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

March 23, 2009

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

Subject: Emigrant Project Revised Draft Environmental Impact Statement (EIS), Elko County, Nevada [CEQ # 20080468]

Dear Mr. Wenker:

The U.S. Environmental Protection Agency (EPA) has reviewed the above referenced document. Our review and comments are provided consistent with the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act. We appreciate the extensions BLM has granted us on the comment due date for this Revised Draft EIS.

We have rated this Revised Draft EIS as "**3 - Inadequate Information**" (see Enclosure 1: "Summary of Rating Definitions and Follow-Up Action"). The proposed Emigrant gold mine would disturb 1,418 acres of land and involve: (1) the excavation of a 615-acre open pit, (2) heap leaching of 92 million tons of ore with cyanide, and (3) the disposal of 83 million tons of waste rock over a 14-year mine life. EPA does not believe that the Revised Draft EIS adequately assesses the potentially significant environmental impacts of the action, particularly to surface water and groundwater. In particular, we believe that (1) the proposed waste rock handling methods are inadequate to prevent groundwater or surface water contamination, and the proposed project would likely result in unmitigated exceedences of the water quality standards on a long-term basis; (2) the Revised Draft EIS does not support the Bureau of Land Management's (BLM) conclusions that mine operations will not contaminate groundwater and surface water; (3) leachate control, capture, and/or treatment measures will be needed to effectively prevent groundwater and surface water contamination from the mine; and (4) a sufficient financial assurance mechanism needs to be in place to ensure that the necessary funds are available as long as they may be needed for this purpose.

EPA does not believe that the Revised Draft EIS is adequate at this stage. EPA believes that because of the deficiencies in the Revised Draft EIS, additional alternatives and measures should be evaluated and made available for public comment in a revised or supplemental Draft EIS. On the basis of the potential significant impacts involved, this

project could be a candidate for referral to the President's Council on Environmental Quality (CEQ) in accordance with 40 CFR Part 1504.

We are including in our comments alternatives and engineering controls that are not analyzed in the Revised Draft EIS, but are available and have been implemented at other mines throughout the western U.S. These alternatives and control measures, such as facility relocation, covers, liners, and capture and treatment systems, should be analyzed in the revised or supplemental Draft EIS in order to reduce the potentially significant environmental impacts. We recommend the development of additional alternatives and measures be accompanied by a process that uses state-of-the-art means to determine their effectiveness in addressing various contaminant leaching issues.

Financial assurance is not discussed in the Revised Draft EIS. Long-term post-closure care may be necessary to protect water quality, and meaningful assurances are needed that a financial instrument will exist to ensure adequate funds are available as long as they may be needed for this purpose. The need for, and cost of, reclamation and closure activities and post-closure controls and/or treatment should be addressed in the revised or supplemental Draft EIS. 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 the impacts and inform a decision about whether the project is cost-effective. EPA believes this information is essential for an adequate analysis of the proposed project because it could make the difference between a project sufficiently managed over the long-term by the site operator versus an unfunded/under-funded contaminated site that becomes a liability for the Federal government, e.g., under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

We also continue to have many of the same concerns we expressed to BLM on the 2005 Draft EIS. These issues include heap leach closure, Clean Water Act permitting and best management practices, water quality, groundwater characteristics, avoiding waters of the U.S., air quality and hazardous air pollutant emissions, and closure and reclamation. The revised or supplemental Draft EIS should also provide information regarding these issues. Our detailed comments on this Revised Draft EIS are enclosed (Enclosure 2).

We appreciate the opportunity to review this Revised Draft EIS and look forward to working with BLM as this project continues. We will call to arrange a meeting with the Elko Field Office 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 Jeanne Geselbracht, our lead NEPA reviewer for this project, at (415) 972-3853. Please send two copies of the revised or supplemental EIS to this office (mailcode CED-2) at the same time it is filed with our Washington, D.C. office.

Sincerely,

/s/

Laura Yoshii
Acting Regional Administrator

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Enclosures:
(1) "Summary of Rating Definitions and Follow-Up Action"
(2) EPA's detailed comments on the Emigrant Mine Revised Draft EIS
(3) October 17, 2007 letter from EPA to BLM
(4) January 22, 2009 letter from EPA to BLM

cc: Ken Miller, BLM – Elko District Office
Leo Drozdoff, Nevada Division of Environmental Protection
Jim Harvey, U.S. Fish and Wildlife Service
Christine Hanson, U.S. Army Corps of Engineers

Emigrant Mine Revised Draft EIS
EPA Detailed Comments – March, 2009

I. General Comments and Background

We have provided comments to BLM over the last several years to improve the information used to support the proposed project. A high degree of uncertainty remains regarding acid generation potential at the proposed mine site. A better understanding of the geochemistry of the ore rock and waste rock is critical to predicting the proposed project's potential environmental impacts and determining appropriate alternatives and/or measures to avoid those impacts.

Mine drainage has contaminated surface water and groundwater at numerous mine sites around the country. EPA believes the proposed waste rock handling methods in the Revised Draft EIS are likely inadequate to prevent groundwater or surface water contamination. In accordance with 40 CFR 1502.14, EPA believes BLM should develop and analyze, in a revised or supplemental Draft EIS, additional alternatives and/or mitigation measures to effectively prevent groundwater and surface water contamination from the mine. These measures should include leachate control, capture, and/or treatment technologies. The need for, and cost, of reclamation and closure activities and post-closure controls and/or treatment should also be addressed in the document, as well as the need for meaningful assurances that a financial instrument will exist to ensure funds are available as long as they may be needed to prevent degradation of water quality.

II. Geochemistry

A. Uncertainties Regarding Mine Geochemistry.

It is unlikely that waste rock at the Emigrant Mine will be able to provide neutralizing potential to itself and other, more acid-generating rocks at the site, such as the Chainman Formation. The Webb Siltstone comprises 67% of waste rock and 76% of the ore that would be excavated for the proposed Emigrant Mine project. A large number of static tests were conducted on the ore and waste rock at the site. [1] The static testing results showed that 86 percent of the samples are either in the potentially acid generating or uncertain category. In addition, even though the sulfide percentages are relatively low, there is essentially no carbonate in the Webb Siltstone. Short-term 20-week kinetic test results show that samples with sulfur values well below 1.0 percent can produce acid and elevated metal concentrations. Even during the 20-week period, leachate from a number of the Webb Siltstone samples became more acidic as the tests progressed. Most "final" pH values were outside the water quality standard range for pH.

Because the kinetic tests were stopped prematurely, the results of those tests are inadequate to determine whether or not the Webb Siltstone will become acid-

[1] Newmont, 2005: *Spreadsheet reporting LECO data for waste and ore samples within current Emigrant Plan of Operations pit design*.

generating over time as a result of mining activities (see our October 17, 2007 letter to BLM - Enclosure 3). First, static and kinetic test results indicate that most of the Webb Siltstone, which would comprise two-thirds of the waste rock at this mine, will provide poor neutralization potential and is unlikely to adequately neutralize the acid generated by waste rock from this formation. Second, the kinetic testing was conducted for too short a time and on too few samples to support BLM's conclusion that only a small percentage of the waste rock should be handled as potentially acid generating (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. Not only has the Webb Siltstone not been demonstrated to have sufficient net neutralizing potential, it also appears, based on the static and kinetic test results, to comprise much more PAG rock than the text of the Revised Draft EIS indicates. We believe the criteria proposed by Newmont Mining Corporation (Newmont) and BLM to distinguish PAG rock from non-PAG rock are not supported by the test results and that, without an effective management tool to distinguish PAG from non-PAG rock in the field, it is likely that PAG rock may be incorrectly identified as non-PAG rock.

EPA believes the follow-up paste pH tests and PHREEQC modeling conducted more recently by Newmont do not lend additional support to BLM's conclusions drawn from the kinetic test results (see our January 22, 2009 letter to BLM - Enclosure 4). The very short-term paste pH and the net carbonate value (NCV) results may dramatically underpredict the longer-term acid generation potential of the samples. In addition, we believe the inputs used in the PHREEQC modeling led to an underestimation of contaminant concentrations in waste rock leachate. We continue to believe the testing results are inadequate to determine if the Webb Siltstone will become acid-generating over time as a result of mining activities.

EPA believes that, before the project moves forward, a more effective management tool must be found to separate potentially acid generating (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. We have previously outlined two options for BLM's consideration: (1) longer kinetic tests should be conducted on more samples to support the characterization of the waste rock and ensure proper disposal; or (2) in the absence of further testing to improve the geochemical characterization of the waste rock, all Webb Siltstone should be considered and handled as PAG rock in the mining process, and financial assurance should be adequate to ensure proper reclamation, closure, and post-closure care.

> **Recommendation:** We continue to recommend that, consistent with BLM practice at other Nevada mines, longer kinetic tests (up to one year or longer) be conducted on more samples (approximately 30 Webb Siltstone samples) to more reliably characterize the waste rock. This would help in the development of appropriate waste rock management measures to ensure proper disposal. The revised or supplemental Draft EIS should describe, in detail, the geochemistry of the Webb Siltstone within the pit, as well as a discussion of the availability of net

neutralizing waste rock during each mining/disposal phase, and measures that would be taken to ensure sufficient neutralizing capacity during each phase.

Recommendation: If further work is not conducted to improve geochemical characterization of the waste rock, the revised or supplemental Draft EIS should characterize all Webb Siltstone as PAG rock, and it should be handled as such in the mining process. More detailed comments on this option are provided below.

B. Potential Impacts of Mine Rock.

EPA believes that the Revised Draft EIS does not adequately identify or discuss the potential impacts should the waste rock, pit high wall, or heap leach facility generate contaminated leachate in the future. According to the Revised Draft EIS (p. 3-59), potential release of trace metals and other constituents to surface water would not be expected due to the surface water control systems, site reclamation, isolation of PAG rock, and lack of interconnection between the groundwater and surface water. However, data provided for "Metal Mobility Results for Waste Rock and Ore Samples from Meteoric Water Mobility Procedure Tests" (Table 3-7, p. 3-21) indicate that stormwater discharges may contain metals and other constituents at concentrations that will exceed the water quality standards. In addition, it appears that part of the pit high wall will be in the Chainman Shale, which has acid generation potential.

Even under non-acidic conditions, static and kinetic test results indicate potential for contaminant mobility and elevated concentrations (above water quality standards) for several metals and metalloids. The Meteoric Water Mobility Procedure (MWMP) simulates the expected characteristics of storm water discharge from waste rock and the potential for mobilizing metals from waste rock and ore. The Webb Siltstone will comprise approximately 67% of waste rock (approximately 56 million tons) of the proposed project. The MWMP results indicate exceedences of the water quality standards for arsenic, manganese, nickel, selenium, thallium, zinc and sulfate. The Devils Gate Limestone will comprise approximately 32% of waste rock (approximately 27 million tons) at the mine site. The MWMP results for the Devils Gate Limestone waste rock samples exceeded water quality standard values for antimony, arsenic, cadmium, manganese, mercury, selenium, thallium, fluoride and sulfate. Additionally, the Chainman/ Fresh Webb Siltstone formation may be exposed in the high wall of the final pit (Fig 3-3), even after backfill. The MWMP test results indicate water exposed to Chainman/ Fresh Webb Siltstone formation exceeded water quality standards for arsenic, cadmium, lead, manganese, nickel, selenium, thallium, zinc, fluoride, sulfate, and pH.

Waste rock facility specifications do not appear adequate to preclude air and water flow into the waste rock or to provide sufficient neutralizing capacity to prevent generation of contaminated leachate. The proposed project also involves the encapsulation of PAG waste rock with a 10-foot thick layer of non-PAG acid-neutralizing waste rock and placement of a 0.5- to two-foot thick growth medium cover over each encapsulation cell (Revised Draft EIS, p. 2-23). The encapsulation cell would be located in the backfilled pit where Devils Gate limestone is exposed. As has been demonstrated

at numerous mine sites where acid drainage has occurred, water infiltration and air flow can occur deep inside waste rock dumps, and insufficient information was made available for this project to demonstrate that such exposures will not occur. Furthermore, as discussed earlier, non-acidic leachate is projected to exceed water quality standards and must be controlled.

EPA believes several streams in the area could be significantly adversely affected by acidic and/or non-acidic rock drainage from the waste rock dump, the high wall, and the heap leach facility. Some of these streams would be adjacent to or overlain by proposed mine facilities, and one stream will be diverted along the high wall of the pit.

EPA believes groundwater quality could also be adversely affected by improper design of the mine facilities. The Revised Draft EIS predicts that any potential groundwater impacts would be adequately mitigated by the limestone and approximately 450 feet of unsaturated zone underlying the PAG waste rock storage area. However, the underlying limestone will not necessarily 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 predominate flow path, reducing or 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.

> **Recommendation:** The revised or supplemental Draft EIS should discuss the potential impacts to surface water and groundwater resources should the waste rock or spent ore generate contaminated leachate either in the short- or long-term.

C. Alternatives to Avoid Surface Water and/or Groundwater Contamination.

The Revised Draft EIS does not evaluate alternatives to avoid long-term uncontrolled surface water and groundwater contamination from mine facilities. In light of the potential for contaminated leachate to affect water quality, the revised or supplemental draft EIS should describe and discuss measures that would be taken, if needed, to prevent acidic and non-acidic leachate from contaminating surface water and groundwater, as well as remedial measures that could be taken should prevention measures fail. Properly sited and designed facilities could help minimize the need for, and costs of, long-term post-closure treatment activities.

> **Recommendation:** The revised or supplemental draft EIS should evaluate alternatives to control, capture, and treat any leachate, including non-PAG leachate, from the mine site. At a minimum, this evaluation should address the following.

- Relocation of facilities should be evaluated to determine if control of leachate could be facilitated by careful site designation (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 contamination 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.

- Additional geochemical information is needed to demonstrate whether some of the Webb Siltstone has sufficient net neutralizing potential to be used to neutralize PAG rock in certain instances. Additional mass balance information is needed to demonstrate whether sufficient Devils Gate Limestone is available to be used for this purpose.

- 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 Emigrant 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 technical participants in this analysis should agree on the selection of appropriate models for predicting water quality at the Emigrant Mine and use them to conservatively predict contaminant leaching potential and impacts on various water resource receptors. (Note: We believe it is appropriate for EPA to be involved in the development and evaluation of these models.)

- 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 draft EIS should describe and discuss contingency measures that would be taken should prevention measures fail.

- The revised or supplemental draft EIS 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 calculate the costs of operations and maintenance, facilities replacement, monitoring, and reporting.

III. Financial Assurance.

Financial assurance is not discussed in the Revised Draft EIS, but is critical to determining whether all commitments for proper closure, reclamation, and post-closure care 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, and post-closure care measures are significantly underfunded and, therefore, infeasible, contamination of surface water and groundwater may not be controlled. EPA believes the adequacy of financial assurance for these activities could make the difference between a project sufficiently managed over the long-term by the site operator, or an unfunded/under-funded contaminated site that becomes a liability for the Federal government, e.g., under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Furthermore, 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, so that Newmont and BLM can make an informed decision about whether the project is cost-effective. 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 Draft EIS identify the estimated bond amounts needed for each closure and reclamation activity for the proposed project facilities. Also discuss whether 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 facilities are not properly designed up front.

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)]
>
> **Recommendation:** If long-term post-closure operations and maintenance are necessary, a long-term, post-closure plan for preventing and/or managing mine drainage should be developed and included in the revised or supplemental Draft EIS. It should include specific plans for operating, maintaining, and replacing facilities, 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 a long-term plan is needed, a long-term trust fund or other funding mechanism will need to be established 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. As you are aware, Newmont's Phoenix Mine long-term trust fund recently failed to perform as Newmont and BLM had predicted. In our comment letter to BLM on the Phoenix Final EIS (November 25, 2002), EPA noted that BLM's expected real return rate for that fund was unrealistic and that the net present value should be based upon investment in low-risk instruments, which would provide a higher degree of assurance that the funds would be available to pay for treatment when necessary. The failure of the Phoenix Mine long-term trust fund illustrates how the types of financial instruments and the specific fund details can affect the viability of the fund over the long term.

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:** If a long-term plan is needed, a long-term trust fund or other funding mechanism should be established to ensure adequate funding will be available to implement the post-closure plan. The revised or supplemental Draft

EIS 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 trust fund growth rate, and mechanics of the trust fund. The revised or supplemental Draft EIS should discuss all requirements BLM would impose on the mine operator to establish a trust fund to ensure post-closure care, in accordance with 43 CFR 3809.552(c). EPA believes 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.

IV. Stormwater Management

A. Storm Water Permitting.

The Revised Draft EIS (p. 3-43) states, AWaste discharges to any state water must be such that no impairment of beneficial uses occurs as a result of the discharge (NAC 445A.120[2]). No discharges, however, are planned for the Emigrant Project." Nevertheless, based on the design and geochemistry of the proposed mine, as well as statements made in other sections of the Revised Draft EIS, it appears that there will be discharges from the mine site to tributaries of Dixie Creek that would be subject to National Pollutant Discharge Elimination System (NPDES) permitting requirements. See 40 CFR 122.26(b)(14). EPA regulations define "storm water associated with industrial activity" to include discharges of storm water from "active or inactive mining operations contaminated by contact with or that has come into contact with, any overburden, raw material, intermediate products, finished products, byproducts or waste products located on the site of such active or inactive mining operations. 40 CFR 122.26(b)(14)(iii).

Recommendation: Information should be provided regarding how the site will meet the permitting requirements for discharges to surface waters. The revised or supplemental Draft EIS should describe the types of discharges subject to NPDES permitting (individual and/or general) for various discharge scenarios at the Emigrant Mine.

B. Best Management Practices (BMPs).

The proposed storm water BMPs discussed in the Revised Draft EIS do not appear to adequately consider the water quality issues associated with storm water discharges from the waste rock. Because of the potential for stormwater discharges to exceed water quality standards, as described above, BMPs or treatment may be needed to control stormwater discharges. The Revised Draft EIS describes some of the BMPs that will be used on site, such as interceptor trenches, berms, ditches, silt traps, silt fences and sediment ponds. However, these BMPs are designed to control sediment and erosion and are not likely to control metals and metalloids (including arsenic and antimony) that may be dissolved or adsorbed onto clays, hydroxides and organic matter.

Recommendation: The revised or supplemental Draft EIS should provide information on the BMPs to be utilized to ensure that there are no discharges of substances that will cause or contribute to a violation of the water quality standards. Specifically, it should identify the location of all stormwater outfalls and discuss how the BMPs will ensure compliance with all applicable water quality standards. If BMPs are not effective, what additional treatment or containment options would be implemented?

The sediment basins depicted in Figure 2-2 of the Revised Draft EIS appear to be located in waters of the U.S., a practice that should be avoided and appears to be unwarranted in this case. Furthermore, before mine closure, additional basins and other BMPs will be needed for stormwater discharges from haul roads and flows across waste rock that has been placed back into the pit. BMPs such as bails or waddles are only temporary measures for construction and not appropriate as the only BMPs for channelized flow from waste rock piles.

Recommendation: The revised or supplemental Draft EIS should include a figure depicting the locations of sediment basins or other BMPs, and a discussion of when they would be built and when they would be reclaimed. Sediment basins should not be located in waters of the U.S.

C. Monitoring.

The Revised Draft EIS indicates that total suspended solids (TSS) and possible other constituents in surface water would be monitored (p. 3-64).

Recommendation: The revised or supplemental EIS should present a detailed plan for monitoring stormwater discharges to demonstrate compliance with the water quality standards and that BMPs are functioning properly. We recommend quarterly monitoring of stormwater outfalls for all the parameters listed in Nevada's Profile 1, as well as implementation monitoring and effectiveness monitoring.

V. Water Quality

A. Water Quality Standards.

The Draft EIS (p 3-42) states, "For purposes of comparison, Nevada „Profile 1' reference values included in Table B-2 (Appendix B) are used to evaluate groundwater quality in the Study Area." While it may be appropriate to include the Nevada "Profile 1" reference values in Table B-2, all comparisons to evaluate the impacts on surface water quality should be made to the Water Quality Criteria and Standards for Nevada (also included in Table B-2). While many of the Nevada "Profile 1" reference values are identical to the Water Quality Criteria and Standards, several are not. For example, the aquatic life water quality criteria for copper are two orders of magnitude lower than the "Profile 1" reference value.

Recommendation: In order to evaluate impacts to surface water quality, Table 3-7 (p. 3-21) and associated text on pages 3-19 to 22 documenting Meteoric Water Mobility Test Results should be revised to reflect the comparison to the Nevada Water Quality Criteria and Standards.

We also note that the Revised Draft EIS, in summarizing applicable standards to Class B streams such as Dixie Creek, does not include their beneficial uses as specified in NAC 445.125.

Recommendation: We recommend the revised or supplemental Draft EIS include the following language specifying beneficial uses applicable to Class B waters: "The beneficial uses of Class B waters are municipal or domestic supply, or both, with treatment by disinfection and filtration only, irrigation, watering of livestock, aquatic life and propagation of wildlife, recreation involving contact with the water, recreation not involving contact with the water, and industrial supply. (NAC 445A.125.2)"

B. Existing Water Quality.

The description of existing surface water quality (pp. 3-41 to 3-45 and Table B-5) in the vicinity of the proposed mine is not adequate to determine baseline conditions. The only data for the suite of "Nevada Profile 1" parameters (including arsenic, mercury, lead, etc) appear to have been taken at Emigrant Spring. However, Emigrant Spring is downstream of acid mine drainage seep discharges from the Rain Mine waste rock pile, and should not be considered background water quality. For example, the mean conductivity at Emigrant Spring is approximately four times higher than conductivity elsewhere in the vicinity. Mean conductivity at Emigrant Spring was 809 Φmhos/cm, compared to mean conductivities farther downstream of 255, 204, 182, 343, and 190 Φmhos/cm (at DC-6, EMI-D1, EMI-D1-C, EMI-D2, EMI-D3, respectively). The Draft EIS describes the results of only one water quality sample for turbidity, TSS, electrical conductivity, pH, and temperature, which was taken between 1994 and 2004 immediately below the proposed mine site at EMI-D1.

Recommendation: The revised or supplemental Draft EIS should include baseline water quality data for the proposed project. Surface water sampling data from immediately upstream (EMI-D1-B and EMI-D1-A) and downstream (EMI-D1-C) of the proposed mining area for all the Nevada Profile 1 parameters should be obtained and included in the revised or supplemental Draft EIS.

Recommendation: The revised or supplemental Draft EIS should discuss the effects the Rain Mine has had on water quality, including Emigrant Spring and downstream. The discussion should include the chemistry of the Rain Mine acidic discharge, the distance the discharge flowed down stream, the length of time it flowed, the date when it was first discovered, when it was first fully contained, and when the stream was remediated.

VI. Hydrogeology

The Revised Draft EIS provides new information regarding the hydrologic properties of the subsurface. Information is still needed, however, regarding how long the drill holes were allowed to recover before the presence of water was determined and how removal of the Emigrant Fault hydrologic barrier during pit excavation could affect groundwater in the vicinity.

> **Recommendation:** The revised or supplemental Draft EIS should discuss how long the drill holes were allowed to recover before the presence of water was determined. In addition, a discussion should be included on how removal of the Emigrant Fault hydrologic barrier during pit excavation could affect groundwater in the vicinity, including potential dewatering of upgradient streams and springs.

VII. Proposed Mine Facilities

A. Diversion Channels and Roads.

The Revised Draft EIS indicates that the diversion channel will be located primarily on bedrock of Devils Gate limestone (p.2-9). However, Figure 3-1 and cross-sections D and E in Figure 3-3 indicate that the pit will be deep in that area (on the west side of the pit near the Emigrant fault).

> **Recommendation:** The revised or supplemental Draft EIS should provide a cross section of the diversion channel area to show this area in more detail and explain how the diversion will be on bedrock through the pit area and how the acid producing or otherwise reactive portions of the Webb formation will not degrade water quality in the channel or the bedrock near the channel. It is also unclear where sediment catch basins depicted in figure 2-6 would drain and how they would prevent contaminants from leaching into the engineered stream channel.

The Revised Draft EIS indicates that non-PAG rock would be used for roads and diversion channels. Given the outstanding uncertainties associated with the majority of the waste rock at the mine, it is unclear whether non-PAG rock would be available when it is needed for these facilities. As stated previously, we believe the very short-term paste pH and the NCV test results may dramatically underpredict the longer-term acid generation potential of the samples. It appears that the neutralizing potential to acid potential (NP:AP) ratio is a much better indicator with the results from the kinetic testing conducted on Emigrant mine materials. Many other mines rely on NP:AP ratios to characterize mined materials in the field, and the results presented by Newmont[2] show that this would also be the best approach to use for the Emigrant Project if further kinetic

[2] Newmont, 2008. NCV & Paste pH, a Proposal for Waste Rock Determination for the Emigrant Project. August 4.

testing is not conducted to more reliably characterize the waste rock. EPA believes additional information is needed regarding the specifications for waste rock that will be used at the mine for such facilities.

> **Recommendation:** The revised or supplemental Draft EIS should provide the geochemical specifications that will need to be met by waste rock used for subgrade, roads, diversion channels and trenches, and other facilities at the mine. When the waste rock has been characterized and the best static test has been determined for use in the field (i.e. the one that comes closest to matching the results of the long-term kinetic testing), the numeric cutoffs for use of waste rock for these facilities can be determined. In the absence of further kinetic testing to more reliably characterize the waste rock, we recommend that waste rock used for these facilities meet an NP:AP ratio of 3:1 to ensure that net neutralizing rock is used. The document should also estimate the amount of such material that would be needed during each mining phase and the amount of material meeting the specifications that would be available during each mining phase for these facilities. If shortfalls may occur, identify alternative sources of material to be used for this purpose.

VIII. Clean Water Act Section 404

According to the Revised Draft EIS (pp. 3-79 to 3 - 84), Newmont is seeking a Clean Water Act Section 404 permit from the U.S. Army Corps of Engineers (Corps). Section 404 of the Clean Water Act (CWA), 33 U.S.C. §1344, regulates the discharge of dredged or fill material into waters of the U.S., including wetlands and other "special aquatic sites." The Revised Draft EIS indicates the proposed project will result in the fill of 0.15 acre of wetlands and 0.88 acre of other waters of the U.S., based on surveys conducted in the project area in 2004.

A. Jurisdictional Delineation of Waters of the U.S.

EPA is concerned about the potential adverse impact to aquatic resources that could result from the proposed project. To determine the extent of impacts to waters, a jurisdictional delineation should be conducted for the alternatives presented in the Revised Draft EIS, and verified by the Corps.

> **Recommendation:** The revised or supplemental Draft EIS should provide the results of the U.S. Army Corps of Engineers' jurisdictional delineation for the project site.

B. Least Environmentally Damaging Practicable Alternative.

If it is determined that there are jurisdictional waters within the project area, a CWA Section 404 permit will be required to authorize any discharges of dredged or fill material into these waters, including wetlands and other special aquatic sites, and EPA will review the project for compliance with *Federal Guidelines for Specification of Disposal Sites for*

Dredged or Fill Materials (40 CFR 230), promulgated pursuant to Section 404(b)(1) of the CWA. Any permitted discharge into waters of the U.S. must be the Least Environmentally Damaging Practicable Alternative (LEDPA) available to achieve the project's purpose. (See 40 CFR 230.10(a)) Based on this provision, the applicant is required, in all cases, (regardless of whether the discharge site is a special aquatic site) to evaluate opportunities for use of non-aquatic areas and other aquatic areas that would result in less adverse impact on the aquatic ecosystem. A CWA Section 404 permit cannot be issued where there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem (so long as the alternative does not have other significant adverse environmental impacts). The Revised Draft EIS does not demonstrate that the proposed project is the LEDPA.

> **Recommendation:** The revised or supplemental Draft EIS should demonstrate the project's compliance with the 404(b)(1) Guidelines. If, under the proposed project, dredged or fill material would be discharged into waters of the U.S., the revised or supplemental EIS should discuss alternatives to avoid those discharges. Specifically, the revised or supplemental Draft EIS should thoroughly evaluate alternatives that avoid waters of the U.S. for such facilities as the non-PAG waste rock disposal facility, the road from SP-10 to the non-PAG waste rock disposal facility, borrow area #1, the heap leach pad, and the mine pit.

C. Indirect Effects.

Waters of the U.S. would be altered by permanently changing physical and hydrological conditions, including modifying the timing, velocity and volume of stormwater flows, changing sediment transport conditions, and discharging pollutants from nuisance flows into receiving waters. In addition, as mentioned above, pit excavation across the Emigrant Fault hydrologic barrier could affect groundwater in the vicinity. EPA is concerned about the indirect changes to the physical and hydrologic conditions of the functioning network of waters of the U.S. and aquatic habitat values on the site, and the Revised Draft EIS does not provide adequate detail on these changes.

To ensure the long term integrity of waters of the U.S. on the mine site, appropriate buffers should be established. Waterway buffers are essential in protecting the functions of stream systems including desert washes. Land use changes that expand the cover of impervious surfaces tend to increase: (1) the frequency, rates and volumes of stormwater runoff; (2) the annual pollutant loads to receiving waters; and (3) the modification of physical and biological processes of the receiving waters.

> **Recommendation:** To minimize the adverse effect of the project on ephemeral waters, appropriate buffer widths must be established to capture more of their floodplain and help maintain ecosystem processes. These should be described in the revised or supplemental Draft EIS.

> **Recommendation:** The revised or supplemental Draft EIS should discuss how removal of the Emigrant Fault hydrologic barrier during pit excavation could

potentially result in dewatering of upgradient streams and springs, as well as how such impacts would be avoided to comply with the 404(b)(1) Guidelines.

D. Mitigation.

If a discharge is to be permitted, required mitigation for impacts to waters of the U.S. should be identified in the revised or supplemental Draft EIS for evaluation by the public and decision-makers. The Record of Decision should include commitments to ensure such mitigation is implemented.

> **Recommendation:** The revised or supplemental EIS should discuss how potential impacts would be minimized and mitigated if a discharge of dredged or fill material is permitted. This discussion should include: (a) acreage and habitat type of waters of the U.S. that would be created, restored, or preserved; (b) water sources to maintain the mitigation area; (c) a revegetation plan utilizing native plants, including the numbers and age of each species to be planted; (d) maintenance and monitoring plans, including performance standards to determine mitigation success; (e) the size and location of mitigation zones; (f) the parties that would be ultimately responsible for the plan's success; and (g) contingency plans that would be implemented if the original plan fails. Mitigation should be implemented in advance of the impacts to avoid habitat losses due to the lag time between the occurrence of impacts and successful mitigation.

IX. Air Quality

A. Criteria Air Pollutants.

The proposed project involves excavating and hauling an average of 18 million tons of ore and waste rock per year over a ten-year period. Ore processing is expected to last fourteen years. However, the Revised Draft EIS does not provide an analysis of impacts to air quality in the project area over the life of the mine. Open pit mine operations can be significant sources of particulates smaller than ten microns (PM10). Blasting, material handling, hauling, mobile emissions, and wind erosion can be significant fugitive sources of PM10. Crushers, conveyors, and carbon regeneration kilns also emit PM10. Other criteria pollutants, including particulates smaller than 2.5 microns (PM2.5), carbon monoxide, oxides of nitrogen (NOx), and sulfur dioxide (SO2), are emitted in the exhaust from mine processing equipment and mobile sources, such as earth-moving equipment and transportation vehicles.

BLM's South Operations Area Project Amendment Draft EIS (2000) states that ambient monitoring for PM10 has been conducted since 1992. Table 3-10 of the Emigrant Mine Revised Draft EIS includes PM10 emissions concentrations from Newmont's Gold Quarry Mine (South Operations Area) for 1995, 1996, and 1997, but does not include the air quality monitoring data for the years since then. Current information is important in establishing the existing air quality at Gold Quarry, which will be affected by the proposed Emigrant project. Ore from the Emigrant Mine will be processed at Gold

Quarry, and the associated impacts should be addressed in the supplemental or revised Draft EIS.

> **Recommendation:** The supplemental or revised Draft EIS should provide current ambient air concentrations in the Emigrant Mine project area, if available, as well as in the South Operations Area. The supplemental or revised Draft EIS should also provide direct, indirect, and cumulative emissions projections for criteria pollutants at the Emigrant Mine and the South Operations Area. In addition, it should provide projected emissions concentrations for both controlled and uncontrolled stationary and fugitive sources, and compare them to the National Ambient Air Quality Standards (NAAQS).

B. Emissions Control Measures.

The Revised Draft EIS mentions that fugitive dust from ore handling activities would be controlled using BMPs, which could include water application, use of chemical binders or wetting agents, and revegetation of disturbed areas. Additional measures exist that could be used to control PM10 emissions, as well as diesel particulate matter (DPM) and other criteria pollutants, from fugitive sources at the mine.

> **Recommendation:** We recommend the following additional emissions reduction measures be considered to control fugitive emissions.
>
> - Use particle traps and other appropriate controls to reduce emissions of 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.

C. Mercury Air Emissions.

About once per week, the gold-loaded carbon from the carbon columns at the Emigrant Mine would be transferred to Newmont's Gold Quarry processing facility in its South Operations Area to recover gold. Mercury, a persistent bioaccumulative toxic substance, is often released during gold recovery. Releases from facilities that process or use greater than ten pounds of mercury per year must be reported by a mining company in its annual Toxics Release Inventory submitted to EPA. Controls added to processing equipment can recover some of the mercury to prevent its release. Mercury emission controls at

Newmont's South Operations Area processing facility capture a substantial amount of mercury from the ore processed there.

The Revised Draft EIS states that carbon columns from the Emigrant Project would offset production from existing sources with no projected increases in total annual mercury emissions from the South Operations Area (p. 4-11). The Leeville Mine Draft EIS (2002) similarly states that processing of Leeville ore at the South Operations Area would offset production from existing sources with no projected increases in total annual mercury emissions. It is unclear what this statement means, e.g., which existing sources would no longer be processed and, therefore, be offset.

> **Recommendation:** The following modifications should be made in the supplemental or revised Draft EIS.
>
> - Explain how mercury emissions from current production at the South Operations Area would be offset by emissions from production of Emigrant ore.
> - Describe how any condensed or captured mercury is recycled, sold, or disposed.
> - Include a comparison of these cumulative mercury emissions to the total annual (mercury) air emissions in the United States. The supplemental or revised Draft EIS is an appropriate document to bring mercury air emissions from gold mines and ore processing into perspective.

The Revised Draft EIS (p. 3-30) states: "Carbon handling and refinery services at the South Operations Area Facility that emit mercury to the atmosphere include carbon regeneration, carbon stripping, electro-winning, retorting, and melting. Mercury emissions at each of these processes are subject to controls that have been determined by the Environmental Protection Agency to provide the Maximum Achievable Control Technology (per Mercury Reduction Program 2002) and are listed in NAC 445B.3651 as constituting presumptive Nevada Maximum Achievable Control Technology proposed for mercury."

> **Recommendation:** This section as written is not accurate and therefore should be revised to state: "Carbon handling and refinery services at the South Operations Area Facility that emit mercury to the atmosphere include carbon regeneration, carbon stripping, electro-winning, retorting, and melting. Mercury emissions at each of these processes are subject to controls that are listed in NAC 445B.3651 as constituting the presumptive Nevada Maximum Achievable Control Technology for controlling mercury emissions from these processes under Nevada's Mercury Air Emissions Control Program."

D. Other Hazardous Air Pollutant Emissions.

With the exception of mercury, the projected sources and emissions of hazardous air pollutants (HAP) from the proposed project are not provided in the Revised Draft EIS. The document also does not discuss or describe how HAPs would be controlled.

> **Recommendation:** The supplemental or revised Draft EIS should estimate releases of HAPs from the proposed project, identify all sources of HAPs at the mine, and discuss how all HAPs would be controlled to reduce their emissions.

E. Greenhouse Gas Emissions

There have been significant developments in the scientific, regulatory, and judicial landscape regarding greenhouse gas emissions since the original publication of the Emigrant Project Draft EIS. Given these recent developments, EPA believes the potential greenhouse gas emissions from the proposed project and alternatives should be discussed in the revised or supplemental Draft EIS.

> **Recommendation:** We recommend the revised or supplemental Draft EIS quantify the estimated greenhouse gas emissions from the proposed project and consider appropriate mitigation measures. Information on voluntary GHG reduction initiatives sponsored by EPA and other federal agencies can be found at: http://www.epa.gov/climatechange/policy/neartermghgreduction.html. We also recommend that the revised or supplemental Draft EIS include a qualitative discussion of cumulative climate change impacts related to greenhouse gas emissions.

Closure and Reclamation Activities

A. Growth Medium and Store and Release Covers.

During construction and excavation, growth medium will be stripped from disturbed areas such as the pit, waste rock pile, heap leach pad, and Borrow Area #1, and salvaged in stockpiles for use during reclamation. It appears from Appendix C of the Revised Draft EIS that the majority of soils in the pit area and proposed Borrow Areas are deemed either poor or not salvageable. The Revised Draft EIS (p. 2-43) states that soil replacement depths would vary according to location and soil type. Figure 2-8 indicates soil cover over PAG waste rock would be six inches to two feet thick. Given the uncertainties regarding the amount of PAG waste rock for the proposed project, it is unclear whether there will be sufficient growth medium to reclaim all disturbed areas, including up to two feet on PAG waste rock.

> **Recommendation:** The supplemental or revised Draft EIS should identify the projected amount (cubic yards) of growth medium needed and the depths deemed sufficient to support vegetation for each reclamation site and each soil type.

Describe how this was determined and indicate whether sufficient growth medium exists on-site to successfully reclaim and revegetate the proposed project site.

Recommendation: Store and release covers for the waste rock piles and leach pad should be evaluated and modeled for effectiveness and appropriateness, and discussed in the revised or supplemental Draft EIS. The document should indicate whether sufficient material exists in the project area for effective covers. If additional appropriate cover or growth medium may be needed during reclamation, discuss where it could be obtained, estimate its cost, and analyze the environmental impacts associated with its removal from its source location, its transport, and its use at the project site.

B. Proposed Evapotranspiration Cells.

When heap leaching ceases, the total volume of solution in the pad and pond system would be reduced by evaporation, until flow has diminished to a point that it can be passively treated. As drain down from the process circuit subsides, evapotranspiration cells would be constructed by filling the ponds with growth medium and irrigating them with the drain down solution (Revised Draft EIS, p. 2-47). It is unclear how long the active and passive drain-down phases are predicted to take. We believe metals and salts would accumulate in the substrate and in the plants and invertebrates on top of the pond liner. *Nevada Bureau of Land Management's Reclamation/Closure Policy for Water Management for Hardrock Mining Activities* (August 2000 Instruction Memorandum) recognizes the need for collecting and evaluating information on heap detoxification and drain-down waters in Plans of Operation and NEPA documents. Nevertheless, the Revised Draft EIS does not provide adequate information on heap leach closure, which we believe is critical to evaluating the environmental impacts of the proposed project.

Recommendation: The revised or supplemental Draft EIS should discuss the fate and transport of cyanide and the other constituents in the heap over the course of closure and post-closure, and address the ecological risks posed by the evapotranspiration cells. The discussion should include cations, such as sodium which, if applied in excessive concentrations, can affect plant growth. The revised or supplemental Draft EIS should provide the following information:

- Describe the method proposed for handling/treating post-closure residual drain-down. For example, would the system be continued? Would the cells have sufficient capacity to ensure against overflow in the future? How important would a successful vegetation cover be to the water balance in the cells?
- Identify the constituents and their potential concentration ranges anticipated in the drain-down solution over the course of closure and over the long-term.
- Identify the constituents and their anticipated availability at the end of closure in (1) the substrate and (2) remaining in the heap.

- Describe and discuss the potential problems that could result from contaminants concentrated in the substrate, and residual constituents remaining in the heap after closure.
- Describe the vegetation in the evapotranspiration cells during drain-down. Indicate whether the cells would be saturated and whether vegetation type would change over time as drain-down solution diminishes. Address the potential need for covering the contaminated substrate with growth medium in order to support plant growth should salts and metals accumulation preclude plant growth. Identify the potential vegetation seed mixtures that would be considered for reclaiming the cells.
- Identify the specific standards that cyanide and other constituents in the drain-down solution would be required to meet, and indicate whether these standards are expected to be met prior to start up of the passive treatment system.
- Describe how the substrate in the cells would be treated or disposed after they are no longer in use.
- Describe the plant and animal exposure pathways for constituents from drain-down solution in pumpback irrigation, evapotranspiration cell substrate, and any free-standing water.
- Describe the metals uptake and bioaccumulation predicted for plants, invertebrates, and other wildlife in the cells. The discussion should address all potential pathways, including pumpback irrigation, substrate, and any free-standing water.
- Discuss whether the constituents at anticipated concentrations from any of the pathways would be harmful to plants or wildlife.
- Describe methods that would be used to exclude wildlife (e.g., netting and fencing) from the cells during closure and/or post-closure.
- Discuss whether vegetation would need to be occasionally harvested in order to reduce the metals loading to these basins.

C. Successes and Drawbacks of Evapotranspiration Cells.

Evapotranspiration cell leach heap closure systems have been proposed and/or used at other mine projects in Nevada over the last several years. However, the Revised Draft EIS does not provide information regarding the successes, drawbacks, or monitoring results associated with such systems at other mines. This information would be useful in evaluating this proposal for closure of the Emigrant Mine heap leach pad, including predicting potential impacts and identifying mitigation measures and/or contingency plans.

Recommendation: We recommend the revised or supplemental Draft EIS describe and discuss the success, drawbacks, and monitoring results of passive heap leach closure systems at other mines, including how long they have been used, whether the systems are meeting or exceeding expectations, the monitoring methods that are being used at these other mines, and any revisions that have been made to either the systems or their anticipated time lines thus far. The revised or supplemental Draft EIS should also

identify the applicable standards and describe how monitoring would be conducted during heap leach closure at the Emigrant Mine.