Appendix C

Monitoring and Mitigation Plan

HOLLISTER UNDERGROUND MINE PROJECT
MONITORING AND MITIGATION PLAN

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INTRODUCTION

This Monitoring and Mitigation Plan ("Plan") further elaborates on the monitoring, mitigation and conservation measures referenced in the resource sections of the Environmental Impact Statement (EIS) prepared for the Hollister Underground Mine Project (Project). The monitoring and mitigation measures discussed in this Plan cover the range of impacts of the proposed Project. The Plan may not address monitoring or mitigation for impacts already addressed by the applicant committed protection measures described in the EIS. In response to comments received on the DEIS, and further evaluation, this Plan revises and provides detail for certain monitoring and mitigation measures that were described in the DEIS, and proposes certain additional monitoring and mitigation measures not originally included in the DEIS. Some contingent mitigation measures may require future permitting or National Environmental Policy Act (NEPA) analysis at the time of design and prior to implementation.

The following previously approved Bureau of Land Management (BLM) or state plans are incorporated herein by reference: Noxious Weed Prevention Control Plan, Reclamation Plan, Programmatic Agreement, and Fugitive Dust Control Plan.

The CEQ Regulations (40 CFR §§ 1500-1508) for Implementing the Procedural Provisions of NEPA define mitigation (40 CFR §§ 1508.20) as follows:

(a) Avoiding the impact altogether by not taking a certain action or parts of an action;

(b) Minimizing impacts by limiting the degree of magnitude of the action and its implementation;

(c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;

(d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; or

(e) Compensating for the impact by replacing or providing substitute resources or environments.

LAND USE AND ACCESS

Potential Impact: Little Antelope Creek Road crosses Little Antelope Creek at least three times within the Project boundary. The Silver Cloud Road and the Little Antelope Creek Road cross Antelope Creek downstream from the confluence of Little Antelope Creek and Antelope Creek. It is possible, although not expected, that increased water discharge into Little Antelope Creek via the National Pollutant Discharge Elimination System (NPDES) discharge may cause the existing low water crossings to no longer be passable, thus periodically limiting access along Little Antelope Creek Road or at the Antelope Creek and Little Antelope Creek Road crossing or Antelope Creek and the Silver Cloud Road crossing.

Monitoring and Mitigation Measure LU-1

Monitoring: Upon commencement of NPDES-permitted clean water discharges into Little Antelope Creek, Rodeo Creek Gold (RCG) would visually monitor: 1) the low water crossings along Little Antelope Creek Road potentially affected by increased water flow due to the NPDES discharge, 2) the intersection of the Little Antelope Creek Road and Antelope Creek, and 3) the intersection of the Silver Cloud Road with Antelope Creek. Figure 1 of this Plan shows the approximate location of the low water crossings which would be monitored.

Such monitoring would be performed on a weekly basis during active discharge periods to determine whether such crossings have become impassable. If weekly monitoring indicates that a crossing has become impassable, then RCG would monitor that crossing for five consecutive days following the discovery and notify the BLM within 1 week of the monitoring results. If, after three months of NPDES-permitted clean water discharges, the weekly monitoring shows no impacts to access at a particular low water crossing location, RCG may reduce the frequency of monitoring at that location to monthly monitoring during discharge periods.

RCG would document monitoring results and would provide the BLM a summary report of monitoring results 6 months after NPDES-permitted clean water discharge begins. Thereafter, RCG would provide summary reports on an annual basis.

Mitigation: The low water crossings along Little Antelope Creek, the intersection of the Little Antelope Creek Road and Antelope Creek, and the intersection of the Silver Cloud Road and Antelope Creek, are typically impassible for portions of the spring runoff period. If, outside of spring runoff periods, any of the low water crossings become impassible for more than 5 consecutive days, then RCG would coordinate with the BLM to design and install BLM-approved rock/concrete aprons or other low-water crossings or culverts. Any such installations would be appropriately sized and placed to allow passage by aquatic life at each low-water crossing that is no longer passable by vehicle. In the event that rock/concrete aprons or crossings or culverts are deemed not appropriate given the location or level of impact, RCG and the BLM would meet to discuss other appropriate measures that would be designed and implemented to ensure access in the area.

Depending upon the design and surface impacts of the culvert, rock/concrete aprons or crossings or other mitigation measures, implementation of mitigation may require further federal or state permitting and associated reviews.

Effectiveness: In the event that NPDES-permitted clean water discharge into Little Antelope Creek renders low-water crossings impassible, placing culverts or rock/concrete

aprons or low-water crossings (that allow for passage by aquatic life) at the affected road crossings would maintain accessibility with a vehicle and allow for aquatic species to move up and down the stream channels. This mitigation measure would be fully effective at maintaining access to affected road crossings.

GROUNDWATER AND SURFACE WATER RESOURCES

Groundwater Resources

Potential Impact: Due to possible long-term effects of technical groundwater removal (to keep the underground mine workings dry for operations), a reduction in flow rates could occur at up to 15 seeps, springs and spring complexes associated with the Vinini Formation and the Pennsylvanian/Permian Strathearn Formation that fall within the maximum extent of the 10-foot groundwater drawdown contour and that lie less than 50 feet above the groundwater elevation. The characteristics of each of the 15 "high potential" seeps and springs are summarized in Table 3.6-7 in the DEIS. The location of the seeps and the springs are illustrated on Figure 2 of this Plan.

The groundwater model also shows that drawdown associated with proposed mine groundwater removal has the potential to reduce spring-derived flows at two perennial stream reaches: 1) Alkali Creek to its confluence with Antelope Creek and 2) Squaw Creek to its confluence with Antelope Creek. These two perennial stream reaches are downstream of potentially impacted Spring Complex Numbers 1 and 3. The location of the two perennial stream reaches are illustrated on Figure 3.6-2 in the DEIS. These perennial stream reaches are water features with established beneficial uses, including surface water for livestock and wildlife. If such surface waters are impacted, grazing and wildlife use could then relocate and concentrate in the remaining available water and riparian habitat, with consequent potential increased impacts to those areas.

Finally, reduced flow at the seeps, springs, and spring complexes from groundwater drawdown may impact up to 11.8 acres of associated riparian and wetland habitat along Antelope Creek. Groundwater drawdown also may impact 0.20 acre of riparian and wetland habitat unassociated with seeps or springs. In addition, 5.34 acres of riparian and wetland habitat have been identified as "high potential" for impacts and 6.64 acres have been identified as "low potential" for impacts. The characteristics of each of the "high potential" wetland and riparian areas are summarized in Table 3.9-2 in the DEIS. The location of the 12 acres of potentially impacted riparian and wetland habitat are illustrated on Figure 2 of this Plan.

Monitoring and Mitigation for Groundwater Removal Impacts – *Revised Mitigation Measure GW-1*

Monitoring: The monitoring required by Revised Mitigation Measure GW-1 includes monitoring of groundwater levels as well as measurements of surface flow.

During the life of the mine and through reclamation, RCG would conduct groundwater monitoring as described below. A monitoring report shall be provided to the BLM by April 30 of each year. The report would be provided on a CD, or other digital storage format compatible with the BLM's information technology. The report would include applicable information such as, but not limited to, the methodology used to collect data, field data information, chemical analyses, depth to water, and discussion or conclusion of observations. The monitoring report would provide hydrographs from all piezometers and monitoring wells which would reflect baseline levels and the quarterly depth to groundwater measurements. The report would illustrate all piezometer, monitoring well,

and sampling site locations. Comprehensive electronic water level files would be provided to the BLM with the monitoring report, and at any time requested by the BLM. RCG would conduct the following groundwater level monitoring, according to the protocols indicated below:

- Groundwater Monitoring within the Project Area: RCG would monitor groundwater by conducting quarterly depth to groundwater measurements at existing monitoring wells (H6-227WW, H7-252WW, H7-253WW, H7-254WW, and DGW-2C) in the Vinini formation within the Project boundary. The location of these monitoring wells is shown on Figure 3 in this Plan. See Attachment A, Water Resource Monitoring Summary, of this monitoring and mitigation plan.
    - The southern and northern most wells (DGW-2C and H7-254WW) along with the two new piezometers or monitoring wells, located north to northeast of the mine, would be sampled for field parameters. Figure 3 illustrates the general proposed location for the two new wells. The field parameters (i.e., depth to water, pH, temperature, specific conductivity, and total dissolved solids), would be monitored quarterly. Chemical analyses of each monitoring well would be done quarterly utilizing NDEP Profile 1.
    - If the field parameter monitoring shows major changes in characteristics during the groundwater measurements, the monitoring could be changed from quarterly monitoring to monthly monitoring for affected wells. If the Profile 1 chemical analysis shows no change, monitoring could be changed to annual monitoring.
    - Monitoring data would be collected and recorded using a standardized protocol and format. The protocols for monitoring groundwater levels at these locations are discussed in Protocol A attached hereto.
- Barrick Wells: There are currently three wells (identified as BX-4s, BX-2Rs, and NA-46), east of the Hollister Project boundary, which are owned and monitored by Barrick. Barrick collects depth to groundwater level data at these wells, which is within the predicted Hollister Mine 10-foot drawdown contour and within the Vinini Formation. The location of these wells is reflected on Figure 3 in this Plan. The BLM would provide RCG with the raw depth to groundwater data (public information) received from Barrick for these wells. Barrick data would be utilized by RCG to incorporate into, further refine, and calibrate the groundwater model, as appropriate.
- New North/Northeast Area Groundwater Monitoring Wells or Piezometers: Because of the relatively small rate of groundwater removal within the mine workings, groundwater impacts outside of the immediate underground mine areas are not immediately anticipated. To verify the groundwater model and to provide additional drawdown data, RCG would establish two new groundwater monitoring locations: one to the north of the underground workings within the Project area, and one to the northeast of the underground workings within the Project area. These wells would be used to collect data from the Vinini Formation. The approximate locations of these two new wells are shown on Figure 3 of this Plan. The north monitoring location shall be established within 1 year of Project approval. The northeast monitoring location shall be established within 2 years of Project approval.
- Contingent Groundwater Monitoring Wells or Piezometers for Impacts to Springs: Two of the Barrick monitoring wells (BX-2Rs and BX-4s) are located between the Project area and the spring complexes potentially affected by Hollister Mine water removal. Because of the relatively small rate of groundwater

removal within the mine workings, groundwater impacts outside of the immediate underground mine areas are not immediately anticipated. If BX-2Rs or BX-4s show consistent decline in groundwater elevations of more than 10 feet below the groundwater baseline elevation for these wells, then RCG shall establish a new monitoring well or piezometer at an appropriate location (determined in coordination with the BLM) between the impacted Barrick well and the spring complex(es). For BX-2Rs, the current groundwater elevation is approximately 5,500 feet, with a trigger elevation of 5,490 feet above mean level (aml). Well BX-4s has a current groundwater elevation of approximately 5,600 feet with a trigger elevation of 5,588 feet aml.

- As groundwater monitoring wells are mined out, become nonfunctional, reach trigger elevations, or dry up, replacement wells would be installed in a location determined by RCG in consultation with the BLM. As groundwater data is acquired from the monitoring wells, additional step-out wells or new wells may be installed as needed to monitor groundwater movement.

At least every 5 years and up to every 2 years, if warranted, RCG would recalibrate the groundwater model and provide the results to the BLM. The monitoring plan would be adjusted as necessary to identify potential impacts to perennial surface water resources and groundwater resources within the area potentially affected by mine-related drawdown, as depicted in Figure 3.5-2 and 3.5-15 of the DEIS (10-foot drawdown contour). Revisions to the monitoring plan would be reviewed and approved by the BLM.

Surface Water Resources

***Monitoring*:** RCG would conduct surface water monitoring. The monitoring, testing, and reporting requirements for the seeps and springs are identified in Attachment A. Monitoring data would be recorded using Protocol B. RCG would provide reports to the BLM for the life of the mine. RCG would provide the BLM with an annual report regarding the surface water flow at the springs listed below and shown in Attachment A. The report would be due by April 30 each year following the data collection the prior fall. The surface water report may be combined into one report with the groundwater report.

Mitigation: Impacts to surface waters (i.e., seeps, springs, and wetlands) are not certain, and all are located on private land. In lieu of monitoring for impacts to the seeps, springs and wetlands potentially affected by mine water removal and then establishing mitigation to address such impacts, RCG would mitigate for any such impacts through a Riparian Mitigation Fund to be established within 120 days of Project approval. The Riparian Mitigation Fund shall be a separate, interest-bearing account established and controlled by the BLM and funded by RCG. Total amount to be funded is $120,000, based on a replacement ratio of 1:1. Funds in the Riparian Mitigation Fund would be available to the BLM to fund on-the-ground improvements such as site assessments, studies, and other enhancement measures for riparian habitats on public or private lands within the Twenty-five Allotment.

Effectiveness*:* The following information describes the anticipated effectiveness of the Revised Mitigation Measure GW-1, identified above.

While the EIS groundwater modeling identifies the potential for impacts to 15 seeps, or springs within four spring complexes, and two stream reaches, the GW-1 monitoring is intended to identify actual impacts of the Project on groundwater levels. This information would ensure that appropriate mitigation is implemented at an early stage to effectively address actual identified impacts. Water quantity measurements would include pumpage

rates from groundwater pumping, water levels in monitoring wells and piezometers, and flow rates for surface water monitoring locations as identified in Attachment A of this plan.

The monitoring measures are designed to ensure early detection and remediation of potential Project-related impacts to groundwater and surface water quantity within the 10-foot drawdown contour. Groundwater data also would be used to refine the groundwater model.

Establishment of the Riparian Mitigation Fund would provide funds to be utilized by the BLM for improvements to wetland and riparian habitats in the area, whether or not there are actual impacts to such wetland and riparian habitats from the Project. Such funds would allow the BLM to improve or offset Project impacts (if any) to wetland and riparian areas. BLM also would be able to use such funds to mitigate for non-Project related impacts or for wetland and riparian improvements in the Twenty-five Allotment. The funds, therefore, would be effective in mitigating or offsetting any Project impacts.

Environmental Impacts Associated with Implementation of Mitigation Measures. Any surface disturbance from the above-identified mitigation measures would be managed and reclaimed in accordance with BLM and State of Nevada requirements. Surface disturbance impacts associated with implementation of site-specific mitigation are expected to be reclaimed within 3 years after disturbance. For future projects funded through the Riparian Mitigation Fund, all policies and procedures applicable to activities on public lands including completion of NEPA and conducting Section 106 compliance would be followed.

Monitoring and Mitigation for Water Quality Impacts

Potential Impact: Potential impacts to water quality from the Project not specifically addressed by RCG's applicant committed environmental protection measures include poor water quality within the underground workings as the workings refill with water approximately 130 years after cessation of mining. Migration of that water may result in elevated pH, Al, Sb, Be, Cr, Se, SO_4, Th, and TDS, toward the southwest corner of the Project boundary (in-situ mine water). While unlikely, there also is concern that storage of waste rock in the West Pit could affect water quality in Little Antelope Creek from increased flows in the MA-1 seep.

Monitoring and Mitigation Measure GW-2

Monitoring: Water quality monitoring of groundwater and surface water resources would consist of:

Monitoring Wells and Piezometers: RCG would test water quality at the monitoring wells and piezometers as identified in Protocol A. The location of the wells and piezometers from which water quality would be monitored is illustrated on Figure 3. RCG would provide reports of such monitoring to the BLM for the life of the mine.

Little Antelope Creek: RCG is currently monitoring surface water quality along Little Antelope Creek and would continue to do so. RCG also would monitor water quality in Little Antelope Creek pursuant to RCG's NPDES discharge permit. See Protocol B. RCG would provide the BLM with a copy of all reports submitted to NDEP. See Figure 4 for current surface water monitoring locations along or near Little Antelope Creek. Additional monitoring locations may be required pursuant to the NPDES discharge permit.

MA-1 Seep: RCG would monitor water quality at the MA-1 seep via quarterly sampling events at the MA-1 seep, GBG-02, and GBG-03, in accordance with Protocol B. The monitoring locations are illustrated on Figure 4. RCG would provide reports to BLM for the life of the mine.

TCP Springs: While no impacts are anticipated, because these springs are not connected to any aquifer that could be impacted by the Project and therefore no mitigation is proposed, surface water quality and flow at the Ivanhoe, Buttercup and Antelope springs would continue to be monitored because of their cultural significance to the Western Shoshone people of the area. RCG would continue to monitor water quality (and quantity) at these springs to provide information to the BLM for their management. Monitoring would occur annually in the fall following the Project approval and would continue during the life of the mine.

In-situ Mine Water: No monitoring is proposed for the first 100 years, because there would be no in-situ mine water during active mining operations and prior to recovery of the groundwater table. Monitoring of groundwater quality would be required beginning at 100 years after cessation of mining when the in-situ mine water is predicted to begin migrating toward the southwest Project boundary.

Mitigation:

MA-1 Seep: The MA-1 seep currently has little flow, and does not normally reach Little Antelope Creek. If monitoring of the MA-1 seep and/or Little Antelope Creek, however, indicates impaired water flow of 1 gallon per minute or more from the MA-1 seep having the potential to reach Little Antelope Creek for a sustained six months or more of non-seasonal influenced events such as spring run-off or storms (precipitation events), then RCG would construct an artificial wetland in accordance with then-recommended parameters. Should the artificial wetland prove ineffective, or if flow is not sufficient to sustain a wetland, RCG would install a collection device to remove any impaired water flowing from the MA-1 seep and transport such water off-site to a permitted disposal or treatment facility.

In-situ Mine Water: Currently, there are no surface or underground receptors for such water. However, potential receptors cannot be predicted 100 to 400 years into the future. Within two years of Project approval, the BLM would establish and RCG would fund a Long-Term Trust Fund (LTTF) for a monitoring well in an appropriate location toward the southwest corner of the Project boundary. This LTTF would be established to ensure that the BLM or other managing authority is able to monitor the attenuation of the groundwater or implement other measures that become applicable treatment options due to advances or improvements in technology over time. It is impractical to establish a monitor well at this point in time because migration of this groundwater is not anticipated to begin until after equilibrium is reached within the underground workings in approximately 130 years. The LTTF, therefore, shall be sufficient to ensure adequate funds are available when the BLM deems it appropriate to fund such a well at approximately 100 years post mining. In approximately 400 years, based on modeling, the in-situ mine water would have reached steady state and potentially migrated to the southwest. Within 1.5 miles, natural attenuation is predicted to be met for all state water quality standards except for antimony. Antimony concentrations are naturally elevated, and the modeled concentration level would not be significantly elevated above current background levels.

EPA recommends that monitored attenuation, potentially coupled with institutional controls, is appropriate mitigation to contaminated in-situ groundwater. *See, EPA, 2001.*

A Citizen's Guide to Monitored Natural Attenuation, United States Environmental Protection Agency, April and EPA, 2007; Metal Attenuation Processes at Mining Sites, United States Environmental Protection Agency, September.

Effectiveness: Constructing an artificial wetland to treat any identified RCG water quality impacts through the MA-1 seep should be effective given current conditions at the site. Should conditions change that would make an artificial wetland less effective, or should a constructed wetland prove less effective than anticipated, collecting any impaired water at the MA-1 seep and disposing or treating such water off-site would be effective in preventing impacts to Little Antelope Creek.

Establishing a LTTF to enable the BLM to perform monitored attenuation of the in-situ mine water movement, and to establish institutional controls if needed. This measure would be effective in preventing impacts to human or surface receptors for such water, if any such receptors should be established in the future.

SURFACE DISTURBANCE IMPACTS

Potential Impact: Surface disturbance and other activity at the Project site and at outlying road improvements and maintenance, such as the use of chemical treatments (e.g., magnesium chloride, dust suppressants), could result in vegetation and soil removal, and may create runoff. Impacts from such activities could include erosion, sedimentation, and reduced runoff water quality, which could drain to nearby streams or springs. Increased runoff or concentrated flows could reduce channel and bank stability, particularly on steep slopes near stream crossings.

Mitigation for Impacts Caused by Surface Disturbance

Mitigation Measure SW-1

***Monitoring*:** Annually, in early spring and after heavy precipitation events, RCG would survey low water crossings, travel routes, and direct disturbance areas around the mine and unreclaimed exploration sites for erosion and sedimentation. Monitoring would continue until the reclamation bond is released.

Mitigation: If erosion or sedimentation is found to occur, RCG would immediately install weed-free hay bales, silt fences, or other erosion controls to stabilize the area. RCG would monitor any stabilized site to determine if such measures are effective and replace hay bales and silt fences as needed. If Project-related changes to stream channels are identified, additional mitigation and stabilization practices such as installation of gabions or concrete diversion panels or placement of rock material, would be implemented and maintained by RCG in coordination with the BLM. Other protective measures also are provided by the storm water pollution prevention plan and applicant committed environmental protection measures. Disturbed areas no longer in use for mining or exploration activities would be reclaimed in accordance with the reclamation plan.

***Effectiveness*:** The monitoring measures of SW-1 are designed to ensure early detection and remediation of potential Project-related erosion or sedimentation. Hay bales, silt fences, and other physical controls are considered highly effective in controlling sedimentation, erosion, and preventing changes in stream channels. Dust suppressants such as magnesium chloride are an effective means of preventing air quality issues and sedimentation concerns for stream channels adjacent to roads. This mitigation measure would improve the stability of land surfaces and surface water quality in the Project area**.**

SOILS AND RECLAMATION

Potential Impact: Recent tests have demonstrated that the existing growth media stockpile in the south Rapid Infiltration Basin (RIB) stockpile has elevated salts and sodium. Elevated levels can prohibit plant growth and reduce the effectiveness of reclamation.

Mitigation Measure SL-1

Mitigation: RCG would use a BLM-approved salt and sodium tolerant seed mixture for areas where the south RIB stockpile is used for reclamation. Adding other amendments such as organic matter or elemental sulfur would be used as necessary to establish vegetation.

Effectiveness: While excess salts and sodium can prohibit plant growth, certain vegetation types are adapted to these types of conditions. Use of a seed mixture with species that can tolerate the salt and sodium content of the growth media in the south rapid infiltration basin stockpile would be effective in addressing the potential for diminished plant growth during reclamation.

VEGETATION

Potential Impact: Impacts to vegetation resulting from the existing and proposed surface disturbance would be addressed as set forth in RCG's Reclamation Plan and in accordance with the BLM and NDEP policy guidance, and no additional mitigation is proposed.

Monitoring and Mitigation Measure VR-1

Monitoring: RCG would monitor basal and foliar cover of reclaimed vegetation and provide annual monitoring reports to the BLM and NDEP for review and assessment of reclamation success.

Mitigation: If BLM inspection results in a determination that reclamation has not succeeded, RCG would consult with the BLM to develop a second seeding to be based on the types of outcomes desired and which addresses the specific lack of success of the initial revegetation attempt.

Effectiveness: RCG's reseeding plan contained in the Reclamation Plan would be effective because it requires use of a BLM-approved seed mixture of grasses, forbs, and shrubs native to the Project area. Reclamation at exploration sites in the Project area using a similar protocol as contained in the Reclamation Plan has proven effective at re-establishing native vegetation. It is expected that re-vegetation for the Project would be similarly successful. Also as noted, if monitoring identifies less than desirable reclamation in certain areas, a second seeding designed to address the specific issue would be developed and implemented which would be effective in addressing such issues.

RIPARIAN AND WETLANDS

In addition to the mitigation and monitoring described in GW-1, GW-2, and AR-1, the following measures describe mitigation to wetland vegetation and riparian vegetation potentially affected by groundwater drawdown.

Potential Impact: As discussed above, potential impacts from groundwater removal from the underground workings, reduced flow at the seeps, springs and spring complexes from groundwater drawdown may impact up to 12 acres of riparian and wetland habitat along Antelope Creek. Because all or most of the riparian and wetland areas are privately owned, and not under management by the BLM, the landowners could prevent access for the monitoring and mitigation measures described in the DEIS. The inability to implement mitigation measures described in this mitigation plan to prevent impacts or restore riparian areas or wetlands could lead to a cumulative loss of wetlands within the 10-foot groundwater drawdown contour.

Mitigation Measure RW-1

Mitigation: See GW-1 (Riparian Mitigation Fund) and AR-1 (Springsnail Mitigation Fund). The mitigation measures that would be implemented for potential impacts from groundwater drawdown and potential impacts to aquatic resources also mitigate potential impacts to wetland and riparian areas.

Effectiveness: See the effectiveness discussions of GW-1 and AR-1.

Potential Impact: As a result of the discharge of pumped groundwater into Little Antelope Creek, additional riparian and/or wetlands may be created. This new habitat could be impacted by livestock attracted to the new habitat.

Monitoring and Mitigation Measure RW-2

Monitoring and Mitigation Measure: To preserve this new habitat, RCG would repair and maintain the two adjacent exclosures to each other along Little Antelope Creek for the life of the Project to prevent access by livestock. Evaluation of the two exclosures may warrant adjustments to the fencing, creating one exclosure instead of two, as well as changes to the fence line to incorporate the springs into the exclosure.

RCG would install one cattleguard on the lower end of the existing exclosure on Little Antelope Creek. RCG would maintain the four cattleguards along the Little Antelope Creek Road. Maintenance of the cattlequards includes, but is not limited to, lifting the rails and cleaning the soil material out of the area below the rails; ensuring the rails and wings are intact; ensuring that the fence wiring is attached to the fence post and cattlequard wing; and ensuring that soil material in the roadbed is level with the base, thus preventing a drop off or erosion around the cattleguard. RCG would enter into a cooperative agreement for materials, labor, and maintenance with the BLM Elko District to implement this measure.

Effectiveness: This measure would enhance and protect riparian vegetation by excluding cattle grazing from this segment (exclosure area) of Little Antelope Creek. This measure would help offset any loss of riparian and wetland areas caused by the groundwater drawdown and enhance water quality by preventing grazing caused erosion and sedimentation.

NOXIOUS WEEDS AND NON-NATIVE INVASIVE PLANT SPECIES

Potential Impact: Surface disturbance from mining activities could allow for the establishment of noxious weeds.

Monitoring and Mitigation Measure NW-1

Monitoring and Mitigation Measure: During construction, operation, and reclamation, RCG would identify and monitor the Project area for the establishment of noxious weeds and non-native invasive plant species. RCG would treat weed infestations according to its Noxious Weed Prevention and Control Plan, and the BLM and Nevada Division of Environmental Protection regulations. RCG's weed prevention measures consist of the following:

- Hand pulling or digging of weeds;
- Spraying of BLM-approved herbicides;
- Washing of earthmoving equipment before mobilizing on to site;
- Inspection of areas and roads transversed by equipment (trucks, etc.);
- Use of certified weed-free plant materials (i.e., straw) for soil protection; and
- Use of certified weed-free seed mixtures to revegetate disturbed areas.

RCG would provide the weed treatment information included in Attachment B of this plan to the BLM when treating noxious weeds or non-native invasive plants species on public lands.

Effectiveness: Based upon experience with implementing these measures on other projects, the BLM and RCG believe these measures would be effective to control the spread of noxious weeds and non-native plant species.

Potential Impact: If groundwater drawdown results in the reduction of riparian and wetland communities within the maximum extent of the 10-foot groundwater drawdown contour, noxious weeds could become established in such areas.

Monitoring and Mitigation Measure NW-2[1]

Monitoring and Mitigation Measure: RCG would take commercially reasonable efforts to come to an agreement with the private landowners of the wetlands to allow RCG to monitor for and control any noxious weed infestations in such riparian/wetland areas consistent with its Noxious Weed Prevention and Control Plan. RCG would not be required to provide any consideration to the landowner in exchange for access, other than performing or paying for such weed control.

Effectiveness: Implementation of such noxious weed control measures would minimize the potential spread of noxious weeds and non-native invasive plant species.

RANGE RESOURCES

See GW-1 for monitoring for, and mitigation of, any long-term loss of surface water sources for livestock. Previous RR-1 from the Draft EIS is now incorporated into GW-1.

[1] This mitigation measure was identified in the Draft EIS as RW-3. As this mitigation measure addresses noxious weeds, it has been moved to this section and re-numbered as NW-2.

WILDLIFE

See GW-1 for monitoring for, and mitigation of, any long-term loss of surface water sources for wildlife.

AQUATIC RESOURCES

Potential Impact: There are nine springs associated with springsnails that fall within the 10-foot drawdown contour for the Hollister Project. Eight of the springs are within Spring Complex Number 4 and one spring is in Spring Complex Number 3 (Figure 2). Springsnail populations (Figure 5) may be at risk from groundwater pumping which could potentially reduce flow in these spring complexes.

Monitoring and Mitigation Measure AR-1

Monitoring: Monitoring the wells BX-2Rs and BX-4s would identify drawdown impacts in the direction of the spring complexes well before the springs would be impacted. The contingency monitoring location (in Monitoring Measure GW-1) to be established if impacts are identified in either BX-2Rs or BX-4s would further identify the potential for impacts to the springsnail spring complexes well before such impacts would occur.

Mitigation: Springs which supports springsnail and which occur on private lands in Spring Complex Numbers 3 and 4 (described above) would be fenced with steel or other fencing material within two years of Project approval. Fence location(s) would be determined in the field in consultation with the private landowner or representative, the Nevada Department of Wildlife (NDOW), and the BLM. Note that not all springs containing springsnails may be fenced depending on desires of the landowner. The total dollar amount for this commitment, including labor and materials is currently estimated at $62,000, based on projections for constructing up to four exclosures with three rail pipe fence. Costs for associated cultural inventories and survey and design are not included and are the responsibility of RCG. In addition, RCG would work directly with the private landowner or representative to complete the actual building phase of the Project, including purchase of materials and contracting construction.

Impacts to springs containing springsnails are not certain. In lieu of additional monitoring for impacts to springsnail populations potentially affected by Hollister Mine water removal and then establishing mitigation to address such impacts, RCG would mitigate for any such impacts through a Springsnail Mitigation Fund to be established within one year of Project approval. The Springsnail Mitigation Fund shall be a separate, interest-bearing account established and controlled by the BLM and funded by RCG. Total amount to be funded is $42,000 based on a replacement ratio of 1:1. Funds in the Springsnail Mitigation Fund would be available to the BLM to fund on-the-ground improvements, monitoring, studies, general springsnail research, and/or other enhancement measures for springsnails or their habitats.

Effectiveness*:* The following information describes the anticipated effectiveness of Mitigation Measure AR-1, identified above.

Spring Fencing: Fencing and protection of springs along the Upper Antelope Creek drainage would limit livestock impacts and improve habitat condition and resiliency. Currently, these areas are impacted by livestock in the form of trampling and compaction, and in some locations, overuse of riparian plant species. Protective fencing would allow spring habitats to function properly, resulting in reduced erosion rates, improved

infiltration and water storage capacity, energy dissipation, expansion of wetland and riparian plant communities, and greater biodiversity.

Springsnail Mitigation Fund: Establishment of the Springsnail Mitigation Fund would provide the BLM with funds to benefit springsnails in the form of research, monitoring, habitat improvement, or other measures whether or not there are actual impacts to this species from the Project. Such funds would allow the BLM to improve or offset Project impacts (if any) to springsnails. Applicable mitigation measures for springsnails are unknown at this time. For example, past attempts to mitigate by relocating springsnails failed; therefore, mitigation measures may be ineffective for springsnails. Due to the lack of information and knowledge regarding springsnails and known applicable mitigation measures, utilizing this fund to monitor, provide research opportunities, and habitat enhancement measures may be the only means to effectively try to mitigate for springsnails.

Environmental Impacts Associated with Implementation of Mitigation Measure

Spring Fencing: Improved ecological function of springs is expected to directly and indirectly benefit many species of wildlife including those considered special status. Species such as springsnails, sage-grouse, migratory birds, and many species of mammals are dependent on functioning riparian habitats during all or some parts of their life cycles. Fencing of springs along Antelope Creek also would add a positive cumulative impact to on-going efforts to improve riparian habitats in other parts of the Twenty-five Allotment.

Potential adverse direct and indirect impacts from fencing of springs along Upper Antelope Creek include ground disturbance, creation of perching areas for predatory bird species, and a possible collision hazard for some species of wildlife. These impacts would be reduced or mitigated by the following resource protection stipulations: fences would be constructed to the BLM specifications to provide for wildlife passage; disturbed areas would be reseeded or reclaimed; and standard protocols for limiting expansion of weed infestations would be followed.

The proposed mitigation would be consistent with sage-grouse conservation measures outlined in the BLM instruction memorandums 2012-043 (BLM 2011a) and 2012-044 (BLM 2011b) and the Western Association of Fish and Wildlife Agencies (WAFWA) guidelines (Connelly et al. 2000).

Springsnail Mitigation Fund: For future projects funded through the Springsnail Mitigation Fund, all policies and procedures applicable to activities on public lands including completion of NEPA and conducting Section 106 compliance would be followed.

SPECIAL STATUS SPECIES

To prevent disruption of greater sage-grouse breeding activities, RCG adopted in its applicant committed environmental protection measures section of the plan of operations, appropriate BMPs described in *A Report on National Greater Sage-grouse Conservation Measures*, (Sage-grouse National Technical Team (NTT) 2011), as described in Section 2.4.9. During the greater sage-grouse breeding season (March 15- June 15), no exploration activities would be allowed within 3 miles or line-of-sight of an active lek from 1 hour before sunrise to 10:00 am and speed limits would be posted on access roads.

***Issue*:** Northeastern Nevada has more greater sage-grouse leks than personnel to survey them annually. As such, many leks have inconsistent survey data. Due to the remoteness of the East Velvet, East Clementine, and Big Butte leks (Figure 6), NDOW has only sporadic data on sage-grouse attendance at these leks.

Monitoring Measure SSS-1

***Monitoring*:** RCG would hire an appropriate contractor or train its personnel to conduct lek surveys according to NDOW protocols for the East Velvet, East Clementine, and Big Butte leks each year during the breeding season (March 15 to June 15) for the life of the mine and report the results to the BLM and NDOW.

Effectiveness: By implementing SSS-1, accurate annual lek counts would be obtained for the East Velvet, East Clementine, and Big Butte leks. Based on trend data for these three leks, the BLM and NDOW would be able to monitor the status of the leks and determine if any Project impacts are occurring to these leks and sage-grouse. The collection of this data would provide valuable information to the BLM and NDOW to assist them with broader sage-grouse management and planning efforts.

PALEONTOLOGICAL RESOURCES

Potential Impact: Construction of the transmission line could have potential impacts to invertebrate, vertebrate, or plant fossils that may not have been fully identified in pre-Project surveys.

Monitoring and Mitigation Measure PR-1

Monitoring: During construction, installation, and reclamation of the proposed transmission line, RCG would hire a qualified paleontological specialist to monitor areas with high potential for the occurrence of paleontological resources.

Mitigation: If vertebrate fossils or unique or site-specific invertebrate or plant fossils are found, the regulations at §3809.420(b)(8)) would be implemented. Work on the transmission line by NV Energy would stop immediately and the BLM would be notified. The BLM would assess the situation and determine any necessary mitigation. A qualified specialist would evaluate the site, report on the findings, and recommend preservation of the fossils or data recovery.

Effectiveness: This measure would allow for the evaluation of any vertebrate, invertebrate, or plant fossils that may be discovered and would provide adequate time for their preservation or data recovery.

CULTURAL RESOURCES

Potential Impact: The Project is located within an area known to contain a diverse and dense population of Historic Properties. Construction of overhead electric transmission and distribution lines may impact Historic Properties. Mining and exploration may encounter Historic Properties. The heightened public awareness of the area due to the EIS may create negative impacts to Historic Properties.

Monitoring and Mitigation Measure CR-1

Monitoring: The Programmatic Agreement (PA) attached to the Final EIS (Appendix A) describes the procedures whereby the BLM, RCG and the Tribes would monitor for

potential direct and indirect adverse effects to Historic and Traditional Cultural Properties (TCPs).

Mitigation: Subsequent to the Draft EIS, and due to concerns of area Tribes with data recovery, the BLM determined that Historic Properties potentially impacted by Project activities could be avoided through pre-planning efforts and implementation of the avoidance protocols in the PA. Therefore, the BLM determined that the previously considered Historic Properties Treatment Plan would not be required.

Effectiveness: These measures would allow for the protection of both inadvertent discoveries and known Historic Properties from mining operations, exploration activities, and related indirect impacts. The avoidance protocols described in the PA would be effective in avoiding adverse effects to National Register of Historic Places (NRHP)-eligible resources.

NATIVE AMERICAN TRADITIONAL VALUES

Potential Impact: The Project is near the Tosawihi Quarries Traditional Cultural Properties and the Tosawihi Quarries Archaeological District. The heightened public awareness of the area due to the EIS may create negative impacts to TCPs.

Mitigation Measure NATV-1

Monitoring: The PA (Appendix A) defines the BLM, RCG, and Tribal processes and procedures for monitoring proposed exploration and associated activities, mining and associated operations, site testing, data recovery, and Traditional Cultural Properties throughout the life of the Project.

Mitigation: For both the Mining Area of Potential Effect (APE) and the Exploration APE, the PA describes the type and priority of mitigation tools (i.e., avoidance, denial of access, treatment, and data recovery) and the processes and protocols under which those tools would be implemented. The mitigation types as defined cover known, inadvertent discovery, or other impacts to Historic and Traditional Cultural Properties.

Effectiveness: The BLM acknowledges that certain impacts cannot be fully mitigated to the satisfaction of the Tribes. While possible mitigation measures may lessen certain impacts, adverse effects to religious, spiritual, or sacred values cannot be monitored or mitigated. The monitoring and mitigation processes, procedures, and protocols as defined within the PA and in coordination with Tribes are designed to address issues raised by the Tribes during consultation and may continue to be adjusted by the BLM based on continuing consultation. Therefore, mitigation for Native American traditional values and beliefs would probably be considered as ineffective by Tribes.

New Mitigation Measure NATV-2

Mitigation*:* As an additional measure, RCG would not propose mining or exploration activity within 250 feet of any currently identified TCP area.

Where applicable in the mining operations and exploration activities, RCG would utilize night lighting reduction techniques and equipment, as needed.

Effectiveness: By providing a buffer area around identified TCP areas, this measure is an effective means to further reduce impacts from temporary exploration activities and

mining operations. However, the Tribes may regard this mitigation as an ineffective means of mitigating Native American traditional values and beliefs.

Use of night lighting reduction techniques and equipment would reduce the visual impacts of lighting at the mine site in the night sky allowing for a more natural environmental experience. This mitigation measure can be effective in reducing artificial lighting during the darkness of the night.

REFERENCES

Bureau of Land Management (BLM). 2011a. Greater Sage-Grouse Interim Management Policies and Procedures. Instruction Memorandum No. 2012-043.

Bureau of Land Management (BLM). 2011b. BLM National Greater Sage-Grouse Land Use Planning Strategy. Instruction Memorandum No. 2012-044.

Connelly, J. W., M.A. Schroeder, A. R. Sands, and C. E. Braun. 2000. Guidelines to manage sage grouse populations and their habitats. Wildlife Society Bulletin 28: 967-985.