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

AUG 6 2010

OFFICE OF THE
REGIONAL ADMINISTRATOR

Ron Wenker, State Director
Bureau of Land Management
1340 Financial Blvd.
Reno, NV 89520

Subject: Genesis Mine Project Draft Environmental Impact Statement (EIS), Elko County, Nevada [CEQ # 20100154]

Dear Mr. Wenker:

The U.S. Environmental Protection Agency (EPA) has reviewed the Draft Environmental Impact Statement (Draft EIS) for the Proposed Genesis Mine Project (Project). Our comments are provided pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) Regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act (CAA).

We have rated the Draft EIS as a "Category 3 - Inadequate Information" (see Enclosure: "Summary of Rating Definitions and Follow-up Actions"). The "Category 3 - Inadequate Information" rating is based on the Draft EIS's failure to offer an adequate prediction of the true acid producing potential of the waste rock. While data from static testing indicate that a high percentage of the waste rock to be generated by the proposed project falls either under the category of potentially acid generating (PAG) or "uncertain", the standard kinetic tests necessary for determining the true ratio of PAG to non-PAG were not run to equilibrium. Without these data, the Draft EIS could not provide a complete analysis regarding water quality impacts, nor could it establish financial assurance measures for mine closure and remediation. EPA's comment letter of June 18, 2009, regarding our review of the Administrative Draft EIS, identified these same issues.

We do not believe that the Draft EIS, as written, supports the Bureau of Land Management's (BLM) conclusion that the proposed action would not contaminate groundwater and surface water. Proceeding with the proposed project without first completing the geochemical analysis and subsequently reevaluating proper mine design could result in unacceptable acid mine drainage and necessitate long-term water quality treatment. In addition, an Adaptive Management Plan (AMP) was proposed in order to compensate for the inadequate waste rock characterization. This is an unacceptable approach to NEPA compliance and, if an AMP is to be used in conjunction with the proposed project, it will need to be revised, based on complete geochemical analysis prior to Project approval, and accompanied by adequate financial

assurance. Although BLM's surface mining regulations provide for using the NEPA document as one option to disclose financial assurance information, with regard to the Genesis Mine Project and others, BLM has taken the position that it does not address financial assurance in EISs. BLM did, however, include such information in the 2002 EIS for the Phoenix Mine and there are significant lessons to be learned from the history of the long-term trust fund established for that project. We believe the Phoenix fund started out -- and continues to be -- significantly underfunded and includes inappropriately variable and risky investments, as demonstrated by the loss of approximately 40 percent of the fund in late 2008. Additional discussion of the inadequacies and other issues related to the Genesis Draft EIS is enclosed.

I have requested that my staff arrange a meeting with the Elko Field Office to discuss our comments and the next steps for resolving the inadequacies and other issues identified in Draft EIS. If the "Category 3 - Inadequate Information" issues cannot be resolved, this project could be a candidate for referral to the President's Council on Environmental Quality (CEQ) in accordance with Section 309 of the Clean Air Act.

If you have any questions, please call me at (415) 947-8702 or have your staff contact Carter Jessop, our lead NEPA reviewer for this project, at (415) 972-3815. Please send two copies of the revised or supplemental DEIS to this office (mail code CED-2) at the same time it is it is made available to the public.

Sincerely,

Jared Blumenfeld

Enclosures:
"Summary of Rating Definitions and Follow-up Actions"
EPA's Detailed Comments

cc: Ken Miller, BLM – Elko District Office
Leo Drozdoff, Nevada Division of Environmental Protection
Willie R. Taylor, Department of Interior

SUMMARY OF EPA RATING DEFINITIONS*

This rating system was developed as a means to summarize the U.S. Environmental Protection Agency's (EPA) level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the Environmental Impact Statement (EIS).

ENVIRONMENTAL IMPACT OF THE ACTION

"LO" (Lack of Objections)

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

"EC" (Environmental Concerns)

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

"EO" (Environmental Objections)

The EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

"EU" (Environmentally Unsatisfactory)

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

ADEQUACY OF THE IMPACT STATEMENT

"Category 1" (Adequate)

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

"Category 2" (Insufficient Information)

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analysed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

"Category 3" (Inadequate)

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analysed in the draft EIS, which should be analysed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From EPA Manual 1640, Policy and Procedures for the Review of Federal Actions Impacting the Environment.

EPA Detailed Comments on the Draft Environmental Impact Statement (EIS) for the Genesis Mine Project, Elko County, Nevada [CEQ # 20100154] – August, 2010

"Category 3 - Inadequate Information"

Waste Rock Geochemistry

EPA believes that the geochemical characterization methods employed are inadequate. Static testing results of Genesis waste rock samples categorized as Codes 1 through 5 indicate either uncertain or positive acid generating potential. Waste rock in these categories constitutes 65 percent of the waste rock in the proposed Genesis backfill and 98 percent of waste rock in the proposed West Genesis backfill. However, based on 20-week kinetic tests, the Draft EIS (DEIS) states that only material categorized as Code 1 and Code 2 contain potentially acid generating (PAG) material. EPA believes that the kinetic tests were stopped prematurely, and therefore, unlikely to predict the true acid potential of the samples. The tests should have been run longer if they are to support BLM's conclusion that only a small percentage of the waste rock should be handled as PAG. BLM has required several Nevada mines to conduct kinetic tests far longer than 20 weeks to more reliably predict how mine rock will react over the long term. For example, the Mount Hope, Round Mountain, and Phoenix mines have all run kinetic tests for longer than one year.

Under the proposed project, the Section 5 waste rock facility would have a 10-foot thick rind of carbonate-rich waste rock around the PAG cell. In the Section 36 waste rock facility, PAG waste rock would be placed above the carbonate-rich waste rock and be completely encased with a ten-foot thick layer of non-PAG material. The in-pit PAG cells also depend on carbonate layers to attenuate contaminants released in acidic leachate. However, depending on the dissolution rates of minerals in the waste rock surrounding or underlying PAG material with neutralizing material may not be effective in neutralizing the PAG material over the long term. In addition, based on our review of the static tests conducted for this project, we believe the amount of PAG waste rock could be far higher than the Project proponent Newmont Mining Corporation (Newmont) has predicted. Additional information is needed regarding the geochemistry of the waste rock.

> **Recommendation:** Consistent with BLM's Instruction Memorandum issued January 8, 2010[1] as well as the practice at other Nevada mines, we recommend much longer kinetic tests (up to one year or longer) be conducted on ore and waste rock samples to more reliably characterize the waste rock and ensure consideration of appropriate waste rock management measures. A revised or supplemental DEIS should be prepared that describes, in detail, waste rock geochemistry, including the availability of net neutralizing waste rock during each mining/disposal phase, and measures that would be taken to ensure sufficient neutralizing capacity and/or other necessary controls during each phase.

The very short-term paste pH and the net carbonate value (NCV) results reported in the DEIS may dramatically under predict the longer-term acid generation potential of the

[1] Nevada BLM, January 8, 2010, Instruction Memorandum No. NV-2010-014, Rock Characterization and Water Resources Analysis for Mining Activities

samples. The paste pH test comes out of the soil science community and is designed for weathered material, such as soil. The test is not predictive when applied to unweathered rock, as it was for the Genesis Project.[2] Furthermore, it must be recognized that the results from the static testing and the final humidity cell pH are not necessarily a good indicator of the ability of waste rock or ore to generate contaminated leachate. As discussed in the DEIS, all waste rock generated at the site has the ability to generate contaminated leachate. Appendix B indicates that all the mined material has a relatively high ability to generate leachate with elevated metals and other constituent concentrations. Independent of the PAG results, the mined material should be isolated from groundwater and surface water as part of the mine management system.

While geochemical testing does add to confidence in predictions, such predictions have limits. Examples include many cases in which geochemical testing, including kinetic testing conducted over long periods of time, have yielded results which proved to be inconsistent with actual conditions at subsequent mining operations.[3] Only seepage from waste rock piles can provide "actual" estimates of the potential to produce acid. The reason for the inconsistencies can include limitations of the testing methods, sample representation, and extrapolation of predictions from test results. Considering the history of mining in the project area and existing waste rock storage piles in the project vicinity, the collection and analysis of seepage samples from existing facilities could provide a higher degree of certainty regarding the potential for both acid and non-acid contamination as a result of the proposed Project.

> **Recommendation:** Further analysis is needed to properly assess the potential environmental impacts of the waste rock generated under the proposed project. The EIS should identify the potential impacts to groundwater resources resulting from the placement of PAG materials either above or below the groundwater table. We recommend that sampling and testing of seepage from existing waste rock storage facilities and any representative backfilled mine pits be completed and included in the revised or supplemental DEIS. This analysis should identify the sites from which seepage was collected and include justification for why the selected sites are considered representative of the geochemistry of the proposed project.

EPA believes groundwater quality could be adversely affected by improper design of the mine facilities. Newmont's modeling assumes that the PAG encapsulation cells and underlying carbonate rock will be 100 percent effective in limiting the movement of contaminated leachate to groundwater and surface water at the Genesis Project. The DEIS predicts that any potential groundwater impacts would be adequately mitigated by the limestone and the unsaturated zone underlying the PAG waste rock storage area. However, the underlying limestone may not be available for contact or reaction with contaminated leachate emanating from the mine sources. This is due to both the potential for fracture flow to be the predominant flow path, reducing or

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[2] It is notable that the paste pH test has not been used for a number of years for mine permit applications in Pennsylvania because the State's Department of Environmental Protection has concluded that it is not predictive of acid mine drainage formation (Brady et al, 1998).

[3] Kuipers, J.R., Maest, A.S., MacHardy, K.A., and Lawson, G. 2006. Comparison of Predicted and Actual Water Quality at Hardrock Mines: The reliability of predictions in Environmental Impact Statements. Prepared for Earthworks. 195pp. Available online at: http://www.mine-aid.org/predictions/

eliminating contact times, and the potential for the limestone to become unavailable for reaction due to rimming that often occurs after initial contact with acidic solutions. In addition, flow through the unsaturated zone may not take on the characteristic of "slow dispersed movement," but rather may find the most favorable flow paths, or "finger flow," through the unsaturated zone, which has been observed and investigated at other mine sites.[4]

> **Recommendation:** The revised or supplemental DEIS should provide realistic analyses of the transport and fate of all potential leachate constituents as they flow through the waste rock and underlying unsaturated and saturated zones. It should discuss the potential impacts to surface water and groundwater resources should the waste rock or spent ore (at the North Operations leach pad and Mill 5/6) generate contaminated leachate either in the short- or long-term. In addition, it should address the monitoring and mitigation that will be in place to identify, isolate and treat any potential contamination.

> **Recommendation:** The revised or supplemental DEIS should consider the placement of shallow subsurface monitoring wells at the down gradient edge of waste rock disposal facilities and backfilled pits in order to monitor for possible movement of contaminated water in surface-layer sediments.

Backfilled waste rock would result in elevated contaminant levels in groundwater. According to the DEIS (p. S-18), "[a]s the regional groundwater system rebounds following cessation of regional dewatering, waste rock backfill in the Genesis Pit would react with incoming groundwater and temporarily result in relatively high concentrations of constituents including sulfates and metals." The DEIS is vague regarding the predicted fate and transport of constituents in groundwater from in-pit and above ground waste rock, and the time frame of this "temporary" condition; however, we understand it may be hundreds of years (pers. comm. Kirk Laird, BLM). Appendix B of the DEIS indicates that most constituents released from the waste rock would be attenuated. However, EPA believes that arsenic and other metalloids would most likely not be attenuated as a result of contact with limestone, and the production of alkaline waters by the material surrounding the PAG rock could result in greater concentrations of arsenic and other constituents.

> **Recommendation:** The revised or supplemental DEIS should provide more detailed information regarding the predicted transport and fate of constituents in leachate from backfilled waste rock, as well as waste rock disposed above ground. The revised or supplemental EIS should also recognize that any time alkalinity is proposed as a means of dealing with acid drainage there is potential for an opposite adverse reaction that could make other potential pollutants more soluble. As we have discussed with BLM in the past, this is a critical issue that must be addressed in the EIS and a key component of each alternative analyzed.

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[4] Maest, A.S., Kuipers, J.R., Travers, C.L., and Atkins, D.A. 2005. Predicting Water Quality at Hardrock Mines: Methods and models, uncertainties, and state-of-the-art. Prepared for Earthworks. 77pp. Available online at: http://www.mine-aid.org/predictions/

Other Environmental Issues

Inappropriate Use of Adaptive Management

EPA believes the Genesis Mine Adaptive Management Plan (AMP) is unacceptable and should not be implemented. As stated above, EPA believes that the geochemical kinetic tests conducted for the Genesis Mine Project (Project) were stopped prematurely and should have run longer for more reliable predictions of the acid generating potential of the waste rock. For this reason, we advised BLM, in our June 18, 2009 comments on the Administrative Draft Environmental Impact Statement (ADEIS) for the Project that a more effective management tool was needed to separate PAG and metal-leaching rock from environmentally benign rock to ensure that the mine is properly managed over the long-term by the site operator. Rather than conducting further kinetic tests, Newmont drafted an Adaptive Management Plan (AMP) for BLM's approval, which defers starting the tests until after a Record of Decision (ROD) is signed. BLM incorporated the AMP into the DEIS. Under the AMP, all waste rock generated during the first year of operations would be treated as PAG material, while additional geochemical characterization is completed.

Normally, an adaptive management approach would be applied to adjust a project management plan only *after* the lead federal agency has made a good faith effort to predict potential impacts in a scientifically reliable manner, allowing adjustments to be made and management to be improved, as information is discovered during the life of the project. Department of Interior guidance[5] requires that an AMP must be detailed enough to identify what steps would take place under several scenarios, and is not a substitute for adequate testing up front, which can influence mine design. Furthermore, an AMP should not be used as a substitute for a thorough and adequate analysis conducted pursuant to the National Environmental Policy Act (NEPA) where information needed for the analysis can reasonably be obtained prior to completion of the environmental impact statement. Several static and kinetic test methods are routinely used in geochemical characterization for EISs in other Nevada BLM offices, and this information can be reasonably obtained during the NEPA process. It remains unclear why BLM has not required completion of the geochemical characterization for the Genesis Project.

The AMP addresses only one potential issue: future identification of more PAG waste rock than was initially predicted in the DEIS. The sole contingency measure identified for this scenario is for additional PAG encapsulation cells to be constructed, as necessary, up to the potential maximum amount of PAG waste rock initially predicted by Newmont, and, if testing indicates that PAG rock exceeds this amount, the AMP stipulates that operations would be suspended until a revised waste rock management plan could be approved by BLM. This is not an alternative that has been analyzed throughout the DEIS, nor is it one that could be easily implemented, given the job loss implications. Furthermore, based on our review of the static tests conducted for this project, we believe the amount of PAG waste rock could be far greater than Newmont has predicted. If this turns out to be the case, mining would need to be suspended at the Genesis Mine while BLM considers options for waste rock disposal, which should have been evaluated in the EIS. As we have stated to BLM regarding a similar proposal for the Emigrant Mine project,

[5] Adaptive Management: The U.S. Department of the Interior Technical Guide, 2009. Available online at http://www.doi.gov/initiatives/AdaptiveManagement/TechGuide.pdf

EPA does not believe that suspending mining operations because due diligence was not conducted during the NEPA process is an acceptable approach to mine permitting. In response to our disapproval of that approach, BLM deleted that option from the proposed Emigrant Mine AMP.

> **Recommendation:** The Genesis Mine AMP is unacceptable and should not be implemented. The revised or supplemental DEIS should be expanded to include more detailed geochemical characterization analyses and to analyze all reasonable alternatives to the proposed action. If an AMP is to be used for the Genesis Mine, it should not be used as a substitute for due diligence during the NEPA and planning stages. Rather, it should be designed and used as a life-of-mine tool to monitor and adjust management actions based on feedback from monitoring during operations and after closure.

Based on statements and protocols in the AMP, we have serious concerns about BLM's intended approach in conducting necessary geochemical tests for the Genesis project. For example, according to the AMP, the planned schedule for completion of supplemental testing studies is within one year of Newmont receiving the necessary permits and authorizations for the Genesis Project. Before testing can be started, however, it could take several months for agreement between the parties on the selection of samples, appropriate/desirable tests and protocols, etc. Therefore, completion of properly conducted kinetic tests could take longer than one year following receipt of authorization. As another example, BLM's recent Instruction Memorandum states that BLM and the Nevada Division of Environmental Protection (NDEP) will determine when it is appropriate to use Net Carbonate Value (NCV) to supplement the required static tests (i.e., acid-base accounting (ABA) using "NDEP" Modified Sobek Procedure, net acid/alkaline production, and Meteoric Water Mobility Procedure (MWMP)). The policy also indicates that paste pH tests may only be used with agency approval. The AMP, however, indicates that the Supplemental Waste Rock Characterization (SWRC) Study includes several protocols that appear to be inconsistent with the instruction memorandum, including some using NCV and paste pH tests.

> **Recommendation:** Additional information should be included in the revised or supplemental DEIS to demonstrate how all geochemical testing will comply with BLM's recent instruction memorandum. If NCV and paste pH tests are to be used, the justification for doing so should be thoroughly explained.

Alternatives Analysis

The DEIS provides detailed consideration of only the Proposed Action and No Action alternatives. The DEIS justifies this by stating that neither BLM nor any cooperating agency proposed an alternative that provided an environmental benefit, while still satisfying the project's purpose and need (p. S-4). EPA believes that this justification for eliminating a number of alternatives in Section 2.4 of the DEIS is invalid. In accordance with 40 CFR 1502.14, a DEIS must consider all reasonable alternatives that reduce potential environmental impacts. As discussed below, EPA believes that the project poses a potentially significant risk to groundwater quality, and, in our comments on the ADEIS, we specifically recommended several alternatives that could reduce that risk. BLM has not demonstrated that those alternatives are unreasonable.

Specifically, the placement of PAG materials below groundwater level in backfilled pits, disposal of PAG and neutral waste rock in alternate locations, and use of alternate cover designs, all have the potential to reduce groundwater impacts and should, therefore, be considered. Furthermore, based on the additional geochemical information that will be collected, the revised or supplemental DEIS should consider and discuss whether measures may be needed to mitigate potential future problems with existing waste rock disposal facilities. If so, the revised or supplemental DEIS should evaluate all reasonable alternatives for redesigning and/or rehandling existing waste rock disposal facilities.

> **Recommendation:** The revised or supplemental EIS should evaluate the placement of PAG cells within in-pit waste rock below the water table, as well as placement of submerged PAG cells in pit lakes. The document should also evaluate other design features, such as covers for waste rock facilities located both within pits and outside of pits, and evaluate all reasonable alternatives for redesigning and/or rehandling existing waste rock disposal facilities, if necessary. In addition, significantly more detailed information is needed in the EIS to evaluate the comparative merits of the alternatives, including alternatives not yet included in the analysis.

The DEIS does not evaluate alternatives to avoid long-term uncontrolled surface water and groundwater contamination from mine facilities. As has been demonstrated at numerous mine sites where acid drainage has occurred, water infiltration and air flow can occur deep inside the waste rock dumps, but the DEIS does not adequately demonstrate that such exposures will not occur at the Genesis Mine. It also appears that non-acidic leachate from the proposed project is projected to exceed water quality standards and must be controlled.

In light of the uncertainties discussed above and the potential for contaminated leachate to affect groundwater and surface water resources, we believe the proposed waste rock handling methods may be inadequate to protect these resources. The revised or supplemental DEIS should describe and discuss alternatives to prevent acidic and non-acidic leachate from contaminating surface water and groundwater, as well as remedial measures that could be taken should these preventive alternatives fail. Properly sited and designed facilities could help minimize the need for, and costs of, long-term post-closure treatment activities.

> **Recommendation:** We recommend BLM evaluate several alternatives to avoid surface water and groundwater contamination from mine facilities. The revised or supplemental DEIS should evaluate alternatives to prevent, control, capture, and/or treat all leachate, including non-PAG leachate, from the entire mine site. The development and evaluation of alternatives should be based on the cumulative geochemical predictions for all past, present, and foreseeable future waste rock at the mine, and, at a minimum, this evaluation should address the following.
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> - Relocation of facilities should be evaluated to determine if control of leachate could be facilitated by careful site design (i.e., to take advantage of, or avoid, certain geologic or hydrologic features).

- Waste rock handling alternatives should include appropriate cover to prevent or minimize infiltration of meteoric water into, and contaminant leaching from, both PAG and non-PAG material. Bottom liners and leachate capture systems to preclude, to the extent practicable, the transmission of any contaminants to groundwater or surface water should be evaluated. The evaluation should discuss whether any leachate recovered by this alternative would be treated, discharged, or used in mine operations.

- Groundwater capture systems (e.g., slurry walls, French drains, groundwater wells) should be evaluated. We believe additional hydrological characterization (e.g., geologic structures, flow preferences, etc.) is needed to properly design and determine the effectiveness of a capture system. The additional hydrological characterization would also aid in determining the extent to which the proposed mitigation (underlying limestone and unsaturated zone) would truly be effective.

- Treatment systems (passive and/or active) should be evaluated and targeted for each contaminant of concern.

Recommendation: The development of additional alternatives for the Genesis Project should be accompanied by a process that evaluates those alternatives using state-of-the-art means to determine their effectiveness in addressing various contaminant leaching issues.

- The agencies and Newmont should agree on the selection of appropriate models for predicting water quality at the Genesis Mine and use them to conservatively predict contaminant leaching potential and impacts on various water resource receptors.

- The models should be used to conduct sensitivity analyses based on various alternative actions (e.g. reduction of infiltrate quantity and/or change in leachate chemistry), and determinations should be made of the likelihood of various outcomes, such as exceedance of applicable water quality standards.

- The revised or supplemental DEIS should describe and discuss contingency measures that would be taken should prevention measures fail.

- The revised or supplemental DEIS should include the costs of these prevention, capture, and treatment controls, as well as additional measures likely to be needed over the life of the project and for as long as they would be implemented after mine closure. The document should include the calculated costs of operations and maintenance, facilities replacement, monitoring, and reporting.

Financial Assurance

Financial assurance is not discussed in the DEIS, but is critical to determining whether all commitments for proper closure, reclamation, post-closure care, monitoring, and

contingency measures can be met by the mining company. Because the amount and viability of financial assurance are critical factors in determining the effectiveness of these activities, EPA believes it is necessary to analyze these factors in the EIS to determine the significance of potential impacts and the feasibility of long-term mitigation measures. For example, if appropriate closure, reclamation, post-closure, or follow up contingency measures are significantly underfunded and, therefore, infeasible, contamination of surface water and groundwater may not be controlled. Thorough geochemical analyses of *all* Genesis Mine waste rock, including existing waste rock, will be critical to determining appropriate design, reclamation, closure, post-closure, and mitigation measures and their costs.

EPA believes the adequacy of financial assurance for these activities could make the difference between the Project being sufficiently managed over the long-term by the site operator, or being an unfunded/under-funded contaminated site that becomes a liability, that may need to be addressed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Furthermore, in the interest of public disclosure and informed decision making regarding any potential financial liabilities, the economic viability of the proposed project, including the cost of long-term controls and/or treatment, should be evaluated before the project is authorized. BLM should require Newmont to provide adequate financial assurance that long-term controls and/or treatment will be implemented when necessary during and after mine closure.

> **Recommendation:** We recommend that the revised or supplemental DEIS identify the estimated bond amounts needed for each closure and reclamation activity for the entire Genesis Mine, including any necessary measures needed to redesign or mitigate problems with existing waste rock disposal facilities. Also, the revised or supplemental DEIS should discuss whether, when, and how BLM can modify the bond during the course of operations if temporary, long-term, or perpetual treatment and/or remediation needs are discovered during operations. Identify who would be responsible for any post-closure cleanup actions should they be necessary.

Long-term post-closure operations and maintenance may be necessary for the proposed project, especially if existing or proposed facilities are not properly designed. Mining projects have resulted in the expenditure of billions of dollars by the federal government for environmental cleanups. There are many examples of large and well capitalized mining companies going bankrupt before their responsibilities for environmental cleanups could be satisfied. In light of this history, BLM's Surface Management Regulations for Surface Mineral Operations at 43 CFR 3809 authorize BLM to require operators to:

> ". . . [e]stablish a trust fund or other funding mechanism available to BLM to ensure the continuation of long-term treatment to achieve water quality standards and for other long term, post-mining maintenance requirements. The funding must be adequate to provide for construction, long-term operation, maintenance, or replacement of any treatment facilities and infrastructure, for as long as the treatment and facilities are needed after mine closure. BLM may identify the need for a trust fund or other funding mechanism during plan review or later." [43 CFR 3809.552(c)]

To estimate the potential costs that may be required to address long-term post-closure operations and maintenance, a plan should be developed.

> **Recommendation:** If long-term post-closure operations and maintenance will be needed to prevent resource degradation from mine drainage, a long-term, post-closure plan for preventing and/or managing mine drainage should be developed and included in the revised or supplemental DEIS. It should include specific plans for operating, maintaining, and replacing facilities and infrastructure, monitoring, and follow up mitigation over the long term. The plan should also include protocols for surface water and groundwater monitoring, and specify the parameters to be monitored. It should identify and describe follow-up mitigation actions that would be taken should destabilization or contamination be detected, and identify who would be responsible for these actions.

If long term water quality treatment is needed, a long term trust fund or other funding mechanism should be established pursuant to 43 CFR 3809.552(c) to ensure adequate funding will be available to implement the post-closure plan. The appropriate level of funding, types of financial instruments, and mechanics of the fund are critical to ensuring it will be available when it is needed. If a long-term plan and trust fund are needed, EPA would like to work with BLM to develop appropriate cost estimates and fund criteria. Engaging an independent third party could also be useful for this purpose.

> **Recommendation:** The revised or supplemental DEIS should discuss all requirements BLM would impose on the mine operator to establish a trust fund or other funding mechanism to ensure post-closure care, in accordance with 43 CFR 3809.552(c). The revised or supplemental DEIS should identify the projected long-term engineering and monitoring costs of each activity, as well as the financial assumptions used to estimate the funding level, projected growth rate, and mechanics of a trust fund or other funding mechanism. EPA believes that the financial assurance necessary to fund post-closure activities must be kept current as conditions change at the mine, and BLM should ensure that the form of the financial assurance does not depend on the continued financial health of the mine operator or its parent corporation.

Cumulative Impacts

The DEIS is vague and incomplete, lacking adequate assessment of cumulative impacts. "Cumulative impact" means "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future action regardless of what agency (Federal or non-Federal) or person undertakes such other actions." (40 CFR 1508.7). Because the geochemistry of the existing waste rock piles at the Genesis Mine is not adequately characterized, the cumulative geochemical impacts associated with the proposed Project, as well as overall project closure and post-closure care, are not presented in an accurate context. Thorough geochemical analyses of *all* Genesis Mine waste rock, including existing waste rock, is critical to determining appropriate design, reclamation, closure, post-closure, and mitigation measures, as well as their costs. As another example, cumulative runoff to Rodeo Creek (from the Genesis-Bluestar Mine and other nearby mine facilities) is not

described in the DEIS. Furthermore, the DEIS fails to consider the potential environmental impacts that may occur offsite as a result of this project. For instance, although milling and leaching of ore extracted under the proposed Project would occur at offsite locations, the incremental and cumulative impacts of the Project at these offsite facilities are not considered.

> **Recommendation:** The document should clearly describe all potential impacts of the proposed Project when added to the existing project and other actions in the project vicinity. The revised or supplemental DEIS should address entire waste rock dumps, i.e., including previously disposed waste rock, rather than just the balance of waste rock that would be disposed in the dumps under the proposed Project. The mass loading of all sources needs to be determined in order to properly design a successful long-term water management and treatment system. The revised or supplemental DEIS should consider all potential impacts of the Project whether they occur within the designated Project area, or at some offsite location. It should also describe the cumulative impacts to all resources in the cumulative effects study area, including from other past, present, and reasonably foreseeable future actions not necessarily associated with the Genesis-Bluestar Mine.

Surface Water Quality

The DEIS does not provide sufficient information regarding existing surface water quality in the project area, particularly for Rodeo Creek and Sheep Creek. For example, the DEIS (Section 3.4.3.2) states that five surface water samples from Rodeo Creek are analyzed annually as part of Newmont's Leeville Project Mitigation Plan, and that 2008 samples indicated mercury concentrations below reporting limits. It is unclear why only 2008 samples for mercury in Rodeo Creek are singled out, what the concentrations are for other parameters analyzed over the years, and why this information is not included in the DEIS. BLM may consider this information to be included "by reference;" however, in the interest of public disclosure, we recommend it be included in the body of the EIS along with the reporting limits. In addition, while Table S-1 states that no perennial or ephemeral streams are located within the project footprint, several maps indicate that Sheep Creek has perennial flow in the vicinity of the mine site, but this is not acknowledged nor discussed in the DEIS. In addition, the DEIS does not provide projected surface water quality information for the area under the proposed alternative nor other reasonable alternatives. The revised or supplemental DEIS should include a thorough analysis of existing surface water conditions, as well as any direct, indirect, or cumulative impacts that may result under the proposed Project or other reasonable alternatives.

> **Recommendation:** The revised or supplemental DEIS should include existing water quality values for surface waters in and around the Genesis Mine area, including downstream from the Genesis-Bluestar Mine. The laboratory's analytical minimum level and the test method used should be included for each water quality value. A table would be useful for this purpose. The revised or supplemental DEIS should also project water quality values for these waters under the proposed alternative and other reasonable alternatives. Attention should be given to direct, indirect, and cumulative impacts that may result from Project implementation, including impacts resulting from offsite milling, leaching, etc.

The DEIS does not provide adequate detail regarding surface run-*on* diversion channels, including maps, topography, and flow direction. The information and figures provided in the DEIS do not support the conclusion that surface water resources will not be affected by the project.

> **Recommendation:** The revised or supplemental DEIS should include maps and additional discussion that depict and describe the location and flow routes of run-on diversion channels to a greater extent and at multiple scales so that specific design and overall flow patterns can both be discerned.

The DEIS does not provide adequate detail regarding surface stormwater run-*off* diversion channels, including maps, topography, and flow direction, to support the conclusion that surface water resources will not be affected. Specifically, the revised or supplemental EIS should describe flow routes of the stormwater, and whether the flow will be diverted to any perennial stream reaches. In addition, a number of figures, including Figure 2-3 and Figure 2-11, indicate that some surface flows across the site exit the project boundaries. In particular, Figure 2-11 indicates that flow off waste rock disposal facilities 5 and 36 will exit the project boundary to the west in the direction of surface waters referred to as "Unnamed tributaries to Boulder Creek" and that surface flow across the back-filled Beast Pit is expected to exit the project site to the east, in the direction of Rodeo Creek. Despite this, the DEIS does not include a discussion of either projected or potential impacts to these surface waters. Nor does it answer some basic questions essential to establishing the likelihood and severity of potential impacts. For instance, will the project's contribution of pollutants exceed thresholds? Does either stream flow to any waters of the United States? Does water on the site have the potential for underground flow and re-emergence elsewhere?

> **Recommendation:** The revised or supplemental DEIS should include maps and additional discussion that addresses whether any flow across the site has the possibility of interaction with offsite waters and if so, what the potential impacts could be and how flows would be monitored and controlled. The apparent discrepancy between the text of the document and the figures in the document needs to be rectified.

The DEIS does not provide data regarding the expected concentrations of pollutant parameters to be generated from waste rock runoff. Based on information in Appendix B, it appears that waste rock runoff could contain elevated levels of a number of pollutants, including arsenic, antimony, nickel, and selenium.

> **Recommendation:** The revised or supplemental DEIS should thoroughly describe waste rock runoff characterization, as well as the Best Management Practices that will be needed to control stormwater runoff and ensure that water quality standards are met.

Groundwater Quality and Quantity

The DEIS does not provide adequate information regarding existing and projected groundwater quality in the project area. While the DEIS states that waste rock would not

generate acid drainage, EPA believes the acid-base accounting methods employed and the abbreviated 20 week kinetic test leave a high degree of uncertainty regarding the potential for acid production. For this reason, we also believe that the risk to groundwater resources remains uncertain and potentially significant.

The DEIS does not adequately discuss current and possible future uses of groundwater. The DEIS indicates in Appendix B that "groundwater in the Project Area is not used for drinking," but it also states (p. 3-46) that there are groundwater rights in Boulder Valley, including two rights in the Project area. In addition, the DEIS does not discuss whether the groundwater is a potential Underground Source of Drinking Water (USDW, see Title 40, Code of Federal Regulations (40 CFR) Section 144.3) for *future* users. If the groundwater at the site represents a potential USDW, the increase in trace metal and constituent concentrations anticipated to occur as groundwater levels rebound post-mining would serve to further degrade this drinking water source.

> **Recommendation**: The revised or supplemental DEIS should address current and future uses of the groundwater in the Project area and down gradient and discuss whether the groundwater is a potential USDW for future users. If it does not represent a USDW, the revised or supplemental DEIS should provide the specific information and citations to support that claim. In addition, the revised or supplemental DEIS should identify the nearest private and public water wells to the Project site and describe any potential impacts to those wells.

The DEIS provides concentrations for a number of parameters at wells DS-66 and GEN-39; however, no effort appears to have been made toward providing a comprehensive picture of the existing groundwater quality. While information may be included by reference, EPA believes that a more comprehensive discussion of the background groundwater quality conditions would facilitate understanding of possible groundwater impacts and more adequately fulfill the need for full public disclosure. In addition, no data are provided nor cited for the existing groundwater quality in the perched groundwater table in the Vinini formation; nor is any prediction provided for water quality impacts to this groundwater source.

> **Recommendation:** The revised or supplemental DEIS should include sampling data taken at a number of wells in the project area over a period of multiple years, so as to show any changes or trends that may be occurring to the groundwater quality conditions as a result of existing operations. A table would be appropriate for this. A more comprehensive discussion of existing groundwater conditions at the project site, as well as projected changes in groundwater quality under the proposed action and other alternatives is needed. The revised or supplemental DEIS should also provide information regarding the existing and predicted groundwater conditions in the Vinini formation located on the east of the Project site.

Air Pollutant Emissions

The DEIS does not provide adequate information regarding air pollutant emissions from the Genesis Mine. The DEIS states that the proposed project would result in the emission of a

number of federally designated criteria pollutants, including sulfur dioxide (SO2), carbon monoxide (CO), oxides of nitrogen (NOx), volatile organic compounds (VOC), and particulate matter (PM). However, the DEIS neither provides specific emissions projections for these pollutants nor discusses how the proposed project may contribute to the cumulative deterioration of air quality in the region. The DEIS also describes the projected mercury emissions that are likely to result from the ore processing at Newmont's South Operations (i.e., Newmont Corp. Gold Quarry facility), but does not provide an adequate description of how the Nevada Mercury Control Program and the EPA's proposed national emissions standards will affect these emissions.

> **Recommendation:** The revised or supplemental DEIS should provide current emissions estimates of all criteria pollutants from the existing mine site, including both PM10 (particulate matter of 10 micrometers or less) and PM2.5 (particulate matter of 2.5 micrometers or less); the projected emissions of all criteria pollutants from the proposed project and alternatives; and a discussion of these emissions in the context of cumulative air impacts.
>
> With regard to mercury emissions, the DEIS should include a more comprehensive discussion of the Nevada Mercury Control Program (NMCP) requirements, especially the Phase 2 permits, and how the NMCP will require mercury controls at this facility. The DEIS should also include a brief description of the proposed national emissions standard for mercury emissions from gold mines, which was published in the Federal Register on April 28, 2010, and how this rule will limit mercury emissions from this facility. The proposed rule is available at: http://www.epa.gov/ttn/oarpg/new.html.

The DEIS states that no mitigation would be employed for the reduction or remediation of the criteria pollutant emissions. Although the air basin in which the project would occur is unclassified or designated as attainment for all National Ambient Air Quality Standards, numerous technologies exist for the reduction of criteria pollutant emissions. Because the project has the potential to produce large amounts of PM10, EPA recommends that the revised or supplemental DEIS include emissions reduction measures to control fugitive dust emissions at the Genesis Mine.

> **Recommendation:** We recommend the following emissions reduction measures be considered to control fugitive emissions.
>
> - Apply water or other wetting agents to dust-prone locations;
> - Revegetate disturbed areas as soon as disturbance activities are completed;
> - Use particle traps and other appropriate controls to reduce emissions of diesel particulate matter (DPM) and other air pollutants. Traps control approximately 80 percent of DPM, and specialized catalytic converters (oxidation catalysts) control approximately 20 percent of DPM, 40 percent of carbon monoxide emissions, and 50 percent of hydrocarbon emissions;
> - Minimize construction-related trips of workers and equipment, including trucks and heavy equipment;
> - Lease or buy newer, cleaner equipment (1996 or newer model);

- Employ periodic, unscheduled inspections to ensure that construction equipment is properly maintained at all times and does not unnecessarily idle, is tuned to manufacturer's specifications, and is not modified to increase horsepower, except in accordance with established specifications.

Monitoring and Mitigation

The DEIS does not adequately discuss monitoring and mitigation for surface water, groundwater, or air emissions. It appears that there are no mine-specific monitoring or mitigation plans for the Genesis Mine. The DEIS indicates that monitoring will take place in accordance with a number of existing monitoring plans, such as the Maggie Creek Basin Monitoring Plan, but these plans are not included in the DEIS and no additional details are provided. The DEIS does not demonstrate that the Maggie Creek Basin Monitoring Plan or any other monitoring plans mentioned will address all potential impacts that might result from the Genesis project. Nor does it indicate action thresholds or contingency measures that would apply in the event monitoring indicates that action thresholds are exceeded.

Recommendation: The revised or supplemental DEIS should include a mine-specific groundwater and surface water monitoring and mitigation plan specific to the Genesis Mine. The plan should identify and describe all monitoring that will occur during mine operations and post-closure, as well as specify action thresholds and specific follow up measures to be taken if groundwater monitoring indicates actual impacts (e.g., contaminant concentrations) are greater than the predicted impacts summarized in the DEIS. The revised or supplemental DEIS should also discuss mine-specific air emissions monitoring, action thresholds, and mitigation measures to reduce emissions of criteria pollutants, hazardous air pollutants, and greenhouse gases.

Greenhouse Gases

The DEIS should include a discussion of the potential impacts of climate change on the project. In addition to considering mitigation measures for greenhouse gases (GHGs), EPA recommends that the discussion of GHGs in the DEIS include a brief, qualitative summary of the potential impacts of climate change at a regional, U.S., and global scale, based upon U.S. Global Change Research Program and IPCC summaries. We also recommend that BLM translate the proposal's estimated GHGs into an easily-understood equivalency, such as the number of passenger vehicles annually emitting an equivalent amount of GHGs. See, e.g., http://www.epa.gov/cleanenergy/energy-resources/calculator.html Finally, we recommend that BLM update the discussion of EPA's GHG-related regulatory activity under the Clean Air Act at p. 3-31 of the DEIS.