systems during all on-site VCUP activities. In order to protect existing utilities, the location of buried public utilities was depicted on a scaled lot map based on locates arranged through the Utility Notification Center of Colorado. The locations of private buried utilities were based on the owner's description and site observations and confirmed as necessary by probing/test pits during excavation. Soil removal terminated at the drip line of established trees and shrubs to preserve these high value plantings. Damage to such features that occurred in the course of the work was repaired or replaced in kind. Also, standard construction controls were implemented during all excavation and grading operations to control fugitive dust.

Soil remediation was completed, except for some open issues regarding post-remediation landscaping concerns, at a total of 75 properties (each property includes one or more parcels recorded by Dolores County). Attachment 2 is a list of the previously remediated properties. AR was unable to address eight parcels with lead levels above the action level because access for remediation was denied by the owners. As part of the VCUP, AR obtained releases that the work was acceptable from the property owners of the majority (approximately 80 percent) of the remediated parcels. Approximately 10 percent of the property owners did not respond regarding completed work, and another 10 percent of the property owners refused to sign the releases for various reasons.

4 VAN WINKLE MINE SITE REMEDIATION

The Van Winkle Mine site encompasses less than 2 acres and is the location of the historical Van Winkle head frame and associated waste rock pile. A site-specific plan for the Van Winkle property was submitted with the Phase I Work Plan and Preliminary Data Report (ARCO 2004b). Pursuant to the Van Winkle Conceptual Plan and the Van Winkle Subdivision Plan approved by the Town in 2007, exchanges and conveyance of properties or portions of properties comprising or surrounding the Van Winkle Mine site were completed to consolidate the mine site into a single parcel for future ownership by a single entity. AR is the current owner of the remediated Van Winkle Mine site.

Given the size of the mine site and its similarity to other waste rock sites in the area, the cleanup consisted of techniques to limit human exposure to the existing waste rock, reduce the potential release of dissolved-phase metals to surface water, and provide for the long-term stability of the remediated area. Specific measures incorporated as part of the cleanup were designed to reduce infiltration, control run-on and runoff, and limit direct human contact. Waste materials were consolidated and shaped to achieve reduced grades and to minimize the size of the area to be remediated. Lead-impacted soils removed from the site were transported to the Rico Soil Lead Repository for disposal. The mine site property now contains a pocket park for Town use. The Van Winkle headframe structure was preserved as an historically significant feature.

5 REFERENCES

AECOM. 2014. Sampling and Analysis Plan, Revision 1 Rico Soils Voluntary Cleanup Program, Rico, Colorado. July 2014.

Anderson Engineering Company Inc. (Anderson). 2007. Rico Railroad Corridor Sampling and Analysis Report. Prepared for Atlantic Richfield Company. January 2007.

Anderson. 2008. Email from Chris Sanchez/Anderson to Doug Yadon/SEH and Check Stilwell/BP with attached spreadsheets titled streets Sampling. Subject: Alley Sample Results. October 7, 2008.

Atlantic Richfield Company (Atlantic Richfield). 2004a. Rico Townsite Soils VCUP Application, Rico, Colorado. Submitted to CDPHE. Submitted by Atlantic Richfield Company, Rico Renaissance, LLC, Rico Properties, LLC, Town of Rico. Prepared by Short Elliott Hendrickson Inc. June 24, 2004.

AR. 2004b. Rico Townsite Soils Phase I Work Plan and Preliminary Data Report, Rico, Colorado. Submitted to CDPHE. Submitted by Atlantic Richfield Company, Rico Renaissance, LLC, Rico Properties, LLC, Town of Rico. Prepared by Short Elliott Hendrickson Inc. September 23, 2004.

AR. 2004c. Engineering Design and Operations Report to accompany Application for Certificate of Designation for Soil Lead Repository, North Rico (St. Louis Ponds) Site in Rico (Dolores County), Colorado. Submitted to Dolores County and CDPHE. Submitted by Rico Properties, LLC as a representative of Rico Renaissance, LLC. Prepared by Short Elliott Hendrickson Inc. December 22, 2004.

AR. 2005. Rico Townsite Soils VCUP Project Phase II Work Plan, Rico, Colorado. Submitted to CDPHE. Submitted by Atlantic Richfield Company, Rico Renaissance, LLC, Rico Properties, LLC, Town of Rico. Prepared by Short Elliott Hendrickson Inc. May 25, 2005.

AR. 2006. Volume I Rico Townsite Soils VCUP Project Final Data Report and Data Evaluation, Rico, Colorado. Submitted to CDPHE. Submitted by Atlantic Richfield Company, Rico Renaissance, LLC, Rico Properties, LLC, Town of Rico. Prepared by Short Elliott Hendrickson Inc. June 7, 2006.

AR. 2007. Letter from Chuck Stillwell, Environmental Manager, Atlantic Richfield Company to Mark Walker, Voluntary Cleanup Program, CDPHE, dated February 2, 2007 RE: Rico Railroad Corridor Sampling and Analysis Report.

Short Elliott Hendrickson Inc. (SEH). 2008. Memorandum from Douglas P. Yadon/SEH to Chuck Stilwell/BP. Subject: Rico Unpaved Streets. October 9, 2008.

TREC, Inc. 2015. Rico Town Soil Sampling Project, Rico (Dolores County) Colorado, 2014–2015 Data Summary Report (DSR). Submitted to Atlantic Richfield Company. December 11, 2015.

APPENDIX B – RICO TOWNSITE SOILS 2021 PHASE 1 VCUP WORK PLAN

RICO TOWNSITE SOILS
2023 VOLUNTARY CLEANUP PROGRAM (VCUP) APPLICATION

APPENDIX B – PHASE 1 VCUP WORK PLAN (Version 1.7)

Prepared for:
Atlantic Richfield Company
and
Town of Rico, Colorado

Prepared by:
Formation Environmental, LLC
2500 55th Street, Suite 200
Boulder, Colorado 80301

and

Alloy Group
406 E. Park Ave.
Anaconda, MT 59711

APRIL 2023

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LIST OF ABBREVIATIONS

AR	Atlantic Richfield Company
bgs	below ground surface
CDOT	Colorado Department of Transportation
CDPHE	Colorado Department of Public Health and Environment
CLP	Contract Laboratory Program
cy	cubic yard(s)
EPA	U.S. Environmental Protection Agency
FAQ	Frequently Asked Questions
GIS	Geographic Information System
GPS	Global Positioning System
ICP	Inductively Coupled Plasma
ICs	Institutional Controls

IDW	Investigation Derived Waste
ISWP	Individual Site Work Plan
LAL	Lead Action Level
LCS	Laboratory Control Sample
mg/kg	milligrams/kilogram (parts per million)
MS	Matrix Spike
NAD	No Action determination
NFA	No Further Action
PPE	Personal Protective Equipment
PUD	Planned Unit Development
QC	Quality Control
RPD	relative percent difference
RL	reporting limit
SOP	Standard Operating Procedure
sq ft	square feet
VCUP	Voluntary Cleanup Program
XRF	X-Ray Fluorescence

1 INTRODUCTION

This Work Plan describes work to be performed during Phase 1 (Soil Characterization and Soil Remediation) of the Rico Townsite Soils Voluntary Cleanup Program (VCUP) project in accordance with the 2023 Rico Townsite Soils Voluntary Cleanup Program (VCUP) Application. The work described in this Work Plan is an extension of the work previously completed under the 2004 VCUP Application and related plans approved by the Colorado Department of Public Health and Environment (CDPHE) for the Rico Townsite Soils VCUP project. As noted in the 2023 VCUP Application, the objective of the Rico Townsite Soils VCUP is to address the presence of lead in surface soil in the Town of Rico (Dolores County), Colorado.

The 2023 VCUP Application and this Work Plan are based on the same soil-remediation objectives and plans that were presented in the 2004 Rico Townsite Soils VCUP Application (AR et al. 2004a), as well as subsequent Rico Townsite Soils VCUP Work Plans and Sampling and Analysis Plans (AR et al. 2004b; AR et al. 2005; AECOM 2014) approved by CDPHE. The lead soils action levels have been selected by the Town and AR based on values developed and recommended by CDPHE. The 2023 VCUP Application and this Work Plan are being submitted in anticipation of an acceptable funding agreement being negotiated between the Town of Rico and Atlantic Richfield Company.

1.1 VCUP PROJECT BACKGROUND

Atlantic Richfield Company (AR, which for the purpose of this Work Plan refers to Atlantic Richfield and its affiliates, consultants, and contractors) previously conducted investigations of soil in the Town of Rico (the Town) as part of the Rico Townsite Soils VCUP project. Soil sampling and analysis were performed at various times beginning in 2004 and continuing through 2015. The prior investigations included collection of soil samples from developed and undeveloped residential and non-residential properties; along unpaved roadways and proposed sewer alignments; and within the Dolores River corridor, which included sampling along an historical railroad corridor (AEC 2007). Soil samples have been collected for analyses of lead from over 400 properties.

AR also previously conducted soil remediation at individual properties in Rico to address soil lead concentrations above the risk-based action levels for lead that were approved by CDPHE and EPA for use by the Rico Townsite Soils VCUP project. Soil remediation was completed at all but a few of the properties that were sampled in 2004-2005 and found to have soil lead concentrations above the Rico Townsite Soils VCUP action levels approved by CDPHE in 2006 and 2007. To date, soil remediation has not been completed under the VCUP at properties sampled in 2014-2015, unpaved roads, or land parcels along the Dolores River.

AR's past VCUP activities also included the design, construction, and operation of a soil repository for disposal of lead-containing soil removed from Rico properties during soil remediation. The operations plan, closure plan, and post-closure plan for the Rico Soil Lead Repository were provided in the 2004 Engineering Design and Operations Report that accompanied the Application for Certificate of Designation for the Soil Lead Repository at the North Rico (St. Louis Ponds) Site (SEH 2004). The operations plan was prepared pursuant to the requirements of 6 CCR 1007-2, Part 1, Regulations

Pertaining to Solid Waste Sites and Facilities (Section 3.3 - Operating Criteria and Section 3.4 - Recordkeeping).

The Rico Soil Lead Repository was constructed in October 2005 approximately 1 mile north of the Town of Rico on property now owned by AR on the east side of the Dolores River. The repository covers an area of approximately 1.5 acres and was designed to accept 40,000 cubic yards (cy) of soil. The repository is operated by AR and accepts only soil with elevated lead levels. As of October 2021, the repository has a remaining capacity of approximately 20,000 cubic yards (cy), or 50 percent of the original capacity. The repository is available to accept qualifying soil removed during the additional soil remediation that will be conducted in accordance with this Work Plan.

If the capacity of the existing Rico Soil Lead Repository is exhausted, AR will, in consultation with the Town, determine how to continue to manage such action-level soils and mine waste in accordance with applicable state and federal law, including expansion of the Soil Lead Repository, construction of a new repository, beneficial use of the material, and/or off-site transport and disposal. If a new repository is constructed or other off-site disposal option is used, it will either be located a similar driving distance from the Town as the existing repository, or delivery of action-level soils to the existing repository will continue and AR will transport the delivered soil and mine waste to the new repository or off-site location.

1.2 ORGANIZATION OF THE WORK PLAN

The purpose of this 2023 VCUP Work Plan is to describe the approach for completing Phase 1 soil characterization and soil remediation described in the 2023 Rico Townsite Soils VCUP Application. Section 2 of this Work Plan identifies the sampling and analysis methods that will be adopted to complete soil characterization in the VCUP project area. The sampling and analysis methods specified in Section 2 are generally consistent with those used during previous VCUP sampling efforts in 2004-2005, 2006, 2008 and 2014-2015, as described in the 2004 VCUP Application (AR et al. 2004a, 2004b). Section 3 of this Work Plan presents the approaches that will be adopted for soil remediation at the various types of developed properties present in Rico, including instructions for preparation of the Individual Site Work Plans (ISWPs) that will serve as the property-specific design document at each of the properties where AR conducts Phase 1 soil remediation. Plans for remediation of soil on unpaved road segments and management of VCUP soil data and soil-remediation records are described in Sections 4 and 5. The Institutional Controls (ICs), including the Overlay Zone Regulations, that will be implemented following the Phase 1 soil sampling and analysis and the soil remediation activities described in this Work Plan and the overall schedule for the Rico Townsite Soils VCUP project are provided in the 2023 VCUP Application (refer to Sections 6 and 7 of the Application).

2 COMPLETION OF SOIL SAMPLING

The primary purpose of soil sampling and soil analyses performed for the Rico Townsite Soils VCUP project is to provide data describing the lead concentrations in soil at individual properties in a manner that can be used to determine whether, and where, soil remediation is needed to address surface soil with lead concentrations greater than the site-specific action levels.

The Rico Townsite Soils VCUP project area is defined as the land within the boundaries of the Town of Rico, which has been divided into multiple land parcels or Town lots. For the purpose of this Work Plan, each individual parcel/lot and each group of contiguous parcels/lots under the same ownership will be described and managed as a single "property." The properties in the VCUP project area, as defined by the 2023 VCUP Application, have a range of different land uses. The Town of Rico zoning map (see Figure 6 of the 2023 VCUP Application) identifies the different land uses, each of which has distinct considerations for collection of soil samples that will be used to evaluate the need for remediation.

Data collected in accordance with this plan will fill the data gaps remaining for the Rico Townsite Soils VCUP project. The new data will ultimately be used along with other available VCUP-project data for the following purposes:

- Identify locations within the project area where surface soil-lead concentrations are above the applicable, site-specific action level and determine the scope of soil remediation at individual properties and on unpaved roadways within the project area;
- Guide AR's preparation of the engineering design documents for soil remediation at individual properties (ISWPs) and on unpaved road segments (Road Remediation Work Plan);
- Provide additional data as needed to support requests to CDPHE for No Action Determinations (NADs) and No Further Action Determinations (NFAs); and
- Provide additional data to support the ICs program that will be established to specify appropriate requirements for handling and remediating soil at individual properties when land uses change or new development takes place in VCUP Phases 2 and 3.

This section of the Work Plan provides the soil sampling and analysis procedures that will be followed to complete the VCUP soil investigations in the Rico Townsite Soils project area.

2.1 SCOPE OF REMAINING SOIL SAMPLING ACTIVITIES

The soil-sampling status and soil-remediation status of each individual property within the project area are indicated on the map in Figure B-1. Approximately 100 properties remain to be sampled in order to characterize lead concentrations in surface soil (refer to VCUP Application Attachment 3 for the list of properties identified for sampling during Phase 1).

Based on records maintained by the Town of Rico, approximately 20 of the properties remediated by AR in 2005-2007 may have since been subject to soil disturbance by excavation or construction activities permitted by the Town of Rico (refer to Attachment 5 of the VCUP Application). The clean cover soil placed on these properties during soil remediation may have been partially removed, substantially disturbed, or covered by other soil in a manner that has changed the lead concentration in surface soil. For this reason, resampling the surface soil at these properties may be warranted to confirm that existing conditions are consistent with the goals of the 2023 Rico Townsite Soils VCUP project. Resampling will also occur at five additional properties (including the Town Park and adjacent roadway surface) with existing clean soil covers that do not appear disturbed, for quality control purposes. Properties to be re-sampled will be jointly identified by the Town and AR. If AR and the Town subsequently learn that additional properties previously remediated by AR have since been subject to soil disturbance as described in this sub-section, those properties will also be evaluated for re-sampling and analysis of soil.

Collection of new soil samples at any previously remediated properties will be contingent on the findings of a review of the available excavation or construction records documenting the extent of soil disturbance and a review of current versus historic aerial photographs. The review will be performed by AR with assistance from the Town of Rico. If that review indicates that previously remediated areas were disturbed (or likely disturbed) to depths of more than 12 inches below the ground surface (bgs), that the disturbance penetrated the fabric marker, and/or that soil from below the fabric marker may have been brought to the surface, or if no documentation of the disturbance is available, then the lead concentrations in soil will need to be verified through resampling and analysis, and the property will be included in the soil sampling efforts completed in accordance with this Work Plan.

Road-surfacing materials on unpaved roads within the project area have already been sampled. However, some of the previously sampled roads have been disturbed since the original samples were collected in 2004 and 2008. As a result, re-sampling of the traveled surface of some road segments may be needed, pending consultation with the Town of Rico regarding the extent of recent disturbance activities and approval by CDPHE. Additional sampling may also be conducted to better define the extent of planned remediation of unpaved roads and support development of a final remedial design for unpaved roads (refer to Section 4).

2.2 ACCESS AGREEMENTS FOR SOIL SAMPLING

Before sampling at any property, AR must obtain agreement, in writing, from the current owner (or an authorized representative) allowing access to the property for that purpose. Access agreements will be sent to the address on record for the property owner as listed in the Dolores County Assessor's records. AR will request property owners to provide access to properties for collection of soil samples upon CDPHE acceptance of the 2023 VCUP Application and 2023 VCUP Work Plan. Each request for sampling access will be accompanied by written explanation of the objective of the VCUP program, the rationale for and benefits of soil characterization (and soil remediation) services offered by the VCUP Program, the purpose of sampling and analysis for lead, and a general timeline for conducting the sampling and analysis and then reporting results to the property owner. Requests for access will also provide internet addresses for public-health websites that provide additional information regarding the potential health risks related to exposure to lead in the environment.[1]

AR will mail out or hand deliver an initial written request for sampling access to the owners of the approximately 100 properties that remain to be sampled, with instructions to sign the enclosed access agreement (refer to Attachment 1 for an example access agreement) and return it to AR. AR will also mail out or hand deliver requests for access to the owners of the 20 properties previously remediated by AR that will be resampled to determine current soil lead concentrations (See Section 2.1). In addition, efforts to obtain access agreements from property owners will be made once each year during each of the first three years of Phase 1. As appropriate, the Town of Rico will assist AR in contacting owners or otherwise addressing property owners' specific concerns regarding collection and analyses of soil samples.

2.3 PROPERTY TYPES

Soil sampling will be conducted at three general types of properties, which are defined based on their current land use. Distinct sampling plans will be used to characterize lead in soil within each of the three property types.

The three property types and their current zoning designations are as follows:

1. **Residential, Residential Planned Unit Development (PUD), Historical Commercial, Commercial, Commercial PUD, and Mixed Use**

   Properties with these zoning classifications (Residential, Residential PUD, Historical Commercial, Commercial, Commercial PUD, and Mixed Use) allow residential use. AR will collect soil samples at all properties zoned to allow residential use, including currently vacant and undeveloped properties. Parcels that are subject to floodplain, avalanche, steep slope, or other hazards (see Figure 11 of the 2023 VCUP Application) will not be sampled as part of the initial sampling program for 2023 to 2025.

2. **Town of Rico Open Space and Public Facilities**

   Soil samples will be collected from Open Space parcels that allow public access and at Public Facilities.

3. **Town of Rico's Unpaved Roads**

   This area includes all of the Town of Rico's unpaved roads and routinely traveled alleys, including non-vegetated rights of way. Alleys that provide access to developed residential properties are considered "routinely traveled." The non-vegetated right-of-way area includes

[1] For example: U.S. Environmental Protection Agency's "Learn About Lead" website. https://www.epa.gov/lead/learn-about-lead

the road shoulders, drainage swales, ditches, berms, parking area, and other bare ground next to the traveled roadway within the Town-owned right-of-way.

Both developed and undeveloped properties are targeted for sampling under this 2023 VCUP Work Plan to provide a consistent database of soil-characterization data that will ultimately support the VCUP project's ICs in Phases 2-3. If sampled properties are developed (or redeveloped) in the future as part of Phases 2-3, re-sampling by the property owner may be necessary to characterize the post-development soil lead concentrations. The need for future resampling in conjunction with development (or redevelopment) of the property will be performed by the property owner in accordance with the Overlay Zone Regulations adopted as an IC (refer to Section 6 of the 2023 VCUP Application).

2.4 SOIL SAMPLING AND ANALYSIS PLAN[2]

The general sampling designs and sampling and analysis methods used during prior Rico Townsite Soils VCUP sampling efforts (i.e., from 2004 through 2015) have been adopted for completion of soil characterization within the VCUP project area to ensure consistency in the type and amount of data available for guiding VCUP soil remediation at individual properties.

The following sections describe the numbers and types of samples that will be collected at each of the three property types in the project area.

2.4.1 SOIL SAMPLING AT RESIDENTIAL, RESIDENTIAL PUD, HISTORICAL COMMERCIAL, COMMERCIAL, COMMERCIAL PUD, AND MIXED-USE PROPERTIES

The sampling plans for properties where residential use is allowed are based on the recommendations provided in EPA's Superfund Lead-Contaminated Residential Sites Handbook (EPA 2003), which is the current version of this document. Figures B-2, B-3, and B-4 are schematic drawings that illustrate some example sampling designs based on the residential-property sampling requirements described below.

2.4.1.1 DEVELOPED PROPERTIES

For the purpose of the Rico Townsite Soils VCUP project, a developed property is defined as an improved property with a structure that is in a condition suitable for commercial or residential use and occupation. The minimum number of soil samples required at each developed property varies depending on the following conditions:

- **Developed properties ≤5,000 square feet (sq ft) in total area** – Properties less than or equal to 5,000 sq ft in total area will be divided into at least two sampling areas, excluding buildings, pavement, or other permanent caps over the soil. A minimum of two composite samples (comprised of five subsamples each), one each from the front yard and back yard (and side yard if substantial), plus a separate sample for each distinct driveway, vegetable garden, and active

[2] As specified in the Overlay Zone Regulations (Section D.6.A) "All sampling and analysis must be performed by a qualified contractor, and the conformance of all sampling and analysis with the standards set forth in this Section D.6.A must be certified by a Professional Engineer ("P.E.") registered and licensed in the State of Colorado or a Professional Geologist ("P.G.") meeting the requirements of § 23-41-208(1)(b), C.R.S."

play areas, including but not limited to those where play structures are located, if present, will be collected.

- **Developed properties >5,000 sq ft and < 0.5 acres in total area** – Properties greater than 5,000 sq ft and less than 0.5 acres in total area will be divided into at least four sampling sectors, with each one not exceeding 5,000 sq ft (excluding buildings, pavement or other permanent caps). A minimum of four composite samples (comprised of five subsamples each), one from each sampling sector, plus a separate sample for each driveway, vegetable garden, and active play areas, including but not limited to those where play structures are located, if present, will be collected.

- **Properties ≥ 0.5 acres in total area** – Properties greater than or equal to 0.5 acres in total area will be divided into sampling areas of less than or equal to ¼ acre each, and one five-point composite sample will be collected from each sampling area of the property. All sampling areas will be from the area within a 100-foot radius of the primary structure unless a property or natural boundary (i.e., fence, hedge, tree line, abrupt change in grade, etc.) is encountered at a distance less than 100 feet. In addition, separate samples will be collected from each distinct driveway, vegetable garden, active play areas, including but not limited to those where play structures are located, and other areas of visible active use by the property owner, if any such areas are present.

The five subsamples will be collected at five discrete locations within each composite-sample sector and composited into one composite sample for each separate area for a total of two or more composite samples for each property, based on the property size described above. The locations of the subsamples will be selected by the sampling personnel to represent soil conditions within the area of the yard that the composite is from. All subsamples will be collected from locations that are outside the drip zone of buildings (4 feet from the edge of a building) in order to avoid possible lead paint contamination.

If identifiable or suspected mine waste deposits are observed at the surface, any samples of those materials will be collected and analyzed separately from other soil composite samples collected from the property. One grab sample of the distinct material will be collected from a depth of 0 to 2 inches measured from the top of the soil column at each location where such materials are observed on the property. The grab sample will be prepared and analyzed for lead using the same procedures as other soil samples. Those procedures are described in Sections 2.4.6 and 2.4.7.

For developed properties of any size, additional samples will be collected from unpaved driveways, vegetable gardens, and bare play areas (see example sampling plans in Figures B-2 and B-3), if they are present, as follows:

- **Unpaved driveways** – Surface soil samples will be collected from a depth of 0 to 2 inches at two randomly selected locations in each unpaved driveway. These two samples will be combined into a single composite sample.

- **Vegetable gardens** – Soil samples will be collected from each vegetable garden at a sample density of one sample per 100 sq ft with a minimum of two samples per garden. Samples from vegetable gardens will be collected across the depth of 0 to 12 inches to reflect the typical tilling depth of a garden. These two or more subsamples will be combined into a single composite sample.

- **Play areas for children** – Additional samples will be collected of bare soil in play areas, if present. For relatively small play areas (swing sets, sand lots, etc.), one discrete surface soil grab sample will be collected within the play area. For larger play areas, surface soil samples will be collected from 0 to 2 inches at five randomly selected locations. These five samples will be combined into a single composite sample.

2.4.1.2 Undeveloped Properties

Phase 1 Soil sampling will be completed at currently undeveloped properties identified on Figure 11 of the VCUP Application. Phase 1 sampling excludes properties that are subject to floodplain, avalanche, steep slope, or other hazards. The required number of soil samples collected at these properties will be at least one five-point composite sample from each 5,000 sq ft of land (see example sampling plan in Figure B-4). If a building site, or sites, has already been established for a property, then one five-point composite sample will be collected from the proposed building site of 5,000 sq ft or less. An additional five-point composite sample will be collected for each additional 5,000 sq ft of undeveloped property or building site.

Each soil sample will be a composite of five subsamples, each collected from a depth of 0 to 2 inches. The locations of the discrete subsamples will be selected by the sampling personnel to represent the soil across the subject area (e.g., front, middle, and back areas of the property). The five subsamples will be combined to form a single composite sample representing the average lead concentration in soil across the sampled area.

If identifiable mine waste deposits are observed at the surface, those materials will be sampled for separate analysis for lead concentration. One grab sample will be collected from a depth of 0 to 2 inches in any such areas of the property. The grab sample will be prepared and analyzed for lead using the same procedures as all other samples. Those procedures are described in Section 2.4.6.

2.4.2 Soil Sampling Plan for Open Space and Public Facilities

For Open Space parcels, at least one five-point composite sample will be collected from a depth of 0 to 2 inches per ½ acre of land. The five subsample locations will be selected by the sampling personnel with efforts made to collect the five subsamples from soil that is representative of the subject sample area. The five subsamples will be composited into a single sample representing that half-acre portion of the parcel.

If identifiable mine waste deposits are observed at the surface, those materials can be sampled for separate analysis of lead concentration. One or more grab samples may be collected from any such areas on the property, from a depth of 0 to 2 inches. The grab sample will be prepared and analyzed for lead using the same procedures as for the composite soil samples; those procedures are described in Section 2.4.6.

At properties of this type that include developed play areas for young children (e.g., designated playgrounds) additional samples will be collected from that area.[3]

- **Children's play areas that are less than 5,000 sq ft** – Surface soil samples will be collected from 0 to 2 inches at five locations. These five samples will be composited into a single sample to represent that play area. Opportunistic samples will be collected from areas of bare or limited vegetation and separately analyzed.
- **Children's play areas greater than approximately 5,000 sq ft** – The play area will be divided into two or more sections, each with an area no greater than 5,000 sq ft, and the composite sampling procedure will be applied to each section. For each section of the play area, surface soil samples will be collected from 0 to 2 inches at five locations and composited into a single sample representing that section. Opportunistic samples will be collected from areas of bare or limited vegetation and separately analyzed.

Because property uses in the Open Space/Public Facilities category vary widely, plans for soil sampling will be developed on a property-by-property basis. For example, schools and common areas frequented by children may warrant more extensive sampling. Such variations from the general sampling plan described above will not require specific approval by CDPHE as long as the minimum sampling requirements for the property type are met.

2.4.3 SOIL SAMPLING PLAN FOR TOWN OF RICO'S UNPAVED ROADS

AR will collect composite samples of the road surfacing materials from any unpaved road segments not previously sampled, unpaved road segments where the scope of planned remediation needs to be better defined, and where previously sampled unpaved roads that have been disturbed since the prior VCUP sampling. Analyses of these additional samples will augment the previous data collected for the Rico roadways. Potential sample locations for unpaved roads and alleys are shown on Figure B-5.

AR will collect the soil samples based on previous sampling locations from the Rico Townsite Soils Investigation, Final Data Report (AR et al. 2006), 2008 road and alley sampling activities, and any information concerning new alleyways or roadways established since 2008. Refer to Figure 9 of the VCUP Application for a map of the road and alley sample locations in 2004 and 2008.

For each road segment identified for sampling, AR will collect one composite sample from the traveled surface of the road from a depth of 0 to 2 inches within the designated road segment. The composite will be comprised of four subsamples from each segment. Each segment shall be approximately one block, or the length of a road between two cross-streets, including alleys. Subsamples will be taken at points approximately ¼ of the way and ¾ of the way along the length of the segment, and on either side of the centerline, approximately half the distance to the edge of the road. The subsamples will be composited into a single sample to represent the entire unpaved road segment. For road segments being re-sampled due to known disturbance, additional subsample(s) will be opportunistically collected from the area of disturbance, if it can be identified, and the additional subsample(s) will be incorporated

[3] Although sampling methods for developed play areas on Public Facilities and Open Space parcels are described in this section, the Applicants have not identified any such areas currently existing on parcels zoned as Public Facilities or Open Space.

into the segment composite sample. Additional grab samples will be collected from the non-vegetated right-of-way immediately adjacent to the road at locations where visual observations indicate the presence of mine waste.

2.4.4 COLLECTION OF SOIL SAMPLES

Collection of soil samples will be consistent with sample collection, preparation, and handling procedures used for previous Rico Townsite Soils VCUP investigations. Standard Operating Procedures (SOPs) are included in Attachment 2.

2.4.4.1 COLLECTION METHODS

Soil will be collected at each sample location using hand tools to excavate soil from 0 to 2 inches bgs. The soil samples will be collected from below the base of any sod or root mat that may be present and beyond the drip zone of buildings present on or adjacent to the subject property to avoid possible contamination by deteriorating lead-based paint. In some cases, material other than vegetation will be encountered at a sample location, e.g., wood chips and sand are often found in recreational areas of day-care and school playgrounds. In such cases, the top 2 inches of soil below the cover material should be collected instead of the non-soil cover.

2.4.4.2 COMPOSITING SOIL SAMPLES

For the purposes of this VCUP project, a composite soil sample will consist of the discrete subsamples of roughly equal volumes of soil collected from two or more separate locations within the subject sample area. The soil from each of the subsamples is to be collected into one clean container, such as a stainless-steel bowl or plastic bag, and then thoroughly mixed together. After mixing, the sample will be sieved to homogenize and reduce the size of the soil particles prior to analysis for lead content (see Section 2.4.6).

2.4.4.3 EQUIPMENT DECONTAMINATION

Decontamination will be performed on all re-usable sampling equipment between sample locations. Soil sampling equipment may include stainless-steel sampling utensils, hand tools, and direct-push samplers. Small equipment will be decontaminated by washing with clean, distilled or de-ionized water mixed with detergent solution, and rinsing with clean, distilled or de-ionized water.

2.4.5 SAMPLE PREPARATION AND ANALYSIS METHODS

All soil samples will be sieved through the U.S. Standard No. 60 sieve (250 µm mesh size) and then the materials passing the sieve will be analyzed for lead. Composited soil that does not pass through the sieve can be returned to the ground surface in the area where it was collected. Soils that are wet when collected may need to be dried before sieving. If drying is necessary, the soil should be air dried at ambient temperature, or if necessary, oven dried at temperatures less than 120 degrees F.

A Niton 700 Series XRF instrument, or similar, will be used for field analysis of soil lead concentrations. The methods for XRF analysis will be consistent with EPA SW-846 Method 6200 (Field Portable X-Ray Fluorescence Spectrometry for the Determination of Elemental Concentrations in Soil and Sediment).

Each soil sample will be homogenized by mixing and sieving prior to XRF analysis. Additional details are included in SOP_VCUP_04_200305 - Handheld X-ray Fluorescence (Attachment 2 of this Work Plan).

A subset of samples (minimum of 10 percent) analyzed by XRF will be split after sieving for submittal to a laboratory for lead analysis using EPA SW-846 Method 6010, Inductively Coupled Plasma – Optical Emission Spectrometry (ICP). Upon receipt at the laboratory, these soil samples will be prepared for analysis using EPA SW-846 Method 3050B. The laboratory methods referenced by the contracted laboratory shall conform to the procedures outlined in EPA SW-846, Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, Update IV. Split analyses will not be required for verification of lead concentrations at previously sampled and previously remediated properties or for stockpiled soil.

The lead concentrations reported by the laboratory will be used to confirm the accuracy of the XRF measurements and describe the correlation between the lead concentrations obtained by the two distinct analysis methods (*see* Attachment 2 - SOP_VCUP_07_012621-QAQC XRF). Results of the split-sample comparisons will be evaluated and reported to CDPHE with data reports generated at the end of each year of sampling activities.

2.4.6 Documentation of Sampling Activities

Sampling activities and property conditions at the time of sample collection will be documented by the sampling personnel.

2.4.6.1 Property Maps and Sample Locations

AR will prepare a sketch map of each property that shows property boundaries and improvements, including existing structures (e.g., house, garage, other structures), driveways, fences/walls, patios/decks, and landscaped areas (e.g., lawn, trees, and shrubs). AR will also delineate any vegetable gardens and any established play areas for children on the property map.

AR will clearly delineate each composite-sample area outlined on the property map and document each discrete sub-sample location within that area using a hand-held global position system (GPS) unit. AR will also record subsample locations and sample numbers in field notes at the time of sampling. The X/Y-location coordinates will be recorded in the following format: NAD 1983 State Plane; Colorado South FIPS 0503 Feet; Linear Unit: US Foot (0.3048006096012192).

2.4.6.2 Field Documentation

For sampling at developed residential properties, the following types of sample areas will be established based on specific uses:

- Yards/Lots
- Driveways
- Vegetable gardens
- Play areas

AR will record the type of sample area along with the sample number (see below) during sample collection.

AR will photo-document sampling locations and procedures using either video or still photographs. For still photographs, AR will maintain a log that matches each photograph number with a written description of the photographic location. For video recording, AR will use a voice narrative to describe the location/activity being video recorded. Detailed photographic or video documentation will include the sample locations and the condition of the property during soil sampling and prior to remediation, including location and condition of concrete pads, fencing, sheds, gardens, etc.

2.4.6.3 SAMPLE LABELING

After each soil sample has been prepared for analysis (Section 2.4.6), the sample will be placed into a clean sample container that will be sealed and labeled with the following information:

- Property identification (street address)
- Sample number (includes the previously assigned "VCUP Lot number," as indicated below)
- Sampling date and time
- Sampling personnel
- Requested analysis

2.4.6.4 SAMPLE NUMBERING

A numbering system will be established for tracking each sample. The system will be designed to distinguish between types of properties and types of samples and will be consistent with the sample numbering scheme used during collection of the 2014-2015 samples (TREC 2015). For example, a sample number of 20-RES-028-01 includes the following information:

- The first two digits specify the year samples are collected (e.g.,2021)
- The letters specify the type of property (e.g., RES – residential, NRES – non-residential, RD – unpaved road)
- The three-digit number specifies the VCUP Lot number (e.g., 028)
- The final two digits specify the sample number at each property (e.g., 01, 02, 03)

2.4.7 SAMPLE HANDLING, SHIPPING, AND CHAIN OF CUSTODY

AR will prepare laboratory chain-of-custody forms for all samples, including those analyzed using field methods, to ensure that the samples are traceable from the time of collection until final disposition. Soil samples collected for laboratory analyses will be shipped in sealed coolers. For each sample or set of samples shipped for laboratory analyses, a copy of the completed chain-of-custody form and shipping receipt will be retained by the sampling personnel for the project's field records.

Sample holding times are established to minimize chemical changes in a sample prior to analysis and/or extraction. A holding time is defined as the allowable time between sample collection and analysis recommended to ensure accuracy and representativeness of analysis results, based on the nature of the analyte of interest and chemical stability factors. The holding time for analyses of lead in soil samples by EPA Method 6200 and EPA Method 6010 is 180 days.

2.4.8 MANAGEMENT OF INVESTIGATION-DERIVED WASTE

Investigation-derived personal protective equipment (PPE) and disposable sampling equipment will be contained in plastic garbage bags by AR and disposed of onsite for transport to the municipal landfill by AR. It is anticipated that there will be minimal amounts of investigation-derived waste (IDW) associated with collecting soil sampling. Equipment decontamination water will be transferred to buckets with sealable covers, or other sealable containers, and then disposed at the Rico Soil Lead Repository.

AR will record an inventory of any IDW generated during sampling and analysis activities in daily field notes. The inventory will reference the date and area of generation as well as the storage or disposal location of the IDW.

2.5 QUALITY CONTROL REQUIREMENTS FOR SOIL SAMPLING AND ANALYSIS

This section describes data-quality checks that will be performed to evaluate measurement variability associated with soil sampling and analyses for lead. The following quality control (QC) specifications are generally consistent with those adopted during previous VCUP soil sampling and analysis activities (AR et al. 2004b, 2005; TREC 2015).

2.5.1 QUALITY CONTROL LIMITS FOR MEASUREMENT DATA

The project's target control limits for precision, accuracy, representativeness, and completeness of lead-in-soil measurements for the VCUP project are as follows.

<u>Precision</u>

Data precision is assessed by determining the agreement between replicate measurements of the same sample and/or measurements of duplicate samples. The overall precision of the sampling-and-analysis process is assessed by the analysis of field duplicates. The precision of sample analyses is determined by replicate analyses of the same sample.

Precision of analyses of soil for lead shall be determined by the analysis of field duplicate samples, dual analyses of split samples, and duplicate analyses (i.e., laboratory duplicates). The precision goals for these sample analyses are as follows.

- Field duplicate and split sample results < 35 relative percent difference (RPD).[4]
- Laboratory (analytical) duplicate results < 30 RPD.

<u>Accuracy</u>

Accuracy is the degree of difference between the measured value and the true value. It is a measure of the bias or systematic error of the entire data collection process, which includes sample collection methods, interference effects during sample analysis, and calibration of the measurement system. The accuracy of reported lead concentrations will be evaluated by the analysis of samples with known

[4] For duplicate pairs with one or both lead results being less than five times the reporting limit (RL) of the analysis method, a difference of less than or equal to two times the RL (difference ≤ [2 x RL]) will be used as the precision goal.

concentrations of lead, and the analysis results will be expressed as a percentage recovery measured relative to the true (known) concentration.

For this project, XRF accuracy (EPA Method 6200) will be evaluated using results from XRF analysis of standard reference material (SRM) samples of a soil matrix. Laboratory accuracy (EPA Method 6010) will be determined by the analysis of calibration and method blanks, calibration verification samples, laboratory control samples (LCS), and matrix spike (MS) samples. This project's accuracy goals for analyses of soil samples for lead depend on the analysis method, as follows.

XRF analysis of lead in soil (EPA Method 6200):

- Calibration in accordance with the XRF instrument manufacturer's specifications
- SRM recovery within 70 to 130 percent

Laboratory analysis of lead in soil (EPA Method 6010):

- Calibration and method blank concentrations < method detection limit
- LCS recovery within 80 to 120 percent
- MS recovery within 75 to 125 percent

Representativeness

Data representativeness is defined as the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or environmental conditions. Representativeness is a qualitative parameter that is addressed through the design of an appropriate sampling program. The sampling program described in Section 2.4 has been designed to provide samples that are representative of surface soil at each of the properties where samples are to be collected, and sample representativeness will be controlled through consistent use of the sampling and sample preparation procedures presented in this plan.

In addition, the representativeness of soil samples collected with re-usable and decontaminated sampling equipment will be evaluated through analyses of field equipment rinse samples (i.e., equipment blanks). The target control limit for equipment blank analyses is a lead concentration result less than five times the reporting limit for lead in water, as measured using EPA Method 6010.

Comparability

Data comparability is defined as the confidence with which one data set can be compared to another. Comparability is a qualitative parameter that is considered in the design of the sampling plan and selection of analytical methods, quality control protocols, and data reporting requirements.

Comparability shall be ensured by analyzing samples obtained in accordance with the standardized procedures described in this Work Plan, which are consistent with those used during past Rico Townsite Soils VCUP soil investigations. In addition, measurement data will be calculated and reported in consistent units so that the values can be directly compared to each other and to historical data from the project area. Soil lead concentrations are to be reported in consistent units of milligrams per kilograms (mg/kg, equivalent to parts per million).

2.5.2 Field Quality Control Procedures

Field duplicates of soil samples and SRM samples will be analyzed for lead to provide information regarding precision and accuracy of the sampling and analysis process. In addition, at least 10 percent of the soil samples collected for XRF analyses of lead will be split for confirmation analysis of lead by EPA Method 6010.

2.5.2.1 Field Duplicate Samples

Field duplicates will be collected at a minimum frequency of 1 per 20 field samples (frequency = 5 percent). Field duplicates will be collected simultaneously with or immediately after the corresponding original samples have been collected and prior to preparation of the sample by sieving. Each of the duplicate samples will be sieved separately and then submitted for analysis with a unique sample number/identifier.

2.5.2.2 Standard Reference Materials (SRMs)

SRMs are homogeneous and stable materials for which target analyte concentrations have been determined with a very high degree of certainty. Whenever XRF analysis is relied on for measuring lead content of soil samples, a certified SRM (i.e., SRM soil comparable to the Rico soil matrix) will be obtained and analyzed for lead at a minimum frequency of 1 per 50 field samples analyzed by XRF (EPA Method 6200). Analyses of SRMs will be in addition to daily (or more frequent) calibration of the XRF instrument for measurement of lead.

2.5.2.3 Split Samples for Laboratory Confirmation of XRF Measurements

Whenever XRF analysis (EPA Method 6200) is relied on for measuring lead content of soil samples, split samples will be prepared, at a rate of 1 sample per 10 samples (frequency = 10 percent), for confirmation analysis by EPA Method 6010. The split samples will be prepared from the fine fraction of soil obtained by sieving (refer to Section 2.4.6). One split sample will be analyzed for lead by EPA Method 6200, and the other will be analyzed for lead by EPA Method 6010.

2.5.2.4 Field Equipment Blanks

When the equipment used to collect soil is re-used between composite sample locations and between sampling at separate properties, field-equipment blanks will be collected to evaluate field sampling and decontamination procedures. The equipment blanks will be obtained by pouring deionized water over the decontaminated equipment. Equipment blanks will be collected at a 5 percent frequency for each equipment type that is decontaminated. The equipment blanks will be analyzed for total lead by EPA Method 6010.

2.5.3 Laboratory Quality Control Samples

The laboratory contracted by AR to support the Rico Townsite Soils VCUP project will perform calibration of measurement instruments/equipment and analyze QC samples in accordance with specifications included in EPA Method 6010. A laboratory method blank, LCS, analytical duplicate, and a MS sample should be run in each laboratory QC batch with a minimum frequency of 1 each per 20 field samples. If fewer than 20 field samples are submitted, then 1 set of these QC analyses would be included with the group of less than 20 samples.

Soil samples collected in Rico will be used for preparation of the analytical duplicates and MS samples. The sampling personnel responsible for collection and shipping of samples to the laboratory shall designate the samples to be used for laboratory QC analyses (MS and analytical duplicate) on the COC forms.

2.5.4 Instrument/Equipment Inspection, Calibration, and Maintenance

In order to ensure continual quality performance of instruments or equipment relied on for measurement data, AR will perform equipment testing, inspection and maintenance routinely and record it in field notes.

Field Equipment

AR will use hand-held GPS units for recording sample locations. Portable XRF instruments may be used to analyze soil samples in the field for lead content.

Measurement equipment will always be inspected and the calibration checked before it is transported to a field setting for use. When in use, field equipment shall be calibrated at least once at the start of each day's field activities using the procedures and standards provided by the equipment manufacturer. For lead-in-soil measurements by XRF analysis, the calibration requirements found in EPA Method 6200 shall also apply. Field instruments that fail calibration requirements will be tagged as "non-functional" or "defective" and returned to the manufacturer or other supplier for repair or replacement.

Field instruments will be cleaned and safely stored at the end of each day of use and also between separate sampling events. Any routine maintenance recommended by the equipment manufacturer will be performed at the specified or recommended frequency.

Laboratory Equipment

Laboratory measurement instruments will be maintained in accordance with the laboratory's Quality Assurance Plan and the requirements of the referenced analysis method (i.e., EPA Method 6010). In addition, all measurement instruments and equipment used by the laboratory shall be controlled by a formal testing and preventive maintenance program.

Laboratory preventive maintenance will include routine equipment inspection and calibration at the beginning of each day or each analytical batch, as per the laboratory's internal standard operating procedures (SOPs) and specific method requirements, whichever is more stringent. The laboratory will keep maintenance records and make them available for review, if requested, during laboratory audits.

Physical and chemical calibrations shall be performed at the laboratory as specified by the laboratory's Quality Assurance Plan, instrument manufacturer's guidelines, and the requirements of EPA Method

6010. When laboratory measurement instruments do not meet the calibration criteria of the laboratory's Quality Assurance Plan and/or EPA method, then the instrument will not be used for analysis of samples submitted under this Work Plan.

Records of calibration, repairs, or replacement will be filed and maintained by the designated laboratory personnel performing QC activities. These records will be filed at the location where the work is performed and will be subject to quality assurance audit.

Calibration records and demonstration of acceptable calibration results are also required elements of the laboratory's data reporting to AR.

2.6 DATA QUALITY REVIEW AND EVALUATION OF SAMPLING AND ANALYSIS RESULTS

The QC information provided in field records and laboratory data reports will be reviewed to confirm that the reported measurement data are acceptable to support the VCUP project's objectives.

2.6.1.1 DATA QUALITY REVIEW

The QC information recorded during field and laboratory soil analyses will be subject to review to evaluate data quality. The project's targets for precision, accuracy, and representativeness, which are listed in Section 2.5.1, will serve as the basis for data quality evaluation. Laboratory results that do not achieve the target control limits for these parameters will be identified for data users as "estimated values," and the reason for this designation shall also be recorded for reference by data users.

2.6.1.2 LABORATORY DATA VALIDATION

An initial validation of field and laboratory methods for lead analysis of soil samples will be performed in accordance with SOP VCUP 07 using the general protocols and processes described in EPA National Functional Guidelines for Inorganic Superfund Methods Data Review (EPA 2017) and Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund (EPA 2009). The validation review will be performed for the first approximately 20 percent of samples analyzed by the contracted laboratory during each field season. For example, if the projected number of samples that will be sent to a laboratory for analysis during a field season is 75, then the data reported by the laboratory for analyses of the first 15 samples (20 percent) will be validated. Within 1 month of receiving the final laboratory data report, AR will perform the data validation review and provide the validation results to CDPHE and the Town of Rico, so that any negative findings can be used to identify appropriate corrective actions that can be implemented in conjunction with later sample analyses.

The data validator will perform a manual validation, as defined in EPA guidance (EPA 2009), on the hard copy data reports prepared by the laboratories. Data validation will be equivalent to an EPA Contract Laboratory Program (CLP) Level IIB validation. Data validation protocols and findings will be documented by the reviewer, and the validation records will be maintained with the other VCUP project records. A summary of data validation findings will also be included in a data summary report prepared at the end of the VCUP sampling and analysis activities and then submitted to CDPHE and the Town. Data validation records and the data validation summary reported to CDPHE will indicate any data qualifiers applied to individual results and reasons for application of those qualifiers.

3 SOIL REMEDIATION

The objective of soil remediation under Phase 1 of the Rico Townsite Soils VCUP project is to remove or cover surface soil from locations in the Town of Rico where lead-in-soil concentrations are above the CDPHE-approved risk-based action levels. This Work Plan presents the overall approach and general procedures to be used for remediation of properties within the Rico VCUP project area. The approach and procedures described in this Work Plan are generally consistent with those used during previous VCUP remediation efforts in 2004-2005 (AR et al. 2004a, 2004b, 2005).

3.1 ACTION LEVELS FOR LEAD IN SOIL

A site-specific, human health risk assessment that evaluated residents' exposures to lead in soil and identified levels of lead in soil of potential health concern was performed using soil lead concentrations from properties in the Town of Rico (Integral 2006). Based on information provided by the 2006 risk assessment, EPA and CDPHE approved two risk-based action levels: 1,100 mg/kg for residential areas and 1,700 mg/kg for non-residential areas. These action levels were approved by CDPHE and EPA in 2006 and 2007 for soil remediation conducted as part of the Rico Townsite Soils VCUP project.

In light of recent changes to the Centers for Disease Control and Prevention blood lead reference level, and to ensure continued protectiveness of the action levels, CDPHE re-evaluated the site-specific action levels adopted in 2006 and 2007 and recommended the following new lead action levels (LALs) to be used in this 2023 VCUP:

- residential LAL of 761 mg/kg (referred to in this Work Plan as the "Residential LAL");
- non-residential LAL of 967 mg/kg (referred to in this Work Plan as the "Public Facilities LAL"); and
- recreational LAL of 4,010 mg/kg (referred to in this Work Plan as the "Open Space LAL").

The Residential LAL will apply at properties where Town of Rico zoning permits residential use (except for recreational trails on Town-owned properties), unpaved roads and alleys, and at portions of Public Facilities and Open Space properties where active play areas frequented by young children (as identified by the Town) are present. The Public Facilities LAL will apply to soil on all other portions of Public Facilities parcels. The Open Space LAL will apply to soil on all other portions of Open Space parcels and portions of Town-owned properties where recreational trails are constructed.

3.2 PRELIMINARY SCOPE OF SOIL REMEDIATION

AR has already completed soil remediation at 75 properties in the project area (refer to Attachment 2 of VCUP Application). Additional soil remediation will be conducted to address lead in soil at developed properties where the lead content of soil exceeds the Residential LAL (refer to Attachment 6 of VCUP Application for a preliminary list of properties identified for soil remediation based on exceedance of the Residential LAL of 761 mg/kg lead), including approximately 52 of the developed properties that were sampled in 2014 but not remediated at that time. For the purpose of the VCUP project, a developed property is an improved property with a structure that is in a condition suitable for commercial or residential use and occupation.

Properties with soil-lead concentrations greater than the action level that require remediation may also be identified through planned soil sampling at the remaining unsampled properties within the project area, as previously described in Section 2.1. In addition, soil remediation will be performed at previously remediated properties, if necessary, where soil has since been disturbed by excavation and/or new construction has been permitted by the Town since 2006. Such previously remediated properties will be re-remediated when sampling indicates soil-lead concentrations greater than the applicable action level. Such previously remediated properties will not be re-remediated if sampling indicates soil-lead concentrations lower than 400 mg/kg (the clean soil criterion from the 2004 Rico Townsite Soils VCUP Application). If sampling indicates soil-lead concentrations exceeding 400 mg/kg but less than the applicable LAL, the results will be evaluated in consultation with CDPHE on a case-by-case basis to determine if any additional actions are warranted.

The final remediation design for each property where Phase 1 remediation is planned will be reflected in an ISWP prepared by AR following completion of soil sampling (and analysis) at the subject property. The purpose of the ISWP will be to document the property-specific plan and specifications for soil removal and replacement. Section 3.5 describes the general scope and content of the ISWPs, along with other general requirements of VCUP soil remediation activities.

3.3 OWNER ACCESS AGREEMENTS FOR SOIL REMEDIATION

A valid access agreement must be in place with the current owner of any property prior to AR's implementation of a property-specific remediation plan. A template for preparing the soil-remediation access agreement is provided in Attachment 1. Each request for soil-remediation access will be accompanied by written explanation of the purpose of the VCUP program, the purpose of soil remediation, a summary description of the remediation approach, and a general timeline for conducting the work.

An initial written request for access will be hand-delivered (for local owners) or mailed to the owners of the properties identified for soil remediation based on the results of VCUP sampling and analysis activities. Access agreements will be sent to the address on record for the property owner as listed in the Dolores County Assessor's records. In addition, attempt(s) will be made to contact the property owners who do not respond to the initial request for access via telephone or by going door-to-door, or by other available means (e.g., email or text message). As appropriate, the Town of Rico will assist AR in contacting owners or otherwise addressing property owners' specific concerns regarding soil remediation plans and property disturbance by AR. Efforts to obtain access agreements from property owners will continue once per year for three years.

Before preparation of an ISWP (refer to Section 3.5), representatives of AR will meet with the owner of the property, either in person or by phone, to discuss the general nature of the planned remediation activities and to identify any property-specific factors to be considered as the ISWP is developed. Once the ISWP has been presented and discussed with the property owner, the property owner will be asked to approve the plan, by signing a copy of the ISWP, before remediation activities are initiated by AR at the subject property.

3.4 Soil Remediation Plan, By Property Type

At each of the individual properties to be remediated under the VCUP project, on areas of the property where VCUP soil samples indicate the presence of lead at concentrations greater than the applicable action level for that property type, or where mine waste is identified, soil will be remediated to establish 12 inches of clean soil cover. The Phase 1 remediation will include removal of surface soil, to a depth of 12 inches, in the yard areas where lead in soil exceeds the applicable LAL followed by replacement with clean soil and other appropriate cover materials in the same area(s).

Undeveloped properties where lead in soil exceeds the applicable LAL, or where mine waste is identified, will be remediated in the future as part of the ICs program if, and when, Town-permitted new development takes place at these properties. However, if mine waste is identified and verified at the surface on undeveloped properties, it may be removed to a depth of 12 inches on a case-by-case basis, taking into account site-specific factors such as extent of visible mine waste deposits, use of the parcel, feasibility of removal, owner consent, and probability of access and direct contact with the visible mine waste deposits. In accordance with Town Overlay Zone Regulations that will be adopted as part of the ICs program (refer to Section 5 of this Work Plan), a property-specific soil-remediation plan will be developed in conjunction with building plans prepared for review and approval by the Town of Rico.

The detailed plans for soil remediation on any property in the project area will vary depending on the type and size of the subject property. General guidelines for soil remediation at developed properties are provided below. More specific procedures that will be followed during soil removal and replacement are explained in Section 3.5.2.

3.4.1 Developed Properties Allowing Residential Use

The extent of yard-soil remediation at developed properties will be property-specific and dependent on the number and location of yard areas identified where the lead content of surface soil exceeds the residential action level. For properties with a total area of less than or equal to 5,000 sq ft, sampling areas that exceed the action level will be remediated to the property boundary (excluding areas that are paved or covered by structures or other permanent cover materials) . For properties with a total area greater than 5,000 sq ft, soil remediation will be performed within a 100-foot radius of the structure in sampling sectors where the action level is exceeded rather than across the entire property. Decisions to remediate unpaved driveways, active play areas, including but not limited to those where play structures are located, other areas of visible active use by the property owner, and vegetable gardens will be based on the individual sample results associated with each such area present. An example soil-remediation plan for a typical property of more than 5,000 sq ft is included as Figure B-3.

In the areas of the property where lead concentrations exceed the Residential LAL, existing soil will be removed, generally to a depth of 12 inches bgs, followed by placement of clean soil over the excavated area(s). For properties that have a vegetable garden with soil lead concentrations that exceed the

Residential LAL, the soil will be removed from the garden area to a depth of 18 inches bgs and then replaced with 18 inches of clean soil.

3.4.2 Developed Open Space/Public Facilities Parcels

Decisions to remediate soil on land parcels zoned for Open Space and Public Facilities use will depend on whether LALs are exceeded in specific portions of the parcel.

Because no active play areas frequented by young children have been identified on any Public Facilities parcels, these parcels will be subject to remediation where soil lead concentrations exceed the Public Facilities LAL. Soil in the areas where sample results indicate lead content greater than the Public Facilities LAL will be removed to a depth of 12 inches and then replaced with clean soil.

No soil remediation is planned to occur on the eight parcels zoned for Open Space during Phase 1. Available sampling results indicate soil lead concentrations within these parcels are below the Open Space LAL, and there are currently no developments, areas of intensive public use, or active play areas frequented by young children on these parcels. If mine waste is identified and verified at the surface on Open Space properties, it may be removed to a depth of 12 inches on a case-by-case basis, taking into account site-specific factors such as extent of visible mine waste deposits, use of the parcel, feasibility of removal, owner consent, and probability of access and direct contact with the visible mine waste deposits.

3.4.3 Unpaved Road and Alley Segments

The approach and procedures for remediation of unpaved road and alley segments are described separately in Section 4.2 of this Work Plan.

3.5 General Procedures for Soil Remediation

The soil-remediation methods, components, and materials described in this Work Plan are consistent with those used during previous VCUP remediation efforts conducted in 2005-2007 (AR et al. 2004a, 2004b, 2005).

3.5.1 General Requirements

The following requirements are applicable to soil remediation performed within the VCUP project area.

3.5.1.1 Individual Site Work Plans

Before initiating cleanup activities at any individual property, AR will develop an ISWP for review by the property owner(s). The ISWP will include a brief narrative and/or an annotated map that presents a description of the areas where soil will be removed, the estimated volume of soil to be removed, the final cover type (e.g., native species, sod, aggregate or rock mulch), a list of features such as trees, shrubs, and/or fences that will remain, if any, and steps that will be taken to minimize damage to any other features at the property. Generally, mature trees will remain, with steps taken to minimize damage, while shrubs, bushes, and small trees may be excavated and replaced in kind as set forth in the ISWP developed in consultation with the property owner. Where vegetation will remain on the property, excavation depths and cover thickness around existing trees and shrubs that will be preserved may be limited to protect root structures. These areas may contain residual contaminants after site work is completed. The map or site-plan drawing will show the property boundaries and any features that will be disturbed or modified by soil removal; the plan will also include an inventory of key features of the yard. An example conceptual-site-plan for soil remediation at a developed residential property is included as Figure B-6. The ISWP will also include a list of AR's contractor(s) and key personnel responsible for on-site construction activities, with their contact information. Finally, AR will include in the ISWP a photographic or video documentation of the condition of the property prior to remediation, including concrete pads, fencing, sheds, gardens, etc.

AR and the property owner must sign the ISWP to indicate acceptance of the plan for soil remediation before AR performs the work outlined in the ISWP for their property.

AR's oversight representative(s), remediation contractor(s), and the property owner will conduct a walk-through of each property to review and discuss elements of the final ISWP prior to implementation of the plan. Once AR has completed the work, any changes to the ISWP adopted during construction will be noted by AR's on-site representative on an "as built" version of the ISWP, and a copy of the amended/as-built ISWP will be provided to the property owner. The as-built ISWP will also be maintained in the project records available to the Town of Rico and CDPHE.

Upon completion of the VCUP soil remediation described in this Work Plan, AR will provide copies of all ISWPs to the Town of Rico for reference in the implementation and enforcement of regulations adopted for the ICs program, which is described in Section 5 of this Work Plan.

3.5.1.2 Specifications for Borrow Source and Clean Cover Soil

Prior to initiating soil remediation, AR will locate a borrow area (or areas) to serve as the source of clean cover and growth media on remediated properties. Soil from the borrow source(s) will be tested to confirm suitability for use in soil remediation as clean cover soil (soil with lead concentration less than 100 mg/kg). Suitable clean soil may also be obtained from a source other than a borrow area (e.g., construction site in a nearby town or other existing soil stockpile), but that source must also be sampled and tested to confirm its suitability as clean cover soil.

<u>Engineering and Agricultural Specifications</u>

All cover soil will meet the lead content criterion specified below. AR will develop technical specifications for the upper six inches of cover soil that are intended to support vegetation. The technical specifications will include suitability criteria for the following parameters:

- soil pH and conductivity
- texture and particle sizing
- percent organic matter
- sodium absorption ratio or exchangeable sodium percentage
- nutrient analysis (nitrogen, phosphorus, potassium)

Testing may identify a need for screening to remove excess coarse material or addition of organic amendments before the borrow soil is suitable for use as growth media.

Lead Content

The maximum lead concentration in clean cover soil obtained from a borrow area, or other source that is not the property being remediated, will be specified at 100 mg/kg (total lead, reported on a dry weight basis). The required frequency for sampling and analysis for lead concentration shall be at least one sample for every 200 cy of clean soil intended for use in soil remediation.

For borrow areas, AR will test soil for lead as it is moved into the project area or to a stockpile located outside the project area. The volume transported will be tracked over time, and one soil sample will be collected for lead analysis for every 200 cy moved from the borrow area.

For existing stockpiles not previously tested for lead, the surface area of the pile will be subdivided using a systematic grid pattern, with the grid areas sized to cover an area that corresponds to a volume of approximately 200 cy. Within each grid area, three subsamples will be collected, each one from a depth of 0 to 12 inches below the existing surface, and these three subsamples will be composited into a single sample representing that 200 cy volume of soil.

3.5.1.3 TRANSPORT AND DISPOSAL OF EXCAVATED SOIL

Soil removed from any property during remediation will be hauled to the Rico Soil Lead Repository for permanent disposal. The repository was designed for disposal of soil containing elevated lead concentrations. Materials other than soil will generally be removed from loads before hauling excavated soil to the repository; however, AR will be responsible for disposal of non-soil materials excavated from the property as part of the planned remediation, such as trees, shrubs, and rocks. As noted in Section 1.1, if the capacity of the existing Rico Soil Lead Repository is exhausted, AR will, in consultation with the Town, determine how to continue to manage such action-level soils and mine waste in accordance with applicable state and federal law, including expansion of the Soil Lead Repository, construction of a new repository, beneficial use of the material, and/or off-site transport and disposal. If a new repository is constructed or other off-site disposal option is used, it will either be located a similar driving distance from the Town as the existing repository, or delivery of action-level soils to the existing repository will continue and AR will transport the delivered soil and mine waste to the new repository or off-site location.

The following requirements shall apply to routine transport and disposal of excavated soil at the Rico Soil Lead Repository:

- Soil transport and disposal conducted during Phase 1 will be performed by AR's contractor(s).
- During transport, excavated soils shall be covered or adequately wetted in the haul vehicle to prevent fugitive dust emissions. Each work area will have a dry decontamination (decon) area established to limit tracking of contaminated soil off the work area on vehicles. The established decon area will have poly tarp placed and secured, hard bristle hand brushes, a 30-gallon trash can, and will be separated from the work area by fence or caution tape.

- Vehicles may require washing of residual soil after disposal to limit dust emissions and tracking of soil from the repository into the Town of Rico. If so, AR contractor personnel will perform all washing activities at the Rico Soil Lead Repository.

3.5.1.4 POST-REMEDIATION RESTORATION

Final reclamation of the clean soil surface will be designed to match the pre-remediation surface and cover conditions. Properties with pre-existing native vegetation will be seeded with native vegetation species, fertilized, and mulched. Existing lawns may be replaced with sod if requested by the property owner but native vegetation or xeriscaping using plants comparable to those present before the remediation will be encouraged. Vegetation such as shrubs, bushes, and small trees that were excavated from the property will be replaced in kind. AR will remove from the property rocks contained in the top 12 inches of soil removed during the excavation. Unpaved driveways and any erosion-prone areas of the yard will be capped with gravel or rock mulch (i.e., topsoil material with angular rock included to inhibit erosion). Lawn watering and maintenance of other types of reclamation vegetation will be the responsibility of the property owner. Existing irrigation systems, if any, will be re-installed.

3.5.2 SOIL REMOVAL AND REPLACEMENT PROCEDURES

The following procedures will be adhered to in the performance of soil removal and replacement activities undertaken for the VCUP project.

Scheduling

Each property owner will be given a minimum of one-week notification, in person or by phone, prior to scheduling soil removal and replacement work. AR will coordinate with the owner to accommodate reasonable requests for rescheduling planned soil remediation.

Typical Soil Removal

Soil will be removed from identified areas of a remediated property to a nominal depth of 12 inches, where practical, using equipment such as conventional trackhoes or backhoes, small Bobcat-type loaders or excavators, and hand tools. Special precautions and grading requirements will apply near structures/facilities and trees/shrubs that are to remain on the property. While mature trees will generally remain on the property, at the request of the property owner, shrubs, bushes, and small trees may be excavated and replaced in kind. AR will haul excavated soils to the Rico Soil Lead Repository for disposal. AR will implement precautions to prevent fugitive dust emissions during excavation, which could include spraying water on the surface of the soil being excavated.

Shallow Bedrock and Very Coarse Soil

If during soil removal, bedrock or predominantly very coarse-grained (D50 > approximately 3 inches, and with less than approximately 10 percent minus U.S. Standard No. 10 sieve) natural colluvial or alluvial soils are encountered and cannot be excavated using standard heavy equipment mobilized for soil remediation, excavation may be terminated. In such cases, the 12 inches of clean soil may be achieved by placing borrow and/or growth media above pre-existing grade, as necessary. If clean soil is to be placed above pre-existing grade, the soil will be placed so as not to interfere with existing surface drainage patterns within the property. If necessary due to drainage considerations, AR will request permission from CDPHE to locally modify the 12-inch clean soil criterion.

Trees and Shrubs

The areal extent of soil removal will generally stop at the dripline of established trees and shrubs designated by the property owner to remain (as shown on the map/drawing in the ISWP), and soil removal will terminate at the drip line of trees and shrubs to protect these plantings. In the case of mature trees with especially large canopies with overhead clearance allowing easy potential access to children, excavation for removal will continue toward the trunk but at progressively shallower depth using small equipment and/or hand tools as necessary to avoid damage to shallow roots. Also, large roots will be avoided and worked around if encountered during excavation. As noted in Section 3.5.1.1, excavation depths and cover thickness around existing trees and shrubs that will be preserved may be limited to protect root structures. Residual contaminated materials may remain within these protected root structures.

Near the dripline of shallow-rooted aspen trees and between trees in aspen groves, soil will be removed to an approximate depth of 2 inches, using special care to minimize damage (cuts, breaks) to the aspen roots. Areas characterized by very dense thickets of aspen trees that are judged not readily accessible to children will be left undisturbed. Such areas will be specifically noted on the ISWP prepared for the subject property.

Vegetable Gardens

Soil will be removed from vegetable gardens to an approximate depth of 18 inches using equipment such as conventional trackhoes or backhoes, small loaders or excavators, and hand tools. Eighteen inches of growth medium will be placed into the excavation area to re-establish the garden bed. AR will develop technical specifications for growth medium that are intended to support vegetation. The technical specifications will include suitability criteria described in Section 3.5.1.2.

Vegetable gardens will not be revegetated following placement of 18 inches of growth medium.

Protection of Existing Utilities, Structures/Appurtenances, and Other Improvements

Special consideration will be given to protection of septic systems, propane tanks and lines, other utilities, fences, retaining walls, concrete features (e.g., patios, sidewalks), sheds and outbuildings, and subsurface irrigation systems during all on-site cleanup activities. In order to protect existing utilities, the location of buried public utilities will be determined to the extent practicable by AR's remediation contractor prior to initiating any excavation (including calling the Utility Notification Center of Colorado at Colorado 811, if applicable). The locations of private buried utilities will be based on the property owner's description and site observations and confirmed as necessary by probing/test pits during excavation. Should any damage to such features occur during the course of the remediation work, the damaged property will be repaired or replaced in kind by and at the expense of AR, without expense to the property owner.

Placement of a Visible Marker

A light-weight but durable, geotextile, which includes landscape fabric or other appropriate commercial-grade marker barrier fabric, will be placed on the excavated subgrade surface of remediated areas of the property, except in the vicinity of aspen trees, on bedrock/coarse angular gravel/cobble subgrades, and on steeper slopes. The biologically inert and chemically resistant geotextile or geogrid will serve as a long-lasting visual marker indicating, for persons/entities performing any future excavations, that the base of the clean backfill soil has been reached.

In areas of nominal 2-inch soil removal around aspen trees, a lightweight but durable, woven, biaxial geogrid will be placed on the subgrade. The open aperture design of the geogrid permits some penetration by shallow aspen roots and is intended to minimize the potential for damage by cutting of the cambium by the geogrid during root growth. Geogrid will also be used where excessive damage to marker fabric may occur during installation, and/or on steeper slopes where the geogrid will help stabilize the overlying clean soil against slippage.

Cover Soil Requirements and Surface Restoration

In areas disturbed by soil remediation, a suitable growth medium will be established by placing clean soil from an approved source (refer to Section 3.5.1.2). Organic amendments and/or fertilizer may be added to the soil if needed to meet the suitability criteria for growth media.

Together the backfill and any overlying final surface material (including rock mulch or aggregate, where used) will provide a minimum 12-inch-thick cover to minimize potential for human contact with any remaining subgrade soils with elevated lead concentrations. The cover materials will also provide suitable growth media for restoring and maintaining vegetation and ensure positive drainage consistent with pre-existing drainage patterns within the property. Backfill areas will be regraded such that when finished with the final cover material the area will blend with the surrounding topographic contours.

Where vegetable gardens are addressed during remediation, the backfill will consist of 18 inches of growth medium.

In areas of aspen trees, the backfill requirement is 4 inches of suitable growth medium.

Clean cover soil from the stockpile referred to in Section 3.5.1.2 in areas receiving native seed and vegetable garden areas will be appropriately prepared for revegetation. The method applied will be appropriate to the materials and site conditions. The objectives will be to promote adequate water retention and drought tolerance while minimizing excessive settlement.

In areas of vehicular traffic (i.e., parking areas and driveways) to be surfaced with a layer of coarse gravel or aggregate, the clean backfill will be compacted to its full depth prior to placement of the surface gravel or aggregate material.

Seeding

For areas of the property previously vegetated with native species, the soil surface will be prepared and revegetated with a native-seed mix. Two seed mixtures are specified to best match the pre-existing conditions in areas to be reclaimed by seeding. One mix (Type 1 – Native Lawn) is comprised of three or four native grass species for use in areas that are currently mowed, but where the property owner prefers not to place sod. The Type 1 revegetation will provide a more conventional lawn appearance, will be suitable for mowing if desired by the property owner, and will be more tolerant of natural precipitation versus frequent watering. The other mix is comprised of graminoids and forbs characteristic of native mountain meadow vegetation (Type 2 – Native Yard).

Mulching will be required only for areas of seeded revegetation with southern exposures that receive full sunlight. Mulch will meet the material, quality and application requirements in the Technical Specifications. Conventional (weed-free hay/straw) mulch or hydromulch will be used as appropriate to the site conditions.

Alternatively, at the discretion of the property owner, aggregate or rock mulch cover may be placed instead of revegetation with a native-seed mix.

Sod Placement

In instances where the remediation disturbs a previously established and maintained lawn, the property owner may elect to have weed-free lawn sod placed over new growth media/clean soil. The property owner may also choose for native seed mix, aggregate, or rock mulch cover to be placed instead of sod. If sod is selected, as indicated in the ISWP and agreed upon by the property owner before the start of soil remediation, the property owner will be responsible for initial and subsequent watering of newly placed sod. Watering for a minimum of 21 days following sod placement is recommended. If long-range weather forecasts indicate that the ground may freeze before 21 days has elapsed since sod placement, revegetation may be delayed until spring with the concurrence of the property owner and CDPHE. Sod will not be installed on properties that did not have a previously established and maintained lawn.

Aggregate and Rock Mulch Covers

A layer of coarse gravel or an aggregate cover may be used as the finished surface in areas of soil removal that were previously unvegetated, including driveways, parking areas, storage areas, foot paths, etc. At the discretion of the property owner, aggregate may also be placed as final cover to reclaim disturbed ground in areas that were previously vegetated with either maintained lawn or native species. Aggregate will be placed to a minimum depth of 3 inches over previously placed and compacted clean backfill.

Rock mulch, generally defined as predominantly coarse-grained natural soil not necessarily meeting all grading and durability requirements specified for aggregate, may be placed in disturbed areas that are not to be revegetated and are not subject to vehicular traffic. These may include storage areas, rock gardens, etc. The decision to use rock mulch in a particular area will be made in consultation with the property owner and will be contingent upon the availability of materials meeting the rock mulch specifications. Minimum depth of rock mulch cover will be 3 inches or 1.5 D50 of the rock mulch, whichever is greater. A weed barrier fabric will be placed between rock mulch and the subgrade clean soils.

3.6 PROPERTY-OWNER STATEMENT OF COMPLETION

Upon completion of soil remediation activities at each individual property, the property owner will be asked to sign a Statement of Completion stating that remediation work has been completed in an acceptable manner and in accordance with the ISWP. AR will work to obtain a signed statement from each owner (or their designated representative). For each remediated property, AR will maintain the signed statement with the owner access agreement for soil remediation and the final or "as built" ISWP. These records will be made available to the Town of Rico and CDPHE.

4 REMEDIATION OF UNPAVED ROAD SEGMENTS

Detailed sampling of unpaved roads and alleys within the Town of Rico was performed in 2004 to characterize soil lead concentrations in road-surface materials. The basic sampling protocol involved collection of two subsamples from each block or road segment, with one sample collected approximately ¼ of the way along the length of the block and the other sample collected approximately ¾ of the way along the block. The two samples were then combined to create a composite sample. The lead concentration in the composite soil sample was analyzed using a laboratory-grade XRF instrument. In addition to the road samples, additional grab samples were collected from the non-vegetated right-of-way immediately adjacent to the road at locations where visual observations indicated the possible presence of mine waste.

Additional sampling of unpaved alleys and selected right-of-way areas was performed in 2008. Surface soil samples were collected from a depth of 0 to 2 inches bgs at two locations along the in-use portion of the alley approximately equally spaced from the center of the in-use reach. Lead concentrations were measured with a Niton 700 Series XRF instrument. Analyses were completed in accordance with EPA Method 6200. Sample preparation included drying followed by screening through a U.S. Standard No. 60 sieve. The material passing through the sieve (i.e., < 250 µm diameter) were then analyzed for lead.

4.1 POTENTIAL RE-SAMPLING OF UNPAVED ROAD SEGMENTS

As indicated in Section 2.1, additional sampling may be necessary along previously sampled unpaved roads that have been disturbed since the original samples were collected in 2005 and 2008. Soil samples will be collected from the traveled surface of unpaved roads within each block identified as having been recently disturbed by the Town of Rico. Road segments will be identified for re-sampling in consultation with the Town of Rico and following review of the Town of Rico's records of road disturbances since the 2004 VCUP sampling activities.

The lead concentrations reported with any new samples collected from road segments in the project area will be reviewed to evaluate whether any updates to the scope of planned roadway remediation are warranted to address the most recent conditions.

4.2 PRELIMINARY SCOPE OF REMEDIATION

Road and alley segments with an average lead concentration in surface materials greater than the Residential LAL are targeted for remediation, including the adjacent Town-owned, unvegetated right-of-way areas that also have surface-soil lead contents greater than the Residential LAL. The lead concentrations of composite samples collected from the top 2 inches of road and alley surface materials are shown in a map view in Figure 9 of the VCUP Application.

Additional data collection is planned along unsampled road segments as well as some of the previously sampled road segments, and the results of the additional sample analyses for lead will help refine the locations and total road length targeted for remediation.

The Residual Risk Analysis completed for the Rico Townsite Soils VCUP project in 2010 (Integral 2010) recommended that future soil remediation also address soil in the road right-of-way adjacent to the property assigned VCUP Lot Number 45. The recommended soil remediation at this location would also be performed as part of the larger road remediation task.

4.3 Conceptual Design

The basic concept for remediation of lead concentrations exceeding the Residential LAL in soil on unpaved roads, including any unpaved alleys used for routine access to residences, in the Town of Rico is as follows:

1) Excavate up to 12 inches of roadway surface materials in the portions of the traveled way, adjacent unvegetated, Town-owned right of way, and in-use alleys with lead concentrations greater than the Residential LAL. Depending on the existing surface elevation and grade, less than 12 inches of material may be removed from some road/alley segments prior to placement of the 12-inch clean cover.

2) Haul excavated materials for disposal to the Rico Soil Lead Repository or another suitable disposal location approved by CDPHE; spread and compact waste soils at the repository in accordance with original specifications.

3) Prepare excavated subgrade within the prior traveled way and in-use alleys by proof rolling as necessary.

4) Purchase or otherwise acquire suitable subbase and aggregate base course and haul to site.

5) Place and compact 8 inches of subbase (approved bank or pit run material with maximum particle size of 4 inches and attaining a minimum R-value of 50) within the traveled way and in-use alleys.

6) Place and compact 4 inches of Colorado Department of Transportation Class 6 Aggregate Base Course over sub-base within the traveled way and in-use alleys.

7) Place and compact 12 inches of subbase (approved bank or pit run material with maximum particle size of 4 inches and attaining a minimum R-value of 50) within the non-vegetated right-of-way.

8) Implement all applicable traffic and environmental controls (e.g., dust and construction period stormwater runoff) during the course of the work.

This remediation concept is based on performing only that work necessary to address the elevated lead concentrations in roadway/in-use alley materials. Road remediation will be coordinated to the extent practicable with necessary road drainage improvements and the Town's installation of a new sanitary sewer system.

It is assumed that base course and subbase materials will be imported from outside the Town of Rico. These materials must be tested or otherwise certified as having lead values less than 100 mg/kg.

The timing of road remediation will be coordinated to the extent practicable with necessary road drainage improvements and the Town's installation of a new sanitary sewer system to maximize cost effectiveness and expediency and to limit disruption of previously remediated road and alley segments.

4.4 ROAD REMEDIATION WORK PLAN PREPARATION

Upon finalization of the scope of road and alley remediation, a Town contractor will prepare a Road Remediation Work Plan. The Road Remediation Work Plan will provide the final design details, including materials and equipment specifications, for road remediation conducted to reduce residents' exposure to lead. The scope of the design and construction work for roads and alleys will be consistent with the existing infrastructure and, where needed, existing structures (e.g., culverts) will be replaced in-kind. The scope of work will include drainage improvements and stormwater controls to the extent such improvements and controls are necessary to protect the integrity of remediated road segments from uncontrolled stormwater flows.

The Road Remediation Work Plan will include detailed technical specifications for:

- removal of surface materials
- dust control/management of wastes
- transport and disposal of material removed from road segments
- clean backfill, road base, clean cover materials
- placement and compaction of road base and surfacing materials
- placement of clean backfill in non-vegetated rights of way
- drainage controls during construction
- post-construction drainage plan and specifications

AR and Town of Rico will work together with the Town contractor to finalize these specifications and produce the final Work Plan.

The Road Remediation Work Plan will also include a map of the road segments and any non-vegetated right-of-way areas where remediation is planned. That map will be prepared from the data represented on Figure 9 of the VCUP Application and any additional lead data obtained during the soil sampling and analysis activities completed in accordance with this Work Plan.

5 DATA MANAGEMENT, RECORD KEEPING, AND REPORTING

Standard data management and record-keeping protocols will be adopted during the VCUP activities described in this Work Plan to ensure that complete and accurate records of VCUP soil sampling and soil remediation activities are available for future reference by the Rico Soils Management Program and the Town of Rico.

5.1 Environmental Data Management

A key element of the VCUP project's data management process is maintenance of an electronic database to store relevant soil sampling data in a consistent and readily retrievable format. AR has prepared an electronic database for the existing VCUP soil data. During Phase 1, AR will maintain the existing electronic database of soil sampling results and remediation records for properties within the VCUP project area (i.e., within the Town of Rico). The database will be routinely updated as additional soil-lead data are collected and properties are remediated.

Once the Overlay Zone Regulations are in place, the Rico Soil Management Program will accept responsibility for the database, including all necessary updates and maintenance. This responsibility includes a commitment of the resources needed for secure data storage and backup, database updating, error correction, and other maintenance.

5.1.1 Electronic Data Management Practices

Sampling and property data are currently stored in an SQL Server database that is electronically linked to a GIS (ArcView™). Standardized data import formats and procedures are to be used to upload new data. Prior to incorporation of new data into the project database, the data and supporting documentation are subject to review to ensure the accuracy and completeness of original data records. Standardized parameter names, numerical formats, and units of measure are applied to the original information, as needed to facilitate comparability across all datasets and within the database.

Detailed records of soil sampling/analysis and remediation activities will be maintained for each property where Phase 1 work is conducted by AR. Data and other records associated with each of the participating properties will be entered into a central electronic database. Property-specific information will be tracked using its "VCUP Lot Number," a unique identification number assigned to each property in the Town of Rico.

5.1.2 Database and GIS Search Application

A web-based GIS application has already been developed that retrieves property soil data and property remediation status for individually owned parcels within the Town of Rico. The key elements of that GIS application are as follows:

1. **GIS layers**
    a. Soil sample locations and lead data
    b. Parcel boundaries
    c. Town boundary

   d. Roads and highways
   e. Surface hydrologic features

2. **Dynamic mapping capabilities**, allowing the user to:
   a. Navigate around the map (pan, zoom in and out), as well as specific on-click map events.
   b. Toggle the visibility of any of the individual GIS layers listed above.
   c. Change the base map from a list of available options (imagery, topographic, or topo map).

3. **Searching and viewing tools** for access to soil-lead data and remediation status for individual parcels. Search by:
   a. Street Address (partial addresses allowed; a list of matching addresses will be returned).
   b. VCUP Lot Number (entered number must find an exact match in order to show a returned record).
   c. Owner last name (entered name must find an exact match in order to show a returned record).
   d. Map-click (user clicks on a parcel boundary, returned record displayed).

4. **Data and document retrieval** following a successful parcel search and selection. The following information will be displayed for the selected parcel:
   a. A map image showing lead concentrations for each sample location and sampled depth interval.
   b. Soil sample attributes:
      - Sample ID
      - Sample Date
      - Collection Depth (minimum and maximum depths)
      - Sample Lead Concentration (mg/kg)
   c. Parcel attributes:
      - Dolores County Property ID Number (PIN)
      - VCUP Lot Number
      - Property Street Address
      - Recorded Owner Name
      - Town of Rico Zoning Classification
      - Development Status (Developed/Undeveloped)
      - Remediation Status (Remediated/Not Remediated)
      - Remediation Documents (associated with Parcel boundaries) are available for properties that have been remediated. A hyperlink to the associated records opens the Parcel's associated *.pdf file for review and/or downloading.
      - CDPHE's VCUP Determination (i.e., NADs and NFAs)

5.2 Record Keeping and Reporting

5.2.1 Reports to Property Owners

Property owners will be individually notified of the lead concentrations in soil samples collected from their properties. For each of the sampled properties, AR will prepare a final Soil Sampling Report that presents the soil sampling and analysis results. That report will provide the lead concentrations associated with each soil sample collected on the property, along with descriptions of the sample date, depth, and location. These reports will be mailed to each property owner within 4 months of soil sampling at the subject property.

For owners of properties having soil lead concentrations above an action level, AR will develop an ISWP for each such property and will provide that plan as an attachment to the access agreement with the owner for review and acceptance. Once remediation has been completed, the property owner shall also receive a copy of the Cleanup Completion Report prepared to document soil remediation activities. The Cleanup Completion Report will include a copy of the soil-remediation access agreement, signed by the property owner and AR, indicating that AR received the property owner's permission to act as their agent under the VCUP in the performance of soil remediation and to request a VCUP NFA from CDPHE. Each Cleanup Completion Report will also include a copy of the ISWP prepared for the property, with any changes to that plan identified, and a statement of completion signed by the property owner and AR's representative.

Owners shall also be provided with copies of requests made to CDPHE for No Action determinations (NADs) and No Further Action determinations (NFAs) specific to their property.

5.2.2 PROPERTY RECORDS

AR will maintain all hard-copy records for an individual property within the project area in a single file, cross referenced by the VCUP Lot Number. Those records will include signed access agreements and attachments, field forms and data sheets, field notes and maps, laboratory analysis results, data quality review results, Cleanup Completion Reports, and NADs/NFAs. CDPHE and the Town shall be permitted access to these hard-copy records upon request.

5.2.3 ANNUAL STATUS REPORTS

AR, and later the Rico Soil Management Program, will prepare a project-status report at the end of each calendar year. The purpose of these annual reports will be to document the work completed during the subject calendar year. Each annual report shall include the following elements:

- Summary of soil sampling activities, including numbers and types of properties where soil sampling was completed (i.e., type of property, any roadway segments, rights of way, and borrow areas or other clean soil sources).
- Soil sampling locations, by VCUP Lot Number, property address and x-y coordinates, and results of soil sample analyses for lead (i.e., samples collected from all property types and any samples collected from borrow areas or other sources of clean soil identified for use at remediated properties).
- Summary of sample analysis data quality and any corrective actions taken to address data quality concerns.
- List of properties identified where soil lead content exceeded the Residential, Public Facilities, or Open Space LAL.

- Lists of properties where ISWPs were prepared for soil remediation and properties where soil remediation was completed.
- Copies of ISWPs prepared, including notes regarding any "as built" modifications.
- Requests sent to CDPHE for NADs and NFAs, referenced by the VCUP Lot Number, and any determinations received from CDPHE.

Much of this information will be compiled from the VCUP project database and GIS. These reports will be prepared during the first quarter of the year following the subject calendar year, and each report will be maintained on file by AR, or later the Rico Soils Management Program, and the Town of Rico.

5.2.4 PROJECT RECORDS

The VCUP project records will be routinely updated and maintained by AR. These records, either electronic or hard copy in form, shall include:

- CDPHE-approved VCUP Applications and associated sampling and analysis plans and work plans, with any CDPHE-approved modifications, updates, and addendums
- Soil sampling field records
- Soil analysis laboratory records
- Correspondence from AR (or its representatives) to individual property owners, including signed access agreements and Soil Sampling Reports prepared for property owners
- Final "as built" ISWPs for individual properties and corresponding Cleanup Completion Reports.
- Requests to CDPHE for NADs, for each sampled property with soil lead less than the applicable LAL, and CDPHE's final determination
- Requests to CDPHE for NFAs, for each remediated property, and CDPHE's final determination
- Final Road Remediation Work Plan and related technical specifications for contractors
- Borrow soil/stockpile soil sampling and analysis records
- Rico Soil Lead Repository operations records indicating the volume of soil (in cy) transported to the Repository from the project area for disposal

Hard-copy field and laboratory records shall be maintained chronologically for future reference. The electronic versions of these records are to be maintained on a central server system with backup scheduled on a daily basis.

AR will retain these records for future reference by the Rico Soils Management Program. These records will also be made available for the Town of Rico's ongoing reference.

6 REFERENCES

Anderson Engineering Company (AEC). 2007. Rico Railroad Corridor Sampling and Analysis Report, prepared for Atlantic Richfield Company. January 2007.

AECOM. 2014. Sampling and Analysis Plan, Revision 1 Rico Soils Voluntary Cleanup Program, Rico, Colorado. July 2014.

Atlantic Richfield Company, Rico Renaissance LLC, Rico Properties LLC, and Town of Rico (AR et al.). 2004a. Rico Townsite Soils VCUP Application, Rico, Colorado. Submitted to Colorado Department of Health and Environment (CDPHE). Prepared by Short Elliott Hendrickson Inc. June 24, 2004.

AR et al. 2004b. Rico Townsite Soils Phase I Work Plan and Preliminary Data Report, Rico, Colorado. Submitted to CDPHE. Prepared by Short Elliott Hendrickson Inc. September 23, 2004.

AR et al. 2005. Rico Townsite Soils VCUP Project Phase II Work Plan, Rico, Colorado. Submitted to CDPHE. Prepared by Short Elliott Hendrickson Inc. May 25, 2005.

AR et al. 2006. Volume I Rico Townsite Soils VCUP Project Final Data Report and Data Evaluation, Rico, Colorado. Submitted to CDPHE. Prepared by Short Elliott Hendrickson Inc. June 7, 2006.

Integral Consulting Inc. (Integral). 2006. Integral Consulting Inc. Lead Health Risk Assessment for Rico Townsite Soils. Submitted to CDPHE. Submitted by Atlantic Richfield Company, Rico Renaissance, LLC, Rico Properties, LLC, and Town of Rico. April 6, 2006.

Integral. 2010. Integral Consulting Inc. Rico Soils Residual Risk Analysis, Rico, Colorado. Prepared for Atlantic Richfield Company. February 4, 2010.

Short Elliott Hendrickson (SEH). 2004. Engineering Design and Operations Report to accompany Application for Certificate of Designation for Soil Lead Repository, North Rico (St. Louis Ponds) Site in Rico (Dolores County), Colorado. Prepared for Rico Properties, LLC, as a representative of Rico Renaissance, LLC by Short Elliott Hendrickson Inc. December 22, 2004.

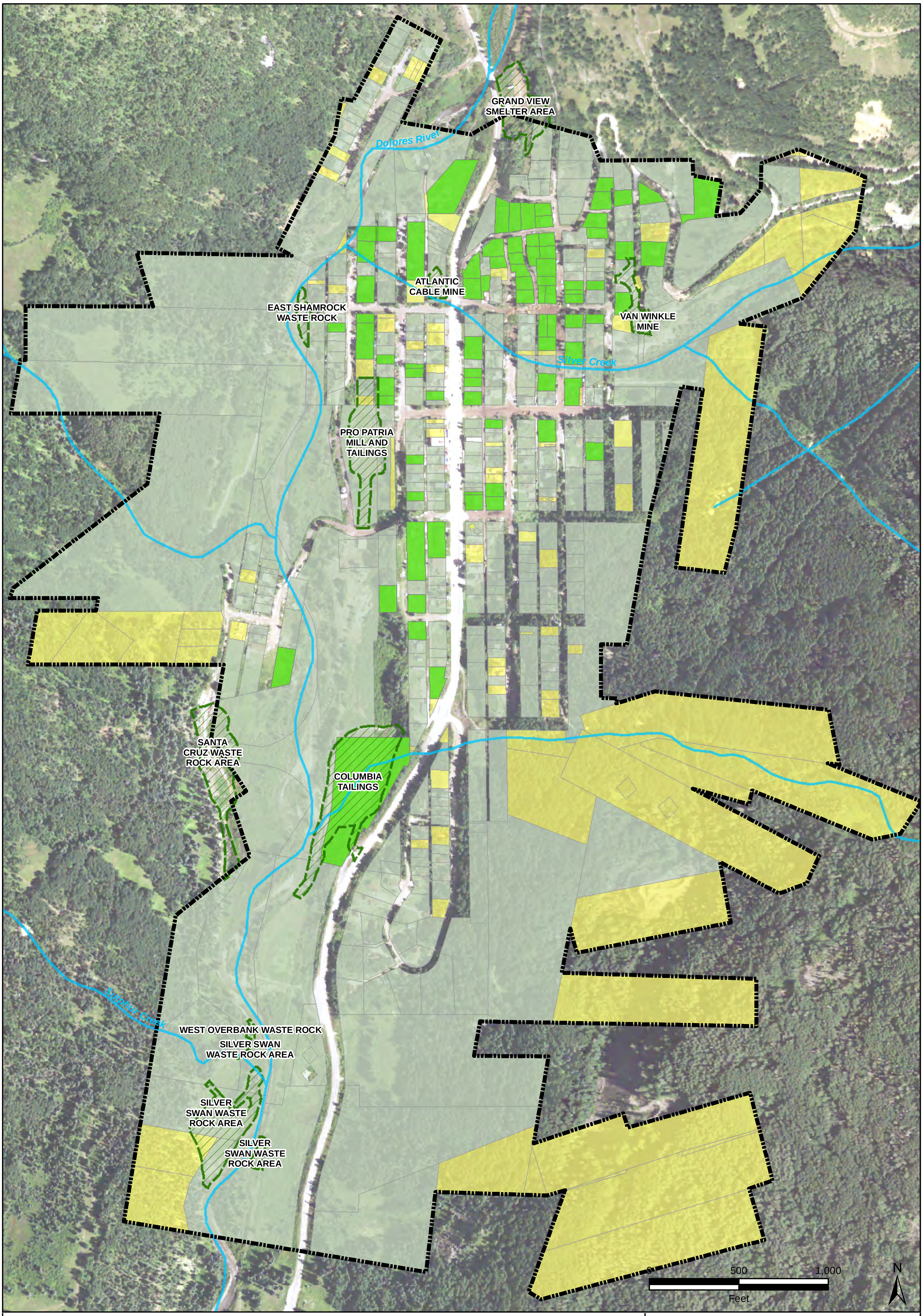
TREC, Inc. 2015. Rico Town Soil Sampling Project, Rico (Dolores County) Colorado, 2014–2015 Data Summary Report (DSR). Submitted to Atlantic Richfield Company. December 11, 2015.

US Environmental Protection Agency (EPA). 2003. Superfund Lead-Contaminated Residential Sites Handbook, Final: August 2003, OSWER 9285.7-50.

US EPA. 2009. EPA Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use. EPA 540-R-08-005. January.

US EPA. 2017. National Functional Guidelines for Inorganic Superfund Methods Data Review. Office of Superfund Remediation and Technology Innovation (OSRTI), United States Environmental Protection Agency (EPA), Washington, DC. EPA-540-R-2017-001. January 2017.

FIGURES



Legend

- Parcel Boundaries
- Parcels Without VCUP Soil Lead Data
- Remediated Parcels
- VCUP Mine Sites
- Parcels Where VCUP Soil Sampling Was Performed (2005-2015)
- Rivers and Streams
- Town of Rico Boundary (Source: Town of Rico, 2019)

Basemap: 2015 NAIP Imagery

RICO, COLORADO

FIGURE B-1

PREVIOUSLY SAMPLED AND REMEDIATED PARCELS

DATE: SEP 07, 2022	
BY: DKG	FOR: BGH

FORMATION ENVIRONMENTAL

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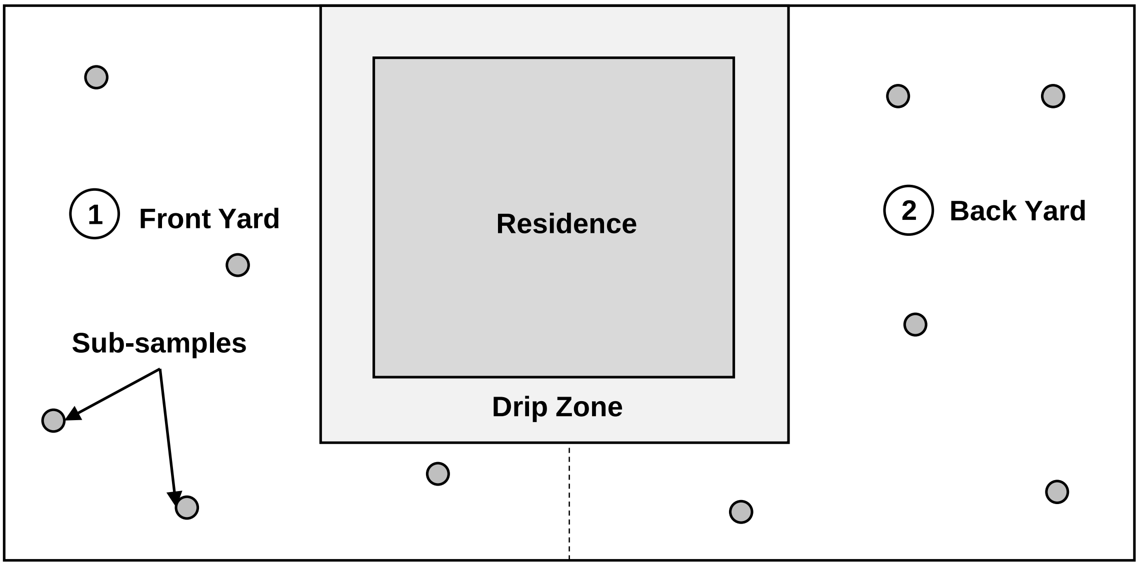
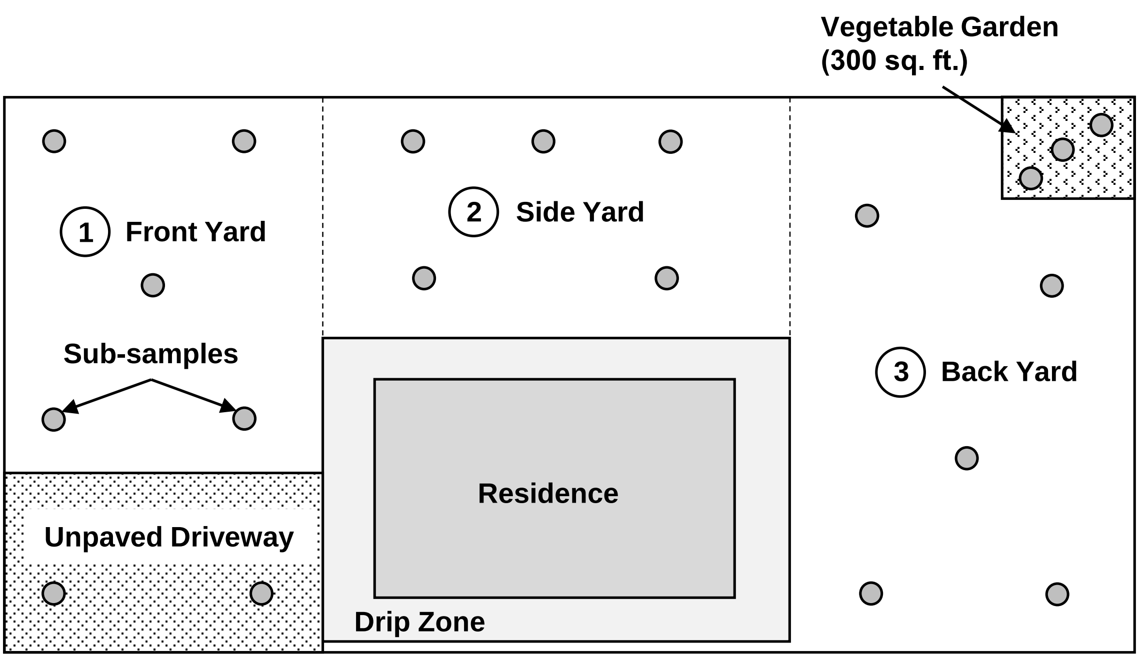


Example residential property ≤ 5,000 sq ft

Collect two five-point composite samples, one each from front yard and back yard (outside drip zone).
Sample depth = 0 to 2 inches.

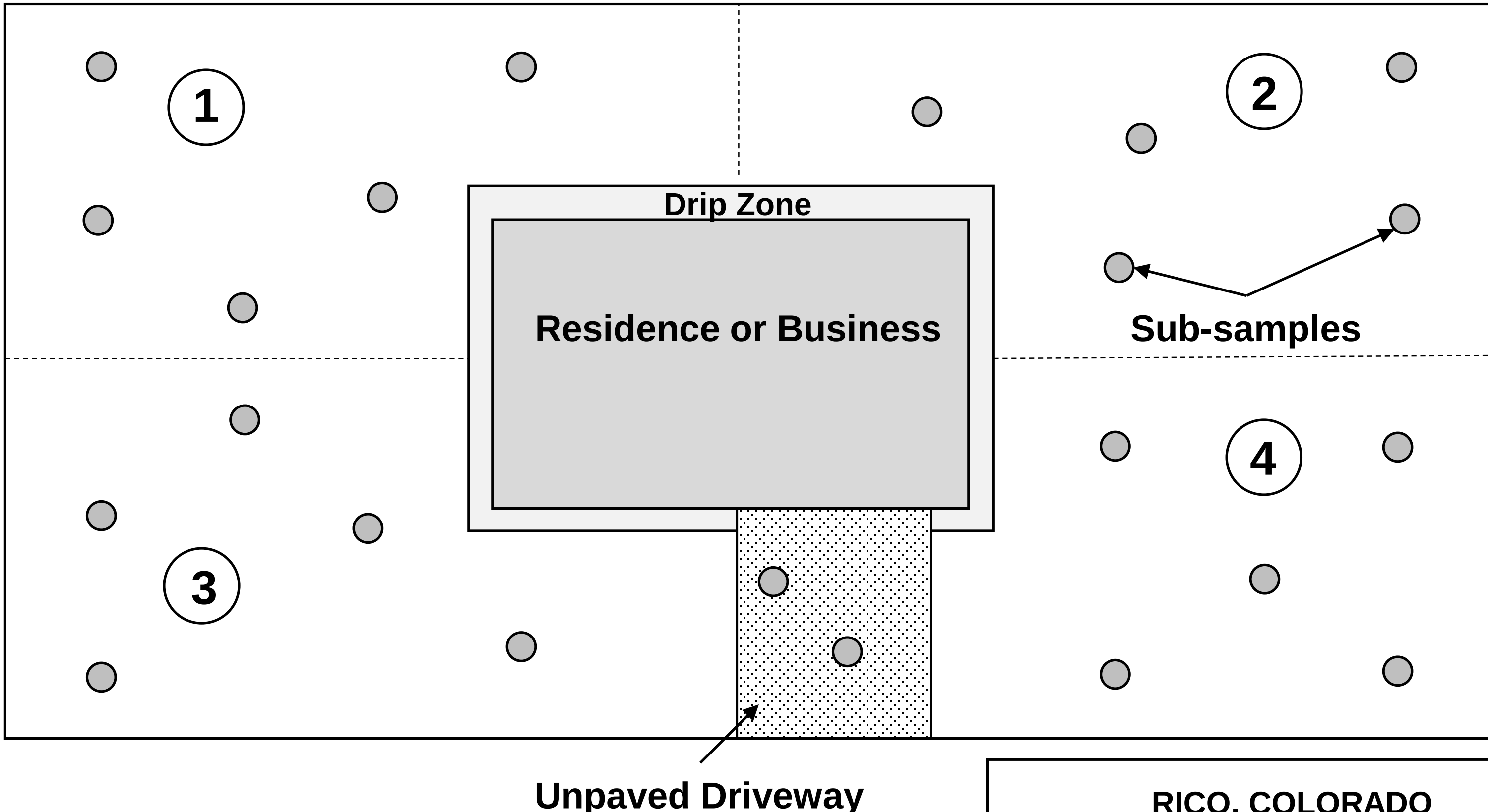


Example residential property ≤ 5,000 sq. ft. with three yard areas and other distinct features.

Collect three five-point composite samples, one each from front yard, back yard, side yard (outside drip zone).
Collect one two-point composite sample from unpaved driveway.
Sample depth = 0 to 2 inches.

Also collect one three-point composite of vegetable-garden soil.
Sample depth = 0 to 12 inches.

RICO, COLORADO		
FIGURE B-2 **SCHEMATIC SAMPLING PLANS FOR DEVELOPED PROPERTIES ≤ 5,000 SQ FT**		
DATE: FEB 2020		FORMATION ENVIRONMENTAL
BY: ASF	FOR: BGH	



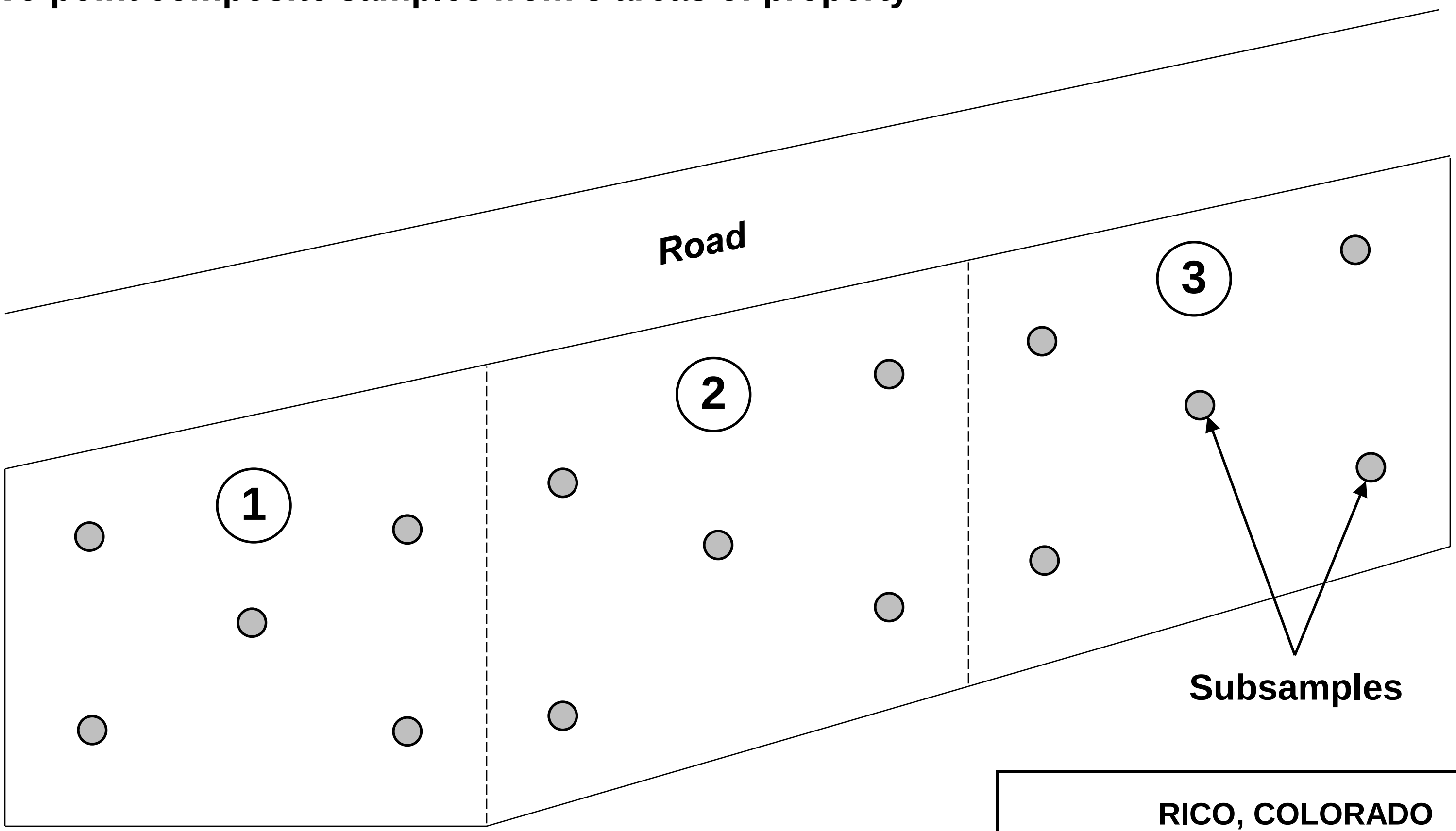
Example: residential or commercial property >5,000 sq ft

Divide parcel area into quadrants.
Collect four five-point composite samples, one from each quadrant, avoiding drip zone.
Collect one two-point composite from unpaved driveway.
Sample depth = 0 to 2 inches.

RICO, COLORADO		
FIGURE B-3 **SCHEMATIC SAMPLING PLAN FOR DEVELOPED PROPERTIES > 5,000 SQ FT**		
DATE: FEB 2020		FORMATION ENVIRONMENTAL
BY: ASF	FOR: BGH	

S:\GIS\a5\Rico\plt\VCUP_application_2021\AppendixD\Sample_Schematic_D3.pdf

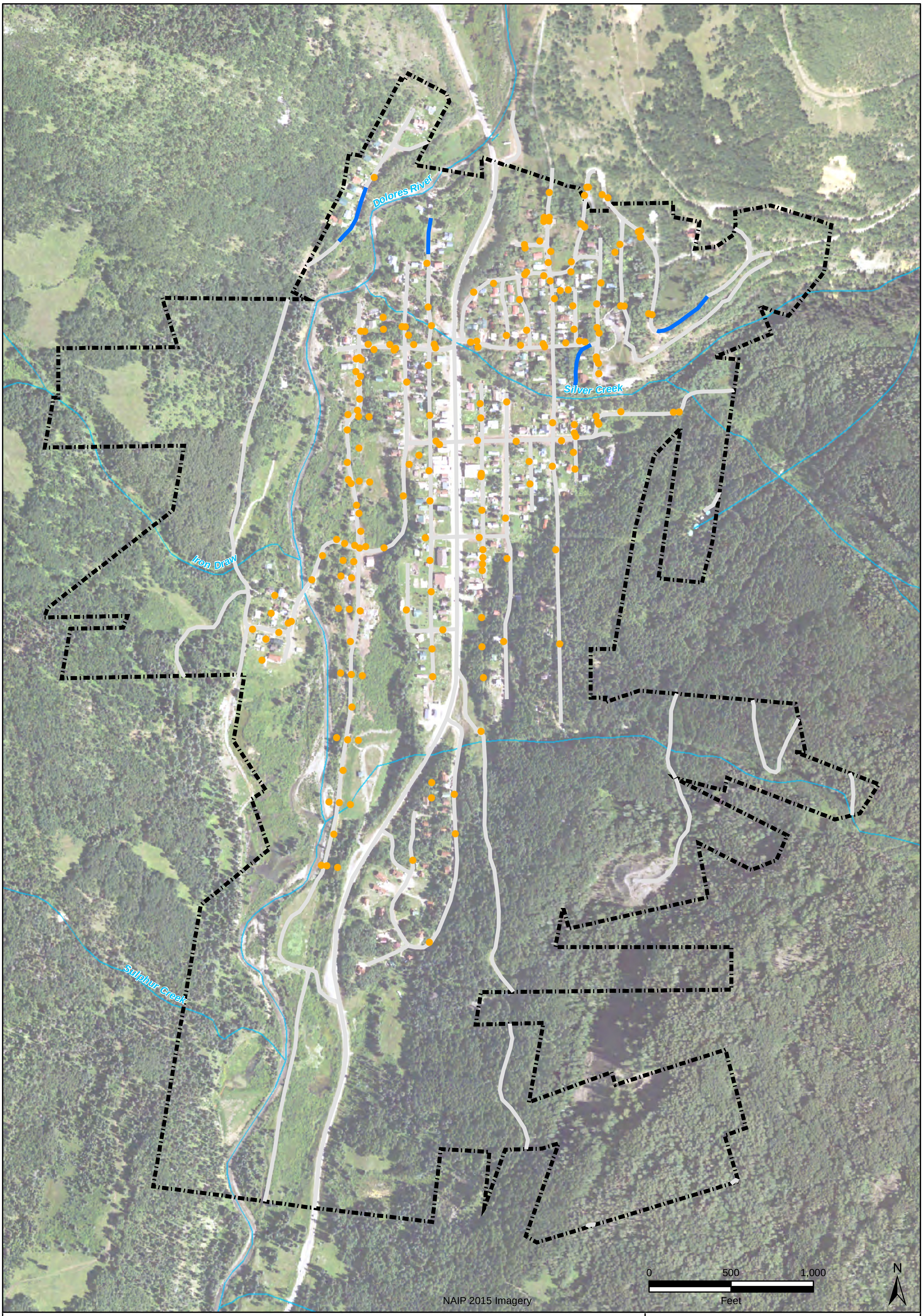
Five-point composite samples from 3 areas of property



PUD – Planned Unit Development
Divide Property into semi-equal sections < 5,000 sq. ft.
One five-point composite sample from each section
Sample depth 0 to 2 inches

RICO, COLORADO		
FIGURE B-4 **SCHEMATIC SAMPLING PLAN FOR AN UNDEVELOPED PROPERTY > 5,000 SQ FT**		
DATE: NOV 2021		FORMATION ENVIRONMENTAL
BY: ASF	FOR: BGH	

S:\GIS\a5\Rico\plt\WorkPlan_2019\Concept\Sample_Schematic_D3_D4.pptx



Legend

- Road/Alley Lead Results 0 - 2" Depth
- Road/Alley Segments To Be Sampled
- Roads
- Rivers and Streams
- Town of Rico Boundary

RICO, COLORADO

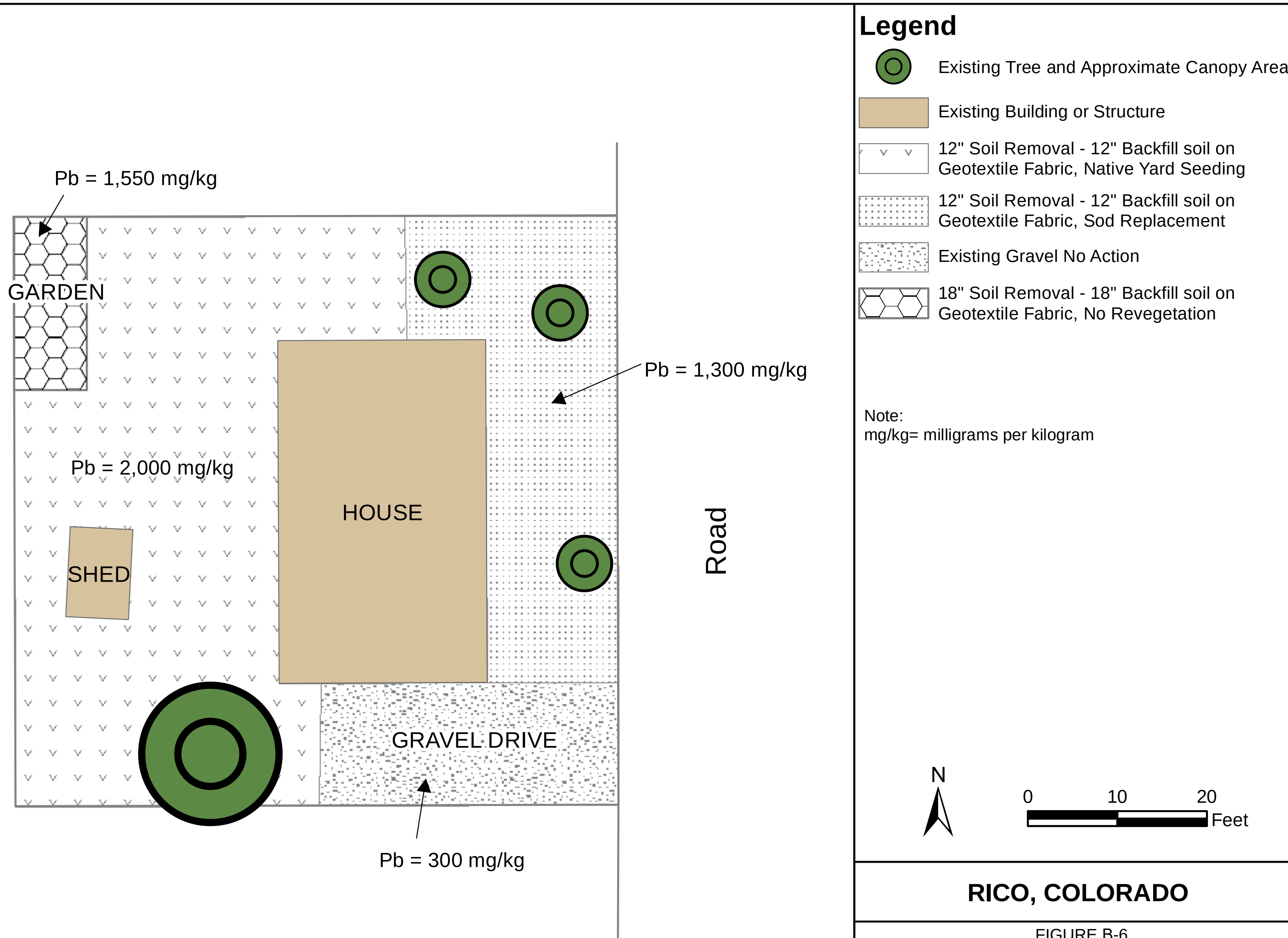
FIGURE B-5

POTENTIAL FUTURE SAMPLING LOCATIONS FOR UNPAVED ROADS AND ALLEYS

DATE: NOV 10, 2022

BY: ASF/DKG | FOR: BGH

FORMATION ENVIRONMENTAL



RICO, COLORADO

FIGURE B-6

EXAMPLE SOIL REMEDIATION CONCEPT FOR A RESIDENTIAL PROPERTY

DATE: OCT 28, 2021
BY: ASF
FOR: KJT

FORMATION ENVIRONMENTAL

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ATTACHMENT 1. PROPERTY ACCESS AGREEMENTS

Request to Owner for Property Access to Perform Soil Sampling

Request to Owner for Property Access to Conduct Soil Remediation

ACCESS AGREEMENT FOR SOIL SAMPLING

________________________________ ("Owner") and Atlantic Richfield Company ("Atlantic Richfield") enter into this Access Agreement ("Agreement") this ____ day of ________________, 202[_].

RECITALS

A. Atlantic Richfield is evaluating the presence of lead in soils on certain properties in the Town of Rico as part of the Voluntary Cleanup Plan ("VCUP") approved by the Colorado Department of Public Health and the Environment ("CDPHE") pursuant to the Colorado Voluntary Cleanup and Redevelopment Act, C.R.S. § 25-16-301.

B. To facilitate that evaluation, Atlantic Richfield wishes to conduct soil sampling on the real property owned by Owner, located at ________________, Rico, Dolores County, Colorado, as legally described in Exhibit 1 (the "Property"), in accordance with the Rico Townsite Soils VCUP Application submitted by the Town of Rico ("Town") and Atlantic Richfield and approved by CDPHE on ________, 2023 ("VCUP Application"). Access to the Property is needed for Atlantic Richfield to conduct this sampling work.

C. Owner agrees to permit Atlantic Richfield to conduct such sampling work on the Property pursuant to the terms and conditions of this Agreement.

THEREFORE, in consideration of the mutual covenants and promises contained in this Agreement, Owner and Atlantic Richfield hereby agree as follows:

1. GRANT OF ACCESS. Owner hereby grants to Atlantic Richfield and CDPHE, including their respective authorized representatives, the right to enter the Property to conduct and oversee, respectively, VCUP-related soil sampling activities, including, without limitation, the collection of surface and sub-surface soil samples for chemical analysis (the "Sampling"), to evaluate and document the presence and extent of lead in soils and lead-containing materials on the Property in accordance with the VCUP Application. Owner warrants and represents to Atlantic Richfield that, to the best of Owner's knowledge, Owner possesses ownership interests in the Property sufficient to grant such access to conduct the Sampling. Atlantic Richfield will make reasonable efforts to minimize inconvenience to Owner during its Sampling on the Property, and will coordinate with Owner to address concerns Owner may have about the Sampling.

2. VCUP REPRESENTATIVE. Owner hereby authorizes Atlantic Richfield to act as the Owner's designated VCUP representative in the performance of the Sampling and to request, if appropriate for the reasons stated in this Paragraph 2, a VCUP No Action Determination ("NAD") (as defined below) from CDPHE. A VCUP NAD shall mean a determination by CDPHE pursuant to C.R.S. § 25-16-307 that the Sampling was performed in accordance with the VCUP Application, and that, based on the results of the Sampling, remediation of the Property is not necessary to protect human health and the environment

because soil lead concentrations are below the applicable site-specific lead action level of [761 mg/kg for Residential] [967 mg/kg for Public Facilities] [4,010 mg/kg for Open Space]. If the Sampling Report prepared in accordance with Paragraph 6 below shows that lead concentrations in soil on the Property are less than the action level of [761 mg/kg for Residential] [967 mg/kg for Public Facilities] [4,010 mg/kg for Open Space], Atlantic Richfield, as Owner's designated VCUP representative, is authorized to submit the Sampling Report to CDPHE with the request for a VCUP NAD. If the Sampling Report shows that lead concentrations in soil on the Property are greater than [761 mg/kg for Residential] [967 mg/kg for Public Facilities] [4,010 mg/kg for Open Space], Atlantic Richfield will notify Owner of the results and discuss next steps for appropriate management of soil and/or mine waste on the Property.

3. INDEMINIFICATION OF OWNER. Atlantic Richfield agrees to indemnify and hold harmless Owner from any and all actions, claims, demands, losses, liabilities, or expenses, including but not limited to damage to property, and enforcement actions ("Liabilities"), which may be imposed on or incurred by Owner as a result of Atlantic Richfield's negligent, reckless, or willfully wrongful acts or omissions while on the Property to conduct the Sampling, except to the extent that such Liabilities result from the acts or omissions of Owner. Provided that the Sampling is conducted without negligence, recklessness, or willfully wrongful acts or omissions by Atlantic Richfield, Owner and Atlantic Richfield agree that the Sampling conducted pursuant to this Agreement shall not give rise to a claim for indemnification under this provision.

4. COVENANT NOT TO SUE AND RELEASE. Owner covenants not to sue Atlantic Richfield, and releases Atlantic Richfield from any liability, for actions, claims, demands, losses, damages, expenses, injunctive relief, indemnification or any other relief or Liabilities, including, but not limited to, damages to property or for loss of use of property, arising out of or related to the planning, implementation, or performance of the Sampling, provided that the Sampling is conducted without negligence, recklessness, or willfully wrongful acts or omissions and in accordance with the terms and conditions of this Agreement.

5. SAMPLING NOTICE. Atlantic Richfield shall provide Owner, either in writing or verbally, with at least 24 hours' notice prior to first commencing the Sampling on the Property.

6. SAMPLING REPORT. Once the Sampling has been completed, Atlantic Richfield shall prepare a soil sampling and analysis report ("Sampling Report") documenting the sample locations, depths, and lead concentrations associated with the Property. Atlantic Richfield will timely provide a copy of the Sampling Report to Owner.

7. PROPERTY TRANSFER. In the event that Owner enters into an agreement to grant, transfer, or convey any interest in the Property prior to the termination of this Agreement, Owner shall, at least thirty (30) days prior to the closing of such grant, transfer or conveyance: (a) provide written notice of the grant, transfer or conveyance to Atlantic Richfield pursuant to Paragraph 8, and (b) provide the transferee with a copy of this

Agreement.

8. NOTICE. All written notices pertaining to this Agreement shall be sent to Owner and Atlantic Richfield at the respective addresses below. Either Owner or Atlantic Richfield may designate a different address for receipt of notice by providing written notice of such change to the other.

TO ATLANTIC RICHFIELD: Mike McAnulty
317 Anaconda Rd
Butte, MT 59701
(907) 355.3914
mcanumc@bp.com

TO OWNER: [Owner Name]
[Address]
[Phone Number]
[Email]

9. RESTORATION OF PROPERTY AND RECORDATION. Atlantic Richfield shall, within a reasonable period of time after completion of the Sampling, use its best efforts to repair any damage to Owners' Property resulting from Atlantic Richfield's entry upon or presence at or on Owners' Property for the purpose of performing the Sampling. Owner agrees to permit Atlantic Richfield to create a photographic/video record to document the condition of the Property prior to and following the Sampling. Copies will be made available for review upon Owner's request.

10. INSTITUTIONAL CONTROLS. Owner acknowledges that all documents, data, and other information ("Records") developed by Atlantic Richfield or its representatives related to the Sampling shall be publicly available. Atlantic Richfield intends to provide such Records to the Town and CDPHE for either's use in the development, administration, and enforcement of any institutional controls related to the VCUP, including the environmental overlay zone regulations adopted by the Town into the Rico Land Use Code on [__], 2023. Such Records may include, but are not limited to, the following: this Agreement and its exhibit; correspondence between Atlantic Richfield and Owner regarding the Sampling or this Agreement; the Sampling Report; and VCUP NAD requests to CDPHE and CDPHE's determination approving the NAD.

11. MISCELLANEOUS.

a. Effect of Agreement. This Agreement and the rights and obligations created hereby shall be binding upon and inure to the benefit of Owner and Atlantic Richfield and their respective assigns and successors in interest.

b. No Admission of Liability. The parties entering into this Agreement do not admit any liability arising out of any transactions or occurrences, or any environmental conditions whatsoever, relating to the subject matter hereof or as set forth in this

Agreement or any other record documents attached hereto or incorporated by reference; nor do the parties acknowledge that the existence of lead or other metals on or beneath the Property endangers in any way the public health or welfare or the environment. Where responsibility for performing or paying for certain tasks or obligations is assigned to one or more parties under this Agreement, such assignment is not intended, and shall not be interpreted, as an admission of any liability or responsibility other than as between the parties hereto and pursuant to the express terms hereof. This Agreement, any factual or legal statements made in this Agreement, and the resulting obligations of the parties shall not be admissible in any judicial or administrative proceeding against any of the parties over their objection, as evidence of liability or as an admission of any factual or legal statements or determinations made herein.

c. <u>Negation of Agency Relationship.</u> This Agreement shall not be construed to create, either expressly or by implication, the relationship of agency or partnership between Owner and Atlantic Richfield. Except for the authority granted in Paragraph 2, neither Owner nor Atlantic Richfield is authorized to act on behalf of the other in any manner relating to the subject matter of this Agreement.

d. <u>Termination.</u> This Agreement will terminate on December 31, [Two Years After Agreement is Signed], provided that Paragraphs 2, 3, and 4 shall survive such termination.

e. <u>Governing Law.</u> This Agreement shall be governed by and construed in accordance with the laws of the State of Colorado.

f. <u>Construction.</u> The invalidity or unenforceability of any provision of this Agreement shall not affect the validity or enforceability of any other provision.

g. <u>Entire Agreement.</u> This Agreement and the exhibits referenced herein embodies the entire agreement of Owner and Atlantic Richfield with respect to the subject matter hereof, and no prior oral or written representation shall serve to modify or amend this Agreement. This Agreement may be modified only by a written agreement signed by Owner and Atlantic Richfield.

IN WITNESS WHEREOF. Owner and Atlantic Richfield have executed this Agreement effective as of the first date written above.

OWNER:

________________________________ Date ______________________

Title: <u>Owner</u>__________________________

ATLANTIC RICHFIELD COMPANY:

__________________________________ Date _____________________

Title: Liability Manager________________

EXHIBIT 1 ACCESS AGREEMENT

DESCRIPTION OF PROPERTY

That certain real property as more fully described as follows:

Parcel Number:

Physical Address:

Legal:

ACCESS AGREEMENT FOR SOIL REMEDIATION

________________________________ ("Owner") and Atlantic Richfield Company ("Atlantic Richfield") enter into this Access Agreement ("Agreement") this ____ day of ________________, 202[_].

RECITALS

A. Atlantic Richfield is conducting soil cleanup activities on certain properties in the Town of Rico as part of the Voluntary Cleanup Plan ("VCUP") approved by the Colorado Department of Public Health and the Environment ("CDPHE") pursuant to the Colorado Voluntary Cleanup and Redevelopment Act, C.R.S. § 25-16-301.

B. Real property owned by the Owner, located at ________________, Rico, Dolores County, as legally described in Exhibit 1 (the "Property"), has been identified for cleanup of soils pursuant to the Rico Townsite Soils VCUP Application submitted by the Town of Rico ("Town") and Atlantic Richfield and approved by CDPHE on ________, 2023 ("VCUP Application"). Access to the Property is needed for Atlantic Richfield to conduct this cleanup work.

C. Owner agrees to permit Atlantic Richfield to conduct such cleanup work on the Property pursuant to the terms and conditions of this Agreement.

THEREFORE, in consideration of the mutual covenants and promises contained in this Agreement, Owner and Atlantic Richfield hereby agree as follows:

1. GRANT OF ACCESS. Owner hereby grants to Atlantic Richfield and CDPHE, including their respective authorized representatives, the right to enter the Property to conduct and oversee, respectively, all soil cleanup activities described or depicted in the Individual Site Work Plan ("ISWP") attached as Exhibit 2 hereto, including without limitation: excavation, transport, and removal of soils; placement of soil cover material; revegetation; erosion control; ingress and egress of equipment; machinery and personnel staging and temporary storage of equipment; and information gathering activities such as field investigation, data collection, surveys, and testing (collectively referred to as "Work"). Owner warrants and represents to Atlantic Richfield that, to the best of Owner's knowledge, Owner possesses ownership interests in the Property sufficient to grant such access to conduct the Work. Unless otherwise agreed to in writing by Owner and Atlantic Richfield, all tools, equipment or other property taken or placed upon the Property by or at the direction of Atlantic Richfield (or its authorized representatives) shall remain the property of Atlantic Richfield and may be removed by Atlantic Richfield at any time within a reasonable period after completion of the Work. Atlantic Richfield will make reasonable efforts to minimize inconvenience to Owner during its Work on the Property, and will coordinate with Owner to address concerns Owner may have about the Work.

2. VCUP REPRESENTATIVE. Owner hereby authorizes Atlantic Richfield to act as the Owner's designated VCUP representative in the performance of the Work and to request a

VCUP No Further Action Determination ("NFA") (as defined below) from CDPHE. A VCUP NFA shall mean a determination by CDPHE pursuant to C.R.S. § 25-16-307 that the Work was performed in accordance with the VCUP Application and is adequate to protect human health and the environment in light of the current or proposed use of the Property.

3. INDEMINIFICATION OF OWNER. Atlantic Richfield agrees to indemnify and hold harmless Owner from any and all actions, claims, demands, losses, liabilities, or expenses, including but not limited to damage to property, and enforcement actions ("Liabilities"), which may be imposed on or incurred by Owner as a result of Atlantic Richfield's negligent, reckless, or willfully wrongful acts or omissions while on the Property to conduct the Work, except to the extent that such Liabilities result from the acts or omissions of Owner. Provided that the Work is conducted without negligence, recklessness, or willfully wrongful acts or omissions by Atlantic Richfield, Owner and Atlantic Richfield agree that the Work conducted pursuant to this Agreement shall not give rise to a claim for indemnification under this provision.

4. COVENANT NOT TO SUE AND RELEASE. Owner covenants not to sue Atlantic Richfield, and releases Atlantic Richfield from any liability, for actions, claims, demands, losses, damages, expenses, injunctive relief, indemnification or any other relief or Liabilities, including, but not limited to, damages to property or for loss of use of property, arising out of or related to the planning, implementation, or performance of the Work described in Exhibit 2, provided that the Work is conducted without negligence, recklessness, or willfully wrongful acts or omissions and in accordance with Exhibit 2 and the terms and conditions of this Agreement.

5. WORK NOTICE. Atlantic Richfield shall provide Owner, either in writing or verbally, with at least 24 hours' notice prior to first commencing the Work on the Property.

6. CLEANUP COMPLETION. Once the Work on Owner's Property has been completed, any changes to the ISWP adopted during construction will be noted by Atlantic Richfield on an "as built" version of the ISWP, a copy of which shall be provided to the Owner. In addition, Atlantic Richfield shall prepare a cleanup completion report ("Completion Report") documenting that the Work was performed in accordance with the ISWP and the VCUP Application. Owner acknowledges that Atlantic Richfield, as Owner's designated VCUP representative, shall submit the Cleanup Report to CDPHE with a request for a VCUP NFA. The Completion Report will include a Statement of Completion (form attached as Exhibit 3) stating that the Work has been completed in an acceptable manner and in accordance with the ISWP, which Owner agrees to sign upon verification that the Work was conducted in accordance with Exhibit 2 and the terms and conditions of this Agreement.

7. FUTURE ACCESS. After completion of the Work, Owner hereby grants a continuing non-exclusive right of access to the Property to Atlantic Richfield, CDPHE, the Town, and their respective authorized representatives, for the purpose of investigating, monitoring, sampling, and inspecting the integrity of the Work.

8. PROPERTY TRANSFER. In the event that Owner enters into an agreement to grant, transfer or convey any interest in the Property prior to the termination of this Agreement, Owner shall, at least thirty (30) days prior to the closing of such grant, transfer or conveyance: (a) provide written notice of the grant, transfer or conveyance to Atlantic Richfield pursuant to Paragraph 9, and (b) provide the prospective transferee with a copy of this Agreement.

9. NOTICE. All written notices pertaining to this Agreement shall be sent to Owner and Atlantic Richfield at the respective addresses below. Either Owner or Atlantic Richfield may designate a different address for receipt of notice by providing written notice of such change to the other.

TO ATLANTIC RICHFIELD:	Mike McAnulty 317 Anaconda Rd Butte, MT 59701 (907) 355.3914 mcanumc@bp.com
TO OWNER:	[Owner Name] [Address] [Phone Number] [Email]

10. RECORDATION. Owner agrees to permit Atlantic Richfield to create a photographic/video record to document the condition of the Property prior to and following the Work. Copies will be made available for review upon Owner's request.

11. RESTORATION OF PROPERTY. Atlantic Richfield shall, within a reasonable period of time after completion of the Work, use its best efforts to repair any damage to Owners' Property resulting from Atlantic Richfield's entry upon or presence at or on Owners' Property for the purpose of performing the Work, provided such restoration is not inconsistent with the Work.

12. INSTITUTIONAL CONTROLS. Owner acknowledges that all documents, data, and other information ("Records") developed by Atlantic Richfield or its representatives related to the Work and the VCUP Application shall be publicly available. Atlantic Richfield intends to provide such Records to the Town and/or CDPHE for either's use in the development, administration, and enforcement of any institutional controls related to the VCUP, including the environmental overlay zone regulations adopted by the Town into the Rico Land Use Code on [__], 2023. Such Records may include, but are not limited to, the following: this Agreement and its exhibits; soil and remediation field records and laboratory analysis; the Completion Report; correspondence between Atlantic Richfield and Owner regarding the Work or this Agreement; VCUP NFA requests to CDPHE and CDPHE's determination approving the NFA; and any restrictive notice or environmental covenant that Owner elects to record in the Office of the Dolores County Clerk and

Recorder documenting the existence of this Agreement and the VCUP NFA.

13. MISCELLANEOUS.

a. Effect of Agreement. This Agreement and the rights and obligations created hereby shall be binding upon and inure to the benefit of Owner and Atlantic Richfield and their respective assigns and successors in interest, and, if recorded in the Office of the Dolores County Clerk and Recorder, shall be binding on subsequent owners of the Property.

b. No Admission of Liability. The parties entering into this Agreement do not admit any liability arising out of any transactions or occurrences, or any environmental conditions whatsoever, relating to the subject matter hereof or as set forth in this Agreement or any other record documents attached hereto or incorporated by reference; nor do the parties acknowledge that the existence of lead or other metals on or beneath the Property endangers in any way the public health or welfare or the environment. Where responsibility for performing or paying for certain tasks or obligations is assigned to one or more parties under this Agreement, such assignment is not intended, and shall not be interpreted, as an admission of any liability or responsibility other than as between the parties hereto and pursuant to the express terms hereof. This Agreement, any factual or legal statements made in this Agreement, and the resulting obligations of the parties shall not be admissible in any judicial or administrative proceeding against any of the parties over their objection, as evidence of liability or as an admission of any factual or legal statements or determinations made herein.

c. Negation of Agency Relationship. This Agreement shall not be construed to create, either expressly or by implication, the relationship of agency or partnership between Owner and Atlantic Richfield. Except for the authority granted in Paragraph 2, neither Owner nor Atlantic Richfield is authorized to act on behalf of the other in any manner relating to the subject matter of this Agreement.

d. Termination. This Agreement will terminate thirty (30) days following execution of the Statement of Completion (Exhibit 3) and Atlantic Richfield's delivery of the Statement of Completion to Owner in accordance with this Agreement, provided that Paragraphs 2, 3, 4, and 7 shall survive such termination.

e. Governing Law. This Agreement shall be governed by and construed in accordance with the laws of the State of Colorado.

f. Construction. The invalidity or unenforceability of any provision of this Agreement shall not affect the validity or enforceability of any other provision.

g. Entire Agreement. This Agreement and the exhibits referenced herein embodies the entire agreement of Owner and Atlantic Richfield with respect to the subject matter hereof, and no prior oral or written representation shall serve to modify or amend this Agreement. This Agreement may be modified only by a written agreement signed by Owner and Atlantic Richfield.

IN WITNESS WHEREOF. Owner and Atlantic Richfield have executed this Agreement effective as of the first date written above.

OWNER:

__________________________________ Date ______________________

Title: Owner__________________________

ATLANTIC RICHFIELD COMPANY:

___________________________________ Date ______________________

Title: Liability Manager________________

EXHIBIT 1 ACCESS AGREEMENT

DESCRIPTION OF PROPERTY

That certain real property as more fully described as follows:

Parcel Number:

Physical Address:

Legal:

EXHIBIT 2 TO ACCESS AGREEMENT

INDIVIDUAL SITE WORK PLAN

EXHIBIT 3 TO ACCESS AGREEMENT

STATEMENT OF COMPLETION

Owner and Atlantic Richfield hereby acknowledge, by signing this Statement of Completion, that the VCUP cleanup work performed by Atlantic Richfield on Owner's Property was conducted as stated in the Individual Site Work Plan (Exhibit 2) and completed to the satisfaction of the Owner.

SIGNED:____
Owner

NAME:____

DATE:______________________

SIGNED:____
Atlantic Richfield Company Representative

NAME:____

DATE:____

ATTACHMENT 2. STANDARD OPERATING PROCEDURES

SOP_VCUP_01 – Field Documentation

SOP_VCUP_02 – Soil Sampling

SOP_VCUP_03 – Sample Identification, Custody, Packaging, and Shipment

SOP_VCUP_04_200305 - Handheld X-ray Fluorescence

SOP_VCUP_05 – Equipment Decontamination

SOP_VCUP_06 – Storage and Disposal of Investigation Derived Waste

SOP_VCUP_07_012621-QAQC XRF

Copper Environmental Consulting
A PRISM SPECTRUM COMPANY

Standard Operating Procedure – Field Documentation	
Project Name: VCUP Townsite Soils	
Name:	Date:

1. INTRODUCTION

1.1. Purpose and Scope

This document is meant to act as a Standard Operating Procedure (SOP) for the completion of field documentation as it relates to the Rico Townsite Soils VCUP remediation program.

Field logbooks are intended to provide enough data and observation notes to enable participants to reconstruct events which occurred while performing field activities and to refresh the memory of field personnel while writing reports or giving testimony during legal proceedings. As such, all entries should be as factual, detailed and descriptive as possible so that a situation can be reconstructed without reliance on the collector's memory. Field logbooks are not intended to be used as the sole source of project or sampling information. Logbooks will be assigned to project members to ensure that each field team always has a logbook with them. Hardcopy or electronic field forms may be used instead of logbooks for routine sampling and maintenance operations ***providing*** the field forms contain the applicable information listed within this SOP.

It is important to adequately document sample locations in environmental investigations because additional sampling events may become necessary. An identifiable record of the previous sampling locations prevents replicate sample locations and increases the efficiency of the investigation.

1.2. Minimum Required Equipment	Initials
• Level D PPE in accordance with associated Task Risk Assessments (TRAs), the Copper Environmental Consulting (CEC) Task Specific Health and Safety Plan (TSHASP), and the Rico Program Plan.	
• Pen/Tablet	
• Camera (Use camera on tablet as first option)	
• Logbook	
• Field Documents/Field documents template	
• Handheld GPS unit set to NAD 1983 State Plane; Colorado South FIPS 0503 Feet, Linear Unite: US Foot	

1.3. Pertinent/Required Reference Information	Initials
1.3.1. Sops/User Manuals	
• SOP_VCUP_02 – Soil Sampling	
1.3.2. Task Risk Assessments (TRAs)	
• TBD	

2. PROCEDURE	
2.1. Field Logbooks	Initials
2.1.1. Field Logbook Identification	
Field logbooks shall be bound water-resistant books with consecutively numbered pages. Logbooks will be permanently assigned to field personnel for the duration of a project but are to be stored in site project files when not in use. If site activities stop for an extended period of time (i.e., two weeks or more), field logbooks will be stored in the project files. Prior to commencement of sampling, logbooks will be assigned to field personnel. Routine visitors to the site may keep their own logbook throughout the construction season.	
The cover of each logbook will contain the following information:	
1. Person or organization to whom the book is assigned	
2. Book number	
3. Project name/number	
4. Site name/number	
2.1.2. Logbook Entry Procedure	
Every field team will have a logbook and each field activity will be recorded in the logbook by a designated field team member to provide daily records of significant events, observations, and measurements during field operations. Beginning on the first blank page and extending through as many pages as necessary, the following list provides examples of useful and pertinent information to be recorded.	
1. Date and initials at top of each page.	
2. Start Time and weather conditions.	
3. Equipment used (include time used and calibration date) and procedures to be followed.	
4. List all field personnel present and directly involved.	
5. Field calculations.	
6. Signature of the person making the entries on the bottom of each page.	
7. Sample description including any sample numbers, time, depth, volume, containers, preservative, and media sampled.	
8. Field QC information (duplicates, splits, etc.).	
9. Observations about site and samples.	
10. Information about any activities or conditions that may affect sample integrity.	
11. Any public interactions, visitors, or press.	
12. Background levels of instruments used.	
13. Unusual observances, irregularities, or problems with any equipment.	
14. Include file name and description of any photographic documentation.	
15. Sketch of property with sampling locations.	
16. All logbook entries will be made in indelible black or blue ink.	
17. Do not erase or black out any information. Strike out any incorrect information with a single line through the center. Initial and date after the information has been struck from the logbook.	
18. Do not start a new day's information on a page with information from previous days.	

19. No pages or spaces will be left blank. If the last entry for the day is not at the end of a page, draw a diagonal line through the remaining blank space, initial, and date the area.	
20. If a page is skipped a diagonal line most be drawn through the page and it shall be initial and dated.	
2.2. Field Documentation	Initials
2.2.1. Field Forms	
Field forms or electronic forms may be used for routine sampling and maintenance to consolidate specific sample parameters for ease of data collection. Information contained within field forms does not need to be repeated in the logbook; however, logbook entries shall indicate the sample time and sample ID.	
2.2.2. Sample Logbooks	
Each sampling event requires an entry into the field logbook which will be used to record the relevant sample information. The sample logbooks require the following information:	
1. Property Identification (street address) and VCUP lot number	
2. Date (YYYYMMDD) and time (24-hour clock) of sample collection.	
3. GPS Coordinates	
4. Location/Sample characteristics (yard, garden, depth, etc.).	
5. Sample Method	
6. Sample identifier information (sample ID, sample number and tag number, field replicate ID, and subsample ID)	
7. Sample Volume	
8. Sample analysis and identification of any QC samples.	
9. Observations and/or comments relevant to the sampling.	
10. Photograph identification and information.	
11. Name of all sampling personnel.	
2.2.3. Labels	
Labels will be required on samples, coolers, lab equipment and decontamination equipment (buckets, spray bottles, etc.).	
1. Labels will be printed or legibly filled out in permanent ink that will not smudge when wet.	
2. Printed labels shall be on weatherproof backing and paper.	
3. All hazardous materials including decontamination acids must be properly labeled.	
4. Attempts should be made to store labeled containers inside when possible.	
5. Pre-printed labels should include all necessary fields to identify the materials in a container. All fields on a label should be fully filled out.	
6. For application of labels on non-routine samples, document the labeled item in the field logbook.	
2.2.4. Photograph Documentation	
Photographic documentation should be completed at all sample locations. Documentation should be recorded in a consistent location such as the field logbook, on a field form, or on sampling forms.	
1. Record camera and lenses type use.	
2. Record the file name of digital photos.	
3. Record name of photographer and individuals in the photograph.	

4. Record Property Identification and VCUP lot number.	
5. Record accurate description of what the photograph shows.	
6. Record location, weather conditions, date, and time of capture.	
7. Record orientation of the photographic view.	

3. ATTACHMENTS

4. FIGURES

5. SIGNATURE AND NOTES

Notes:	
Signature:	Date:

Standard Operating Procedure – Soil Sampling	
Project Name: VCUP Townsite Soils	
Name:	Date:

1. INTRODUCTION	
1.1. Purpose and Scope	
The objective of this Standard Operating Procedure (SOP) is to provide standardized methods for the field collection of soil samples using manual or rig-assisted techniques. This procedure specifies the methods to be followed by the field personnel for the collection of surface and subsurface soil samples. The collection techniques and equipment selected are dependent on the nature of subsurface soil conditions (i.e., degree of consolidation and moisture content), depth of the desired sample, type of sample required, type of soil being sampled, and analytical and/or geotechnical laboratory testing methods that will be requested for the sample.	
1.2. Definitions	Initials
Surface soil for this project is the top 2 inches of a soil horizon profile (i.e., soil from 0-to-2-inches below ground surface [bgs], Figure 1). Subsurface soil for this project is the top 12 inches of a soil horizon profile (i.e., soil from 0-to-12-inches below ground surface [bgs], Figure 1). Composite soil samples are combinations of aliquots collected at various sample locations, or at various depths at a single location. Analysis of composite samples yields a value representing an average over the various sampled sites or depths from which individual samples were collected. Discrete soil samples are discrete aliquots from distinct sampling intervals, of a specific size, that are representative of one specific sample location at a specific point in time.	
1.3. Minimum Required Equipment	Initials
• Level D PPE in accordance with associated Task Risk Assessments (TRAs), the Copper Environmental Consulting (CEC) Task Specific Health and Safety Plan (TSHASP), and the Rico Program Plan.	
• Stainless steel or disposable mixing bowls	
• Stainless steel spoons/trowels	
• Stainless steel hand auger	
• Stainless steel core sampler which uses stainless steel or Lexan liners (optional)	
• Stainless steel shovel	
• Appropriate sample containers	
• Chain of Custody Forms	
• Individual Site Work Plan	
• Field Logbook, Field Sample Documentation, and/or Tablet	
• Indelible Pen	
• Nitrile Gloves	

1.4. Pertinent/Required Reference Information	Initials
1.4.1. Sops/User Manuals	
• SOP_VCUP_01 – Field Documentation	
• SOP_VCUP_03 – Sample Identification, Custody, Packaging, and Shipment	
• SOP_VCUP_04 – Handheld X-Ray Fluorescence	
• SOP_VCUP_05 – Equipment Decontamination	
• SOP_VCUP_06 – Storage and Disposal of Investigation Derived Waste	
1.4.2. Task Risk Assessments (TRAs)	
• TBD	
2. SOIL SAMPLING PLAN BY PROPERTY TYPE	
2.1. Developed Properties	
Divide the property into several sampling sections dependent upon the size of the property; • Less than or equal to 5000 sq ft o Divide into at least two sampling areas, excluding buildings, pavement, or other permanent caps over the soil. At minimum of two composite samples (comprised of five subsamples each), one each from the front yard and back yard (and side yard if substantial), plus a separate sample for each distinct driveway, vegetable garden, play area, if present, will be collected. • Greater than 5000 sq ft and less than 20,000 sq ft o Divide into at least four sampling areas, with each one not exceeding 5,000 sq ft (excluding buildings, pavement or other permanent caps). A minimum of four composite samples (comprised of five subsamples each), one from each sampling area, plus a separate sample for each driveway, vegetable garden, and play area if present, will be collected. • Properties over one-half acre in size o Divide sampling areas of less than or equal to ¼ acre each, and one five-point composite sample will be collected from each sampling area of the property. All sampling areas will be within a 100-foot radius of the primary structure. In addition, separate samples will be collected from each distinct driveway, vegetable garden, and play area, if any such areas are present. The five subsamples will be collected at five discrete locations within each composite-sample sector and composited into one composite sample for each separate area for a total of two or more composite samples for each property, based on the property size described above. The locations of the subsamples will be selected by the sampling personnel to represent soil conditions within the area of the yard that the composite is from. All subsamples will be collected from locations that are outside the drip zone of buildings (4 feet from the edge of a building) in order to avoid possible lead paint contamination. If distinctive materials, such as waste rock from mining, are observed at the surface, those materials will be sampled for separate analysis of lead concentration. One grab sample will be collected from a depth of 0 to 2 inches in any such areas of the property. The grab sample will be prepared and analyzed for lead using the same procedures as all other samples. Those procedures are described in SOP_VCUP_04 – Handheld X-ray Fluorescence.	

2.1.1. Earth Driveway Composite	
Surface soil samples will be collected from a depth of 0 to 2 inches at two randomly selected locations in each unpaved driveway. These two samples will be combined into a single composite sample.	
2.1.2. Garden Composites	
Soil samples will be collected from each vegetable garden at a sample density of one sample per 100 sq ft with a minimum of two samples per garden. Samples from vegetable gardens will be collected across the depth of <u>0 to 12 inches</u> to reflect the typical tilling depth of a garden. These two or more subsamples will be combined into a single composite sample.	
2.1.3. Play Areas Sampling	
Additional samples will be collected of bare soil in play areas, if present. For relatively small play areas (swing sets, sand lots, etc.), one discrete surface soil grab sample will be collected within the play area. For larger play areas, surface soil samples will be collected from 0 to 2 inches at five randomly selected locations. These five samples will be combined into a single composite sample.	
2.2. Undeveloped Properties	
Soil samples at currently undeveloped properties that are subject to the Phase 1 sampling (see Attachment 4 to the VCUP Application – Properties to be Sampled). The required number of soil samples collected at these properties will be at least one five-point composite sample from each 5,000 sq ft of land. If a building site, or sites, has already been established for a property, then one five-point composite sample will be collected from a proposed building site of 5,000 sq ft or less, and at least two composite samples from each proposed building site greater than 5,000 sq ft. Each soil sample collected from an undeveloped residential property will be a composite of five subsamples, each collected from a depth of 0 to 2 inches. The locations of the discrete subsamples will be selected by the sampling personnel to represent the soil across the subject area (e.g., front, middle, and back areas of the property). The five subsamples will be combined to form a single composite sample representing the average lead concentration in soil across the sampled area. If distinctive materials, such as waste rock from mining, are observed at the surface, those materials will be sampled for separate analysis for lead concentration. One grab sample will be collected from a depth of 0 to 2 inches in any such areas of the property. The grab sample will be prepared and analyzed for lead using the same procedures as all other samples. Those procedures are described in SOP_VCUP_04 – Handheld X-ray Fluorescence.	
2.3. Open Space and Public Facilities	
For open space parcels, at least one, five-point composite sample will be collected from a depth of 0 to 2 inches per ½ acre of land. The five subsample locations will be selected by the sampling personnel with efforts made to collect the five subsamples from soil that is representative of	

the subject sample area. The five subsamples will be composited into a single sample representing that half-acre portion of the parcel.

If distinctive materials such as waste rock from mining are observed at the surface, those materials can be sampled for separate analysis of lead concentration. One or more grab samples may be collected from any such areas on the property, from a depth of 0 to 2 inches. The grab sample will be prepared and analyzed for lead using the same procedures as for the composite soil samples; those procedures are described in SOP_VCUP_04 – Handheld X-ray Fluorescence.

At properties of this type that include developed play areas for young children (e.g., designated playgrounds) additional samples will be collected from that area.

- **Children's play areas that are less than 5,000 sq ft**
    - Surface soil samples will be collected from 0 to 2 inches at five locations. These five samples will be composited into a single sample to represent that play area.
- **Children's play areas greater than approximately 5,000 sq ft**
    - Divide into two or more sections, each with an area no greater than 5,000 sq ft, and the composite sampling procedure will be applied to each section. For each section of the play area, surface soil samples will be collected from 0 to 2 inches at five locations and composited into a single sample representing that section.

Because property uses in the open space/public facilities category vary widely, plans for soil sampling may be developed on a property-by-property basis. For example, schools and common areas that may be frequented by children may warrant sampling in a similar manner to residential properties, and public facilities may warrant sampling as commercial properties. Such variations from the general sampling plan described above will not require specific approval by CDPHE as long as the minimum sampling requirements for this property type are met.

2.4. Town of Rico's Unpaved Roads and Alleys

For each road segment identified for sampling, one composite sample will be collected from the traveled surface of the road from a depth of 0 to 2 inches within the designated road segment. The composite will be comprised of four subsamples from each segment. Each segment shall be approximately one block, or the length of a road between two cross-streets, including alleys. Subsamples will be taken at points approximately ¼ of the way and ¾ of the way along the length of the segment, and on either side of the centerline, approximately half the distance to the edge of the road. The subsamples will be composited into a single sample to represent the entire unpaved road segment.

3. SOIL SAMPLING PROCEDURE

Field personnel will follow the samples design criteria outlined in Section 2 of this SOP.

Field personnel shall obtain and verify access agreement is in place before accessing properties.

Before initial use, and after each subsequent use, all sampling equipment (unless disposable) must be decontaminated using the procedures outlined in SOP_VCUP_05 – Equipment Decontamination.	
All boreholes and pits will be filled in with the material removed during sampling unless otherwise specified.	
3.1. Surface and Shallow Depth Soil Sampling	Initials
3.1.1. Surface Soil Sampling for Depths of 0-2 inches	
1. Review ISWP and walk property - note locations on individual site work plan of any: • Potential mine waste • Vegetable gardens • Large shrubs/trees • Aspen trees • Play areas • Driveways	
2. Select appropriate number of random locations based on design criteria in Section 2 of this SOP.	
3. Prior to sampling, remove leaves, grass, and surface debris from an approximate 1 square foot area using decontaminated stainless steel (or disposable) trowel. Note any material removed from the sampling site in the field logbook.	
4. Use a decontaminated stainless steel (or disposable) trowel, spoon, or stainless-steel auger to collect surface sub-samples from a 4 by 4-inch square within the cleared area in the previous step. Subsamples should be approximately 150g.	
5. Place all subsamples into a sealable plastic bag.	
6. A duplicate composite sample will need to be collected at a rate of 1 per every 20 composite samples.	
7. Label container as per instructions in SOP_VCUP_03 – Sample Identification, Custody, Packaging, and Shipment.	
8. Complete Field Documentation, Logbook entries, and chain of custody record (SOP_VCUP_03 – Sample Identification, Custody, Packaging, and Shipment, SOP_VCUP_01 – Field Documentation).	
9. Store Samples in a cool dark place until analyzed.	
10. See SOP_VCUP_04 – Handheld X-Ray Fluorescence for sample analysis.	
11. Decontaminate all non-disposable sampling equipment as necessary (SOP_VCUP_05 – Equipment Decontamination).	
12. Field equipment blanks will be collected every 20 samples. This is done by pouring deionized water over the decontaminated equipment and submitted to Pace for lead analysis.	
3.1.2. Subsurface Soil Sampling for Depths of 0-12 inches	Initials
Sampling of soils from depths of 0-12 inches should only occur for garden areas and stockpiled soils. These areas should be noted on the individual site work plan.	
1. Prior to sampling, remove leaves, grass, and surface debris from an approximate 1 square foot area using decontaminated stainless steel (or disposable) trowel. Note any material removed from the sampling site in the field logbook.	

2. Excavate soil to the pre-determined sampling depth by using a decontaminated hand auger or shovel. Periodically, remove the cuttings from the auger	
3. When the sample depth is reached, remove the hand auger or shovel and all cuttings from the hole	
4. Lower the decontaminated core sampler or hand auger to the bottom of the hole. When using a core sampler, it must contain a decontaminated liner appropriate for the constituents to be analyzed.	
5. Mark the sample interval (i.e. one-foot above ground level on the hammer stem or auger)	
6. Operate the slide hammer on the core sampler to drive the sampler head into the soil or advance the auger until it is flush with the interval mark at ground level.	
7. When the core sampler or auger has been advanced to total depth of the required sample, remove it from the bottom of the hole.	
8. Immediately remove the liner from the core sampler and transfer the samples into a sealable plastic bag.	
9. A duplicate composite sample will need to be collected at a rate of 1 per every 20 composite samples.	
13. Label container as per instructions in SOP_VCUP_03 – Sample Identification, Custody, Packaging, and Shipment.	
14. Mark the sample location with a pin flag, nail or stake and label with a tag. Sample location markers can be removed after the sample location is recorded by GPS and by	
15. Complete Field Documentation, Logbook entries, and chain of custody record (SOP_VCUP_03 – Sample Identification, Custody, Packaging, and Shipment, SOP – Field Documentation).	
16. Store Samples in a cool dark place until analyzed.	
17. See SOP_VCUP_04 – Handheld X-Ray Fluorescence for sample analysis.	
18. Decontaminate all non-disposable sampling equipment as necessary (SOP_VCUP_05 – Equipment Decontamination).	
19. Field equipment blanks will be collected every 20 samples. This is done by pouring deionized water over the decontaminated equipment and submitted to Pace for lead analysis.	
3.1.3. Sample Point Marking	Initials
All samples points should be located by the criteria presented in the SOP_VCUP_02 – Soil Sampling. When a sample point is located, it will be marked so it can be located by any investigator working on the project. The following practical methods can be used to mark sample points: • Recording of coordinate points in a GPS database that allows precise determination of the location for future reference. • Two measurements collected off a permanent structure (e.g., two building foundation corners), precise to 1 hundredth of a foot. • A wooden stake driven securely into the ground and identification code recorded on an attached tag. • A metal spike or concrete nail driven into asphalt or concrete and the site identification code recorded on an attached tag	

• The location and identification code spray painted on the ground or ground cover surface.	
1. The location of each sample point will be recorded on a site map and referenced with field portable global positioning system (GPS).	
2. Sample points will not be documented until they have been sampled, as field operating conditions can dictate the movement of any sample points.	

4. ATTACHMENTS

5. FIGURES

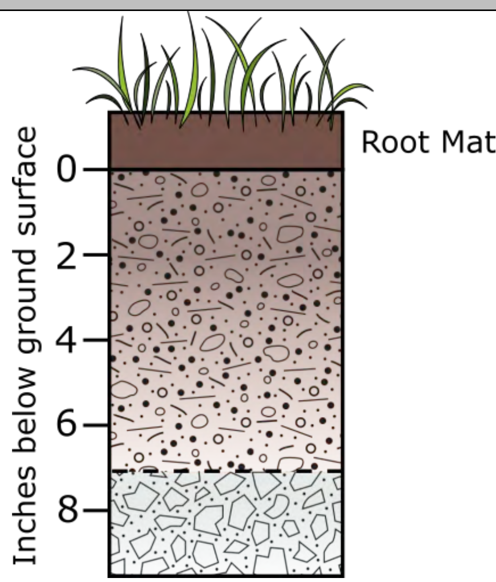


Figure 1. Surface soil visualization.

6. SIGNATURE AND NOTES

Notes:

Signature:	Date:

Standard Operating Procedure – Sample Identification, Custody, Packaging, and Shipment	
Project Name: VCUP Townsite Soils	
Name:	Date:

1. INTRODUCTION

1.1. Purpose and Scope

This document is meant to act as a Standard Operating Procedure (SOP) for the tracking and handling of sample custody, packaging, and shipment of Rico Townsite Soil VCUP samples.

1.2. Minimum Required Equipment	Initials
• Level D PPE in accordance with associated Task Risk Assessments (TRAs), the Copper Environmental Consulting (CEC) Task Specific Health and Safety Plan (TSHASP), and the Rico Program Plan.	
• Sample Cooler	
• Nitrile Gloves	
• Packing Paper	
• Bubble Packing Material	
• Indelible Pen	
• Sample Labels	
• Strapping and packing tape	
• Scissors	
• Ziplock bags	
• Bagged ice	
• Custody seals	
• Chain of custody (COC) form	
• Shipping label	

1.3. Pertinent/Required Reference Information	Initials
1.3.1. Sops/User Manuals	
• SOP_VCUP_01 – Field Documentation	
• SOP_VCUP_02 – Soil Sampling	
• SOP_VCUP_04 – Handheld X-Ray Fluorescence	
1.3.2. Task Risk Assessments (TRAs)	
• TBD	

2. PROPERTY TYPE ABREVIATIONS

2015 TREC Abbreviations

Vacant/Undeveloped Lots – (VAC)
New Unpaved Roadways – (RDN)
Previously Sampled Unpaved Roadways – (RDO)
Dolores River Corridor Discrete – (DRD)
Dolores River Corridor XRF – (DRX)
Background – (BKG)

2020 Additional Abbreviations

Developed Lots– (DEV)
Previously Sampled Property – (PSP)

Previously Remediated Property – (PRP) Stockpiled Soils – (SS) Unpaved Alley – UPA	
3. SAMPLE IDENTIFICATION PROCEDURES	Initials
The code system described here will be used to identify each sample taken during the sampling program. This code system was developed to provide a method for tracking each sample. Proper sample identification will allow information about a sample to be retrieved easily and will enable the analytical results to be assigned to a specific location. It is imperative that each sample be labeled clearly and concisely and that a consistent and standard identification system be used as described.	
4. SAMPLE LABELING PROCEDURE	Initials
4.1. Sample Number	
A previously established numbering system shall be used to track each sample. The system was designed to distinguish between types of properties and types of samples. Example: 20-DEV-028-01	
• The first two digits specify the year samples are collected (e.g., "20" for 2020)	
• The letters specify the type of property (e.g., DEV – developed, VAC – vacant/undeveloped, RDN – unpaved road)	
• The three-digit number specifies the VCUP Lot number (e.g., 028)	
• The final two digits specify the sample number at each property (e.g., 01, 02, 03)	
4.2. Sample Label	
In order to prevent misidentification of samples, all samples shall be identified with the sample ID and analyses to be performed written on the respective container. Labeling on the lid will not substitute for labeling of the container. Labeling will be conducted with the use of an indelible pen, crayon, or paint marker. Sample labels can be affixed to the sample container prior to sampling, but if the label gets wet, the writing on the label may run or the label may fall off. If the sample container is to have labels affixed prior to sampling, each label must be plastic-coated (blank or preprinted) and each label must meet the following criteria: 1. Waterproof 2. Will not disintegrate 3. Will retain indelible ink markings when wet 4. Must be self-adhesive	
After each soil sample has been prepared for analysis (SOP_VCUP_02 –Soil Sampling) the sample will be placed into a clean sample container that will be sealed and labeled with the following information:	
• Date – an eight-digit number indicating the month, day and year of collection (e.g., YYYYMMDD, 20200101).	
• Time – Time (24-hour clock) sample was collected.	
• Project Name	
• Property Identification (street address)	
• Location – Brief sample location description. This can also be the sample ID.	
• Depth – Depth at which the sample was collected.	
• Sample Number ID – Unique sample number as described in Section 3.1 above.	

• Requested Analysis	
• Signature – Signature (or initials) of sampler who collected the sample.	
Make sure all applicable laboratory quality control sample designations have been made on the sample analysis request forms. Sections 5 through 7 below should be used when packing and shipping samples to the analytical laboratory.	
5. SAMPLE PACKING AND SHIPPING	Initials
5.1. Prepare Samples	
1. Ensure all sample lids are tightly fastened to bottles.	
2. Further secure all bottle lids using vinyl tape (electrical tape) by tightly taping the lid to the top of the jar or bottle.	
3. Cover any handwritten labels with clear package tape to protect label from rubbing off during shipment.	
4. Wrap all glass sample jars one time with bubble wrap or use laboratory supplied materials (bubble bags). Make sure to leave the sample tag facing out (if applicable), while making sure that there is bubble wrap coverage on the top and bottom of the sample container.	
5. Place plastic sample bottles in a plastic Ziplock bag and eliminate as much air as possible. Make sure the sample tag is placed face out so it can be read during the final quality control check.	
6. Ensure all tags and labels correspond to the samples listed on the chain-of-custody record.	
5.2. Packing and Shipping	
1. Clean the inside and outside of the cooler.	
2. Line one layer of bubble wrap, bottom side down, to absorb shock.	
3. Line cooler with one large garbage bag. (Cooler Liner)	
4. Place bags of sample containers into cooler liner. Verify all label information is filled out, correct, and <u>consistent with the COC</u> and field forms as containers are placed into cooler. Keep containers upright and do not double stack samples. Verify number of bottles on COC.	
5. Check COC to ensure all information is filled out and consistent with sample container labels and field forms. Have a second person check the COC for errors and completeness.	
6. Use available packing materials to fill any potential open space in the cooler.	
7. Gather cooler liner bag and remove as much air as possible. Then twist and seal with tape.	
8. Relinquish COC by signing and dating.	
9. Make a copy of relinquished COC and keep in project file. Fold COC and place into a gallon resealable bag. Tape bag with chain of custody to inside of cooler lid. For multiple coolers under a single COC, place a copy of the relinquished COC in each cooler.	
10. Shut cooler, tape cooler lid shut with clear packing tape or (preferably) strapping tape a minimum of three times around each end (Fig. 1). Tape up the drain hole if applicable.	
11. Place custody seals (including the information: "Custody Seal", signature, date, and time) across the lid of the container where it contacts the remainder of the cooler. A	

custody seal should be placed on both the front and back of lid. Tape over the custody seal with clear packing tape.	
12. Apply shipping label, cover with clear packing tape if needed to ensure the label stays dry. If shipping on a Friday, apply "Saturday Delivery" Label. Verify any remaining "excepted quantities", "REQ", or hazardous shipping labels have been removed from cooler. Filled sample containers ship as non-hazardous goods.	
6. CHAIN-OF-CUSTODY	Initials
Laboratory chain-of-custody forms will be prepared for all samples, including those analyzed using field methods, to ensure that the samples are traceable from the time of collection until final disposition. For each sample or set of samples shipped for laboratory analyses, a copy of the completed chain-of-custody form, and shipping receipt will be retained by the sampling personnel for the project's field records. The holding time for analyses of lead in soil samples by EPA Method 6200 and EPA Method 6010 is 180 days.	
7. SHIPMENT	Initials
1. Verify coolers are properly prepared for shipment. (Section 5)	
2. Verify shipping label with to and from designations is securely attached to cooler.	
3. Drop off or have Fedex/UPS pickup coolers.	

8. ATTACHMENTS

9. FIGURES

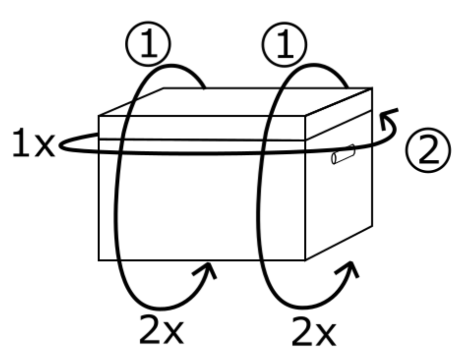


Figure 1. Strapping tape configuration and order, (1) two passes of tape over the lid positioned on the hinges, (2) one pass of tape to seal the lid.

10. SIGNATURE AND NOTES

Notes:

Copper Environmental Consulting

A PRISM SPECTRUM COMPANY

Signature:	Date:

Standard Operating Procedure – Handheld X-ray Fluorescence Soil Characterization for Lead	
Project Name: VCUP Townsite Soils	
Name:	Date:

1. INTRODUCTION	
1.1. Purpose and Scope	
This document is meant to act as a Standard Operating Procedure (SOP) for the Bruker S1 Titan handheld XRF that conforms with EPA Method 6200. **This device produces high intensity x-rays. Do not expose any part of the body to the beam.**	
1.2. Minimum Required Equipment	Initials
• Level D PPE in accordance with associated Task Risk Assessments (TRAs), the Copper Environmental Consulting (CEC) Task Specific Health and Safety Plan (TSHASP), and the Rico Site Program Plan.	
• Bruker S1 Titan Handheld XRF	
• Calibration standard(s) – quartz block or clean sand, well characterized intact site sample near the action levels	
• Spare battery and charger	
• Nitrile Gloves	
• Mortar and pestle	
• Clean quartz sand	
• XRF Polyethylene sample cups – 31 to 40 mm in diameter	
• 2.5 µm X-ray Mylar film	
• 60-mesh (0.25 mm) sieve	
• Stainless Steel Trowel	
• Glass or plastic containers to store sample (8 oz or 250 mL)	
• Plastic Sample Bags	
• Drying oven	
• Butcher paper	
• Box of Kimwipes®	
• Paper Towels	
• USB Flash Drive	
1.3. Pertinent/Required Reference Information	Initials
1.3.1. SOPs/User Manuals	
• SOP_VCUP_02 – Soil Sampling	
• SOP_VCUP_03 – Sample Identification, Custody, Packaging, and Shipment	
• SOP_VCUP_05 – Equipment Decontamination	
• SOP_VCUP_06 – Storage and Disposal of Investigation Derived Waste	
1.3.2. Task Risk Assessments (TRAs)	
• TBD	
2. CALIBRATION	Initials
1. The EPA recommends using a soil sample near the clean up action level (1100 mg/Kg) to ensure compliance with project goals.	

• A site-specific soil calibration confirmation sample near 1100 mg/Kg should be collected and verified by third party analytical analysis. • Once verified this sample should be labeled, retained, and used as calibration confirmation sample.	
2. Instrument blank at the start and end of each working day and once every 20 samples.	
3. Method blank of clean silica sand or lithium carbonate should undergo the same preparations procedures as the samples. This should be analyzed daily.	
4. Calibration verification checks should be performed on a well characterized intact site sample before and after each working day. The target analytes should not be more than ±20% from the true values.	
5. Precision measurements should be done once daily and analyzed 7 times in replicate and should have less than a 20% relative standard deviation. RSD = (Standard deviation/mean concentration) × 100	
3. PROCEDURE	Initials
1. Turn on the XRF and allow to warm up for 15 minutes prior to sample analysis. • Unlock the device on the logon screen with the password (default is 12345). • Under application select "Geo Exploration"	
2. Consult SOP_VCUP_02 – Soil Sampling for detailed sampling instructions by property type and sub-sample location.	
3. Homogenize the sample by placing sample on butcher paper (2 × 2 feet). Take the corners and roll the soil over itself towards the opposite corner. This should be done 20 times. • Alternatively, the sample can be mixed in a plastic bag or stainless-steel bowl.	
4. Once homogenized, an aliquot of 20 to 50 g of shall be dried for 2 to 4 hours in an oven (e.g., toaster oven) below 120 °C. The remaining sample should be placed back into original sample container and retained until analytical testing is complete.	
5. Once dried, half of sample shall be ground with a mortar and pestle. Grinding should be repeated until 90% of the original sample passes through a 60-mesh sieve. • Decontaminate mortar and pestle with a Kimwipe® and then scour by grinding quartz sand. Discard appropriately.	
6. Place an aliquot of the sieved sample in an XRF sample cup and covered with Mylar film. Sample cup should be at least ¾ full (8–10 g). The remaining sample should be placed into the original sample container.	
7. To analyze the sample in the sample cup covered with Mylar film. • Ensure sample analysis location is set up so all body parts are >30 cm away from the XRF examination window. • Hold XRF examination window to the sample. • Pull the XRF trigger for 120 – 220 seconds (needs to be field verified with XRF unit, the error should be below 220 ppm for Pb). • Release the XRF trigger and repeat the above steps for subsequent samples.	
8. Retain sample to submit to Pace for confirmatory analysis every 10 samples. (SOP_VCUP_03 – Sample Identification, Custody, Packaging, and Shipping)	
9. Samples that are not retained should be disposed of according to SOP_VCUP_06 – Storage and Disposal of Investigation Derived Waste.	
10. Decontaminate equipment (SOP_VCUP_05 – Equipment Decontamination). • Brush equipment to remove particles;	

- Scrub with laboratory-grade detergent/portable water;
- Rinse with distilled or deionized water; and
- Allow equipment to dry or use Kimwipes® to dry the optic window and paper towels to dry everything else.
- Field equipment blanks will be collected every 20 samples. This is done by pouring deionized water over the decontaminated equipment and submitted to Pace for lead analysis.

11. End of day procedures.
    - Backup data to USB flash drive (p. 43 in user manual) and transfer to project OneDrive folder;
    - Remove battery and charge; and
    - Store XRF in a safe place.

4. TROUBLESHOOTING

Initials

1. The EPA recommends performing a gain check every 10 to 20 sample measurements or once an hour, whichever is more frequent. Additionally, If the ambient temperature changes by 10°F a gain check should be performed according to the manufactures recommended procedures.
2. Data quality objectives for project:

Parameter	Detection limit Goal (mg/kg)	Bias (%)	Precision (RPD)	Completeness (%)	Holding Time (180 days)
Lead	0.2–200	65–135	35	90	180

$$RPD = \frac{(Sample\ 1 - Sample\ 2)}{(Sample\ 1 + Sample\ 2)/2} \times 100$$

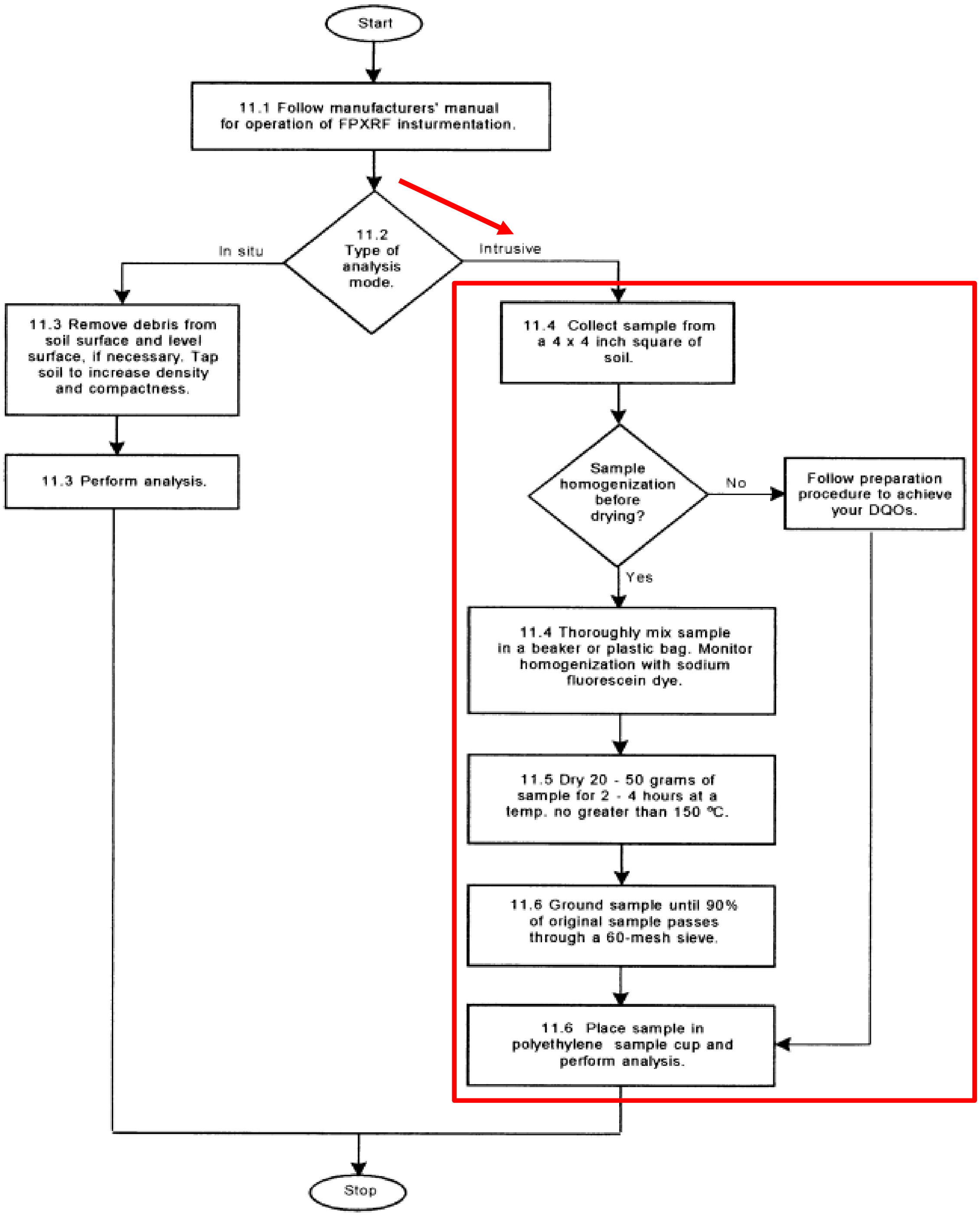
$$Completness = \frac{valid\ data\ points\ obtained}{total\ data\ points\ planned} \times 100$$

5. ATTACHMENTS

EPA Method 6200

XRF User Manual

6. FIGURES



Flow chart from EPA Method 6200. This SOP is for the intrusive branch.

7. SIGNATURE AND NOTES

Notes:

Signature:	Date:

Standard Operating Procedure – Equipment Decontamination

Project Name: VCUP Townsite Soils

Name:	Date:

1. INTRODUCTION

1.1. Purpose and Scope

The objective of this Standard Operating Procedure (SOP) is to establish consistent methods to reduce or eliminate:

- Contamination and cross-contamination of environmental samples by sample equipment, other samples, or personnel.
- Health and environmental risk caused by the spread of contaminants.

1.2. Minimum Required Equipment	Initials
• Level D PPE in accordance with associated Task Risk Assessments (TRAs), the Copper Environmental Consulting (CEC) Task Specific Health and Safety Plan (TSHASP), the Rico Townsite Soils TSHASP, and the Rico Program Plan.	
• Clean Buckets or tubs to hold wash and rinse solutions of a size appropriate to the equipment to be decontaminated.	
• Tap water / potable water	
• Nitrile Gloves	
• Deionized or distilled water	
• Plastic bags	
• Aluminum foil	
• Flat-bladed scrapers	
• Long handled stiff bristle brush	
• Liquinox Soap	
• Plastic sheeting or pop-up containment for decontamination area	
• Sealable buckets / drums to hold the waste decontamination solutions	
• Labels to properly identify the contents of drums / buckets	
• Towels and wipes	
• Dispensing bottles / sprayers	

1.3. Pertinent/Required Reference Information	Initials
1.3.1. Sops/User Manuals	
• SOP_VCUP_01 - Field documentation	
1.3.2. Task Risk Assessments (TRAs)	
• TBD	

2. BACKGROUND	Initials
Decontamination consists of physically removing contaminants from personnel or equipment. To prevent the transfer of harmful materials, procedures have been developed and are implemented before anyone enters a site and continue throughout site operations. The decontamination area should be located, if possible, where decontamination fluids and soil wastes can be easily discarded or discharged after receipt of analytical results which determine	

if discharge parameters have been met. Decontamination wastewater should be managed in accordance with the Investigation Derived Waste SOP or as directed in the Work Plan or Quality Assurance Project Plan. Wastewater will be collected and stored on-site until it can be properly disposed.	
3. DECONTAMINATION STATION SET-UP	Initials
Large equipment. Where possible, large equipment should be decontaminated over the open excavation surface prior to backfill with clean material or over the Soil Lead Repository by rinsing all soil material off with water from a water truck or pressure washer. If necessary, a decontamination pad should be established for cleaning of heavy equipment or large sampling tools. This pad can be a prefabricated area that already exists on-site for washing large equipment or can be constructed. If a prefabricated area exists, it needs to allow for collection of fluids and solids that will fall off the large equipment. Decontamination pads can be constructed in a variety of ways, but the following should be considered: • The pad will need to be constructed so it provides complete secondary containment. Hence, all sides will require berms to prevent off pad migration of fluids. The berms need to be constructed by considering the balance between sump pump removal rates and the amount of fluid that will be generated. • Fluids from decontamination processes cannot escape and be directly discharged vertically into the ground; hence, if plastic sheeting is used it should be minimally double layered and thick (greater than 8 mil). • The pad will have to drain in one general direction where a sump pump can collect fluids. • The pad will need to be located near power and water, if possible. However, a generator can supply power and water can be trucked in. **Small equipment**. For small equipment decontamination and PPE decontamination, a smaller station is established, either in the contaminant reduction zone or at the sampling location if contamination zones are not established. For this station, clean buckets or tubs (5-gallon buckets are most common) should be used. Buckets should be placed on a pop-up containment or plastic sheeting to prevent spillage to the ground, and to help keep the decontamination area and equipment as clean as possible. The buckets should be filled half to three-quarters full as follows: 1. Tap water with non-phosphate biodegradable detergent such as Liqui-Nox. 2. Tap water for rinsing. 3. Deionized or distilled water for the final rinsing A clean area, generally covered with plastic sheeting or large clean plastic bags, is also needed to set down decontaminated equipment prior to reuse or air drying and packaging for later use. A stainless-steel rack can aid drying activities.	

4. PROCEDURE	Initials
After the decontamination area is set up, equipment decontamination is comprised of four general steps: **1. Removal of gross (visible) contamination;** **2. Removal of residual contamination;** **3. Prevention of recontamination; and** **4. Disposal of wastes associated with the decontamination**	
1. Remove Gross Contamination: Gross contamination generally applies to soil sampling equipment, which may have significant residue clinging to the piece of equipment. This can be removed by brushing, scraping, or rinsing with water.	
2. Remove Residual Contamination: All sampling equipment used at the site must be cleaned prior to any sampling effort, after each sample is collected, and after the sampling effort is accomplished. Removal of residual contamination consists of the following steps: 1. Place the item in the first bucket (detergent wash) and scrub the entire surface area of each piece of equipment to be decontaminated. Utilize scrub brushes to remove all visible contamination. Change the water periodically to minimize the amount of residue carried over into the second rinse. 2. Place the item in the second bucket (clear water rinse – tap or deionized water) and rinse. Change the water periodically to minimize the amount of residue carried over into the third rinse. 3. Place the item in the third bucket (deionized or distilled water) and repeat the rinsing procedure. Change water as necessary. 4. Place the item on a clean surface such as plastic sheeting to await reuse or packaging for storage (e.g., wrapping foil).	
3. Prevent Recontamination After Decontamination: After the decontamination process, equipment should be stored to preserve its clean state to the extent practical. The method will vary by the nature of the equipment. Protection measures include covering or wrapping in plastic or sealable plastic bags or wrapping with oil-free aluminum foil.	
4. Disposal of Contaminants and Spent Rinse Fluids: All washing and rinsing solutions are considered investigation derived waste and should be containerized. After use, gloves and other disposable PPE should also be containerized and handled as investigation derived waste. See SOP on Investigation Derived Waste Handling Procedures.	
5. Field personnel shall routinely document all equipment decontamination: Decontamination procedures shall be documented in the field logbooks. All documentation of decontamination procedures shall include the following information: • Serial number and model number of each piece of equipment • Method of decontamination if it deviated from the method described herein.	

5. ATTACHMENTS	
6. FIGURES	
7. SIGNATURE AND NOTES	
Notes:	
Signature:	Date:

Standard Operating Procedure – Storage and Disposal of Investigation-Derived Waste	
Project Name: VCUP Townsite Soils	
Name:	Date:
1. INTRODUCTION	
1.1. Purpose and Scope	
This document is meant to act as a Standard Operating Procedure (SOP) for the proper storage and disposal of investigation-derived waste (IDW) matter generated by completion of field activities related to the Rico Townsite Soils VCUP remediation.	
1.2. Minimum Required Equipment	Initials
• Level D PPE in accordance with associated Task Risk Assessments (TRAs), the Copper Environmental Consulting (CEC) Task Specific Health and Safety Plan (TSHASP), and the Rico Program Plan.	
• Field Documents/sample waste log sheet	
• Sealable buckets / Containers	
• Waste Container Labels	
• Garbage Bags	
• Nitrile Gloves	
1.3. Pertinent/Required Reference Information	Initials
1.3.1. SOPS/User Manuals	
• SOP_VCUP_05 – Equipment Decontamination	
1.3.2. Task Risk Assessments (TRAs)	
• TBD	
2. TYPES OF INVESTIGATION DERIVED WASTE (IDW)	Initials
1. Soil	
2. Water, solvents, or other fluids used to decontaminate field equipment	
3. Decontamination equipment	
4. Disposable sampling equipment	
5. PPE	
3. PROCEDURE	Initials
1. Disposal of IDW will be conducted under the direction of the Field Manager.	
2. All IDW may be disposed of on-site, recycled, or decontaminated and disposed of in a municipal landfill.	
3. Soil left over from sampling and not collected as a duplicate sample, will be returned as backfill to its respective sample location hole regardless of lead concentrations detected. Alternatively, leftover sampling soils may be disposed of at the Soil Lead Repository.	
4. Do not mix soils from different sample locations or dispose of soil from one location in another sample location hole.	
5. At the end of each working shift, soil buckets that are properly labeled shall be sealed and decontaminated (SOP_VCUP_05 – Equipment Decontamination) like other field equipment.	
6. Decontaminated and labeled buckets should be stored with other sampling equipment.	

7. IDW from sampling in the form of water, soils, or sands can be disposed of in the Rico Soil Lead Repository.	
8. Equipment decontamination water (EDW) should be disposed of in the respective sample excavation or transferred to labeled sealable buckets (or other sealable containers) for disposal at the Soil Lead Repository. Care should be taken to not expose exterior of bucket to waste materials (soils or water).	
9. EDW buckets should be stored in a secure area with other sampling equipment until transported for final disposal at the Soil Lead Repository.	
10. After use, waste buckets should be decontaminated and reused and/or recycled appropriately.	
11. Only investigation-derived soil and water will be disposed of at the Soil Lead Repository.	
12. IDW that cannot be decontaminated shall be double-bagged and kept in a sealed and properly labeled container until it can be disposed of off-site. Labels shall clearly indicate contents, collection date, contaminant and contaminant levels, estimated disposal date, and sampler or company contact information. Labels shall be clear, complete and legible.	
13. Solid waste generated during sampling and decontaminating activities (nitrile gloves, sample plastics, paper towels, PPE etc.) will be cleaned of any soil/sediment accumulation and placed in double garbage bags and disposed of as municipal landfill waste.	
14. An inventory of any IDW generated during sampling and analysis activities will be recorded in daily field logbooks or Field Forms. The inventory will reference the date and area of generation the waste volume, and the storage or disposal location of the IDW.	

4. ATTACHMENTS

5. FIGURES

6. SIGNATURE AND NOTES

Notes:

Signature:	Date:

Standard Operating Procedure – Quality Assurance and Quality Control for Handheld X-ray Fluorescence Soil Characterization for Lead	
Project Name: VCUP Townsite Soils	
Name:	Date:

1. INTRODUCTION

1.1. Purpose and Scope

This document is meant to act as the Standard Operating Procedure (SOP) for quality assurance and quality control (QA/QC) for analysis with a handheld X-ray fluorescence (XRF).

This device produces high intensity x-rays. Do not expose any part of the body to the beam.

1.2. Minimum Required Equipment	Initials
• Level D PPE in accordance with associated Task Risk Assessments (TRAs), the Alloy Task Specific Health and Safety Plan (TSHASP), and the Rico Site Program Plan.	
• Bruker S1 Titan Handheld XRF	
• Calibration standard(s) – lithium carbonate or clean sand, well characterized intact site sample near the action levels	
• Spare battery and charger	
• Nitrile Gloves	
• Mortar and pestle	
• Clean quartz sand	
• XRF Polyethylene sample cups – 31 to 40 mm in diameter	
• 2.5 µm X-ray Mylar film	
• 60-mesh (0.25 mm) sieve	
• Glass or plastic containers to store sample (8 oz or 250 mL)	
• Plastic Sample Bags	
• Butcher paper	
• Kimwipes®	

1.3. Pertinent/Required Reference Information	Initials
1.3.1. SOPs/User Manuals	
• SOP_VCUP_02 – Soil Sampling	
• SOP_VCUP_03 – Sample Identification, Custody, Packaging, and Shipment	
• SOP_VCUP_04 - Handheld X-ray Fluorescence	
• SOP_VCUP_05 – Equipment Decontamination	
• SOP_VCUP_06 – Storage and Disposal of Investigation Derived Waste	
1.3.2. Task Risk Assessments (TRAs)	
• TRA_Rico_44_200824 - XRF Use (or the most updated version) – Discusses the hazards and mitigations for safe operation of the handheld XRF.	

2. QA/QC FOR FIELD XRF	Initials

1. Data quality objectives for field XRF:

Parameter	Detection limit Goal (mg/kg)	Precision (RPD)	Holding Time (180 days)
Lead	0.2–200	<35%	180

$$Relative\ percent\ difference\ (RPD) = \frac{\lvert(Sample\ 1 - Sample\ 2)\rvert}{(Sample\ 1 + Sample\ 2) \times 0.5} \times 100$$	
2. Silicon dioxide instrument blanks will be analyzed at the start and end of each working day and once every 20 samples. No element concentrations should be detected above the established lower limit for the instrument blank.	
3. Field duplicate readings will be conducted once every 10 samples and RPD will be calculated.	
4. Method blank of clean silica sand should undergo the same preparations procedures as the samples. This should be analyzed daily when samples are being prepared. The method blank would be considered acceptable if the blank is less than the lowest level of detection or less than 10% of the lowest sample concentration for the analyte, whichever is greater.	
5. Calibration verification checks should be performed on a well characterized intact site sample or CS-M2 Geo/Soil Sample before and after each working day. The target analyte (i.e., Pb) should not be more than ±20% (%D) from the true values. If the measurement is repeatedly outside of parameters, the instrument will need to be recalibrated. $$Percent\ difference\ (\%D) = \frac{(C_s - C_k)}{C_k} \times 100$$ Where: C_k = Certified concentration of standard sample C_s = Measured concentration of standard sample	
6. Precision measurements of a sample near site action levels should be done once daily with the same duration as normal samples and analyzed 7 times in replicate. The measurements should have less than a 20% relative standard deviation (RSD). $$Relative\ standard\ deviation\ (RSD) = \frac{Standard\ deviation}{Mean\ concentration} \times 100$$	
3. QA/QC LABORATORY CONFIRMATORY SAMPLES	Initials
7. Split samples will be submitted to Pace Laboratories for analysis (EPA 3050 and 6010) every 10 samples (10%) or a minimum of one per sampling event. Samples should reflect the range of low, middle, and upper concentrations that were measured with the XRF.	
8. The comparison between XRF and lab samples will be a least squares linear regression analysis. If the data span more than one order of magnitude the data should be log-transformed. The correlation coefficient (r) for the results should be 0.7 or greater for the XRF data to be considered screening level data by the EPA. An r value of 0.9 or greater is required for the data to be considered definitive level data.	
9. To correct for any significant bias in the correlation, a post analytical correction factor will be applied to the XRF data using the below formula. $$Average\ \%\ Recovery_i = \frac{\left(\sum_1^n \frac{XRF_i}{ICP_i} \times 100\right)}{n}$$ Where: XRF_i = reported average XRF concentration for i^{th} element	

ICP_i = reported ICP concentration for the ith element
n = the number of XRF samples used in the average

Once the average percent recovery (APR) is calculated, the value will be applied to correct the XRF concentrations with the following:

$$XRF_c = \frac{XRF_i}{APR_i}$$

Where:
XRF_C = corrected XRF concentration for the ith element
XRF_i = reported average XRF concentration for ith element
APR_i = average % recovery for the ith element

4. ATTACHMENTS

EPA Method 6200 | XRF User Manual

5. START AND END OF DAY CALIBRATION CHECK

Silica Dioxide Blank				CS-M2 Soil Sample			
Date:				Date:			
Time	Value	Established Pb lower limit (mg/kg)	%D (±20%)	Time	Value	Acceptable Pb value (mg/kg)	%D (±20%)
Start of day				**Start of day**			
		<LOD				797 ± 80	
		<LOD				797 ± 80	
		<LOD				797 ± 80	
		<LOD				797 ± 80	
		<LOD				797 ± 80	
		<LOD				797 ± 80	
		<LOD				797 ± 80	
End of Day				**End of Day**			
		<LOD				797 ± 80	
		<LOD				797 ± 80	
		<LOD				797 ± 80	
		<LOD				797 ± 80	
		<LOD				797 ± 80	
		<LOD				797 ± 80	
		<LOD				797 ± 80	
				$\%D = \frac{(C_s - 797\ ppm)}{797\ ppm} \times 100$			

6. SIGNATURE AND NOTES	
Notes:	
Signature:	Date:

APPENDIX C – COLORADO VCUP CHECKLIST

VOLUNTARY CLEANUP AND REDEVELOPMENT ACT CHECKLIST

INFORMATION REQUIRED	SECTION
I. GENERAL INFORMATION	**2**
Name and address of owner	**2.1**
Contact person and phone number	**2.2**
Location of property	**2.3**
Type and source of contamination	**2.4**
Voluntary Cleanup (VC) or No Action Determination (NAD)	**2.5**
Current Land Use	**2.6**
Proposed Land Use	**2.6**
II. PROGRAM INCLUSION	**3**
Is the applicant the owner of the property for the submitted VC? The Voluntary Clean-up Program requires owner/designated representative to complete the submittal.	**3**
Is the property submitted for the VC the subject of corrective action under orders or agreements issued pursuant to provisions of Part 3 of Article 15 of this Title or the federal RCRA 1976 as amended? The Voluntary Clean-up Program requires details of a RCRA corrective action for an eligibility determination.	**3**
Is the property submitted for the VC subject to an order issued by or an agreement with the Water Quality Control Division pursuant to Part 6 of Article 8 of this Title? If Water Quality has issued a permit, the applicant is ineligible.	**3**
Is the property submitted for the VC a facility that has or should have a permit or interim status pursuant to Part 3 of Article 15 of this Title for treatment, storage or disposal of hazardous waste? For the Voluntary Clean-up Program, details of permits or interim status are necessary for an eligibility determination. Based on the site specifics of the permitted facility, the applicant may qualify for the program.	**3**
Is the property submitted for the VC subject to the provisions of Part 5 of Article 20 of Title 8 (Underground Storage Tanks) CRS or of Article 18 of this Title (RCRA)? For the Voluntary Clean-up Program details of Underground Storage Tank or RCRA requirements are necessary to make an evaluation. In some cases (e.g., tanks were removed prior to 12/22/88), the applicant may be eligible for the program.	**3**
Is the property submitted for the VC listed or proposed for listing on the National Priorities List of Superfund sites established under the federal act (CERCLA)? For the Voluntary Clean-up Program, details of CERCLA action are necessary to make an evaluation. In some cases, the applicant may not be eligible for the program.	**3**
III. ENVIRONMENTAL ASSESSMENT	**4**
Qualified environmental professionals must submit environmental assessments. The applicant must submit documentation, in the form of a statement of qualifications or resume.	**Appendix D**

INFORMATION REQUIRED	SECTION
The applicant should provide the address and legal description of the site and a map of appropriate scale identifying the locations and size of the property.	**4.1**
The applicant should describe the operational history of the property in detail, including the most current use of the property.	**4.2**
A description of all business/activities that occupy or occupied the site as far back as record/knowledge allows.	**4.2**
A brief description of all operations that may have resulted in the release of hazardous substances or petroleum products at the site, both past and present, including the dates activities occurred at the property and dates during which the contaminants were released into the environment. For the Voluntary Clean-up Program, the exact dates and quantities of activities, releases, etc., of hazardous substances or petroleum products are necessary for an evaluation of eligibility.	**4.2**
A list of all site-specific notifications made as a result of any management activities of hazardous substances conducted at the site, including any and all Environmental Protection Agency ID numbers obtained for management of hazardous substances at the site from either the state or the Environmental Protection Agency is necessary for a Voluntary Clean-up Program evaluation. ***Not Applicable - No such activities have been conducted by the Applicants relative to potential sources of lead in soil in the Town of Rico.***	**NA**
A list of all notifications to county emergency response personnel for the storage of reportable quantities of hazardous substances required under Emergency Planning and Community Right-to-Know statutes is necessary for a Voluntary Clean-up Program evaluation. ***Not Applicable - No such notifications have been made by the Applicants relative to possible sources of lead in soil in the Town of Rico.***	**NA**
A list of all notifications made to state and/or federal agencies, such as reporting of spills and/or accidental releases, including notifications to the State Oil Inspection Section (OIS) required under 8-20-506 and 507 and 25- 18-104 CRS 1989 as amended and 6 CCR 1007-5 subpart 280.50 Part 3 of the OIS regulations, etc. ***Not Applicable - No such notifications have been made by the Applicants relative to possible sources of lead in soil in the Town of Rico.***	**NA**
A list of all known hazardous substances used at the site with volume estimates and discussion of relative toxicities. The hazardous substances used, volumes and toxicities are important for a VC in the overall evaluation of risk and sampling efforts. ***Not Applicable - There is no current use of hazardous substances known to the Applicants.***	**NA**
A list of all wastes generated by current activities conducted at the site and manifests for shipment of hazardous wastes off site. The manifest information is important for a VC evaluation, as in the above item. ***Not Applicable - There are no current activities generating wastes at the site related to lead.***	**NA**
A list of all permits obtained from state or federal agencies required as a result of activities conducted at the site. These are important for the Voluntary Clean-up Program so the Department can evaluate what potential sources may be at the site. ***Not Applicable - Due to the historical nature of past mining activities, no state or federal permits were required related to mining and processing activities that occurred in and around the Town of Rico.***	**NA**

INFORMATION REQUIRED	SECTION
A brief description of the current land uses, zoning and zoning restrictions of all areas contiguous to the site.	**2.6 and Figure 6**
The applicant shall describe the physical characteristics of the site, including a map to scale, and an accompanying narrative showing and describing the following, utilizing historic knowledge as well as current data:	**4.4**
• Topography	**4.4.1**
• All surface water bodies and waste water discharge points	**4.4.2**
• Ground water monitoring and supply wells	**4.4.3**
• Facility process units and loading docks ***Not Applicable to this Rico Townsite Lead VCUP Application***.	**NA**
• Chemical and/or fuel transfer and pumping stations ***Not Applicable to this Rico Townsite Lead VCUP Application.***	**NA**
• Railroad tracks and rail car loading areas ***Not Applicable – There are no railroad tracks within the Town of Rico.***	**NA**
• Spill collection sumps and/or drainage collection areas ***Not Applicable - Drainage collection in the Town of Rico has not been documented. Overland flow is toward the Dolores River and Silver Creek, both of which flow continuously year-round.***	**NA**
• Wastewater treatment units • ***Not Applicable - Currently, no centralized wastewater treatment is available in Rico, and individual disposal systems (septic/leach field) are used to treat wastewater. For all new development in the project area, the Town requires compliance with the State of Colorado individual sewage disposal systems rules. Town has prepared a Wastewater Treatment Study, a Preliminary Engineering Report for centralized wastewater treatment, and various financing applications for state and federal funding. In November of 2000 the Rico voters approved a 3.939 % property tax increase to be dedicated for the construction, design and operation of a wastewater treatment system. Federal grant money for construction has been obtained, but there is no formal plan or schedule for construction of wastewater treatment facilities at this time.***	**NA**
• Surface and storm water runoff retention ponds and discharge points ***Not Applicable - No retention ponds exist within the Town of Rico.***	**NA**
• Building drainage or wastewater discharge points ***Not Applicable - Information is not available regarding building drainage. There is no centralized wastewater treatment in the Town of Rico, therefore there is no centralized wastewater discharge point.***	**NA**
• All above or below ground storage tanks ***Not Applicable - Storage tanks are not relevant to the soil lead VCUP.***	**NA**

INFORMATION REQUIRED	SECTION
• Underground or above ground piping ***Not Applicable - The only known underground or above ground piping would be associated with known tanks and would be localized to the immediate vicinity of the tank system.***	**NA**
• Air emission control scrubber unit ***Not Applicable - No air emission control scrubber units exist within the Town of Rico.***	**NA**
• Water cooling systems or refrigeration units ***Not Applicable - The Town of Rico has no water-cooling systems or refrigeration units that would affect the presence of lead in soil.***	**NA**
• Sewer lines ***Not Applicable - The Town of Rico does not presently have a centralized sewer system. Future plans include the construction of such a system, however.***	**NA**
• French drain system ***Not Applicable - No French drain systems are known to exist in the Town of Rico.***	**NA**
• Water recovery sumps and building foundations ***Not Applicable - No water recovery sumps or building foundation drains are known to exist that would affect the presence or distribution of lead in soils in the Town of Rico.***	**NA**
• Surface impoundments ***Not Applicable - No surface impoundments exist within the Town of Rico.***	**NA**
• Waste storage and/or disposal areas/pits, landfills ***Within the Town of Rico, there are several mine sites that have been addressed under separate VCUP applications, including the Columbia/Old Pro Patria Mill tailings, Silver Swan Mine, Grand View Smelter, and Santa Cruz Mine.***	**4.3**
• Chemical or product storage areas ***Not Applicable - Other than fuel storage, no significant chemical or product storage areas are known to be present in the Town of Rico.***	**NA**
• Leach fields ***In addition to leach fields associated with sanitary septic systems, a septic tank and leach line have been identified at the Assay Building in Rico. This building is located on the east side of Glasgow Avenue, north of the Burley and theater buildings. This building was previously a laboratory used to determine the mineral content of ores. Wastewater generated at the Assay Building was discharged to an individual septic system.***	**NA**
• Dry wells or waste disposal sumps ***Not Applicable - The Applicants are not aware of any dry wells or waste disposal sumps that would affect lead in soils in the Town of Rico.***	**NA**
If ground water contamination exists or the release has the potential to impact ground water, the applicant should provide the following information for areas within a one-half mile radius of the site:	
• The state engineer’s office listing of all wells within one-half mile radius of the site, together with a map to scale showing the locations of these wells.	**4.4.3**

INFORMATION REQUIRED	SECTION
• Documentation of due diligence in verifying the presence or absence of unregistered wells supplying ground water for domestic use, when the potential for such wells is deemed likely as in older residential neighborhoods, or in rural areas. ***There are no known unregistered wells within the Town of Rico, as described in Section 4.4.3.***	**4.4.3**
• A statement about each well within the half-mile radius of the site, stating whether the well is used as a water supply well or ground water monitoring well.	**4.4.3**
• Lithologic logs for all on-site wells; copies of field log notes may be appropriate. ***There are no known groundwater wells within the Town of Rico.***	**NA**
• Well construction diagrams for all on-site wells showing screened interval, casing type and construction details including gravel pack, interval, bentonite seal thickness and cemented interval. ***There are no known groundwater wells within the Town of Rico.***	**NA**
• Description of the current and proposed use of on-site ground water in sufficient detail to evaluate human health and environmental risk pathways. In addition, the applicant will provide a discussion of any state and/or local laws that restrict the use of onsite ground water. ***Not Applicable – There are no known groundwater wells within the Town of Rico. Groundwater use within the Town of Rico is not restricted. However, there is no current or proposed use of ground water in the Town of Rico, therefore this pathway is not considered further in this application.***	**NA**
The applicant should provide information concerning the nature and extent of any contamination and releases of hazardous substances or petroleum products that have occurred at the site, including but not limited to:	**4.5**
• Identification of the chemical nature and extent, both onsite and offsite, of contamination that has been released into soil, ground water or surface water at the property, and/or releases of substances from each of the source areas identified, including estimated volumes and concentrations of substances discharged at each area, discharge point, or leakage point as per Section 25.16.308(2)(b). Although Phase II assessments identify the nature of contamination, the extent is not always fully defined. For Voluntary Clean-up Program purposes, the source, nature, extent and estimated volumes of the release are important in the overall evaluation of risk and eligibility.	**4.5**
• A map to scale showing the depth to ground water across the site, direction and rate of ground water movement across the site using a minimum of three measuring points. ***No groundwater monitoring or water supply wells are known to exist within the Town of Rico. Therefore, no data are available to prepare a map showing the depth to groundwater or the direction and rate of groundwater movement.***	**4.5.1**
• A discussion of all hydraulic tests performed at the site to characterize the hydrogeologic properties of any aquifers onsite and in the area. ***No hydraulic tests are known to have been performed within the Town of Rico.***	**4.5.1**

INFORMATION REQUIRED	SECTION
• All reports and/or correspondence, which detail site soil, ground water and/or surface water conditions at the site, including analytical laboratory reports for all samples and analyses.	**4.5.1** **4.5.2**
• A discussion of how all environmental samples were collected, including rationale involved in sampling locations, parameters and methodology, a description of sampling locations, sampling methodology and analytical methodology and information on well construction details and lithologic logs. All sample analyses performed and presented as part of the environmental assessment should be appropriate and sufficient to fully characterize all constituents of all contamination that may have impacted soil, air, surface water and/or ground water on the property. The applicant should use Environmental Protection Agency approved analytical methods when characterizing the soil, air, surface water and/or ground water.	**4.5.3**
IV. APPLICABLE STANDARDS/RISK DETERMINATION	**5**
The applicant should provide a description of any applicable standards/guidance (federal, state, or other) establishing acceptable concentrations of constituents in soils, surface water, or ground water, for the proposed land use.	**5.2**
The applicant should provide a description of the human and environmental exposure to contamination at the site based on the property's current use and any future use proposed by the property owner, including:	**5.1**
• A table or list for site contaminants indicating which media are contaminated and the estimated vertical and areal extent of contamination in each medium.	**Integral (2006a)**
• A table or list of site contaminants, indicating the maximum concentrations of each contaminant detected onsite in the area where contaminant was discharged to the environment, and/or where the worst effects of the discharge are believed to exist. The Voluntary Clean-up Program requests this item so that an understanding of the source and nature of the contaminants can be made as it relates to risk.	**Section 4.5 and Table 1**
• A table or list for site contaminants indicating whether the contaminant has a promulgated state standard, the promulgated standard and the medium the standard applies to. A comparison of the site contaminants with state standards is important to evaluate whether the remedy will meet risk-based clean-up objectives.	**5.1**
• A description and list of potential human and/or environmental exposure pathways pertinent to the present use of the property. The VC will use risk as part of the overall evaluation.	**Integral (2006a)**
• A list and map defining all source areas, areas of contamination or contaminant discharge areas. The Voluntary Clean-up Program requires that these areas be defined to indicate the proximity of contaminant with respect to receptors and sampling efforts.	**Integral (2006a)**
• A discussion of contaminant mobilities, including estimates of contaminants to be transported by wind, volatilization, or dissolution in water. For those contaminants that are determined to be mobile and have the potential to migrate and contaminate the underlying ground water resources, the applicant should also evaluate the leach ability/mobility of the contaminants. This evaluation should consider, but not be limited to the following: leachability/mobility of the contamination, health-based ground water standards for the contamination; geological characteristics of the vadose	**Integral (2006a)**

INFORMATION REQUIRED	SECTION
zone that would enhance or restrict contaminant migration to ground water, including but not limited to grain size, fractures and carbon content; and depth to ground water. This evaluation, and any supporting documentation, should be included in the plan submitted. The Voluntary Clean-up Program will evaluate the risk involved with the proposed clean-up in order to evaluate the application.	
The applicant should then provide, using the information contained in the application, a risk-based analysis of all exposure pathways, which details how the proposed remediation will obtain acceptable risk levels. The Voluntary Clean-up Program requires this analysis to show that the remediation proposal will attain an acceptable risk or break pathways.	**Integral (2006a)**
The Voluntary Clean-up Program includes remediation. The following are the requirements for the clean-up proposal. ***The Cleanup Proposal is included in Section 6 of this VCUP Application. Additional details are provided in Appendix B, 2023 VCUP Work Plan.***	**6 and Appendix B**
• A detailed description of the remediation alternative, or alternatives selected, which will be used to remove or stabilize contamination released into the environment or threatened to be released into the environment.	**6 and Appendix B**
• A map identifying areas to be remediated, the area where the remediation system will be located if it differs from the contaminated areas, the locations of confirmation samples, the locations of monitoring wells, areas where contaminated media will temporarily be stores/staged and areas where contamination will not be remediated.	**Figures 10-13 and Attachments 3 and 4**
• Remediation system design diagrams showing how the system will be constructed in the field. ***Appendix B provides a general remediation design, and future Individual Site Work Plans will document remediation details for each of the individual properties addressed.***	**Appendix B**
• A remediation system operation and maintenance plan that describes, at a minimum, how the system will be operated to ensure that it functions as designed without interruptions and a sampling program that will be used to monitor its effectiveness in achieving the desired goal. ***Institutional Controls described in Section 6.2 will ensure appropriate management and disposal of lead containing soils during future development activities, road maintenance, and utilities work.***	**6.2 and 6.3**
• The plan should include a schedule of implementation. ***A schedule for the Cleanup Proposal is included in Section 7.***	**7**
The clean-up completion report is necessary to demonstrate that the remediation was completed according to the application. The following items should be included in the completion report:	
• A final list of all site contaminants, along with the remaining concentrations, and any deviations from the original plan. ***Lead is the site contaminant. A final list of any deviations from the original cleanup plan will be provided in the Cleanup Completion Report prepared for each individual property where VCUP soil remediation has been performed.***	**Future Submittals**
• A final list defining which media are contaminated and the estimated vertical and areal extent of contamination to each medium.	**Future Submittals**

INFORMATION REQUIRED	SECTION
Soil is the contaminated medium. The extent of contaminated soil will be provided in the Cleanup Completion Report prepared for each property where VCUP soil remediation has been performed.	
• A final list and map defining all source areas, areas of contamination or contaminant discharge areas. ***A final map defining areas of soil contamination will be provided in the Cleanup Completion Report prepared for each property where VCUP soil remediation has been performed.***	**Future Submittals**
Soil Contamination: Remediation by Excavation Only	
• One confirmation sample per 500 ft2 as measured at the base on the excavation OR two confirmatory samples, whichever method results in the collection of the most samples.	**NA**
• One composite sample from each wall of the excavation. In excavations of an irregular shape, one composite sample for every 100 lineal feet of wall. For excavations greater than 5000 ft2, preparation of a grid for randomization of sampling.	**NA**
• Explanation of the sampling method in the narrative as well as any modifications to 1 and 2 above used to better characterize the remedial efforts.	**Appendix B**
• If contamination is to be left in place, an additional sample should be collected from the area of the worst contamination, as verified or with a field-sampling device. ***Documentation of sampling for contamination left in place, if needed, will be provided in the Cleanup Completion Report prepared for each property where VCUP soil remediation has been performed.***	**Future Submittals**
• Depth of samples collected. ***Documentation of sample depths will be provided in the Cleanup Completion Report prepared for each property.***	**Future Submittals**
• Provision of waste disposal manifests. ***Documentation of soil disposal will be provided in the Cleanup Completion Report prepared for each property where VCUP soil remediation has been performed.***	**Future Submittal**
In-Situ Soil Remediation	**NA**
• Completion of a minimum of two soil borings, with at least one completed in the area identified in the site assessment as the area of highest contamination. For larger areas of contamination, one boring per 10,000 ft2 of plume area. ***Not Applicable – No in-situ soil remediation is planned for the Townsite Soils Site as part of this VCUP Application.***	**NA**
• Completion of the borings should employ a field-screening device and borings should be logged. ***Not Applicable – No in-situ soil remediation is planned for the Townsite Soils Site as part of this VCUP Application.***	**NA**
• Soil sample submitted for analysis from each boring would be the sample with the highest field screening or one located at the ground water interface for each boring. ***Not Applicable – No in-situ soil remediation is planned for the Townsite Soils Site as part of this VCUP Application.***	**NA**

INFORMATION REQUIRED	SECTION
Ground Water Remediation	**NA**
• Field testing should include aquifer and contaminant characteristics such as gradient, partition coefficients, original contaminant levels, etc. ***Not Applicable – No groundwater remediation is planned for the Townsite Soils Site as part of this VCUP Application.***	**NA**
• At each regular monitoring event, a map showing ground water flow direction, depth to ground water and sampling locations. ***Not Applicable – No groundwater remediation is planned for the Townsite Soils Site as part of this VCUP Application.***	**NA**
• Tabular presentation of data collected. ***Not Applicable – No groundwater remediation is planned for the Townsite Soils Site as part of this VCUP Application.***	**NA**
Summary of Voluntary Clean-up Program participation. ***This requirement will be met through preparation and submittal of Cleanup Completion Reports for each property where soil remediation has been performed.***	**Future Submittals**
Summary of field activities, remedial activities, any deviations from original plans. ***A summary of field activities, remedial activities, and any deviations from original plans will be provided in the Cleanup Completion Report prepared for each property where soil remediation has been performed.***	**Future Submittals**
Pertinent figures and drawings of remedial system. ***Figures and drawings documenting the soil remediation will be provided in the Cleanup Completion Report prepared for each property where soil remediation has been performed.***	**Future Submittals**
Conclusions made after remedial activities are completed. ***Any conclusions made following completion of remedial activities will be provided in the Cleanup Completion Report prepared for each property where soil remediation has been performed.***	**Future Submittals**

NA = Not Applicable
TBD = To Be Determined

APPENDIX D – QUALIFICATIONS OF ENVIRONMENTAL PROFESSIONALS

FORMATION ENVIRONMENTAL LLC
Synopsis of Qualifications

Formation Environmental, LLC (Formation) is led by a partnership of senior scientists, hydrogeologists, and engineers with a long history of shared work experience and successful collaboration. Formation's focus is the creation of successful multi-disciplinary teams that bring the skills and experience needed to effectively navigate and resolve each client's unique technical, regulatory, and financial objectives. Formation provides strategic environmental consulting services including hydrogeologic characterization, numerical modeling (surface water, groundwater, watersheds, soil erosion by wind and water, weather events and wind patterns), risk assessment, permitting and impact assessment support, water supply development, resource planning and management, water quality studies, environmental remediation plans and specifications, and litigation support. We have over 45 senior experts in the following disciplines:

- Hydrogeologists, geochemists, and field geologists;
- Agricultural, civil, mechanical, chemical, and geological engineers;
- Agronomists, soil scientists, ecologists, and biologists; and
- Remote sensing, geospatial, and GIS analysts.

Our senior staff provide broad expertise in a range of areas:

- Computer modeling of watershed, surface water, groundwater, and solute transport processes;
- Hydrogeologic characterization of groundwater basins;
- Water budget analysis;
- Remote sensing, geospatial and GIS analysis to assess water budgets, evapotranspiration, land use and vegetation;
- Geophysical investigations to assess subsurface soil moisture conditions;
- Test well programs and aquifer testing;
- Assessment of environmental impacts resulting from groundwater withdrawals;
- Dust control and mitigation;
- Numerical simulation of weather events and wind patterns to estimate wind loads on structures and power transmissions lines and guide vegetation management in utility corridors;
- Geochemistry and reactive transport;
- Ecosystem restoration, wildlife biology, and contaminant bioaccumulation through food webs; and
- Groundwater resources planning, entitlement strategy and sustainability analysis.

Formation staff have unparalleled expertise managing Remedial Investigation (RI), Feasibility Study (FS) and Human Health and Ecological Risk Assessment (HHRA/ERA) efforts and field studies at CERCLA (Superfund) and RCRA sites. In addition, Formation's senior consultants have also provided litigation strategy, support, prepared expert reports and have been expert witness for nationally prominent, multi-party sites and other cases involving allocation costs and divisibility of liability. Finally, Formation staff are also leading mitigation efforts for two of the largest sources of inhalable particulate (PM_{10} and $PM_{2.5}$) emissions in the U.S – the Salton Sea and Owens Lake in California.

Brian G. Hansen, P.E., P.G.
Senior Geological Engineer

Mr. Hansen has over 35 years of experience in the fields of geological engineering, hydrogeology, and geology. He is a registered Professional Engineer in six states and provides project management and engineering expertise for environmental investigation and remediation projects, including:

- Groundwater and soil investigation design and data interpretation;
- Contaminant fate and transport evaluations;
- Remedial Investigations/Feasibility Studies;
- Engineering Evaluations/Cost Analyses;
- Remedial Design/Remedial Action; and
- Litigation support.

REPRESENTATIVE EXPERIENCE

Bonita Peak Mining District Superfund Site, Colorado. Providing consulting services to a mining company with respect to potential sources of metals contamination to the Animas River upstream of Silverton, Colorado. Project work has involved multiple surface water sampling episodes, some in conjunction with state and federal agencies, as well as installation of over 50 borings/monitoring wells in the vicinity of several tailings impoundments.

Rico Townsite Soils Voluntary Cleanup. Providing technical assistance to a private company and its counsel in connection with a Colorado Voluntary Cleanup (VCUP) project involving remediation of lead-containing soil in the town of Rico, Colorado.

Illinois Gulch Site, Colorado. Providing technical assistance to the landowner and counsel at this mining-impacted site near the town of Breckenridge. The site includes a large waste rock pile, two draining mine adits, and residential yards with potentially elevated metals concentrations. Formation is supporting this work through preparation of remedial design work plans.

Anaconda Copper Mining Company (ACM) Smelter and Refinery Site, Great Falls, Montana. The site, located in Great Falls, Montana, includes several hundred residential properties that may have been impacted by aerial emissions from the former smelter. Served as project manager for the Remedial Investigation/Feasibility Study (RI/FS) for Operable Unit 1 of the site, which includes adjacent residential areas. Routinely interacted with EPA Region 8 and Montana Department of Environmental Quality staff.

Butte Priority Soils Operable Unit (BPSOU) Phase II Remedial Investigation/Feasibility Study (Silver Bow Creek/Butte Area Superfund Site), Montana. Project manager for the Phase II RI/FS, which spanned over ten years. The primary issues at this site are waste rock piles proximal to residences; elevated lead concentrations in some residential yards; metals-impacted storm water runoff; and metals-impacted groundwater. The project included coordination of a diverse PRP group and liaison with EPA, the Montana Department of Environmental Quality, and technical representatives of a local citizens' group. The FS evaluated six distinct alternatives for soil, surface water, storm water, and groundwater remediation in the Butte urban area.

Iron Mountain Mine Site, Montana. Prepared expert reports, provided deposition testimony, and participated as an expert witness on behalf of a mining company defendant in a jury trial regarding the potential presence of mine tailings on the plaintiff's property. In a separate action, prepared an expert report to assist the mining company in its defense of a lawsuit alleging that tailings from the client's historic mining site had impacted a natural spring that served as the water supply for a nearby community.

El Paso Copper Smelter, Texas. Provided litigation support, prepared an expert report, and provided testimony during a deposition regarding the quantity of groundwater that may need to be extracted and treated to facilitate reconstruction of a canal adjacent to the smelter site.

Coeur d'Alene Basin, Idaho. Provided technical support to counsel in preparation for Natural Resource Damages litigation against private mining companies. Prepared an expert report and provided testimony during a deposition regarding lead emissions from a former milling and smelting operation as well as the environmental impacts of tailings that were used to construct an interstate highway.

Asarco LLC Bankruptcy - Miscellaneous Federal and State Sites. Expert witness regarding reasonable settlement amounts for 25 former mining and metals refining sites across the United States.

Talache Mine Tailings Site, Idaho. Project manager and Engineer of Record for site characterization, preparation of EE/CAs, ecological/human health risk assessments, and tailings piles closure. Oversaw a team of engineers during the development of the remedial design that addressed collection of dispersed tailings and stabilization of the tailings ponds and coordinated oversight of the construction. Served as Corporate Representative [30(b)(6)] witness for a mining/smelting company regarding its historic operations at the site.

Smoky Canyon Phosphate Mine, Idaho. Contributing author to the EECA for the mine site that evaluated several removal action alternatives to reduce mobilization of selenium from site waste rock piles. Project manager for Removal Action construction activities associated with water diversion around a 26-million cubic yard overburden pile, which fills a stream valley. The construction activities include a 10,000-foot pipeline, a partially lined infiltration basin, and a 4,000-foot run-on control channel. Served as Engineer of Record for a second Removal Action that consists of placing a revegetated, earthen cover system on the overburden pile to reduce infiltration of precipitation.

Conda/Woodall Mountain Phosphate Mine, Idaho. Engineer of Record for a Removal Action conducted on the Pedro Creek overburden pile. The Removal Action consisted of regrading the steeply sloped angle-of-repose pile to a 3:1 slope and construction of associated run-on and run-off control features, with the installation of a vegetated cover soil system. The Removal Action is expected to reduce selenium loadings originating from the pile.

Confidential Site, Brazil. Prepared and oversaw the execution of a soil sampling and analysis plan to evaluate the extent of metals contamination in soil at this remote former mining site.

Dresser Industries-Magcobar Mine Site, Arkansas. Project manager for the Site Investigation and Feasibility Study at this former barite mining property. The Site includes a flooded mine pit, over 20 million cubic yards of acid-generating mine spoil, and tailings ponds. The Site Investigation includes baseline human health and ecological risk assessments. The Arkansas Department of Environmental Quality selected the remedial alternative recommended in the Feasibility Study.

Eureka Mills Superfund Site, Utah. Provided technical assistance to a major railroad company and its counsel during successful settlement negotiations with EPA and the Utah Department of Environmental Quality. Provided project coordination and regulatory liaison on behalf of the railroad.

Bunker Hill Superfund Site, Idaho. Provided management and hydrogeological expertise supporting the RI/FS and various remedial designs for this site, which is impacted by mine tailings and lead-smelter emissions. These designs addressed remediation of residential yards, commercial properties, rights-of-way, water well closure, smelter demolition and closure, closure of a 265-acre tailing impoundment by capping, and development of a large (174-acre) constructed wetland treatment system.

Triumph Mine Tailings Piles Site, Idaho. Project manager for Remedial Design/Remedial Action activities at the site. The project involved residential yard remediation, regrading and capping of two tailings piles and a waste rock pile, and installation of a concrete mine-adit plug.

Abandoned Railroad Right-of-Way, Washington. Managed and provided engineering expertise for removal of lead-bearing railroad ballast (impacted from mine tailings) from residential areas. Overall, approximately 60,000 tons of ballast were removed, with approximately 19,000 tons requiring chemical stabilization prior to disposal to limit potential leaching of lead.

Metal Recycling Sites, Montana and Idaho. Managed and oversaw subsurface investigation and remediation of impacts associated with former lead battery recycling operations at three operating facilities. Remediation included chemical fixation of the lead.

Upper Blackfoot Mining Complex (Heddleston District), Montana. Managed, provided engineering expertise, and served as regulatory liaison for voluntary remedial activities at a complex mining site in western Montana. The project included 1) relocation of mine waste rock to engineered repositories, and 2) construction of passive biological treatment systems (constructed wetlands) to address mine-adit discharges.

Canyon Creek, Idaho. Provided management and engineering expertise for the design of a pilot bioreactor project to treat mine adit discharge. The bioreactor system was designed to treat up to 10 gpm through either a high-permeability (gravel substrate) bioreactor or a low-permeability (compost-based) bioreactor.

Alleged Clean Water Act Violations, Washington. Provided technical assistance to a confidential mining client and its counsel during summary judgment activities in connection with a lawsuit alleging violations of the Clean Water Act due to seepage from tailings ponds.

"Shadow" Hazard Ranking System Scoring, Idaho. Scoring was conducted for an open pit mine/cyanide heap leach facility to assist the confidential client in assessing potential CERCLA liabilities. The shadow scoring showed that, using the flexibility in the HRS, the site could either be listed on the NPL or not, depending on the assumptions used.

Industrial Landfill, California. Conducted a computer modeling study to assess the effectiveness of various alternative extraction well arrays in terms of containing or extracting a plume of volatile organic constituents in groundwater originating in the industrial landfill.

REGISTRATIONS

Registered Professional Engineer in Arkansas, Colorado, Idaho, Montana, Nevada, and Washington.
Registered Professional Geologist in Wyoming.

EDUCATION AND TRAINING

M.E., Geological Engineering - Colorado School of Mines, 1988
B.S., Geology - Fort Lewis College, Durango, Colorado, 1983

WORK HISTORY

Senior Geological Engineer, Partner – Formation Environmental, LLC; Colorado (2009 - Present)
Senior Engineer/Hydrogeologist, Partner – NewFields Boulder, LLC; Colorado (2004 - 2009)
Senior Engineer/Hydrogeologist – MFG, Inc. (now TetraTech MM); Colorado (2002 – 2004)
Senior Engineer/Hydrogeologist - MFG, Inc.; Missoula, Montana (1994-2002)

Project Hydrogeologist/Geological Engineer - MFG, Inc.; Colorado (1991-1993)
Project Hydrogeologist/Geological Engineer - Dames & Moore; Colorado (1988-1991)
Graduate Research Assistant - Kansas Geological Survey (1987-1988)
Engineering Geologist - Michael W. West & Associates; Colorado (1986-1988)
Hydrologic Technician - U.S. Geological Survey; Colorado (1985-1986)
Civil Engineering Technician - R.V. Lord & Associates; Colorado (1984)

PUBLICATIONS

Co-author, "U.S. Geological Survey Urban Stormwater Database of Constituent Storm Loads; Characteristics of Rainfall, Runoff, and Antecedent Conditions; and Basin Characteristics." U.S. Geological Survey Water-Resources Investigations 87-4306.

Author, "Evaluating the Hydrogeology of Meade County, Kansas, Using Vertical Variability Analysis and Numerical Modeling." Kansas Geological Survey Open File Report 88-47.

KATHRYN J. TEGTMEYER, Ph.D.
Senior Geochemist

EXPERIENCE SUMMARY

Over 25 years of consulting experience providing expertise in aqueous geochemistry, contaminant fate and transport evaluation, environmental forensics (metals/metalloids), metals bioavailability, geochemical investigations and modeling, statistical data analysis and design of statistically based data-collection programs for a diverse range of environmental investigation, assessment and monitoring projects.

GEOCHEMICAL INVESTIGATIONS AND MODELING

Smoky Canyon Mine Site Investigation, J.R. Simplot Company, Idaho. Senior geochemist for the Site Investigation and Engineering Evaluation/Cost Analysis at a phosphate mine in southeastern Idaho where past disposal of overburden rock has resulted in mobilization of selenium. The site investigation was designed to describe selenium fate and transport in the environment under a range of redox conditions, including an evaluation of natural attenuation mechanisms potentially operating in deep groundwater flow systems.

Smoky Canyon Mine Supplemental EIS, J.R. Simplot Company, Idaho. Provided key technical support and prepared comments on the groundwater impact analysis portions of the draft Supplemental Environmental Impact Statement for the Panels B and C mine expansion. Input regarding the design and use of a fate and transport model to predict selenium release to groundwater and subsequent revisions to that model resulted in prediction of substantially less potential for impacts to groundwater resources.

Former Murray Smelter Site Engineering Evaluation/Cost Analysis, ASARCO Incorporated, Utah. Senior geochemist for an Engineering Evaluation/Cost Analysis for a former lead smelter in central Utah. Developed aqueous speciation and solute transport models for use in evaluating remedial alternatives related to arsenic contamination of shallow groundwater. Demonstrated effectiveness of monitored natural attenuation as remedial action for arsenic in groundwater. Monitored natural attenuation was a component of remedy ultimately selected by EPA.

Jasper County (Missouri) Superfund Site, Feasibility Study. Evaluated effectiveness of subaqueous-disposal scenarios for large quantities of lead and zinc mill wastes that were surface deposited across the site. Based on the findings of that evaluation, the disposal of mill wastes in nearby water-filled subsidence pits was ultimately included as a component of the remedy selected by the EPA.

Former Industrial Landfill, Confidential Client, Kokomo, Indiana. Senior geochemist for development of in situ treatment approaches for removal of arsenic from groundwater underlying a former landfill site and design of pilot-scale treatability studies for implementation at the site. Geochemical speciation models were used to assist in treatment system design and selection of practical approaches for testing. Two in situ treatment approaches, utilizing both liquid and gaseous reagents to facilitate arsenic retention by aquifer solids, were eventually tested during the two-month pilot test.

Poplar Island Ecosystem Restoration Project, Maryland Environmental Service, Maryland. Identified geochemical mechanisms contributing to release of copper and zinc from dredged materials placed in dewatering cells. Aqueous speciation and geochemical reaction models were developed from site-specific data and used to evaluate containment-cell conditions, develop pilot-scale test procedures, and make recommendations for modifications to containment-cell management practices to limit future metals release to water that is ultimately discharged to the Chesapeake Bay.

Confidential Client, Northern Idaho Mining District. Developed methods for assessing metal contents of surface waters due to natural water-rock interactions within a large watershed in the northwest United States. A flow-load model based on empirical data from the site was used to provide estimates of background metal concentrations within an extensive mining district. The model indicates that metals loading to surface water from natural weathering and erosion of undisturbed ore deposits results in elevated metals concentrations in the nearby surface water drainages.

Upper Arkansas River Basin Natural Resource Damage Assessment, Colorado. Evaluated metals mass loading to upper Arkansas River due to erosion of tailings deposits using a combined mass-loading and open-system-sorption model to predict metals concentrations in river water and mass transport from tailings to river water over time. Model predictions used in evaluation of actions to restore portions of the drainage that have been impacted by historic mining and metals-refining activities in and around Leadville, Colorado.

STATISTICAL METHODS AND ENVIRONMENTAL MONITORING

California Gulch Superfund Site, ASARCO Incorporated, Colorado. Participated with EPA and Colorado Department of Public Health and Environment in developing performance measures for the remedy being implemented in residential portions of the California Gulch Superfund Site, Lake County, Colorado. Performance is measured annually using blood lead monitoring data collected by the Lake County Community Health Program. Providing annual performance evaluation reports, including results of statistical analyses, to the health program, state and federal agencies.

Lowry Landfill Superfund Site, City and County of Denver and Waste Management, Inc., Colorado. Developed statistically based procedures for groundwater monitoring to support demonstrations of remedy effectiveness and compliance with applicable groundwater quality standards at a former municipal and hazardous waste landfill facility east of Denver. Procedures for evaluation of long-term groundwater monitoring data are consistent with EPA's data quality objectives process and provide data appropriate for regulatory decision making at a known level of confidence. Factors considered included multiple source areas within the site and temporal variations in groundwater conditions outside the areas where hydraulic controls have been established as part of the overall site remedy.

Smoky Canyon Mine Supplemental EIS, J.R. Simplot Company, Idaho. Developed a statistically-based groundwater monitoring plan for evaluating ongoing compliance with applicable groundwater protection standards at an active phosphate mining and milling facility in southeastern Idaho. The plan was prepared to address requirements of a Consent Order between the mine operator and the Idaho Department of Environmental Quality. Acceptance of the monitoring plan, including data-analysis and decision-making procedures, was critical for state and federal approval of a plan for mine expansion.

Everett Smelter Site, ASARCO Incorporated, Everett, Washington. Evaluated sampling approaches for soils in residential areas around a former lead smelter. A "bootstrap" modeling method was used with data describing metals concentrations in soils to simulate the performance of several different sampling and remediation approaches. The simulation model results were used to identify the approach that demonstrated the highest performance considering its cost effectiveness and implementability within the residential area.

Various projects and clients. Prepared Remedial Design Reports for groundwater monitoring at former lead smelter in central Utah and a fertilizer production facility in southern Idaho. Both designs included statistically based performance standards for evaluating the long-term effectiveness of remedial actions and criteria for decision making at known confidence levels.

Chrome Sludge Landfill, Alcoa Warrick Operations, Indiana. Developed approach for the statistical evaluation of groundwater monitoring data at a landfill site for inclusion in the existing post-closure permit. The statistical methods for the detection monitoring program reduced the sampling and analysis requirements while meeting the existing permit requirements for landfill monitoring, and they were ultimately approved by Indiana Department of Environmental Management.

Comanche Peak Site, TU Electric, Northern Texas. Designed a post-closure groundwater monitoring program for a hazardous waste disposal facility. Non-parametric prediction limits were adopted as performance standards for selected indicator parameters in order to meet EPA Subtitle C regulations. Sampling and analysis requirements were reduced relative to previous monitoring programs while achieving lower error rates and acceptable statistical power.

Rocky Flats Plant Site, EG&G, Colorado. Project manager and technical lead for the Groundwater Monitoring Report for RCRA-regulated units. Managed a team of technical staff to provide the results of quarterly groundwater monitoring at three RCRA units and statistical analysis of monitoring data.

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES/REMEDIAL DESIGN

California Gulch Superfund Site, ASARCO Incorporated, Colorado. Managed the Lake County Community Health Program in Leadville, Colorado, a pilot program designed to identify and address sources of lead exposure for children who reside within the site. The program is implemented cooperatively with the Lake County Health Department and includes blood lead monitoring; environmental sampling and analysis of soil, house paint, dust and drinking water samples for lead; database management and reporting; community education programs; and remediation of potential sources of lead exposure at individual residences. The program has widespread support from the community and has been effective in reducing the percentage of Leadville children with elevated blood lead levels.

North Denver Superfund Site, U.S. Environmental Protection Agency, Colorado. Designed the Community Health Program component of the remedy selected for the Vasquez Boulevard/I-70 Operable Unit. This is a residential area that has been subject to releases of arsenic and lead from various local sources over time. The program will be implemented cooperatively with local public-health agencies and will cost-effectively improve the overall performance of the remedy by utilizing a combination of outreach, education and health intervention methods to address any potential risks remaining following a yard-soil removal and replacement program.

Pecos (Terrero) Mine Site, Cyprus-Amax Minerals Company, New Mexico. Project manager for a $1.5 million RI/FS at an inactive Cu-Pb-Zn mine in New Mexico. Provided technical oversight for and coordination of field investigations, data management and analysis, and document preparation. Designed remedial investigation and monitoring programs for groundwater, surface water, sediments and soil. Also co-wrote a field investigation plan to determine the physical properties of the vadose zone and calculated a water balance for a 150,000 cubic yard waste-rock dump.

Rocky Flats Site, EG&G, Colorado. Provided project management support and technical oversight to the Operable Unit 7, Present Landfill, RFI/RI at the Rocky Flats Plant. Directed field implementation of the work plan. As the data-management coordinator, evaluated analytical data quality, assessed data usability and conducted statistical analyses and statistical comparison of onsite and background geochemical data to determine the extent of contamination.

ANALYTICAL CHEMISTRY AND DATA QUALITY EVALUATION

Lavaca Bay Superfund Site, Alcoa Point Comfort Operations, Gulf Coast, Texas. Developed ultra-clean groundwater sampling methods for trace-level mercury and methylmercury analyses based on procedures in EPA's Method 1669. Appropriate sampling equipment and sample collection and handling methods were identified in a detailed standard operating procedure, which was used successfully for several groundwater investigations.

Copper Mine, Mill and Smelter Site, New Mexico Environment Department, New Mexico. Directed analyses of soils for free cupric-ion activities using an ion-selective electrode to measure copper in soil extract solutions. The cupric-ion activities were used in conjunction with total organic carbon, pH and metals concentration data to identify the soil conditions that control copper bioavailability and soil phytotoxicity.

Fly-Ash Disposal, Alcoa Rockdale Mine, Texas. Developed batch tests to evaluate the leaching characteristics of fly ash and a series of batch sorption tests to evaluate the natural attenuation characteristics of surrounding geologic materials for a proposed fly-ash disposal site. The test results describe the site-specific partitioning behavior of fly ash constituents leached to groundwater.

Soil Remediation, Exide/NL Industries, Dallas, Texas. Designed a series of batch adsorption tests to provide site-specific soil/water distribution coefficients for lead. The resultant sorption isotherms were used to model lead release and transport from surficial soils to groundwater. Results demonstrate that the soil-lead cleanup level used in a residential area was protective of groundwater quality.

Lavaca Bay Superfund Site, Alcoa Point Comfort Operations, Gulf Coast, Texas. Senior project chemist and quality assurance manager with oversight of data quality objectives development, data validation and statistical data analysis for remedial investigations. Contaminants at the site included mercury, arsenic, chromium, selenium, polynuclear aromatic hydrocarbons, chlorinated organics (including DNAPL phase), cyanide and fluoride.

REGISTRATIONS AND PROFESSIONAL AFFILIATIONS

American Chemical Society
International Society of Environmental Forensics

EDUCATION AND TRAINING

Ph.D., Geological Sciences, University of Colorado at Boulder, 1990
B.A. (*magna cum laude*), Geology with Honors, Hamilton College, 1984

PAST WORK HISTORY

Senior Geochemist – Formation Environmental (2009 – present)
Senior Geochemist – NewFields (2004 – 2009)
Senior Geochemist – MFG, Inc. (1996-2004)
Senior Geochemist/Project Manager – The S.M. Stoller Corporation (1990-1996)
Graduate Research Assistant – Cooperative Institute for Research in Environmental Science, University of Colorado (1986-1990)
Geologist – U.S. Geological Survey, Branch of Western Mineral Resources (1984-1986)

PUBLICATIONS

Lewis, M.C., Tegtmeyer, K.J. and Allen, J.M., 2002. Measurement of cupric ion activity in soil solutions to evaluate site-specific copper bioavailability. Soil and Sediment Contamination, v.11, no.3, p. 380.

Tegtmeyer, K.J., M.K. Vaag, M.C. Broussard, J.W. Langman, 1991. Surface geologic mapping at Rocky Flats Plant, Jefferson County, Colorado: An often overlooked, inexpensive, non-intrusive method for characterizing groundwater contaminant pathways, Geological Society of America Abstracts with Program, v. 23.

Tegtmeyer, K.J., 1990. Regional variations in the Nd and Sr isotopic compositions of Tertiary peralkaline rhyolites from the Great Basin, western U.S., Transactions American Geophysical Unit, v.71, p. 1682-1683.

Tegtmeyer, K.J. and G.L. Farmer, 1990. Nd isotopic gradients in upper crustal magma chambers: Evidence for in situ magma-wall rock interaction, Geology, v.18, p. 4-9.

Tegtmeyer, K.J., G.L. Farmer and D.E. Broxton, 1989. Isotopic evidence for the origin of late Tertiary metaluminous and peralkaline rhyolites from the Great Basin, western U.S., International Association of Volcanology and Chemistry of the Earth's Interior Abstracts, New Mexico Bureau of Mines and Mineral Resources Bulletin 131, p. 266.

Tegtmeyer, K.J. and G.L. Farmer, 1988. Nd isotopic gradients in large volume peralkaline rhyolites: evidence for water rock interaction in upper crustal magma chambers, Geological Society of America Abstracts with Program, v.20, p. A249.

Tegtmeyer, K. and G.L. Farmer, 1988. Nd isotopic evidence for the origin of large-volume, extension-related peralkaline rhyolites from the Great Basin, western U.S., Transactions American Geophysical Union, v.86, p. 1512.

PRESENTATIONS

Tegtmeyer, K., Jonas, J., Werner, S., Johnson, M., 2008. Smoky Canyon Mine: Geologic and Hydrogeologic Setting and Groundwater Monitoring Activities, Presented at 2008 Idaho Ground Water Connections Conference, Boise, ID, Sept. 23-24, 2008; University of Idaho Water Resources Institute, Boise, ID.

Tegtmeyer, K.J., A. Morrison and B. Litle, 2002. Addressing multiple sources of lead exposure using a community-based environmental health program. 18th Annual International Conference on Contaminated Soils, Sediments and Water, University of Massachusetts, Amherst, MA, October 2002.

Lewis, M.C., Tegtmeyer, K. and Allen, J., 2002. Measurement of cupric ion activity in soil solutions to evaluate site-specific copper bioavailability. Association for Environmental Health and Sciences 12th Annual West Coast Conference on Contaminated Soils, Sediments and Water, San Diego, CA, March 2002.

MYRA (VAAG) LUGSCH, PG
Senior Geologist

EXPERIENCE SUMMARY

Ms. Lugsch has 29 years of experience in the fields of geology and environmental science. She is a Registered Professional Geologist in Wyoming and provides expertise in site characterization, nature and extent of contamination, and screening and development of remedial alternatives for Resource Conservation and Recovery Act (RCRA), Comprehensive Environmental Response, Compensation and Recovery Act (CERCLA), and National Environmental Policy Act (NEPA) projects for the Department of Energy (DOE), Air Force Center for Engineering and the Environment (AFCEE), and various private clients at hard rock mine sites, smelter sites, oil refineries, and former nuclear weapons facilities.

RI/FS PROJECT EXPERIENCE

DOE, Landfill Closure IM/IRA, Rocky Flats Plant, Colorado. Managed the Interim Measure/Interim Remedial Action (IM/IRA) project for Operable Unit 7, Present Landfill, at the Rocky Flats Plant former nuclear weapons facility. Tracked costs and schedule and supervised a team of engineers that developed and screened various cover and removal alternatives for remedial action. Worked with DOE and Colorado Department of Public Health and the Environment (CDPHE) personnel to gain a consensus on the approach for remediation. Coauthored the IM/IRA Decision Document for the Record of Decision (ROD).

DOE, Landfill RFI/RI, Rocky Flats Plant, Colorado. As Site Manager for the RCRA Facility Investigation/CERCLA Remedial Investigation (RFI/RI) at the landfill at the Rocky Flats Plant, supervised the day-to-day aspects of a 6-month field investigation to collect data for site characterization, characterization of waste disposed in the landfill, and determination of the nature and extent of contamination downstream and downgradient due to releases of leachate. Interfaced with drilling and CPT subcontractors and supervised a 25-member field team that collected soil, soil gas, leachate, sediment, surface water, and groundwater samples that were analyzed for organic compounds, metals, and radionuclides. Coordinated consolidation and transport of drums of investigation-derived waste material from the drilling in the landfill to the drum storage area within union constraints. Worked with DOE and the client to modify the investigation while it was underway based on data collected to achieve project goals and complete the project on schedule.

DOE, Site Characterization for 881 Hillside RFI/RI, Rocky Flats Plant, Colorado. Provided project management support and technical expertise for the Operable Unit 1, 881 Hillside, RFI/RI at the Rocky Flats Plant. As technical lead on the project, analyzed geologic, hydrogeologic, geochemical, and geophysical data to characterize the site and determine the nature and extent of contamination. Worked with a project team of geologists, geochemists and geophysicists to develop at conceptual site model. Coauthored the RFI/RI Report.

DOE, Geologic Characterization Study, Rocky Flats Plant, Colorado. Provided project management support for field tasks that included drilling, packer testing, borehole geophysics, well installation, and seismic reflection surveys. As project geologist, mapped a 60-square-mile area around Rocky Flats, measured stratigraphic sections, completed a petrographic analysis, and coauthored a geologic report. Geologic characterization data were combined with hydrogeologic characterization data and geochemical characterization data to develop a comprehensive conceptual site model for the Rocky Flats Plant to guide the cleanup process.

DOE, Site Characterization and Groundwater Monitoring, Hanford Plant, Washington. As project geologist, drilled boreholes in unconsolidated Palouse soil, Ringold Formation sediments, and Hanford Formation sands and gravels deposited on basalt bedrock for installation of groundwater monitoring wells in the 400 Area (Fast Flux Test Facility) at the Hanford DOE Facility for site characterization. Groundwater level monitoring data were used to evaluate groundwater flow directions, track changes in water levels, and to relate changes to evolving disposal practices at Hanford. Groundwater chemistry was monitored to identify areas with impacted groundwater quality and to track the extent of contamination and note trends in the contaminant plumes. The tritium plume was the most widespread plume in the 400 Area.

AFCEE, Lowry Air Force Base RI/FS, Colorado. Managed FS projects for coal storage yards, a fire training area, and the landfill at Lowry Air Force Base. Tracked costs, interfaced with clients and regulatory agencies, and wrote monthly status and budget reports. Compiled data, reviewed aerial photographs, summarized site characteristics, and developed and screened remedial alternatives. Coauthored FS reports, Proposed Plans (PP), and RODs that documented preferred alternatives for soil removal and remediation of the sites.

Sunnyside Gold Corporation, Proposed Bonita Peak Mining District Superfund Site, Colorado. Reviewed and commented on EPA's Hazard Ranking System (HRS) score for the Bonita Peak Mining District in southwestern Colorado. The site was placed on the National Priorities List (NPL) in 2016 and includes rivers and streams impacted by mineralization and historical gold mining and milling operations.

BP Atlantic Richfield, ACM Smelter and Refinery Site RI/FS, Montana. Reviewed and commented on EPA's HRS score for a copper smelter/refinery near Great Falls. The site was placed on the NPL in 2011 and includes residential properties impacted by aerial emissions from the smelter. Assisted counsel in responding to a CERCLA Section 104(e) request. Coauthored the RI/FS work plan and sampling and analysis plan for Operable Unit 1 (OU1), Community Soils Areas of Interest and Outlying Areas. Researched the history of the ACM copper smelter/refinery and coauthored the Current Conditions Report. Evaluated data and coauthored the OU1 RI Report and FS Technical Memorandum for the Community Soils Areas of Interest.

J.R. Simplot Company, Smoky Canyon Phosphate Mine RI/FS and Conda Phosphate Mine RI/FS, Idaho. Compiled and reviewed historical data to evaluate the quality and usability for the RI/FS. Performed a technical review and technical edit of the RI Report, Human Health, Ecological, and Livestock Risk Assessment Reports, and various other deliverables for the Smoky Canyon Mine and Conda Mine. Updated the environmental monitoring plan for a non-time-critical removal action (NTCRA) at Pole Canyon. Compiled data and coauthored the Pilot Study Report for a semi-passive biological treatment technology. Developed and screened remedial technologies and process options and co-authored the FS Technical Memorandum for Smoky Canyon.

J.R. Simplot Company, Smoky Canyon Phosphate Mine Monitoring, Idaho. Supervised and coordinated a team that reviewed and updated the Comprehensive Environmental Monitoring Program Plan (CEMPP) for the mine which streamlined and consolidated monitoring requirements and 11 individual monitoring plans into a comprehensive document. Reviewed and edited Annual Groundwater and Surface Water Monitoring Reports.

Wells Cargo, North Maybe Phosphate Mine, West Ridge Operable Unit RI/FS, Idaho. Compiled and reviewed historical data from the North Maybe Mine and South Maybe Canyon Site Investigation (SI) to evaluate quality and usability for the RI/FS. Reviewed and edited the 2011 Data Summary Report. Coauthored the RI Report for the West Ridge Operable Unit that characterized site conditions and the nature and extent of contamination in the east-dipping Paleozoic formations along Dry Ridge.

J.R. Simplot Company, Rock Springs Phosphate Plant, Wyoming. Researched the history of the facility and the geology and hydrogeology of the site and developed a description of site conditions. Designed the field investigation and wrote the Sampling and Analysis Work Plan for the RCRA Section 3013(a) investigation at the phosphate processing plant and gypsum storage facility near Rock Springs. Performed a technical review and technical edit of the Sampling and Analysis Summary Report.

Jacobs Engineering Group, STORET Database, Central US. Compiled well construction parameters and water quality data from groundwater monitoring wells at RCRA sites in the US for EPA's STORET database**.**

NEPA/NRDA EXPERIENCE

Port of Portland, Natural Resource Damage Assessment (NRDA), Oregon. Reviewed thousands of documents to identify those useful for evaluating natural resources injury and potential natural resource restoration needs associated with the Portland Harbor Superfund Site, Lower Willamette River.

Battle Mountain Gold, Battle Mountain Gold Mine EIS, Nevada. As a consulting geologist, supervised borehole drilling, logged cuttings and core, constructed geologic map and cross sections, and measured groundwater levels in existing wells. Compiled geologic and hydrogeologic data for site characterization and groundwater modeling to quantify the potential effects of proposed gold mining operations for preparation of the Draft Environmental Impact Statement (EIS).

LITIGATION SUPPORT

Calumet Montana Refining, Calumet Refinery Litigation Support, Montana. Reviewed thousands of documents and prepared a summary of the sources, nature and extent of contamination, and history of work performed at the oil refinery under RCRA. Assisted in preparing reports for expert witness testimony.

BP Atlantic Richfield, East Helena Lead Smelter Litigation Support, Montana. Assisted counsel and testifying expert researching topics related to the distribution of arsenic in groundwater underlying the site and in downgradient areas and compiled environmental data and references for disposition.

GEOLOGY EXPERIENCE

US Geological Survey, Central Mineral Resources, Nevada and Wyoming. Mapped areas of the Toano-Goshute Range in eastern Nevada, interpreted the structural geology of the region, and coauthored several USGS maps and reports. Researched and compiled published information on the mineral and energy resource potential of 107 roadless areas and wilderness areas in Wyoming and coauthored an open-file report.

Oil Company Subscribers, Database/Regional Studies, Wyoming and Montana. Compiled and entered drilling, well completion, and oil production data into the WOFDA database for wells in the Williston, Permian, and Powder River Basins. Updated a 6000-well Minnelusa Formation database in the Powder River Basin. Described core and cuttings, constructed cross sections and fence diagrams, interpreted depositional environments and diagenesis, and coauthored reports summarizing the oil potential of Pennsylvanian/Permian reservoirs in the Denver Basin, Wyoming, and Silurian Interlake Group in the Williston Basin, Montana.

BP ARCO Exploration Company, Western US. Collected rock samples for geochemical analyses to determine hydrocarbon content and source rock potential at outcrop locations in the western US. Wrote a report on the petroleum potential of source and reservoir rocks in the Columbia River Basin.

ExxonMobil, Mobil Coal Company/Nufuels Corporation, Alaska and Wyoming. Supervised drilling contractors, described core, wrote daily drilling reports, constructed cross sections, correlated coal seams, and calculated coal reserves in Alaska. Supervised drilling contractors, described cuttings, and delineated ore zones for a uranium exploration project in Wyoming.

American Stratigraphic Company (Amstrat), Colorado and Montana. Described over 50,000 feet of cuttings and core from oil and gas wells in the Denver, Raton, and Piceance Basins. Constructed interpretive logs using lithology, hydrocarbon shows, and geophysical well logs. Picked tops, correlated well logs, and constructed 54 cross sections of the Devonian Duperow and Birdbear Formations in the Williston Basin.

REGISTRATIONS AND PROFESSIONAL AFFILIATIONS

Registered Professional Geologist, Wyoming PG-3995
Geological Society of America

EDUCATION AND TRAINING

MS Geology, University of Arizona, 1984
BA Geology, Western Colorado University, 1978

Environmental Chemistry, University of Wisconsin
Investigation and Remediation of Hazardous Waste Sites, University of Wisconsin
Technical Writing, National Groundwater Association
40-Hour OSHA Health and Safety Training

WORK HISTORY

Senior Geologist – Formation Environmental, Colorado (2009–present)
Consulting Geologist – WOFDA, Colorado (2007–2009)
Project Manager/Senior Geologist – Versar, Colorado (1996–1998)
Consulting Geologist – Baker Consultants, Nevada, Colorado (1995–1996)
Senior Geologist/Project Manager – S.M. Stoller, Colorado (1992–1995)
Geologist/Project Manager – TetraTech/Ebasco, Washington, Colorado (1990–1992)
Consulting Geologist – Minnelusa Exploration Database, Wyoming (1989)
Consulting Geologist – E.R. Magathan & Assoc., Montana, Colorado (1986–1988)
Geologist – USGS, Central Mineral Resources, Nevada, Wyoming (1984–1986)
Geologist – BP/ARCO, ExxonMobil, Wyoming, Alaska, Western US (1981–1983)
Geologist – American Stratigraphic Company, Colorado, Montana (1979–1980)

PUBLICATIONS

Ketner, KB, Day, WC, Elrick, Maya, Vaag, MK, Zimmerman, RA, Snee, LW, Saltus, RW, Repetski, JE, Wardlaw, BR, Taylor, ME, and Harris, AG, 1998. An outline of tectonic, igneous, and metamorphic events in the Goshute-Toano Range between Silver Zone Pass and White Horse Pass, Elko County, Nevada: A history of superposed contractional and extensional deformation. USGS PP 1593, 12p.

Tegtmeyer, KJ, Vaag, MK, Broussard, MC, and Langman, JW, 1991. Surface geologic mapping at Rocky Flats Plant, Jefferson County, Colorado: An often overlooked, inexpensive, non-intrusive method for characterizing groundwater contaminant pathways. GSA Abstracts with Program, v. 23.

Day, WC, Elrick, Maya, Ketner, KB, and Vaag, MK, 1987. Geologic map of the Bluebell and Goshute Peak Wilderness Study Areas, Elko County, Nevada. USGS Miscellaneous Field Studies Map MF-1932.

Ketner, KB, Day, WC, Elrick, Maya, Vaag, MK, Gerlitz, CM, Barton, HN, and Saltus, RW, 1987. Mineral resources of the Bluebell and Goshute Peak Wilderness Study Areas, Elko County, Nevada. USGS Bulletin 1725-C, 18p.

Ketner, KB, Day, WC, Elrick, Maya, Saltus, RW, Vaag, MK, and Zimmerman, RA, 1986. Structural style and age of extension, Toano-Goshute Range, Elko County, Nevada (abst.). GSA Rocky Mountain Section Meeting, Flagstaff, Arizona.

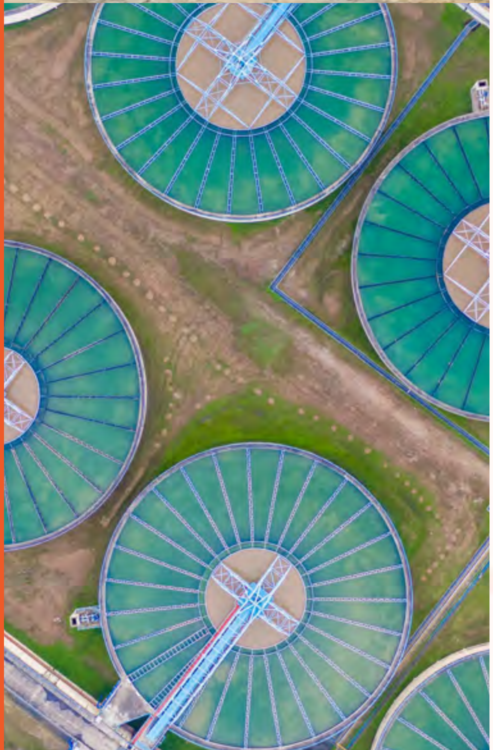
Vaag, MK and Wise, KK, 1985. Mineral resource potential of National Forest RARE II and Wilderness lands in Wyoming. USGS Open-File Report 85-0273, 102p.

QUALITY ENVIRONMENTAL AND ENGINEERING CONSULTING SERVICES AND A COMMITMENT TO SAFETY

Statement Of Qualifications

Soil and Groundwater Sampling and Remediation

COMPANY PROFILE



Only the right people with the right experience can achieve the best project outcome.

Alloy Group has the fundamental goal of providing high quality environmental consulting products and services at a reasonable cost to our clients. We have strong experience in areas including water treatment, groundwater and soils sampling, soil removal and reclamation, groundwater treatment, project management, and construction management and supervision.

Alloy Group is a growing business that continues to emphasize client-centered values. We tailor expertise to individual clients, hire only the most valuable personnel, and remain flexible to client demands. Quality is our top priority to ensure maximum customer satisfaction and trust.

We find opportunities that result in continuous environmental and operational improvements, decreased project management burden and lower lifecycle project costs. Throughout our work, we maintain a commitment to safety. Alloy Group has received the Contractor Performance Award from BP Remediation Management for the past five years of incident free work.

> "Quality is our top priority to ensure maximum customer satisfaction and trust"

Our team holds a collective wealth of knowledge and skill. Individually, our team members have direct experience in the mining, energy, environmental, and construction industries.

Reliable and Safe Operations

Butte Priority Soils, Montana

Alloy Group personnel managed all aspects of the Butte Priority Soils Remedial Investigation and Feasibility Study including the following: a) Development of the Remedial Investigation Work Plan that met Administrative Order Statement of Work requirements; b) Development of detailed Remedial Investigation sampling and analysis plans; c) development and implementation of treatability studies (including work plans/ designs, sampling and analysis plans, construction, implementation, operations and maintenance, construction completion reporting etc.); d) planning and implementation of the Feasibility Study, including: development of preliminary technology screening; developing preliminary remedial alternative objectives and goals; and conducting alternative development and screening against NPL criteria.

"Development of the Remedial Investigation Work Plan that met Administrative Order requirements"

Anaconda-Deer Lodge County Waterline Soils Characterization, Montana

ADLC selected Alloy Group to provide engineering design, surveying, and construction oversight services for the replacement of municipal water supply transmission lines, including characterizing soils at several locations within the city of Anaconda. The soil sampling and characterization component of this project involved designing, permitting, and overseeing borehole drilling operations; documenting soil characteristics (texture, grain size, color, etc.) during drilling; collecting samples for geotechnical laboratory analysis; and interpreting geotechnical analysis to inform pipeline design and construction requirements.

Yerington Mine Site, Nevada

The Yerington Mine Site consists of over 2,000 acres of historic pit mining, ore process facilities, and waste rock.

Technical needs at the site include large-scale groundwater monitoring and sampling, evaluating contaminant fate and transport in complex groundwater and surface water systems, and developing human health and ecological risk assessments.

In addition to overall site progression and project management, Alloy Group provided expertise in the characterization of on-site and off-site groundwater, native soils, and waste solids to distinguish potential mine and process area contributions from other non-mine contamination sources.

Alloy Group completed a groundwater Remedial Investigation Report representing a successful completion to 10+ years of sampling and characterization activities.

Rico Soils, Colorado

Personnel of Alloy Group administered all aspects of project management for the project, which including the implementation of large scale residential yard soil sampling and yard soil removal activities; development of water treatment effluent discharge standards; and evaluation of water treatment alternatives. Personnel of Alloy Group organized local, state, and federal agency negotiations that successfully resulted in avoidance of Superfund listing.

"...characterization of on-site and off-site groundwater ... and soils"

Permitting and Regulator Services, Multiple States

Alloy Group personnel have supported clients with the development, submittal and maintenance of multiple environmental, development and construction permits in several states, including Montana, Colorado, California, New Mexico, and Arizona.

Permitting support has included Aquifer Protection Permits, State Mine Inspector Reclamation Planning, Storm Water Management permits and plans, Spill Prevention Control and Countermeasures Plans, Army Corps of Engineers Nationwide Permits, Bureau of Land Management Plan of Operations, United States Forest Service Environmental Assessments, Nuclear Regulatory Commission permits, city and county development permits and plans, floodplain delineation and permitting, and State Historic Preservation Office cultural resource inventories.

Acid Storage, Miami Mine

Alloy Group personnel provided civil engineering design services for the construction of a concrete/high-density polyethylene lined storage facility, approximately 400,000 gallon acid effluent tank and two, 1.3 Million gallon process acid storage tanks, including geotechnical evaluations, process pumping and piping system, controls, lighting and spill containment facilities at the Miami Mine near Globe, Arizona.

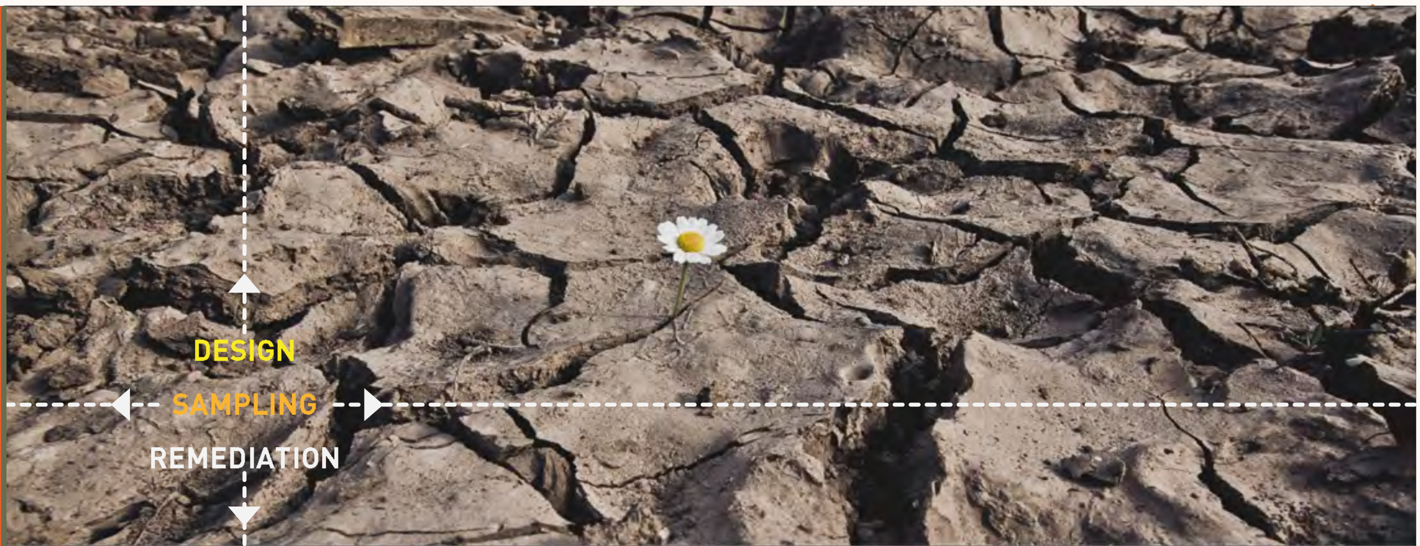
"1.3 Million gallon process acid storage tanks"

Industrial Facilities Soil and Groundwater Sampling and Remediation Capabilities

Alloy Group staff have extensive experience in soil and groundwater services for a range of industrial facilities. We have successfully worked under a variety of state and federal regulatory programs and strict health and safety plans to provide innovative solutions to industrial soil and groundwater issues. We work closely with clients to design outcome-based sampling plans that are focused on meeting regulatory needs and risk-based quality objectives.

Our capabilities include implementing a wide range of efficient sampling methods consistent with job site and access requirements, performing quality assurance oversight of sampling and analytical results, and data review and interpretation. When sampling is over, we excel at condensing results into clear and concise reports that emphasize easy-to-understand data visualizations and accurate interpretations. We advocate for our client by effectively presenting finding to regulatory agencies and stakeholders.

SERVICES



SOIL & GROUNDWATER SAMPLING

> Sampling program development

> Program implementation and management

> Site characterization

> Sampling protocol and analysis QA/QC

SOIL & GROUNDWATER REMEDIATION

> Remediation design and implementation oversight

> Cost estimating

> Project management

> Health and safety consulting

We provide high-quality soil and groundwater sampling and remediation consulting services

DATA COLLECTION AND MANAGEMENT

> Database management and analysis

> Data flow optimization

> Mobile data collection and delivery systems

> Topographic surveying and GIS mapping

at a reasonable cost.

CONTACT

Alloy Group is ready to help

We welcome the opportunity to discuss your project-specific needs or overall project development in process engineering and piping design.

www.alloygroup.com

CONTACT

Clive Mecham, CIH
Vice President Engineering & Environmental Services

Alloy Group
406 East Park Avenue, Suite 2
Anaconda, MT 59711
Email: cmecham@alloygroup.com
Office: 406.563.2700

Alloy Group - *Corporate Headquarters*
4000 Triangle Lane, Suite 160
Export, PA 15632
Office: 877.635.3311

The Alloy Group
406 East Park Avenue
Anaconda MT, 59711
(406) 563-2700

Education
B.S. Chemical Engineering

Expertise
Acid Rock Drainage (ARD)

Mine Site Remediation

Water Treatment

Project Controls

Project Management

Field Oversight

Certifications/Training
40-hr HAZWOPER

8-hr HAZWOPER Supervisor

Kevin Pfeifer

Senior Engineer/Project Manager

Kevin has ten years of experience specializing in water treatment of Acid Rock Drainage (ARD) and mine site remediation. His specific skills include project controls and cost estimations, technical document preparation, field oversight, data analysis, engineering design, and project management.

Selected Key Project Experience

Representative Experience:

- Rico-Argentine Mine Site, Colorado. Provide project management for site operations, maintenance, and monitoring (OM&M) as well as engineering evaluations and designs. Supported development of water and soil sampling and analysis plans. Performed project control tracking of multiple projects including the development and tracking of schedules and field observation of work on-site. Supported data analysis, sampling, operations and maintenance, and troubleshooting activities of the commissioning of the Constructed Wetlands Demonstration Treatment System and Enhanced Wetland Demonstration Treatment System that treats ARD. Assisted with the development of cost estimations and conceptual design of multiple ARD water treatment system scenarios.
- Leviathan Mine Site, California. Provided field oversight and field engineering support for commissioning and operations and maintenance activities of a high-density sludge (HDS) water treatment system and a bioreactor water treatment system, both designed to treat ARD. Participated in numerous off-site troubleshooting activities involving ARD water treatment power generation system, fire control panel, and other components. Assisted in the preparation of multiple agency-required reports and the design of a conveyance system to convey ARD to the HDS treatment system.
- Butte Priority Soils Operable Unit, Montana. Assisted in the preparation of technical proposals for storm water control improvements, surface amendments, and expansion of the mine waste repository including health and safety, project controls, development of quantities, project tasking, scheduling, and cost estimates.
- Mill Creek TIFID Preliminary Engineering Report, Montana. Assisted in the preparation of a preliminary engineering report including water distribution system design, sanitary sewer system design, stormwater design, road design, and preliminary subdivision. Developed cost estimates for infrastructure improvements.
- Anaconda Waterline Replacements, Montana. Assisted with field QA/QC of waterline replacement projects on an as-needed basis. Reviewed submittals and provided project oversight/management support as needed.

APPENDIX E - STATE'S TECH MEMO ON RISK-BASED SCREENING LEVELS FOR LEAD IN SOIL AT RICO TOWNSITE

Technical Memorandum

Risk-based Screening Levels for Lead in Soil at the Rico Townsite, Voluntary Cleanup Site

Prepared by the Toxicology and Environmental Epidemiology Office

9/16/2022

COLORADO
Department of Public Health & Environment

Contents

List of Acronyms

ALM	Adult Lead Model
ATSDR	Agency for Toxic Substances and Disease Registry
PbBo	baseline blood lead concentration value
BGS	below ground surface
PbB	blood lead concentration value
BLLs	blood lead levels
CDC	Centers for Disease Control and Prevention
CDPHE	Colorado Department of Public Health and Environment
EPA	US Environmental Protection Agency
GSD	geometric standard deviation
GSD_i	geometric standard deviation of PbB
IEUBK	Integrated Exposure Uptake Biokinetic Model
Pb	lead
LAL	lead action level
MSD	Mass Soil-to-Dust
mg/day	milligrams of lead per day
mg/kg	milligrams of lead per kilogram of soil
NCI	National Cancer Institute
NHANES	National Health and Nutrition Examination Survey
OLEM	Office of Land and Emergency Management
RBSLs	risk-based screening levels
SHEDS-Soil/Dust	Stochastic Human Exposure and Dose Simulation Soil and Dust
µg/dL	micrograms of lead per deciliter of blood
µm	micrometer
VCUP	Voluntary Cleanup Program

Introduction and Purpose of Evaluation

The Toxicology and Environmental Epidemiology Office (TEEO) of the Colorado Department of Public Health and Environment (CDPHE) drafted this memorandum upon request from the Hazardous Waste and Waste Management Division (HMWMD) of CDPHE. The overall purpose of this memorandum is to establish risk-based screening levels (RBSLs) for lead in soil at residential properties and recreational areas at the Rico Townsite, Dolores County, Colorado.

A draft application has been submitted to the HMWMD's Voluntary Cleanup Program (VCUP) by the Town of Rico and the Atlantic Richfield Company. The intent of the VCUP application is to investigate and remediate lead contaminated soil within the Town of Rico. The VCUP effort was initiated in 2004 and approximately 78 properties have been remediated to date. Around 2007, the VCUP efforts at the Rico Townsite stalled and no properties have been remediated since that time. The current application to the VCUP is intended to revitalize the remedial efforts initiated in 2004.

In general, the remedial plan includes excavation of soil in parcels where the 0-2-inch soil lead concentration exceeds the applicable lead action level (LAL). The soil is removed to a depth of approximately 12 inches below ground surface (bgs) and clean soil is used to backfill the excavated area. Prior to backfilling, a barrier/marker material is placed at the bottom of the excavation to mark depth of soil replacement. The excavated soil is then transported to a repository for disposal. The 2004 VCUP agreement was based on LALs of 1,100 milligrams of lead per kilogram of soil (mg/kg) for residential properties and 1,700 mg/kg for non-residential properties.

Since the initial VCUP efforts were initiated, there have been a number of changes to the way health hazards from lead are evaluated due to the expansion in the body of knowledge regarding lead exposures and the potential health hazards. The LALs used in the 2004 VCUP were based on predicted blood lead concentrations of 10 micrograms of lead per deciliter of blood (µg/dL). In short, 95% of children would be expected to have blood lead levels lower than 10 µg/dL from exposures to lead in soil at this site. However, the current scientific literature on lead toxicology and epidemiology provides evidence that adverse health effects are associated with blood lead levels (BLLs) less than 10 µg/dL. There has also been a number of changes to the inputs, or assumptions, to the models that are used to predict blood lead levels in an exposed population.

The purpose of this memorandum is to use this updated information and guidance on lead toxicology and modeling to develop a range of RBSLs that can be used by project managers and applicants of the proposed VCUP to establish LALs that will be used to guide remedial decisions at the Rico Townsite. Many considerations go into establishing a LAL. Primary considerations include the potential health hazards associated with lead in soil, the logistical aspects of a remedy, and background concentrations of lead in the soil. The estimation of

RBSLs only considers the potential health hazards of exposure to lead in soil and therefore represents only one component of risk management associated with a site-specific LAL.

Site Description and Scope of Evaluation

Rico, Colorado is a former mining town sited at the confluence of the Dolores River and Silver Creek in southwestern Colorado. Rico had its first mining claim in 1869. Subsequent mining enterprises in and out of town processed ores for precious metals and lead. Mining activity ceased by 1977, leaving smelter slag, mine waste piles, and tailings spread around town and other areas. Heavy metals from this mining district contribute to elevated background concentrations of naturally occurring lead in surficial soil and rock found in this area.

Exposure to lead can impact peoples' health in a number of ways with the nervous system being the primary target in children and adults. Children are more vulnerable to lead poisoning than adults because their nervous system is still developing. Children can be exposed to lead in their environment and before birth from lead in their mother's body. At lower levels of exposure, lead can decrease mental development, especially learning, intelligence, and behavior (Attachment A).

There are approximately 288 people that live in Rico and roughly nine children ages 0-5 years and 58 women of child-bearing age. These are the most sensitive populations in terms of health risks from lead. The median age of Rico residents is 51 years. This data was pulled from the 2020 Census (https://data.census.gov/cedsci/profile?g=1600000US0864090). However, the number of people living in Rico may differ in the summer and winter months as there are seasonal residents that typically come for the summer and reside elsewhere in the winter.

Since the initial VCUP application in 2004, a variety of sampling and remedial activities have occurred. To date, soil samples have been collected and analyzed for lead from 348 residential parcels (216 developed and 132 undeveloped), 73 non-residential parcels, unpaved roads and alleys, proposed sewer-line corridors, and the Dolores River corridor. As mentioned previously, approximately 78 parcels have been remediated (72 developed and six undeveloped). Therefore, roughly 343 residential and non-residential parcels are potentially under consideration in the current VCUP application. This should be considered a rough estimate of the potential scope of the current VCUP application, not precise numbers of parcels under consideration.

Summary statistics for the parcels that have been sampled is shown below (Table 1). It is important to note that soil lead data has been collected by a number of consultants or agencies over the years. No less than eight different data sources were reviewed for this assessment with data collection spanning from 1995-2015 (Walsh 1995, PTI 1995, CDPHE 1996, Titan 1996, Hudson et al 1997, EPA 2003, TREC 2015, Formation 2021). Not all of these data sources align and there is noted ambiguity and uncertainty associated with the complete data set. The focus of this evaluation is not to conduct a complete data review. Rather, the scope of this assessment is to develop RBSLs for lead in soil for residential and recreational use. RBSLs are not dependent on site-specific soil lead concentrations.

Table 1. Summary Statistics for Lead in Soil at Sampled Parcels in the Rico Townsite, 0-2 inches Below Ground Surface

Remedial Status	Number of Parcels*	Mean Minimum Soil Lead Concentration (mg/kg)	Mean Soil Lead Concentration (mg/kg)	Mean Maximum Soil Lead Concentration (mg/kg)
Un-remediated	278	416	805	1,440
Remediated	76	953	2,158	4,640
Total	354	531	1,096	2,127

Source: Formation Environmental, Rico VCUP Viewer, data pulled on August 25, 2022.
NOTE: mg/kg = milligram lead per kilogram of soil, *the values listed in this table should be considered estimates, any differences in the values presented above with other sources of data is most likely a result of data handling or data discrepancies between various data sources.

Recent Changes in the Body of Knowledge Regarding Lead Toxicity and Epidemiology

A number of changes have recently been made to the assessment of health risks associated with exposure to lead in the environment. Mainly, this includes target BLLs of concern and updated inputs to the models that are used to evaluate lead exposures.

The current screening level listed in the US Environmental Protection Agency's (EPA) Regional Screening Level tables for lead in soil is 400 mg/kg (EPA 2022). This value is based on EPA's Office of Solid Waste and Emergency Response (currently Office of Land and Emergency Management or OLEM) Directive #9355.4-12 (EPA 1994b) and was derived for residential exposures with a target BLL of 10 µg/dL. The current scientific literature on lead toxicology and epidemiology provides evidence that adverse health effects are associated with BLLs less than 10 µg/dL. The latest guidance from EPA in OLEM Directive #9200.2-167 (EPA 2016b), suggests that RBSLs should be derived for a range of target BLLs (from 2-8 µg/dL) to inform site-specific risk management decisions. This approach was utilized in this evaluation to derive a range of RBSLs for consideration as a site-specific LAL for the Rico Townsite.

The EPA recommends the use of toxicokinetic models to correlate blood lead concentrations with soil exposures. Specifically, the EPA recommends the use of the Integrated Exposure Uptake Biokinetic Model (IEUBK) to evaluate exposures from lead-contaminated media for children (ages 12-72 months) in a residential setting (EPA 1994a, EPA 1994c, EPA 1998) . For assessing risks associated with non-residential adult exposures to lead in soil, such as a recreational scenario, the Adult Lead Model (ALM) is used. This methodology focuses on estimating fetal blood lead concentrations in women exposed to lead-contaminated soils.

The IEUBK model is used to predict blood lead concentrations in exposed children and to estimate the probability of a blood lead concentration exceeding a target BLL cutoff. The model allows users to input data on the levels of lead in soil, dust, water, air, and diet. At the low-end of EPA's target BLL cutoff range (i.e. 2 µg/dL), the IEUBK returns RBSLs less than 1 mg/kg lead in soil. This is due to the contribution of lead from other exposure pathways included in the model (i.e. air, water, dietary lead intake).

On Oct. 28, 2021, Centers for Disease Control and Prevention (CDC) updated its blood lead reference value from 5 µg/dL to 3.5 µg/dL in response to the Lead Exposure Prevention and Advisory Committee recommendation made on May 14, 2021 (CDC 2021). The blood lead reference value is a screening tool to identify children who have higher levels of lead in their blood compared with most children. Children who have blood lead test results above the blood lead reference value may need early intervention to prevent lead poisoning. Since the low end target BLL cutoff does not provide any meaningful results for this evaluation, RBSLs will be calculated from a target blood lead level of 3.5 µg/dL to 8 µg/dL.

Changes in the Evaluation of Health Risks from Exposure to Lead at Superfund Sites

Changes to the model inputs have a significant effect on the estimated RBSL values.The latest guidance on recommended input parameters for the IEUBK and ALM was therefore used to establish RBSLs for lead in this evaluation.

As mentioned previously, the IEUBK model uses a number of factors such as dietary lead ingestion, ambient air, water, and indoor dust and soil ingestion to estimate a soil concentration at which a particular blood lead level is predicted to occur.

Following an extensive review of new information and a reevaluation of the default input values used to quantify each exposure pathway included in the model, the EPA Technical Review Workgroup for Lead and Asbestos released a number of updated recommendations to the IEUBK in 2016 and 2017. In May 2021, the EPA released an updated version of the IEUBK model (IEUBK Version 2 or IEUBKv2) incorporating those recommendations. These changes are discussed in detail in Attachment B. Three of the most notable changes to the defaults in IEUBKv2 were updated soil and dust ingestion rates, updated drinking water ingestion rates, and updated inputs for dietary lead exposure. These changes are expected to improve the model's ability to more accurately predict blood lead levels in a residential population.

For recreational exposures, the EPA ALM was used to establish a range of RBSLs for consideration as the LAL. Updated guidance for the ALM was released in 2017 (EPA 2017). Two notable changes were made to the default values including the geometric standard deviation (GSD) and the baseline blood lead levels (PbB_o) in women of childbearing age.

The PbB_o is the geometric mean blood lead concentration (µg/dL) in U.S. women of child-bearing age. The former PbB_o values were originally derived from blood lead data for U.S. women 17-45 years of age that contributed to the 3rd National Health and Nutrition Examination Survey (NHANES) survey (1988-1991) and other site-specific information. These parameters were updated in 2002, 2009, and 2016 using additional NHANES data (1988-1994; 1999-2004; 2007-2012). PbB_o was updated by EPA again in 2017 using the most recent six years of NHANES blood lead data (2009-2014) for women 17-45 years old. Analysis in the EPA study noted the declining PbB_o over time in sequential NHANES data sets. The ALM PbB_o was ultimately updated to 0.6 µg/dL with a 90% confidence interval of 0.62-0.66 (EPA 2017).

The GSD is a measure of the inter-individual variability of blood lead and is used to create a blood lead concentration distribution. The 2017 guidance document updated the default GSD to 1.8 with a 90% confidence interval of 1.76-1.85.

Changes to the Default Parameters in the Integrated Exposure Uptake and Biokinetic Model used in this Evaluation

In this assessment, two of the default parameters in the IEUBK were also adjusted based on additional analysis of ingestion rates for young children and more recent information from other mining sites in EPA Region 8 regarding the mass soil to dust transfer ratio, or MSD.

Soil and Dust Ingestion Rates

The IEUBKv2 included a number of updates to the default input parameters of the model including updated model input variables for dietary lead exposure using data from NHANES along with statistical methodology developed by the National Cancer Institute (NCI) and updated the soil/dust ingestion rates based on an analysis of soil, indoor dust and blood lead concentration data from the Bunker Hill Superfund Site (von Lindern et al 2016). However, more recent analysis of soil and dust intake suggest that the mean intake of soil and dust by young children is lower than some of the current default soil and dust ingestion rates that are based on von Lindern et al (2016) (Zartarian et al 2017, Ozkaynak et al 2022).

These studies use the Stochastic Human Exposure and Dose Simulation Soil and Dust (SHEDS-Soil/Dust) model to estimate soil and dust ingestion rates. The SHEDS-Soil/Dust model predicts soil and dust ingestion by pathway, source type, population group, geographic location, and other factors, which may offer a better characterization of exposures relevant to health risk assessments (Ozkaynak et al 2011).

In general, the soil and dust ingestion rates from von Lindern et al (2016), Ozkaynak et al (2022) and Zartarian et al (2017) align fairly well, particularly for the 3-6 year old age range (Table 2). For the 1-2 year old age range, however, the ingestion rates found in von Lindern et al (2016) are nearly two times as high as the values found using the SHEDS-Soil/Dust model, (93 mg/day vs. 45-48 mg/day, respectively). Ozkaynak et al (2022) suggests that differences in the methodology used, smaller sample size of the biokinetic study for young children and the specific geographic location of the von Lindern et al (2016) study may have played a role in differences found in the observed findings (Ozkaynak et al 2022).

In light of the improved modeling approach used by Ozkaynak et al (2022) and Zartarian et al (2017) and the increased likelihood that the ingestion rates found using the SHEDS-Soil/Dust model better represent actual ingestion rates of soil and dust by young children, the values from the Ozkaynak et al (2022) study were used in this evaluation.

Table 2. Mean Soil and Dust Ingestion Rates Found in Various Studies (mg/day)

Age (years)	von Lindern et al 2016	Zartarian et al 2017	Ozkaynak et al 2022
1	84	44	***40***
2	93	45	***48***
3	67	52	***52***
4	62	56	***59***
5	65	63	***59***
6	51	54	***59***
Average	70	53	***53***

NOTE: mg/day = milligram lead per day. Values from Ozkaynak et al (2022) study (italics) were used in this evaluation

Mass Soil to Dust Transfer Ratio (MSD)

The Mass soil-to-Dust (MSD) transfer ratio describes how much lead from outdoor soil is tracked into the house and is found in dust. When discussing lead in particular, the MSD predicts how the lead in indoor dust is related to soil lead concentrations in the surrounding property. The MSD is another input variable in the IEUBK model. The default IEUBK MSD is 0.70 (EPA 1994b). Simply put this means that approximately 70% of lead found in household dust is attributable to outdoor soil. Paustenbach et al (1997) commented “In general, the concentration of contaminants appears to be greater in house dust relative to exterior soil.” They also caveated this statement by observing the reverse condition in mining or smelting areas, which suggests that MSD values may be lower at these sites.

According to a number of studies, the MSD used in the current version of the IEUBK may overestimate the true MSD found at various sites in Region 8 using paired sampling of soil and dust (Brattin and Griffin 2011, EPA 2016a, PWT 2017, Tu et al 2020). Overestimation of the MSD in the IEUBK can result in a protective, but overestimation of childhood lead hazards. Brattin and Griffin (2011) examined paired soil and dust data from multiple properties at nine different sites in Region 8 and found MSD values of 0.04 to 0.35 after using a simple method to account for measurement errors. EPA (2016a) and PWT (2017) found the MSD at the Colorado Smelter site in Pueblo, Colorado of 0.36 using paired indoor dust and outdoor soil data from 102 residential properties. Tu et al (2020) used paired data from residential yard soil and indoor dust datasets from eight communities near historical mining, smelting, and found MSD values ranging from 0.14 to 0.47.

It is also important to note that studies have that found that when soil lead levels are high (e.g., at former mining/smelting sites), the concentration of lead in indoor dust may tend to be lower than outdoor soil (Paustenbach et al 1997, Oomen and Lijzen 2004, Tu et al 2020). This is an important point to consider at sites such as the Rico Township that have high naturally occurring background levels of lead. Paired household dust and soil samples have been collected in Rico in the past in an attempt to describe the MSD for the Rico Townsite (Integral 2006a, Integral 2006b, Integral 2007, Tu et al 2020, Ramboll 2022).

Tu et al (2020) examined paired data from 53 homes in the Rico Townsite and found a MSD value 0.087. However, there are several potential discrepancies that were identified. The data used in Tu 2020 only included dust data collected in May 2006. Additional dust data was collected in September 2006 from the site. The paired sampling data from Tu et al (2020) was not available in the document, so a deep dive into the data was not possible. However, based on the number of samples that were included in the analysis, it appears that dust collection at some properties occurred after the soil had been remediated. This data should have been excluded from the analysis.

TEEO reanalyzed the paired soil and dust data collected from the Rico Townsite (Attachment C). TEEO's reanalysis of this data indicated primarily negative MSDs, which could indicate that the paired soil and dust data that has been collected in Rico is not representative of actual conditions at the site or that a good correlation between soil and dust can not be established using the regression approach. However, when the paired soil and dust data ratios from Rico are averaged, the MSDs align fairly well with the MSD of 0.36 established at the Colorado Smelter site.

Based on the review of these studies and a multiple lines of evidence approach, a MSD of 0.36 was selected for use in this evaluation. This MSD is consistent with other studies at mining and smelting sites in Region 8 and is thought to provide a conservative, yet more realistic estimate of childhood lead hazards at this site. Additional discussion regarding the MSD is included as Attachment C. It should be noted that this MSD is considered appropriate for mining and smelting sites in Colorado based on the currently available information. Any adjustment to the default MSD at other sites in Colorado should be considered on a site-specific basis.

Site-Specific Risk-based Screening Levels for Lead

Using the exposure inputs described above, IEUBKv2 was used to determine RBSLs for child residents and the ALM was used for recreational exposures as described below.

Residential RBSLs

The RBSLs for each target BLL cutoff ranging from 3.5 µg/dL to 8 mg/dL are shown below (Table 3). These RBSLs are based on a high level of confidence meaning that there is a 95% chance that children exposed to lead in soil at these RBSLs will have BLLs lower than the chosen blood lead cutoff. The corresponding RBSLs range from 150 mg/kg for the 3.5 µg/dL target BLL cutoff to 761 mg/kg for 8 µg/dL. At 5 µg/dL, the RBSL is 348 mg/kg.

Table 3. Risk-based Screening Levels for Residential Parcels

Change Cutoff (µg/dL)	Mass Soil to Dust Ratio	Soil and/or Dust Concentration (mg/kg)
3.5	0.36	150
4	0.36	216
5	0.36	348
6	0.36	483
7	0.36	620
8	0.36	761

NOTE: µg/dL = micrograms of lead per deciliter of blood, mg/kg = milligrams of lead per kilogram of soil

Recreational RBSLs

The RBSLs for recreational exposures were derived using the latest guidance on the EPA ALM (Table 4). The ALM predicts the fetal blood lead level in pregnant individuals as opposed to children. No adjustment was made to the default exposure factors in the ALM. The recreational RBSLs were derived based on the assumption of 52 days of exposure over an averaging time of 6 months (approximately 2 days per week). This averaging time was selected since it is unlikely that recreational exposures to soil will occur more than six months per year in this area due to snow cover limiting exposure to soil.

As with the IEUBK, these RBSLs are based on a high level of confidence meaning that there is a 95% chance that fetal BLLs are lower than the chosen blood lead cutoff. The corresponding RBSLs range from 1,267 mg/kg for the 3.5 µg/dL target BLL cutoff to 4,010 mg/kg for 8 µg/dL. At 5 µg/dL, the RBSL is 2,182 mg/kg.

Table 4. Risk-based Screening Levels for Recreational Users

Variable	Description of Variable	Units	GSD_i and PbB_o from Analysis of NHANES 2009-2014	GSD_i and PbB_o from Analysis of NHANES 2009-2014	GSD_i and PbB_o from Analysis of NHANES 2009-2014	GSD_i and PbB_o from Analysis of NHANES 2009-2014	GSD_i and PbB_o from Analysis of NHANES 2009-2014	GSD_i and PbB_o from Analysis of NHANES 2009-2014
$PbB_{fetal, 0.95}$	Target PbB in fetus (e.g., 2-8 µg/dL)	µg/dL	3.5	4	5	6	7	8
$R_{fetal/maternal}$	Fetal/maternal PbB ratio	--	0.9	0.9	0.9	0.9	0.9	0.9
BKSF	Biokinetic Slope Factor	µg/dL per µg/day	0.4	0.4	0.4	0.4	0.4	0.4
GSD_i	Geometric standard deviation PbB	--	1.8	1.8	1.8	1.8	1.8	1.8
PbB_0	Baseline PbB	µg/dL	0.6	0.6	0.6	0.6	0.6	0.6
IR_S	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050	0.050	0.050	0.050	0.050	0.050
$AF_{S, D}$	Absorption fraction (same for soil and dust)	--	0.12	0.12	0.12	0.12	0.12	0.12
$EF_{S, D}$	Exposure frequency (same for soil and dust)	days/yr	52	52	52	52	52	52
$AT_{S, D}$	Averaging time (same for soil and dust)	days/yr	180	180	180	180	180	180
RBSL in Soil*	**Risk-based screening levels in soil for recreational users**	**mg/kg**	**1,267**	**1,572**	**2,182**	**2,791**	**3,400**	**4,010**

NOTE: mg/kg: milligrams of lead per kilogram of soil, µg/day = microgram of lead per day, g/day = gram per day, days/yr = days per year, µg/dL = micrograms of lead per deciliter of blood, *no more than 5% probability that fetal PbB exceeds target PbB

Recommendations

The selection of a site-specific Lead Action Level (LAL) is dependent upon a number of factors. Primary considerations include the potential health hazards associated with lead in soil (RBSLs), the logistical aspects of a remedy, and background concentrations of lead in the soil. The derivation of RBSLs only considers the potential health hazards of exposure to lead in soil and therefore represents only one component of risk management associated with a LAL. In circumstances where background soil lead concentrations are negligible or unknown, the RBSL is usually selected as the LAL. However, background concentrations of lead in soil are also considered when establishing a LAL because it is not common practice to reduce soil lead concentrations below naturally occurring levels at VCUP, or other similar sites.

Background concentrations of lead in soil in the Rico area have been assessed in other documents (Formation 2021, TEEO 2022) and naturally occurring lead appears to be elevated in this area with respect to other sites in Colorado. Naturally occurring lead concentrations exceed a number of the RBSLs derived in this evaluation. TEEO recommends that the LAL selected for this site is the lowest RBSL that is reasonably achievable considering other site characteristics and does not exceed the target blood lead level cutoff of 8 µg/dL, or 761 mg/kg for residential exposures and 4,010 mg/kg for recreational exposures.

References

(Brattin and Griffin 2011). Brattin W and Griffin S. Evaluation of the Contribution of Lead in Soil to Lead in Dust at Superfund Sites. Human and Ecological Risk Assessment: An International Journal. 17(1): 236-44. February 2011.

(CDC 2021). Centers for Disease Control and Prevention. Recommendation for a Revised Blood Lead Reference Value. August 2021.

(CDPHE 1996). Colorado Department of Public Health and Environment. Hazardous Materials and Waste Management Division, Soils study, Rico, Colorado. August 1996.

(EPA 1994a). U.S. Environmental Protection Agency. Guidance Manual for the Integrated Exposure Uptake Biokinetic Model for Lead in Children. Office of Emergency and Remedial Response. Publication Number 9285.7-15-1. EPA/540/R-93/081. February 1994.

(EPA 1994b). U.S. Environmental Protection Agency. Office of Solid Waste and Emergency Response. Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities. OSWER Directive #9355.4-12. EPA/540/F-98-030. August 1994.

(EPA 1994c). U.S. Environmental Protection Agency. Technical Support Document: Parameters and Equations Used in the Integrated Exposure Uptake Biokinetic Model for Lead in Children (v0.99d). Office of Solid Waste and Emergency Response. OSWER #9285.7-22. EPA 540/R-94/040. December 1994.

(EPA 1998). U.S. Environmental Protection Agency. Clarification to the 1994 Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities. OSWER Directive 9200.4-27. EPA/540-F98/030. August 1998.

(EPA 2003). U.S. Environmental Protection Agency. Recommendations of the Technical Review Workgroup for Lead for an approach to assessing risks associated with adult exposures to lead in soil. EPA/540/R/03/001. January 2003.

(EPA 2016a). U.S. Environmental Protection Agency. Evaluation of the contribution of outdoor lead in soil to indoor lead in dust at Colorado Smelter Superfund site. June 2016.

(EPA 2016b). U.S. Environmental Protection Agency. Office of Land and Emergency Management. Updated Scientific Considerations for Lead in Soil Cleanups. OLEM Directive 9200.2-167. December 2016.

(EPA 2017). U.S. Environmental Protection Agency. Office of Land and Emergency Management. Transmittal of update to the Adult Lead Methodology's default baseline blood lead concentration and geometric standard deviation parameters. OLEM Directive 9285.6-56. May 2017.

(EPA 2022). U.S. Environmental Protection Agency. Regional Screening Levels for Chemical Contaminants at Superfund Sites, Generic Tables. May 2022.

(Formation 2021). Formation Environmental. Memorandum: Background Lead Concentrations in Rico Townsite soil (with accompanying spreadsheet). October 2021.

(Hudson et al 1997). Hudson TL, Borden JC, Russ M, and Bergstrom PD. Controls on As, Pb, and Mn distribution in community soils of an historical mining district, southwestern Colorado. Environmental Geology. 33(1): 25-42. December 1997.

(Integral 2006a). Integral Consulting Inc. Lead health risk assessment for Rico Townsite soils. April 2006.

(Integral 2006b). Integral Consulting Inc. Blood lead and environmental monitoring study for Rico Townsite, Phase I data summary report. September 2006.

(Integral 2007). Integral Consulting Inc. Blood lead and environmental monitoring study for Rico, Colorado, Phase II data summary report and trend analysis. February 2007.

(Oomen and Lijzen 2004). Oomen AG and Lijzen JPA. Relevancy of human exposure via house dust to the contaminants lead and asbestos [Dutch]. RIVM report 711701037: 1-58. 2004.

(Ozkaynak et al 2011). Özkaynak H, Xue JP, Zartarian VG, Glen G, and Smith L. Modeled estimates of soil and dust ingestion rates for children. Risk Analysis. 31(4): 592–608. April 2011.

(Ozkaynak et al 2022). Özkaynak H, Glen G, Cohen J, Hubbard H, Thomas K, Phillips L, and Tulve N. Model based prediction of age-specific soil and dust ingestion rates for children. Journal of Exposure Science & Environmental Epidemiology. 32: 472-80. January 2022.

(Paustenbach et al 1997). Paustenbach DJ, Finley BL, and Long TF. The critical role of house dust in understanding the hazards posed by contaminated soils. International Journal of Toxicology. 16(4-5):339-362. February 1997.

(PTI 1995). PTI Environmental Services. Summary of Townsite soils data for Rico, Colorado. November 1995.

(PWT 2017). Pacific Western Technologies. Technical memorandum, site-specific soil-to-dust mass transfer ration (Msd) calculation. Colorado Smelter Superfund site, Pueblo, Pueblo County, Colorado. April 2017.

(Ramboll 2021). Ramboll Environment and Health. Risk-based Concentrations for lead in Rico Townsite soil. December 2021.

(Ramboll 2022). Ramboll Environment and Health. Memo: Re-analysis of mass soil-to-dust transfer factor in Rico Townsite soils. July 2022.

(TEEO 2022). Toxicology and Environmental Epidemiology Office, Colorado Department of Public Health and Environment. Technical Memorandum: Review of Background Concentrations of Lead Soil at the Rico Townsite, Voluntary Cleanup Site. September 2022.

(Titan 1996). Titan Environmental Corporation. Geological mapping and geochemical sampling at Rico, Colorado. January 1996.

(TREC 2015). TREC, Inc. Rico town soil sampling project, Rico (Dolores County) Colorado, 2014-2015 Data Summary Report. December 2015.

(Tu et al 2020). Tu JW, Fuller W, Feldpausch AM, Van Landingham C, and Schoof RA. Objective ranges of soil-to-dust transfer coefficients for lead-impacted sites. Environmental Research. 184: 109349. May 2020.

(von Lindern et al 2016). von Lindern I, Spalinger S, Stifelman ML, Stanek LW, and Bartrem C. Estimating children's soil/dust ingestion rates through retrospective analyses of blood lead biomonitoring from the Bunker Hill Superfund site in Idaho. Environmental Health Perspectives. 124(9): 1462-70. September 2016.

(Walsh 1995). Walsh Environmental Scientists and Engineers, Inc. Phase I and phase II environmental site assessment, Rico, Colorado. March 1995.

(Zartarian et al 2017). Zartarian V, Xue J, Tornero-Velez R, and Brown J. Children's Lead Exposure: A Multimedia Modeling Analysis to Guide Public Health Decision-Making. Environmental Health Perspectives. 125(9): 097009-1-10. September 2017.

Attachment A. Lead Fact Sheets

A1. Lead and Your Health

Learning about lead

Lead can affect almost every organ and system, but the main concern is the nervous system. Lead exposure is hard to detect. Signs and symptoms don't appear until dangerous amounts have accumulated in the body. Children under age 3 and pregnant people are at the highest risk. The good news? Lead poisoning is preventable.

Lead affects children differently

Lead is more dangerous for infants and children because they are rapidly growing and developing. They eat, drink, and breathe at higher rates than adults. Since they spend a lot of time on the floor or ground, they eat or breathe in more dirt and dust. If the dirt or dust they breathe in or swallow has lead in it, more lead will get into their bodies. Have your child tested for lead if they:

- Live in or regularly visit a home built before 1978.
- Live near industrial areas such as lead smelters, battery recycling plants, airports, or others that may release lead.
- Live with an adult whose job or hobbies involve lead.
- Have been in Mexico, Central America, or South America in the past year.
- Use the home remedies Azarcon, Alacron, Greta, Rueda, or Pay-loo-Ah.
- Have a playmate who has been treated for lead poisoning.
- Eat imported candies or foods containing imported spices.
- Have a habit of eating dirt or other non-food items.

Common sources of lead in Colorado

Lead is a metal found in all parts of the environment, including the air, soil, and water. Lead also comes from human activities such as burning coal, mining, and manufacturing. Lead has been used in gasoline, batteries, ammunition, and cosmetics.

Lead-based paint in homes built before 1978.

Home remedies like Greta, Azarcon, Alacron, Rudea or Pay-loo-Ah.

Imported, glazed pottery that may be used for cooking.

Imported spices: turmeric, coriander, black pepper, thyme, & hanuman sindoor.

Lead-containing soil or dust that is tracked into the home.

Hobbies: leaded bullets or fish sinkers, artist paints, furniture refinishing.

Work in industries like construction, mining, welding, and plumbing.

Water in pipes from homes built before 1986.

Questions? Contact ToxCall

303-692-2606 | cdphe_toxcall@state.co.us

How lead poisoning happens

Lead poisoning usually happens when a child eats or inhales small amounts of lead for a long time. But lead poisoning can happen quickly if a person swallows something with lead, such as a toy or paint chip. Lead can hurt your whole body and can harm young children and babies before they are born.

Signs and symptoms of lead poisoning

It can be hard to tell if a child is lead-poisoned because there may be no signs, or the signs may be hard to notice. Lead can cause:

- Harm to the brain and other systems.
- Speech, behavior, and learning problems.
- Slowed growth.
- Hearing problems.
- Digestive problems, loss of appetite.

Lead poisoning can harm health for a long time, even into adulthood. If you think you or your child may have lead poisoning, talk to a health care provider. Some low-cost health clinics also provide lead testing.

Preventing lead poisoning

- If you live in or spend a lot of time in a home that was built before 1978 (for example, grandparents or in-home daycare):
  - » Make sure children cannot get to peeling paint or chewable surfaces that may be covered with lead-based paint, such as windowsills.
  - » If you see any peeling paint chips or dust, clean them up right away. If you rent, let your landlord know about peeling or chipping paint.
  - » Wipe down floors and other household surfaces with a damp cloth or mop at least once a week to reduce possible exposure to lead dust. Thoroughly rinse cloths and mops when you are done.
  - » Regularly wash children's hands and toys to remove dust and dirt. Household dust and outdoor dirt can both contain lead.
  - » If you work around lead, make sure to change your clothes and shoes before entering the house.
  - » Use only cold water from the tap for cooking, drinking, and mixing baby formula. Lead in tap water usually comes from lead pipes in the house, not from the water supply. Hot water is more likely to pick up lead from water pipes.
  - » If you haven't used your water for several hours, run the cold tap water until the temperature is noticeably colder. This can take as much as two minutes.
- Avoid regularly using products from countries that do not have strict lead regulations.
  - » Some imported food products, such as spices and candies, are associated with elevated blood lead levels in Colorado children.
  - » Keep kids away from toys that may contain lead.These toys are often imported.
- Avoid traditional remedies that contain lead.
  - » Some traditional (folk) medicines used by East Indian, Indian, Middle Eastern, West Asian, and Hispanic cultures contain lead.

Lead poisoning in adults

Adults can get lead poisoning. To protect yourself and your family:

- Take precautions if you have a job or a hobby that involves lead. (see Page 1).
- Shower and change your clothes and shoes after finishing an activity that involves working with lead.
- Contact a health care provider if you think you might have lead poisoning.

If you or your child has lead poisoning

- If your doctor has checked your blood for lead and you have been told it is high:
  - » Ask your doctor if the test needs to be confirmed.
  - » If it's still high after the confirmatory test:
    - ◊ Work with your physician on a treatment plan that follows CDC's recommendations.
    - ◊ Work with your local public health department or a lead investigation firm to have your home tested for lead.
    - ◊ Eat a diet high in iron and calcium. Good nutrition can reduce the amount of lead that is absorbed into the body.
    - ◊ Get retested every 3-6 months until your blood lead level returns to normal.
    - ◊ Follow basic steps for prevention (see Page 1).
    - ◊ If you have other individuals living in your home, talk to your doctor about checking their blood lead levels.

A2. Dirt Alert Fact Sheet

Dirt alert!

The soil you come into contact with every day may contain heavy metals, such as lead, arsenic, and mercury, that can get into your body by accidentally eating or breathing in dirt and dust particles. Luckily, you can take simple actions to protect yourself and your family.

HEALTHY HOME BEST PRACTICES

Regularly wash with soap and water

- Hands, especially for children after playing and before eating (***make it a washing game or contest***).
- Toys, bottles, and pacifiers.
- Fruits and vegetables.
- Garden tools.
- Floors (use a mop).
- Surfaces and windowsills.

Keep dirt outside

- Remove and clean shoes before you come in to avoid tracking dirt through the house.
- Use doormats to clean shoes before going inside.
- Leave gardening tools outside.

Create safe places to play

- Don't allow kids to play in bare soil along the sides of buildings or under porches.
- Keep play areas away from old buildings, roads, and suspected mine waste.
- Make sure sandboxes are clean and filled with new sand before using.

Garden safely

- Use raised garden beds with store-bought soil.
- Don't garden next to buildings or roads.
- Remember to wear gloves.

Eat healthy

- Eat a variety of foods rich in iron, calcium, and vitamins A, B, C, and E to reduce the effects of lead and arsenic.

Maintain your home

If you have a home built before 1979, you may have lead-based paint.

- Keep the paint in your home in good condition to reduce peeling, chipping, or flaking paint.
- Do not remove the paint yourself.
- Hire EPA lead-safe certified contractors.
- Replace air filters regularly.

WHY HEAVY METALS MIGHT BE IN THE SOIL

Heavy metals are found naturally in some soil. Other sources include industrial and mining sites. Soil near roads may be contaminated as well. Older homes may have lead paint and arsenic-treated wood, and newer industrial sites might have arsenic-treated wood. The materials can peel, chip, and splinter, and end up in the soil.

More information

Arsenic: www.atsdr.cdc.gov/toxfaqs/tf.asp?id=19&tid=3
Lead: www.atsdr.cdc.gov/toxfaqs/TF.asp?id=93&tid=22

COLORADO
Department of Public Health & Environment
CDPHE
JUNE 2021

Attachment B. US Environmental Protection Agency: Lead at Superfund Sites: Software and Users' Manuals

Overview of Changes to IEUBK Model Software from IEUBKwin version 1.1 build 11 to IEUBKwin version 2.0 build 1.63

Overview of Changes to IEUBK Model Software from IEUBKwin version 1.1 build 11 to IEUBKwin version 2.0 build 1.63

The following changes made have been made in this version of the Integrated Exposure Uptake Biokinetic (IEUBK) model software:

- Updated model input variables for dietary lead exposure using data from the National Health and Nutrition Examination Survey (NHANES) and statistical methodology developed by the National Cancer Institute (NCI).
- Updated model input variables for drinking water consumption using data from the 1994-1996 and 1998 CSFII database and drinking water concentration using data from the 1998-2005 National Compliance Monitoring Information Collection Request.
- Updated baseline maternal blood lead concentration (PbB) using data from NHANES.
- Replaced the inhalation rates with rates that were estimated using a database of doubly-labeled water energy expenditure developed by the institute of Medicine (IOM).
- Updated the soil/dust ingestion rates based on an analysis of soil, indoor dust and blood lead concentration data from the Bunker Hill Superfund Site.
- Changed calculations that are not apparent to user: fixed calculation of GM to sum & divide by number of iterations; calculating just 6 months for 6 to 12 months in the yearly averages.
- Changed the ‘Find’ function and ‘Run’ to reflect P5 target and recommended age range (12-72 months) by default.
- Changed the graphical user interface (GUI) to simplify use, improve appearance and update all links to the TRW homepage.
- Changed the output files to report ages consistently in months.
- Windows 10 environments officially supported.
- Updated the help file to correspond to the updated versions of the IEUBK documentation.

Dietary Lead Update

Version 2.0 reflects new data on food lead concentrations from the Food and Drug Administration's (FDA) market basket survey (FDA, 2010), food consumption data from NHANES (CDC, 2010a,b) and an improved method for estimating food consumption rates developed by the NCI (Tooze et al., 2006). See Table 1.

Table 1. Default and updated values for dietary lead intake in the IEUBK model.

Age Category (months)	IEUBK v1.0 Default Dietary Lead Intake (μg/day)	Previous Recommended Update Dietary Lead Intake (1991-1999 TDS data) (μg/day)	IEUBK v1.1 Updated Dietary Lead Intake Estimate (1995-2003 TDS data) (μg/day) [0.1LOD–0.9LOD]	IEUBK v2.0 Updated Dietary Lead Intake Estimate (1995-2005 TDS data) 2003-2006 NHANES WWEIA (μg/day)
0-11	5.53	3.16	2.26 [1.51–3.01]	2.66
12-23	5.78	2.60	1.96 [1.18–2.74]	5.03
24-35	6.49	2.87	2.13 [1.24–3.03]	5.21
36-47	6.24	2.74	2.04 [1.18–2.90]	5.38
48-59	6.01	2.61	1.95 [1.13–2.77]	5.64
60-71	6.34	2.74	2.05 [1.17–2.92]	6.04
72-84	7.00	2.99	2.22 [1.26–3.18]	5.95

Drinking Water Consumption

The default values for water consumption rates in Version 2.0 are based on an analysis of data from the 1994-1996 and 1998 CSFII database (Kahn and Stralka, 2009). The updated consumption rates are for *consumers only* and correspond to estimates that include all water sources. See Table 2.

Table 2. Default and updated values for water consumption rates in the IEUBK model.

Age Category (months)	IEUBK v1.0 Default Water Consumption Rate (L/day)	IEUBK v2.0 Updated Water Consumption Rate (Kahn and Stralka, 2009) (L/day)
0-11	0.20	0.40
12-23	0.50	0.43
24-35	0.52	0.51
36-47	0.53	0.54
48-59	0.55	0.57
60-71	0.58	0.60
72-84	0.59	0.63

Drinking Water Lead Concentration

The default value of the water lead concentration variable in Version 2.0 has been changed from 4 to 0.9 µg/L. This variable is used to represent the lead concentration in drinking water at the site. The updated value is based on an analysis of water lead concentration data that was developed for the U.S. EPA's Second Six-Year Review of National Primary Drinking Water Regulations (EPA, 2010a, b)[1].

Inhalation Rate

Version 2.0 includes updated inhalation rates that were estimated using data published by the IOM (IOM, 2005). The IOM data were selected following a literature review to identify data and methods for estimating inhalation rates for children. The updated inhalation rates are based on a non-linear regression model estimated using a doubly-labeled water energy expenditure database developed by the IOM. See Table 3.

Table 3. Default and updated values for inhalation rates in the IEUBK model.

Age Category (months)	IEUBK v1.0 Default Inhalation Rate (m^3/day)	IEUBK v2.0 Updated Inhalation Rate Estimate (IOM, 2005) (m^3/day)
0-11	2	3.22
12-23	3	4.97
24-35	5	6.09
36-47	5	6.95
48-59	5	7.68
60-71	7	8.32
72-84	7	8.89

[1]The water lead concentration in drinking water database developed by EPA (2010A,B) using data obtained from the 1998-2005 National Compliance Monitoring Information Collection Request Dataset (i.e., "Six-Year Review-ICR Dataset") was not published as part of the Six-Year Review of National Primary Drinking Water Regulations (U.S. EPA, 2010a,b). The database was delivered by U.S. EPA Office of Groundwater and Drinking Water to the TRW for the purpose of estimating an updated drinking water lead concentration value for the EIBUK Model.

Soil/Dust Ingestion Rate

Version 2.0 includes updated soil/dust ingestion rates that are based on an analysis of data from the Bunker Hill Superfund Site (von Lindern et al., 2016). The updated values were derived using structural equation modeling with lead concentration data for soil and indoor dust, site-specific soil and indoor dust bioavailability data and blood lead concentration data. See Table 4.

Table 4. Default and updated values for soil/dust ingestion rates in the IEUBK model.

Age Category (months)	IEUBK v1.0 Default Soil/Dust Ingestion Rates (mg/day)	IEUBK v2.0 Updated Soil/Dust Ingestion Rates (von Lindern et al., 2016) (mg/day)
0-11	85	86
12-23	135	94
24-35	135	67
36-47	135	63
48-59	100	67
60-71	90	52
72-84	85	55

Changes to the GUI

IEUBKwin Version 2.0 implements several changes to the GUI to make the model easier to use and understand. User-defined age ranges (in months) are now available for all for all run modes and output is presented for only the months selected. All output is expressed in terms of months. Batch mode output now includes the absorption fraction that was used in the batch run. The default cutoff blood lead concentration on the Find and Run functions has been lowered from 10 μg/dL to 5 μg/dL.

Software Installation and Environment

The IUEBK model software has been ported to the latest Microsoft build tools, migrated to work in the Windows 10 environment and enhanced to be backward compatible with the Windows 7 environment. Users can select compatibility mode to run the IEUBK model in earlier versions of Windows. Version information is now read from and held in Version.txt file for version verification outside the software and to support continuous integration build process.

References

Institute of Medicine (IOM). 2005. Doubly Labeled Water Data Set - used to establish the estimated average requirement for energy. Retrieved November 10, 2005, from http://iom.edu/Activities/Nutrition/SummaryDRIs/~/media/Files/Activity%20Files/Nutrition/DRIs/DLW_Database.ashx.

Kahn, H., Stralka, K. 2009. Estimated daily average per capita water ingestion by child and adult age categories based on USDA's 1994-96 and 1998 continuing survey of food intakes (CSFII). J Expo Sci Environ Epidemiol. 19(4):396-404. Epub 2008 May 14.

Tooze, J.A.; Midthune, D.; Dodd, K.W.; Freedman, L.S.; Krebs-Smith, S.M.; Subar, A.F.; Guenther, P.M.; Carroll, R. J.; Kipnis, V. 2006. A New Statistical Method for Estimating the Usual Intake of Episodically Consumed Foods with Application to their Distribution. J. Amer. Diet. Assoc. 106(10): 1575-87.

U.S. Centers for Disease Control and Prevention (U.S. CDC). 2010a. National Health and Nutrition Examination Survey. 2003-2004 Examination, Dietary, and Demographics Files. Retrieved October 4, 2010 from http://www.cdc.gov/nchs/nhanes/nhanes2003-2004.

U.S. Centers for Disease Control and Prevention (U.S. CDC). 2010b. National Health and Nutrition Examination Survey. 2005-2006 Examination, Dietary and Files. Retrieved October 4, 2010 from http://www.cdc.gov/nchs/nhanes/nhanes2005-2006.

Centers for Disease Control and Prevention (CDC). 2012a. National Health and Nutrition Examination Survey. 2009-2010 Laboratory File. Retrieved 2/1/12 from http://www.cdc.gov/nchs/nhanes/nhanes2009-2010/labo9 10.htm

Centers for Disease Control and Prevention (CDC). 2012b. National Health and Nutrition Examination Survey. 2009-2010 Demographics File. Retrieved 2/26/12 from http://www.cdc.gov/nchs/nhanes/nhanes2009-2010 / demoog 10.htm

Centers for Disease Control and Prevention (CDC). 2014a. National Health and Nutrition Examination Survey. 2009-2010 Laboratory File. Retrieved 7/14/14 from http://www.cdc.gov/nchs/nhanes/20011-2012/PbCd G.htm

Centers for Disease Control and Prevention (CDC). 2014b. National Health and Nutrition Examination Survey. 2009-2010 Demographics File. Retrieved 7/14/14 from http://www.cdc.gov/nchs/nhanes/2011-2012/ demo G.XPT

Centers for Disease Control and Prevention (CDC). 2017a. National Health and Nutrition Examination Survey. 2009-2010 Laboratory File. Retrieved 2/6/14 from http://www.cdc.gov/nchs/nhanes/20011-2012/PBCD H.htm

Centers for Disease Control and Prevention (CDC). 2017b. National Health and Nutrition Examination Survey. 2009-2010 Demographics File. Retrieved 2/14/17 from http://www.cdc.gov/nchs/nhanes/2011-2012/ DEMO H.XPT

U.S. Food and Drug Administration (FDA). 2010. Total Diet Study. U. S. Food and Drug Administration Center for Food Safety and Applied Nutrition. Accessed on July 14, 2010 from https://www.fda.gov/food/total-diet-study/analytical-results-total-diet-study.

USEPA. 2010a. Final Six-Year Review of National Primary Drinking Water Regulations: "Final_6Yr_Lead_12.23.10.accdb". Microsoft Access Database. As provided by Rebecca Allen, U.S. EPA Office of Groundwater and Drinking Water. Received December 23, 2010.

USEPA. 2010b. The Analysis of Regulated Contaminant Occurrence Data from Public Water

Systems in Support of the Second Six-Year Review of National Primary Drinking Water Regulations. Office of Ground Water and Drinking Water. EPA-815-B-09-006. September. Available online at: http://water.epa.gov/scitech/datait/databases/drink/sdwisfed/howtoaccessdata.cfm.

von Lindern, I., Spalinger, Stifelman, M.L., Stanek, L.W., C. Bartrem. 2016. Estimating children's soil/dust ingestion rates through retrospective analyses of blood lead biomonitoring from the Bunker Hill Superfund site in Idaho. Environ Health Perspect 124(9):1462-1470. http://dx.doi.org/10.1289/ehp.1510144

Attachment C. Discussion of Mass Soil to Dust Transfer Ratio

The Mass soil-to-Dust (MSD) ratio describes how much lead from outdoor soil is tracked into the house and is found in dust. When discussing lead (Pb) in particular, the MSD predicts how the lead in indoor dust is related to soil lead in the surrounding property. The MSD is used as an input variable in the Integrated Exposure Uptake Biokinetic Model (IEUBK). The IEUBK model uses a number of factors such as dietary lead ingestion, soil/dust ingestion, concentrations of lead in ambient air, water, and soil, to estimate a soil concentration at which a particular blood lead level is expected to occur. The default IEUBK MSD is 0.70 (EPA 1994). Simply put this means that approximately 70% of lead found in household dust is attributable to outdoor soil. Paustenbach et al (1997) commented "In general, the concentration of contaminants appears to be greater in house dust relative to exterior soil." They caveated this statement by observing the reverse condition in mining or smelting areas, which suggests that MSD values may be lower at these sites.

There are two common ways of estimating the MSD after collecting paired dust and soil samples: 1) Dividing the dust sample (mg/kg) by the soil sample (mg/kg) and 2) Using statistics like linear regression on the whole data set to obtain a formula consisting of the MSD and an intercept. The latter offers the possibility of including covariates in the regression to control for conditions that might affect either the indoor concentration of contaminants or the ability to track soil into the home environment.

History of MSD in Rico, Colorado

Consulting firms working on behalf of Atlantic Richfield have produced documents that assessed residential and non-residential health hazards of mining-related exposure to lead in Rico (Integral 2006a, Integral 2006b, Integral 2007). The 2006a assessment used two different MSDs as input variables in a sensitivity analysis using the IEUBK, 0.3 (Cdust=0.3Csoil) and 0.34 (Cdust=0.34Csoil + 150). The latter of these two was developed for the Vasquez Boulevard/I-70 Superfund site in Colorado and was thought to "provide a more accurate representation of dust concentrations in older homes in Rico."

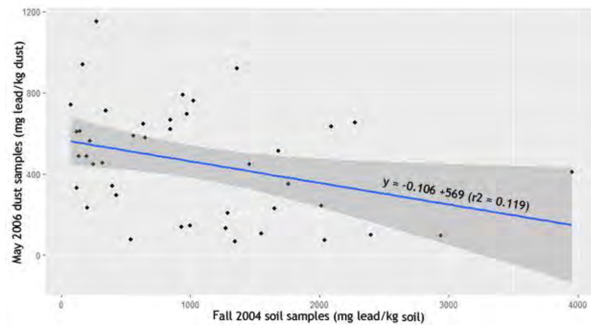
Ramboll Environmental and Health Inc (2021) reassessed residential IEUBK lead risks in response to a reduction of federal blood lead risk levels to 5μg/dL. They used the Rico site-specific MSD of 0.087 generated by Tu et al (2020) as one input factor for the IEUBK. Unlike previous estimates that used ordinary linear regression EPA (2016) and PWT (2017), this MSD was estimated using multivariate regression analysis. Utilization of 0.087 was made in spite of the authors note that a R^2 value of 0.24 was below criteria of $R^2 \geq 0.25$, which indicates a poor model fit. Tu et al (2020) also noted "significant MSDs for models with a good to moderate fit range from 0.14 to 0.47 for lead", and the "results of our study are consistent with prior studies suggesting that MSDs for metals without internal sources are 0.3-0.4, and application of MSDs in that range will provide more reliable exposure estimates than the 0.7 default value used by the… IEUBK model.”

TEEO Re-analysis of Paired Soil and Dust Data Collected from the Rico Townsite

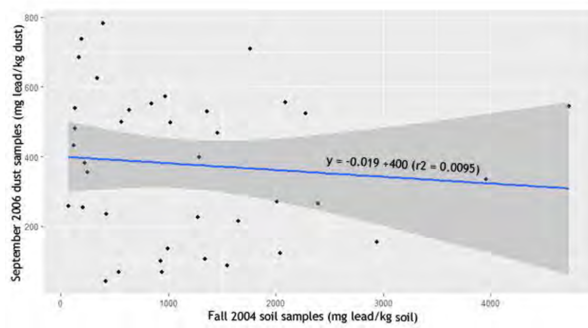
TEEO re-analyzed MSDs estimated from paired soil and dust data collected in Rico in 2004 (soil) and 2006 (dust). Dust data was extracted from Integral (2006b; May) and Integral (2007, September). Paired soil data was extracted from Ramboll’s (2022) MSD memo.

- Data cleaning - Sample dates
    - Sample dates were used to determine if remediation had occurred in between soil and dust collection. All properties remediated after soil collection but before dust collection were removed from analysis. This selective process paired data down to 42 May dust samples and 38 September dust samples.
- Data cleaning – Soil sample inclusion or exclusion
    - The Formation Environmental property viewer was used to view the locations of soil sample sites in relation to property borders. Soil samples collected outside referenced property borders were excluded from analysis. Soil samples located within property borders, but not referenced in Ramboll (2022), were added back into the analysis. Soil samples located close to the property borders that could potentially contribute to indoor dust were added into a separate analysis.
- Data organization
    - The modified set of soil data was segregated into three categories; 1) “Yard”, 2) All original data except those identified as outside property borders, and 3) All data identified in #2 plus other data outside, but close to the property borders.
- Data analysis
    - Individual property soil averages and related indoor dust average data were used in ordinary linear regressions to estimate MSDs for May, September, and combined data sets.
    - No outliers were found in the May, September, or combined data sets.
    - Linear regression analysis of the modified data sets resulted in primarily negative MSDs.

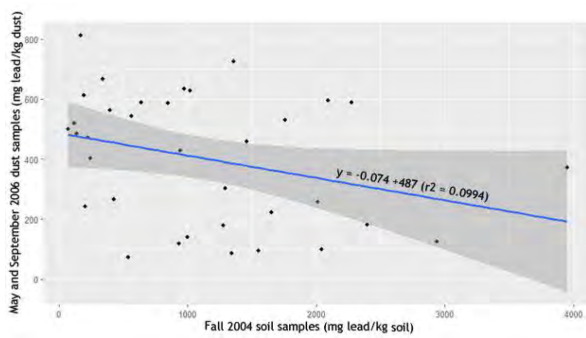
- May 2006 dust data set ($y = -0.106x+569$, $R^2=0.119$)

- September 2006 dust data set ($y = -0.019x+400$, $R^2=0.0095$)

- Averaged 2006 May-September dust data set ($y = -0.074x+487$, $R^2=0.0994$)

This analysis indicates that there is poor correlation between the paired soil and dust samples that have been collected from the Rico Townsite. A meaningful MSD could not be derived using the regression approach. There are a number of potential reasons for this finding spanning from data collection methods and temporal variability to reduced soil lead track in at this site.

Basis for the Selected MSD

The value of 0.36 from EPA (2016) and PWT (2017) was selected as a reasonable representation for the MSD in Rico, Colorado. Many reasons prompted this selection.

- Site similarity
    - EPA (2016) and PWT (2017) considered soil and dust samples collected from the Colorado Smelter Superfund site, an extensive area contaminated with mine waste and slag. Activities at Rico also contain mine tailings and slag.
- Sample number
    - The EPA analysis considered 102 paired soil/dust samples (93 after outlier removal). This number of samples was larger than that in Tu et al (2020; n = 53), Ramboll (2022; n = 48-53), or TEEO's analysis of Rico samples (n = 42-45) data sets.
- Sample collection
    - Increased site heterogeneity and sample collection (e.g. discrete versus composite) can affect the estimation of MSD. Area averaging of site samples as was done in EPA (2016) and PWT (2017) can result in more representative property soil lead estimates than simple averaging.
    - The EPA assessment used soil samples sieved to sub-250 μm pre-analysis. Soil samples collected in Rico in 2004 were sieved using a 2-mm sieve (Integral 2006a). It is thought that "fine" sub-250 μm particles are more easily transported into indoor environments by footwear and that this fraction is closely associated with indoor dust levels (Paustenbach et al., 1997; Tu et al, 2020). Therefore, analysis of the sieved sub-250 μm particles is preferred over that of larger particles when estimating an MSD.
- Sample relevance and timing
    - The EPA analysis considered soil and dust samples collected in 2015-2016. Most paired samples were collected within a day or two of each other. Only one dust sample was collected 39 days after the soil sample (EPA 2017). Sample pairs in Rico were collected at a longer interval (2004 for soil and 2006 for dust). Temporal relevance is important because there are many factors that influence soil and dust concentrations (and MSDs) can change over time.
- Sample analysis
    - The EPA analysis used area-based weighting of soil samples from different decision units. Soil sample averaging of discrete samples was used in the TEEO analysis of this data.
    - The EPA analysis used validated and adjusted XRF data for sample determination. Soil sample data from AR et al (2004) was analyzed for lead using the XRF, but not adjusted to compensate for differences from lab data.

- Repeatable conclusions
    - EPA (2016), PWT (2017), and Ramboll (2022) analyses present data and methods that allow results to be replicated. Tu et al (2020) has adequately descriptive methodologies but lack the raw data sets necessary to replicate results.
- Conclusion robustness
    - EPA (2016) and PWT (2017) used simple regression to estimate an MSD of 0.36. This regression line had a correlation coefficient (R^2) of 0.32. This R^2 was much higher than that for the MSD proposed in Tu et al (2020) (R^2=0.24). Tu et al (2020) noted that the "R^2 value of 0.24 [was] below criteria of $R^2 \geq 0.25$, which may indicate a poor model fit."
- Conclusion consistency and conservatism
    - The MSD found at the Colorado Smelter is quantitatively close to MSD's developed for the Vasquez Boulevard/I-70 Superfund site, Tu et al (2020), and Brattin and Griffin (2011).

Uncertainties

A variety of uncertainties and confounders are associated with analyses such as that used in estimating the MSD.

- Selection of sample site dust-soil pairs
    - The precise identification of paired dust and soil samples is necessary to determine the relationship between soil lead and tracked in or endogenous lead found in household dust. A reanalysis of the Ramboll (2022) MSD data identified additional property samples that might be included or excluded in the estimation of a MSD. In at least one circumstance, a residence could not be visually located on the referenced property, further bringing into question the overall matching of soil and dust samples.
- Choice of sample sites
    - It has also been suggested in Paustenbach et al (1997) and EPA (2016) that higher soil concentrations of lead may mitigate the effects of other sources of lead and present as comparatively lower interior dust samples. Approximately ⅓ of the properties in the Rico dataset had lower average soil lead concentrations (<400 mg/kg), which could potentially mask the relationship of soil lead to interior dust lead.
- Timing of analysis
    - The input variables for the MSD (soil lead, dust concentration, vegetation coverage, age of home occupants, activity patterns, pets) are constantly evolving so analyses that are temporally separated from cleanup activities might be less relevant. Brattin and Griffin (2011) noted that estimated MSDs from East Helena, MT and Midvale Slag OU2, UT changed drastically when

re-estimated decades apart (East Helena MSD: 1983-0.70, 2005-0.17; Midvale Slag OU2 MSD: 1989-0.66, 1998-0.10).

- Outlier analysis methods
    - The identification and removal of outliers affects the overall outputs from linear regression. EPA (2016) identified nine outliers in paired Colorado Smelter data using estimated dust concentrations, residuals, and standard deviations. The removal of outliers substantially changed both the MSD and the R^2 coefficient (Pre-outlier removal, y = 0.2563x+109.18, R^2=0.0215; Outlier removal, y = 0.3603x+26.968, R^2=0.3204).
- Covariates and methods used in regression analysis
    - The choice of method used to determine the MSD and the covariates to control for influences the estimation of the MSD. Tu et al (2020) used a variety of regression analyses and covariates to attempt to control for other indoor sources of lead (home age, indoor heating source) and potential track in factors (pets, time spent in mine, soil coverage).

Attachment C. References

(AR et al 2004). Atlantic Richfield Company; Rico Renaissance, LLC; Rico Properties, LLC; Town of Rico. Rico Townsite Soils VCUP Application Rico, Colorado. June 2004.

(Brattin and Griffin 2011). Brattin W and Griffin S. Evaluation of the Contribution of Lead in Soil to Lead in Dust at Superfund Sites. Human and Ecological Risk Assessment: An International Journal. 17(1): 236-44. February 2011.

(EPA 1994). U.S. Environmental Protection Agency. Office of Solid Waste and Emergency Response. Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities. OSWER Directive #9355.4-12. EPA/540/F-98-030. August 1994.

(EPA 2016). U.S. Environmental Protection Agency. Evaluation of the contribution of outdoor lead in soil to indoor lead in dust at Colorado Smelter Superfund site. June 2016.

(EPA 2017). U.S. Environmental Protection Agency. Office of Land and Emergency Management. Transmittal of update to the Adult Lead Methodology's default baseline blood lead concentration and geometric standard deviation parameters. OLEM Directive 9285.6-56. May 2017.

(Integral 2006a). Integral Consulting Inc. Lead health risk assessment for Rico Townsite soils. April 2006.

(Integral 2006b). Integral Consulting Inc. Blood lead and environmental monitoring study for Rico Townsite, Phase I data summary report. September 2006.

(Integral 2007). Integral Consulting Inc. Blood lead and environmental monitoring study for Rico, Colorado, Phase II data summary report and trend analysis. February 2007.

(Paustenbach et al 1997). Paustenbach DJ, Finley BL, and Long TF. The critical role of house dust in understanding the hazards posed by contaminated soils. International Journal of Toxicology. 16(4-5):339-362. February 1997.

(PWT 2017). Pacific Western Technologies. Technical memorandum, site-specific soil-to-dust mass transfer ration (Msd) calculation. Colorado Smelter Superfund site, Pueblo, Pueblo County, Colorado. April 2017.

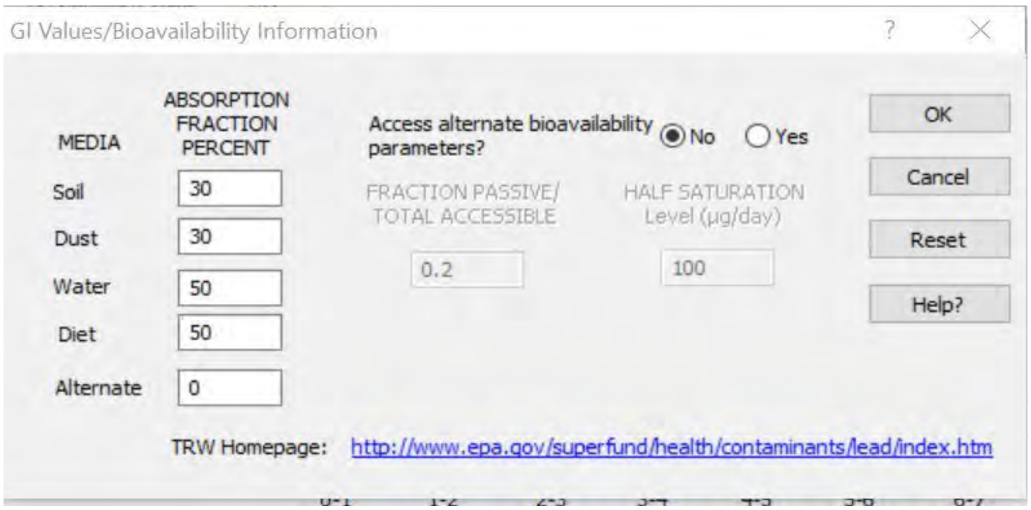
(Ramboll 2021). Ramboll Environment and Health. Risk-based Concentrations for lead in Rico Townsite soil. December 2021.

(Ramboll 2022). Ramboll Environment and Health. Memo: Re-analysis of mass soil-to-dust transfer factor in Rico Townsite soils. July 2022.

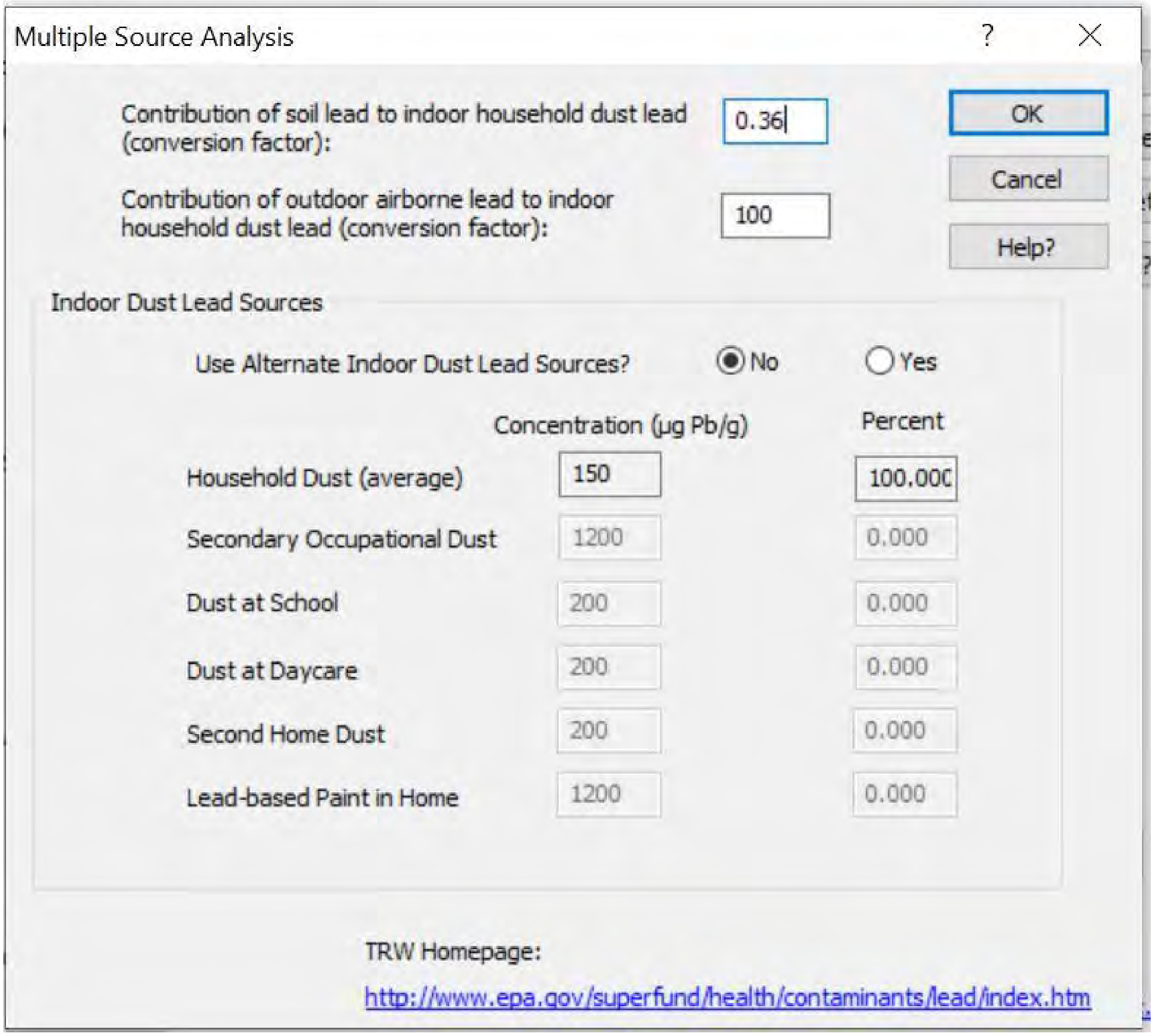
(Tu et al 2020). Tu JW, Fuller W, Feldpausch AM, Van Landingham C, and Schoof RA. Objective ranges of soil-to-dust transfer coefficients for lead-impacted sites. Environmental Research. 184: 109349. May 2020.

Attachment D. Integrated Exposure Uptake and Biokinetic Model (IEUBKv2) Screenshots of Input Variables and Model Outputs for Residential Exposures

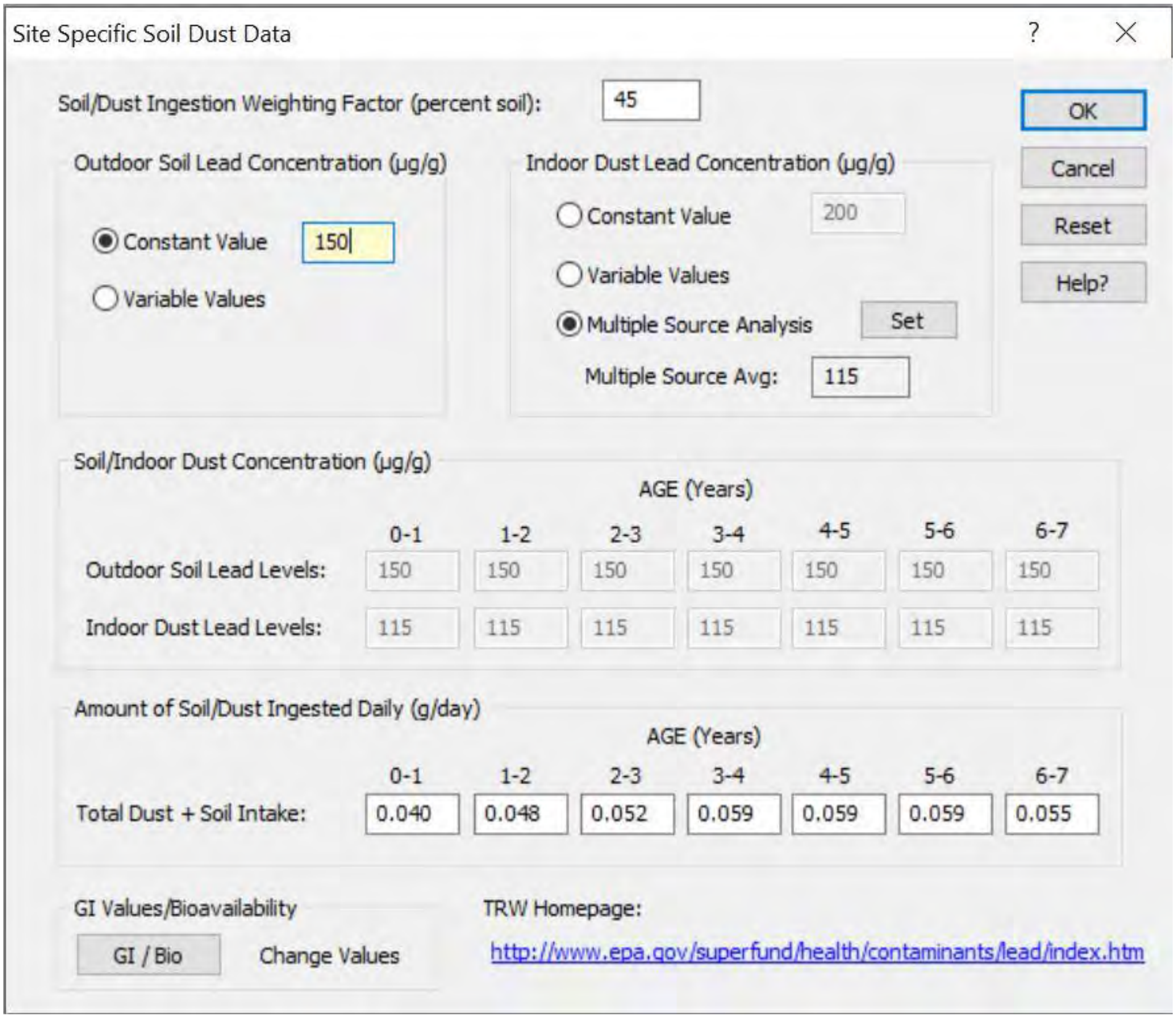
D1. Bioavailability Screenshot



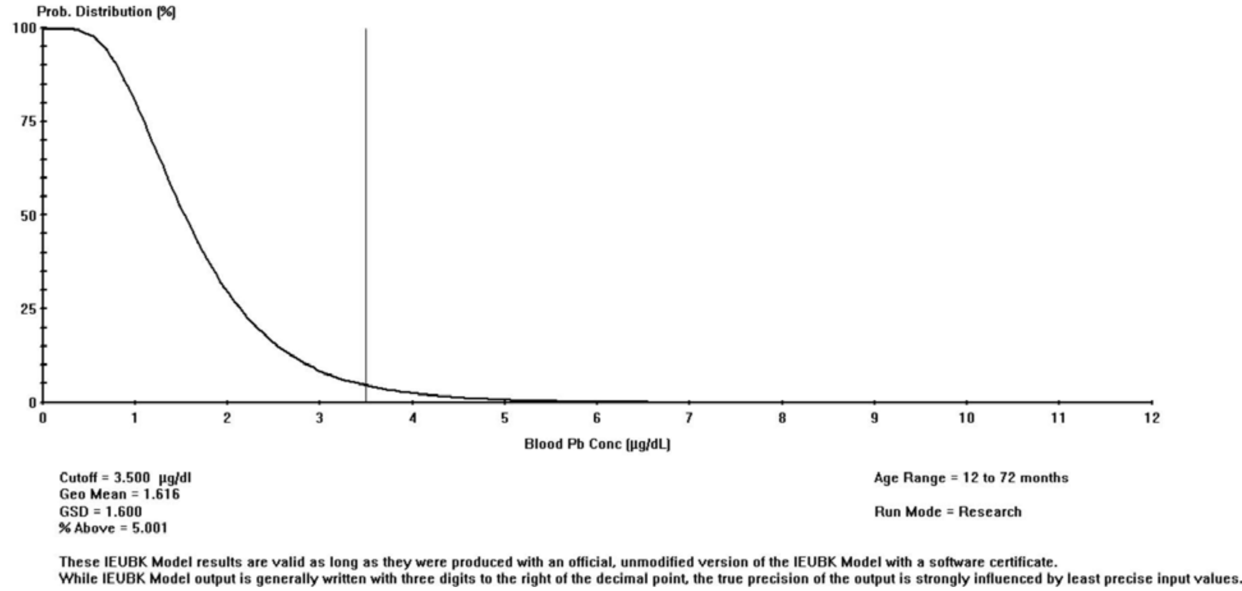
D2. MSD Screenshot



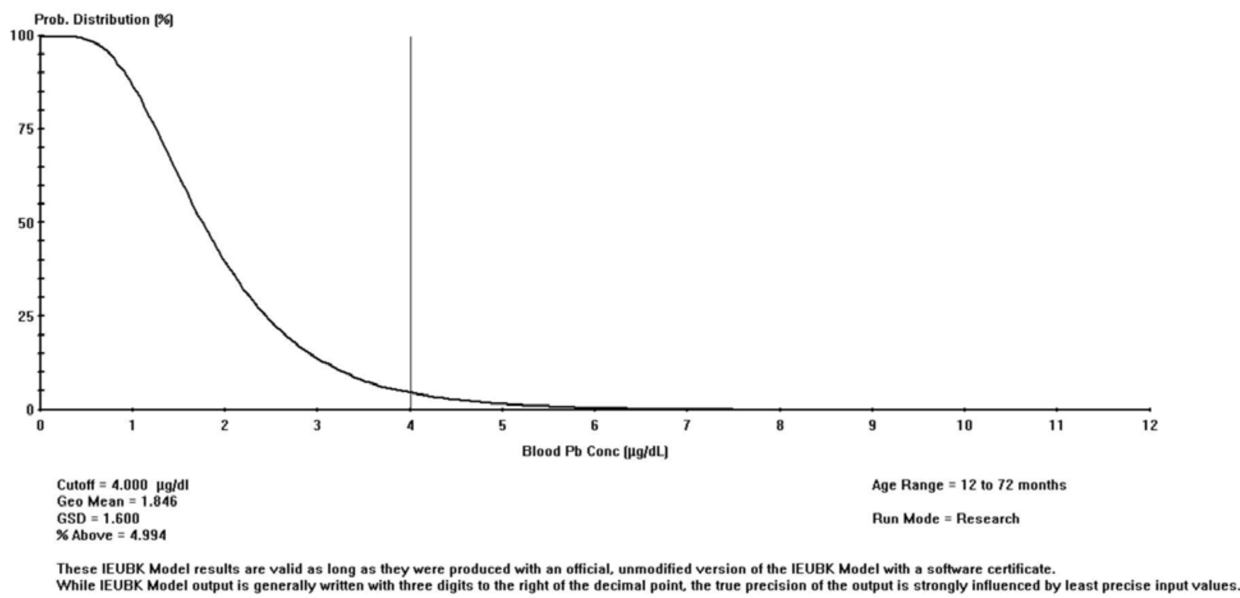
D3. Soil and Dust Ingestion Rate



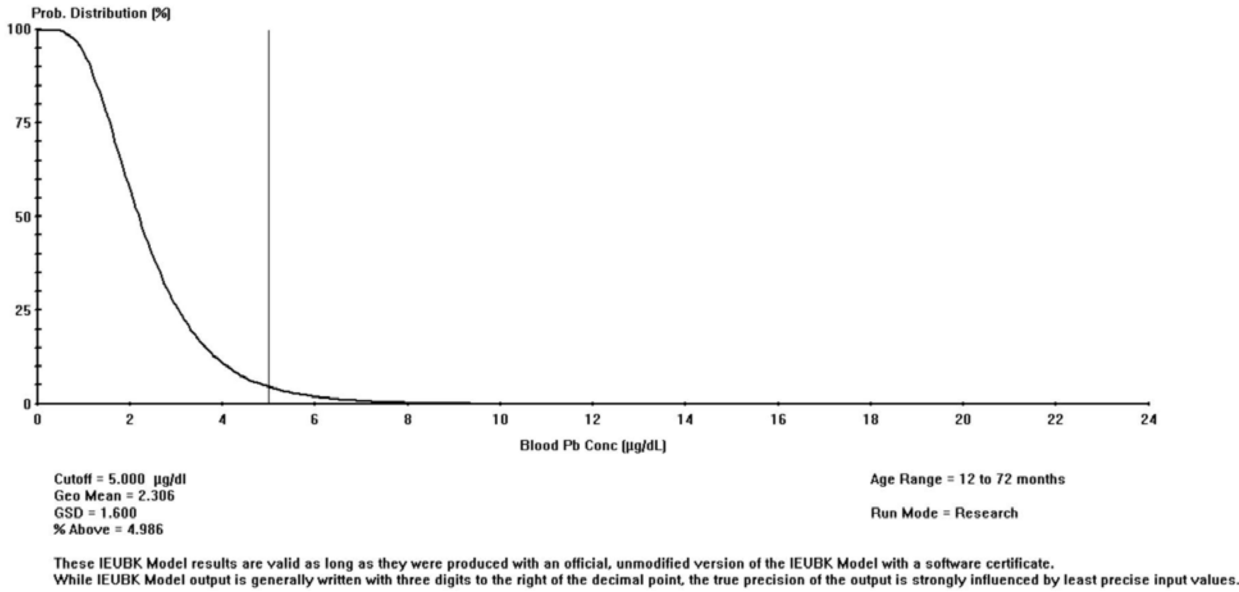
D4. 150 Milligrams per Kilogram Soil Lead Concentration Probability Distribution Output



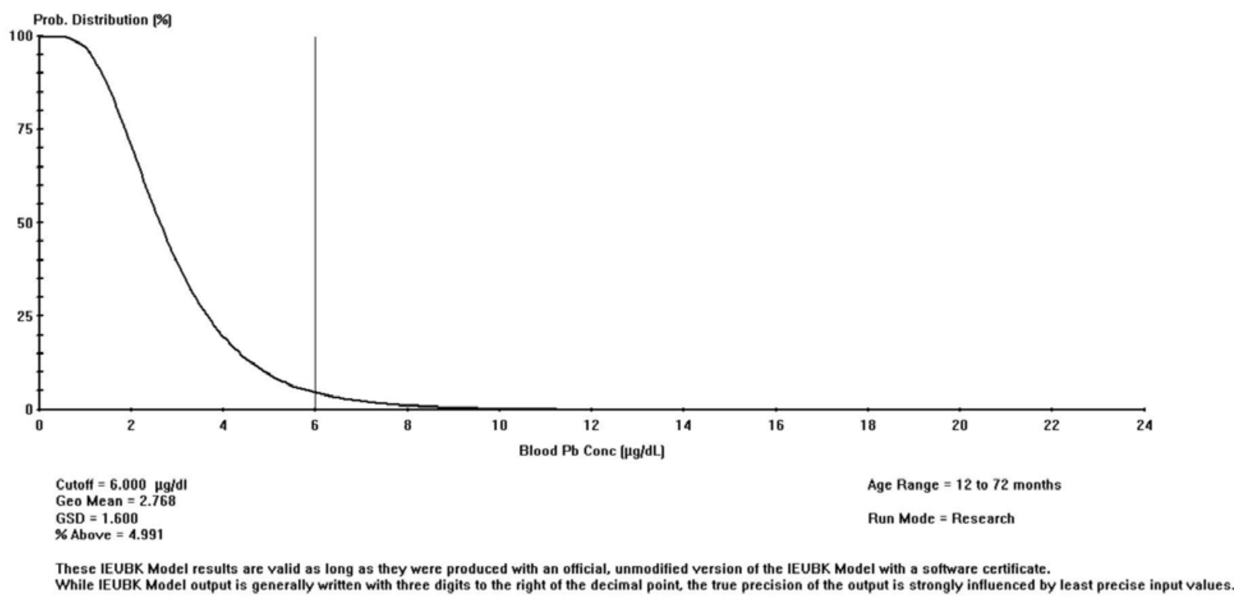
D5. 216 Milligrams per Kilogram Soil Lead Concentration Probability Distribution Output



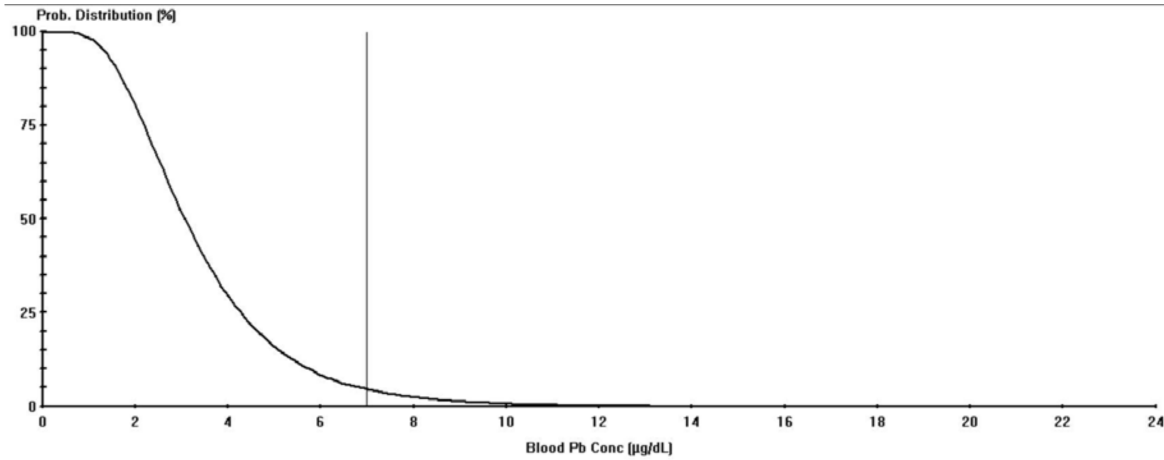
D6. 348 Milligrams per Kilogram Soil Lead Concentration Probability Distribution Output



D7. 483 Milligrams per Kilogram Soil Lead Concentration Probability Distribution Output



D8. 620 Milligrams per Kilogram Soil Lead Concentration Probability Distribution Output



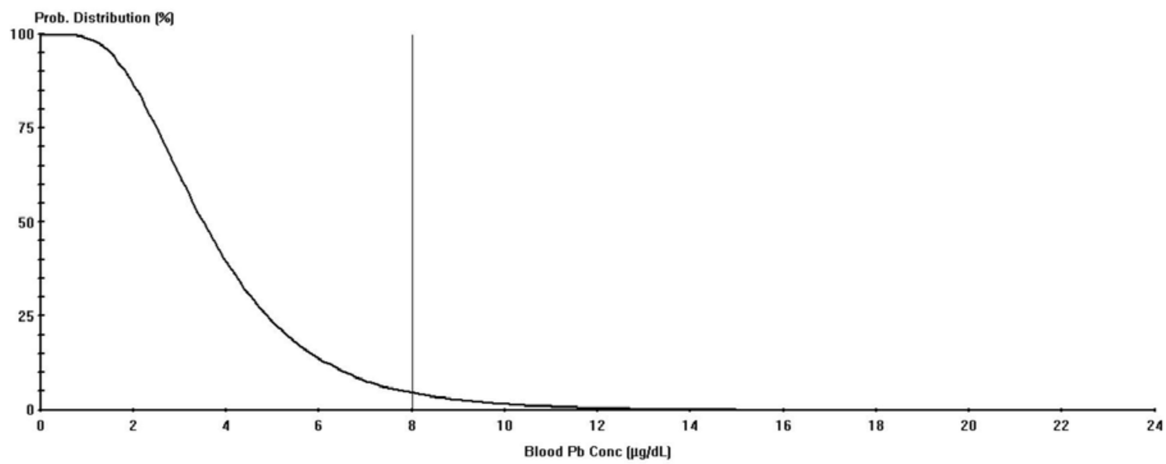
Cutoff = 7.000 µg/dl
Geo Mean = 3.228
GSD = 1.600
% Above = 4.979

Age Range = 12 to 72 months

Run Mode = Research

These IEUBK Model results are valid as long as they were produced with an official, unmodified version of the IEUBK Model with a software certificate.
While IEUBK Model output is generally written with three digits to the right of the decimal point, the true precision of the output is strongly influenced by least precise input values.

D9. 761 Milligrams per Kilogram Soil Lead Concentration Probability Distribution Output



Cutoff = 8.000 µg/dl
Geo Mean = 3.692
GSD = 1.600
% Above = 4.994

Age Range = 12 to 72 months

Run Mode = Research

These IEUBK Model results are valid as long as they were produced with an official, unmodified version of the IEUBK Model with a software certificate.
While IEUBK Model output is generally written with three digits to the right of the decimal point, the true precision of the output is strongly influenced by least precise input values.

Addendum to the Technical Memorandum:

Risk-based Screening Levels for Lead in Soil at the Rico Townsite, Voluntary Cleanup Site

Prepared by the Toxicology and Environmental Epidemiology Office

2/24/2023

COLORADO
Department of Public Health & Environment

Introduction and Purpose of Addendum

The Toxicology and Environmental Epidemiology Office (TEEO) of the Colorado Department of Public Health and Environment (CDPHE) drafted this addendum upon request from the Hazardous Waste and Waste Management Division (HMWMD) of CDPHE. This is an addendum to the Technical Memorandum entitled “Risk-based Screening Levels for Lead in Soil at the Rico Townsite, Voluntary Cleanup Site” dated September 16, 2022. TEEO 2022 focused on the development of RBSLs for residential and recreational exposures to lead at the Rico Townsite (Site). This addendum focuses specifically on worker exposures to lead in soil at Public Facilities within the site.

Brief Background and Scope of Addendum

A brief background is provided below for informative purposes. Please see TEEO 2022 for additional details regarding the evaluation of RBSLs at the Rico Townsite.

A draft application has been submitted to the HMWMD’s Voluntary Cleanup Program (VCUP) by the Town of Rico and the Atlantic Richfield Company. The intent of the VCUP application is to investigate and remediate lead contaminated soil within the Town of Rico. The VCUP effort was initiated in 2004 and around 2007, the VCUP efforts at the Rico Townsite stalled and no properties have been remediated since that time. The current application to the VCUP is intended to revitalize the remedial efforts initiated in 2004.

In general, the remedial plan includes excavation of soil in parcels where the 0-2-inch soil lead concentration exceeds the applicable lead action level (LAL). The soil is removed to a depth of approximately 12 inches below ground surface (bgs) and clean soil is used to backfill the excavated area. Prior to backfilling, a barrier/marker material is placed at the bottom of the excavation to mark depth of soil replacement. The excavated soil is then transported to a repository for disposal. The 2004 VCUP agreement was based on LALs of 1,100 milligrams of lead per kilogram of soil (mg/kg) for residential properties and 1,700 mg/kg for non-residential properties (VCUP 2004).

Since the initial VCUP efforts were initiated, there have been a number of changes to the way health hazards from lead are evaluated due to the expansion in the body of knowledge regarding lead exposures and the potential health hazards. The LALs used in the 2004 VCUP were based on predicted blood lead concentrations of 10 micrograms of lead per deciliter of blood (µg/dL). However, the current scientific literature on lead toxicology and epidemiology provides evidence that adverse health effects are associated with blood lead levels (BLLs) less than 10 µg/dL. There has also been a number of changes to the inputs, or assumptions, to the models that are used to predict blood lead levels in an exposed population.

This addendum incorporates updated information and guidance on lead toxicology and modeling to develop a range of RBSLs that can be used by project managers and applicants of the proposed VCUP to establish LALs that will be used to guide remedial decisions at the Rico Townsite. This addendum utilizes the most recent version of EPA's Adult Lead Model (Version date: 6/14/2017) to calculate RBSLs for workers at Public Facilities that are not zoned for residential redevelopment.

Risk-based Screening Levels for Workers at Public Facilities (Rico Townsite)

The Adult Lead Model, or ALM, is used at Superfund and other similar sites where lead contaminated soil is present. The ALM is used for non-residential exposure scenarios such as indoor and outdoor workers and recreational users. This model is used to predict the fetal blood lead concentration of pregnant individuals. The fetus is thought to be the most sensitive potential receptor when considering non-residential scenarios. This evaluation assumes both indoor and outdoor workers are likely to frequent the public facilities under consideration. Indoor workers may include general office work, janitors, and other staff that mainly work indoors. Outdoor workers may include maintenance workers, gardeners, landscapers, and others that spend a significant portion of the work week outdoors.

In addition to the evaluation of blood lead levels less than 10 ug/dL, two updates have been made to the ALM since the worker scenario has been evaluated at this site. The baseline blood lead concentration (PbB) input parameter of the ALM represents the geometric mean blood lead concentration in individuals of child-bearing age and the geometric standard deviation (GSD) input parameter is a measure of the inter-individual variability in these concentrations.

Default values for these input parameters were originally derived from an analysis of blood lead (PbB) data for U.S. women 17-45 years of age, from Phase I (1988 to 1991) of the Third National Health and Nutrition Examination Survey (NHANES III) as well as consideration of available site-specific data on blood lead concentrations and GSD values. The updated estimates for the ALM are based on the most recent six years of PbB data from NHANES 2009-2014 (EPA 2017).

Furthermore, two adjustments to the default input parameters in ALM were made to more accurately describe the worker exposure scenarios that are likely to occur in Rico, CO. First, the default assumptions in the ALM for exposure frequency and averaging time are 219 days per year and 365 days per year, respectively. Rico receives significant amounts of snow during the late fall and early spring months of the year. When snow cover is present, contact with contaminated lead soils is reduced or eliminated.

The site-specific exposure frequency based on snow-covered ground was estimated for Rico. Snow cover was estimated over 5 years for the Rico Townsite using the NOAA National Operational Hydrologic Remote Sensing Center and information from the CARIC-MADIS station (37.68626 N, -108.03810 W). Hourly data were organized into days with modeled snow depths of zero inches and those days with greater than 0 inches. Overall, five years of modeled data (2017-2022) suggested that Rico had 893 days with snow cover >0" (average of 178.4 days/year) and 934 days where snow cover was not present (average of 186.6 days/year; 26.7 weeks/year). The timing of snow cover was generally correlated with the winter season. However, bare ground existed intermittently at various times throughout all of the seasons.

Therefore, the averaging time that workers were assumed to potentially be exposed is over a period of six months per year (e.g. Averaging time = 182 days) based on the meteorological data (NOAA 2023). The default exposure frequency of 219 days/year is the central tendency occupational exposure frequency recommended by U.S. EPA (1993) Superfund guidance, which is based on 1991 data from the Bureau of Labor Statistics. This estimate corresponds to the average time spent at work by both full-time and part-time workers engaged in intensive activities (EPA 1993). The ratio of the default exposure frequency to default averaging time is 0.6. Applying this ratio to an averaging time of 182 days per year equates to an exposure frequency for Rico workers of 109 days per year.

Lastly, the default soil ingestion rate in the ALM 50 milligrams per day is considered a plausible point estimate of the central tendency for daily soil ingestion from all occupational sources, including soil in indoor dust, resulting from non-contact intensive activities. This would include exposures that are predominantly indoors. Higher ingestion rates would be expected for predominantly outdoor activities such as construction, excavation, yard work, and gardening (Hawley 1985). As mentioned previously, indoor and outdoor workers are likely to be present at the public facilities under consideration in this evaluation. The ingestion rate used for outdoor workers is 100 mg/day which is the default ingestion rate used in the EPA Regional Screening Levels and Default Values for Superfund for outdoor workers (EPA 2014, EPA 2022). Since this ingestion rate is higher, the outdoor worker scenario is considered protective of the indoor worker scenario. The resulting RBSLs for outdoor workers at public facilities within the Rico Townsite are shown below in Table 1.

Recommendations

The selection of a site-specific Lead Action Level (LAL) is dependent upon a number of factors. Primary considerations include the potential health hazards associated with lead in soil (RBSLs), the logistical aspects of a remedy, and background concentrations of lead in the soil. The derivation of RBSLs only considers the potential health hazards of exposure to lead in soil and therefore represents only one component of risk management associated with a LAL. In circumstances where background soil lead concentrations are negligible or unknown, the RBSL is usually selected as the LAL. However, background concentrations of lead in soil are also considered when establishing a LAL because it is not common practice to reduce soil lead concentrations below naturally occurring levels at VCUP, or other similar sites.

Background concentrations of lead in soil in the Rico area have been assessed in other documents (Formation 2021, TEEO 2022) and naturally occurring lead appears to be elevated in this area with respect to other sites in Colorado. Naturally occurring lead concentrations exceed a number of the RBSLs derived in this evaluation. TEEO recommends that the LAL selected for this site is the lowest RBSL that is reasonably achievable considering other site characteristics and does not exceed the target blood lead level cutoff of 8 µg/dL, or 967 mg/kg for worker exposures at Public Facilities within the Rico Townsite.

Table 1. Risk-based Screening Levels for Outdoor Workers

Variable	Description of Variable	Units	GSD_i and PbB_o from Analysis of NHANES 2009-2014	GSD_i and PbB_o from Analysis of NHANES 2009-2014	GSD_i and PbB_o from Analysis of NHANES 2009-2014	GSD_i and PbB_o from Analysis of NHANES 2009-2014	GSD_i and PbB_o from Analysis of NHANES 2009-2014	GSD_i and PbB_o from Analysis of NHANES 2009-2014
$PbB_{fetal, 0.95}$	Target PbB in fetus (e.g., 2-8 µg/dL)	µg/dL	3.5	4	5	6	7	8
$R_{fetal/maternal}$	Fetal/maternal PbB ratio	--	0.9	0.9	0.9	0.9	0.9	0.9
BKSF	Biokinetic Slope Factor	µg/dL per µg/day	0.4	0.4	0.4	0.4	0.4	0.4
GSD_i	Geometric standard deviation PbB	--	1.8	1.8	1.8	1.8	1.8	1.8
PbB_0	Baseline PbB	µg/dL	0.6	0.6	0.6	0.6	0.6	0.6
IR_S	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.100	0.100	0.100	0.100	0.100	0.100
$AF_{S, D}$	Absorption fraction (same for soil and dust)	--	0.12	0.12	0.12	0.12	0.12	0.12
$EF_{S, D}$	Exposure frequency (same for soil and dust)	days/yr	109	109	109	109	109	109
$AT_{S, D}$	Averaging time (same for soil and dust)	days/yr	180	180	180	180	180	180
RBSL in Soil*	**Risk-based screening levels in soil for recreational users**	**mg/kg**	**306**	**379**	**526**	**673**	**820**	**967**

NOTE: mg/kg: milligrams of lead per kilogram of soil, µg/day = microgram of lead per day, g/day = gram per day, days/yr = days per year, µg/dL = micrograms of lead per deciliter of blood, *no more than 5% probability that fetal PbB exceeds target PbB

Addendum References

(EPA 1993) U.S. Environmental Protection Agency. Superfund's Standard Default Exposure Factors for the Central Tendency and RME-Draft. Working Draft, November 1993.

(EPA 2003). U.S. Environmental Protection Agency. Recommendations of the Technical Review Workgroup for Lead for an approach to assessing risks associated with adult exposures to lead in soil. EPA/540/R/03/001. January 2003.

(EPA 2014). U.S. Environmental Protection Agency. Office of Solid Waste and Emergency Response. Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors. OSWER Directive 9200.1-120. February 2014.

(EPA 2017). U.S. Environmental Protection Agency. Office of Land and Emergency Management. Transmittal of update to the Adult Lead Methodology’s default baseline blood lead concentration and geometric standard deviation parameters. OLEM Directive 9285.6-56. May 2017.

(EPA 2022). U.S. Environmental Protection Agency. Regional Screening Levels for Chemical Contaminants at Superfund Sites, Generic Tables. May 2022.

(Formation 2021). Formation Environmental. Memorandum: Background Lead Concentrations in Rico Townsite soil (with accompanying spreadsheet). October 2021.

(Hawley 1985). Hawley, J.D. 1985. Assessment of health risk from exposure to contaminated soil. Risk Analysis.Volume 5, Issue 4: 289-302. December 1985.

(NOAA 2023). National Oceanic and Atmospheric Administration. National Operational Hydrologic Remote Sensing Center, Interactive Snow Information. https://www.nohrsc.noaa.gov/interactive/html/graph.html?station=CARIC_MADIS&w=600&h=400&o=a&uc=0&by=2017&bm=1&bd=1&bh=6&ey=2018&em=1&ed=1&eh=6&data=0&units=0&region=us, last accessed January 2023.

(TEEO 2022). Toxicology and Environmental Epidemiology Office, Colorado Department of Public Health and Environment. Technical Memorandum: Risk-based Screening Levels for Lead in Soil at the Rico Townsite, Voluntary Cleanup Site. September 2022.

(VCUP 2004) Atlantic Richfield Company, Rico Renaissance, LLC; Rico Properties, LLC; Town of Rico. Rico Townsite Soils, VCUP Application, Rico, Colorado. Submitted to the Colorado Department of Public Health and Environment, June 24, 2004.

APPENDIX F – TOWN OF RICO OVERLAY ZONE REGULATIONS

<u>Rico Land Use Code Appendix D Section D.1 Findings of Fact</u>

A. <u>Background</u>. In the Town of Rico (the "Town") and the surrounding area, elevated levels of lead are present in the soil due to solid waste from past mining activities, as well as local geologic conditions that may lead to naturally-occurring elevated lead levels. The presence of elevated levels of lead has been described in a number of documents, including the Rico Townsite Soils Voluntary Cleanup Program ("VCUP") application submitted by the Town and Atlantic Richfield Company and approved by the Colorado Department of Public Health and Environment ("CDPHE") on [__], 2023 (the "VCUP Application"), pursuant to the Colorado Voluntary Cleanup and Redevelopment Act, § 25-16-301, C.R.S. There are two designated areas in the Town where elevated levels of lead and potentially other metals in soil may be present: the Rico Soils Overlay Zone District ("RSOZ") and the Environmental Remediation Overlay Zone District ("EROZ"). These Environmental Overlay Zone Regulations (alternatively referred to hereinafter as the "Regulations") primarily pertain to the RSOZ and remediation of lead soils contamination. The EROZ covers several non-contiguous areas within the Town boundaries, as listed in Section D.2.B.10, that were subject to previous VCUP remediation efforts.

B. <u>Not Areas of State Interest</u>. Except to the extent the boundaries of the RSOZ or EROZ overlap with properties of an area designated as an Area of State Interest in Article VIII of the Rico Land Use Code ("RLUC"), properties within the RSOZ or EROZ shall not be considered Areas of State Interest. To the extent a development activity covered by these Regulations is proposed for properties within an area designated as an Area of State Interest, the provisions in the RLUC relating to Areas of State Interest shall be separate from, and apply in addition to, the requirements provided for in these Regulations.

C. <u>Environmental Overlay Zone Regulations Are Additional</u>. These Regulations are in addition to any other applicable requirements of the RLUC.

D. <u>Non-Liability of the Town of Rico</u>. These Regulations shall not be construed to hold the Town or any of its employees, officials, or designees, acting within the scope of their employment, responsible or liable for any damages to persons or property resulting from: any inspection, enforcement, or review, or failure to inspect, enforce, or review as required by these Regulations; the issuance or denial of any permit pursuant to or in accordance with these Regulations; or the institution or failure to institute any court action as authorized or required by these Regulations. In enacting these Regulations, the Town intends to preserve all rights of the Town, its agencies and departments, and its elected and appointed officials, employees, and designees to immunity from liability as set forth in the Colorado Governmental Immunity Act, §§ 24-10-101, C.R.S., *et seq.*, and any other applicable law, regulation, or standard.

Rico Land Use Code Appendix D Section D.2 General Provisions

A. Lands to Which Environmental Overlay Zone Regulations Apply. Sections D.1 – D.9 of these Regulations shall apply to all lands situated in the overlay zone known as RSOZ. For lands located within the overlay zone known as EROZ, Sections D.1, D.2, and D.9 shall apply.

B. Definitions. The following terms, as used throughout these Environmental Overlay Zone Regulations, shall have the meanings set forth below. Where there is a conflict between the definitions set forth below and the definitions set forth in Article IX of the RLUC, the definitions below shall prevail for purposes of these Regulations only.

 1. Action Level(s). Action Level(s) shall mean the site-specific, human health risk-based, concentration levels of lead in soil approved by CDPHE, with concurrence from the U.S. Environmental Protection Agency, in 2022 for soil remediation performed as part of Rico Townsite Soils VCUP project. The Action Levels are set at 761 mg/kg for Residential Use properties (the "Residential Action Level"), 967 mg/kg for Public Facilities properties (the "Public Facilities Action Level"), and 4,010 mg/kg for Open Space properties (the "Open Space Action Level"). On portions of Public Facilities and Open Space properties where active play areas frequented by young children (as identified by the Town) are present, the Residential Action Level will apply. On portions of Town-owned properties where recreational trails are constructed for public use, the Open Space Action Level will apply.

 2. Application. Application shall mean an application submitted under these Regulations requesting a Soils Excavation Permit, as that term is defined below.

 3. CDPHE. CDPHE shall mean the Colorado Department of Public Health and Environment.

 4. Cleanup Completion Certification. Cleanup Completion Certification shall mean a determination by the Town issued pursuant to Section D.5.C of these Regulations.

 5. Cleanup Completion Report. Cleanup Completion Report shall mean a report prepared and submitted by a Developer as required by Section D.5.B of these Regulations.

 6. Development Activity. Development Activity shall mean any manmade change in the use or character of land that involves or results in construction, grading, excavation, digging, demolition, drilling, planting, placing Non-Native Fill, landscaping, or other similar activities that disturb or move soils.

 7. Developer. Developer refers to the property owner, or other person or entity acting on the property owner's behalf, engaged in a Development Activity.

 8. Disturbed Native Soils. Disturbed Native Soils are Native Soils that have been significantly disturbed by prior activities (e.g., regrading).

9. Environmental Officer. Environmental Officer refers to the Town Manager or the Town Manager's designee for the purposes of administering these Regulations and issuing Soils Excavation Permits.

10. Environmental Remediation Overlay Zone District ("EROZ"). Environmental Remediation Overlay Zone District means the sites listed below within Town boundaries that (i) received a VCUP No Further Action Determination on December 10, 1999, from CDPHE pursuant to the state VCUP program, (ii) were otherwise remediated under CDPHE oversight, or (iii) nonetheless warrant inclusion within the EROZ due to unique environmental conditions on the property. These properties are depicted in Figure 1 and are defined as follows:

    a. Columbia Tailings Site, CDPHE VCUP Site No. 30, located on the east side of the Dolores River corridor west of Highway 145 and Rico townsite Blocks 11 and 39, in portions of E1/2 of the NE1/4 of the SE1/4 of Section 35, and the NW1/4 of the NW1/4 of the SW1/4 of Section 36, T40N, R11W, NMPM, Dolores County, within portions of the following land tracts: Tremble Tract, Winkfield Tract East, and Town of Rico tracts (bounded on west by Winkfield Tract East and Tremble Tract, and on the east by Blocks 11 and 39). Approximately 3.3 acres.

    b. Grand View Smelter Site, CDPHE VCUP Site No. 40, located on the east side of State Highway 145 at the north end of the Town of Rico in the middle of the SW1/4 of the SW1/4 of Section 25, T40N, R11W, NMPM, Dolores County, comprising portions of the following patented mine claims: Columbia Millsite (Patent No. 10202, Mineral Survey No. 365B), and Homestake & Little Cora Consolidated Placer (Patent No. 14903, Mineral Survey No. 410). Approximately 1.7 acres.

    c. Santa Cruz, Iron Clad, and Rico Boy Mines Site, CDPHE VCUP Site No. 36, located on the west side of the Dolores River Corridor, south of west Rico townsite Blocks 34 and 36, in a portion of N1/2 of the NE1/4 of the SE1/4, and the NW1/4 of the SE1/4 of the SE1/4 of Section 35, T40N, R11W, NMPM, Dolores County, comprising portions of the San Juan Nation Forest, R.G.S. "Y" Tract, Winkfield Tract, Winkfield Tract West, A.E. Arms Tract North, and Max Boehmer Tract, and portions of the following patented mine claims: Iron Clad (Mineral Survey No. 865), Santa Cruz (Patent No. 25864, Mineral Survey No. 6132), Hardscrabble (Patent No. 27326, Mineral Survey No. 8070), and Burchard (Patent No. 27326, Mineral Survey No. 8070). Approximately 5 acres.

    d. Silver Swan Mine Site, CDPHE VCUP Site No. 22, located on the west side of the Dolores River corridor in the southwest portion of the Rico townsite in a portion of the S1/2 of the SE1/4 of the SE1/4 of Section 35, T40N, R11W, NMPM, Dolores County, comprising portions of the A.E. Arms Tract North,

A. E. Arms Tract, F.G. Day Tract, A.E. Arms Tract South, and R.G.S. R.O.W. South. Approximately 4 acres.

e. Silver Swan Mine East Wasterock Pile Site, located on the east side of the Dolores River corridor west of the historic Rio Grande Southern railroad grade, in portions of the SE1/4 of the SE1/4 of the SE1/4 of Section 35, T40N, R11W, NMPM, Dolores County, within portions of the following land tracts: F.G. Day Tract and R.G.S. R.O.W. South; materials from the site were consolidated to the Columbia Tailings Site, CDPHE VCUP Site No. 30. Approximately 0.1 acre.

f. Pro Patria Mill Tailings Site, located on the east side of the Dolores River corridor east of the historic Rio Grande Southern railroad grade, west of River Street, and southwest of the west end of Mantz Avenue (where the historic Pro Patria mill was located), in portions of the E1/2 of the E1/2 of the NE1/4 of Section 35 and SW1/4 of the NW1/4 of the NW1/4 of Section 36, T40N, R11W, NMPM, Dolores County, within portions of the following land tracts: R.G.S. Tract, Roy's Tract, and Block 28, Lots 3-4 and west 80 feet of Lots 5-20; materials from the site were consolidated to the Columbia Tailings Site, CDPHE VCUP Site No. 30. Approximately 2 acres.

g. Van Winkle Mine Site, Van Winkle Subdivision (recorded plat at Reception No. 157374), Lot 2 and Lot 3, Rico, Dolores County.

h. East Shamrock Mine Wasterock Pile Site, located north of the Pro Patria Mill Tailings Site on the east bank of the Dolores River, approximately ½ mile north of the Columbia Tailings Site; materials from the site were consolidated to the Columbia Tailings Site, CDPHE VCUP Site No. 30.

11. Excavated Soils. Excavated Soils shall mean soils (including Surface Soils and underlying soils) disturbed at, or excavated from, the property during a Development Activity.

12. Existing Soils Cover. Existing Soils Cover shall mean a Soils Cover that has been installed over a geotextile fabric or other cover that meets the requirements of Section D.7.D, the placement of which is documented in soil remediation records maintained by the Town under these Regulations.

13. Mine Waste. Mine Waste shall mean solid waste materials resulting from mining, milling, smelting or processing operations, including, without limitation, waste rock, ore, and tailings, which are visibly distinctive in appearance (color and texture) as compared to the surrounding Native Soil, unless testing shows the material does not contain lead at a concentration greater than the Residential Action Level using the analytical procedures set forth in Section D.6.C.

14. Native Soils. Native Soils shall mean naturally occurring soils (not imported fill or landscaping materials) that exist at the property subject to the Development Activity

prior to the Development Activity that have not been significantly disturbed in the past (e.g., regraded).

15. Non-Native Fill. Non-Native Fill shall mean soils from a location other than the property subject to the Development Activity.

16. Open Space. Open Space shall mean an area of one or more parcels that is zoned as an Open Space District as defined in the RLUC, Article II § 290. The Open Space Action Level applies to soil on Open Space properties, except on those portions of Open Space properties where active play areas frequented by young children (as identified by the Town) are present, in which case the Residential Action Level will apply.

17. Open Space No Action Confirmation: Open Space No Action Confirmation shall mean a determination by the Town issued pursuant to Section D.2.D of these Regulations for an Open Space property with lead soil concentrations below the Open Space Action Level. An Open Space No Action Confirmation issued pursuant to Section D.2.D is separate and independent from a VCUP No Action Determination as defined in Section D.2.B.29.

18. Planned Unit Development. Planned Unit Development shall have the meaning stated in § 24-67-103(3), C.R.S., and shall include, without limitation, any Development (as defined in Article IX, Section 910 of the RLUC) within a Residential Planned Unit Development District or a Commercial Planned Unit Development District in the Town of Rico, as such terms are used and defined in Articles II, III, and VIII of the RLUC.

19. Public Facilities. Public Facilities shall mean an area of one or more parcels that is zoned as a Public Facilities Zone District as defined in the RLUC, Article II § 290. The Public Facilities Action Level applies to soil on Public Facilities properties, except on those portions of Public Facilities properties where active play areas frequented by young children as identified by the Town are present, in which case the Residential Action Level will apply.

20. Public Facilities No Action Confirmation: Public Facilities No Action Confirmation shall mean a determination by the Town issued pursuant to Section D.2.D of these Regulations for Public Facilities property with lead soil concentrations below the Public Facilities Action Level. A Public Facilities No Action Confirmation issued pursuant to Section D.2.D is separate and independent from a VCUP No Action Determination as defined in Section D.2.B.29.

21. Residential No Action Confirmation. Residential No Action Confirmation shall mean a determination by the Town issued pursuant to Section D.2.D of these Regulations for a Residential Use property with lead soil concentrations below the Residential Action Level. A Residential No Action Confirmation issued pursuant to Section

D.2.D is separate and independent from a VCUP No Action Determination as defined in Section D.2.B.29.

22. Residential Use. Residential Use shall mean use of a property where zoning allows for residential use, as provided in the RLUC. Residential Use is allowed in all zoning districts except for "Public Facilities" and "Open Space." The Residential Action Level applies to soil on Residential Use properties and those portions of Public Facilities and Open Space properties where active play areas frequented by young children as identified by the Town are present.

23. Rico Soils Lead Repository or Repository. Rico Soils Lead Repository or Repository shall mean the soil lead repository located approximately 0.75 miles north of Rico and adjacent to the St. Louis Tunnel portal in the NWl14, NW1/4 of Section 25, T40N, R11W in Dolores County, and operated under the Certificate of Designation issued by Dolores County on October 24, 2005.

24. Rico Soils Overlay Zone District ("RSOZ"). Rico Soils Overlay Zone District shall mean the area delineated on Figure 1 as the RSOZ but excluding the area delineated as the EROZ.

25. Soils Excavation Permit. Soils Excavation Permit shall mean a soils excavation and grading permit approved by the Environmental Officer pursuant to these Regulations.

26. Soils Cover. Soils Cover shall mean a cover consisting of natural earthen or other material that meets the requirements of Section D.7.D placed over contaminated soils or material to encapsulate, immobilize, and eliminate surface exposure of such soils and material.

27. Subdivision. Subdivision shall mean the subdivision activities listed in Article V, Section 506.1 of the RLUC, and any other division of land within the Town of Rico into two or more lots, tracts, sites, parcels, separate interests, interests in common, or other division that is subject to the Rico Subdivision Regulations, as defined in Article V, Section 506.1 of the RLUC.

28. Surface Soils. Surface Soils shall mean earthen material found in the top twelve (12) inch soil layer. Where Surface Soils are either Native Soils or Disturbed Native Soils or Non-Native Fill comprising a depth of at least twelve (12) inches, soil samples collected from the top two (2) inches of the soil layer shall be considered representative of Surface Soils for the purpose of characterizing the soil lead concentrations. Where Surface Soils are Disturbed Native Soils or Non-Native Fill comprising a depth of less than twelve (12) inches, soil samples collected from the top two (2) inches of the soil layer may be considered representative of Surface Soils on a case-by-case basis in consultation with the Environmental Officer.

29. VCUP No Action Determination ("VCUP NAD"). VCUP NAD shall mean a property-specific determination made by CDPHE pursuant to the Colorado Voluntary Cleanup and Redevelopment Act, § 25-16-307, C.R.S., that remediation of the

property is not necessary to protect human health and the environment in light of the current or proposed use of the property, because sampling performed in accordance with these Regulations demonstrates that lead in soil does not exceed the applicable Action Level. A VCUP NAD also means CDPHE written concurrence with a Residential, Public Facilities, or Open Space No Action Confirmation obtained from the Town pursuant to Section D.2.D of these regulations, when the property owner (or property owner's designated representative) submits a no action petition to CDPHE pursuant to § 25-16-307, C.R.S. Consistent with Section D.2.F.6 of these Regulations, Development Activities on properties for which a prior VCUP NAD has been made are exempt from these Regulations, provided that, (i) no exposed Mine Waste is encountered on the property; and (ii) for Public Facilities properties, there has not been a change in the zoning of the property to Residential Use, and for Open Space properties, there has not been a change in the zoning of the property to Public Facilities or Residential Use since issuance of the VCUP NAD.

30. VCUP No Further Action Determination ("VCUP NFA"). VCUP NFA shall mean a property-specific determination made by CDPHE pursuant to the Colorado Voluntary Cleanup and Redevelopment Act, § 25-16-307, C.R.S., that soil remediation performed and maintained in accordance with a Soils Excavations Permit issued by the Town pursuant to these Regulations is adequate to protect human health and the environment in light of the current or proposed use of the property, where the surface soil-lead concentrations were above the applicable Action Level before the Development Activity, and the property owner (or property owner's designated representative) has requested, and received, the determination after the Effective Date of these Regulations. VCUP NFA shall also mean a property-specific determination by CDPHE issued pursuant to § 25-16-307, C.R.S., prior to the Effective Date of these Regulations for soil remediation performed on a property in accordance with a CDPHE-approved VCUP application that resulted in a prior VCUP NFA. Development Activities on properties for which a prior VCUP NFA has been made remain subject to these Regulations.

31. CDPHE VCUP Project Manager. CDPHE VCUP Project Manager shall mean the current CDPHE individual(s) overseeing any existing and prospective VCUP projects in and around Rico, CO, whose office is located at 4300 Cherry Creek Drive South, Denver, CO 80246.

C. Town Approval. Unless exempt under these Regulations, any Development Activity within the RSOZ shall require (a) prior approval by the Town of a Soils Excavation Permit; or (b) a Residential, Public Facilities, or Open Space No Action Confirmation issued by the Town pursuant to Section D.2.D of these Regulations. A Residential, Public Facilities, or Open Space No Action Confirmation under these Regulations will apply to subsequent development activities at the property, unless the provisions of Section D.2.D provide otherwise.

D. Residential, Public Facilities, or Open Space No Action Confirmations. A Residential, Public Facilities, or Open Space No Action Confirmation under these Regulations shall mean that the property or portion of the property for which the Confirmation is obtained is exempt from the requirement to obtain a Soils Excavation Permit. However, a Public Facilities No Action Confirmation will no longer apply if the zoning on the property changes to allow Residential Use, and an Open Space No Action Confirmation will no longer apply if the zoning on the property changes to allow Residential Use or Public Facilities (subject to applying for and receiving a Residential or Public Facilities No Action Confirmation following the change in use). Additionally, properties that receive Residential, Public Facilities, and Open Space No Action Confirmations shall remain subject to the Mine Waste management provisions of Section D.7.E of these Regulations if exposed Mine Waste is encountered on the property during a Development Activity. A Residential, Public Facilities, or Open Space No Action Confirmation under these Regulations may be obtained under the following circumstances and with the following conditions:

1. **For Developments on Residential Use or Public Facilities Property Less than 5,000 Square Feet**: If the lead concentration in each composite sample collected from Surface Soils at the property is below the applicable Action Level based on soil sampling conducted pursuant to the procedures established in Section D.6, then the Developer may apply for a Residential or Public Facilities No Action Confirmation, as applicable based on the zoning of the property. However, a Public Facilities No Action Confirmation will no longer apply if there has been a change in zoning of the property to allow Residential Use (subject to applying for and receiving a Residential No Action Confirmation following the change in use).

2. **For Developments on Residential Use or Public Facilities Properties Greater than 5,000 Square Feet**: If the lead concentration in each composite sample collected from Surface Soils at the property is below the applicable Action Level based on soil sampling conducted pursuant to the procedures established in Section D.6, then the Developer may apply for a Residential or Public Facilities No Action Confirmation, as applicable based on the zoning of the property. If sampling has been or is conducted on only the portion of the property that is developed or is to be developed, and the lead concentration in each composite sample collected from Surface Soils in that portion of the property is below the applicable Action Level based on soil sampling conducted pursuant to the procedures established in Section D.6, then the Developer may apply for a Residential or Public Facilities No Action Confirmation for that portion of the property, as applicable based on the zoning of the property. The Residential or Public Facilities No Action Confirmation will not apply to any other portion of the property. Additionally, a Public Facilities No Action Confirmation will no longer apply if there has been a change in zoning of the property to allow Residential Use (subject to applying for and receiving a Residential No Action Confirmation following the change in use).

3. **For Developments on Open Space Areas**: If the lead concentration in each composite sample collected from Surface Soils in the portion of the property to be developed is below the Open Space Action Level based on soil sampling conducted pursuant to the procedures established in Section D.6, then the Developer may apply for an Open Space No Action Confirmation for that portion of the property. The Open Space No Action Confirmation will not apply to any other portion of the property. Additionally, the Open Space No Action Confirmation will no longer apply if there has been a change in zoning of the property to allow Residential Use or Public Facilities (subject to applying for and receiving a Residential or Public Facilities No Action Confirmation following the change in use).

4. **Recording:** A Residential, Public Facilities, or Open Space No Action Confirmation shall be signed by the Environmental Officer and filed with the Town within five (5) business days after the Environmental Officer's issuance of the Residential, Public Facilities, or Open Space No Action Confirmation. The Developer may elect to record the Residential, Public Facilities, or Open Space No Action Confirmation in the Dolores County Clerk and Recorder's Office.

E. <u>Activities Not Entitled to Certain VCUP Benefits</u>. A Development Activity proposed for the sole purpose of covering, capping, removing, or reducing the concentration of or potential for exposure to contamination or contaminants in the soil, *e.g.*, where there is no current or planned use of the property for residential, commercial, or recreational purposes, or need for the Development Activity for utility maintenance or repair, shall not be eligible for certain benefits of the Rico Soils Management Program, as described in the VCUP Application, including reimbursement for incremental costs, use of the Repository, and the provision of materials.

F. <u>Activities Exempt from Regulations</u>. The following Development Activities are hereby exempt from review and application of these Regulations, except that if Mine Waste is encountered in the course of a Development Activity in the RSOZ, the Developer shall comply with Section D.7.E:

1. A discrete event of excavation/grading/digging/filling, not associated with a larger plan for development, resulting in a disturbance of less than a total of **<u>one cubic yard</u>** of soil associated with the Development Activity, provided that this exemption does not apply to any excavation the purpose of which is to install, relocate, or repair underground utilities;

2. Installation, repair or relocation of fences and porches;

3. Excavation for the sole purpose of conducting soil sampling and other soils testing, provided that this exemption does not apply to test pitting for the purposes of soil sampling if the excavation disturbs greater than one cubic yard of soil;

4. Excavation for the sole purpose of conducting soil testing for septic tanks on undeveloped properties;

5. Excavation/grading/digging/filling required to address an emergency situation, including, without limitation, broken or frozen plumbing fixtures, provided that the Environmental Officer confirms the emergency nature of the situation, that the Developer complies with these Regulations to the maximum extent practicable under the circumstances, and that the Developer complies fully as soon as the emergency has passed, including by complying with the remedial standards in Section D.7; and

6. Development Activities on properties where testing has confirmed that lead concentrations in Surface Soils do not exceed the applicable Action Level, and either (i) the Town has issued a Residential, Public Facilities, or Open Space No Action Confirmation consistent with Section D.2.D of these Regulations, or (ii) a prior VCUP NAD has been made and remains in effect.

G. Phase 1 VCUP Remediation Exempt from Regulations and Article IV, Section 494 of the RLUC. The Phase 1 VCUP soil remediation work performed by Atlantic Richfield Company, pursuant to Section 6 and Appendix B of the VCUP Application, shall be exempt from review and application of these Regulations because Section 6 and Appendix B of the VCUP Application satisfy the requirements of these Regulations. For the same reason, Phase 1 VCUP soil remediation work performed by Atlantic Richfield Company on property owned by the Town, pursuant to Section 6 and Appendix B of the VCUP Application, shall be exempt from the requirements of Article IV, Section 494 of the RLUC.

H. Exemption for Town Development Activities Along Road and Alley Segments Prior to Phase 1 VCUP Road Remediation. At the Environmental Officer's discretion, the Environmental Officer may exempt from these Regulations Development Activities involving excavation of Town road and alley segments for the purpose of installing utility infrastructure prior to the commencement of the Phase 1 road remediation described in Appendix B of the VCUP Application, provided that excavated material is returned to the excavation or otherwise managed consistent with these Regulations. A decision by the Environmental Officer to grant or deny an exemption pursuant to this Section D.2.H may be appealed to the Board of Trustees, which appeal shall proceed in accordance with the provisions set forth in Article V, Section 516 of the RLUC.

I. Failure to Obtain Prior Approval. The following are deemed a violation of this RLUC and shall be punishable in accordance with Article VII: (a) the commencement of any Development Activity not exempted by Section D.2.F within the RSOZ prior to review and approval by the Town; and (b) the failure to comply with Section D.9 for any property within the EROZ.

J. Failure to Obtain or Comply with Soils Excavation Permit or File Required Cleanup Completion Report. Any failure to obtain a Soils Excavation Permit when so required, to comply with a Soils Excavation Permit that has been obtained, or to file a Cleanup Completion Report required pursuant to Section D.5.B is hereby deemed a violation of this RLUC and shall be subject to the enforcement provisions of the RLUC, including but not limited to provisions in Article VII.

K. Prohibition on Creation of Nuisance. Partial completion of work covered by an approved Soils Excavation Permit can in some instances create a nuisance pursuant to Ordinance Number 277. The creation of such nuisance is hereby prohibited.

L. Failure to Perform and Report Required Testing. It is illegal and a violation of these Regulations to falsify or fail to disclose to the Town any test results required by these Regulations.

M. Persons Liable. The owner, tenant, or occupant of any building or land or part thereof and any builder, agent, or other person who participates in, assists, directs, creates, or performs any Development Activity without first performing the requirements of these Regulations may be held responsible for the violation of these Regulations and subject to the enforcement provisions of the RLUC.

N. Duration of Soils Excavation Permit. Soils Excavation Permits issued under these Regulations shall be valid for a period not to exceed one year, unless renewed by the Environmental Officer.

O. Transfer of Soils Excavation Permit. A Soils Excavation Permit is not transferable to a subsequent owner unless the subsequent owner expressly agrees to transfer of the permit into his or her name in writing and obtains written consent of the Environmental Officer for such transfer.

P. Effective Date of Regulations. These Regulations shall take effect 30 days after adoption by the Town Board of Trustees, which shall be the "Effective Date," and shall only apply to Applications filed pursuant to Section D.4 after the Effective Date.

Q. Consultation to Amend. Prior to the Town considering any amendment to these Regulations in this Appendix D of the RLUC, the Town shall consult with CDPHE and shall incorporate such requirements as CDPHE may recommend to ensure these Regulations continue to protect human health and the environment.

R. Lack of Third-Party Enforcement Rights. The enforcement of these Regulations is within the discretionary police power of the Town of Rico, and these Regulations are not intended to, nor do they, create a third-party right of enforcement; provided, however, that these Regulations are directly enforceable by CDPHE, pursuant to the Intergovernmental Agreement between CDPHE and the Town of Rico.

S. Water Quality Issues Not Addressed. These Regulations do not address water quality issues, and it remains the responsibility of the Developer to comply with state and federal requirements with respect thereto.

Rico Land Use Code Appendix D Section D.3 Reviewing Entity

A. Environmental Officer. The Town Manager is the representative of the Town for purposes of administering these Regulations and shall be responsible for issuing Soils Excavation Permits under these Regulations. The Town Manager shall be referred to as the "Environmental Officer" in this capacity. The Town Manager may, with consent of the Board of Trustees, designate another person to serve as the Environmental Officer for purposes of these Regulations or to fulfill certain tasks for which the Environmental Officer is responsible under these Regulations. Such designation shall remain in effect until revoked by the Town Manager or Board of Trustees, with or without cause.

<u>Rico Land Use Code Appendix D Section D.4 Application Requirements</u>

Before commencing any non-exempt (with exempt activities being those specified in Section D.2.F) Development Activity within the RSOZ, the Developer shall prepare and submit an application in hard copy and in electronic format to the Town, for review by the Environmental Officer. The application shall contain the following information unless, in consultation with CDPHE, the Environmental Officer determines that the required information is not applicable to the scope of work to be performed under the application, or that the Environmental Officer already has the required information on file, and waives the requirement for the Developer to include that specific information:

A. <u>Existing Soil Sampling Data</u>. The Developer shall submit with the application all existing soil sampling data reasonably available to the Developer for the subject property and/or any information regarding the presence of Disturbed Native Soils, Non-Native Fill materials, and/or an Existing Soils Cover at the subject property. The source of soil data shall be identified. The Developer shall consult with the Environmental Officer regarding the availability of existing data before submitting an application, so that all existing data, including soil data collected to support VCUP projects within the Town of Rico, is provided in the application.

B. <u>New Soil Sampling Data</u>. If the existing soil sampling data for the property do not meet the standards for soil sampling set forth in Section D.6, or conditions on a site have changed such that existing soil sampling data are no longer representative, then the Developer shall submit new soil sampling data that meet the standards of Section D.6. The Environmental Officer may also determine upon review of the application that more data are desired to assess soil or fill conditions or to facilitate the development of the property for the proposed use, in which case the Developer shall resubmit the application with the required soil sampling data.

C. <u>Soil Sampling Data Must Be Submitted with Application</u>. The Developer shall submit the required sampling data, whether existing or new, with the Application, regardless of whether the Developer proposes to place Non-Native Fill, use Disturbed Native Soils, or retain the Native Soils following the Development Activity. Submission of sampling data for an Existing Soils Cover is not required.

D. <u>Description of Property Zoning</u>. The Developer shall identify whether the property qualifies as Residential Use, Public Facilities, or Open Space pursuant to these Regulations and the zoning provisions of the RLUC.

E. <u>Description of Proposed Development Activity</u>. The Developer shall describe the proposed Development Activity, including a narrative statement, site plan, description of area and depth of any excavation or fill placement, extent of any grading, and the time frame for the

Development Activity. To the extent stockpiling of soils is planned during the Development Activity, the Developer shall specify the means of protecting the stockpile and the planned duration of the proposed stockpiling. If placement of a Soils Cover is an element of the Development Activity, the Developer shall specify the source of the Soils Cover material to be used and the means by which that cap shall be placed and maintained.

F. Authorization for VCUP Representation. In an application submitted pursuant to these Regulations, the Developer may, if it has not already done so, authorize the Town and Atlantic Richfield Company to act as its VCUP representative for purposes of obtaining a VCUP NFA from CDPHE upon completion of a Development Activity performed in accordance with these Regulations.

Rico Land Use Code Appendix D Section D.5 Application Review and Determinations

A. Application Review. The Environmental Officer shall review the application to determine: (1) whether the required information is contained in the application, taking into account any waiver granted by the Environmental Officer pursuant to Section D.4; (2) whether a Soils Excavation Permit is in fact required for the specific property and Development Activity at issue; (3) if soil sampling data is required for the specific property and Development Activity, whether sufficient data that meets the standards for soil sampling set forth in Section D.6 has been submitted; (4) whether the Developer has requested a conditional Cleanup Completion Certification for the Development Activity pursuant to Section D.5.D; and (5) whether the Developer has requested a Residential, Public Facilities, or Open Space No Action Confirmation pursuant to Section D.2.D. If the required information has been submitted, the Environmental Officer may: (1) approve the application and issue the Soils Excavation Permit; (2) issue a conditional Cleanup Completion Certification; (3) issue a Residential, Public Facilities, or Open Space No Action Confirmation; or (4) deny the application. If the application is denied, the Environmental Officer shall state in writing the reason(s) for the denial.

B. Cleanup Completion Report. For any Development Activity subject to an approved Soils Excavation Permit, the Developer shall prepare and submit a Cleanup Completion Report to the Town once the work as described in the approved Soils Excavation Permit is complete. The Cleanup Completion Report shall set forth: a legal description of the site; a description of the nature of the site, lead concentrations in Surface Soils, and date of soil sample collection and analysis for lead; documentation of the location, quantity and date that soils with elevated lead concentrations were removed from the site; and shall include as an attachment the Soils Excavation Permit approved by the Town. If the Developer has removed soil from the property, the Developer shall provide documentation that the soil was properly disposed of pursuant to this Appendix D of the RLUC.

C. Cleanup Completion Certification. Based on the information provided in the Cleanup Completion Report, the Environmental Officer shall either issue a Cleanup Completion Certification for the Development Activity or decline to issue a Cleanup Completion Certification and provide conditions that need to be met to obtain a Cleanup Completion

Certification. At its sole discretion, the Environmental Officer may require an inspection of the property to determine whether the information provided in the Cleanup Completion Report is accurate before issuing or declining to issue a Cleaning Completion Certification. The Cleanup Completion Report shall be signed by the Environmental Officer and filed with the Town within five (5) business days after the Environmental Officer's issuance of a Cleanup Completion Certification. The Developer may also record the Cleanup Completion Report and Cleanup Completion Certification in the Dolores County Clerk and Recorder's Office.

D. Conditional Cleanup Completion Certification. A Cleanup Completion Certification may be issued conditionally when the conditions outlined in Section D.7.A.1 of these Regulations are met. The Environmental Officer may include appropriate conditions in a conditional Cleanup Completion Certification, including but not limited to the conditions that the Development Activity not disturb soils below an Existing Soils Cover and the Existing Soils Cover will be repaired as part of the Development Activity. After completion of the Development Activity and a successful inspection by the Environmental Officer to ensure that the requirements of Section D.7.D are met, the Environmental Officer shall make the conditional Cleanup Completion Certification final rather than conditional, and the Cleanup Completion Certification may be recorded in the Dolores County Clerk and Recorder's Office.

E. Appeals. A Developer may appeal any final decision by the Environmental Officer as to the issuance or denial of a Soils Excavation Permit, Residential, Public Facilities or Open Space No Action Confirmation, or Cleanup Completion Certification. The Developer may appeal the decision of the Environmental Officer to the Board of Trustees by filing a notice of appeal with the Town Clerk within thirty (30) days of the Developer's receipt of the final decision by the Environmental Officer. The appeal to the Board of Trustees shall proceed in accordance with the provisions set forth in Article V, Section 516 of the RLUC.

Rico Land Use Code Appendix D Section D.6 Standards for Soil Sampling

The following requirements and guidelines shall govern all environmental testing and sampling performed under these Regulations:

A. Existing Soil Sampling Data. A Developer may use existing soil sampling data to satisfy Soils Excavation Permit requirements if the number and types of samples collected and the laboratory analyses conducted meet the standards in this Section D.6.

B. Approved Sampling Contractors. All sampling and analysis must be performed by a qualified contractor, and the conformance of all sampling and analysis with the standards set forth in this Section D.6 must be certified by a Professional Engineer ("P.E.") registered and licensed in the State of Colorado or a Professional Geologist ("P.G.") meeting the requirements of § 23-41-208(1)(b), C.R.S. The proper chain of custody shall be maintained and documented for all samples collected for the property. All samples undergoing laboratory analysis shall be submitted to a CDPHE-approved or EPA-certified laboratory qualified to perform metals analysis in a solid matrix.

C. Analytical Procedures. All samples to be analyzed for lead content will be sieved through a U.S. Standard No. 10 mesh sieve. If any sample has less than 5 percent passing the No. 10 sieve it should be discarded and not processed further for metals analysis. Soil samples shall be analyzed for lead using laboratory-grade x-ray fluorescence (XRF) or using inductively coupled plasma (ICP). Analytical methods shall conform to the then-current procedures prescribed in EPA's Test Methods for Evaluating Solid Waste, Physical / Chemical Methods, SW-846, as amended, or an equivalent method approved by the Environmental Officer.

D. Minimum Number of Samples. Within each sampling sector established pursuant to Section D.6.E, soil samples will be collected from a depth of 0 inches to 2 inches (below the base of any sod or root mat that may be present) at five randomly selected locations. The five surface samples collected from within each sector should be of similar size and composited into a single sample for analysis for that sector. Soil samples should not be collected from locations where Mine Waste material is observed or from the drip zone of buildings (four feet from the edge of a building) to avoid lead paint contamination. If any areas of the sampling sector include areas from which Mine Waste has been removed, one of the samples should be collected from that area.

E. Number and Division of Sampling Sectors. When soil sampling data are collected, whether before or after development, adherence to the following sampling plans is required:

1. **For Properties Less than 5,000 Square Feet**: Properties less than or equal to 5,000 square feet in total area will be divided into at least two sampling areas, excluding buildings, pavement, or other permanent caps over the soil. A minimum of two composite samples (comprised of five subsamples each), one each from the front yard and back yard (and side yard if substantial), plus a separate sample for each distinct driveway, vegetable garden, and play area, if present, will be collected.

2. **For Public Facilities Properties Greater than 5,000 Square Feet and Less than 0.5 Acre:** The property shall be divided into a minimum of four (4) sampling sectors not to exceed 5,000 square feet in size (excluding buildings, pavement, or other permanent caps over the soil that cannot be removed by hand to expose the underlying soil). If only a portion of such property is to be developed, the Developer may: (i) subdivide the property subject to provisions in the RLUC and complete the sampling only on the portion of the property that will be developed; or (ii) sample a 100-foot radius ("Sampling Radius") around the area affected by the Development Activity and, when submitting a Cleanup Completion Report to the Town per Section D.5.B, provide clear documentation of the portions of the property that have and have not been sampled and remediated. If the resulting Subdivision or Sampling Radius results in an area greater than 5,000 square feet, it shall be divided into sampling sectors as described in this sub-paragraph. If the resulting Subdivision or Sampling Radius results in an area less than 5,000 square feet in size, it shall be divided into two (2) sampling sectors based on the criteria in Section D.6.E.1. Once the sampling sectors have been defined, the procedures established in Section D.6.D shall be followed for each sampling sector. A separate sample will also be collected for each

distinct driveway, vegetable garden, and play area, if present. This section does not create any additional rights for creating a Subdivision, and any Subdivision must comply with all other applicable requirements of the RLUC for obtaining the Subdivision approval.

3. **For Residential Use Properties Greater than 5,000 Square Feet and Less than 0.5 Acre**: The property shall be divided into a minimum of four (4) sampling sectors not to exceed 5,000 square feet in size (excluding buildings, pavement, or other permanent caps over the soil that cannot be removed by hand to expose the underlying soil). If only a portion of such property is to be developed, the Developer may (i) subdivide the property subject to provisions in the RLUC; or (ii) establish and document a Sampling Radius as provided for in Section D.6.E.2, and complete the sampling only on the portion of the property to be developed and, if necessary, remediated, so long as the development area sampled includes the greater of: (a) a total area of 3,000 square feet adjacent to and surrounding the residence, not including areas covered by pavement or other permanent caps over the soil; (b) the portion of the property to be developed that will not be covered by buildings, pavement, or other permanent caps over the soil; or (c) all areas to be developed as lawns (sod or seeded), play areas, gardens, and other landscaped features around any structures. If the sampling area based on the above criteria is greater than 5,000 square feet, it shall be divided into sampling sectors as described in this sub-paragraph. If the sampling area based on the above criteria is less than 5,000 square feet in size, it shall be further divided into two (2) sampling sectors based on the criteria in Section D.6.E.1. Once the sampling sectors have been defined, the procedures established in Section D.6.D shall be followed for each sampling sector. A separate sample will also be collected for each distinct driveway, vegetable garden, and play area, if present. This section does not create any additional rights for creating a Subdivision, and any such Subdivision must comply with all other applicable requirements of the RLUC for obtaining the Subdivision approval.

4. **For Residential Use and Public Facilities Properties Greater than 0.5 Acres:** The property to be sampled shall consist of a 100-foot radius around the area affected by the Development Activity. The procedures of Section D.6.E.1 through D.6.E.3 shall apply depending on the size and zoning designation – Residential Use or Public Facilities – of the portion of the property subject to sampling. On portions of such property outside the 100-foot radius around the area affected by the Development Activity, no specific standard or requirement applies, except that if Mine Waste is encountered, the provisions for management of Mine Waste in Section D.7.E shall apply.

5. **For Open Space Areas**: The area to be sampled shall consist of the area affected by the Development Activity (e.g., only the area impacted by a utility easement, road, or trail), and not the full area of the individual lot or lots. The procedures of Section D.6.E.1, D.6.E.2, and D.6.E.4 shall apply depending on the size of the portion of the

property subject to sampling. On undisturbed portions of such property where the use is to remain Open Space, no specific standard or requirement applies, except that if Mine Waste is encountered, the provisions for management of Mine Waste in Section D.7.E shall apply.

F. Placement of Non-Native Fill. The Developer shall identify the source of any Non-Native Fill transported to the property as part of the Development Activity, whether for use as a Soils Cover or any other purpose, and shall: (1) show that the source has been approved by the Town pursuant to Section D.7.D; or (2) show, using sampling data or other information acceptable to the Environmental Officer, that the Non-Native Fill contains less than 100 mg/kg lead.

G. Additional Sampling. Additional sampling may be required if deemed necessary by the Environmental Officer for accurate analysis of potential health risks posed by soil conditions considering the proposed Development Activity and/or use of the property.

H. Failure to Certify Soil Testing. The Developer's failure to provide to the Town soil sampling data that has been certified by a registered and licensed P.E. or a P.G. meeting Colorado statutory requirements shall result in denial of the Soils Excavation Permit.

I. Provision of All Soil Sampling Results. Developers shall promptly provide all soil sampling results to the Town.

Rico Land Use Code Appendix D Section D.7 Remediation Standards

The objective of these Remediation Standards is to ensure that the average lead concentration in exposed soil in each sector of the property, whether Native Soils, Disturbed Native Soils, or Non-Native Fill, based on soil samples collected according to or in a manner consistent with Section D.6, do not exceed applicable Action Levels. If the lead concentration of one or more composited Surface Soil samples collected within a sampling sector exceeds the applicable Action Level for the property in question, then the average lead concentration for Surface Soils in that sector is deemed to exceed the Action Level.

A. Requirements Applicable to Development Activities on Properties or Property Sectors with an Existing Soils Cover.

   1. If the Development Activity will not disturb soils below the Existing Soils Cover or any disturbance to the Existing Soils Cover is limited to the depth of that soil cover, which is typically no more than twelve (12) inches below the ground surface, and the Existing Soils Cover will be repaired as part of the Development Activity, the Developer may seek a conditional Cleanup Completion Certification from the Town, based on the existing conditions meeting the requirements of Section D.7.D. The purpose of the conditional Cleanup Completion Certification is to allow the Development Activity to proceed with minimal administrative requirements, while ensuring the Environmental Officer is aware of the Development Activity. Upon completion of the Development Activity, the Developer shall schedule and complete

an inspection by the Environmental Officer to ensure that the requirements of Section D.7.D are met.

2. If the Development Activity will disturb an Existing Soils Cover and underlying soils, then:

    a. The Existing Soils Cover material (above the geotextile fabric) shall, to the extent practicable, be removed and stockpiled on a clean surface (e.g., pavement or plastic sheets) and later reused for repairing the Soils Cover (or at other locations at the site), provided the Existing Soils Cover material does not become contaminated with underlying soils or Mine Waste and provided further that such Existing Soils Cover material is stockpiled onsite at the property that is subject to the Development Activity. If contamination of the Existing Soils Cover material occurs during the course of a Development Activity, the Developer shall notify the Environmental Officer, who will address such situations on a case-by-case basis to ensure proper management and disposal of the contaminated Existing Soils Cover material. In the Environmental Officer's discretion, and on a case-by-case basis, contamination of the Existing Soils Cover material may lead to the Developer's exclusion from certain benefits of the Rico Soils Management Program, as described in the VCUP Application, up to and including loss of reimbursement for the incremental costs of handling the contaminated Existing Soils Cover material.

    b. Excavated Soils shall (i) to the extent space is available in the excavation, be returned to the excavation to a depth up to twelve (12) inches below the final surface grade and placed below a Soils Cover pursuant to Section D.7.D; or (ii) demonstrated to have lead levels below the applicable Action Level using the sampling procedures established in Section D.6. Any Excavated Soils that remain after backfilling to a depth up to twelve (12) inches below the final surface grade shall be managed in accordance with Section D.7.C. If Excavated Soils are stockpiled onsite at the property that is subject to the Development Activity, they must be stockpiled in an area to be capped or on a surface that will be cleaned after the stockpile is removed.

    c. Stockpiled Excavated Soils shall be protected from erosion, covered with plastic sheets, or managed using other appropriate controls if left on site for more than 24 hours. Any soil that does erode or blow from a stockpile shall be promptly collected and returned to the stockpile. Using best management practices, the Developer must also control generation and dispersal of fugitive dust from any soil or Mine Waste that is exposed by the Development Activities. It is not permissible to stockpile soils that will be sent to the Repository, except as provided in Section D.7.C.

d. The final grade in the area disturbed by the Development Activities must consist of a Soils Cover meeting the requirements of Section D.7.D.

e. Confirmation soil samples must be collected according to the procedures established in Section D.6 in any areas where the upper 2 inches of the exposed final grade consists of Native Soils that were not previously tested (for example, deeper soils exposed by excavation and grading activities or Surface Soils that remained in place but were potentially contaminated by Development Activities), to demonstrate that these materials are below the applicable Action Level. Confirmation sampling is not required for caps consisting of imported fill from a location pre-approved by the Town pursuant to Section D.7.D.

B. Requirements Applicable to Development Activities on Properties or Property Sectors Without an Existing Soils Cover.

1. If the lead concentration in each composite sample collected from Surface Soils at the property is below the applicable Action Level based on soil sampling conducted pursuant to the procedures established in Section D.6, then no further testing or remedial action will be required under these Regulations (other than compliance with the requirement for placement of clean Non-Native Fill), and the Developer may apply for a Residential, Public Facilities, or Open Space No Action Confirmation pursuant to Section D.2.D. However, if exposed Mine Waste is encountered on the property, the procedures of Section D.7.E shall apply.

2. For each sector where one or more composite samples in existing Surface Soils at the property is above the applicable Action Level based on soil sampling conducted pursuant to the procedures established in Section D.6, Excavated Soils shall be managed as follows:

   a. Excavated Soils shall, to the extent space is available in the excavation, be returned to the excavation to a depth up to twelve (12) inches below the final surface grade and placed below a Soils Cover pursuant to Section D.7.D. Excavated Soils that remain after backfilling to a depth up to twelve (12) inches below the final surface grade shall be managed in accordance with Section D.7.C. Stockpiled Excavated Soils must be placed in an area to be capped or on a clean surface (e.g., pavement or plastic sheets) that will be cleaned after the stockpile is removed.

   b. In a sampling sector where the average lead concentration of Surface Soils is below the applicable Action Level, the Applicant can elect to remove and temporarily stockpile the Excavated Soils and later reuse such soils for the Soils Cover, provided that such soils do not become contaminated with underlying soils or Mine Waste, and provided further that such materials are stockpiled onsite. Stockpiled Excavated Soils must be placed in an area to be capped or on a clean surface (e.g., pavement or plastic sheets or clean sector).

c. Stockpiled Excavated Soils shall be protected from erosion, covered with plastic sheets, or managed using other appropriate controls if left on site for more than 24 hours. Any soil that does erode or blow from a stockpile shall be promptly collected and returned to the stockpile. The Developer must also control fugitive dust using best management practices. The Soils Excavation Permit Application shall specify appropriate time limits for temporary stockpiling of soil disturbed during the Development Activities, to be approved by the Environmental Officer.

d. The final grade in the area disturbed by the Development Activities must consist of Soils Cover materials meeting the requirements of Section D.7.D.

e. Confirmation soil samples must be collected pursuant to the procedures established in Section D.6 in any areas where the upper 2 inches of the final grade consists of soils that were not previously tested (for example, deeper soils exposed by excavation and grading activities or Surface Soils that remained in place but were potentially contaminated by Development Activities) to demonstrate that the average lead concentrations of these materials are below the applicable Action Level. Confirmation sampling is not required for caps consisting of imported fill from a location pre-approved by the Town pursuant to Section D.7.D.

C. Management and Disposal of Excavated Soils.

1. **For Development Activities Involving a Single Lot**: For Development Activities on a property that is not within or associated with a Planned Unit Development or Subdivision consisting of six (6) or more total lots created after the Effective Date, or at any lot subject to a Development Activity following the initial remediation of such lot pursuant to these Regulations, soils meet the criteria for disposal at the Repository if they are: (1) Excavated Soils from sectors that exceed the applicable Action Level and that remain as excess after Excavated Soils are used as backfill in the excavation; or (2) Mine Waste identified and managed in accordance with Section D.7.E. If the amount of excess Excavated Soil from a Development Activity that cannot be used as backfill is three (3) cubic yards or less, it may be transported by the Developer to the Repository for disposal without further testing to determine the concentration of lead in the soil. If the amount of excess Excavated Soil from a Development Activity that cannot be used as backfill is greater than three (3) cubic yards, excluding any soil removed to accommodate the twelve (12)-inch cap, the Developer must contact the Environmental Officer to request confirmation testing of the Excavated Soil. If such confirmation testing confirms that the excess Excavated Soil exceeds the Action Level, it may be transported by the Developer to the Repository for disposal. If such confirmation testing determines that the excess Excavated Soil does not exceed the Action Level, it shall not be transported to the Repository for disposal, and the Developer shall manage it in accordance with Article VIII of the RLUC or otherwise to prevent a nuisance. In all instances, the soil removed to accommodate the twelve

(12)-inch cap may be transported to the Repository without confirmation testing. In general, materials such as tree roots, large boulders, trash, and other non-soil debris may not be disposed of at the Repository, and must be removed from Excavated Soils before transport by the Developer to the Repository; provided however that materials removed from the top 12 inches of a property to make room for a clean Soils Cover will be accepted at the Repository, including when such materials contain rocks and vegetation. Soils to be disposed of at the Repository must be placed directly into trucks or roll-off containers at the time of excavation, or stockpiled pursuant to the procedures described in Sections D.7.A and D.7.B. The Developer shall ensure that all soils and Mine Waste transported to the Repository are covered during transport to the Repository. The Developer shall obtain a certificate from the operator of the Repository to demonstrate that soils excavated pursuant to these Regulations were in fact disposed of at the Repository, and shall submit this certificate with its Cleanup Completion Report.

2. **For Development Activities Involving a Planned Unit Development or Subdivision Consisting of Six (6) or More Total Lots Created After the Effective Date**: Excavated Soils and Mine Waste from a Development Activity within or associated with a Planned Unit Development or Subdivision consisting of six (6) or more total lots created after the Effective Date are not eligible for disposal at the Repository. Such Excavated Soils and Mine Waste shall be managed and disposed of as follows: Any Developer who generates Excavated Soils or Mine Waste in connection with a Development Activity within or associated with a Planned Unit Development or Subdivision consisting of six (6) or more total lots created after the Effective Date shall submit a soils management and disposal plan to the CDPHE VCUP Project Manager and the Environmental Officer for review and approval. The soils management and disposal plan shall describe the methods and procedures to be used by the Developer to ensure that all Excavated Soils and Mine Waste that cannot be returned to the excavation to a depth up to twelve (12) inches below the final surface grade and/or placed below a Soils Cover are managed and disposed of in accordance with applicable federal, state, and local requirements. Excavated Soils and Mine Waste from a Development Activity within or associated with such Planned Unit Developments or Subdivisions shall not be transported from the property that is subject to the Development Activity except in accordance with the soils management and disposal plan after approval in writing by CDPHE, with concurrence from the Environmental Officer. The restrictions in this paragraph do not apply where a Development Activity occurs on a lot following the initial remediation of such lot pursuant to these Regulations.

D. <u>Installation of Soils Covers</u>. The following materials may be used as a cap to cover soils exceeding the Action Level.

1. <u>Soils Cover</u>. A minimum of 12 inches of soil from the property subject to the Development Activity may be used as the Soils Cover if it has an average lead

concentration below the applicable Action Level, provided the soils are adequately protected against erosion (e.g., by appropriate grading and/or vegetation). Alternatively, the Soils Cover may consist of soils imported from off-site (e.g., from a location other than the property subject to the Development Activity), provided the imported soils contain less than 100 mg/kg lead and otherwise are suitable for use as a Soils Cover. Such clean soils must come from a source approved by the Environmental Officer, or be shown to be clean fill by soil sampling data obtained pursuant to the procedures set forth in Section D.6. The Environmental Officer may pre-approve soil borrow areas based on analytical testing from geographic areas demonstrating the soils from such areas are below 100 mg/kg lead and otherwise suitable for use as fill due to the absence of contamination. A commercial-grade geotextile fabric or other marker material, as approved by the Environmental Officer, shall be installed directly beneath the clean soil layer to mark the boundary between the Soils Cover and underlying Native Soils.

2. <u>Mature Trees</u>. Where mature trees are present and will remain after the Development Activity, soil beneath the canopy must have a lead concentration less than the applicable Action Level (or 100 mg/kg lead concentrations if imported soils are used) to a depth of 12 inches at the edge of the canopy, and to a depth of 0 inches at the base of the tree trunk. For soil beneath mature Aspen trees, the depth of soil may be reduced to a uniform 4 inches depth beneath the canopy.

3. <u>Pavement</u>. An impervious surface such as 4 inches of concrete or 2 inches of asphalt over a minimum 4 inches of clean granular fill (e.g., driveways, patios, walks) may be used to cover soils with concentrations of lead above the applicable Action Level.

4. <u>Buildings and Structures</u>. Where construction of a permanent building or structure is part of the Development Activity, the footprint of the building or structure may be used to cover soils with lead concentrations above the applicable Action Level.

E. <u>Identification, Management, and Disposal of Mine Waste</u>. Notwithstanding other terms of these Regulations, in the event that Mine Waste is encountered during any Development Activity, the Developer shall (i) presume that such materials exceed the applicable Action Level; (ii) contact the Environmental Officer to confirm the presence or absence of Mine Waste through a visual inspection and/or testing; and (iii) upon such confirmation, manage such waste pursuant to Section D.7 by removing Mine Waste from a depth of 0 to 12 inches below the ground surface for disposal at the Repository and installing a Soils Cover meeting the requirements of Section D.7.D. Alternatively, the Developer may choose to leave the Mine Waste in place on the property and cap the Mine Waste by installing a Soils Cover meeting the requirements of Section D.7.D that fully covers the Mine Waste to prevent exposure. The Mine Waste may be contoured as needed. Additionally, Mine Waste present at depths greater than 12 inches shall be left in place below a Soils Cover. If Mine Waste is excavated from a depth greater than 12 inches during the Development Activity, it shall be managed the same as other Excavated Soils in accordance with the provisions of this Section.

Rico Land Use Code Appendix D Section D.8 Maintenance of Remedial Features

A. To the extent a Soils Cover exists on a property, the current owner of that property is required to maintain the integrity of that Soils Cover in a manner that minimizes the risk of human exposure to soils with elevated levels of lead that may exist below the Soils Cover. Filing of the Cleanup Completion Certification, Soils Excavation Permit, and related documents with the Town (and optional recording the same in the Office of the Dolores County Clerk and Recorder) is intended to advise transferees and future owners of past remediation activities and on-going maintenance requirements with respect to the Soils Cover.

B. In the event that a Soils Cover is not maintained as required by this Appendix D, the Town Manager may issue a written notice of violation to the then-current property owner describing the conditions present on the property that constitute a failure to maintain the Soils Cover. If such a notice is issued, the notice shall be posted on the property in a conspicuous place and mailed via registered mail to the last known address of the property owner according to the Dolores County Assessor's records. The property owner shall have thirty (30) days after the posting and mailing of such notice to remedy all conditions on the property related to the described violation.

C. A property owner can request an extension of time to remedy any violation under this Section D.8, which request shall be in writing, shall indicate good cause for requesting an extension, and shall propose a definite date to remedy all impaired property conditions and restore the integrity of the Soils Cover consistent with the approved Soils Excavation Permit. The Town Manager on behalf of the Town shall have authority to grant a single extension of up to one hundred eighty (180) days. The Rico Board of Trustees shall have the authority to grant greater extensions. Any grant of extension shall be in writing and mailed to the property owner at the last known address according to the Dolores County Assessor's records.

D. The failure to remedy any violation under this Section D.8 within thirty (30) days after receiving notice, or after a definite date approved in an extension, shall be deemed a violation of the RLUC and each day shall be deemed a separate violation, and such violation shall be punishable in accordance with Article I of this RLUC.

Rico Land Use Code Appendix D Section D.9 Development Activities Within the EROZ Overlay

A. Properties within the EROZ. Properties within the EROZ were subject to previous remedial efforts pursuant to the State VCUP program or otherwise have unique environmental conditions that warrant inclusion within the EROZ. Substantial Development Activities on such lands could pose the risk of contaminating other nearby lands within the Town through erosion, wind-blown dust, changes to erosion controls, or other damage to existing remedial features. As a result of these conditions and the involvement of CDPHE, Development Activities within the EROZ are prohibited unless the Developer obtains approval from the CDPHE VCUP Project Manager pursuant to a separate VCUP or other written approval from

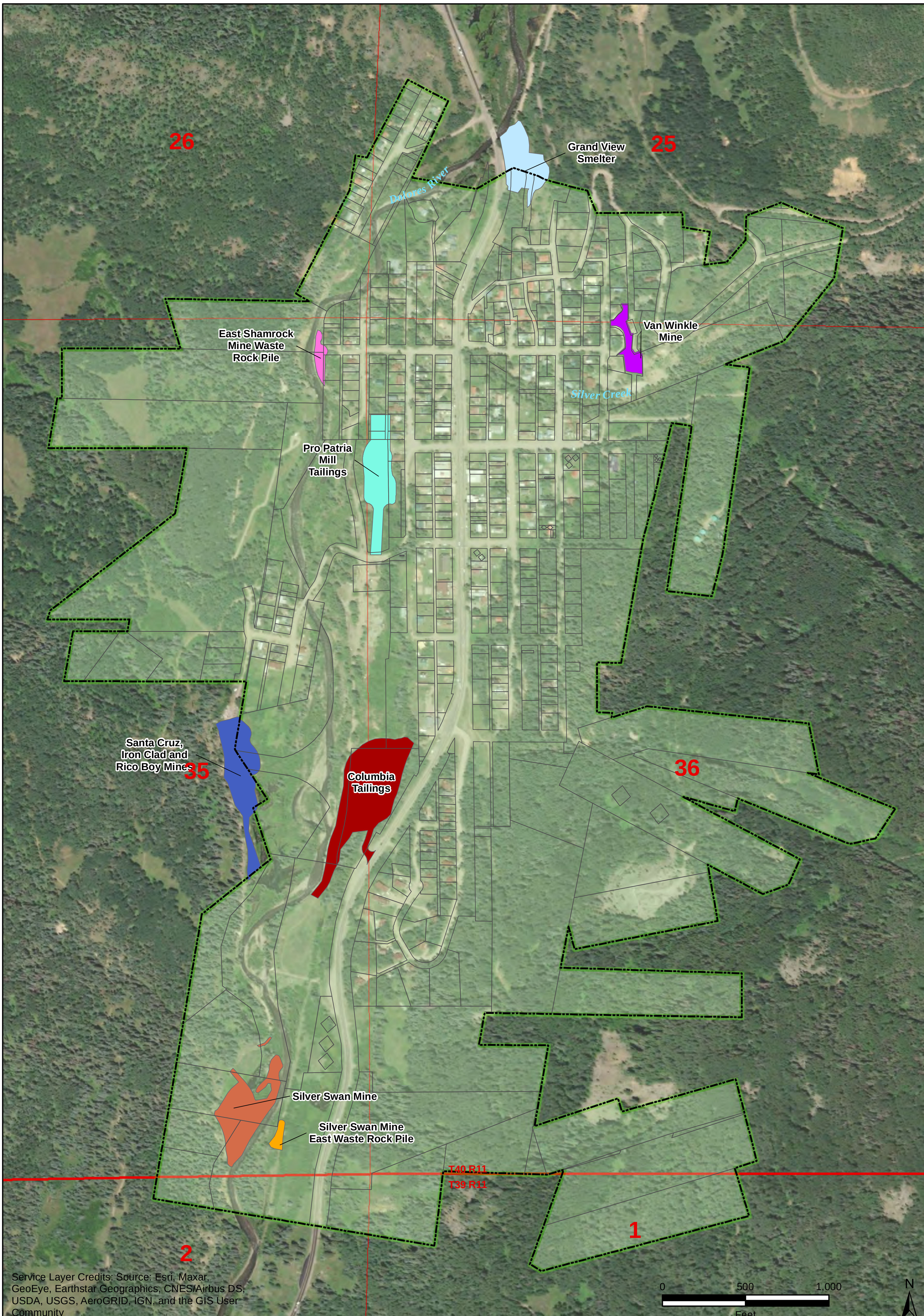
CDPHE for the Development Activity. Certain EROZ properties contain erosion control features, soil caps, surface grading, and passive water treatment features. It is the responsibility of the owner of the property to maintain those features and protect them against damage resulting from any proposed Development Activity.

B. Developer Submittals. At the same time the Developer submits materials related to the Development Activity to the CDPHE VCUP Project Manager, the Developer shall provide copies of documents to the Environmental Officer.

C. Approvals from CDPHE. If the Developer obtains approval from the CDPHE VCUP Project Manager, the Developer shall provide written documentation of the approval to the Town prior to initiating the Development Activity. Upon completion of the Development Activity, the Developer shall provide notice to the Town that the work has been completed to the satisfaction of the CDPHE VCUP Project Manager, including but not limited to any documentation from CDPHE with respect to same. A written approval from the CDPHE VCUP Project Manager obtained pursuant to this Section D.9 does not relieve the Developer from any other required approvals or requirements that may apply to the Development Activity.

D. Restrictive Covenants or Notices. To the extent a property within the EROZ contains a land use covenant or restrictive notice that is more restrictive than these Regulations, the more restrictive covenant or notice requirement shall apply in addition to these Regulations, including additional notice or approval requirements that may be imposed by virtue of the land use covenant. Development Activities inconsistent with the more restrictive land use covenant or notice shall not be permitted.

E. EROZ and RSOZ Overlaps. To the extent a legal parcel lies within both the EROZ and RSOZ, only the portion of parcel that is within the EROZ is subject to this Section D.9, with the balance of the parcel being subject to the other provisions of these Regulations; however, in such situations, a Developer may elect to manage an entire parcel under this Section D.9 at its option.



EROZ Sites

- Columbia Tailings
- Grand View Smelter
- Santa Cruz, Iron Clad and Rico Boy Mines
- Silver Swan Mine
- Silver Swan Mine East Waste Rock Pile
- Pro Patria Mill Tailings
- Van Winkle Mine
- East Shamrock Mine Waste Rock Pile

Rico Soils Overlay Zone (RSOZ)

- RSOZ Boundary

- Town of Rico Boundary
- Parcels
- Section
- Township/Range

RICO, COLORADO

FIGURE 1

ENVIRONMENTAL REMEDIATION OVERLAY ZONE (EROZ) AND RICO SOILS OVERLAY ZONE (RSOZ)

DATE: DEC 21, 2022	
BY: DKG	FOR: BGH

FORMATION ENVIRONMENTAL

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