December 13, 2007

Edward F. Sproat, Director
Office of Civilian Radioactive Waste Management
U.S. Department of Energy, Headquarters
1000 Independence Avenue, S.W.
Washington, DC 20585

SUBJECT: U.S. NUCLEAR REGULATORY COMMISSION COMMENTS ON U.S. DEPARTMENT OF ENERGY DRAFT ENVIRONMENTAL IMPACT STATEMENTS RELATED TO A PROPOSED GEOLOGIC REPOSITORY AT YUCCA MOUNTAIN, NEVADA

Dear Mr. Sproat:

On behalf of the U.S. Nuclear Regulatory Commission (NRC), I am providing comments on the following U.S. Department of Energy (DOE) documents:

- "Draft Supplemental Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada" (DOE/EIS-0250F-S1D)

- "Draft Supplemental Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada – Nevada Rail Transportation Corridor" (DOE/EIS-0250F-S2D)

- "Draft Environmental Impact Statement for a Rail Alignment for the Construction and Operation of a Railroad in Nevada to a Geologic Repository at Yucca Mountain, Nye County, Nevada" (DOE/EIS-0369D)

With respect to these draft documents, NRC is a commenting agency under the National Environmental Policy Act and the Nuclear Waste Policy Act (NWPA). The NRC staff developed the enclosed comments consistent with NRC's regulations in Part 51 of Title 10 of the *Code of Federal Regulations* (CFR) and NUREG-1748, *Environmental Review Guidance for Licensing Actions Associated with NMSS Programs*. Please note that the comments do not represent any NRC staff position concerning adoption of an environmental impact statement (EIS) as required by the NWPA or 10 CFR 51.109. Such determinations would be made during a licensing review if DOE submits an application for the licensing of a high-level waste repository.

The draft documents appear to discuss the affected environment and potential impacts that would be associated with the proposed actions as described. DOE could strengthen and improve the clarity and completeness of the final documents by addressing the comments enclosed and summarized below. The comments fall under the following general areas:

- Revisions to enhance completeness and to more fully characterize or bound certain aspects of the analyses:
    - Specific locations for some facilities or sites that are part of the proposed action have not been determined; therefore, impacts associated with their construction or operation may not have been bounded.
    - The cumulative impacts associated with reasonably foreseeable future actions do not appear to be fully characterized and may not be bounded.
    - Some of the affected environment or impacts discussions may not completely characterize the affected environment or bound potential impacts, especially with regard to the draft rail EIS.
- Revisions to enhance transparency and traceability of analyses and consistency of some discussions. For example, clearly stated, traceable technical bases are not provided for certain descriptions of the affected environment and for statements regarding impacts on different resource areas.

Additionally, the NRC staff observed that an integrated timeline for both the repository and rail proposed actions would enhance the utility of the documents.

Please contact Ms. Christine Schulte if you have any questions about this letter or the enclosures. Ms. Schulte can be reached at 301-492-3154.

Sincerely,

E. Leeds /RA/ for
Michael F. Weber, Director
Office of Nuclear Material Safety
and Safeguards

Enclosures:
1. "U.S. Nuclear Regulatory Commission's Comments on U.S. Department of Energy's Draft Supplemental Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada"

2. "U.S. Nuclear Regulatory Commission's Comments on U.S. Department of Energy's Draft Supplemental EIS for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada – Nevada Rail Transportation Corridor, and Draft EIS for a Rail Alignment for the Construction and Operation of a Railroad in Nevada to a Geologic Repository at Yucca Mountain, Nye County, Nevada"

cc: See attached list.

Dr. Jane Summerson
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- Revisions to enhance completeness and to more fully characterize or bound certain aspects of the analyses:
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cc: See attached list.

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U.S. Nuclear Regulatory Commission's Comments on
U.S. Department of Energy's Draft Supplemental Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada

This enclosure provides comments by the U.S. Nuclear Regulatory Commission (NRC) staff on the U.S. Department of Energy's (DOE's) "Draft Supplemental Environmental Impact Statement [EIS] for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste [HLW] at Yucca Mountain, Nye County, Nevada" (DOE/EIS-0250F-S1D). NRC staff comments on the draft supplemental EIS on Nevada rail transportation corridors (DOE/EIS-0250F-S2D) and the draft EIS for the proposed rail alignment (DOE/EIS-0369D) are provided in a separate enclosure.

For the convenience of the reader, the following terms are used to refer to the various documents discussed in these comments:

- *2002 FEIS* = Final Yucca Mountain EIS (DOE/EIS-0250F)
- *[Draft or final] repository SEIS* = 2007 Supplemental EIS for the repository (DOE/EIS-0250F-S1D)
- *[Draft or final] rail EIS* = EIS for the proposed rail alignment (DOE/EIS-0369D)
- *[Draft or final] corridor SEIS* = Supplemental EIS for the Nevada rail corridors (DOE/EIS-0250F-S2D)

COMMENTS

PROPOSED ACTION

1. Comment:

The specific locations are not identified for some facilities described in sections 2.1.4 and 2.1.7.3.3 that would support the proposed action. The repository final SEIS should include the proposed locations and associated impacts for facilities whose locations are not identified in the draft SEIS or state why the analysis is bounding.

Basis:

The draft repository SEIS indicates that locations of certain facilities, such as the solid waste landfill, explosives storage area, borrow pits, and cask maintenance facility, have not been determined. The draft repository SEIS and rail EIS assume for analytical purposes that the cask maintenance facility is within the rail equipment maintenance yard; however, the repository SEIS indicates the facility could be located anywhere along the Caliente rail line. Impacts may not be adequately characterized or bounded if locations are unknown.

CUMULATIVE IMPACTS

2. Comment:

Further evaluation of cumulative impacts is warranted, especially regarding the consideration of additional reasonably foreseeable future actions that are not addressed in the draft repository SEIS. The final repository SEIS should include more analysis of reasonably foreseeable future actions. The final repository SEIS should describe which reasonably foreseeable future actions contribute to impacts on which resource areas. Additionally, the final repository SEIS should provide summary information on groundwater withdrawals for the repository, Caliente rail line, the Nevada Test and Training Range (NTTR), the Nevada Test Site (NTS), and nearby development projects that also require periodic or continuing groundwater usage.

Basis:

- Table 8-2 includes broad categories of several types of actions; however, no detailed information or analysis is included in the associated discussion. In addition, other pertinent reasonably foreseeable future actions and their associated impacts are not identified. For example, there are continuing and anticipated reasonably foreseeable future actions associated with the NTTR, NTS, and four EISs being prepared by DOE, National Nuclear Security Administration, and the Bureau of Land Management (BLM). Further, the Statewide Transportation Plan for southern Nevada has a planning horizon that extends to 2026. In addition, numerous other commercial, industrial, and residential developments are being planned for Nye County and nearby locations in adjacent counties.

- The impacts that the reasonably foreseeable future actions listed in Table 8-2 would have on the resource areas do not appear to be completely characterized in Chapter 8.

- Section 2.3.4 considers the combined impact from the repository and rail construction, and section 4.1.3.2.5 considers the combined impact of water demands from the repository construction and the NTS. However, no discussion of cumulative impacts is included to address the combined impacts from the locations and activities mentioned above.

References:

CEQ, "Considering Cumulative Effects Under the National Environmental Policy Act." Council on Environmental Quality. Washington, DC. January 1997.

NRC, *Environmental Review Guidance for Licensing Actions Associated with NMSS Programs,* NUREG-1748. Office of Nuclear Material Safety and Safeguards. Washington, DC. August 2003.

LOW-LEVEL WASTE

3. Comment:

The draft SEIS does not appear to address certain aspects of low-level waste disposal. As a result, low-level waste management impacts may not be bounded. The final repository SEIS should present the relationship among low-level waste disposal estimates associated with the repository, existing disposal capacity, and DOE's options for disposal of the different low-level waste classes.

Basis:

Though Chapters 2, 3, and 4 generally discuss low-level wastes generated as a result of repository activities, the draft SEIS does not contain a discussion of existing low-level waste disposal capacity or DOE's eligibility to dispose of wastes at the identified facilities (e.g., NTS). Also, there appears to be no discussion of the impacts that repository low-level waste disposal would have on existing disposal facilities.

ENVIRONMENTAL JUSTICE

4. Comment:

Sections 3.1.13 and 4.1.13 state, "This [NRC] policy defined the identification of low-income and minority communities as the affected area's percentage of minority or low-income population that significantly exceeds that of the state or county." This statement does not properly reflect NRC's "Policy Statement on the Treatment of Environmental Justice Matters in NRC Regulatory and Licensing Actions" (NRC, 2004). The final repository SEIS should accurately reflect the NRC Policy Statement.

Basis:

NRC's Policy Statement on environmental justice reads, "Under current NRC staff guidance, a minority or low-income community is identified by comparing the percentage of the minority or low-income population in the impacted area to the percentage of the minority or low-income population in the County (or Parish) and the State." This Policy

Statement indicates that if the percentage in the impacted area significantly exceeds that of the State or County percentage for either the minority or low-income population, then environmental justice will be considered in greater detail. Alternatively, the Policy Statement indicates that environmental justice matters will be considered in greater detail when the minority or low-income population in the affected area is greater than 50 percent.

Reference:

NRC, "Policy Statement on the Treatment of Environmental Justice Matters in NRC Regulatory and Licensing Actions." 69 FR 52040-52048, August 24, 2004.

CONSULTATIONS

5. Comment:

The draft repository SEIS refers to ongoing consultations with agencies and Indian tribes. In some cases, consultations are not discussed but may be needed for a complete assessment of potential impacts and mitigation measures in the final repository SEIS. The final repository SEIS should update the discussion contained in Appendix C of the 2002 FEIS, specifically with regard to Table C-2, and including any DOE responses to the Native American viewpoints expressed throughout the draft repository SEIS. The table should be expanded to include any new consultations, as well as overlap with rail alignment consultations (e.g., BLM resource management plans). The final repository SEIS impact analysis should consider how these consultations may affect the analysis of impacts.

Basis:

A number of state and federal agencies have relevant expertise or activities that may be affected by the proposed action, including the National Nuclear Security Administration, (for the NTS) and the Air Force (for the NTTR). Also, BLM has developed resource management plans for the management of natural and cultural resources in its field offices. The status of consultations with these entities is not clearly described. Additionally, the draft repository SEIS does not appear to indicate whether the differing Native American viewpoints will be addressed further.

Other consultations discussed in the draft repository SEIS are:

- The Army Corps of Engineers: As discussed in section 3.1.4.1.1, the Corps has not determined whether some ephemeral washes in the Yucca Mountain area, such as Fortymile Wash, are classified as "waters of the United States." Such a classification could limit DOE's control over construction actions.

- The U.S. Fish and Wildlife Service: The draft repository SEIS reflects a change in the proposed action (i.e., the repository footprint). This change may not be reflected in the 2001 biological opinion prepared for the 2002 FEIS.

- The Nevada State Historic Preservation Office and the Advisory Council on Historic Preservation: the draft repository SEIS indicates that DOE is negotiating a programmatic agreement.

REFERENCING

6. Comment:

The draft repository SEIS contains examples where the current version of a reference is not cited, information in a reference is not appropriately paraphrased, or no reference is provided where one is needed. DOE should ensure that its referenced information is complete, up-to-date, appropriate, and accurate. DOE should also ensure that assertions or quantitative estimates that are not described in the text are properly referenced with supporting citations.

Basis:

Examples are presented below where referencing appears to be inappropriate or inadequate:

- Section F.2.10 provides few references to document the igneous intrusive and volcanic eruption modeling cases. In addition, section F.2.10.2 states that "DOE used information from the probabilistic volcanic hazard analysis," but provides no reference.

- Section 5.9 indicates that DOE has conducted analyses of potential nuclear criticality during the postclosure period. However, no references are provided for these studies.

- Section D.4 provides no listed references for how the calculations of doses for members of the public and non-involved workers were performed. Further, the numbers in Table D-9 for doses to involved workers do not appear to be consistent with the numbers provided in the reference.

- DOE based its analysis in section 3.1.3.3 on Wong and Stepp (1998) and Bechtel SAIC Company (2004). The information in these two reports has been updated. Also, the probabilistic seismic hazard evaluation for the Yucca Mountain area is a part of the National Seismic Hazard Map, which has been updated recently.

- Section 11.2.6 lists Native American concerns and laws regarding cultural resources. There is no mention, however, of State of Nevada laws and regulations that may be applicable to cultural resources.

- Sections S.3.1.8.2, 4.1.8.4, and E.7 list and paraphrase physical protection requirements taken from 10 CFR 73.51. The list is incomplete and some of the paraphrasing does not accurately reflect NRC requirements. For example, the draft repository SEIS states, "Adequate illumination must be provided for observation and threat assessment." However, 10 CFR 73.51(d)(2) states, "Illumination must be sufficient to permit adequate assessment of unauthorized penetrations of or activities within the protected area."

References:

Wong, I. G. and J. C. Stepp, "Probabilistic seismic hazard analyses for fault displacement and vibratory ground motion at Yucca Mountain, Nevada." A report to the U.S. Department of Energy, Oakland, California. 1998.

Bechtel SAIC Company, "The Preclosure Seismic Design Methodology for a Geologic Repository at Yucca Mountain." TDR-WHS-MD-000004, Rev 01. Las Vegas, Nevada: Bechtel SAIC Company. 2004.

BASES AND SUPPORTING STATEMENTS

7. Comment:

The technical bases supporting descriptions of the affected environment and the analyses of impacts need to be clear. The final repository SEIS should provide supporting statements or references as bases for conclusions. DOE should ensure that assertions or quantitative estimates are referenced with supporting citations.

Basis:

Examples where the bases to support statements in the draft repository SEIS appear to be inadequate or are not provided include:

<u>Affected Environment</u>

- Section 3.1.7.3 states, "In Nye County, Payments-Equal-to-Taxes from the Yucca Mountain Project are currently a major revenue source for the county," but provides no information or data to support this statement.

<u>Environmental Impacts of Repository Construction, Operation, Monitoring and Closure</u>

- Section 4.1.2 indicates that there would be no source of lead at the repository. However, concrete batch plants are a component of the proposed action. The standards for concrete batching referenced in the draft repository SEIS include emission factors for lead.

- Air quality impacts analyses presented in the draft repository SEIS were calculated using the AERMOD Modeling System instead of the Industrial Source Complex model used in the 2002 FEIS. The draft SEIS does not clearly indicate whether this change in models could affect the impacts assessed.

- Section 4.1.5 does not clearly discuss whether all of the "analyzed land withdrawal area" has been surveyed for cultural resources. Further, the term "physical disturbance" does not encompass potential adverse effects that are not physical (e.g., long-term access restriction to the sites).

- Section 4.1.8 states that all waste-handling operations would be remote and that workers would be in enclosed facility operating rooms isolated from the waste. However, recent DOE information (DOE, 2007) indicates that some local waste handling operations would occur.

Potential Accidents during Repository Operations

- Table 4-25 uses a crane drop rate to develop the frequencies for the first 12 accident scenarios listed. The same rate is used for dropped casks, dropped lids, dropped fuel assemblies, and fuel assembly collisions. The NRC staff understanding is that this value was developed from data in NUREG-1774 (NRC, 2003) for drops involving very heavy load lifts. The draft SEIS does not clearly indicate how this rate is applied to accident scenarios that do not involve a very heavy load lift.

- The draft SEIS addresses airborne activity releases by radionuclide for drops of commercial spent nuclear fuel, naval spent fuel, and high-level waste glass, but does not address DOE-owned spent nuclear fuel. Although section E.2.1.1 states that a safety strategy would preclude a breach of DOE canisters, it is not clear why this statement bounds potential impacts associated with DOE-owned spent nuclear fuel.

- Section E.2.1.2.2 does not discuss how the seismic design basis and associated design margins are sufficient to demonstrate appropriate consideration of reasonably foreseeable impacts that have potentially significant consequences, even if their probability of occurrence is low.

- Section E.2.1.2.1 does not discuss the basis for the bounding of impacts associated with an aircraft crash on surface facilities.

<u>Repository Performance</u>

- The draft repository EIS does not clearly identify the consequences (or lack thereof) on postclosure performance of the use of a standardized transport, aging and disposal (TAD) canister. With the exception of a statement concerning the increased thickness of Alloy-22 outer barrier, there appears to be no discussion of TAD canister effects on postclosure performance.

- Although section F.4.2.1.2 indicates that the dose from the igneous intrusion scenario has increased, the significant reduction of the dose from the extrusive scenario does not appear to be identified or discussed. The analysis supporting these results has not been adequately referenced.

- The approaches used to estimate median doses under conditions of uncertainty are not clearly described. For example, Figure F-17 shows a mean annual dose and a median annual dose for each scenario and for the combined set of scenarios. The calculation of the net mean annual dose is described in section F.4.3; however, it is not clear how the median total dose was determined.

- The discussion of release of metals from corrosion of the waste packages does not clearly identify the processes limiting the releases of metals. Specifically, section 5.2.2 states that corrosion would release certain metals, that some of this would precipitate, and that the amount remaining in solution would be subject to release from the repository. The reader could infer that release is dependent on solubility, but the calculation appears to assume that corrosion limits the release.

No Action Alternative

- Table 7-1 states that disproportionately high and adverse impacts on minority or low-income populations would be unlikely because there is no reason to believe they would be any more likely to be affected by job loss. Likewise, Table 7-2, Scenario 2 indicates that impacts would be large, with the potential for disproportionately high and adverse impacts on minority or low-income populations. No supporting information is provided for these statements.

- Table 7-2 estimates radiological health impacts on the public during the 10,000-year period to be less than those reported in section 7.2.2.5.3 of the 2002 FEIS. It is not clear why the estimated latent cancer fatalities decreased, given the risk factor has increased.

References:

DOE, "NRC/DOE Technical Exchange on Layout and Operations," Las Vegas, Nevada: DOE, Office of Civilian Radioactive Waste Management. May 2007.

NRC, *A Survey of Crane Operating Experience at U.S. Nuclear Power Plants from 1968 through 2002*, NUREG-1774. Washington, DC. July 2003.

CONSISTENCY

8. Comment:

The draft repository SEIS is not always consistent internally, with the draft rail EIS, or with the 2002 FEIS. The draft repository SEIS should be consistent internally, with the 2002 FEIS, and with the rail EIS, or inconsistencies should be justified.

Basis:

The draft repository SEIS contains internal inconsistencies or inconsistencies with the 2002 FEIS or draft rail EIS. Examples include, but are not limited to, the following:

- Chapter 3 and Appendix F indicate other locations where groundwater flowing under Yucca Mountain could discharge to the surface (e.g., Amargosa River, Franklin Lake Playa, and Death Valley). Chapter 5 only discusses impacts on groundwater resources at the location of the reasonably maximally exposed individual (RMEI). The final repository SEIS should explain why impacts on groundwater resources were only described at the RMEI location and not described for other locations, such as natural discharge points.

- Chapter 9 of the draft SEIS presents a summary of best management practices that can be used to reduce potential impacts. In the impacts analyses sections (Chapters 4, 5, and 6), DOE identifies numerous actions that it will use to reduce identified impacts. These are not all captured in Table 9-1.

- Although Chapter 4 discusses closure impacts on other resource areas, it does not include a discussion of the socioeconomic impacts of closing the repository. A discussion of closure impacts was included in the 2002 FEIS.

- Sections 4.1.13.3 and 8.2.13 of the draft repository SEIS conclude that no special pathways related to minority or low-income groups were identified. However, section 3.4.2.4 of the draft rail EIS refers to a Native American statement that "Loss of access to traditional foodstuffs and medicine has greatly contributed to undermining the cultural well being of Indian people."

- DOE's refinement of design and the proposed action led to information contained in the 2002 FEIS (e.g., accident scenario lists, thermal operating modes) being superseded. The draft repository SEIS does not clearly identify proposed action information from the 2002 FEIS that is no longer applicable and therefore not included in the draft repository SEIS. Other information that was included in the 2002 FEIS, such as project costs, does not appear to be included in the draft repository SEIS.

U.S. Nuclear Regulatory Commission's Comments on U.S. Department of Energy's Draft Supplemental EIS for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada, Nevada Rail Transportation Corridor, and Draft EIS for a Rail Alignment for the Construction and Operation of a Railroad in Nevada to a Geologic Repository at Yucca Mountain, Nye County, Nevada

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COMMENTS

CUMULATIVE IMPACTS

1. Comment:

The discussions of cumulative effects lack details in relation to actions at the Nevada Test and Training Range (NTTR); from combined groundwater withdrawals associated with the repository, new wells for the Caliente rail line, the Nevada Test Site (NTS), and NTTR; and from conflicts resulting from mineral and energy development along the Caliente rail line. The final rail EIS should provide more detailed analyses related to cumulative effects associated with NTTR actions that affect the boundary, combined groundwater withdrawals, and land use conflicts. Alternatively, the final rail EIS should state why the existing analyses are bounding.

Basis:

The Caliente rail alignment borders a portion of the northern boundary of the NTTR, as well as the entire western boundary. There are multiple continuing and anticipated new actions at the NTTR that may contribute to cumulative impacts associated with the rail line, especially with regard to the boundary. Section 5.2.2.6 considers the combined impact from rail construction and the NTS. However, no environmental assessment is included that considers the combined environmental impact from the sites and activities mentioned above. Concerning mineral and energy development conflicts, no basis is provided to support the conclusion in section 5.2.2.2.3 that related impacts would be small.

References:

CEQ, "Considering Cumulative Effects Under the National Environmental Policy Act," Council on Environmental Quality. Washington, DC. January 1997.

NRC, *Environmental Review Guidance for Licensing Actions Associated with NMSS Programs*, NUREG-1748. Office of Nuclear Material Safety and Safeguards. Washington, DC. August 2003

GEOLOGY

2. Comment:

The impact analysis of disruptive geologic events and related hazards on the rail system, shipments, and system safety appears to be incomplete. The final corridor SEIS and final rail EIS should include maps that identify potential geologic hazards (e.g., buried faults) relative to the rail corridor, as discussed in the examples above. The final rail EIS should also include a technical basis concerning the seismic safety standards DOE intends to implement for the Caliente rail system.

Basis:

The draft rail EIS identifies potential geologic hazards that may affect the construction and operation of a Nevada railroad, but the technical bases for the analysis of the potential impacts do not appear to be complete. Examples include:

- Section 3.2.1 concludes that the rail road, including bridges, culverts, and ancillary facilities, could be subject to the effects of earthquakes or surface fault displacements in the next 50 years. Earthquakes that occur outside the rail line map boundaries (not included in the draft rail EIS) may also impact the rail system if they are large or close to the boundary (e.g., earthquake on the Death Valley-Furnace Creek Fault).

- Active faults at or close to the surface are not mapped. Further, the draft rail EIS does not appear to discuss the occurrence of buried faults, which may affect the impacts associated with faulting along the rail line.

- Section 4.2.1.2.1.2 does not definitively state whether DOE would use the standard seismic guidelines of the American Railway Engineering and Maintenance-of-Way Association to design and operate the proposed railroad.

LAND USE

3. Comment:

The analyses of the potential impacts from the operation of borrow sites and quarrying operations for rail line construction appear to be incomplete. The final rail EIS should provide an analysis of the potential long-term impacts of quarrying operations. The final rail EIS should also provide the approximate locations and amounts of sand and gravel needed for subballast, concrete plants, and any other operations, and describe the associated impacts (or state why the assessment is bounding).

Basis:

Section 2.2.2.4.2 indicates that DOE is evaluating six potential quarry sites along the Caliente rail alignment. The draft rail EIS provides little or no description of the longer-term impacts of quarrying operations on air quality, water supplies and quality, drainage, or aesthetics. There is also little or no discussion of the potential restoration of the pit, piles and ponds, or hazards associated with abandoning these sites.

Sand and gravel from alluvial fans could be used for subballast material and as an aggregate for concrete. As stated in section 3.2.1.2.2.3, DOE has not evaluated sand and gravel sources with regard to subballast suitability or determined the potential locations of suitable borrow sites. Further, section 4.2.11.2.1.4 of the draft rail EIS does not fully evaluate the impact of sand and gravel production, given that both the location of the sources of the material and

the amount of material needed for the batch plants over the construction phase have not been provided.

4. Comment:

More information is needed for the description of the impacts of rail construction and operations co-located with underground mines and mining activity, and the potential consequences of mining on the safety of the railway and shipments. The final rail EIS should include a technical basis for its description of both potential impacts on mines by the proposed railroad operation and potential impacts on the proposed railroad caused by various mining activities. Alternatively, the final rail EIS should state why the analysis bounds potential impacts.

Basis:

The draft rail EIS does not completely address mining activities involving the storage, shipment, and use of explosives, which could impact the operation of the proposed rail line. Also, the potential effects on stability of underground openings such as existing mines, tunnels, and shafts from disturbance and vibrations of rail way construction and quarrying activities do not appear to be addressed.

The draft rail EIS does not discuss the extent and characterization of mines and tunnels potentially below the rail alignment, such as those contained in records of mining claims, mine inspection reports, direct observations, or geophysical surveys designed to detect underground openings.

5. Comment:

The draft rail EIS does not completely discuss potential impacts associated with mining rights and mining and energy leaseholders whose properties are near the Caliente rail alignment. The final rail EIS should discuss more completely the potential conflicts and impacts associated with existing and future mining and other resource activities. The final rail EIS should also discuss the impacts of any investigations that would be needed beyond the boundary of the rail line right-of-way.

Basis:

Section 4.2.2.2.6 of the draft rail EIS states that rail construction and operations would not affect mining activity, access to mining activity, or energy resource extraction. It further states that DOE would negotiate the surface rights across unpatented claims with claim holders. However, potential impacts may not be fully evaluated in the draft EIS if DOE has not completed investigations of design and safety issues or developed engineering solutions to potential construction and design problems. For example:

- DOE indicates that the Bureau of Land Management (BLM) could issue new unpatented mining and energy leases on lands near the rail line. However, the rail draft EIS does not indicate whether BLM would require a mining or

energy lease applicant to ensure non-interference with railroad construction or operations.

- Section 4.2.2.2.6.7 does not clearly indicate whether DOE needs to conduct invasive investigations outside the boundary of the construction right-of-way to determine the existence of any resource conflicts.

COMPLETENESS

6. Comment:

Some of the discussions of certain aspects of the affected environment and analyses of potential impacts are not sufficiently complete. DOE should ensure that its final corridor SEIS and final rail EIS present complete discussions of the affected environment and potential impacts.

Basis:

Affected Environment

- The rail alignment passes less than 2 kilometers (1.2 miles) north of both Dry Lake Playa (section 3.2.5.3.2 and Figure 3-61) and Mud Lake Playa (section 3.2.5.3.6 and Figure 3-69). The geotechnical characteristics of the ground beneath the alignment may be the same as the areas designated as playa; however, the draft rail EIS does not appear to discuss special construction considerations or impacts that may be associated with these features.

- Section 3.2.1.2.3 of the draft rail EIS states that soil surveys around the NTS and NTTR have not been completed. It further states that, for areas with no available soils data, DOE does not consider the unavailable data critical to the design and construction of a railroad along the Caliente rail alignment, because soils are expected to be similar to those already surveyed. However, there are attributes of the rail line in the last 5 percent of the proposed route that differ from previous descriptions (e.g., sand ramps around Busted Butte).

Environmental Impacts

- The draft rail EIS does not appear to discuss the risk of dispersive soil in arid regions. Construction of embankments using dispersive soils could result in rapid erosion during any flooding events.

- Section 4.2.5 of the draft rail EIS does not include average water quality values found below rail lines that are in use and that have a climate and sediments similar to those of the Caliente rail corridor. This information could characterize the effects of rail use on water quality below railroad beds, accounting for factors such as routine use of herbicides and other chemicals, as well as small but continual spills from lubricants and fuel.

- Section G.1.1 states that vertical groundwater flow can occur between aquifers and that part of the flow from pumping an aquifer may be derived

from vertical flow. However, potential impacts from the vertical flow of poor-quality water into the affected environment do not appear to be characterized.

- Section 4.2.5.2.1.7 states that the rail line would be designed to avoid springs whenever practicable. However, impacts are not documented for those discharge areas where avoidance is not possible.

- Table 4-54 of section 4.2.5.1 states that adverse impacts on wetlands or waters from altered drainage patterns are discussed. However, the draft rail EIS does not include this discussion.

BASES AND SUPPORTING STATEMENTS

7. Comment:

The technical bases supporting descriptions of the affected environment and the analyses of impacts need to be clear. DOE should ensure that the final rail EIS provides supporting statements or references as bases for conclusions. DOE should ensure that assertions or quantitative estimates are appropriately referenced with supporting citations.

Basis:

Affected Environment

- The draft rail EIS indicates that the risk of wind-blown soil deposits is relatively small but does not provide a clear basis for this conclusion. Deep bodies of wind-blown soils can accumulate in small canyons to depths of 15 feet (4.6 meters) or more, and the collapse potential can be 40 percent or more.

Environmental Impacts

- The draft corridor SEIS concludes that "No special pathways were identified," but does not provide a basis for the conclusion. However, section 3.4.2.4 of the draft rail EIS refers to a Native American statement that "Loss of access to traditional foodstuffs and medicine has greatly contributed to undermining the cultural well being of Indian people."

- The draft rail EIS does not clearly describe the ability of the Beatty Wash Bridge to withstand the largest design flood (Table F-4). The discussion in Appendix F of the flooding analysis does not include a technical basis for whether the proposed Beatty Wash bridge abutments and bridge supports affect the downstream flood potential of the Wash.

- Section 4.2.6 documents the perennial yield for each hydrographic area, but the impact on each aquifer is not clearly presented. For example, the draft rail EIS does not clearly discuss the affected aquifers and their yields or how the aquifer parameter values used in section G.1.2.2 were obtained. Also, groundwater basins and subbasins are not presented for the rail alignment areas.

- Section 4.2.6.2.2 states that DOE considered the possibility of intersecting cones of depression from the simultaneous pumping of the nearest existing well and the proposed new well; however, Tables 4-61 though 4-68 do not show the radius of influence of the nearest existing pumping well.

- Section 4.2.1.2.1.2 states that rail line construction activities, such as blasting and other cut procedures, would have the potential to induce rock falls and landslides. The draft rail EIS concludes that construction activity impacts would not include inducing earthquakes or reactivating faults. However, no clear technical basis is provided for the conclusion.

- Section 5.2.2.2.3 concludes that small cumulative impacts would be associated with potential mineral and energy development along the alignment. However, no clear basis for this conclusion is presented.

ENVIRONMENTAL JUSTICE

8. Comment:

The draft corridor SEIS and draft rail EIS reference outdated NRC guidance for environmental justice and do not accurately reflect NRC and Council on Environmental Quality (CEQ) guidance. DOE should correct its discussions regarding a low-income population. DOE should accurately reference or quote the NRC Policy Statement on environmental justice and CEQ guidance.

Basis:

Section 5.1.1.12 of the draft corridor SEIS and the draft rail EIS state that a low-income community exists when the low-income population percentage in the area of interest is *meaningfully greater* than the low-income population in the general population. CEQ guidance (Council on Environmental Quality, 1997) only uses the expression "meaningfully greater" in reference to evaluating disproportionate impacts on minority populations.

The draft corridor SEIS and draft rail EIS refer to NRC guidance to support its use of a 10 percent threshold for minority populations. Current NRC guidance (NRC, 2004) on environmental justice does not refer to a 10 percent threshold. Additionally, the documents state that the 20 percent threshold was "established by the Nuclear Regulatory Commission *and the Council on Environmental Quality*…" [emphasis added]. CEQ did not establish this threshold.

References:

CEQ, "Environmental Justice Guidance Under the National Environmental Policy Act." Council on Environmental Quality. Washington, DC. December 1997.

NRC, "Policy Statement on the Treatment of Environmental Justice Matters in NRC Regulatory and Licensing Actions." 69 FR 52040-52048, August 24, 2004.

CULTURAL RESOURCES

9. Comment:

The draft rail EIS does not describe clearly how DOE relates adverse effects determined under the Section 106 consultation process to the EIS discussion of small, moderate, or large impacts. This appears to have resulted in inconsistencies or gaps in some of the discussions of impacts (e.g., discussions of visual intrusion). The final rail EIS should clearly explain how potential impacts were assessed to be consistent with 36 CFR 800.5. Also, the final EIS should present its conclusions about impacts consistently.

Basis:

As defined in 36 CFR 800.5(1),"…an adverse effect is found when an undertaking may alter, directly, or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association...Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative."

The draft rail EIS either appears to omit impacts or does not clearly discuss impacts that could be considered adverse effects under 36 CFR Part 800. For example:

- Section 4.2.13.2 states that nearly all potential direct impacts on cultural resources, including those that would physically damage, alter, or disturb a historic property, would occur during the construction phase. However, visual intrusion effects from construction in remote areas are not discussed.

- Table 4-144 indicates that during operations, no additional direct or indirect impacts on cultural resources would occur, but section 4.2.13.2.2 states that trains using tracks may be a potential visual intrusion on the character of cultural landscapes.

- Section 5.2.2.13 states that, with ground disturbance associated with construction of the rail alignment, cultural resources could be destroyed, damaged, or discovered for recovery or mitigation. However, DOE concludes in the same section that impacts on cultural resources would be small, because DOE would conduct field surveys and implement mitigation measures.

10. Comment:

The draft rail EIS does not provide a clear discussion of the methodology used to assess archaeological resources in the context of National Register eligibility. The final rail EIS should clarify the criteria for the listing of archaeological resources on the National Register.

Basis:

Section 3.2.13 of the draft rail EIS states that "…archaeological resources are prehistoric or historic remains of human lifeways or activities that are at least 100 years old...." However, no basis is provided for this statement and it may not be consistent with the evaluation criteria in 36 CFR 60.4.

11. Comment:

The draft rail EIS does not clearly discuss cultural resource preservation in the context of the BLM visual resource classification rating system, especially with regard to Class III and Class IV landscapes. The final rail EIS should clarify how cultural landscapes that fall within BLM jurisdiction would be preserved, protected, and managed and clarify the applicability of the "State Protocol Agreement Between the Bureau of Land Management and the Nevada State Historic Preservation Office" and Section 110 of the National Historic Preservation Act.

Basis:

Section 3.2.13.3.4 states that several areas along the Caliente rail alignment have been assessed to contain potential cultural landscapes based on the criteria of historic and prehistoric activities. Many of these areas fall under Class III and IV of the BLM visual resource management system (BLM, 1986). Along the project areas, identified potential cultural landscapes that may be eligible for listing on the National Register include ethnographic, rural historic, and historic mining districts. As stated in the draft rail EIS, railroad construction and operation could lead to unavoidable changes in cultural landscapes.

References:

Bureau of Land Management, *Visual Resource Inventory*, Manual H-8410-1. Washington, D.C. 1986.

State Protocol Agreement Between the Bureau of Land Management and the Nevada State Historic Preservation Office (DN2001868743-ALA20050513.0262).

CONSULTATIONS

12. Comment:

The draft rail EIS does not state whether Section 4(f) of the Department of Transportation (DOT) Act needs to be applied in assessing and mitigating transportation impacts on cultural resources. The final rail EIS should clarify DOT's role with regard to the EIS and should clarify whether Section 4(f) is applicable to the proposed action. If Section 4(f) is applicable, the final EIS should include a discussion of how DOE intends to meet the associated requirements.

Basis:

Section 4(f) of the Act states that DOT should make special effort to preserve natural and cultural properties that are present in public park and recreation lands, wildlife and waterfowl refuges, and historic sites. Section 4(f) also requires DOT coordination with the Department of Interior in developing transportation plans involving public lands, such as parks, recreation areas, wildlife refuges, or land from historic sites of national, State, or local significance.

Additionally, the regulations implementing the National Historic Preservation Act (36 CFR 800.3(b)) state that the agency official should coordinate Section 106 consultation with other reviews required under other authorities and agency-specific legislation, such as 4(f) of the Department of Transportation Act. As stated in the Handbook on Departmental Review of Section 4(f) Evaluations (Department of the Interior, Office of Environmental Policy and Compliance, 2002), Section 4(f) "requires a more rigorous level of consideration for historic properties than does Section 106. Section 106 requires only that the effects on historic properties be considered and commented upon, while Section 4(f) requires that historic properties be used only if there is no feasible and prudent alternative."

Reference:

49 *Code of Federal Regulations* 1105; 49 CFR 1150; Section 4(f) of the Department of Transportation Act of 1966 (49 USC 303).