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February 14, 2024

ELECTRONIC DELIVERY

Mr. Patrick Lennberg
Environmental Protection Specialist
Colorado Department of Natural Resources
Division of Reclamation, Mining and Safety
Office of Mined Land Reclamation
1313 Sherman Street, Room 215
Denver, Colorado 80203

Re: Division Adequacy Review No. 1; Technical Revision 141 (TR-141) Grassy Valley Monitoring Well Installation – Phase 1, Permit No. M-1980-244

Dear Mr. Lennberg:

On January 23, 2024, Newmont Corporation's Cripple Creek and Victor Gold Mining Company (CC&V) received the Division of Reclamation, Mining and Safety (DRMS) preliminary adequacy review of Technical Revision (TR) 141 to Permit M-1980-244, regarding Grassy Valley Monitoring Well Installation – Phase I. Below are DRMS comments in **bold** and CC&V's responses in *italics*.

1. **In the background section the Operator states the Division requested the Operator withdraw TR-138. The statement is inaccurate, the Division was going to deny TR-138 as submitted, however the Operator chose to withdraw the application to preempt the denial.**

   No response needed. Thank you for the clarification.

2. **Please provide the details on what the Operator means by "implementing pre-feasibility level closure studies" and how the results of those studies will be conveyed to the Division in a timely manner.**

   The pre-feasibility level closure study is an options identification and evaluation study complete with data acquisition, model development, and trade-off assessments to develop an integrated closure strategy that aligns with Newmont Values, Study/Project Requirements by Stage and Standards and applicable Federal, State, and Local regulations. The pre-feasibility study will evaluate multiple options and recommend a preferred option to be carried into a feasibility study which includes more detailed designs. These studies are completed years in advance of closure prior to any construction activities and will be the basis of amendments to the mining and reclamation plans. The scope of the pre-feasibility level study will encompass all CC&V facilities and all closure aspects (technical and non-technical), particularly the Overburden Stockpiles, Valley Leach Facilities, and associated water management aspects.

   CC&V has commenced planning for a pre-feasibility closure study and is currently working on

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scope development. CC&V will convey the results of the study through a presentation with the Division upon final review of the completed study and acceptance by Newmont.

3. **On page 2, the third paragraph the Operator discusses the monthly monitoring and seasonal increase of concentrations within GVMW-25. The Division wants to note that during the September and October 2023 sampling events the concentrations measured in GVMW-25 were the highest observed to date.**

   No response needed. CC&V will continue to collect samples and monitor the groundwater quality based on the agreed upon monitoring program. The approval of the additional monitoring wells will enhance this program and will allow Newmont to refine the scope of additional mitigation activities such as the engineering and construction of a groundwater interception and collection system.

4. **On September 2, 2021 the Division performed an inspection of the site and in the inspection report, issued on October 14, 2021, the Division cited several problems. Specifically, Problem #1 addressed Seep 1 expressing at the toe of the ECOSA. On November 15, 2021 the Operator provided their initial responses to the corrective actions. On December 13, 2021 the Operator provided detailed responses to the problem citations. In the response to the Corrective Action No. 5 – A formal plan on how the new seep will be monitored and managed for Problem Citation No. 1 the Operator responded "*Following the discovery of the new expressions in August 2021, CC&V developed a scope of work for a project at ECOSA that would provide a longer-term solution for managing seepage expressions. The scope includes a gap assessment of existing data at ECOSA/Grassy Valley, evaluation and development of recommended management solutions options, and a work plan. On October 21st, Golder Associates was awarded a bid to carry out this scope of work on behalf of CC&V. Golder has since performed a site visit and developed a draft gap assessment memo outlining critical data needs. A final work plan to mitigate and manage ARD at ECOSA is expected to be developed by February 2022. Implementation of recommended solutions will be initiated following finalization of the work plan.*"**

   The Division, to date, has not received a copy of the Golder (WSP) evaluation, including identified data gaps, of groundwater impacted by seepage from the ECOSA. Provide a copy of the evaluation.

   WSP Golder Report: East Cresson Overburden Storage Area Acid Rock Drainage Sustainable Solutions Evaluations; Cripple Creek & Victor Mine; Shallow Groundwater Investigation Work Plan, dated April 18, 2022 is included in Attachment 1.

   Since the development of the work plan, CC&V has progressed the phases outlined in the report to address identified data gaps and allow for a better understanding of the colluvial groundwater regime in Grassy Valley. Work up to and including Phase 3 has been completed. This investigation led CC&V to pursue the installation of additional monitoring wells in Grassy Valley to provide more information on the hydrogeology and have the potential to be

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converted into interception wells as the most effective approach to monitor and manage ECOSA seepage (this planned work is generally equivalent to Phase 4/5. If the Division has further questions regarding the work plan, CC&V would be willing to organize a meeting to facilitate a more effective discussion regarding the contents of the work plan.

5. **The Division was not aware the Operator performed a geophysical survey of Grassy Valley by Collier Geophysics (Collier). Provide a figure that shows all the geophysical transects that were performed by Collier in Grassy Valley.**

   Collier Geophysics was retained to conduct an ERI geophysical survey in Grassy Valley to address gaps in the previous survey. The previous geophysical work used an electromagnetic method that achieved only relatively shallow penetration into the subsurface which did not provide the necessary information to determine the potential subsurface flow paths. Collier Geophysical Survey figures showing electrical resistivity profiles for both transects are included in Attachment 2.

6. **The Operator needs to provide a detailed discussion regarding interpretation of the results of the Electrical Resistivity Imaging (ERI) survey. Include in the discussion how potential seepage pathways relate to low and high resistivity zones identified by the ERI survey and why.**

   The Electrical Resistivity Imaging method is used to characterize subsurface lithology and/or materials in terms of electrical resistivity. Electrical resistivity (the reciprocal of conductivity) is a material property which is diagnostic of the type of geologic material present. Unsaturated soils have higher resistivity (lower conductivity) than saturated soils. Materials saturated with water containing high total dissolved solids have very low resistivity values (high conductivity) that could indicate potential seepage pathways from ECOSA. As described in the Work Plan and shown in Figure 1 of TR-141, the proposed monitoring well locations were selected based on the low resistivity areas (shown in blue on Figure 1) observed from the ERI Survey.

7. **Will new roads be required to allow for the installation of the proposed monitoring wells? If so, provide an updated figure showing the locations of the roads and give the approximate dimensions. Additionally, will the roads be surfaced and maintained in a manner that guarantees year around access to the wells? If no roads will be created or will be reclaimed after well installation, please discuss how the Operator will ensure monthly monitoring will be accomplished throughout the year.**

   New access roads will need to be constructed for drilling, construction, and monitoring access to each of the proposed well locations. Access roads to the proposed GVMW-28 – GVMW-36 wells will be constructed off of the existing ECOSA Toe Access Road and access to GVMW-27 will be constructed off of the County Road through Lower Grassy Valley. The new access roads will be constructed approximately 8 feet in width at the approximate lengths outlined in

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the table below. Total linear footage for the proposed access roads is approximately 2,340 LF for a total disturbance of approximately 18,720 SF. All proposed well locations and access roads are located on CC&V property within the existing permit boundary. CC&V will maintain the new access roads throughout the year to the extent that it is safely possible to provide year round access for monitoring. The proposed access road alignments are shown Attachment 3.

Description	Approximate Length (LF)
GVMW-27 Access	290
GVMW-28 Access	300
GVMW-29 – GVMW-33 Access	1,150
GVMW-34 – GVMW-35A/B Access	400
GVMW-36 Access	200

8. Provide a construction schedule for drilling and installing the proposed monitoring wells.

The anticipated drilling and installation schedule is shown below as it relates to permitting approvals.

ECOSA Monitoring Well Installation Schedule	
Task Name	**Schedule**
TR-141 Submission	12/20/2023
Drilling Contracting	TR Approval + 40 days
Develop Well Permit Applications	Drilling Contract + 10 days
DWR Review	Application Submission + 45 days
Access Road & Drill Pad Construction	15 days (during DWR Permit Review)
Monitoring Well Drilling & Installation	DWR Approval + 30 days

** Schedule may be subject to change based on permit approvals, drill rig availability, and drilling conditions.*

9. Provide a summary of the drilling method(s) that will be used to install the monitoring wells along with how the wells are planned to be developed.

All wells are anticipated to be drilled using reverse circulation drilling methods. Airlift well development techniques are anticipated to be utilized to develop the wells. A tremie pipe will be tripped into the completed well and used to inject air to lift the water out of the well. The air pressure will be adjusted to maintain a continuous flow of water out of the well and attempt to match the rate of flow into the well. The well will be developed until the water coming out of the well is observed to be clean.

10. Commit to providing the Division with a Monitoring Well Drilling and Installation Report for the proposed new monitoring wells within 30 days of the last well being installed. At a minimum, the report must contain location maps of the installed

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wells, boring logs, well construction diagrams (with survey coordinates and measurements), well development records, and a narrative of the drilling program including any deviations or unexpected occurrences encountered during drilling.

CC&V commits to provide the Division with a Monitoring Well Drilling and Installation report to include location maps of installed wells, boring logs, well construction diagrams (with survey coordinates and measurements), well development records and a narrative of the drilling program including any deviations or unexpected occurrences encountered during the drilling. CC&V commits to delivering this report within 45 days of the last well installation, similar to the commitment made in TR-129 regarding a PoC Well Drilling Report. Should any circumstance arise which may necessitate additional time to complete the specified report, CC&V will communicate with the Division regarding the circumstances and need for additional time.

We trust that the additional information described above and provided in the attachments addresses the comments provided by DRMS regarding the preliminary adequacy review of Technical Revision (TR) 141 to Permit M-1980-244 for the Grassy Valley Monitoring Well Installation. Should you require further information, please do not hesitate to contact Antonio Matarrese at (719) 851-4185, Antonio.Matarrese @Newmont.com, or myself at (719) 237-3442 or Katie.Blake@Newmont.com.

Sincerely,

DocuSigned by:
Katie Blake
5A3D013B629844B...

Katie Blake
Sustainability & External Relations Manager
Cripple Creek & Victor Gold Mining Co

EC:

M. Cunningham – DRMS
T. Cazier - DRMS
E. Russell - DRMS
A. Matarrese – CC&V
J. Gonzalez – CC&V
K. Blake – CC&V

Attachments:

Attachment 1: Shallow Groundwater Investigation Workplan
Attachment 2: Collier Geophysical Transect Figures
Attachment 3: ECOSA Monitoring Well Access Road Map

File: "C:\Users\19012214\Newmont USA Limited\CC&V – S&ER Environmental - Permits\Technical Revisions\TR 141 Grassy Valley Monitoring Wells\Adequacy Review 1\Final"

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Attachment 1: Shallow Groundwater Investigation Workplan

REPORT

East Cresson Overburden Storage Area Acid Rock Drainage Sustainable Solutions Evaluations; Cripple Creek & Victor Mine

Shallow Groundwater Investigation Work Plan

Submitted to:

Cripple Creek & Victor Mining Company LLC

Submitted by:

Golder Associates USA Inc.

7245 W Alaska Drive, Suite 200, Lakewood, Colorado, USA 80226

+1 303 980 0540

21497838-002-R-1

April 18, 2022

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TABLES

FIGURES

1.0 INTRODUCTION

Golder Associates USA Inc. (WSP Golder), a member of WSP USA, has prepared this Work Plan for Cripple Creek and Victor Gold Mining Company LLC to summarize the recommended path forward for additional characterization of the hydrogeologic setting and impacts to shallow groundwater from acid rock drainage (ARD) seepage from the East Cresson Overburden Storage Area (ECOSA) at the Cripple Creek and Victor (CC&V) Mine located in Teller County, Colorado.

This Work Plan is being submitted in conjunction with the Issued-for-Construction design for the seepage collection trench to be constructed along the toe of the ECOSA. In combination, the collection of toe seepage through the trench and the generation of additional data related to the hydrogeological setting of Grassy Valley is intended to provide a more sustainable and comprehensive approach to ARD seepage collection, management, and remediation throughout the remainder of the life of the ECOSA facility.

1.1 Site Background

The area known as Grassy Valley is located immediately to the east and south of the ECOSA facility. The CC&V Mine relies on the subsurface bedrock structure, known as the Cripple Creek Diatreme, to direct water infiltrating through the surface mine operations toward and through an igneous diatreme and ultimately discharge via the historic Carlton Tunnel. The Grassy Valley area is located beyond the eastern extent of the diatreme structure. Grassy Valley is underlain by colluvium and granitic bedrock with groundwater present in the bedrock and, at some locations, within the colluvium.

ARD impacts observed at monitoring well GVMW-25, which is screened within the Grassy Valley colluvium suggests that some quantity of infiltration through the ECOSA is not being captured, either by the volcanic diatreme or through shallow sumps constructed by Mine Operations in 2021 to collect and manage visible ARD seepage from the ECOSA toe. CC&V staff have indicated that monitoring well GVMW-25 is currently the only monitoring well completed within the colluvium in Grassy Valley. A preliminary review of available lithologic well logs or field groundwater sampling logs of existing monitoring wells in Grassy Valley (Table 1) have also identified GVMW-12B as screened within the Grassy Valley colluvium; however, the location of GCMW-12B is not known at this time.

Table 1: Summary of Grassy Valley Wells Logs

Well ID	X-Coordinate (NAD83 UTM)	Y-Coordinate (NAD83 UTM)	Total Depth (ft)	Screened Lithology	Thickness of Colluvium (ft)
GVMW-1A			200	Bedrock	25
GVMW-1B			50	Bedrock	25
GVMW-2A			200	Bedrock	21
GVMW-2B			30	Bedrock	20
GVMW-3A			200	Bedrock	47
GVMW-3B			50	Bedrock	25
GVMW-4A	489116	4288420	480	Bedrock	15
GVMW-4B	488354	4289090	50	Bedrock	15
GVMW-5A			250	Bedrock	40

Well ID	X-Coordinate (NAD83 UTM)	Y-Coordinate (NAD83 UTM)	Total Depth (ft)	Screened Lithology	Thickness of Colluvium (ft)
GVMW-6A	489992	4289310	200	Bedrock	5
GVMW-7A	489191	4288790	200	Bedrock	30
GVMW-7B	489187	4288790	50	Bedrock	20
GVMW-8A	490350	4288020	250	Bedrock	20
GVMW-8B	490347	4288020	50	Bedrock	20
GVMW-9A	489965	4288900	200	Bedrock	20
GVMW-10	488352	4289090	270	Bedrock	35
GVMW-11A			500	Bedrock	8
GVMW-11B			50	Bedrock	12
GVMW-12A			300	Bedrock	71
GVMW-12B			50	Colluvium	> 50
GVMW-13A			600	Bedrock	23
GVMW-13B			500	Bedrock	32
GVMW-13C			50	Bedrock	31
GVMW-14A			100	Bedrock	
GVMW-14B			100	Bedrock	50
GVMW-14C			600	Bedrock	50
GVMW-15A	488203	4288980	820	Bedrock	15
GVMW-15B	488213	4288980	102	Bedrock	15
GVMW-16A			820	Bedrock	15
GVMW-16B			102	Bedrock	25
GVMW-17A			820	Bedrock	10
GVMW-17B			105	Bedrock	15
GVMW-21A	488524	4289490	190	Bedrock	< 15
GVMW-22A	489551	4288080	90	Bedrock	
GVMW-22B	489557	4288080	30	Bedrock	
GVMW-25	489602	4287960	78	Colluvium	

WSP Golder is aware of the following additional wells groundwater monitoring wells in Grassy Valley; however, lithologic logs or well completion details have not been provided to date:

Table 2: Summary of Other Grassy Valley Wells

Well ID	X-Coordinate (NAD83 UTM)	Y-Coordinate (NAD83 UTM)	Total Depth (ft)
GVMW-15C	488191	4288990	1000
GVMW-23A	490322	4288440	65
GVMW-23B	490323	4288440	30
GVMW-24A	489681	4287690	250
GVMW-24B	489683	4287680	100
OSABH-12	489682	4287680	
OSABH-14	489543	4288080	
OSABH-16	489105	4288430	
OSABH-17	488467	4288860	
OSABH-18	488191	4288980	

These well data are tabulated herein to summarize the monitoring well documentation that has been provided to WSP Golder to date as well as highlight the data gaps in existing data; the highlighted wells are those wells believed to be screened within colluvium material in Grassy Valley.

It is evident by the number of existing monitoring wells in Grassy Valley that CC&V has previously invested in the targeted characterization and monitoring of bedrock groundwater units. However, in the absence of data associated with the completion and/or monitoring of the shallow colluvial monitoring wells, WSP Golder is unable to leverage this prior investment in the development of our conceptual site model. Task 1 of this Work Plan is provided to address and resolve these existing data gaps where possible to help inform future decision-making processes associated with remediating and mitigating shallow groundwater impacts in Grassy Valley.

1.2 Investigation Phases

WSP Golder proposes a phased approach to continuing to investigate shallow groundwater conditions in Grassy Valley and assessing the extent of ARD impacts in shallow groundwater, specifically the colluvial groundwater. This phased approach will allow for the progressive collection of data and recurring data analysis and refinement to help guide future data collection efforts, as necessary.

1.2.1 Phase 1: Existing Data Inventory

WSP Golder has completed a review of available records provided by CC&V, which included existing reports related to the site completed by others, monitoring well completion records (Table 1), and general site hydrogeologic information. The data that have been reviewed thus far indicate a bedrock groundwater flow regime that generally flows toward the diatreme, although the spatial distribution and temporal consistency of depth to groundwater measurements create uncertainty and do not include coverage in the southeastern portion of the Grassy Valley adjacent to the ECOSA. Groundwater flow within the colluvium cannot be determined because there is currently only one monitoring location, GVMW-25, that is known to be screened in the colluvium.

The primary data gaps identified through the records review that are relevant to assessing ARD impacts to groundwater are:

- Detailed lithologic descriptions of Grassy Valley colluvium
  - including grain size and sorting
- Detailed lithologic descriptions of Grassy Valley shallow and deep bedrock
  - including crystal size, mineralogy, and fractures
- Reliable depths to the colluvium-bedrock contact across the Grassy Valley
- Temporally consistent groundwater elevation records to demonstrate groundwater flow behavior over multiple years
  - differences between the shallow and deep groundwater regimes are not discernable, if present
  - not enough monitoring locations known to be screened in colluvium to ascertain the presence/extent of a shallow colluvial groundwater regime that behaves independent of the bedrock groundwater regime

The remainder of the phases outlined in this Work Plan were developed to specifically address these data gaps and allow for a better understanding of the colluvial groundwater regime, including any potential connectivity between the colluvial groundwater regime and the shallow bedrock groundwater regime. This data is intended to inform future evaluation and design of shallow groundwater remediation alternatives to prevent off-site migration and management of ARD-impacted groundwater.

1.2.2 Phase 2: Electromagnetic Induction Survey

WSP Golder recommends an Electromagnetic (EM) induction investigation to support evaluation of subsurface ground conditions related to observed seepage from the ECOSA and to provide a reconnaissance level map of bulk conductivity of the subsurface within Grassy Valley. EM will be used to evaluate the fluid flow conditions/moisture distribution of the materials in areas of interest, specifically the eastern toe of ECOSA extending approximately ¾-miles to the east through Grassy Valley. EM is a geophysical method that allows measurement and mapping of variations in the electrical properties of subsurface materials. Due to the contrasting electrical properties of the subsurface material, EM surveys are useful for identifying saturated zones and other hydrogeologic features, including the top of water, the top of bedrock surface, changes in lithology, and changes in pore fluid chemistry such as salinity or total dissolved solids. A change in any of these properties results in a variation of apparent conductivity.

It is anticipated that any areas of high Total Dissolved Solids and/or ARD seepage will appear as higher EM conductivity zones. EM surveys are completed by walking along the ground surface with an instrument and recording apparent conductivity measurements concurrently with GPS position. A series of transects of EM data will be collected to evaluate the spatial distribution of conditions in the subsurface and used to generate a map of conductivity which may correlate to areas with ARD-impacted earth materials.

EM induction instruments measure the apparent electrical conductivity of the near surface soils. A transmitter coil is used to induce an electrical (eddy) current into the ground. These induced currents produce secondary EM fields, and a receiver coil measures the strength of the secondary EM field generated by these currents. For this survey, quadrature-phase measurements will be collected to provide a profile of measured apparent conductivity (given in units of milli-Siemens per meter [mS/m]).

WSP Golder proposes to use both a Geonics Ltd. EM31-MKII (EM31) and an EM34-3 for this investigation. The EM31 and EM34 are both well suited to mapping terrain conductivity. The quadrature component for the EM instruments is sensitive to materials that have a low induction number, such as earth materials, and calibrated to give a measure of the bulk apparent conductivity of the subsurface. Apparent conductivity is a measure of electrical conductivity of the subsurface, which is primarily a function of interconnected porosity, clay content, moisture content and the dissolved ion concentration in the pore fluid. The EM-31 and EM-34 paired investigation is proposed to accomplish an appropriate survey depth. The EM-31 is capable of investigating to a depth of approximately 17 feet below ground surface (ft bgs). The EM-34 is capable of investigating to a depth of approximately 25 to 150 ft bgs, depending on the configuration of the receiver coils.

At the conclusion of the EM survey, a summary technical memorandum of the geophysical survey will be prepared including georeferenced color-contoured maps of apparent conductivity along the survey transects. Conclusions and recommendations regarding next steps will be presented in a teleconference between WSP Golder and CC&V following the submittal of the report.

1.2.3 Phase 3: Electrical Resistivity Imaging (ERI)

If the results of the EM survey do not clearly indicate shallow groundwater and/or seepage flow paths and/or do not clearly indicate the first occurrence of groundwater with enough confidence to inform subsequent phases of investigation, an Electrical Resistivity Imaging (ERI) survey may be recommended to better characterize the subsurface with depth along each proposed transect.

ERI is an electrical geophysical method used to determine the lateral and vertical changes in electrical resistivity of subsurface materials. These changes may result from variations in lithology and mineralogy, water content, pore-water chemistry, and the presence of altered or water-bearing fractured bedrock. The method involves transmitting an electric current into the ground between two current electrodes and measuring the voltage between two separate potential electrodes. The measured value at each point represents the apparent resistivity of the area beneath the electrodes. A combination of different electrode arrangements is used to collect a sufficient number of measurements to produce a high resolution geo-electric cross-section representing the distribution of varying apparent resistivity values along the transect.

WSP Golder generally utilizes IRIS instruments and Advanced Geosciences, Inc. (AGI) ERI systems. Systems consist of an engineering resistivity meter and 1 to 8 electrode cables each containing 8 to 12 connectors, and 24 to 120 stainless steel stakes. These systems are capable of recording ERI data with a spread length of up to 570 meters with a single setup.

The ERI output and display will be an interpreted profile showing the electrical resistivity values of the subsurface stratigraphy along the respective transect. These profiles will be used in combination with the EM survey mapping to identify areas where diffuse ARD seepage may be reporting to shallow groundwater within Grassy Valley and support the siting of additional monitoring or pumping wells for ARD impact monitoring and/or remediation.

1.2.4 Phases 4 and 5: Monitoring Well Installation

1.2.4.1 Phase 4

A Phase 4 monitoring well installation program may include the installation of up to four additional monitoring wells within Grassy Valley to provide permanent depth to groundwater and/or water quality sampling locations and supplement the existing monitoring well network. The monitoring well locations will be based on the conclusions of the EM and/or ERI surveys. WSP Golder preliminarily anticipates monitoring well locations as follows (at a minimum):

- one monitoring well to be located west of GVMW-25, between GVMW-25 and the eastern toe of the ECOSA and screened within the colluvium.
- one monitoring well to be installed east of GVMW-25 and screened in the colluvium to get a better understanding of the eastern extent of mine-impacted groundwater
- one monitoring well will be installed northwest of GVMW-25, downgradient of the ARD surface impoundment, and screened within the colluvium to serve as an additional colluvium monitoring location and to evaluate potential seepage from the retention pond.

The exact monitoring well locations will be determined following evaluation of geophysical survey results and discussion with CC&V.

WSP Golder recommends that one of the new colluvial monitoring wells be installed with a deeper completion pair installed to screen the bedrock at a depth equivalent to other bedrock monitoring wells existing in Grassy Valley (i.e., installed to monitor the bedrock groundwater at equivalent elevations). The purpose of a colluvium/ bedrock monitoring well nest will be to evaluate the vertical hydraulic gradient between the bedrock and colluvial groundwater. The additional bedrock monitoring well will also allow for delineation of potential deep groundwater ARD impacts

The three proposed and one known existing (GVMW-25) colluvial monitoring wells will allow for contouring of the colluvial groundwater elevation and determination of colluvial groundwater flow direction in the Grassy Valley area east of the ECOSA. Additional data may be generated from other existing monitoring wells screened in colluvium and identified under the Task 1 existing well inventory.

1.2.4.2 Phase 5

A Phase 5 monitoring well installation program will include the installation of up to four monitoring wells to be located immediately east of the ECOSA toe seepage collection trench (spaced approximately 1,500 feet along the trench alignment). The purpose of the Phase 5 monitoring wells will be to evaluate the quality of groundwater/ARD seepage that bypasses the collection trench; understanding the seepage bypass of the collection trench will be critical to understanding potential long-term ARD seepage impacts to shallow groundwater east of the ECOSA and in Grassy Valley.

The Phase 5 monitoring wells will be installed prior to construction of the seepage collection trench so that a groundwater sample(s) can be collected from each Phase 5 monitoring well before trench construction to allow for characterization of pre-trench (i.e., background) groundwater quality immediately east of the ECOSA toe. This will allow for an evaluation of pre- and post- trench construction groundwater quality and will help establish an understanding of how effective the trench is at intercepting seepage and mitigating would-be impacts to groundwater east of the ECOSA. It is noted that a single sample will not adequately characterize pre-trench seepage quality due to seasonal variability in groundwater conditions and seepage quality; however, considering the timeline for trench construction (summer 2022), WSP Golder understands that the collection of a full background data set is not feasible.

2.0 FIELD PROCEDURES

The following sections describe the field procedures for each proposed investigation phase.

2.1 Phase 1 – Existing Well Inventory

Well gauging can be performed using a standard electronic water level indicator.

Well surveying can be accomplished using survey-grade GPS rover or other surveying means. Existing ground and top of casing elevations shall be surveyed to a minimum accuracy of 0.01 feet.

2.2 Geophysical Investigation Methods

2.2.1 Phase 2 – EM Methods

With the EM method, an alternating current is passed through a wire coil (the transmitter) producing a time-varying magnetic field. This field in turn induces current to flow in any nearby conductor, the ground included. These induced currents produce a secondary time-varying magnetic field which is sensed together with the primary field at a receiver coil. EM induction instruments are used to measure the apparent electrical conductivity and metal content of the near surface.

The EM instrument's response is calibrated to give a measure of the bulk apparent conductivity (given in units of mS/m) of the subsurface centered at the measurement point. The investigative depth is roughly the depth at which 90 percent of the instrument response has occurred. Conductivity values represent weighted mean values of all the layer conductivities from the ground surface to the maximum depth that is sensed by the EM instrument. The contribution to the measured conductivity from a single layer depends on its conductivity, depth, and thickness. Deeper layers generally contribute less to the final values than do near-surface layers.

Geonics Ltd. EM31-MKII and EM34-3

The Geonics Ltd. EM31-MKII is a one-person operable EM induction device well suited to mapping apparent terrain conductivity with the transmitter and receiver coils mounted at either end of a 3.7 meter (12.1 foot) long boom. For this investigation, the field crew will use a digital "mark two" version of the EM31 (EM31-MKII) coupled with a Juniper Systems Allegro field computer acting as a data logger for both the EM data and GPS data. These data will be downloaded to a personal computer for later processing and analysis.

WSP Golder typically collects EM data with the instrument operated in continuous data collection mode with sub-meter accurate differential GPS positions recorded every second. EM data is collected two times per second as the operator walks with the instrument at a normal walking pace.

The Geonics Ltd. EM34-3 is a two-person operable instrument capable of measuring apparent conductivities to a depth of up to 150 feet depending on coil orientation and spacing. The coils can be oriented in either a vertical dipole or horizontal dipole configuration. For the vertical dipole case, the axes of the coils are oriented perpendicular to the ground surface, and for the horizontal dipole, the axes are parallel to the ground surface. For both cases, the coils are maintained in a coplanar state. The separation between the transmitter and receiver coils is the primary component that determines the depth of penetration. The EM34 coil configuration will be based on the results of the EM31 survey to best fill in vertical data gaps but is expected to be configured to accommodate a 50 foot investigation depth.

Both the EM31 and EM34 have a digital output that is streamed to a Windows-based data logger such as the Juniper Systems Allegro CX concurrently with positional information from a global navigational satellite system (GNSS) receiver. We propose to complete a series of transects along portions of Grassy Valley. A preliminary EM transect map is provided below in Figure 1 (see the green transect lines).

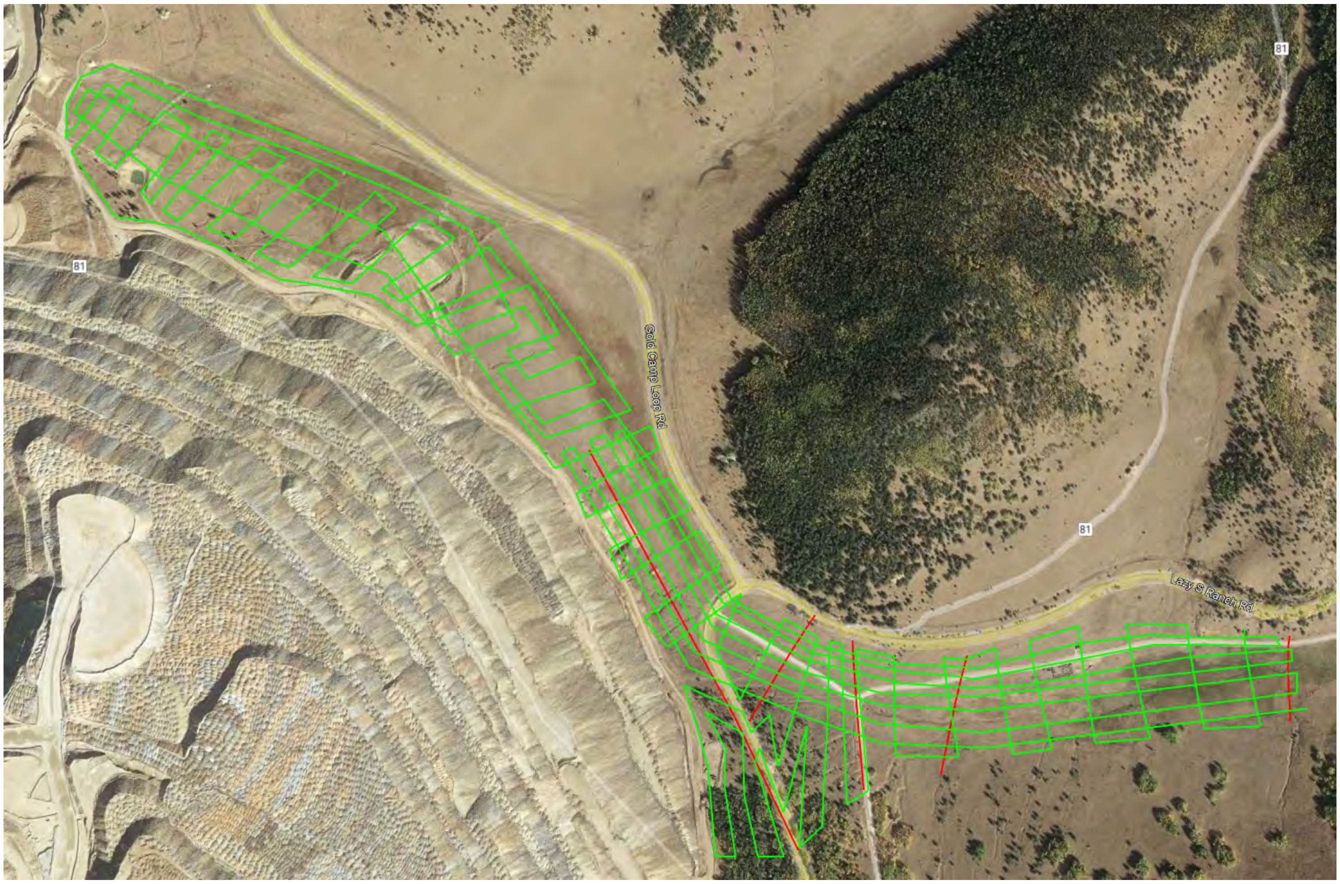


Figure 1: Preliminary Electromagnetic Transect Map

It is anticipated that the EM31 surveying will be completed over two survey days and that the EM34 data collection will be completed over two additional survey days, four days total for the combined EM31 and EM34 scope of work. The EM survey in the Grassy Valley area will be performed over an area of approximately 165 acres with total survey line length of approximately 100,320 feet (19 miles). The EM survey is expected to take four days to complete.

EM data processing and analysis will be performed using commercially available DAT31W and DAT34W software. The resulting dataset will be presented as a georeferenced color-contoured map of the apparent conductivity along the survey transects.

2.2.2 Phase 3 – Electrical Resistivity Imaging Methods

Apparent resistivity data can be collected using a variety of arrays (e.g., pole- dipole, dipole-dipole, Wenner, Schlumberger arrays), which may be sensitive to vertical or lateral variations in earth materials and provide either relatively deeper soundings or shallower sounding with greater resolution. Site conditions will dictate the use of the arrays that are less susceptible to noise from heterogeneous surface conditions and nearby linear utilities (e.g., power lines). The electrode spacing is typically 1 to 6 meters, with 24 to 120 electrodes in an array resulting in spread lengths of 24 to 595 meters (120 electrodes at 5 m spacing). After an initial spread of data is collected, the remaining spreads can be “roll-along” spreads, at half the length.

The cables and electrodes will be placed on the ground at the beginning of the survey day. Each electrode may be lightly immersed in salt water to reduce the contact resistance. A pre-programmed sequence of ERI measurements will be loaded into the digital acquisition system which will then automatically step through approximately 150 to 2,500 measurements. After completion of the first measurement cycle, a portion of the array can be picked up and moved forward for another measurement cycle (roll-along) which continues until the full length of transect has been investigated.

The ERI field crew will consist of a geophysicist and one technician. Approximately 5,900 feet of ERI survey line will be completed along five individual lines along the eastern toe of the ECOSA and within Grassy Valley (see preliminary transect lines shown in red in Figure 1). The ERI effort is expected to take three days to complete.

2.3 Phases 4 and 5 – Drilling and Monitoring Well Installation Methods

Drilling will be performed by a qualified environmental driller under contract to CC&V. It is assumed that drilling will be performed using a drill rig and method capable of retrieving a continuous core of subsurface material (soil and/or rock). The drill rig/method may be sonic, wireline coring, and/or hollow stem auger with continuous sampler. Continuous samples are recommended to retrieve high-quality geologic samples with a high degree of confidence in the depth samples were retrieved from. This is critical so that monitoring well screen intervals can be set at appropriate depths based on the purpose of each well. The borehole locations will be based on the location of utilities, topography, access constraints, ongoing operations, legal access, or other conditions encountered in the field, and informed by the results of the EM and/or ERI survey(s). Boreholes will be identified with naming convention “GVBH-2022-#”. Whatever drilling method(s) is employed, the initial drilling attempt will be made without the addition of drilling fluid. If necessary, water from an approved source may be used to help cool the drilling tooling and facilitate circulation of core and cuttings.

WSP Golder recommends surveying of each borehole location consistent with the surveying work under Phase 1. Preliminarily, WSP Golder can log field coordinates with a handheld GPS with approximately +/- 1 meter (m) lateral accuracy and +/- 2 m vertical accuracy. Geologic logs will be developed in general accordance with the Unified Soil Classification System (USCS) and applicable bedrock classification schemes.

2.3.1 Phase 4 – Grassy Valley Monitoring Well Installation

Up to four monitoring wells will be installed as part of Phase 4 and as previously described in Section 1.2.4.1 of this Work Plan. The colluvial monitoring wells will be installed with the base of the well screen no deeper than the colluvium/bedrock contact. The bedrock monitoring well will be installed at a depth of approximately 250 ft bgs. The colluvial monitoring wells will be completed with 2-inch, Schedule 40 PVC, flush-threaded well casing and screen. Each colluvial well screen will be 10 feet long with 0.010-inch milled slots. The bedrock well will be completed with 4-inch, Schedule 80 PVC, flush-threaded well casing and screen. The bedrock well screen will be 50 feet long with 0.010-inch milled slots. The bedrock well screen length is generally consistent with existing deep bedrock monitoring wells GVMW 8A-250 and GVMW 10-270, For all newly installed monitoring wells, the borehole annular space will be backfilled with silica sand to approximately two feet above the top of the well screen. A minimum two feet long bentonite chip or time release pellet seal, hydrated after placement, will be placed above the filter pack. The remainder of the annular space will be backfilled with hydrated bentonite chips or cement-bentonite grout to the ground surface. The shallow bedrock monitoring well will be completed in the same manner with the exception that the filter pack will not extend more than one foot above the top of the screen and the bentonite plug will cross the colluvium/bedrock interface with approximately one foot below the contact and one foot above the contact. The PVC casing will extend to approximately three feet above the ground surface, and a protective steel casing, concrete pad, and protective bollards will be installed at the request of the CC&V Mine.

2.3.2 Phase 5 – Collection Trench Monitoring Well Installation

Prior to the construction of the ARD seepage collection trench, the three Phase 5 monitoring wells will be installed immediately east of the trench to monitor for potential seepage/groundwater bypass of the collection trench. These wells will be installed per the same general specifications as outlined in Section 2.3.1 but with the top of each well screen set above the adjacent base of the collection trench and with the bottom of each well extending to the depth of bedrock. The locations of the Phase 5 monitoring wells will be based on a review of the colluvium thickness, colluvial water column length, results of the geophysical surveys, and locations where seepage has been identified in the past.

2.3.3 Monitoring Well Development

Newly installed monitoring wells will be developed by the drilling contractor using surge and purge techniques. The wells will be surged with a tight-fitting surge block and purged with a stainless steel or disposable bailer. Purged groundwater will be collected in an appropriate container for disposal. The entire well screen interval will be surged for a period of no less than 30 minutes prior to the start of purging. Water quality parameters including pH, electrical conductivity, and temperature will be measured throughout development until a minimum of five well casing volumes has been purged and the parameters are stable. A casing volume is considered the volume of water standing in the well casing, calculated from the measured total depth of the well minus the measured depth to static water level. Water quality stabilization is defined as less than 10% difference between three consecutive measurements for EC and temperature and less than 0.2 standard unit deviation between three consecutive measurements for pH. If water is used to facilitate drilling, then additional casing volumes may be purged to remove added water.

2.3.4 Phase 4 and Phase 5 Reporting

WSP Golder will prepare a brief technical memorandum describing the Phase 4 and Phase 5 field activities. The technical memorandum will include a discussion of drilling and well installation methods and well development methods, digital borehole logs and well installation diagrams, and relevant site figures.

2.3.5 Groundwater Sampling

WSP Golder recommends routine groundwater level measurement and groundwater sample collection from all newly installed monitoring wells and relevant pre-existing Grassy Valley monitoring wells.

- Routine groundwater level measurement: Depth to groundwater measurements should be collected no less frequently than quarterly but may be collected as frequently as weekly immediately following significant precipitation events. Depth to groundwater measurements should be taken from the fixed and surveyed top of casing location and all wells in the routine water level measurement program should be monitored on a single day, as practical.

- Routine groundwater sampling: Groundwater sampling should be performed no less frequently than quarterly but may be performed more frequently following significant precipitation events. Groundwater sample collection may be performed coincident with depth to groundwater measurements as described above. Groundwater sampling should follow industry-standard purging and sampling practices and samples will only be collected from wells with adequate volume of water to sample.

2.4 Field Documentation

Documentation of field activities will include health and safety forms, general field notes, photographs, boring logs, well construction logs, and well development forms.

2.5 Decontamination Procedures

At a minimum, decontamination will be performed on all non-dedicated, reusable drilling and well development equipment. Decontamination will include a wash with an environmental detergent solution (Alconox or similar) followed by a rinse with approved water. It is expected that decontamination will be required on downhole drilling equipment that is in direct contact with subsurface soil, and development and monitoring equipment in contact with groundwater (e.g., surge block/rod, bailer, water quality meter). Decontamination will be performed by a method that allows for containment and collection of decontamination fluids (e.g., temporary decontamination pad). Additional CC&V-specific decontamination procedures may apply.

2.6 Waste Management Procedures

Investigation derived waste (IDW) generated during drilling and sampling will be containerized in either CC&V Mine-provided containers (e.g., 55-gallon steel drums, 5-gallon buckets, or other rigid container with a lid) for appropriate characterization and disposal by the CC&V Mine. Expected IDW includes, but is not limited to, decontamination wash water, drill cuttings, soil/rock cores, core liners, and groundwater. Additional CC&V-specific IDW management procedures may apply.

3.0 CONCEPTUAL REMEDIAL SOLUTIONS

In anticipation of shallow groundwater remediation to prevent off-site migration of ARD-impacted groundwater, three conceptual remedial solutions, in addition to the ARD seepage collection trench described previously, are currently under presented herein for preliminary consideration:

- A hydraulic control system may include the installation of a series of dual-purpose groundwater pumping wells. The pumping wells would be designed to 1) intercept shallow (i.e., colluvial) ARD-impacted groundwater as it migrates east and potentially bypasses the seepage collection trench and 2) provide hydraulic control by imparting a change in the natural hydraulic gradient such that the groundwater flow direction is maintained towards the control wells to prevent off-site migration of ARD-impacted groundwater. The pumped water would be conveyed the ARD surface impoundment.
- A slurry or cut-off wall would involve excavating a narrow trench perpendicular to the axis of Grassy Valley, to at least the depth of bedrock, and backfilling the trench with a low-permeability slurry (e.g., soil-bentonite, cement-bentonite mix) to prevent down-valley migration of ARD-impacted groundwater. At this time, a slurry or cut-off wall would be the less-preferred conceptual remedial option presented herein because it would require capture and conveyance of groundwater on the upgradient (i.e. west) side of the wall. This would essentially require both the hydraulic control method described above, plus the slurry wall. The slurry wall could be considered secondary to the installation of hydraulic control system if that system was not effective at maintaining hydraulic control on its own.
- A permeable reactive barrier (PRB) would involve excavating a narrow trench perpendicular to the axis of Grassy Valley, to at least the depth of bedrock similar to a slurry or cut-off wall, but backfilling the trench with a permeable reactive media that effective treats low-flow or low-contaminant loading of ARD seepage bypassing the seepage collection trench. PRBs have been used to enhance bacterial sulfate

reduction and metal sulfide precipitation and have the potential to prevent ARD impacts to shallow groundwater and the associated release of dissolved metals.

Other remedial options may be identified and evaluated as additional data related to the occurrence of shallow groundwater, the shallow groundwater system in general, and impacts to shallow groundwater, are gathered and evaluated.

4.0 SCHEDULE

It is recommended that the Phase 1 – Existing Well Inventory commence immediately and Phases 2 and 3 – EM and ERI Geophysical Surveys commence in late spring after the chance of winter weather is reduced. A general phase schedule is provided below. It is noted that the need for subsequent phases will be evaluated progressively; therefore, this schedule is only intended for long-term conservative planning and budgeting.

- Phase 1 - 2+ weeks
- Phase 2 - 2 days on-site for EM31, 2 days on-site for EM34
- Phase 3 - 3 days on-site for the ERI survey; ERI survey could be completed immediately following the EM survey if CC&V was interested in moving forward with both geophysical surveys
- Phase 4 and Phase 5 - dependent on drilling subcontractor availability
  - Phase 4 - 6 days on-site
  - Phase 5 - 6 days on-site

5.0 ROUGH ORDER OF MAGNITUDE COST ESTIMATE AND STAFFING

The following rough order of magnitude (ROM) cost estimates are provided on a per-phase basis for CC&V's budgetary planning purposes. WSP Golder would appreciate the opportunity to provide CC&V with a more formal proposal for any individual phase(s) of the work upon request.

- Phase 1 – Existing Well Inventory: $2,500
  - Deliverable: Technical Memorandum expanding conceptual site model based on additional data
  - It is assumed that CC&V personnel will perform all remaining desktop review components associated with the well inventory.
  - Existing monitoring well inventory and well gauging can be performed by CC&V staff or one WSP Golder staff based in Denver, CO.
- Phase 2 – EM Survey: $20,000
  - Staffed by two WSP Golder staff, one based in Redmond, WA and one based in Denver, CO.
  - The Phase 2 budget includes post-processing of EM data and a brief technical memorandum
- Phase 3 – ERI Survey: $20,000
  - Approximately $3,000 can be saved if CC&V elects to perform the EM and ERI surveys concurrently. The savings is associated with mobilization/demobilization-related costs.

- Deliverable: Summary Technical Memorandum and interpreted profiles
- Staffed by two WSP Golder staff, one based in Redmond, WA and one based in Denver, CO.
- The Phase 3 budget includes post-processing of ERI data and a brief technical memorandum

- Phase 4 – Grassy Valley Monitoring Well Installation and Development: $82,250
  - Deliverable: Well Installation Summary Memorandum and well installation data
  - $21,250 for WSP Golder field oversight. Staffed by one WSP Golder staff member based in Denver, CO.
  - $56,000 for drilling subcontractor, based on $500/hour estimate provided to WSP Golder by CC&V. WSP Golder is not aware of the basis for this estimate, if it includes mobilization fees or materials, or if it is applicable to the drilling methods recommended in Section 2.3. This estimate is assumed to include well development.
  - $5,000 for WSP Golder staff to prepare technical memorandum summarizing phase activities including digital borehole logs and well completion diagrams.
- Phase 5 – Collection Trench Monitoring Well Installation and Development: $63,500
  - Deliverable: Well Installation Summary Memorandum and well installation data
  - $16,500 for WSP Golder field oversight. Staffed by one WSP Golder staff member based in Denver, CO.
  - $42,000 for drilling subcontractor, based on $500/hour estimate provided to WSP Golder by CC&V. WSP Golder is not aware of the basis for this estimate, if it includes mobilization fees or materials, or if it is applicable to the drilling methods recommended in Section 2.3. This estimate is assumed to include well development.
  - $5,000 for WSP Golder staff to prepare technical memorandum summarizing phase activities including digital borehole logs and well completion diagrams.

A total per-phase cost summary is provided in Table 3 below:

Table 3: Rough Order of Magnitude Cost Summary

Phase	ROM Cost
Phase 1 – Existing Well Inventory	$2,500
Phase 2 – EM Survey	$27,000
Phase 3 – ERI Survey	$20,000
Phase 4 – Grassy Valley Monitoring Well Installation and Development	$82,250
Phase 5 – Collection Trench Monitoring Well Installation and Development	$63,500
ROM Total	$195,250

6.0 HEALTH AND SAFETY

All field work will be conducted under a project-specific health and safety program developed by WSP Golder. The health and safety program and requirements will be outlined in documentation including, at a minimum, field vehicle inspection forms, Work Method Statements (WMS), Job Safety and Environment Analysis (JSEA) forms completed prior to the start of each day's work, and Journey Management Plans (JMPs) for each person visiting the CC&V Mine and/or performing field work. Hard copies of the health and safety documentation will be readily available on-site during field work and will identify potential hazards, personal protective equipment (PPE), and communication protocols to ensure a safe work environment.

All field staff will be outfitted with the following PPE:

- hard hat
- hearing protection during drilling activities
- safety glasses with side shield
- safety toed boots
- gloves appropriate to the task being performed
- high-visibility safety vest

Golder field personnel will be current on a United States Food and Drug Administration (FDA) approved by emergency use authorization COVID-19 vaccine, per the manufacturers recommended vaccine series. The drilling subcontractor will submit a Colorado One-Call utility location request via the Utility Notification Center of Colorado (UNCC) before the start of work. No field work will be performed until utility location has been completed and confirmed. Golder will coordinate with the CC&V Mine to ensure private utilities and other known subsurface features, not marked as part of the One-Call request, are located and marked accordingly. If UNCC requires that the proposed borehole locations be marked prior to performing the utility locate, it is assumed that the marking will be performed by CC&V. If there are known subsurface utilities (e.g., water pipeline[s]) that are not located by UNCC and that CC&V is not able to provide certified as-built locations for, a private utility locator and/or daylighting services may be required. Additionally, Golder will coordinate with the CC&V Mine to ensure the site investigation activities are conducted within facility permit/property boundaries.

Signature Page

Golder Associates USA Inc.

Tricia Hall
Consultant, Geologist

Matt Somogyi
Senior Lead Consultant

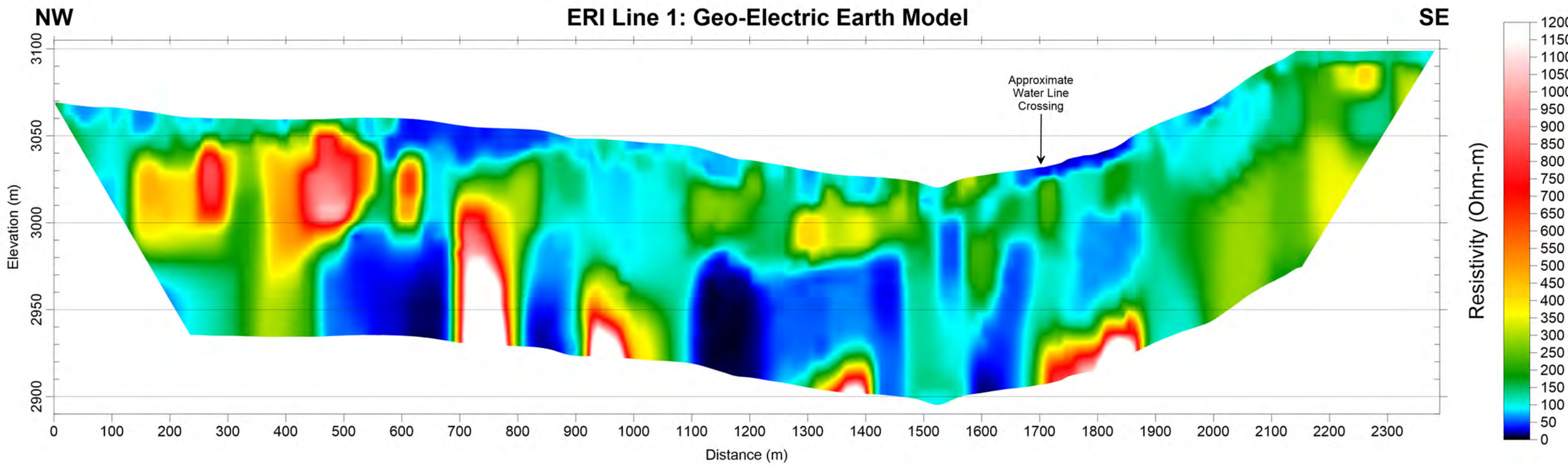
Jeff Rusch, PE (Colorado)
Project Manager

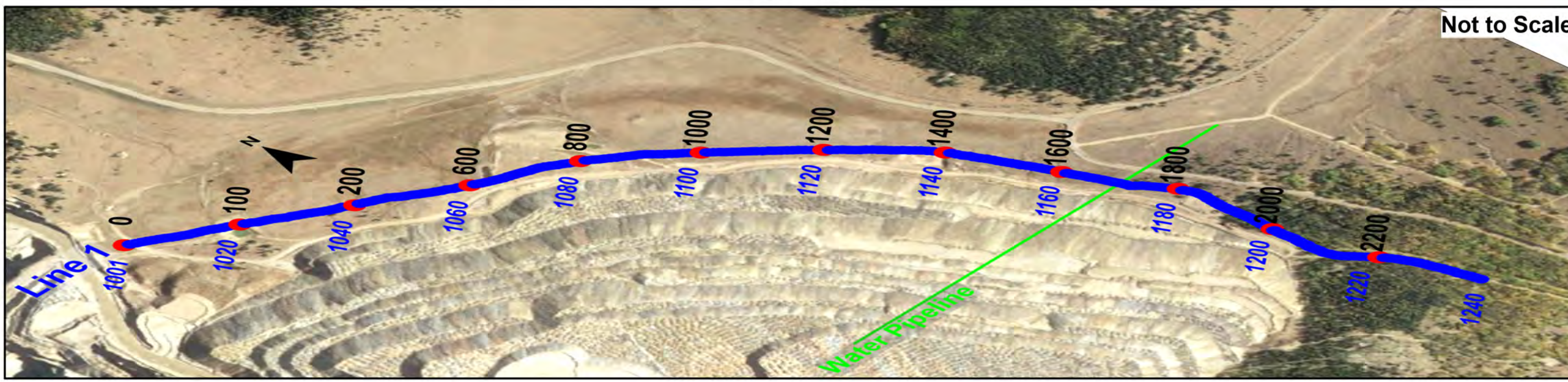
TH/MS/JR/rm

https://golderassociates.sharepoint.com/sites/154109/project files/5 technical work/006 seep data evaluation/work plan/rev 1 - 18apr22/21497838-002-r-1-ecosa_gw_investigation_wp_18apr22.docx golder.com

CRIPPLE CREEK & VICTOR
PO Box 191
100 N. 3rd Street
Victor CO 80860
newmont.com

Attachment 2: Collier Geophysical Transect Figures





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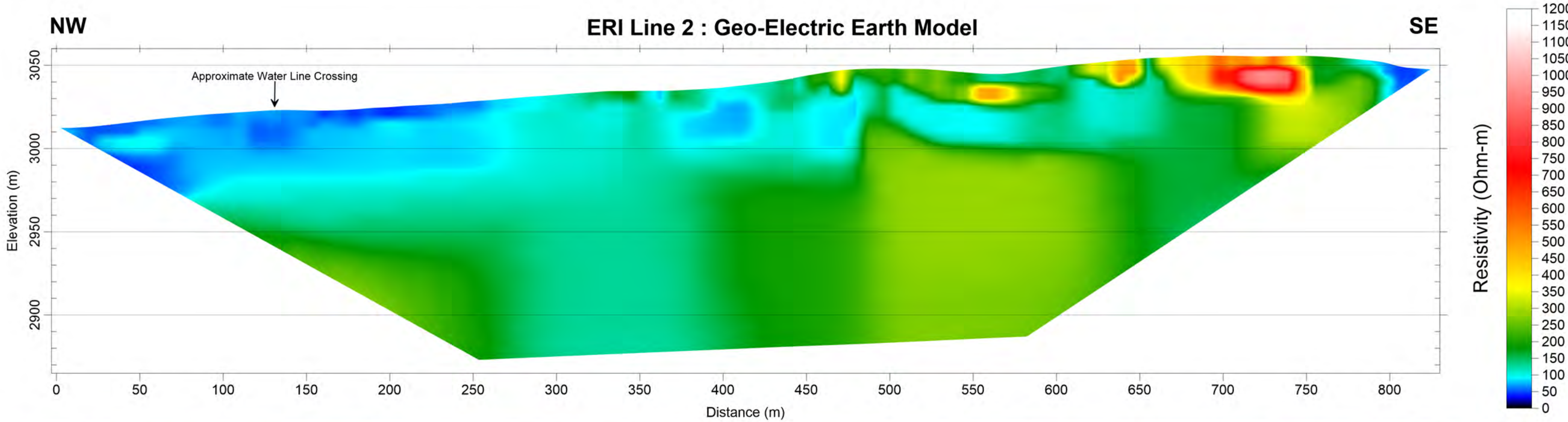
Electrode Station #: ***1001***

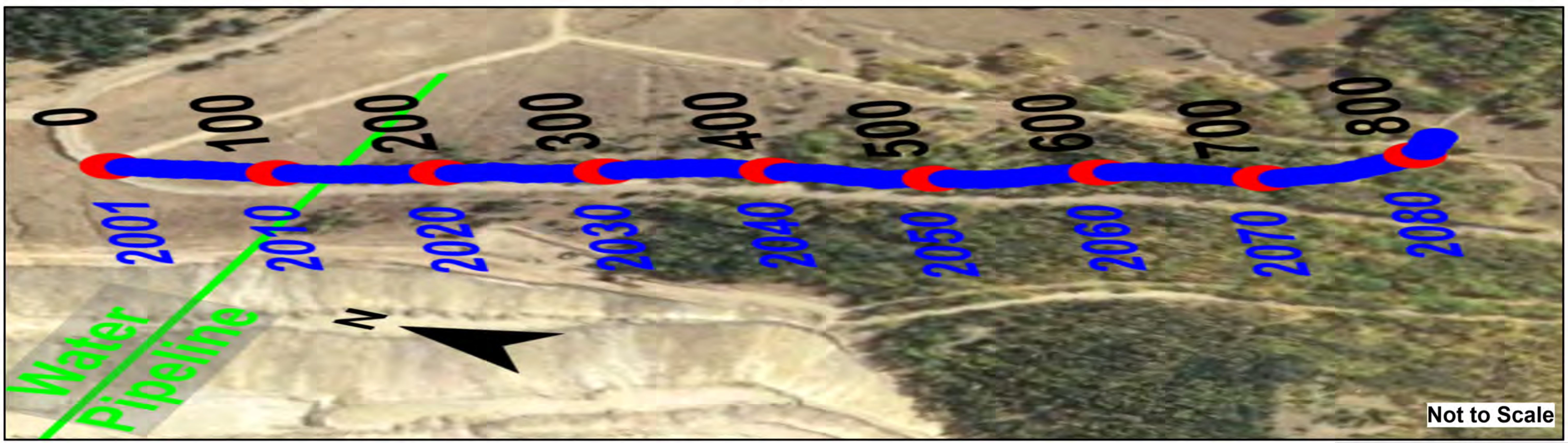
Newmont NORTH AMERICA

COLLIER GEOPHYSICS Surface • Marine • Borehole

Preliminary

ERI Survey CC&V Mine *Cripple Creek, CO*		
Newmont		COLLIER GEOPHYSICS
Project #: 230218	August 2023	
Drafted by: J. Pfeiffer	Checked by:	**Figure 8**





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Newmont NORTH AMERICA

COLLIER GEOPHYSICS Surface • Marine • Borehole

Preliminary

ERI Survey CC&V Mine *Cripple Creek, CO*		
Newmont		COLLIER GEOPHYSICS
Project #: 230218	August 2023	
Drafted by: J. Pfeiffer	Checked by:	**Figure 10**

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100 N. 3rd Street
Victor CO 80860

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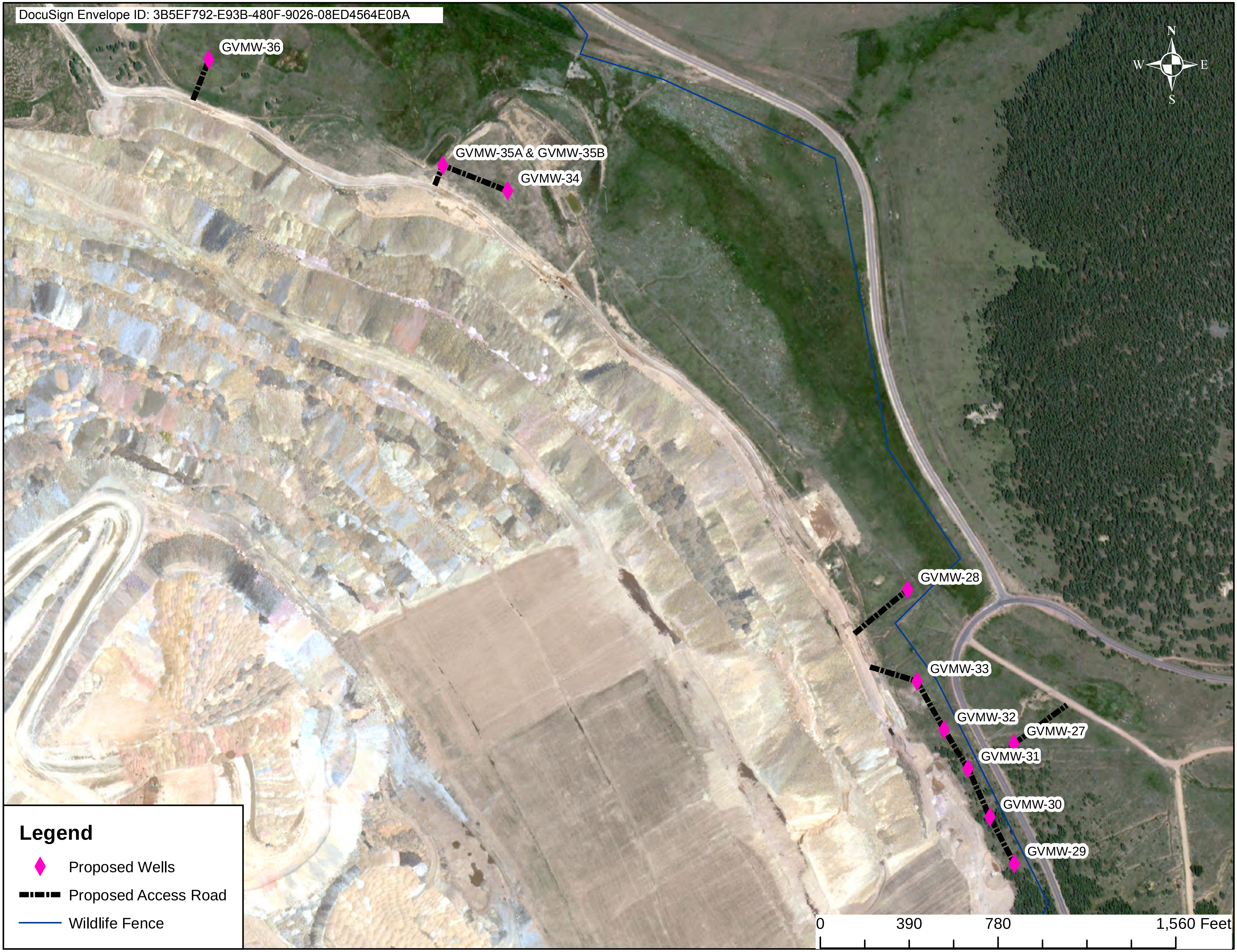
Attachment 3: ECOSA Monitoring Well Access Road Map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GVMW-34
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GVMW-32
GVMW-27
GVMW-31
GVMW-30
GVMW-29
N
S
W
E
Legend
Proposed Wells
Proposed Access Road
Wildlife Fence
0
390
780
1,560 Feet