UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

OFFICE OF THE
REGIONAL ADMINISTRATOR

July 16, 2012

Amy Lueders
Bureau of Land Management
1340 Financial Boulevard
Reno, Nevada 89520

Subject: Hollister Underground Mine Project Draft Environmental Impact Statement, Elko County, Nevada [CEQ # 20120166]

Dear Ms. Lueders:

The U.S. Environmental Protection Agency (EPA) has reviewed the above referenced document. Our review and comments are provided pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality's (CEQ) NEPA Implementation Regulations at 40 CFR 1500 - 1508, and our review authority under Section 309 of the Clean Air Act, as well as the May 21, 2008 Memorandum of Understanding between the Bureau of Land Management (BLM) and EPA.

According to the Draft EIS, the Hollister Underground Mine Project, proposed by Rodeo Creek Gold Inc. (RCG), would disturb 177 acres of land in addition to the 105 acres already disturbed by mining and exploratory activities on the site, and would have an active mine life of approximately 20 years. The proposed project would include the transition from exploration and bulk sampling activities to full-scale production of gold and silver in the existing underground workings and the proposed Hatter production shaft; the construction of an 11.6 mile electrical power transmission line; the installation of a National Pollution Discharge Elimination System (NPDES) permitted outfall for the discharge of dewatering waters; and the placement of waste rock on existing storage facilities as backfill into the underground workings and as partial backfill of the existing West Pit.

Based on the information presented in the Draft EIS, EPA believes that some aspects of the project could result in significant degradation of groundwater and surface water quality, including impairment of water quality in jurisdictional Waters of the United States. The Draft EIS states that, following closure of the mine, the rebounding groundwater table would interact with the mine's backfilled underground workings, producing groundwater contamination expected to exceed Nevada Department of Environmental Protection Profile 1 water quality standards for pH (alkaline), aluminum, antimony, chromium, selenium, sulfate, thallium, and total dissolved solids. Should this contaminated groundwater feed surface water features in the project area or impair adjacent groundwater aquifers, which then source surface waters, surface water quality would be further impaired. In addition, the proposed project is anticipated to result in increased flow of an existing contaminated discharge into Little Antelope Creek at seep MA-

1. This unpermitted discharge into a Water of the United States exceeds NDEP Profile 1 water quality standards for sulfate and total dissolved solids, as well as being elevated in arsenic.

EPA believes that following closure of the proposed Hollister Underground Mine, long-term post-closure monitoring and mitigation may be necessary to ensure that the environmental contamination discussed above is limited and water quality standards are met. Based upon experience with other hardrock mines, EPA believes that an appropriate post-closure management strategy may require source controls such as a pump-and-treat system in order to maintain an inflow condition for groundwater into the closed underground workings. The Draft EIS, however, does not contain discussion of long term maintenance and management activities at the site, nor does it provide any projection or estimation of costs for post-closure obligations on the operator. Without this information, EPA is unable to fully assess the potentially significant environmental impacts of the proposed project and whether the project might result in a long term financial liability to the federal government and the American tax payer in the future, e.g., under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

EPA has rated the Hollister Underground Mine Project Draft EIS as "EO-3 – Environmental Objections - Inadequate Information" (see Enclosure 1: "Summary of Rating Definitions"). The basis for this rating is summarized below. Our detailed comments on the Draft EIS are enclosed (Enclosure 2).

Our objections to the proposed project are based on the likelihood that groundwater and surface water resources would be significantly and adversely affected by the proposed project. The monitoring and mitigation measures proposed in the Draft EIS do not provide sufficient assurance that the potential impacts can or will be mitigated. While the Draft EIS contains a discussion of monitoring efforts as a component of the proposed project, it lacks a detailed discussion of potential mitigating actions in the event that contamination is observed. Without the development of a long term mitigation and management strategy, the proposed project has the potential to result in further exceedance of surface water quality standards.

The Draft EIS is inadequate because it does not disclose information regarding the post-closure operations, long term maintenance, or cost estimates. Nor does the Draft EIS discuss how the BLM will ensure that funds will be available as long as they are needed to implement post-closure obligations, including long term treatment and other mitigation measures. The availability of adequate resources to ensure effective reclamation, closure, and post-closure management is a critical factor in determining the significance of the project's potential impacts and its environmental acceptability.

We appreciate the time and effort that you and your staff have devoted to discussing, with EPA, the important larger issues of financial assurance for mining on federal lands. We look forward to informing the national interagency dialogue on this subject in the near future. In the meantime, EPA continues to believe that the adequacy of financial assurance is a critical element to be disclosed during the NEPA process. We believe such disclosure is consistent with CEQ's guidance, which states that all relevant, reasonable mitigation measures that could improve the project are to be identified in an EIS and, to ensure that environmental effects of a proposed

action are fairly assessed; the probability of the mitigation measures being implemented should also be discussed.[1] We also believe that recent CEQ guidance concerning mitigation may be relevant; this guidance views a discussion of funding for implementation of mitigation commitments as critical to ensuring informed decision making, and suggests that agencies should not commit to mitigation measures if it is not reasonable to foresee the availability of sufficient resources to ensure the performance of the mitigation.[2]

We recommend that BLM disclose an estimate of funding for the reclamation and the closure bond, as well as for the long-term funding mechanism for the proposed Hollister Underground Mine project; analyze the adequacy of the funding amount and mechanism, including associated uncertainties to ensure that sufficient funds would be available as long as they are needed; analyze and revise the discussion of potential impacts to, and mitigation measures associated with, water resources, including their anticipated effectiveness; and prepare more detailed monitoring and mitigation plans with established contingencies in the event that the project proponent is no longer financially capable of implementing essential mitigation measures. This information should be circulated in a Supplemental Draft EIS for public comment, in accordance with NEPA and CEQ's NEPA Implementation Regulations. EPA respectfully requests the opportunity to review this information and provide BLM our feedback before you publish the Supplemental Draft EIS.

We appreciate the opportunity to review this Draft EIS and look forward to working with BLM to resolve the issues outlined in this letter. We will call to arrange a meeting with you to discuss plans for completing the NEPA process. In the meantime, if you have any questions, please call me at (415) 947-4238 or have your staff contact Carter Jessop, our lead NEPA reviewer for this project, at (415) 972-3815. Please send a copy of the Supplemental Draft EIS to this office (mail code CED-2) at the same time it is filed with our Washington, D.C. office.

Sincerely,
/s/

Jared Blumenfeld
Regional Administrator

Enclosures:
(1) Summary of Rating Definitions
(2) EPA's detailed comments on the Hollister Underground Mine Draft EIS

cc: Ken Miller, BLM Elko District Office
Janice Stadleman, BLM Elko District Office
Colleen Cripps, Nevada Division of Environmental Protection
Alan Jenne, Nevada Division of Wildlife

[1] CEQ, Memorandum for Federal NEPA Liaisons, Federal, State and Local Officials and Other Persons Involved in the NEPA Process, Question 19b, March 16, 1981.
[2] CEQ, *Appropriate Use of Mitigation and Monitoring and Clarifying the Appropriate Use of Mitigated Findings of No Significant Impact*. 76 Fed. Reg. 3843, 3848-3849 (Jan. 21, 2011).

Hollister Underground Mine Project Draft Environmental Impact Statement
EPA Detailed Comments – July 16, 2012

Water Quality and Waters of the United States

Geochemical and groundwater modeling

According to the Draft EIS, in the first 130 years following closure of the Hollister Underground mine site, the rebounding groundwater table would interact with the mine's backfilled underground workings, resulting in significant groundwater contamination within the mine pool. Groundwater would exceed Nevada Department of Environmental Protection (NDEP) Profile 1 water quality standards for pH (basic), aluminum, antimony, chromium, selenium, sulfate, thallium, and total dissolved solids (p. 3.5-35). Following the period of inflow, this initial mine volume of groundwater is projected to migrate down gradient southwest of the mine site. Approximately 400 years after closure of the Hollister Underground Mine, the peak of this contaminated plume is projected to reach the proposed project boundary. According to the Draft EIS, a three dimensional dispersal modeling indicates that dilution, dispersal, attenuation, and other geochemical processes will result in reductions of contaminant concentrations such that only antimony would exceed NDEP Profile 1 values at this point of compliance (Brown and Caldwell, 2012). Based upon this result, the Draft EIS concludes that the contamination of groundwater resources resulting from the proposed project represents no risk to wildlife or human uses and requires no mitigating action.

Geochemical modeling typically encounters a number of uncertainties. With the exception of recognizing uncertainty related to the surface area of waste rock in the underground workings that are likely to be exposed to groundwater, the Draft EIS does not identify or discuss the uncertainties associated with the geochemical modeling for this project. A discussion of the range of potential impacts that could be associated with the modeling results is needed so appropriate closure and post-closure management plans can be developed and committed to now, before the project begins.

One method to assess overall uncertainty or error is to propagate Monte Carlo-generated analytical uncertainties through a geochemical code, and generate probabilistic distributions of the output. A generalized Sensitivity Analysis (GSA) can also be used to separate the model responses into two classes or groups based on specified performance criteria. The relative contribution of the uncertainty associated with each input parameter to the output uncertainty is determined by comparing the cumulative distribution functions of the parameters in the two classes. The combined use of the Monte Carlo method with GSA can be used to examine the significance of analytical and thermodynamic uncertainties.

> **Recommendation:** The geochemical modeling used in the mine pool predictions of groundwater quality should include a Monte Carlo or similar type sensitivity analysis of a full-range of potential inputs and outcomes. The Supplemental Draft EIS should identify and thoroughly discuss the uncertainties in the geochemical modeling and the range of potential impacts to groundwater quality.

Impacts resulting from contamination of the Vinini formation aquifer

EPA is concerned that historic and proposed mining and exploration activities may have already jeopardized the integrity of the clay barrier or aquitard that previously prevented movement of water between the Vinini formation aquifer, the volcanic aquifer above it, and the shallow perched aquifer underlying the existing open pit areas. Should groundwater move between the various aquifers at the site, Vinini formation groundwater would introduce high levels of contamination to the other aquifers, which would likely then convey this contamination into seeps, springs and surface water bodies.

> **Recommendation:** The Supplemental Draft EIS should discuss how the proponent will ensure there is no flow between the contaminated Vinini aquifer in the project area and the groundwater aquifers above it despite the numerous locations where the clay aquitard has been pierced.

Contaminated groundwater from the mine pool has the potential to enter seeps, springs and creeks if they receive flow contributions from the Vinini aquifer or if Vinini aquifer waters contaminate an overlying groundwater body that contributes to surface flows. According to Section 3.6, lower reaches of Little Antelope Creek are believed to gain groundwater baseflow contributions through the summer months during years of average or above average precipitation (p. 3.6-8). Although the aquifer that contributes these base flows is apparently unknown, should these flows be contributed by the Vinini aquifer or an aquifer contaminated due to mixing with Vinini formation waters adjacent to the project site, Little Antelope Creek and/or the Rock Creek watershed may have reduced water quality. Likewise, should Vinini formation groundwater overflow the mine portal, conveyance of contaminated groundwater into surface waters adjacent to the project site is likely. In conversations with EPA staff, BLM staff has characterized this as a "worst case scenario". Given the site specific conditions at the Hollister Underground Mine and the complex groundwater interactions that may take place, EPA believes that such a release of contaminants is a foreseeable possibility.

> **Recommendation**: The Supplemental Draft EIS should provide plans for responding to each of the potential sources of water quality contamination from the proposed project, including:
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> - Interim (emergency) Response Plan
> - Fluid Stabilization and Management Plan
> - Closure Water Management and Treatment Plan
> - Post-Closure Water Management and Treatment Plan
>
> The response plans should address the proposed mitigation measures and provide contingency plans in the event that mitigation fails to be fully effective. The response plans should include monitoring plans that address continual calibration of the information using real-time site specific data. This should include: a trend analysis and additional monitoring to provide assumption and/or model feedback prior to any actual exceedance occurring; monitoring of mine pool and monitoring wells located between mine pool and point of compliance well; and monitoring of waste rock storage facility seepage collected in wet well to measure dolomite neutralization effectiveness. The

monitoring plans should provide performance standards upon which to base mitigation triggers that would ensure prevention (e.g. prior detection and mitigation) of any exceedance at either a point of compliance or NPDES discharge location.

Potential for waste rock seepage

The proposed project includes the placement of a wet well/sump under the waste rock storage facilities (WRSF) with water collecting at the synthetic liner underlying the waste rock, to be pumped to water treatment facilities prior to discharge. The leachate data from the active WRSF represents the best opportunity for a direct site analog relative to the existing and proposed material handling mitigation measures (e.g. amendment with dolomite). Site analogs provide site-specific real-time data that can be more accurate in predicting water quality impacts than conceptual modeling based on limited data. Infiltration that has made its way through the existing WRSF and, subsequently, through the dolomite layer and collected in the sump should be representative of future leachate volumes and concentrations from the existing and new WRSF, and indicative of whether treatment will be required. The Draft EIS indicates that, because sump water is presently being sent to the reverse osmosis plant, it has required treatment for contaminants in the past. The Draft EIS contains no information, however, in regards to the water quality of this leachate.

> **Recommendation**: The Supplemental Draft EIS should include water quality and quantity data for the leachate collecting at the synthetic liner under the existing WRSF. It should include a discussion of whether the data supports the laboratory results used in the preparation of the Draft EIS and the potential environmental consequences of any identified discrepancy.

Impacts resulting from discharge at seep MA-1

Sections 3.4 and 3.6 of the Draft EIS provide descriptions of seep MA-1, which discharges into Little Antelope Creek from the Newmont-reclaimed East Waste Rock Storage Facility. Seep MA-1 currently contains elevated levels of arsenic, sulfate, and total dissolved solids (TDS), with sulfate and TDS being above NDEP Profile 1 reference values. Based upon the information presented in the Draft EIS, it seems likely that seep MA-1 receives contributions from the shallow perched aquifer under the previously disturbed operations areas. Under the proposed action, development of the West Pit WRSF and placement of backfill would raise the ground surface in the West Pit and preclude the continued formation of the seasonal pit lake that has in the past occurred approximately 9 months of each year. The removal of this groundwater sink for the perched aquifer is projected to result in an increase in flow of the perched aquifer toward Little Antelope Creek of 1.8 gallons per minute (p. 3.5-37). This increase in movement in the perched aquifer may then result in an increase in flow at seep MA-1 or the development of a new seep along the margin of Little Antelope Creek.

In addition, the existing unnamed seep out of the Newmont-reclaimed South WRSF just downstream from seep MA-1 is stated to similarly contain elevated levels of sulfate and TDS. The Draft EIS indicates that Newmont's passive water treatment system and constructed wetland

at this location has been insufficient at preventing continued contributions of contaminated water to Little Antelope Creek.

RCG proposes to continue to monitor water quality at the MA-1 seep and Little Antelope Creek to determine whether backfill of the West Pit does, in fact, result in changes to water quality and quantity at the MA-1 seep. This information would be utilized to refine the model and to determine whether or not the proposed Hollister Mine is affecting this seep. If the Hollister project is determined to be contributing to flows at seep MA-1, the Draft EIS proposes the construction of an artificial wetland to mitigate for this contamination.

> **Recommendation:** In light of the failure of the existing constructed wetland to prevent seep from Newmont's South WRSF from entering Little Antelope Creek, the basis for proposing construction of another artificial wetland as mitigation for impacts of the proposed project is unclear. EPA recommends that the Supplemental Draft EIS include a more thorough discussion of how flows from seep MA-1 would be controlled and prevented from further contaminating Little Antelope Creek, including an assessment of the likely effectiveness of proposed mitigation measures. Furthermore, the Draft EIS does not indicate whether the development of the West Pit WRSF has the potential to increase flow at the unnamed Newmont South WRSF seep as well. In light of the similarities in water quality data and the indicated movement direction of the perched aquifer toward both of these seeps, the Supplemental Draft EIS should consider this possibility and identify mitigation should reductions in water quality or increases in flow at this location occur.

The Clean Water Act prohibits the discharge of any pollutant through a point source into a water of the United States without a National Pollutant Discharge Elimination System (NPDES) permit. Little Antelope Creek has been identified as a jurisdictional water of the United States by the U.S. Army Corps of Engineers. Seep MA-1 and the unnamed seep exiting Newmont's South WRSF appear to be discharging into Little Antelope Creek without an NPDES permit, and the Draft EIS does not indicate that a NPDES permit will be obtained for these discharges.

> **Recommendation:** EPA recommends the Supplemental Draft EIS accurately characterize these seeps as unpermitted discharge and provide a description of ongoing and proposed mitigation efforts to either eliminate the seep or to obtain NPDES permit coverage.

Jurisdictional Delineation

According to the Draft EIS, (p. 3.6-2), "The U.S. Army Corps of Engineers (USACE) formally determined that Little Antelope Creek and tributary features in the project area are jurisdictional waters of the U.S. (USACE 2004). That determination was valid through April 2009…" Furthermore, "According to earlier field surveys in the project area, approximately 2.43 acres of waters of the U.S. occur along Little Antelope Creek, and approximately 1.01 acres of wetlands occur along this creek (JBR 2003a)." Jurisdictional determinations require re-verification after 5 years have elapsed; however, the USACE in Reno, Nevada indicate that they have not been contacted for re-verification for the Hollister Project.

In addition, while the Draft EIS identifies Little Antelope Creek, Antelope Creek, Rock Creek, etc, as jurisdictional, none of their intermittent/ephemeral tributaries appear to be included as part of the estimate of potentially impacted waters. It appears that the jurisdictional status of these intermittent or ephemeral tributaries has not been determined.

> **Recommendations:** The project proponent should contact the USACE office in Reno, Nevada to request a new jurisdictional determination to verify the amount of waters/wetlands within the entire (cumulative effects) project area.
>
> The Supplemental Draft EIS should report on the status of consultation with the USACE. It should provide the area and linear feet of jurisdictional intermittent/ephemeral tributaries within the project area in addition to the jurisdictional status of perennial waters and wetlands. Furthermore, if there are no discharges of dredged or fill material from the project into WUS, this should be clearly stated in the EIS.

Financial Assurance for Post-Closure Obligations

Need for a Long-Term Funding Mechanism

Based on the information presented in the Draft EIS, EPA believes that the Hollister Underground Mine Project will require long term management and treatment to prevent substantial post-closure environmental contamination. For example, a system to pump and treat Vinini aquifer water may be needed to maintain an inflow condition into the backfilled underground workings until the groundwater no longer exhibits contamination exceeding water quality standards. This would both prevent the propagation of a contaminated groundwater plume from the underground workings and eliminate the possibility of overflow of contaminated groundwater into surface waters.

In addition, water infiltrating through the WRSFs during mine operation would be pumped and treated to meet water quality standards before discharge into the Rapid Infiltration Basins south of the mine. The Draft EIS does not indicate whether pumping and treatment of WRSF seepage would be necessary after mine closure; however EPA believes that this is highly likely based on the information available. For example, there is no indication that WRSF seepage quality is likely to change after closure of the mine and the Draft EIS does not provide evidence that the proposed waste rock/soil cover to be placed over the WRSFs during closure of the mine would effectively prevent all meteoric water infiltration.

The Draft EIS does not contain discussion of financial assurance needed to ensure that the costs of long-term post-closure monitoring and management will be covered by the mine operator for as long as necessary to prevent groundwater and surface water contamination. Specifically, the Draft EIS does not estimate the costs of long-term monitoring and management, analyze the adequacy and uncertainties associated with these estimated costs, or describe or analyze options for long-term funding mechanisms (LTFM) to demonstrate that funding will be available to completely cover the costs of these activities.

Recommendation: The Supplemental Draft EIS should specify all of the necessary post-closure monitoring, operations and maintenance, and replacement activities at the Hollister Underground Mine; describe their performance standards and necessary timing; and include the cost estimates for these activities.

In order to prevent post closure groundwater and surface water contamination from the mine, the BLM should require the mine operator to establish a LTFM to cover the costs of monitoring as well as source controls and/or water treatment facilities after closure of the mine for as long as they will be needed.

The BLM should determine the appropriate level of funding for the Hollister Underground Mine LTFM and disclose the specific mechanism that will be established; analyze the adequacy of the funding amount and mechanism; and provide this information in the Supplemental Draft EIS.

While the actual construction of a trust may vary, the overall goal is to ensure that the trust has sufficient assets to cover the costs for which it was established, for as long as needed.

Recommendations: We recommend BLM consider the following approaches to help ensure that the Hollister Underground Mine LTFM covers the costs of all necessary post-closure monitoring and operation and maintenance obligations for as long as they may be needed, which we believe may be at least several hundred years.

- **Consider the use of current value trusts or net present value (NPV) trusts with a standard benchmark discount rate** as opposed to an individually negotiated rate. Under the current value trust approach, the trust is fully funded immediately; whereas, under the NPV approach, cost estimates are calculated using a discount rate. Where NPV trusts are used, the single most important factor in calculating the beginning amount of the trust corpus (and therefore, the value of the trust in the future) is to use an appropriate discount rate. For example, EPA has authorized the 30-year Treasury Constant Maturity return for some trusts that allow for NPV. Overly aggressive discount rates “backload” contributions to the trust over time and limit true-up contributions.

- **Shift to annual true-up cycle.** BLM requires adjustments, or "true-ups", to trust funds every three years if they are not meeting their growth performance goals. EPA supports the idea of a true-up requirement, but recommends that BLM consider using an annual true-up cycle rather than a 3-year cycle, to address both problematic investment performance and the risk of grantor bankruptcy or other corporate failure more often. Addressing either of these problems quickly (i.e., with a shorter true-up cycle) would ensure that the trust is better positioned to secure the appropriate funds based on performance goals.

- **Consider a more conservative investment portfolio requirement.** BLM imposes few limitations on the types of investments allowed for its trust funds. EPA generally imposes significant limitations on potential investments, especially when the trust is

an NPV trust. We acknowledge that there is a downside to conservative investment strategies (namely, that the grantor contribution would likely increase), but we believe, given the adverse consequences of a trust failure, potentially leading to liability for future taxpayers and/or unacceptable environmental impacts, a conservative approach may be appropriate.

Adaptive Management

EPA believes an adaptive management plan would be appropriate to address some of the water resource issues identified in the Draft EIS. For example, Vinini aquifer contamination may be greater than predicted, and neutralization of acid generating material may be less effective than predicted.

Recommendations: Include, in the Supplemental Draft EIS, an adaptive management plan. The plan should consider potential failure modes and effects and ensure that contingency measures are identified and implementable in the event they become necessary. It should have a clear and detailed process linking monitoring with on-the-ground actions and agency enforcement.

Financial assurance for the project should include costs for undertaking tasks in the adaptive management plan should they become necessary. This cannot be accomplished by requiring financial assurance only after it becomes evident that a problem exists, because the operator may not be financially able to provide additional financial assurance at that time; rather, financial assurance should be required for those activities on a contingency basis.

Wastewater

The Draft EIS does not provide an adequate description of the existing and proposed sources of wastewater generated at the mine, nor of the wastewater treatment and ultimate disposal or re-use of wastewater. Additionally, the text appears to conflict with diagrams provided in the EIS. For example, the text on page 2-11 states "Any draindown water in the WRSF is collected and contained in wet well sumps and sent to water treatment facilities in the East Pit"; however the associated diagram (Figure 2-5 "Hollister Operation Water Management System) does not appear to include this source of water or treatment operation. The text on page 2-13 states that "water inflow" from the mine is sent to the East Pit water treatment facilities and is currently sent to the RIBs. However, Figure 2-5 indicates that "water inflow" from the proposed facility will not be treated prior to discharge to Little Antelope Creek. The Draft EIS does not specifically state that the "water inflow" from the proposed project will be treated. Figure 2-5 also does not include flow data or unit sizes for many of the operations, while several flow diagrams are apparently missing; for example, there is no indication of reverse osmosis brine disposal despite indication in the text that WRSF draindown would be treated via reverse osmosis.

Recommendation: The Supplemental Draft EIS should provide a comprehensive description of each source of wastewater for the proposed project. Specifically, we

recommend revising Figure 2-5 (Water Handling Diagram) to include two separate diagrams; one for the existing inputs and one for the proposed inputs. The diagrams should include each source of wastewater, including WRSF drainage, stormwater, "water inflow", and other sources of water at the mine site. The diagrams and text should clearly indicate projected flows, projected wastewater characteristics, intermediate treatment steps, design standards, and ultimate disposal or re-use. Additionally, the EIS should indicate the expected post-closure rates of surface runoff and seepage and how this water will continue to be treated.

According to 40 CFR 440.132, "mine drainage" is defined as any "water drained, pumped, or siphoned from a mine".

> **Recommendation:** Wastewater referred to in the Draft EIS as "water inflow" and "draindown water in the WRSF" should be characterized correctly as "mine drainage". The EIS should acknowledge that any discharge of mine drainage to surface waters must also comply with the effluent limitations and guidelines at 40 CFR Part 440 Ore Mining and Dressing.

Aquatic Biological Resources

Section 3.13 of the Draft EIS states that groundwater does not recharge Little Antelope or Antelope creeks (i.e., all creek water flows from precipitation and snowmelt). However, the discussion that follows (pgs. 3.13-7 and 8) conflicts with these conclusions by stating that the drawdown of groundwater will affect spring and wetland complexes along Antelope and Squaw creeks, which clearly will have potential adverse consequences on stream flows in these waterbodies (p. 3.13-7). Furthermore, Section 3.6 indicates that lower Little Antelope Creek gains groundwater baseflow contributions during the summer months.

> **Recommendation**: In light of the groundwater contamination discussed above, the matter of whether or not Little Antelope Creek receives groundwater contributions is particularly significant. The Supplemental Draft EIS should more clearly articulate the extent to which Little Antelope Creek receives significant baseflow from groundwater sources and which groundwater aquifers are believed to contribute to this flow.

Section 3.13.1.1 of the Draft EIS states that Little Antelope Creek is intermittent, however the subsequent discussion and Fig. 3.6-2 indicate that substantial portions are perennial.

> **Recommendation:** This discrepancy should be corrected, and presuming that Fig. 3.6-2 is correct, Section 3.13.1.1 should reflect that substantial portions of Little Antelope Creek are perennial.

The fish surveys discussed in Section 3.13.1.2 are outdated and only cover a small portion of the streams and stream reaches in the project area that could potentially support native fish.

Recommendation: The Supplemental Draft EIS should include more recent, thorough fish surveys over several seasons to document the use of project area streams by native fishes.

The "limited visual" surveys of amphibians within the project area, discussed in Section 31.13.1.2, are not adequate to document the status of several amphibian species, such as Great Basin spadefoot toad, western toad, spotted frog, leopard frog, and Pacific tree frog, that are known to use, or could potentially use, aquatic habitats within the area.

Recommendation: More thorough amphibian species surveys should be completed in order to adequately survey all species that could potentially use the aquatic habitats in the project area.

Section 3.13.2.1 of the Draft EIS assumes that sedimentation to Little Antelope Creek from surface disturbance activities will be minor; however, there is little supporting documentation for this conclusion. In addition, it is assumed that fish will not occur in areas affected by sedimentation in intermittent reaches of Little Antelope Creek, despite the fact that the Draft EIS states that flows will become more persistent in Little Antelope Creek due to the proposed NPDES permitted discharge of well water. It is very plausible that fish will colonize newly wetted, perennial reaches of Little Antelope Creek.

Recommendation: The Supplemental Draft EIS should include a discussion of the potential impacts to fish species that may occur due to sedimentation in Little Antelope Creek, including those reaches expected to transition from intermittent to perennial due to the proposed NPDES permitted discharge.

Because impacts from surface disturbance are not adequately discussed or quantified in Section 3.13.2, there is little support for the conclusion presented in Section 3.13.3 (Cumulative Impacts) that the risk posed to aquatic areas from such disturbances is low. Clearly, impacts associated with groundwater pumping and resultant flow reductions in springs, seeps and streams would result in significant impacts to aquatic resources in the Antelope Creek sub-basin, and perhaps adjacent sub-basins. Beneficial environmental effects from increased flows in Little Antelope Creek during the period of discharge of dewatering water are unclear based upon the information presented. While flow augmentation may increase the growth of some riparian/wetland vegetation, there are potential adverse impacts of increasing the length of wetted channel (i.e., promoting the spread of the nonnative red shiner in the watershed, transport of mine drainage to downstream waters).

Recommendation: The Supplemental Draft EIS should discuss and disclose the results and conclusions of a proper risk assessment in regards to the project's potential to cumulatively impact aquatic resources in the study area. Any claims of beneficial effects from temporary increases in flow should be more thoroughly justified and adverse consequences considered.

Groundwater Drawdown/Quantity Impacts

The Draft EIS does not include a description of the potential effects of specific model uncertainties on the model predictions in regards to the potential effects of groundwater drawdown.

> **Recommendation:** In view of the importance of the flow model predictions to subsequent impact analyses, the Supplemental or Revised Draft EIS should include a more complete and specific description of uncertainties associated with factors such as structure, boundary conditions, and calibration of the model and their potential effects on the model predictions, including uncertainties arising in connection with:
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> - availability of calibration data;
> - overparameterization (the total number of parameters comprising the model, whether assigned or calibrated);
> - the incorporation of geologic features such as flow barriers;
> - the specification of constant head conditions on the lateral model boundaries;
> - the plausibility of model-calibrated transmissivity;
> - whether or not the model results in the reproduction of spring discharges; and
> - validity of assumed rates of depth decay of hydraulic conductivity within regional modeling units (RMUs).
>
> The Supplemental Draft EIS should reflect that model predictions of drawdown and changes in spring/stream discharge at specific locations are highly uncertain due to the limitations of the flow model, and, consequently, the analysis of impacts to spring and stream quantity, quality and biology is highly uncertain.

Drawdown predictions produced using the model approximate the minimum areal extent and magnitude of drawdown that will result from project pumping because they are based on 10-ft contours. However small changes in groundwater levels can have dramatic effects on springs, streams and wetlands. A two or five foot contour interval would be a more appropriate measure of the maximum extent and magnitude of drawdown and would allow for more accurate assessment of impacts. The model represents a minimum diffusivity interpretation of the flow system which yields estimates of the minimum extent of drawdown rather than a best estimate.

> **Recommendation:** Both a best estimate and maximum extent drawdown should also be provided in the Supplemental Draft EIS.

There are many more aquatic areas included within the 10-foot groundwater drawdown contour area than are analyzed within the Draft EIS, which focuses primarily on the Antelope Creek sub-watershed. It is unclear why the analysis in the Draft EIS does not consider potential effects of groundwater drawdown on other aquatic features such as Willow Creek, Hot Creek, etc.

> **Recommendation:** The Supplemental Draft EIS should discuss the project's impacts upon all areas that fall within the significance threshold for groundwater quantity impacts.

Table 3.9.2 - Wetland Areas Potentially affected by Groundwater Drawdown, references studies in support of its conclusions, but without any summary of this information in the Draft EIS, and

therefore EPA is unable to judge the validity of the conclusions. Based upon the information available, it seems that the primary justification for determining that certain springs and wetlands have a low potential to be affected by groundwater drawdown is that they do not lie on the Vinini Formation. The Draft EIS does not provide sufficient justification for this assumption. Given the Draft EIS' projection that groundwater drawdown would reduce stream flows along 10.4 miles of Antelope Creek (see Page 3.13-7), and that reduced flows from springs contributing to Antelope, Alkali and Squaw creeks may result in the long-term loss of some riparian vegetation (pg. 3.9-8), it seems likely that riparian/wetland habitats adjacent to the creek would be adversely affected. Furthermore, the Draft EIS does not assess the wetland/stream functions lost or degraded by groundwater pumping and drawdown.

> **Recommendation:** These potential impacts to riparian/wetland areas should be assessed more thoroughly in the Supplemental Draft EIS. The document should include both a quantitative and qualitative analysis of the full extent of riparian/wetland habitats likely to be impacted by the proposed project and a functional assessment of the wetland/stream values likely to be degraded or lost due to groundwater pumping and drawdown.

Mitigation for Impacts from Dewatering

The mitigation measures presented in Sections 3.9.4 and 3.13.4 are not adequate to offset the potential impacts identified in these sections. There is no mention of reduced groundwater pumping as a way to mitigate for water drawdown and its impacts on wetlands and other aquatic areas. There are no monitoring or mitigation measures proposed for the reduced flows/drying along 10.4 miles of Antelope Creek and its effects on aquatic organisms such as fish. Impacts resulting from groundwater pumping associated with the proposed project will likely cause or contribute to significant degradation of the aquatic ecosystem in the project area.

> **Recommendation:** The Supplemental Draft EIS should indicate that the project is likely to result in significant degradation of aquatic ecosystems in the study area. Additional mitigation measures should be considered, including reduction or cessation of groundwater pumping if a particular mitigation threshold is passed.

Stormwater

Section 3.6.2.1 of the Draft EIS states that the proposed action "has the potential to increase sediment and turbidity due to construction and ground disturbing activities". The Draft EIS defers to the Storm Water Pollution Prevention Plan (SWPPP) and Reclamation Plan to address these impacts, stating "To further reduce erosion potential, storm water diversions would be installed upgradient and around project facilities, as needed, to divert storm water runoff around disturbance areas. Facilities would be graded appropriately and monitored following spring snowmelt and intense rain events to ensure that drainage and sediment control measures are effective and operating properly" (Section 2.4.9.2 page 2-59). The Draft EIS provides little information on the types and extent of proposed Best Management Practices (BMPs) and other provisions that would be likely to be included in a NPDES permit for this project issued by the State of Nevada.

Recommendation: Due to the high sensitivity of certain receiving waters identified in the Draft EIS as "Class A" and perennial waters, EPA recommends that the Supplemental Draft EIS provide a comprehensive description of the BMPs and stormwater controls to be utilized, including maps, BMP locations, outfall locations, temporary and permanent stabilization measures, maintenance requirements, and other components of the SWPPP necessary to mitigate the potentially adverse effects on receiving waters.

EPA recommends that the Supplemental Draft EIS include stormwater outfall monitoring for sediment and turbidity to ensure the BMP implementation is protective of receiving water quality. EPA recommends weekly monitoring for Total Suspended Solids and Turbidity for all stormwater outfalls discharging to perennial waters to ensure proper design and implementation of BMPs.

Air Quality

The Draft EIS states, "The only Hazardous Air Pollutant (HAP) that would be emitted due to this project is mercury. Mined ore containing mercury would be processed at either the Esmeralda Mill or the Midas Mill." (3.19-15) Diesel fuel emissions contain a number of HAPs. It seems unlikely, therefore, that this statement accurately reflects all potential sources of HAPs that are likely to be emitted as a result of the proposed project.

Recommendation: The Supplemental Draft EIS should account for all potential sources of HAPs in determining the total emissions associated with the proposed project (i.e. emissions associated with the combustion of diesel fuel, etc.).

The proposed project includes the shipment of ore for milling off site at either the Midas Mill or the Esmeralda Mill. Considering the approximately 300 additional miles from the Hollister Underground Mine site and the Esmeralda Mill site, as compared to the distance to the Midas Mill site, milling of Hollister Underground ore at the Esmeralda Mill would result in a substantially larger carbon footprint for the proposed project as well as increased mobile source emissions, particularly from heavy-duty diesel trucks.

Recommendation: EPA encourages the project proponent and the BLM to reconsider the decision to utilize the Esmeralda Mill site as a milling location for Hollister Underground Mine ore.