

**Compilation of DOE Responses to
Lincoln County/City of Caliente Comments
to the Yucca Mountain Final
Environmental Impact Statement**

**Prepared For:
Board of Lincoln County Board of Commissioners**

and

Caliente City Council

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Introduction

This document presents a compilation of comments submitted by various entities within Lincoln County on the Department of Energy's (DOE) Yucca Mountain Draft Environmental Impact Statement (DEIS) and the DOE's responses to said comments. This compilation represents only comments by Lincoln County entities and represents a small portion of the many thousands of total comments received by DOE on the DEIS. In many cases, DOE has revised the EIS in response to Lincoln County-based comments. In other situations, DOE has provided additional information or explanation in its response to the County-based comment. In both cases, DOE's responses to Lincoln County-based comments sheds light on various facets of the Yucca Mountain Repository System, particularly transportation. After reviewing DOE's responses to Lincoln County-based comments and reviewing the Final EIS, the Board of Lincoln County Commissioners, in consultation with the City of Caliente and their Joint City/County Impact Alleviation Committee prepared comments to the DEIS, a copy of which is included in Appendix A. These comments were subsequently submitted to DOE for consideration.

The numbering system utilized in this document is the same as that included in DOE's comment response document. The numbers represent the Section (ie. 1.1) within which the comment applies and the number assigned by DOE for the comment (ie. 40). In some cases, DOE has summarized several comments and prepared a single response to said summarized comment. Those situations are denoted for example as "24 comments summarized" in the sections below. Where such notation does not exist, the comment was from a single party.

Board of Lincoln County Commissioners (on behalf of the County and the City of Caliente)

1.1 (40)

COMMENT

Commenters suggested that Section 1.3 of the EIS discuss repository siting activities at Lyons, Kansas including why the site was not developed and lessons that can be applied to the Yucca Mountain project.

It was also noted that the determination that a mined deep geologic repository is the best treatment alternative offers information from analyses that are at least 20 years old. If newer studies or reviews have been completed, or if other findings support or dispute these conclusion, the EIS should reference them. In light of the technological advancement, should other alternatives be considered?

RESPONSE

The research studies conducted in a Lyons, Kansas salt mine led to a better understanding of the potential for use of bedded salt deposits for the disposal of high-level radioactive waste. Lessons learned from that research were incorporated in the technical basis for disposal of radioactive waste and into the siting guidelines for a repository, which have evolved since then.

Virtually every expert group that has examined the disposal of high-level radioactive waste (including spent nuclear fuel) has agreed that a geologic repository is the best approach. For more than 40 years, the National Academy of Sciences (NAS), through the National Research Council, has conducted studies on high-level radioactive waste and spent nuclear fuel. Over the course of this period, the Academy has repeatedly mentioned geologic disposal as the preferred method for managing this waste. For example, a panel of the National Academy of Sciences noted in 1990 that there is a worldwide scientific consensus that deep geologic disposal is the best option for disposing of high-level radioactive waste (DIRS 100061-National Research Council 1990). Their May 2001 report *Disposition of High-Level Waste and Spent Nuclear Fuel: The Continuing Societal and Technical Challenges* (DIRS 156712-National Research Council 2001), reaffirms this position. The Academy maintains that "geologic disposal remains the only scientifically and technically credible long-term solution available to meet the need for safety without reliance on active management." This long-term solution would minimize the burden placed on future generations and provide the greatest degree of security from outsiders.

1.1 (7168)

COMMENT

The purpose and need of the environmental impact statement described here should make explicit reference to the potential use of the document in informing the Secretary of Energy, the President and the Congress regarding the need for new legislation.

RESPONSE

Under the NEPA, if DOE decided not to proceed with the development of a repository at Yucca Mountain, it would prepare a report to Congress with its recommendations for further action. To ensure the safe permanent disposal of spent nuclear fuel and high-level radioactive waste would include the need for new legislative authority.

1.2 (81)

COMMENT

Commenters question DOE's decision making process with respect to the transportation of spent nuclear fuel and high-level radioactive waste. One comment stated that it is not clear whether the Secretary of Energy's determination whether to recommend the Yucca Mountain site to the President will include consideration of transportation issues. Other commentaries stated that the Draft EIS Does not provide the information necessary to make transportation mode and routing decisions. Without the necessary information, environmental, socioeconomic, and public health and safety impacts could occur without mitigation.

If the proposed repository is approved on the basis of the EIS, DOE will begin to make a substantial commitment of resources to the proposed repository even though the method of transportation to the site has not been determined. This could result in forcing a transportation-related decision that results in unacceptable adverse impacts. This is the scenario the National Environmental Policy Act process is designed to avoid.

RESPONSE

The Secretary of Energy will consider the potential impacts associated with the transportation of spent nuclear fuel and high-level radioactive waste, among other factors, when determining whether to recommend Yucca Mountain as the site of this Nation's first monitored geologic repository. DOE believes that the EIS adequately analyze environmental impacts that could result from either the Proposed Action or the No-Action Alternative. This belief is based on the level of information and analysis, the analytical methods and approaches used to represent conservatively the reasonably foreseeable impacts that could occur, and the use of bounding assumptions where information is incomplete or unavailable, or where uncertainties exist.

DOE, also believes that the EIS provides the environmental impact information necessary to make certain broad transportation-related decisions, namely the choice of a national mode of transportation outside Nevada {mostly rail or mostly legal-weight truck), the choice among alternative transportation modes in Nevada {mostly rail, mostly legal-weight track, or heavy-haul truck will use of an associated inter modal transfer station), and the choice among alternative rail corridors or heavy-haul truck routes with use of all associated inter modal transfer station in Nevada.

DOE has identified mostly rail as its preferred mode of transportation, both nationally and in tile State of Nevada. At this time, however, the Department has not identified a preference among the five potential rail corridors in Nevada.

If the Yucca Mountain site was approved, DOE would issue at some future date a Record of Decision to select a mode of transportation. If, for example mostly rail was selected (both nationally and in Nevada), DOE would then identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly tile State of Nevada. In this example, DOE would announce a preferred corridor in the *Federal Register* and other media. No sooner than 30 days after the announcement of a preference, DOE would publish its selection of a rail corridor in a Record of Decision. A similar process would occur in the event that DOE selected heavy-haul truck as its mode of transportation in the State of Nevada. Other transportation decisions, such as the selection of a specific rail alignment within a corridor, would require additional field surveys, State and local government and Native American tribal consultations,

environmental and engineering analyses, and NEPA reviews.

1.2 (243)

COMMENT-68 comments stated that the DOE has already decided to construct, operate and monitor and eventually close a repository at Yucca Mountain, regardless of scientific evidence disqualifying the site, and without public concerns. These commentaries believe that the EIS and the hearing process are a “rubber stamp”, and that DOE is trying to “ram the repository down our throats” rather than objectively study the site and then decide based on the evidence.

RESPONSE-This EIS is specifically for Yucca Mountain and doesn’t consider other sites. DOE believes that it has performed site characterization activities, as well as the analyses conducted to support the preparation of the EIS, in an open and honest fashion, consistent with the Nuclear Waste Policy Act (NWPA) and the National Environmental Policy Act. Under no circumstances has DOE manipulated data or assumptions to obtain desired results. If the site was recommended and approved, the Commission would not license a repository unless DOE could demonstrate with “reasonable expectation” that it could meet the regulatory standards.

2 (132)

COMMENT-Commenters asked for additional description and analysis of the effectiveness and feasibility of the active and passive institutional controls described for use at the proposed repository. One comment recommends that the Final EIS clarify the extent to which the Energy Policy Act of 1992 requires active institutional control of the Yucca Mountain site and estimate the environmental impacts associated with a scenario that incorporates such control. Another commenter believes that the passive institutional control of the Proposed Action and the No-Action Alternative provide for only 100 years of monitoring, which the commenter stated is illogical given the known half-life of the placed materials. The same commenter stated that the EIS is insufficient because the post closure monitoring period is inadequate.

RESPONSE-DOE understands that ensuring public safety requires continued stewardship and has developed programs to ensure the long-term safety after closure. These programs would include, but would not be limited to, long-term monitoring of the site and maintaining the integrity and security of the proposed repository.

After repository closure, SOE would be responsible for maintaining institutional control over the repository, consistent with the Energy Policy Act of 1992. Neither the extent nor the length of this regulatory requirement is well defined at present. However, DOE intends to maintain appropriate institutional controls for as long as necessary.

DOE would design and implement a post closure monitoring program consistent with the Nuclear Regulatory Commission regulations at 10 CFR Part 63. Prior to repository closure, DOE would submit a license amendment application to the Nuclear Regulatory Commission for review and approval. The license amendment application would include, among several items:

1. An update of the assessment of the repository performance for the period after closure,
2. A description of the post closure monitoring program
3. A detailed description of the measures to be employed to regulate or prevent activities that could impair the long-term isolation of the spent nuclear fuel and high-level radioactive waste, and to preserve relevant information for use by future generations.

The application also would describe DOE’s proposal for continued oversight to prevent any activity at the site that would pose an unreasonable risk of breaching the repository’s engineered barriers, or increase the exposure of individual members of the public to radiation beyond limits allowed by the Nuclear Regulatory Commission. This final EIS describes the types of monitoring and other institutional controls that would be contemplated; however, the details of this program would be defined during the consideration of the license amendment application for closure. This would allow DOE to take advantage of new technological information.

For impact analysis purposes only, the EIS assumed that passive institutional controls would be applied after repository closure, as described in Section 2.1.2.4. DOE chose to analyze passive institutional controls for the post closure period based on recommendations by the National Research Council of the National Academy of Sciences (consistent with the Energy Policy Act. The National Research Council concluded that: “because it is not technically feasible to assess the probability of human intrusion into a repository over the long term, we do not believe that it is scientifically justified to incorporate alternative scenarios of human intrusion into a fully risk-based compliance assessment that requires knowledge of the character and frequency of various intrusion scenarios”. (DIRS 100018-National Research Council 1995) The National Research Council recommended that the only human intrusion scenario to be considered is inadvertent drilling into the repository. The EIS assumed active institutional controls for at least 50 years and possibly more than 300 years under both the Proposed Action and Scenario 2 of the No-Action Alternative.

3.1 (7179)

COMMENT

Page 2-5 Figure 2-4. This figure should include a rail to legal-weight truck alternative.

RESPONSE-

Section J.21 discusses a rail-to-legal-weight truck scenario. Rail-to-legal-weight truck is not one of the defined alternatives for transporting waste. Therefore, the Department of Energy has not modified the figure.

3.1 (7189)

COMMENT

Page 2-59 Section 2.2. In addition to serving as a baseline, the text here should also recognize that the No-Action Alternative is a choice that could be selected for implementation by the Secretary of Energy in a subsequent Record of Decision.

RESPONSE

The purpose of No-Action scenarios 1 and 2, as defined in the EIS, is for use in the analysis and to provide a basis for comparison to the Proposed Action. Section 113© (1) of the NWSA directs the Secretary of energy to evaluate the suitability of the Yucca Mountain site for an application for authority to construct a repository at the site. If the Secretary decided not to recommend the Yucca Mountain site, the NWSA provides a process for DOE to follow. Section 113©(3)(F) of the Act states that if the Secretary at any time determines that the Yucca Mountain site is unsuitable for development as a repository, the Secretary, within 6 months, is to report to Congress “recommendations for further action to assure the safe, permanent disposal of spent nuclear fuel and high-level radioactive waste...” (See Section 2.2 and 7.1 of the EIS.)

3.1 (7218)

COMMENT

Page 3-115 4th paragraph. The second sentence in this paragraph appears to be incomplete.

RESPONSE

DOE has deleted the incomplete sentence.

3.1 (7226)

COMMENT

Page 4-4 3rd full paragraph. A fourth bullet needs to be added for Rail to Legal-Weight Truck. Such a scenario must be considered in the FEIS.

RESPONSE

This comment suggests adding a bullet describing a rail-to-legal-weight scenario in Section 4.1 of the EIS, in the subsection on Repository Analytic Scenarios. This subsection discusses cask-receiving scenarios. Section J.2.1 of the EIS now discusses the DOE evaluation of a scenario in which all waste would arrive in

Nevada in legal-weight truck casks on railcars and would transfer to legal-weight trucks to continue to Yucca Mountain.

3.2 (51)

COMMENT-Commenters stated that the DOE failure to consider a range of alternatives violates the National Environmental Policy Act and presents the public and decision makers with no real comparative analyses of other possible alternatives. Commentaries stated that just because the NWPA says that DOE “need not consider” other alternatives, this should not prohibit DOE from doing so. Other alternatives suggested for evaluation were disposal at other sites, onsite storage at current sites, transmutation, interim storage at existing sites and/or one or more centralized locations, volume reduction and consolidation at existing sites, other available technologies for storage, and alternatives to minimize impacts.

Commenters stated that the National Environmental Policy Act requires an analysis of all reasonable alternatives, and could include those that are beyond the jurisdiction of DOE or that might require new legislation.

RESPONSE-The NWPA (Sections 114(f)(2) and (3) provides that DOE need not consider in the EIS the need for a geologic repository or alternative to isolating spent nuclear fuel and high-level radioactive waste in a repository (see Section 1.5 of the EIS). In addition, the EIS Does not have to consider any site other than Yucca Mountain for development of a repository. For these reasons, this EIS Does not analyze alternatives other than the Proposed Action and No-Action Alternative.

Prior to the passage of the Nuclear Waste Policy Act of 1982 (Public Law 97-429, 96 Stat. 2201), Congress based its decision to pursue geologic disposal, in part, on the Final Environmental Impact Statement, Management of Commercial Generated Radioactive Waste (DIRS 104832-DOE 1980). In that EIS, DOE examined the environmental impacts that could occur from the implementation of various technologies for the management of spent nuclear fuel.

The NWPA prohibits the Nuclear Regulatory Commission from authorizing the emplacement of more than 70,000 metric tons of heavy metal (MTHM) until a second repository is in operation. However, in response to comments received during the EIS scoping process (see Section 1.5.1.1 of the EIS); DOE evaluated the disposal of more than 70,000 MTHM as a reasonably foreseeable future action. The cumulative impacts discussion in Chapter 8 acknowledges that the emplacement of more than 70,000 MTHM would require legislative action by Congress unless a second licensed repository was in operation. DOE analyzed the NO-Action Alternative to serve as a basis for comparing the magnitude of potential environmental impacts of the Proposed Action (see Chapter 7 of the EIS). Under the No-Action Alternative, and consistent with the HWP, DOE would terminate activities at Yucca Mountain and undertake site reclamation to mitigate significant adverse environmental impacts. In addition, DOE would prepare a report to Congress containing DOE’s recommendations for further action to ensure the safe, permanent disposal of spent nuclear fuel and high-level radioactive waste, including the need for new legislative authority. Under any future course that would include continued storage at the generator sites, commercial utilities and DOE sites would have an obligation to continue managing these materials in a manner that protected public health and safety and the environment. However, the future course that Congress, DOE, and commercial utilities would take if Yucca Mountain was not approved remains uncertain.

3.2 (59)

COMMENTS - 24 comments summarized

Commenters stated that the Draft EIS is not capable of supporting a decision by the Secretary of Energy to recommend the Yucca Mountain site to the President as a geologic repository. The document fails to analyze a sufficient range of alternatives; ignores comments raised during scoping; analyzes incomplete, imagined plans and scenarios; or has too many uncertainties. Therefore, DOE cannot use the document as the basis for choosing a specific design for submittal to the Nuclear Regulatory Commission for licensing. As DOE acknowledges in the Draft EIS, field surveys, state and local government consultations, environmental and engineering analyses, and additional National Environmental Policy Act reviews will be necessary. This demonstrates that the EIS is not complete. Decisions are being based on an inadequate

geologic site and the use of nonexistent, untested transportation and storage casks on unknown routes. Neither members of the public nor Congress can make a decision when DOE does not know the repository design, how much waste is going to go into the repository, or how it is going to get there.

Similarly, the EIS cannot support DOE decisions on transportation modes and routes. In particular, commenters stated that the analysis of transportation impacts in Nevada fails to include a broad range of implementing alternatives and, thus, is insufficient for making modal, corridor, and route decisions. In addition, the floodplain analysis is insufficient for corridor and route selection. A new EIS is required before DOE can make these decisions.

RESPONSE

DOE believes that the EIS adequately analyzes the environmental impacts that could result from either the Proposed Action or the No-Action Alternative. This belief is based on the level of information and analysis, the analytical methods and approaches used to represent conservatively the reasonably foreseeable impacts that could *occur, and* the use of bounding assumptions where information is incomplete or unavailable, or where uncertainties exist.

For the same reasons, DOE believes that the EIS provides the information necessary to make decisions on the basic approaches to transporting spent nuclear fuel and high-level radioactive waste (such as rail or truck shipments), as well as the choice among alternative rail corridors in Nevada. However, follow-on implementing decisions, such as the selection of a specific rail alignment in a corridor, or the specific location of an inter modal transfer station or the need to upgrade heavy-haul track routes, would require additional field surveys; State, local, and Native American government consultations; environmental and engineering analyses; and National Environmental Policy Act reviews.

As discussed in Section 2.1.1 of the Draft EIS, the Proposed Action included the then-current design for the repository and for the construction, operation and monitoring, and closure of the repository. However, since the publication of the Draft EIS, DOE improved its understanding of the interactions of potential repository features with the natural environment, and the advantages of a number of design features (such as titanium drip shields) to enhance waste containment and isolation. DOE published a Supplement to the Draft EIS that focused on the most recent design enhancements (called the flexible design), including various operating modes to manage heat generated by placed spent nuclear fuel and high-level radioactive waste.

The NWPA requires DOE to use casks certified by the Nuclear Regulatory Commission when transporting spent nuclear fuel and high-level radioactive waste to a repository. The Commission certifies that a cask meets the requirements of 10 CFR Part 71, which prescribes cask testing. As part of its detailed technical review, the Commission decides what level of physical testing or analysis is appropriate and necessary for each cask design. If the applicant for a certificate fails to demonstrate compliance with the regulations, the Commission will not issue a certificate. Therefore, if full-scale testing is necessary, it will occur before the Commission issues a certificate of compliance.

DOE developed implementing alternatives and analytical scenarios to ensure that it considered the range of reasonably foreseeable environmental impacts that could result from the Proposed Action. In developing the scope of the Proposed Action, DOE considered the comments and information received and modified the analytical approach to the EIS accordingly (see Section 1.5). For the EIS, DOE used information from a broad range of studies to obtain or evaluate the information needed for the assessment of Yucca Mountain as a monitored geologic repository. In addition, the Department received input from a number of organizations including universities, other Federal agencies, the State of Nevada, counties, municipalities, other local governments, and Native American tribes. Section 2.5 of the EIS indicates that the results and conclusions of these studies and associated analyses often have associated uncertainties. Uncertainties could be the result of assumptions, the complexity and variability of the process, the use of incomplete information, or the unavailability of information. In such instances, the EIS describe the uncertainties associated with the results.

If information is incomplete or unavailable or if uncertainties exist, analysts commonly identify

assumptions to enable their evaluations to proceed. In such instances, the assumptions (and analytical methods) in the EIS conservatively represent (that is, tend to overestimate) the reasonably foreseeable impacts that could occur from the Proposed Action or the No-Action Alternative.

For example, in Section G. 1.1 of the EIS, the total non radiological air quality impacts are the sum of the calculated maximum concentrations, regardless of wind direction. This conservatively maximizes air quality impacts. As another example, DOE based the estimated radiological impacts from the transportation of spent nuclear fuel and high-level radioactive waste on the maximum allowable radiation dose rate from the side of a transport vehicle.

DOE applied this type of approach to conservative estimates of impacts to other resources, as discussed in the EIS.

As noted, DOE would undertake additional field surveys; State, local, and Native American government consultations; environmental and engineering analyses; and National Environmental Policy Act reviews for certain transportation-related implementing decisions, such as the selection of a specific rail alignment in a corridor.

3.2 (64)

COMMENT

Many commenters said that the No-Action Alternative is not reasonable because neither scenario would ever be seriously considered, much less implemented. The resulting impacts from the two No-Action scenarios are, therefore, overstated and, by comparison, make development of a repository at Yucca Mountain seem safe and reasonable. Commenters stated that if an alternative is not reasonable then the comparison is not reasonable. Therefore, comparing the impacts of the No-Action Alternative to the impacts of the Proposed Action is meaningless and in violation of the requirements of the National Environmental Policy Act and its Council on Environmental Quality implementing regulations.

Some commenters said DOE should develop reasonable No-Action Alternatives such as centralized or regional interim storage, onsite above ground monitored storage, and waste encapsulation. Others said the No-Action Alternative should assume that the waste would remain at the generator sites and that the utilities would continue to manage it. Using 10,000 years for the No-Action Alternative seemed arbitrary to some. They suggested instead that the No-Action timeframe should be the foreseeable future, and it should consider the development of new technologies, as well as onsite waste storage buildings that would last much longer than 100 years. Some commenters stated that DOE is obligated to rigorously explore and objectively evaluate all reasonable alternatives, even if these alternatives are outside the scope of what Congress has approved or funded. In this way the findings of the EIS can serve as the basis for modifying the Congressional mandate to dispose of nuclear waste in a mined geologic repository. Others said that DOE should have developed and evaluated the No-Action Alternative to a level of detail that is equivalent to the Proposed Action. Similarly, some commenters said the impacts of the No-Action Alternative should be examined on a site-specific basis, rather than using representative sites and mathematical models. Others said that the impact analyses for the No-Action Alternative did not go far enough in evaluating social, economic, and political impacts. The unbalanced treatment of the Proposed Action and the No-Action Alternative, in the view of some, cripples informed decision-making. Still others said that the NWSA describes a process that would occur if the Yucca Mountain site was determined to be unsuitable. Therefore, DOE should have developed a "best guess" as to the type of nuclear waste program that would replace Yucca Mountain, and then evaluate it under the No-Action Alternative. This could be some form of at-reactor storage for 50 to 100 years combined with waste-reduction technologies, followed by a process to site and construct storage and disposal facilities.

Some commenters stated that leaving waste at current storage facilities is not reasonable because the facilities were never intended to become permanent storage sites, and if the No-Action Alternative was implemented it would result in unacceptable health effects. These commenters stated that if waste was left at current storage locations, this action would be contrary to the NWSA, which requires DOE to dispose of the waste in a repository.

In the NWPA, Congress acknowledged that the Federal Government is responsible for the permanent disposal of spent nuclear fuel and high-level radioactive waste (see Section 1.3.2 of the EIS). To that end, Congress directed the Secretary of Energy to determine whether to recommend approval of the Yucca Mountain site to the President. In that connection, the NWPA Does not direct DOE to examine any other methods of storage or disposal or continuing storage at existing sites because this is not the policy of the Federal Government.

The NWPA does, however, direct DOE to prepare an EIS to accompany any Site Recommendation to the President. In that connection, the NWPA specifies that DOE need not consider in the EIS the need for a repository, alternatives to geologic disposal, or alternative sites to Yucca Mountain (see Section 1.5 off the ELS). Although the NWPA Does not require an evaluation of alternatives to a repository in this EIS, DOE evaluated a No-Action Alternative to provide a basis for comparison to the Proposed Action.

With regard to the reasonableness of the No-Action Alternative, DOE considered guidance in the Council on Environmental Quality's "Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations" (46 *FR* 18026, March 23, 1981). This guidance defines the No-Action Alternative as "... no change from current management direction or level of management authority...." For this reason, DOE believes that continuing to store spent nuclear fuel and high-level radioactive waste at 77 commercial and DOE sites is an appropriate conceptual descriptor of the No-Action Alternative.

As stated in Section 2.2 and Chapter 7 of the EIS, if Yucca Mountain was not approved, DOE would terminate activities at the site and undertake site reclamation activities. In addition, DOE would prepare a report to Congress, with DOE's recommendations for further action to ensure the safe, permanent disposal of spent nuclear fuel and high-level radioactive waste, including the need for new legislative authority. Under any future course that would include continued storage at the generator sites, commercial utilities and DOE would have to continue managing spent nuclear fuel and high-level radioactive waste in a manner that protected public health and safety and the environment. However, the future course that Congress, DOE, and the commercial utilities would take if Yucca Mountain is not approved is uncertain.

DOE's assumption of a loss of institutional control after approximately 100 years is based on a review of generally applicable Environmental Protection Agency regulations for the disposal of spent nuclear fuel and high-level radioactive waste (40 CFR Part 191), Nuclear Regulatory Commission regulations for the disposal of low-level radioactive material (10 CFR Part 61), and the National Research Council report on standards for the proposed Yucca Mountain Repository (DIRS 100018-National Research Council 1995), which generally discount the consideration of institutional control for periods longer than 100 years in performance assessments for geologic repositories. As noted above, assuming no effective institutional control after 100 years provides a consistent analytical basis for comparing the No-Action Alternative to the Proposed Action.

Chapter 7 and Appendix K of the EIS contain additional information about the No-Action Alternative scenarios.

In determining the most appropriate approach to examining the human health impacts from the No-Action Alternative, DOE considered the mechanisms that would most affect the release rate of the radionuclide inventory at the 77 DOE and commercial sites. The release rate would depend primarily on the interactions between environmental conditions (rainfall, freeze-thaw cycles) and engineered barriers (see Section K.2.1.6 of the ELS). Rather than perform 77 separate analyses, DOE chose to simplify its approach by dividing the country into five regions, each region containing a single hypothetical site that would store all spent nuclear fuel and high-level radioactive waste existing in that region. However, to ensure that the regional analyses reflect actual conditions, DOE used the spent nuclear fuel and high-level radioactive waste inventories, engineered barriers and environmental conditions for each of the sites in each region. Weighting criteria also were developed such that the results of the analyses for the hypothetical sites were representative of the sum of the results of each actual site, if they had been analyzed independently.

In addition, because the purpose of the No-Action Alternative is to provide a basis for comparison with the Proposed Action, DOE has tried to be consistent with the analyses of the Proposed Action, as appropriate. Regarding long-term analyses, for example, Section K. 1 notes that DOE did not want to influence the

results to favor the Proposed Action, and thus used assumptions for the No-Action Alternative that minimized predicted impacts. Section K.4 of the EIS discusses examples of these assumptions and their effects on the outcome of the impact analyses. Based on the above, DOE believes that the environmental impacts of the No-Action Alternative discussed in Chapter 7 and Appendix K are not overstated.

3.2 (80)

COMMENT

Comments stated that the Draft EIS is inadequate, does not provide sufficient information, and is substantively and legally deficient. Some commentaries stated that the document does not conform to the National Environmental Policy Act (NEPA), the NEPA implementing regulations promulgated by the Council on Environmental Quality, or DOE's NEPA implementing regulations. Commentaries identified deficiencies and inadequacies in general, but without technical, analytical, or regulatory specificity. On the other hand, some commentaries stated that the Draft EIS was comprehensive and that DOE's analysis demonstrates that the Federal Government is adequately studying the science and examining the impacts that a geologic repository at Yucca Mountain would have on the environment.

RESPONSE

DOE believes that the EIS is consistent with NEPA and NWPA requirements. The level of information and analyses, the analytical methods and approaches used to represent conservatively the reasonably foreseeable impacts that could occur, and the use of bounding assumptions to address incomplete or unavailable information or uncertainties provide a meaningful assessment of environmental impacts consistent with the applicable requirements. DOE agrees that the scope of the Yucca Mountain Project and, thus, the EIS is complex and has unique features. In the EIS, DOE used the best available information from a broad range of studies to obtain or evaluate the information needed for the assessment of Yucca Mountain as a monitored geologic repository. These include, for example reports and studies sponsored by DOE, other Federal agencies, the State of Nevada, universities, the National Academy of Sciences, and affected units of local government (see Chapter 3 for more information).

3.2 (84)

COMMENT

Commenters stated that in developing the EIS, DOE largely ignored information, analyses, and issues presented by counties, communities, the State of Nevada, and other entities during the scoping period for the EIS. Also that the EIS is largely unresponsive to issues of most concern to the communities. Commenters said that, without an evaluation of this information for each community DOE decisions will be invalid.

RESPONSE

DOE received input during the scoping process from the public and a number of organizations including universities, other Federal agencies, the State of Nevada, counties, municipalities, other local governments, and Native American tribes. If the information represented a substantive view, DOE made every effort to incorporate that view in the EIS and to identify its source. In addition, DOE identified comments and information it believes are unrelated to the scope or content of the Proposed Action (such as the constitutional basis for disposal in Nevada) or would have resulted in uncertain or speculative analyses that would not have been meaningful to any individual making a decision.

3.2 (1240)

COMMENT-Page 29 of the County/City EIS Scoping Report points out the need for the DEIS to consider distribution equity. Nowhere in the DEIS could we find any consideration of the inequitable distribution of risk and related impacts which will accrue to south central Nevada.

RESPONSE- As discussed in Section 1.5.1 of the EIS, DOE received input from the public and a number of organizations during the scoping process. DOE considered that input, and modified the analytical approach to the EIS as appropriate. In addition, DOE identified comments and information, such as those on distribution equity, that it believes unrelated to the scope or content of the EIS, or comments for which analyses would be uncertain and speculative. (Section 1.5.1 has been modified accordingly.)

3.2 (1242)

COMMENT-If the DOE renders any decisions based upon the content within the DEIS, such decisions will be made without sufficient knowledge of the consequences of such actions upon the residents, visitors, institutions and environment of Lincoln County and the City of Caliente. The DOE's failure to consider issues of concern to Lincoln County and the City of Caliente will preclude effective minimization of impacts and maximization of benefits. DOE is encouraged to prepare a Final EIS, which addresses concerns raised in scoping by Lincoln County and the City of Caliente and which presents viable proposals for mitigation and compensation of impacts.

RESPONSE-The EIS examines socioeconomic impacts to Lincoln County in Sections 4.1.6 (for the repository) and 6.3 (for waste transport in Nevada). With regard to mitigation of impacts, any decision to provide assistance under Section 116 of the NWPA would be based on an evaluation of a report submitted by an affected unit of local government or the State of Nevada that documented probable economic, social, public health and safety, and environmental impacts, as described in Chapter 9.

3.2 (1299)

COMMENT-Lincoln County and the City of Caliente recognize however, that many compelling reasons exist to move waste to a central repository, not the least of which may be to achieve long-term health and safety benefits. The fact remains that if waste is brought to Nevada, risks will be minimized or eliminated at existing storage sites and concentrated in south-central Nevada. Table 2-7 of the DEIS indicates that during the emplacement phase of the repository, risks will be highest along the transportation corridors used to move waste to Yucca Mountain. Lincoln County and the City of Caliente see this shifting of risks from current storage sites to Nevada as a question of equity, one that is not addressed at all within the DEIS. At a minimum, the Final EIS should provide an estimate of the cost and risk benefits which will accrue to the Nation by moving waste to Nevada.

RESPONSE-DOE believes that the EIS presents the requested information. The EIS compares the environmental consequences of the Proposed Action to construct, operate and monitor, and eventually close a repository to those of the No-action Alternative, in which the materials would remain at the current storage sites. For example, Sections 2.1.5 and 2.2.3 provide cost estimates for the Proposed Action and the No-Action Alternative, respectively.

3.2 (7030)

COMMENT-The Board of Lincoln County Commissioners and the Caliente City Council expect DOE to give full consideration of all comments to the DEIS presented within this document. The County and City anticipate these and other comments offered in response to the DEIS will warrant important changes to the draft document. In the event that substantive changes to the draft are necessary, the County and the City of Caliente request that DOE consider reissuing the DEIS for further review and comment. Lincoln County and the City of Caliente will not hesitate to pursue all avenues afforded by federal and state law to ensure that repository impact issues important locally are fully addressed within the final environmental impact statement and subsequent Record of Decision. The County and City will be particularly interested to see that negative aspects of the repository system are indeed identified and that the FEIS and Record of Decision include substantive commitments to mitigation. Given that the repository and attendant transportation systems are not desired by any state in the Nation, but are being imposed on Nevada and its locales, Lincoln County and the City of Caliente believe that the FEIS and Record of Decision must include commitments by DOE to seek to compensate Nevada for the unwanted burden of hosting the Yucca Mountain project.

RESPONSE

DOE recognized that since it published the Draft EIS, key aspects of the design had changed in ways that would be important to repository performance and reduction of uncertainties. To provide updated information to the public, DOE published the Supplement to the Draft EIS, which focused on the most recent design. This Final EIS incorporates the results of public comments on the Supplement.

-With regard to a Record of Decision, Section 114(a) (1) of the NWSA authorizes the Secretary of Energy to determine whether to recommend approval of the Yucca Mountain site to the President for development as a repository for the disposal of spent nuclear fuel and high-level radioactive waste. A comprehensive statement of the basis for the recommendation, including a Final EIS, would have to accompany such a recommendation. However, the decision to approve the site rests not with the Secretary, but with the President and Congress, if necessary. Because the President and Congress would make this decision, DOE does not anticipate a Record of Decision if the Secretary recommended the site to the President.

-DOE regulations (10 CFR 1021.331) require preparation of a Mitigation Action Plan if mitigation measures are identified in a Record of Decision. Because DOE Does not anticipate issuing a Record of Decision regarding and approval recommendation, it might not prepare a Mitigation Action Plan. However, the Yucca Mountain site, if approved in accordance with provisions of the NWSA, would be subject to licensing by the Nuclear Regulatory Commission. DOE, in submitting its application to build and operate the repository, would identify relevant commitments, including those identified in the Final EIS, to the Commission for its consideration, and could reasonably expect a comprehensive set of mitigation measures or conditions of approval of approval to be part of the licensing process.

DOE anticipates that the project plan and design will continue to evolve, creating additional opportunities for mitigation and potentially eliminating the need for some mitigation measures currently under consideration. Chapter 9 of the EIS, which provides DOE's list of commitments available at this time, describes management actions that DOE would consider to reduce or mitigate adverse impacts to the environment that could occur if it implemented the Proposed Action. Chapter 9 states that Section 116 of the NWSA requires the Secretary to provide financial and technical assistance to mitigate impacts of the development of a repository and the characterization of the site. The Section 116 mitigation assistance review process and the EIS process are distinct from one another and the implementation of one does not depend on the implementation of the other.

DOE would base its final determinations on mitigation measures on the submittal of its License Application to the Nuclear Regulatory Commission and on the Commission's response to the application. Other measures, such as those requested by this comment (for example, compensation for hosting the repository), would be the subject of a separate process described by the NWSA (see Section 11.1 of the EIS).

3.2 (7046)

COMMENT-(Lincoln) County and (the) City (of Caliente) recommended that the comparative evaluation of alternatives for accomplishing deep geologic disposal should also capture the range of uncertainty attendant to such options. In this way, the DEIS could facilitate decision-making under conditions of uncertainty. While uncertainty is addressed to varying degrees throughout the DEIS, a summary assessment of the uncertainty associated with the various alternatives is not included within the DEIS. The FEIS should include such a summary assessment.

RESPONSE-Section 2.5 of the EIS acknowledges that the results of analyses often have associated uncertainties and has described such uncertainties throughout the EIS. Uncertainties could be the result of the assumptions being used, the complexity and variability of the process being analyzed, the use of incomplete information, or the unavailability of information. DOE believes that a summary assessment of uncertainties associated with the various alternatives and scenarios, as suggested by this comment, is not necessary for estimating their impacts.

3.2 (7163)

COMMENT

To ensure that the repository EIS focused upon those issues posing the most threat to existing environmental conditions, [Lincoln] County and [the] City [of Caliente] recommended in comments to the scope of the DEIS that DOE seek to categorize prospective impacts as to their probability of occurrence and their degree of consequence. The County and City reasoned that this course of action would help to encourage a draft NEPA [National Environmental Policy Act] compliance document, which was most responsive to issues perceived important by stakeholders. In their comments, the County and City

referenced their study of potential repository system impacts, which addressed socioeconomic effects. (18) The DEIS Does not include a categorization of impacts as to their probability of occurrence and their degree of consequence. As a result, the DEIS lends no indication as to where efforts to mitigate impacts should be initiated to afford greatest benefit.

(18) Intertech Services Corporation, The Yucca Mountain High-Level Radioactive Waste Repository and Lincoln County: Characterization of Socioeconomic Impacts Framework for Assessment of Effects, prepared for Lincoln County and the City of Caliente, October 1994.

RESPONSE

The National Environmental Policy Act and regulations promulgated by the Council of Environmental Quality to implement that Act require Federal agencies to analyze potential beneficial and adverse impacts of their proposed major actions on the human and natural environments. As discussed in Section 1.5.1 of the EIS, DOE initiated the public seeing process for this project in 1995, eventually holding 15 public meetings around the country. The purpose of the process was to determine the scope and identify the significant issues for in-depth analysis in the EIS. This EIS is the outcome of the process.

For each alternative, the EIS analyses evaluated the affected environments and estimated potential impacts in regions of influence for a variety of environmental resource areas. DOE selected these regions and subjects consistent with Council on Environmental Quality regulations (40 CFR 1502.15) that indicate that the data used and analyses undertaken should be commensurate with the likely importance of the potential impact. DOE addressed impacts in proportion to their potential significance, and addressed clearly insignificant or minor impacts in less detail.

Categorizing impacts by their probability of occurrence or their degree of consequence would not provide information beyond that already in the EIS. Further, the relative importance of consequences to particular resource areas is likely to vary among stakeholders.

3.2 (7174)

COMMENT

Page 1-23 1st full paragraph. This section implies that only Nye County responded to DOE's request for documents setting forth perspectives and views on a variety of issues of local and regional concern. In fact, in response to [the] DOE request representatives of Lincoln County and the City of Caliente met with DOE and DOE contractor staff in Las Vegas and spent several hours presenting a variety of documents prepared by and/or for the County and City reflecting issues of local and regional concern. In addition, the County and City provided DOE and DOE contractor staff with diskettes containing economic impact models developed by the University of Nevada for Lincoln County. DOE was encouraged to utilize all of this information in preparing the DEIS. Lincoln County and the City of Caliente provided this briefing and related documents with the specific understanding that they were responding to DOE's request for perspectives and views. The County and City are very concerned that DOE has not used the variety of information provided to it as evidenced by the lack of specific references to only one document provided by the County and City (ETS 1989).

RESPONSE DOE acknowledges that Lincoln County and the City of Caliente provided a variety of documentation, and has utilized these materials as appropriate in this EIS.

3.2 (7222)

COMMENT

Page 4-3 1st full paragraph. The first sentence of this paragraph should end with "and Congress authorizes construction and appropriates funding to build the repository." As written, the sentence misleads the reader to believe that all that is needed in NRC [Nuclear Regulatory Commission] approval.

RESPONSE

The purpose of Chapter 4 is to describe short-term environmental consequences that could result from implementing the Proposed Action, which is to construct, operate and monitor, and eventually close a geologic repository at the Yucca Mountain site. Section 1.1 of the EIS explains the use of the term

“proposed repository” throughout the EIS and that DOE could not pursue the use of Yucca Mountain as a repository until a Presidential site designation became effective.

Several factors are germane to the construction and operation of a repository. In addition to a license from the Nuclear Regulatory Commission and Congressional authorization and budgetary authority, DOE must comply with its directives, complete a final design and specifications, let contracts for various services, and more. DOE believes that the addition of the suggested language is unnecessary and adds little meaningful information to the overall understanding of the process.

3.3 (178)

COMMENT-Commenters stated that even if DOE is unable to construct a branch rail line or use heavy-haul trucks to transport spent nuclear fuel and high-level radioactive waste in Nevada, it might still prefer to get casks to Nevada by rail. For this reason, commenters suggested the EIS should analyze transporting legal-weight truck casks from generator sites by rail to an inter-modal transfer station in Nevada and then loading the casks onto legal-weight trucks for transport to Yucca Mountain.

RESPONSE-In response to public comments, DOE considered a truck cask on-railcar scenario in which legal-weight truck casks would be shipped by rail from generator sites to Nevada and then loaded onto legal-weight trucks for transport to Yucca Mountain. The purported advantage of this scenario is that DOE could use rail transport nationally but would not have to construct and operate a branch rail line or use heavy-haul trucks in Nevada. As discussed in Section 2.3.3 of the EIS, DOE determined that while this scenario would be feasible, it would not be practical and the scenario was eliminated from further consideration. The number of shipping casks and railcar shipments would be greater by a factor of 5 than for the mostly rail scenario and the additional cost would be more than \$1 billion. In addition, the truck casks on-railcar scenario would lend to the highest estimates of occupational health and public health and safety impacts (mostly coming from rail-traffic related fatalities). Nevertheless, DOE assessed the sensitivity of transportation impacts to assumptions related to transportation scenarios (see Section J.2.1 of the EIS). Under this scenario, because all shipments (except shipments of naval spent nuclear fuel) would use legal-weight truck casks, which would house less fuel assemblies than rail casks, the number of railcar shipments would be about 53,000 over the 24 years of the Proposed Action. This is the same as the number of legal-weight truck plus naval spent nuclear fuel shipments in the mostly legal-weight truck scenario.

3.7 (7165)

COMMENT

DOE is encouraged to meet with representatives of affected units of local government to review proposed agency responses to comments to the DEIS. Such a meeting would help to ensure that local government comments are understood by the Department and if proposed responses are responsive to the comments. DOE is encouraged to provide individual responses to all comments provided so that commenters can easily ascertain what effect, if any, their comment had on the form of the FEIS.

RESPONSE

DOE has offered local governments the opportunity to submit documents providing perspectives of issues associated with the EIS and held formal meetings twice a year with the affected units of local government. These meetings have included discussions and status briefings on a range of issues of interest to local governments. DOE has obtained additional useful information from Federal, state, and local agencies and members of the public as part of the public comment process. Feedback at this stage on analytical errors, gaps in the analysis, and alternative mitigation measures is particularly useful to the Department. DOE will continue to conduct meetings with representatives of affected units of local government to gain a better understanding of their issues. DOE determined that preparing summary comments and responses for specific issues avoids duplication of efforts and repetitiveness in the comment response process.

3.9 (109)

COMMENT-

Many commenters, including the State of Nevada and other affected units of local government, stated that the Final EIS should analyze the impacts of stigma or risk perception and "special effects" on the State of Nevada. Commenters stated that people would avoid places and products associated with nuclear risk or stigma, resulting in decreased property values; less business expansion or new development; location of businesses away from the area; loss of tax revenues; reduced income for existing businesses; loss of new investments; inability to ensure adequate cleanup costs; higher insurance rates; decreased crop, product, and service prices, including effects on the marketability of local specialty agricultural products; decreased business diversification; inability to retain existing businesses; unused infrastructure or infrastructure of questionable value; migration of people from an area; increased population and activity in one county causing a subsequent decrease in neighboring counties; environmental justice impacts due to decreased property values; and an exodus of residents from a contaminated area. Commenters also stated that the perceived risk of serious harm from the proposed repository or transportation activities related to the proposed repository would affect people's health care systems, quality of life, and spiritual well-being. In particular, commenters stated that the existence of a nuclear waste repository at Yucca Mountain, 145 kilometers (90 miles) from Las Vegas, would have a significantly adverse impact on the State's large tourism and gaming industry. Because much of the State's economy is based on the tourist and gaming industry, adverse impacts to the industry could have severe socioeconomic effects throughout the State.

Commenters cited studies, some of which were commissioned by the State of Nevada and prepared by recognized experts in their fields, as evidence of the negative effects of perceived risk. The commenters stated that these reports and the 1986 DOE Environmental Assessment for site characterization activities at the Yucca Mountain site acknowledge the potential for impacts to Nevada's tourism-based economy and the need for additional research. However, commenters stated that DOE performed no subsequent work and did not analyze these potential impacts in the EIS.

Some commenters stated that, although DOE believes that it is not legally required to analyze perceived risk in a National Environmental Policy Act document, nevertheless DOE has an ethical responsibility to address risk perception, based on the methods and findings in this area that are well established in the peer-reviewed social science literature. According to some commenters, the Draft EIS did not explain why DOE did not perform a perceived risk analysis or why it discusses only socioeconomic impacts in terms of positive impacts such as jobs. Commenters stated that the Final EIS should acknowledge the possibility that stigma effects could occur and explain how DOE decided whether to include an analysis of such effects in the Final EIS.

Commenters also asked that the Final EIS address the psychological and social impacts to community residents, the direct effects on local communities, and the impact of having more strangers present. Further, they stated that the Final EIS should address mitigation measures (compensation for loss of tourism and business and decreasing property values, creation of insurance programs, compensation distribution plans, purchase of private property, business and personal relocation) to offset perceived risks, including the costs of government programs, the process for development of the plans, government liability, the type of Federal facility or program to protect or provide compensation, development of a tourism marketing plan, communication and other response strategies to mitigate behavioral consequences of negative perceptions, and monitoring impacts to land values and development. Some commenters requested compensation for damages, but also noted compensation might not work. Others cited the "brownfields" programs of the Environmental Protection Agency and other states that counteract perceived risks of hazardous sites, and stated DOE should look at risk perception work for hazardous wastes. One commenter noted, "Only by undertaking the full range of public responses to high-level radioactive waste can you evaluate the potential socioeconomic impacts from a repository."

RESPONSE

During scoping for the EIS, DOE received comments on the need to address perception-based and stigma-related impacts. DOE considered these issues, guided by the results of its own research and that of the State of Nevada, and by relevant conclusions reached by reviews of this subject by the Nuclear Waste Technical Review Board (an independent board established by the Nuclear Waste Policy Act of 1982) in 1995 and other researchers through about 1997. For the Draft EIS, DOE concluded that analyses of perception-based

and stigma-related impacts would, at best, be uncertain or speculative and not meaningful to any decision maker.

However, in light of the comments received on the Draft EIS concerning this subject, DOE reexamined the relevant literature and the state of research into perception-based impacts and stigma-related effects. DOE was most interested in those scientific and social studies that directly relate to either the Yucca Mountain Project or other DOE actions such as the transportation of foreign research reactor fuel through the State of South Carolina. A number of these studies have been cited in the comments received on both the Draft EIS and the Supplement to the Draft EIS. For this Final EIS, DOE has also reevaluated the independent reviews by the Nuclear Waste Technical Review Board and the State of Nevada, among others, and identified and assessed relevant studies published since DOE published the Draft EIS. Section 2.5.4 of the Final EIS summarizes the Department's reexamination of perceived risk and the stigmatization of communities. Appendix N contains the complete text of the report generated from DOE's reexamination: "Are Fear and Stigmatization Likely, and How Do They Matter: Lessons from Research on the Likelihood of Adverse Socioeconomic Impacts from Public Perceptions of the Proposed Yucca Mountain Repository."

DOE assessed qualitatively the likelihood that perceptions of danger and of stigma, regardless of whether they are based on accurate scientific assessments, might result in adverse socioeconomic impacts on Nevada, particularly the Las Vegas Area. DOE believes the research shows that there is a consensus among social scientists that a quantitative assessment is impossible at this time and probably unlikely even after extensive additional research. The implication is not that impacts would probably be large, but simply difficult to quantify. Social scientists do not know enough to identify what would be the level of concern during the operation of a repository. Similarly, the specific links between attitudes and individual decisions that would have socioeconomic impacts cannot be defined. Based on what is known from surveys and analogues, what outcomes seem most likely qualitatively is summarized below:

Effects from Perceptions of the Proposed Repository:

Although, when asked, many people report that they think of nuclear things as dangerous, these attitudes are usually not salient in people's lives and therefore do not influence personal decisions.

Yucca Mountain is not in Las Vegas, but 145 kilometers (90 miles) away in a remote area. Studies show few indications of adverse socioeconomic effects (and many positive socioeconomic effects) in places that safely store or dispose of radioactive waste.

People who choose to vacation in Las Vegas are less likely to be concerned about the repository than people who choose to vacation elsewhere. Opening a repository, if there is any impact, would likely reinforce the preferences of people who do not intend to visit Las Vegas with or without an operating repository 145 kilometers (90 miles) away. People who like to visit Las Vegas would likely pay little attention.

If the repository would be such a powerful disincentive to investors, businesses considering relocating to southern Nevada and retirees and others considering relocating to the area, some effects of those perceptions should already be apparent. It is widely known that Congress has directed DOE to characterize Yucca Mountain for consideration for a repository and that key program documents suggest that the site might be acceptable. If the proposed repository were such a powerful disincentive, prudent investors, facing a possible opening of the repository, would not be investing in southern Nevada. Similarly, there would be a decline in population in southern Nevada as businesses and people decided to settle elsewhere in anticipation of future risks and stigma. There is no evidence of this behavior.

The assessment that substantial adverse socioeconomic impacts from perceptions of the repository are quite unlikely assumes that operations at the facility will not have a major accident or periodic smaller accidents. These events would most likely raise fears about the repository, make the repository salient to people in southern Nevada, result in some social amplification of risk, and perhaps even stigmatize the region. Adverse socioeconomic effects from perceptions of an accident-prone repository might be substantial even

with the repository 145 kilometers (90 miles) from Las Vegas. Without accidents, these effects are quite unlikely.

Effects from Transportation of Spent Nuclear Fuel and High-Level Radioactive Waste:

Absent accidents, two studies report that, at least a temporary decline in residential property values of approximately 3 percent can be expected in transportation corridors in urban areas. Data from other transportation experiences (such as transuranic waste to the Waste Isolation Pilot Plant), however, suggest that impacts on property values might be negligible or nonexistent. More research on whether property values have fluctuated with the transportation of radioactive materials would be more conclusive. The research, however, would not allow analysts to know with certainty whether there would be any impacts from perceptions of shipments of spent nuclear fuel and high-level radioactive waste to a Yucca Mountain Repository, or how long such impacts would persist.

While stigmatization and resulting adverse impacts can be envisioned under some scenarios, it is not inevitable or measurable, and any such stigmatization would likely be an after effect of unpredictable future events, such as a series of accidents. As a consequence, DOE did address but did not attempt to quantify potential impacts from risk perceptions or stigma in this Final EIS. DOE also did not address potential change in property values near waste-transport routes because of the reasons summarized above and discussed in Appendix N of the EIS. At present, definitive information is not available on specific tracts of land that could be required for a specific transportation mode or route. For land that would be required or materially affected, however, the Department would fairly compensate landowners pursuant to Federal procedures. Should DOE be required to exercise its right of eminent domain, it would do so pursuant to applicable laws and regulations.

With regard to mitigation, Section 116(c) of the NWPA, states that "the Secretary shall provide financial and technical assistance to [an affected unit of local government or the State of Nevada]...to mitigate the impact on such [an affected unit of local government or the State of Nevada] of the development of [a] repository and the characterization of [the Yucca Mountain] site."

Such assistance can be given to mitigate likely "economic, social, public health and safety, and environmental impacts." Within that broad framework, neither Section 116 nor any other provision of the NWPA limits the impacts that are subject to assistance under Section 116 to the environmental impacts considered in this EIS.

As noted above, the impact assistance review process under Section 116(c) of the Act and under the EIS process are distinct from one another, and the implementation of one would not depend on the implementation of the other. Thus, the provision of assistance under Section 116 would not necessarily be limited either by the impacts identified in this EIS or by its findings on such impacts. Any decision to provide assistance under Section 116 would be based on an evaluation of requests for assistance submitted by an affected unit of local government or the State of Nevada pursuant to Section 116 that documented likely economic, social, public health and safety, and environmental impacts. If the proposed repository was to become operational, DOE would enter into discussions with potentially affected units of local government and consider appropriate support and mitigation measures. After a decision on the proposed repository and transportation modes and routes, local jurisdictions would be better able to identify the likely economic, social, public health and safety, and environmental impacts that would be the basis for a request for economic assistance.

Further, consistent with Section 180© of the NWPA, DOE would provide technical assistance and funds to states for training public safety officials of appropriate units of local government and Native American tribes through whose jurisdictions DOE would transport spent nuclear fuel and high-level radioactive waste. Training would cover procedures required for the safe routine transportation of these materials, as well as procedures for dealing with emergency response situations. In addition, Sections 116 (a) and 117 (c) of the NWPA set forth assistance guidelines covering a number of issues, including emergency preparedness and response, state liability arising from accidents, and necessary road upgrading.

3.3 (50)

COMMENT-321 commentaries were disappointed with the DOE efforts to involve the public in the repository program and specifically the EIS. Many said that the DOE failed to educate the public adequately about important issues. Some said that DOE could have better informed the public about the program through the media, schools, and community education programs. These efforts would have helped the public better understand the repository program and the issues that surround it.

RESPONSE-DOE believes that its approach to the public involvement process is consistent with National Environmental Policy Act, Council on Environmental Quality and DOE regulations, and the intent of the NEPA. For this reason, a major element of the Yucca Mountain Project has been to ensure that stakeholders, the media, and the public have an opportunity to participate in the Project, and to acquire information they need to make informed decisions. This effort is focused on building and maintaining relationships with stakeholders and the media through regular interactions for information and educational opportunities. Information was made available by permanent and portable exhibits, information materials, models, audiovisuals, electronic media, publications, and public outreach announcements to mention some avenues to reach the public. A Federal Register notice announced releases and copies were mailed to members of congress, state and territorial governors, state legislators, Federal agencies, Special interest groups, and the members of the public. DOE also distributed paper and electronic copies of the Draft EIS to 38 reading rooms in 17 states and the District of Columbia.

4.5 (217)

COMMENT-Commenters suggested that any solution to waste disposal must maintain the option to monitor and retrieve the waste at any time. Commentaries said that this option was impotent because future generations might develop new technologies for reducing the materials' toxicity or discover new uses for the materials. Commentaries stated that the EIS did not fully evaluate potential impacts resulting from retrieval of the materials including costs associated with identifying and developing alternative disposal sites or transporting the materials to alternative sites, or costs the Federal, state and local governments could incur.

RESPONSE-Section 122 of the NWPA requires DOE to maintain the ability to retrieve placed spent nuclear fuel and high-level radioactive waste during an appropriate period of operation of the facility. Nuclear Regulatory Commission regulations (10 CFR Part 63, particularly Section 63.111(e)) require that the repository be designed so that any or all of the waste could be retrieved on a reasonable schedule starting at any time up to 50 years after the start of waste emplacement. In accordance with these requirements, the operational plan for the Yucca Mountain Repository provides a design and management approach that would isolate wastes from the public in the future while allowing flexibility to preserve options for modifying emplacement and retrieving the waste. This design would maintain the ability to retrieve the placed materials for at least 100 years and possibly as long as long as 300 years to protect the public health and safety or the environment or to recover resources from spent nuclear fuel. Because retrieval is not anticipated, DOE did not include it as part of the Proposed Action. However, the EIS evaluated retrieval as a contingency action, and describes potential impacts if it occurred (see Section 4.2 of the EIS).

Future actions regarding the management and disposal of these materials following retrieval would be at the direction of Congress and are highly speculative; DOE believes it is inappropriate impacts that could result from these actions. In relation to the No-Action Alternative, Scenario 1 assumes that the spent nuclear fuel and high-level radioactive waste would be stored in a configuration that would allow retrieval at any time in the future; therefore, long-term retrieval is not an issue

4.5 (7181)

COMMENT

Page 2-15 Figure 2-9. This figure portrays unrealistic schedule assumptions, which imply that repository construction may (proceed] prior to resolution of transportation routing and modal decisions. In the worst case, transportation of waste to a repository could proceed along routes, which do not serve to minimize

risk because transportation issues and related construction might not be completed in 2010. Further, this schedule Does not appear to reflect the length of time that will be required to resolve the certain (given deficiencies in this DEIS) legal challenges to the sufficiency of this DEIS that will occur. Such legal challenges will likely be filed in the winter of 2000 and will probably not be resolved for 18 to 24 months. At that time DOE may be required to prepare a supplement to the EIS. Under these time frames, the site recommendation could not be made until early 2003 (particularly given proposed revisions to 10 CFR 960, which defer to the EIS for information on environmental, socioeconomic and transportation issues). A more realistic schedule should be included within the FEIS.

RESPONSE

The Secretary of Energy will consider potential impacts associated with transportation of spent nuclear fuel and high-level radioactive waste in determining whether to recommend the Yucca Mountain site to the President as this Nation's first monitored geologic repository. DOE believes that the EIS adequately evaluates the potential environmental impacts that could result from the Proposed Action or the No-Action Alternative. Although DOE would not make any transportation decisions unless and until site approval, it believes that the EIS provides the information necessary to make decisions on basic approaches (mostly rail or mostly track shipments), and if rail was chosen, the choice among the candidate rail corridors in Nevada.

The comment notes that the timeframe might not be realistic due to legal challenges that are likely to occur, given the asserted deficiencies in the EIS. DOE cannot make schedules based on lawsuits that others might file.

5.1 (27)

COMMENT-606 comments expressed broad opposition to the Proposed Action to construct, operate and monitor, and eventually close a geologic repository for the disposal of spent nuclear fuel and high-level radioactive waste at Yucca Mountain. While many commentaries did not identify specific deficiencies or problems, some identified the unfairness of choosing Nevada for the dump and safety concerns for transportation, threat of earthquakes, groundwater contamination etc. These were the usual general concerns.

RESPONSE-DOE acknowledges the commentaries' opposition and the range of concerns expressed about safety. Comments and responses related to specific topics can be further covered (see the Comment-Response Document Table of Contents).

5.4 (248)

COMMENT-Commenters recommended that the alternatives presented in the Draft EIS should focus on a comparative presentation of benefits (such as risk minimization) and cost of various alternatives for repository and related transportation system development and operation to aid DOE and congressional decision makers. Commenters also suggested that the presentation include discussions of risk management benefits and the costs of the use alternative construction materials.

RESPONSE-With regard to estimated project costs, DOE believes it appropriate to provide the details of the cost estimates in reference documents; therefore, the cost discussions in the EIS are brief. The estimated cost information presented in Final EIS Section 2.1.5 was provided as a point of comparison between the Proposed Action and the No Action Alternative. The cost estimate presented in this Final EIS has been revised to reflect design updates (including various construction potions and the staging facility). The transportation information presented is independent of design updates and is the highest estimated cost factoring in mode and route options. Differences in Nevada transportation cost estimates were presented in Draft EIS Sections S.4.2.2. These cost estimates have been updated and incorporated in Sections S.4.2.2 and 6.3 of the Final EIS.

The discussion in the EIS with regard to potential impacts (environmental and economic) could result from either the Proposed Action or the No-Action Alternative provides information for the Secretary of Energy

so that a determination can be made whether to recommend Yucca Mountain as the site for the Nation's first monitored geologic repository. In making that determination, the Secretary would also consider not only the environmental impacts and the costs and benefits of not only the Proposed Action identified in the EIS, but also other technical, economic, and national policy factors and provided in the Science and Engineering Report (DIRS 153849-DOE 2001) and as dictated by the NWPA.

With regard to the risk management benefits and costs associated with alternative construction materials, commentaries are referred to Section 10.3.1 of the EIS, which discusses irreversible or irretrievable commitments of resources including construction materials. Commenters are also referred to Section 10.2 of the EIS, which describes and compares the relationship of resource use to long-term productivity.

5.4 (7188)

COMMENT

Page 2-58 Section 2.1.5 It is not clear whether Table 2-5 includes costs already incurred by DOE for the Yucca Mountain site. The text and table should so indicate. The costs already incurred should be specifically identified in the text and on the table.

RESPONSE

The cost in Section 2.1.5 were developed for comparison to the No-Action Alternative costs and therefore include only costs from 2002, because that is when a decision is scheduled to be made about a repository at Yucca Mountain. Project costs up to that time would be the same regardless of whether a Yucca Mountain Repository was actually developed.

5.4 (7190)

COMMENT

Page 2-61 Section 2.2.2.1. The text here should indicate for how long waste could be safely stored in dry-cask storage. What do the terms long-term and long periods mean? The cost and risk management benefits of on-site storage need to be introduced here and assessed in detail within the EIS. Ultimately, a simple comparison of the costs and risk management benefits of the Preferred and No-Action alternatives should be provided somewhere in the DEIS. This section should also discuss issues such as institutional control and sabotage and terrorism. Introduction of these concepts here is critical to subsequent analysis contained in latter sections to the DEIS.

RESPONSE

The purpose of this section of the EIS is to describe how nuclear utilities are currently managing spent nuclear fuel, not to present conclusions regarding safety and environmental impacts. Sections 2.2.2.2 and 2.2.2.3 of the EIS contain more detailed discussion of the No-Action Alternative scenarios. Chapter 7 describes a complete analysis of the potential environmental impacts, including human health and safety, associated with the No-Action Alternative scenarios. DOE's analysis assumes that all Nuclear Regulatory Commission safety regulations could be met as long as dry storage facilities continue to be monitored and maintained. In the context used in the Comment, "long-term" means more than a few years and is simply a recognition that utilities have constructed dry storage facilities in lieu of wet storage for spent nuclear fuel in almost every instance once their reactor pools were filled to capacity.

The EIS discusses cost estimates of the No-Action Alternative in Section 2.2.3 and environmental impacts in Chapter 7. Cost estimates of the Proposed Action are presented in Section 2.1.5 and environmental impacts of the Proposed Action are presented in Chapter 4 for pre closure impacts, in Chapter 5 for post closure impacts, and in Chapter 6 for transportation impacts. Tables in Sections S. I 1. I and 2.4.1, in the body of the EIS, present a comparison of the impacts from the Proposed Action and the No-Action Alternatives.

The Department has clarified the description of the Proposed Action and No-Action Alternative in Chapter 2 in relation to the concept of institutional controls. Since sabotage and terrorism are not part of the Proposed Action, it would be inappropriate to discuss such in Chapter 2; however. Section 4.1.8.3 includes analysis of potential sabotage events in relation to pre closure repository operations, and Section 6.2.4.2.3 discusses sabotage in return to transportation.

6.0 (11499)

COMMENT

Page 1-3 Last sentence (continuing to Page 1-4) states, "...low-level radioactive wastes could require disposal in a monitored geologic repository." The DEIS Does not appear to consider under what circumstances and in what quantities low-level waste would be disposed of at Yucca Mountain. The DEIS contains no assessment of the transportation requirements associated with transportation of low-level waste to the site.

RESPONSE

The low-level wastes the EIS considers for potential disposal at Yucca Mountain are those that would require eventual disposal in a geologic repository. Section A.2.5 and A.2.6 of the EIS specifically identify these as Greater-Than-Class C low-level and Special-Performance-Assessment-Required waste. The disposal of these wastes is a reasonably foreseeable action identified in a public scoping comment for this EIS. Chapter 8 addresses these wastes as part of Inventory Module 2. Section 8.4 describes their transportation.

6.1 (13)

COMMENT

Several commenters criticized the method DOE used to calculate the metric tons of heavy metal equivalent for high-level radioactive waste. The commenters stated that the formula used (0.5 metric tons of heavy metal per canister of high-level waste) is a generalization and does not adequately reflect the actual content of heavy metal in the waste or the risks associated with the radioactive constituents. Another commenter acknowledged the Nuclear Waste Policy Act of 1982 limit of 70,000 metric tons of heavy metal but notes that by using the current calculation method, half of the high-level waste now in inventory would be precluded from being shipped to Yucca Mountain.

RESPONSE

Appendix A of the EIS describes the basis for several candidate methods for determining metric tons of heavy metal (MTHM) equivalence for high-level radioactive waste and explains that legislative action by Congress would be required to place more than the allotted 70,000 metric tons of heavy metal into the repository until a second repository was in operation. This comment is correct in that, depending on the equivalence methodology used, the total quantity of high-level radioactive waste that could be included in the 70,000 MTHM varies to a great degree. Since 1985, DOE has consistently used the "historical method" (0.5 MTHM per canister) as a planning basis, and this method is used in the EIS to determine the number of canisters of high-level radioactive waste included in the Proposed Action. There is a relatively small quantity of "commercial" high-level radioactive waste (West Valley Demonstration Project) that has been determined to have an MTHM equivalency per canister of 2.3, but the overall assumption of the 0.5 MTHM/canister remains valid since the vast majority of high-level radioactive waste canisters are "defense" waste, and constitute the basis for the 0.5 MTHM/canister assumption. Using this historical method, less than half of the high-level radioactive waste inventory is included in the 70,000 MTHM.

However, DOE has also evaluated the impacts of repository disposal of the entire inventory of high-level radioactive waste. Specifically, Chapter 8 provides cumulative impacts for the Proposed Action inventory (which includes less than half the high-level radioactive waste canisters utilizing the 0.5-MTHM-per-canister method) and for the Inventory Module I (which includes the balance of the high-level radioactive waste canisters). Using different equivalence methods would shift the proportion of the high-level radioactive waste canisters that could be disposed of between the Proposed Action and the Module I Inventory, but would not significantly change the cumulative impacts because spent nuclear fuel would dominate long-term repository performance results. Regardless of the equivalence method used, the EIS analyze the range of potential impacts from disposal of the entire inventory of high-level radioactive waste such that the more conservative consequences are apparent.

The other equivalence methods, including the total radioactivity and the radio toxicity methods, result in lower estimates of MTHM per canister. As such, these other methods result in the total inventory of high-

level radioactive waste being accepted in the 70,000-MTHM Proposed Action repository. DOE is aware of these alternative methods and included them, for information, in Appendix A of the EIS.

7.1 (7049)

COMMENT-Lincoln County and the City of Caliente encouraged DOE to consider alternatives for accomplishing the waste emplacement phase of the repository within the DEIS. The County and City noted that perhaps most important would be the evaluation of various candidate materials from which waste packages might be fabricated. Options suggested by the County and City which DOE might consider include those characterized as corrosion resistant, corrosion allowance, and moderately corrosion resistant.

Each option was noted as performing differently under alternative thermal and geo chemical environments. The County and City recommended that each alternative considered in the DEIS be characterized by varying contributions to risk management, cost and uncertainty. The County and City recommended that a similar evaluation be included for alternative materials for fabrication of waste package baskets. The DEIS Does not provide an assessment of the relative contributions to risk management, cost and uncertainty associated with each alternative considered. The information in the DEIS is therefore of limited value for decision-support.

RESPONSE-As Encouraged by Lincoln County and the City of Caliente. DOE has considered, and continues to consider, enhanced or improved methods of implementing waste emplacement, including waste package materials and repository design. As a result of the evaluations in the *Viability Assessment of a Repository at Yucca Mountain* (DIR 101779-DOE 1998) and concerns such as those of the Total System Performance Assessment Review Panel. DOE modified the waste package design and added a drip shield over the waste packages. The waste package would have Alloy-22 as the outside layer with stainless steel on the inside. The titanium drip shield would add further defense-in-depth to the design.

DOE based the waste package corrosion model in the Final EIS on the corrosion experiments on Alloy-22 at Lawrence Livermore National Laboratory. Those experiments showed that Alloy-22 is very corrosion-resistant and, even accounting for uncertainty would be unlikely to fail for many thousands of years. Because of these evolving design changes, DOE issued a Supplement to the Draft EIS in May 2001. The information in the Supplement, which DOE has incorporated to the Final EIS describes the potential impacts associated with the design modifications. In the case of the Alloy-22 package material, DOE considered its thermal, mechanical, and chemical performance (corrosively), ease of fabrication, costs, and compatibility with other materials.

With regard to monitoring, 10 CFR 63.51 requires DOE to submit a license amendment application prior to permanent closure of the repository. This application would describe the program for post closure monitoring. Section 2.1.2.4 of the EIS provides information on activities that DOE has planned for the closure period (permanent monuments, land records, etc.) and indicates that the Department would add provisions for post closure monitoring. DOE recognizes that the development of new technologies for waste management could occur in the future. In fact, at the direction of Congress DOE is studying accelerator transmutation of radioactive waste. The transmutation process involves state-of-the-art principles, some of which are not yet proven. However, even if transmutation became a feasible technology, a repository would be an essential element of the nuclear fuel cycle because significant quantities of highly radioactive, long-lived materials would remain (see Section 9.1.3 of the EIS).

7.1.1 (754)

COMMENT

Page 2-65 Section 2.2.2.2. The assumption of 10,000 years of institutional control seems inconsistent with NRC (Nuclear Regulatory Commission) licensing guidance which encourages licensees to not assume institutional control beyond 300 years. This scenario should be revised to assume institutional control for 300 years (which is also consistent with the Preferred Alternative for Yucca Mountain).

Page 2-66 Section 2.2.2.3. The assumption of loss of institutional control after 100 years is not consistent

with NRC licensing guidelines nor with assumptions associated with the Preferred Alternative (institutional controls at Yucca Mountain for 300 years). No-Action Scenario 2 should be deleted from the DEIS.

RESPONSE

Because the future course of action taken by the Nation and by commercial utilities would be uncertain if Yucca Mountain was not recommended as a repository site, the No-Action Alternative evaluated two hypothetical scenarios with different assumptions about institutional control to provide a range of impacts that could occur and to provide a basis for comparison to the Proposed Action.

The assumption for Scenario 1 is that DOE and commercial utilities would maintain institutional control of the storage facilities to ensure minimal releases of contaminants to the environment for at least 10,000 years. Although both the Nuclear Regulatory Commission and the Environmental Protection Agency encourage the maintenance of monitoring and physical oversight for as long as possible, they have recognized that projecting society's willingness and ability to provide such a function for more than 100 years into the future is not reasonable. For this reason, Scenario 2 assumes no effective institutional control after approximately 100 years.

DOE based the choice of 100 years on a review of Environmental Protection Agency regulations for the disposal of spent nuclear fuel and high-level radioactive waste at Yucca Mountain (40 CFR Part 191), Nuclear Regulatory Commission regulations for the disposal of low-level radioactive material (10 CFR Part 61), and the National Research Council report on standards for the proposed Yucca Mountain Repository (DIRS 100018-National Research Council 1995), which generally discount the consideration of institutional control for longer periods in performance assessments for geologic repositories. Assuming no effective institutional control after 100 years provides a consistent analytical basis for comparing the No-Action Alternative and the Proposed Action.

7.1.1(7045)

COMMENT-In DEIS scoping comments, the County (Lincoln) and City (Caliente) noted that the disposal of radioactive waste in a deep geologic repository at Yucca Mountain is characterized by both real and perceived risk. The risk of exposure to radiation from atmospheric pathways was noted an important issue to residents of Lincoln County. Volcanism and criticality control were presented as two issues which the County believes every aspect of repository development and operation must be evaluated against. The County and City recommended that the DEIS include a cooperative evaluation of the extent to which alternatives for accomplishing construction, emplacement, closure, and post-closure phases of the facility achieve containment of radioisotopes during volcanic eruption and loss of criticality control. The DEIS Does not provide a comparative evaluation of the extent to which alternatives for construction, emplacement, closure and post-closure achieve containment of radioisotopes during volcanic eruption or loss of criticality control. The FEIS should include such a comparative evaluation.

RESPONSE-DOE has evaluated the long-term geologic stability of Yucca Mountain, including the potential for volcanoes. Volcanic activity has been waning in the recent geologic past; probability of a volcano that could disturb the repository is very low (see Section 3.1.3.1 of the EIS). Sections 5.7.2 and 5.8 of the EIS summarize potential impacts to repository performance from volcanic disturbances and from criticality, respectively. DOE analyzed the effects of both a volcanic eruption, which could release volcanic ash and entrained wastes into the atmosphere, and the intrusion of magma into the emplacement drifts, which could damage waste packages and contaminate the underlying aquifer. DOE estimated potential impacts on the nearest population to the south, conservatively assuming wind in that direction, and determined that the resulting radiation dose would be small. DOE believes that it is not reasonable to rank one concept for a repository ahead of another in terms of their resistance to the effects of volcanism or criticality because such events would be very unlikely.

7.1.1 (7173)

COMMENT-Page 1-17 3rd paragraph. It is not clear in reviewing the DEIS whether DOE has made a finding as to whether the repository is capable of accommodating all of the various waste volumes

potentially needing disposal at the Yucca Mountain site. Can the Yucca Mountain site handle all of the waste described in this paragraph?

RESPONSE-The EIS describes the environmental impacts from the disposal of up to 70,000 metric tons of heavy metal of spent nuclear fuel and high-level radioactive waste. The NWPA restricts the first repository to 70,000 metric tons of heavy metal. DOE has determined that there is sufficient space within Yucca Mountain for this amount of waste. Chapter 8 describes the cumulative impacts from the Proposed Action along with additional amounts and types of waste that could be disposed of in the repository, providing that Congress authorized such an action. DOE has determined that there is sufficient space within Yucca Mountain for this additional waste.

7.1.1 (10453)

COMMENT-The County (Lincoln and City (Caliente) recommended that the DEIS assess alternative materials which might be used to achieve closure for their relative contributions to risk management, retrievability and cost. The DEIS Does not appear to consider the risk management, retrievability and cost attributes of alternative materials which might be used to achieve repository closure. Absent such information closure decisions cannot be supported by the document.

RESPONSE-As a result of the evaluation of the “Viability Assessment of a Repository at Yucca Mountain” (DIRS 101779-DOE 1998) and concerns such as those of the Total System Performance Assessment Review Panel. DOE modified the waste package design and added a drip shield over the waste packages. The waste package would have Alloy-22 as the outside layer with stainless steel on the inside. The titanium drip shield would add further defense-in-depth to the design.

Because of these evolving design changes, DOE issued a Supplement to the Draft EIS in May 2001. The information provided in the Supplement, and incorporated into the Final EIS, describes the potential impacts associated with the design modifications, which took into consideration thermal, mechanical, and chemical performance, case of fabrication, costs, and compatibility with other materials.

While DOE believes the design enhancements will improve the proposed repository’s chances of complying with regulatory requirements over the long term, it would maintain flexibility with regard to when it would ultimately close the repository and under what conditions it would retrieve the waste material. To maintain flexibility and an ability to respond to changing conditions and technologies, Section 122 of the NWPA required retrievability at a high-level radioactive waste repository. Federal regulations (10 CFR Part 63) require that the repository be designed to preserve the option of waste retrieval on a reasonable schedule for as long as 50 years after the start of waste emplacement. Consistent with these requirements, the operational plan for the Yucca Mountain Repository provides for a design and management approach that isolates wastes from the public in the future while allowing flexibility to preserve options for modifying emplacement and retrieving waste. This design would maintain the ability to retrieve emplaced materials for at least 100 years and possibly as long as 300 years in the event of a decision to retrieve the waste, either to protect the public health and safety or the environment or to recover resources from spent nuclear fuel. During this period, the repository would remain accessible for scientists to continue testing and monitoring while providing more flexibility for future generations of scientists and engineers to determine the timing and method of repository closure.

Once the repository is closed, a post closure monitoring program would be implemented pursuant to 10 CFR Part 63. This program would include monitoring activities around the repository after the facility had been closed and sealed. The program would include continued oversight to prevent barriers of increasing

the radiation beyond allowable limits. The details of this program would be defined during the processing of the license amendments for permanent closure.

(7224) 7.2

COMMENT

Page 4-3 4th full paragraph. This section should describe what factors will be used to determine whether a 50 or 300 year performance confirmation period will be utilized. The length has implications for PETT [Payments-Equal-to-Taxes] payments and timing of possible retrieval and related transportation activities.

RESPONSE

Testing and performance confirmation activities would extend until the beginning of repository closure. DOE would decide on the exact date in concurrence with the Nuclear Regulatory Commission and any laws and regulations that exist at that time. For analysis purposes, the Draft EIS evaluated closure starting 100 years after the start of emplacement, but also assessed impacts for closure starting 50 and 300 years after the end of emplacement. The updated flexible design presented in the Supplement to the EIS includes a lower-temperature operating mode with ventilation extended to 300 years after final emplacement. The impacts related to this and other operating modes for the flexible design are presented in Chapter 4 of the Final EIS.

Waste shipments to the repository would not be influenced by a date for starting closure, Payment-Equal-to-Taxes are required under the NWPA, and is not a discriminating factor in the decision making process. DOE has not estimated Payment-Equal-to-Taxes beyond 2003 and, therefore, has not included long-term Payment-Equal-to-Taxes estimates in the EIS.

DOE agrees that the final closure date could affect the timing of any retrieval that might be required. However, the impacts of such contingency action would be relatively insensitive to timing and such an evaluation would produce little meaningful information for the decision making process. For this reason, DOE has not included this evaluation in the EIS.

7.3 (7232)

COMMENT

Page 5-6 Section 5.2. The postulated sequence of events does not include the potential for atmospheric releases due to volcanism, gaseous releases, and human intrusion. Other possible sequences of events relating to atmospheric pathways should be described and analyzed in the DEIS.

Page 5-16 3rd paragraph. Why did the DEIS not consider the potential for portions of the content of a waste package to be brought to the surface as a result of drilling induced human intrusion? Such an occurrence seems more plausible than release to the water table and would likely occur prior to drilling reaching the water table. In practice, a drill penetrating a cask would likely result in fatal exposure to the drill crew at the surface and drilling would likely not proceed to the water table.

Page 5-49 Section 5.10. Table 5-19 should also show LCF's [latent cancer fatalities] during the year of projected peak dose, which is expected to be some time after 10,000 years.

RESPONSE

The EIS does contain analyses of impacts that could arise from natural catastrophic events such as earthquakes and volcanic activity. While DOE cannot predict such events exactly, it can incorporate them statistically into the risk analysis. Chapter 5 of the EIS contains an assessment of the probabilities and effects of such events on long-term radionuclide release and the resultant impacts. The consideration of the combined likelihood and consequences of such events indicates the potential risk, as reported in the EIS.

One change in the EIS is that now there is an aerial pathway release from the analyzed eruptive scenario. The dose rates in Chapter 5 are well below the 40 CFR Part 197 environmental protection standards. In addition, Section 5.5 discusses the potential impacts associated with atmospheric releases.

The drilling intrusion scenario is a prescribed scenario defined in the regulations (40 CFR Part 197 and 10 CFR Part 63). As prescribed the scenario does not provide for effects on the drilling crew or any other transport to the surface.

In the preamble to 40 CFR Part 197, the Environmental Protection Agency recognized that, while there is no scientific basis for limiting the time period of the individual risk standard to 10,000 years or any other period, there is considerable uncertainty that current modeling can provide meaningful projections for tens of thousands to hundreds of thousands of years. The preamble states that "Simply because such models can provide projections for those time periods does not mean that those projections are either meaningful for decision makers or accurate." It further states that " ... as the compliance period is extended to such lengths, uncertainty increases and the resulting projected doses are increasingly meaningless from a policy perspective."

The Environmental Protection Agency requires a calculation of peak dose (40 CFR 197.30) within the period of geologic stability, which is 1 million years for the repository. The Agency requires DOE, to include these results and their bases in the EIS for Yucca Mountain as an indicator of long-term performance. This analysis also serves as another source of information for the decision-makers in making both design and licensing decisions. However, the Agency has recognized the inherent uncertainties associated with these long-term projections and has, therefore, not applied a regulatory standard to the results. Therefore, DOE considers estimates of resultant health impacts to be too speculative and has not included them in the EIS.

7.4 (11261)

COMMENT

Lincoln County and the City of Caliente also provided information during scoping which demonstrated given average wind speeds in the vicinity of Yucca Mountain of 7.4 miles per hour (mph) and peak recorded gusts of 60 mph, it is possible that airborne radioisotopes could be transported to the proximity of Lincoln County communities within 1.5 to 8 hours.* The City and County pointed out that the short airborne emission travel time is in part why DOE has previously declared portions of Lincoln County as within the "Off-site Uncontrollable Area" (OSUA). The County and City urged DOE to assess the potential for and related impacts of off-site exposures to residents and the economy of the County. The DEIS Does not consider off-site exposure of communities within Lincoln County.

*U.S. Department of Energy, Draft Environmental Assessment: Yucca Mountain Site, Nevada Research and Development Area, Nevada, Office of Civilian Radioactive Waste Management, December 1984.

RESPONSE

The highest potential for impacts from accidental releases would be at locations closest to the release point, under conditions of very stable meteorology, which have very low wind speeds [typically 2 meters per second (about 4 miles per hour) or less] and stable atmospheric conditions such as inversions. The high wind speeds and concurrent very unstable meteorological very unstable meteorological conditions mentioned by the commenter would result in lower health impacts but would spread contamination over a greater area during a potential accident. Section 4.1.8 and Appendix 11 of the EIS indicate that the potential for impacts to the maximally exposed individual and the population within 80 kilometers (50 miles) even under unfavorable accident conditions would be very low, with no radiation-related health impacts. Impacts to occupied portions of Lincoln County and the City of Caliente [about 190 kilometers (120 miles) distant] would be much lower. Therefore, repository accident evaluations do not include these locations.

7.4.2 (7241)

COMMENT

Page 6-57 Table 6-20 identifies impacts to workers from industrial hazards during construction and operation. In rural Nevada, access to emergency medical care is limited and challenging. These communities need financial assistance from DOE to be able to have the appropriate facilities and personnel to provide proper medical help for ill or injured workers and their families.

RESPONSE

DOE would initiate discussions with potentially affected units of local government and consider appropriate support and mitigation measures. Further, under the NWPA, Congress has established an impact assistance review process that is distinct from the Yucca Mountain Repository EIS process. The implementation of one process would not depend on implementation of the other. Thus, the impact findings identified in this EIS would not bar the provision of assistance under Section 116 of the NWPA. A decision to provide assistance would be based on evaluation of a report submitted by an affected unit of local government or the State of Nevada pursuant to Section 116 that documented likely economic, social, public health and safety, and environmental impacts.

7.5.2 (7210)

COMMENT

Page 3-10 Section 3.2.1. The text should make clear why an 80 km radius was selected around the Yucca Mountain site for air quality impact analysis. Given wind patterns a consistent radius appropriate for determining potential impacts.

Page 3-12 Section 3.1.2.2. The choice of 60 meters as a maximum for wind measurements (see Figure 3-3) may not be appropriate to determine potential for dispersion under conditions of volcanism. If wind velocities at greater heights were used for atmospheric dispersion modeling, such differing heights should be identified here. This section would also benefit from a table showing dispersion times from the site to community areas offsite (in all directions). The table should indicate how long dispersion from the site would take to reach communities located in all counties surrounding Yucca Mountain.

RESPONSE

Eighty kilometers (50 miles) is the long-established precedent for calculating the potential population (collective) dose around a nuclear facility (dating back to 1975). The National Council on Radiation Protection and Measurements Report *Principles and application of Collective Dose in Radiation Protection* (DIRS 101858-NCRP 1995) contains a brief history of the development of the 811-kilometer application (DIRS 101858-NCRP 1995).

Section 3.1.2.2 of the EIS provides background information on the meteorology of the potentially affected environment around Yucca Mountain. Figure 3-3 shows wind direction and wind speed based on past measurements that can be used in analyzing ground level or stack releases. Appendix G discusses meteorological data and atmospheric dispersion factors. Different meteorological information might be needed to adequately evaluate the potential impacts of volcanic events, depending on the type of event assumed to occur. Disruptive events, including potential volcanic disturbances, are discussed in Section 5.7.2. The ash dispersal model used information on eruption characteristics, wind direction, and velocity, and ash and waste characteristics. The potential impacts of such events or accidents are typically evaluated at the location of the most highly exposed individual and in the direction that would result in the highest exposure to the population. Because volcanic events have extremely low probabilities (estimated at less than 1 in 100 million per year), their associated risk is also very low.

7.5.2 (7227)

COMMENT

Page 4-9 Radiological Impacts to Air Quality from Construction. The DEIS discusses the potential of radio-nuclide releases of radon-222 through the ventilation system. To provide protection to the people that are down wind from the site, DOE should install adequate filters to remove the radioactive particles from any exhaust release.

RESPONSE

Radon-222 removal would not be practical because it is a noble gas and would pass through any filter. The estimated potential radiation doses to the public from naturally occurring radon-222 and its decay products due to repository-related operations would be very small, with the highest annual exposure estimated at 1.3 million millirem per year. For comparison, the average person in the United States and people in the Amargosa Valley near the Yucca Mountain site are exposed to approximately 200 millirem per year from

naturally occurring radon-22 and its decay products (see Table 3-30 of the EIS). The appropriate sections of the EIS (including those mentioned in Chapter 8) have been updated to reflect a comparison to the recently promulgated standard of 15 millirem.

7.5.6 (7143)

COMMENT-

Lincoln County and the City of Caliente recommended that the DEIS include a comprehensive assessment of desirable and undesirable economic and fiscal consequences of repository system activities in the County and City. The County and City noted in their EIS scoping comments that a credible assessment of socioeconomic impacts would only be possible by DOE if the agency had at its disposal an accurate understanding of existing socioeconomic conditions within the County and among its communities. The County and City further suggested that such a baseline assessment of "without repository system" socioeconomic conditions should include the following factors: economy, demographics, social conditions, Native Americans, public perceptions and attitudes, community services, community infrastructure, local government finances, government structure, local politics, telecommunications, emergency management, transportation infrastructure, land use, traffic, military operations, and public health. The County and City noted that the DEIS must present a comprehensive appraisal of current and without repository future socioeconomic conditions. According to the County and City, this baseline of information could then be used to compare against projected with repository conditions to extract resultant system impacts upon the County and its communities. Section 3, Affected Environment of the DEIS provides only a limited description of socioeconomic conditions in Lincoln County and the City of Caliente. The only desegregated description of socioeconomic conditions for Caliente concerns population. The DEIS provides no baseline description for many potentially impacted parameters including: age distribution: projected population growth without repository activities through at least 2035; baseline projected employment and incomes by economic sector through at least 2035; baseline projections of school enrollments by age distribution through at least 2035; baseline projections of supply and demand for public infrastructure (including water, wastewater, solid waste, electricity, recreation facilities, educational facilities, emergency first response equipment and facilities: emergency medical facilities and equipment) through at least 2035; baseline social conditions including crime, substance abuse, and demand for social programs: community cohesion; baseline projections of local government revenues and expenditures at least through 2035; baseline projections of housing availability, condition and cost through at least 2035; and baseline projections of land use through at least 2035 among other possible parameters. All of these descriptions of baseline and without repository projections of conditions should be at the Lincoln County and at the community level (i.e. Caliente, Alamo, Panaca, Pioche, Hiko, Rachel). For example, baseline projections of wastewater treatment facility demand and capacity is key in Caliente as the proposed location of the inter modal facility is the current City wastewater treatment facility which would require that the City's existing wastewater treatment facilities be relocated. In addition, a recent DOE study has identified U.S. 93 (which is immediately adjacent to Pioche) as a potential corridor for legal weight truck shipments of radioactive waste. The social tapestries, which characterize each community in Lincoln County, vary greatly. Religious and occupational variations contribute greatly to community social delineation. Age clusters define important social characteristics within each community. Previous studies by the State of Nevada have detailed differences in social conditions among Lincoln County communities. Growth within Lincoln County's small communities may induce significant changes in social conditions. Ethnographic research sponsored by Lincoln County and the City of Caliente have illustrated the unique cultural dimension which characterizes the County and City. The County and City continue to believe that the EIS must a thorough description of social indicators for Lincoln County communities. Such information is not contained within the DEIS. 6 TRW Environmental Safety Systems, inc., Nevada Potential Repository Preliminary Transportation Strategy Study I Prepared tot U.S. Department of Energy, Office of Civilian Radioactive Waste Management, April 1995.

- Krannich, R. and R. Little, Baseline Community Social Profiles for Communities in Nye, Esmeralda, Lincoln mid Clark Counties (3 volume), prepared for the State of Nevada, Nuclear Waste Projects Office, 1987. See also, Krannich, R. and R. Little, Ethnographic Summary Report: Eastern Lincoln County, prepared for the State of Nevada, Nuclear Waste Projects Office, 1988. See also, Krannich, R. and R. Little, Ethnographic Summary Report: Patronage Valley, prepared for the State of Nevada, Nuclear Waste Projects Office, 1988. See also. Krannich. R. and R. Little, 1988 Rural Community

Surveys: updated Background Report, prepared for the State of Nevada, Nuclear Waste Projects Office, 1989.

- See also, Krannich, R. and R. Little, Analysis of Key Sociocultural Relationships in Seven Southern Nevada Rural Communities, prepared for the State of Nevada, Nuclear Waste Projects Office. 1989.

8 McCracken. B. Lincoln County Oral History Series oral histories of various County residents prepared for the Lincoln County Nuclear Waste Project Office, 1990 through 1993.

RESPONSE-

The final EIS presents a baseline of economic measures, chosen as representative of the economy, to 2035. The measures were projected through the use of the REMI Economic and Demographic Forecasting System 53-sector computer model, and incorporated population estimates from recent years (1998 and 1999). For Lincoln County the REMI model used State Demographer estimates for the period. DOE compared these locally State-derived estimates to the 2000 data provided by the Bureau of the Census. The model projections directly reflect economic and population data developed by and received from State officials. Impacts were measured against this baseline by identifying the changes in the economy as a result of implementation of the alternatives. Section 3.1.7 of the Final EIS addresses the projected baseline conditions through 2035 for Lincoln County. Sections 6.3.2 and 6.3.3 provide an estimate of the change in population and other economic measures for each relevant implementing alternative. The transportation analysis in the Final EIS includes a sensitivity analysis that assigns all potential impacts to Caliente. The analysis conservatively estimates the potential transportation impacts on a community level for what could be the most affected community in the State of Nevada.

In the Final EIS, DOE has expanded the socioeconomic discussion in Chapter 3 to provide a clarified basis for understanding the magnitude of potential impacts described in Chapters 4 and 6. This discussion includes a projection of baseline parameters through 2035 based on the most recently available information and assumptions. The Final EIS provides a quantified estimate, to the extent possible, of potential school enrollment and changes in law enforcement and public service personnel requirements caused by the Proposed Action.

7.5.6 (7145)

COMMENT-During scoping of the EIS, Lincoln County and the City of Caliente made clear the difficulty that small rural counties and communities have in developing and maintaining public services and facilities. Any change in population, related demands for public services and facilities and induced changes in local revenues and expenditures can pose a significant hardship on the area and its residents. The County and City urged the DOE to include in the DEIS the repository EIS and assessment of existing and future “without repository” community service and infrastructure characteristics within Lincoln County and among its various communities. The County and City noted that when included in the affected environment section of the EIS, this information will be useful for comparison with “with repository” service and facility demands to determine net impacts. The DEIS Does not provide a sufficient assessment of existing and without repository future community service and facility needs within Lincoln County and the City of Caliente. As a consequence, subsequent impact analyses are wholly inadequate as a means to discern how the repository system (including transportation) may affect the County and City.

RESPONSE-

The Final EIS presents a baseline of economic measures, chosen as representative of the economy, to 2035. DOE projected the measures through the use of the REMI Economic and Demographic Forecasting System 53-sector computer model, which incorporates population estimates from recent years (1998 and 1999) provided by Nye and Clark Counties for the socioeconomic baseline. For Lincoln County and the Rest of Nevada, the REMI model used State Demographer estimates for the period. The model projections directly reflect economic and population data developed by and received from county and state officials. The model measured impacts against this baseline by identifying changes in the economy resulting from implementation of the alternatives.

In addition, DOE has expanded its socioeconomic discussions in Chapter 3 of the EIS to provide a clarified basis for understanding the magnitude of potential impacts described in Chapters 4 and 6. These discussions include a projection of baseline parameters through 2035 based on the most recently available information and assumptions. The Final EIS provides a quantified estimate, to the extent possible, of school enrollment and changes in law enforcement and public service personnel requirements caused by the Proposed Action.

7.5.6 (7151)

COMMENT

Lincoln County and the City of Caliente encouraged DOE to consider population growth resulting from location of repository system support industries in the County and demands for public services and infrastructure by dependents of DOE or contractor employees within the County and City. The DEIS Does not consider the potential nor attempt to quantify population growth resulting from location of repository support industries in the County or related demands for public services and facilities.

RESPONSE

Section 3.1.7 of the EIS addresses projected baseline conditions for Lincoln County through 2032. Sections 6.3.2 and 6.3.3 of the EIS discuss quantification of changes in population and other economic measures for each relevant implementing alternative. The transportation analysis included a sensitivity analysis that assigned potential impacts to Caliente. This analysis showed the conservative impacts of transportation actions on a community level for what could be the most affected community in Nevada.

7.5.6 (7154)

COMMENT

In comments to the scope of the EIS, Lincoln County and the City of Caliente substantiated the propensity for Clark County and the metropolitan Las Vegas area to garner an inequitable share of economic benefits associated with activities at the Nevada Test Site. The County and City pointed out that unlike many other projects, the construction and operation of the repository system is characterized by clearly discernable risks and benefits. The County and City further noted that unlike many other industrial activities, the spatial and temporal distribution of these risks and benefits has the potential to be inequitable between places and periods of time. The County and City concluded that the distribution of risks and benefits associated with DOE activities in Nevada during the past 30 years has not been fair.

In their comments, Lincoln County and the City of Caliente worried that development and operation of the repository system within Nevada has the potential for extending and perhaps exacerbating this inequitable distribution of risks and benefits. They suggested examples of practices which DOE might adopt which can widen the risk/benefit gap including: use of union workers, most of whom reside in urban areas, provision of subsidized bussing of repository workers electing to reside in Clark County, and purchase of goods and services from vendors located in urban areas, among other possibilities. Lincoln County and the City of Caliente suggested that the repository EIS should evaluate the distribution equity implications of various options for system development mid operation. The County and City recommended that the evaluation should consider the cumulative aspects of risks and benefits associated with other DOE activities likely to occur within Nevada (i.e. LLRW management). They concluded that this information should be used to occur identification and analysis of alternatives for mitigating the inequitable distribution of repository system risks and benefits.

The DEIS Does not consider the potential for inequitable distribution of repository system economic benefits, fiscal impacts and risk to public health and the environment among Nevada's geographic areas. As a consequence no measures to mitigate inequitable distribution of benefits and costs are identified or presented within the DEIS.

RESPONSE

The EIS Does not directly address the "distribution equity implications of various options for system development and operation." The EIS Does include an extensive discussion of cumulative impacts in Chapter 8, which states that "An evaluation of cumulative impacts is necessary to an understanding of the

environmental implications of implementing the Proposed Action and is essential to the development of appropriate mitigation measures and the monitoring of their effectiveness. In addition, consistent with the National Environmental Policy Act, the discussion of potential mitigation measures in Chapter 9 of the EIS is focused on the "...adverse impacts to the environment that could occur if the Department implemented the Proposed Action..." While DOE has evaluated cumulative impacts and considered them in the context of the overall assessment of environmental impacts that could result from the Proposed Action, the discussion of mitigation measures focused appropriately is on the potential impacts of the Proposed Action rather than mitigation of cumulative effects.

Apart from the considerations required under the National Environmental Policy Act, Section 116(c) (2) (A) (i) of the NWPA states that "the Secretary shall provide financial and technical assistance to (State of Nevada or affected unit of local government)...to mitigate the impact on such (State of Nevada or affected unit of local government) of the development of (a) repository and the characterization of (the Yucca Mountain) site." Such assistance can be given to mitigate likely "economic, social, public health and safety, and environmental impacts." Within that broad framework, neither Section 116 nor any other provision of the NWPA limits the impacts that are subject to assistance under Section 116 to the environmental impacts considered in this EIS.

Under the NWPA, the Section 116 impact assistance review process and the EIS process are distinct from one another, and the implementation of one is not dependent on the implementation of the other. Thus, the provision of assistance under Section 116 would not necessarily be limited either by the impacts identified in this EIS or by its findings on such impacts. Any decision to provide assistance under Section 116 would be based on an evaluation of a report submitted by an affected unit of local government or the State of Nevada pursuant to Section 116 to document likely economic, social, public health and safety, and environmental impacts. DOE would enter into discussions with the State of Nevada and affected units of local government and consider appropriate support and mitigation measures.

Examination of the practices suggested by the commenter (lot example, use of union workers, provision of subsidized bussing of repository workers, and procurement practices lot goods and services) is beyond the scope of the EIS or their consideration is premature.

7.5.6 (7155)

COMMENT

In comments to the scope of the EIS, Lincoln County and the City of Caliente concluded that DOE must consider the positive implications of DOE and contractor spending in Lincoln County. In addition, the County and City felt that the EIS must include a thorough analysis of the fiscal consequences of repository system and operation upon Lincoln County, City of Caliente, and the Lincoln County School District.

RESPONSE

Historically, very few workers associated with DOE operations in Nevada have resided in Lincoln County. In the Draft EIS, DOE estimates that no operational workers and only five construction workers on the Yucca Mountain Repository would live in Lincoln County. Either rail or heavy-haul truck traffic could traverse Lincoln County. The largest potential increase in county population would be associated with operation of the Caliente/Chalk Mountain heavy-haul truck corridor. About 241 new residents would be likely during the peak year. Assuming approximately 32 of these individuals would be of school age, the increase in school enrollment would be about 3 percent based on current enrollment estimates. Incremental increases in the Gross Regional Product for Lincoln County would be extremely small.

7.5.6 (7240)

COMMENT

Page 6-57 Socioeconomic Section – In the discussion of the socioeconomic impacts associated with construction of the branch line in the Caliente corridor, the Draft EIS identifies that the annual average number of construction workers to be 500 to 560 and that there would be 5 construction camps. It would seem that some of the camps will be in the vicinity of the rural communities in Nevada and could have a significant economic impact on the community, in terms of setting up the camps, during construction and

when the construction work is completed. We feel that this impact needs to be addressed in the socioeconomic section and how these impacts could be mitigated needs to be included. Some of the measures taken would be to provide temporary living facilities and classrooms, if many of the workers plan to stay in the community for the construction period and have school age children.

RESPONSE

The EIS presents information on the counties in the designated region of influence (Clark, Nye, and Lincoln) and on the Rest of Nevada, which comprises the 14 remaining counties. The socioeconomic simulation model that DOE used to estimate potential impacts indicated that the Rest of Nevada would experience direct economic effects from construction worker spending for food and lodging. The economic simulations assumed that DOE would contract construction camp development and water drilling to firms in the counties in which the camps would be located. They also assumed that all railroad construction workers would commute weekly from Clark County to camps outside Clark County and eat in local restaurants 5 days a week, 50 weeks a year.

The simulations accounted for workforce expenditures through the Eating and Drinking Places Sector and the Construction Sector of the Standard Industrial Code. No impacts to the Rest of Nevada were identified by the simulation.

The transportation analysis in the Final EIS includes a sensitivity assessment that assigns potential impacts to Caliente. This assessment showed conservative impacts of transportation on a community level for what could be the most affected community in Nevada.

With regard to mitigation actions, DOE would conduct discussions with potentially affected units of local government and consider appropriate support and mitigation measures.

7.5.7 (105)

COMMENT—Commenters suggested that DOE should conduct a baseline health assessment in the 10 affected counties. This assessment would determine what types and frequencies of health effects are currently occurring in affected counties. Commenters stated that by showing the present health situation, a case might be made for not adding to a potential number of latent cancer fatalities, and for documenting current health conditions before an occurrence of a radioactive waste accident. Other commenters were concerned about compensation in a timely manner in the event of an accident.

RESPONSE

DOE believes that a baseline health assessment is unnecessary for the Yucca Mountain Repository because adverse health impacts from the Proposed Action would be highly unlikely. For example, in the vicinity of the repository [the area within 80 kilometers (50 miles)]. DOE estimates short-term impacts from construction operation and monitoring, and closure of the proposed repository would result in less than 2 millirem per year to the maximally exposed member of the public (see Table 4-34 of the EIS).

This exposure is less than 15 percent of the 15-millirem limit promulgated at 40 CFR 197.4 and 10 CFR 63.204 and less than 1 percent of the annual 200-millirem dose to members of the public in Amargosa Valley from background levels of naturally occurring radon-222 and its decay products. For the flexible design, for the first 10,000 years after repository closure, the mean peak annual dose to the reasonably maximally exposed individual would be thousands of times less than the individual protection standards at 40 CFR 197.20 and 10 CFR 63.311, which allow up to 15-millirem-per-year dose rates during the first 10,000 years (see Table 5-6). The peak doses would be even smaller at greater distances.

The EIS provides estimates of lifetime doses and potential additional fatal cancers for entire populations that could be affected by the Proposed Action. For example, DOE estimates that for the lower-temperature operating mode, the potentially affected population within 80 kilometers (50 miles) of the repository (estimated to be 76,000 individuals in 2035), could receive as much as 4,000 person-rem over 341 years of operation, which could result in as many as 2 additional cancer fatalities in the exposed population. This would represent an increase of 0.002 percent of the 89,000 cancer deaths expected to occur from natural causes in the potentially exposed populations over a 340-year period (that is, five 70-year generations). In

all cases, these risks have been shown to be very low and, considering the conservatism's used in these estimates, probably nonexistent. DOE believes that even if large-scale health studies were conducted, the identification of adverse health impacts resulting from the Proposed Action would not be discernible.

In the event of actions that compromised the integrity of the repository, mitigation activities would be funded under either the Nuclear Waste Fund or the Price-Anderson Act. The Price-Anderson Act provides liability coverage for commercial activities operating under a license from the Nuclear Regulatory Commission and DOE activities. It establishes a system of private insurance and Federal indemnification that generally ensures that up to \$9.43 billion is available to compensate for damages suffered by the public from a "nuclear incident," regardless of who causes the damage. Payment would be from government funds or, if public liability arose out of nuclear waste activities funded by the Nuclear Waste fund (for example, activities at a geologic repository), from that fund. The liability of all responsible parties is limited to the amount of coverage provided by the Price-Anderson system. State and local governments cannot be required to provide any additional compensation. The EIS has been revised to include more details about indemnification under the Price-Anderson Act (see discussion in Section M.8).

Price-Anderson indemnification would apply to the operators of a nuclear waste repository at Yucca Mountain (which would also be licensed by the Nuclear Regulatory Commission pursuant to the NWPA) and to transporters of nuclear waste from commercial nuclear utilities and from DOE sites to the repository. Thus, Price-Anderson liability coverage extends to DOE contractors that manage and conduct nuclear activities in the DOE complex. In a general sense, the Federal Government acts as an insurer for these contractors against any bindings of liability arising from the nuclear activities of the contractor within the scope of the contract.

7.5.11 (7228)

COMMENT

Page 4-82 2nd bullet. What is the definition of unacceptable? Who will decide? Unacceptable to whom?

RESPONSE

Consistent with the National Environmental Policy Act, the lead agency responsible for the Proposed Action (in this case DOE) decides what is acceptable in terms of proceeding with a proposed action in view of the potential impacts its evaluation has identified. In turn, the NWPA gives the President, the State of Nevada, Congress, and the Nuclear Regulatory Commission opportunities to participate in the decision process relative to the overall suitability of the site; those decisions would be made after considering information in the EIS.

8.1 (259)

COMMENT

Many commenters expressed general opposition to the transportation of spent nuclear fuel and high-level radioactive waste through Nevada. A summary of the comments is as follows:

- * Many were opposed to transportation near certain types of structures or areas, including schools, hospitals, businesses, lakes, rivers, and Native American tribal reservations.
- * Some commenters were more specific, stating that the EIS Does not provide adequate detail about the risks and impacts of spent nuclear fuel and high-level radioactive waste transport to specific towns and cities in Nevada and of impacts to areas through which the largest number of shipments would pass. Specific areas and issues mentioned by commenters include:
 - The Las Vegas Valley, including impacts on tourism
 - Impacts to communities near Yucca Mountain
 - The effects on property values along transportation routes
 - Impacts of using specific routes such as State Route 160 in Pahrump Valley
 - Impacts to specific communities such as the town of Enterprise
 - Impacts to land use and access across a branch rail line

Impacts of heavy-haul truck shipments from Caliente and the feasibility of using U.S. 95 because

of steep grades, curves with a radius of less than 240 meters (800), and critical side slopes and steep drop-offs that would increase the probability of accidents and complicate subsequent clean up.

- Some commenters were opposed to the Caliente and Caliente-Chalk Mountain Corridors through Garden Valley, stating that the use of existing roads would be less wasteful and better from an environmental standpoint.
- The hot springs near the northern end of the Carlin Corridor, as well as the seasonal plays lakes in the area, were cited as reasons not to select the Carlin Corridor. Other commenters, however, said that the Carlin Corridor would be the best because it would avoid many towns and cities in Nevada.
- Some questioned the overall suitability of roads and highways in Nevada to transport spent nuclear fuel and high-level radioactive waste, including the potential for transportation accidents. Many commenters had specific concerns about the use of the Las Vegas Beltway for truck shipments to Yucca Mountain. Those concerns included:
 - The possibility that the Beltway would not meet Interstate Highway System standards until 2023, which is many years after shipments would begin and the use of the U.S. Highway 95/I-15 interchange (the “Spaghetti Bowl”) while the Beltway is being Completed
 - The costs of accelerated construction of the Beltway
 - The future population that would be exposed to spent nuclear fuel and high-level radioactive waste shipments along and near the Beltway, including expected heavily populated residential and commercial areas along the beltway in the City of North Las Vegas and in the Summerlin area on the west side of Las Vegas, and the use of projected traffic volumes on the Beltway in the future.
- Figure S-12 incorrectly shows secondary roads not extending to the vicinity of the Las Vegas Beltway when these roads already extend well beyond the beltway.

Others commentaries were concerned about terrorist attacks, sabotage, and security issues, inexperienced drivers, evacuation measures, emergency response, radiation exposure, compensation for injuries, advance notice of shipments, local control of routing and time-of-day restrictions, bad weather, and the presence of Native American tribal populations along the routes.

RESPONSE 8.1 (259)

Based on the results of the impact analyses presented in chapter 6 and Appendix J of the EIS, as well as the results published in numerous other studies and environmental impact analyses cited in the EIS, DOE is confident spent nuclear fuel and high-level radioactive waste can be and would be safely transported to Yucca Mountain. DOE believes, as the EIS reports, that the potential impacts of this transportation would be so low for individuals who live and work along the routes that these individual impacts would not be discernible even if the corresponding doses could be measured. The analysis presented in the EIS factored in the characteristics of spent nuclear fuel and high-level radioactive waste, the integrity of shipping casks that would be used for transportation, and the regulatory and programmatic controls that would be imposed on shipping operations (see Appendix M). The EIS analytical results are supported by numerous technical and scientific studies that have been compiled through decades of research and development by DOE and other Federal agencies, including the Nuclear Regulatory Commission and the U.S. Department of Transportation, as well as by the international community, including the International Atomic Energy Agency.

DOE believes that the EIS adequately analyzes the environmental impacts that could result from the Proposed Action. DOE also believes that the EIS provides the information necessary to make decisions on the basic approaches to transporting spent nuclear fuel and high-level radioactive waste (either rail or truck shipments), as well as the choice among alternative rail corridors in Nevada, if the site was recommended and approved. See the introduction to Chapter 8 of this Comment-Response Document for more information.

DOE does not believe it necessary to consider population characteristics on a community-by-community basis to determine potential public health and safety impacts from the transportation of spent nuclear fuel

and high-level radioactive waste. The use of widely accepted analytical tools, latest reasonably available information, and cautious but reasonable assumptions if there are uncertainties offer the most appropriate means to arrive at conservative estimates of transportation-related impacts.

In this EIS, DOE has used computer models it has used in previous EISs and other studies. These models are widely accepted by the national and international scientific and regulatory communities. For instance, DOE selected the RADTRAN 5 computer program to estimate radiological impacts to population from incident-free transportation and from accidents. RADTRAN, which was originally developed by Sandia National Laboratories in the late 1970s, has been used in many DOE EISs, and it has undergone periodic review and revision. In 1995, an independent review of RADTRAN 4 (immediate predecessor to RADTRAN 5) demonstrated that it yielded acceptable results when compared to “hand” calculations. More recently, an independent review found that RADTRAN 5 overestimates the measured radiation dose to an individual from moving radiation sources.

To ensure that the EIS analyses reflect the latest reasonably available information, DOE has either incorporated information that has become available since the publication of the Draft EIS or modified existing information to accommodate conditions likely to be encountered over the life of the Proposed Action. For example, the analysis in the Draft EIS relied on population information from the 1990 Census. In this Final EIS, DOE has scaled impacts upward to reflect the relative state-by-state population growth to 2035, using 2000 Census data.

Spent nuclear fuel and high-level radioactive waste can be harmful to human health and the environment because they emit radiation as the elements in them decay. For this reason, Nuclear Regulatory Commission and U.S. Department of Transportation regulations, as well as DOE’s own internal Orders, specify containment, shielding, thermal, and nuclear safety requirements for shipping container (casks). These regulations are designed to preclude even a remote chance of direct exposure. In addition, spent nuclear fuel and high-level radioactive waste are not easily dispersed; they do not readily dissolve in water; they are not liquids or gases that can be easily spilled or leaked, and radiation from them does not make other materials radioactive. Spent nuclear fuel and high-level radioactive waste or solids. They are hard, tough, and dense ceramics, metals, or glasses contained within tough metal barriers.

The shipping casks used to transport these materials are massive, with design features that comply with strict regulatory requirements to ensure that the casks are fault-tolerant. That is, the casks must perform their safety functions even when damaged. Numerous tests and extensive analyses, using the most advanced analytical methods available, have demonstrated that these types of shipping casks would provide containment and shielding even under the most severe kinds of accidents. Since the publication of the Draft EIS, the Nuclear Regulatory Commission published *Reexamination of Spent Fuel Shipment Risk Estimates* (DIRS 152476-Sprung et. 2000. all). Based on more than 99.99 percent of all accidents. (Of the thousands of shipments over the last 30 years, none has resulted in an injury due to release of radioactive materials). This means that of the approximately 53,000 truck shipments, there would be an estimated 66 accidents, each having less than a 0.01 percent chance that radioactive materials would be released. The chance of a rail accident that would cause a release from a cask would be even less. The corresponding chance that such an accident would occur in any particular locale would be extremely low. Section 1.1.4.2.1 of the EIS reports potential consequences for accidents that could release radioactive materials.

Although the risk of releasing radioactive materials from a shipping cask in an accident would be small. The U.S. Department of Transportation requires highway shipments to use preferred routes that reduce time in transit (49 CFR 397.10). The Department of Transportation regulations provide for states and tribes to designate alternate preferred routes. These regulations require a state or tribe to consider overall public safety in designating routes that would be in lieu of or in addition to routes specified by the Department of Transportation regulations.

The U.S. Department of Transportation routing requirements, along with regulatory requirements to limit radiation dose external to a shipping cask, would help to ensure that radiation doses to persons residing

along the routes would be low. The analysis in Chapter 6 of the EIS for mostly legal-weight truck scenario estimates the dose to persons who would drive alongside the trucks as they traveled on the highways, who would be stopped in locales where truck shipments stopped, and who lived along the routes that would be used. In response to public comments, DOE forecasted growth in populations along routes to estimate potential impacts that could occur in the future when shipments would occur. However, the estimated dose to an individual living along a route would not change with changes in population—only the integrated dose to the whole population would change. The dose for a maximally exposed individual who lived along a route would be an average of about .25 millirem per year. This is about 400 times less than the maximum dose permitted for members of the public in 10 CFR Part 20(100millirem).

Based on public comments, the Final EIS includes estimated public health along transportation routes. This analysis accounted for factors such as the locations of intersections, commercial establishments and residence, and traffic signals. The impacts of incident-free transportation would be so low for individuals who lived and worked along the routes that these individual impacts would not be discernible even if the doses could be measured. The total impacts of transportation would be similar for different routes that might be used.

To evaluate the potential impacts to a maximally exposed individual, DOE used information and assumptions from a report sponsored by the City of North Las Vegas, Nevada, because DOE believes it to be the only source of the information (DIRS 15511-Berger Group 2000). However, DOE considers the exposure assumptions presented in the report to be extreme and very unlikely to occur (see text box in Section 6.2.1 of the EIS for additional information). The DOE analysis of dose, using information and assumptions presented in the report, estimated a maximally exposed individual in Nevada would receive a dose of about 530 millirem, over 24 years. This is an annual dose of about 22 millirem, which is about 6 percent of a 1 year exposure to natural background radiation, and 22 percent of the limit for members of the public listed in Nuclear Regulatory Commission regulations (10CFR Part 20). A dose of 530 millirem would increase an individual's risk of a fatal cancer by about 1 chance in 4,000 over a person's lifetime. For perspective, an individual's lifetime risk of a fatal cancer from all other causes is about 1 in 4. So, even using the unlikely exposure assumptions contained in the Berger Group report shows that the dose to a maximally exposed individual would be well below that received from natural background radiation, would not be discernible, and would not add measurably to other impacts that an individual could incur.

Nuclear Regulatory Commission and U.S. Department of Transportation regulations (10 CFR Part 73 and 49 (CFR Part 173, respectively) include requirements to ensure the physical security and protection of shipments from diversion and attack. For the Final EIS, DOE reexamined, for both rail and truck casks, the consequences of an attack that results in a release of material (in other words, the cask's shield wall would be penetrated) (see Section 6.2.4.2.3 of the EIS), and estimated consequences exceeded those presented in the Draft EIS. Differences in the consequences between the Draft EIS and the Final EIS are due to using "representative" spent nuclear fuel (rather than "typical" fuel in the Draft EIS) and an escalation of impacts to represent population growth to 2035. In addition, in the Draft EIS the consequences of the sabotage event were bounded by those of the maximum reasonably foreseeable accident.

The Nuclear Regulatory Commission has developed a set of rules specifically aimed at protecting the public from harm that could result from sabotage of spent nuclear fuel casks. Known as physical protection and safeguards regulations (10 CFR 73.37), these security rules are distinguished from other regulations that deal with issues of safety affecting the environment and public health. The objectives of the physical protection and safeguards regulation are to minimize the possibility of sabotage and facilitate recovery of spent nuclear fuel shipments that could come under control of unauthorized persons. The cask safety features that provide containment, shielding, and thermal protection also provide protection against sabotage. The casks would be massive. The spent nuclear fuel in a cask would typically be only about 10 percent of the gross weight; the remaining 90 percent would be shielding and structure.

It is not possible to predict whether sabotage events would occur, and if they did the nature of such events, nevertheless, DOE examined various accidents, including an aircraft crash into a transportation cask. The consequences of both the maximum reasonably foreseeable accident and the aircraft crash are presented in

the EIS for the mostly truck and mostly rail transportation scenarios and can provide an approximation of the types of consequences that could occur from a sabotage event. In addition, DOE analyzed the potential consequences of sabotage against a truck or rail cask (see Section 6.2.4.2.3 of the EIS). The results of this analysis indicate that the risk of the maximally exposed individual incurring a fatal cancer would increase from approximately 23 percent (the current risk of incurring a fatal cancer from all other causes) to about 29 percent. The same event could cause 48 latent cancer fatalities in an assumed population of a large urban area.

Because of the terrorist attack of September 11, 2001, the Department and other agencies are reexamining the protections built into their physical security and safeguards systems for transportation shipment. As dictated by results of this reexamination, DOE would modify its methods and systems as appropriate.

Although DOE anticipates accidents would occur in transporting spent nuclear fuel and high-level radioactive waste in Yucca Mountain, it does not anticipate that an accident would lead to a release of radioactive materials from a shipping cask. Nevertheless, Price-Anderson Act provides for indemnification of liability up to \$9.43 billion to cover claims that might arise from an accident in which radioactive materials were released, or one in which an authorized precautionary evacuation was made (see Section M.8 of the EIS for a more complete discussion of the Price-Anderson Act). If the damage from a nuclear incident appeared likely to exceed that amount, Price-Anderson Act contains a Congressional commitment to thoroughly review the particular incident and take whatever action is determined necessary to provide full and prompt compensation to the public. U.S. Department of Transportation regulations in Volume 49 of the Code of Federal Regulations and DOE's own Transportation Practices (see Appendix M of the EIS) would apply to shipments of spent nuclear fuel and high-level radioactive waste. Included are requirements for training of transportation personnel who are responsible for the safety of shipments, safety of vehicles, shipping documentation, financial responsibility of transportation carriers, emergency response notification, driving, and parking requirements (including DOE requirements for transportation during severe weather conditions), and other requirements.

Section 180(c) of the NWPA requires DOE to provide technical assistance and funds to states for training of public safety officials of appropriate units of local government and Native American tribes through whose jurisdictions the Department would transport spent nuclear fuel and high-level radioactive waste. The training would cover procedures required for safe routine transportation of these materials, as well as procedures for addressing emergency response situations. DOE would provide the assistance based on the training needs of the states and tribes, as they determined using a planning grant and based on availability of funds in annual Program budgets specified by Congress. Additional Federal response capabilities, such as expert services from the Radiological Assistance Program Team, could be activated, as requested by states and tribes. The schedule in the proposed policy and procedures for implementation of Section 180(c) of the NWPA (63FR 23753; April 30, 1998) is designed to provide adequate time for training of first responders in advance of the first shipments. If there was a decision to proceed with the development of a repository at Yucca Mountain, shipping routes would be identified at least 4 years before shipments began and 'section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. See Section M.6 of the EIS for a discussion of the DOE Section 180(c) policy and procedures.

In addition, DOE would employ satellite tracking and, in accordance with Nuclear Regulatory Commission regulations, provide advance notification to state, tribal (subject to Nuclear Regulatory Commission approval), and local officials for each shipment of spent nuclear fuel. DOE maintains a national radiological emergency response capability that is available to assist states and tribes in the event of a transportation accident (see Appendix M of the EIS).

DOE investigated the potential impacts of transporting spent nuclear fuel and high-level radioactive waste to Yucca Mountain would have on multiple resource areas not related to human health and safety; land use; air quality; biological resources and soils; hydrology; cultural resources; socioeconomic; noise; aesthetics; waste management; utilities, energy, and materials; and environmental justice (see Chapter 6 of the EIS). The Department concluded that the impacts in these resource areas from nationwide transportation (outside Nevada) would not be discernible because shipments would use existing highways and railroads and would

contribute only minimally to the volume of national transportation (0.007) percent of railcar kilometers and 0.008 percent of truck kilometers). Although radiological health and traffic fatality impacts would be adverse because these potential impacts nationwide would not be high for and individual or identifiable group, including Native American tribes, DOE also concluded that transportation of these materials would not raise environmental justice concerns.

As discussed in the EIS, to provide for transportation of rail casks to Yucca Mountain, DOE could construct a branch rail line in one of five candidate rail corridors or could work with the State of Nevada to upgrade one of five highway routes for heavy-haul trucks and, in that case, construct an intermodal transfer facility. For three of the candidate routes for heavy-haul trucks and for purposes of analysis of socioeconomic impacts of heavy-haul truck shipments in Nevada, DOE assumed availability of loaned funds from sources external to Nevada to assist in accelerating construction of the Las Vegas Beltway, if needed. Heavy-haul truck shipments would not travel through the Spaghetti Bowl interchange of Interstate-15 and U.S. 95 in Las Vegas. For the three alternative routes that would pass through the Las Vegas Valley, these trucks would need to use a section of the Las Vegas Beltway to transit from Interstate-15 to U.S. 95 before continuing to Yucca Mountain. DOE's analysis of potential Impacts in Section 6.3.3.1 considered the likelihood that large, heavy-haul trucks would affect traffic flow on roads that they would use, including causing delays to traffic on the Las Vegas Beltway. These shipments would be made under permits issued by the State of Nevada that would contain restrictions designed to minimize the effects on traffic of the large trucks.

In its evaluation of potential impacts of constructing a branch rail line in each rail corridor and of upgrading highways for use by heavy-haul trucks and constructing an intermodal transfer station in Nevada, DOE considered the potential impacts that could occur both to the natural environment and to communities, such as Caliente, that would be nearby (see Section 6.3.2 and 6.3.3 of the EIS).

For example, in the Garden Valley west of Pioche in the northeastern Nye County, DOE biologists found the Welsh's catseye plant, classified as a sensitive species by the Bureau of Land Management, about 2.7 kilometers (1.7 miles) from a potential alignment of the Caliente Corridor (DIRS 104593 CRWMS M&O 1999). In this area, DOE identified potential variations in the Caliente Corridor alignment that could avoid a sensitive environmental feature or other feature that could affect the engineering or construction of the route. In the Carlin Corridor, DOE identified numerous springs within 5 kilometers (3 miles) of the alignment of a branch rail line. At the north end of this corridor, DOE biologists identified a hot spring approximately 0.5 kilometer (0.3 mile) east of Nevada Route 306 about 5 kilometers south of Interstate-80. DOE would locate the alignment of a branch rail line to minimize the potential to affect springs and wet areas.

If a corridor was selected for construction of a branch rail line, DOE would conduct field studies along the corridor that would identify sensitive ecological and cultural resources, and specific land uses to be avoided. DOE would determine how to best avoid detrimental impacts; for example, in some areas, fences could be recommended to protect livestock and open culverts could allow access to both sides of the track.

In light of the comments received on the Draft EIS concerning perceived risk, DOE examined relevant studies and literature on perceived risk and stigmatization of communities to determine whether the state-of-science in predicting future behavior based on perceptions had advanced sufficiently since the scoping process for the EIS to allow DOE to quantify the impact of public risk perception on economic development of property values in potentially affected communities (see Section 2.5.4 and Appendix N of the EIS). Of particular interest were scientific and social studies conducted in the past few years that relate directly either to Yucca Mountain or to DOE actions such as the transportation of foreign research reactor spent nuclear fuel. In addition, DOE reevaluated the conclusions of previous literature reviews such as those conducted by the Nuclear Waste Technical Review Board and the State of Nevada, among others. DOE has concluded that:

- While in some instances risk perceptions could result in adverse impacts on portions of a local economy, there are no reliable methods whereby such impacts could be predicted with any

degree of certainty.

- Much of the uncertainty is irreducible.
- Based on a qualitative analysis, adverse impacts from perceptions of risk would be unlikely or relatively small.

While stigmatization of southern Nevada can be envisioned under some scenarios, it is not inevitable or numerically predictable. Any such stigmatization would likely be an aftereffect of unpredictable future events, such as serious accidents, would not expect such accidents to occur. As a consequence, DOE addressed but did not attempt to quantify any potential for impacts from risk perceptions of stigma in this Final EIS.

8.1 (7148)

COMMENT-During EIS scoping, Lincoln County and the City of Caliente provided DOE with evidence that rail condition can affect accident rates. Reference to County and City sponsored research regular assessments of rail condition along the UP mainline was provided to DOE. The County and City encouraged DOE to an assessment of pre-waste shipment track condition and use within the DEIS. The DEIS is silent on the issue of existing rail condition and implications of rail condition for transportation safety.

ETS Pacific, Inc. Pilot Study and Analysis of 46 Mile Rail Corridor in Lincoln County, Nevada, prepared for the Board of Lincoln County Commissioners, October 1986. See also ETS Pacific, Inc., Condition Update of 46 Mile Rail Corridor in Lincoln County, Nevada, prepared for the Board of Lincoln County Commissioners, June 1989.

RESPONSE-

DOE recognizes that rail conditions could affect accident rates. The analysis in the EIS used state-specific accident rates and data from a recent Nuclear Regulatory Commission study (see Section J.I.4.2.3.1 of the EIS) of the adequacy of its transportation regulations in 10 CFR Part 71 to estimate the likelihood and severity of transportation accidents. The data from these studies are based on national data collected from actual accidents. Thus, the analysis presented in the EIS uses data derived from accidents where unique local conditions were contributing factors, including the Union Pacific mainline in Nevada.

8.1 (170)

COMMENTS-589 comments summarized. Commentaries stated their opposition to the transportation of spent nuclear fuel and high-level radioactive waste to Yucca Mountain by rail, heavy-haul truck, or legal-weight truck. In many cases, reasons for the opposition were not specified or were very broad in scope. Examples include:

- impacts to environment and ecosystem
- generic accidents with catastrophic consequences
- incidental and cumulative radiation exposure to millions of people along transportation routes
- sabotage and terrorist attacks
- natural disasters

Some commentaries stated that the EIS Does not provide adequate detail regarding transportation risks along designated nationwide route and specific cities and communities. Commentaries were also opposed to spent nuclear fuel and high –level radioactive waste transport because of site specific concerns about emergency preparedness training, cleanup costs after an accident, and predicted damages to property values if an accident occurred.

RESPONSE-Based on the results of the impact analyses presented in Chapter 6 and Appendix J of the EIS, as well as the results published in numerous other studies and environmental impact analyses cited in the EIS, DOE is confident that spent nuclear fuel and high-level radioactive waste could be and would be safely transported to Yucca Mountain.

-DOE believes, as the EIS reports, that the potential impacts of this transportation would be so low for individuals who lived and worked along the routes that these individual impacts would not be discernible even if the corresponding dose could be measured.

-DOE believes that the EIS adequately analyzes the environmental impacts that could result from the Proposed Action. DOE also believes that the EIS provides the information necessary to make decisions on the basic approaches to transporting spent nuclear fuel and high-level radioactive waste (either rail or truck shipments), as well as the choice among alternative rail corridors in Nevada, if the site was recommended and approved.

-DOE does not believe it necessary to consider population characteristics on a community-by-community basis to determine potential public health and safety impacts from the transportation of spent fuel and high-level radioactive waste.

-In this EIS, DOE has used computer models has used in previous EISs and other studies. These models (RADTRAN) are widely accepted by the national and international scientific and regulatory communities.

-To ensure that the EIS analyses reflect the latest reasonably available information, DOE has either incorporated information that has become available since the publication of the Draft EIS or modified existing information to accommodate conditions likely to be encountered over the life of the Proposed Action.

-Transportation by legal weight truck would involve shipments along Interstate System highways, beltways, and bypasses where available, in accordance with U.S. Department of Transportation regulations (49 CFR 397.101).

-There are no Federal regulations pertaining to rail routes for shipment of spent nuclear fuel or High-level radioactive waste.

-DOE does not believe that any of the accidents would be severe enough to result in the release of radioactive material, primarily because of the structural integrity of the casks in which the material would be transported.

8.3 (201)

COMMENT

Commenters stated that DOE did not reveal the process or timetable for selecting a preferred rail corridor or heavy-haul truck route or discriminating information for the alternatives. The commenters, in general, stressed the need for DOE to describe the process of selecting implementing alternatives. Several commentaries requested a formal criteria document or comprehensive transportation plan describing the decision process, the criteria for selecting shipping routes, and a sound methodology for evaluating optional mixes of routes and transportation modes. Commenters noted a range of factors that should be part of the selection criteria including emergency response, population, accident rates, weather, seasonal road closures, infrastructure, health and safety, environmentally sensitive areas, and Native American tribal communities. One commenter noted that DOE should recognize (the commenter referred to Section 2.1.3.3. I of the Draft EIS) and explain the role that states might play in routing. Another commenter stated that DOE should specifically address whether it would conduct additional National Environmental Policy Act analyses for every transport segment when route and mode mix was completed. Several commenters took issue with the role Regional Servicing Contractors or carriers could have in the route-selection process. Commenters stated that DOE needs to accept the responsibility for choosing the safest routes available and specify those routes to contractors and carriers rather than abrogating that responsibility and leaving it up to the railroads to decide routing issues.

RESPONSE

If there was a decision to proceed with the development of a repository at Yucca Mountain, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At this time, many years before shipments to a repository could begin, it is impossible to predict with a reasonable degree of accuracy the exact number of shipments that would be made by either truck or rail. For this reason DOE evaluated two scenarios for moving the materials to Nevada: (1) transportation using mostly legal-weight trucks and (2) transportation using mostly rail. DOE analyzed these scenarios to ensure that it considered the range of potential environmental impacts associated with the transportation of spent nuclear fuel and high-level

radioactive waste.

DOE believes that the mostly rail case, in which more than 95 percent of spent nuclear fuel and high-level radioactive waste would be shipped by rail, would most closely approximate the actual mix of truck and rail shipments. In reaching this conclusion, DOE considered the capabilities of the sites to handle larger (rail) casks, the distances to suitable railheads, and historic experience in actual shipments of nuclear fuel, waste, or other large reactor-related components. DOE also considered relevant information published by sources such as the Nuclear Energy Institute and the State of Nevada. In addition, DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. However, the Department has not identified a preference among the five candidate rail corridors in Nevada.

Nevertheless, in response to comments DOE has analyzed the effects of different mixes of rail and truck shipments. The results of this analysis confirm DOE's estimate that the mostly rail and mostly legal-weight truck scenarios represent a reasonable range (lower and upper bound) of potential environmental impacts from the transportation of spent nuclear fuel and high-level radioactive waste.

At this point, it is impossible to predict with a reasonable degree of accuracy which highway routes or rail lines could be used. In the interim, state or Native American tribal governments could designate alternate preferred highway routes, and highways and rail lines could be constructed or modified. Therefore, for purposes of analysis in this EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations, which require the use of preferred routes (Interstate System highway, beltway or bypass, and state or tribal designated alternate route). DOE identified rail lines based on current rail practices, because there are no comparable Federal regulations applicable to the selection of rail lines for the shipment of radioactive materials.

In response to public comments, DOE has included in the EIS maps of representative highway routes and rail lines used for analysis. In addition, potential health and safety impacts associated with shipments are provided for each state through which shipments could pass (see Section J.4 of the FAS).

In response to comments, DOE has added information to the EIS (see Section M.3.2.1.2) on the route-selection process and proposed operational protocols for shipments. Current planning is that contractors providing transportation services would prepare transportation plans that would include proposed routes and modes selected according to U.S. Department of Transportation regulations and Federal Railroad Administration policy. The Department would provide those plans to the states and tribes for comment. DOE would then make final route selections and provide them to the Nuclear Regulatory Commission. The EIS has been revised to include a description of this planning process.

8.3 (7185)

COMMENT

Page 2-54 Apex/Dry Lake and Sloan/Jean Routes. The assumption here that the northern and southern legs of the beltway would be available is inappropriate. This highway will be owned by Clark County and will not necessarily be available for use by heavy-haul shipments. The analysis of routing through the Las Vegas Valley should be confined to existing roadways (1-15~ U.S. 95 etc.).

RESPONSE

Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At this time, many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway route or rail lines DOE would use. In the interim, states and tribes may designate alternative preferred highway routes, and highways and rail lines might be constructed or modified. Therefore, for purposes of analysis in this EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations, which require the use of preferred routes (Interstate System highway, beltway or bypass, and state or tribal designated alternate route) that reduce time in transit (see Figure 6-11). DOE identified rail lines based on current rail practices, as there are no comparable Federal regulations applicable to the selection of rail lines for shipment of radioactive materials (see Figure 6-12).

The U.S. Department of Transportation requirements and the planned completion of the Las Vegas Beltway led DOE to assume, for purposes of analysis in the EIS, that legal-weight truck shipments would not enter the Spaghetti Bowl interchange of Interstate-15 and U.S. 95. Nonetheless, to assess how potential impacts would be different from those of using the Las Vegas Beltway, DOE analyzed the impacts for legal-weight trucks to travel through the Spaghetti Bowl interchange (see Section J.3.1.3 of the EIS for an analysis of the impacts of using different routes in Nevada).

DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada. If the Yucca Mountain site was approved and mostly rail was selected as the preferred mode (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada.

Should a rail corridor be selected, additional engineering and environmental studies would be conducted as a basis for detailed design and the appropriate National Environmental Policy Act reviews.

If DOE selected the Apex/Dry Lake heavy-haul truck implementing alternative, it would initiate additional engineering and environmental studies, including appropriate National Environmental Policy Act reviews. It would also initiate consultations with responsible Federal, State of Nevada, tribal, and local authorities on route-specific details, impacts, and mitigate measures and the permitting process for over dimensional and overweight heavy-haul trucks. As stated in Section 2.1.3.2 of the EIS, DOE would comply with applicable U.S. Department of Transportation and Nuclear Regulatory Commission regulations and state and local requirements. This would include Nevada regulations and conditions of the heavy-haul track permit issued by the Nevada Department of Transportation.

8.3 (7208)

COMMENT

Page 3-98 Section 3.2.1.1. [and Page 3-120, 3rd full paragraph] The second paragraph of this section indicates that final transportation mode and routing decisions will be made on a site-specific basis during the transportation planning process, following a decision to build a repository at Yucca Mountain. This statement implies that the Secretary of Energy's Site Recommendation to the President will be made prior to resolution of site-specific mode and routing decisions. This would seem contradictory to the guidance contained within existing 10 CFR 960 and inconsistent with the proposed revisions to 10 CFR 960, which infer the availability of EIS-based transportation information for use, by the Secretary in preparing a Site Recommendation to the President. In the event that site-specific transportation decisions are deferred until after a decision to build Yucca Mountain is made, such transportation decisions may not be made until 2005, the year DOE anticipates receiving a construction authorization (see Figure 2-9). Such a schedule will provide DOE with just five-years to complete necessary field studies and surveys, complete environmental documentation complete necessary final designs, construct necessary rail and/or highway infrastructure and provide necessary training and equipment to emergency first responders along selected routes. Lincoln Comity and the City of Caliente do not agree with a DOE decision to defer making site-specific transportation decisions until after a decision to build Yucca Mountain is made. The County and City recommend that the DEIS include a phased schedule for making site-specific transportation decisions which begins now so as to avoid decision-making under the pressure of unnecessarily tight time constraints.

Further, the County and City do not agree with the apparent DOE assumption that if a repository site is approved for construction that transportation issues will be resolved and that a satisfactory transportation route mid mode will be available to serve the site. Rather, the DEIS should include a schedule and approach to making transportation decisions which will enable minimization of related risks. The current approach described (or inferred) within the DEIS Does not support risk minimization.

RESPONSE

DOE believes that the EIS adequately analyzes environmental impacts that could result from the Proposed Action. This belief is based on the level of information and analysis, the analytical methods and approaches

used to represent conservatively the reasonably foreseeable impacts, and the use of bounding assumptions where information is incomplete or unavailable, or where uncertainties exist. The use of widely accepted analytical tools, latest reasonably available information, and cautious but reasonable assumptions offer the most appropriate means to arrive at conservative estimates of transportation-related impacts.

For the reasons discussed above, DOE believes that the EIS provides the environmental impact information necessary to make certain broad transportation-related decisions, namely the choice of a national mode of transportation outside Nevada (mostly rail or mostly legal-weight truck), the choice among alternative transportation modes in Nevada (mostly rail, mostly legal-weight truck, or heavy-haul truck with use of an associated inter modal transfer station), and the choice among alternative rail corridors or heavy-haul truck routes with use of an associated inter modal transfer station in Nevada.

If the Yucca Mountain site was approved, DOE would issue at some future date, a Record of Decision to select a mode of transportation. If the example, mostly rail was selected (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. In this example, DOE would announce a preferred corridor in the *Federal Register* and other media. No sooner than 30 days after the announcement of a preference, DOE would publish its selection of a rail corridor in a Record of Decision. A similar process would occur in the event that DOE selected heavy-haul truck as its mode of transportation in Nevada. Other transportation decisions, such as the selection of a specific rail alignment within a corridor, would require additional field surveys, State and local government and Native American tribal consultations, environmental and engineering analyses, and appropriate National Environmental Policy Act reviews.

Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At this time, many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway route or rail lines DOE would use. In the interim, states and tribes may designate alternative preferred highway routes, and highways and rail lines might be constructed or modified.

DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada. If the Yucca Mountain site was approved and mostly rail was selected as the preferred mode (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. Should a rail corridor be selected, additional engineering and environmental studies would be conducted as a basis for detailed design and for appropriate National Environmental Policy Act reviews.

8.3.1 (7063)

COMMENT-Because of the potential for U.S. Highway 6 and State Route 318 to be unavailable due to inclement weather, accidents, or construction, Lincoln County and the City of Caliente noted during scoping that the DEIS must consider impacts of transporting radioactive waste along U.S. Highway 93 through Lincoln County. The DEIS Does not consider transportation along U.S. Highway 93 in Lincoln County.

RESPONSE-The analysis in Section 6.2.1 of the EIS used highway routes that conform to U.S. Department of Transportation regulations (49 CFR 397.101). These regulations, which were developed to promote public safety and reduce radiological risk for transport of Highway Route Controlled Quantities of Radioactive Materials, require the shipments of radioactive material to be made on preferred routes to reduce the time in transit. A preferred route is an Interstate System highway, bypass, or beltway or a route selected by a state or tribal routing agency. The regulations allow a state or tribe to designate alternate

routes in accordance with U.S. Department of Transportation guidelines. This is the basis for the Nevada Department of Transportation identification of the Routes A through F as potential alternative highway routes for legal-weight truck shipments to Yucca Mountain (see Section J.3.1.3. As a consequence, the potential impacts of transporting spent nuclear fuel and high-level radioactive waste through Lincoln County and Caliente are not evaluated in the EIS.

8.3.2 (136)

COMMENT-25 commentaries objected to DOE's position that the Caliente Chalk Mountain Corridor and the Caliente/Chalk Mountain heavy-haul truck route are non-preferred alternatives based simply on U.S. Air Force opposition to routes passing through the Nellis Air Force Range because they would compromise critical and sensitive national security activities. Commenters said that the Air Force's position was not adequately explained in the EIS; that specific reasons for Air Force opposition should be described; and that mitigation measures should then be developed and identified in the EIS. Commenters want to know why the Air Force was given special status, whether the Air Force was a Cooperating Agency in the preparation of the EIS, and whether the Department of Defense has refused to allow DOE access to lands under the control of the Air Force.

RESPONSE-The Air Force was not a cooperating agency in the preparation of the EIS and was not afforded "special status" as suggested by some commenters. Rather, DOE, in designating the corridor/route as "non-preferred alternative" recognizes the implications of the corridor/route on national security uses of the Nevada Test and Training Range. At this time, DOE is not aware of and modifications to the corridor or route that would mitigate the concerns of the Air Force. DOE has been able to obtain sufficient information on the corridor and route to estimate environmental impacts that could occur from the construction and operation of a branch rail line or heavy-haul route.

8.3.3 (178)

COMMENT-Commenters stated that even if DOE is unable to construct a branch rail line or use heavy-haul trucks to transport spent nuclear fuel and high-level radioactive waste in Nevada, it might still prefer to get casks to Nevada by rail. For this reason, commenters suggested the EIS should analyze transporting legal-weight truck casks from generator sites by rail to an inter-modal transfer station in Nevada and then loading the casks onto legal-weight trucks for transport to Yucca Mountain.

RESPONSE-In response to public comments, DOE considered a truck cask on-railcar scenario in which legal-weight truck casks would be shipped by rail from generator sites to Nevada and then loaded onto legal-weight trucks for transport to Yucca Mountain. The purported advantage of this scenario is that DOE could use rail transport nationally but would not have to construct and operate a branch rail line or use heavy-haul trucks in Nevada. As discussed in Section 2.3.3 of the EIS, DOE determined that while this scenario would be feasible, it would not be practical and the scenario was eliminated from further consideration. The number of shipping casks and railcar shipments would be greater by a factor of 5 than for the mostly rail scenario and the additional cost would be more than \$1 billion. In addition, the truck casks on-railcar scenario would lend to the highest estimates of occupational health and public health and safety impacts (mostly coming from rail-traffic related fatalities). Nevertheless, DOE assessed the sensitivity of transportation impacts to assumptions related to transportation scenarios (see Section J.2.1 of the EIS). Under this scenario, because all shipments (except shipments of naval spent nuclear fuel) would use legal-weight truck casks, which would house less fuel assemblies than rail casks, the number of railcar shipments would be about 53,000 over the 24 years of the Proposed Action. This is the same as the number of legal-weight truck plus naval spent nuclear fuel shipments in the mostly legal-weight truck scenario. DOE estimated impacts of this variation of the mostly rail transportation scenario by scaling from the impacts estimated for the mostly rail scenario.

8.5.1 (7073)

COMMENT-Lincoln County and the City of Caliente recommended that alternatives for accomplishing operation of the inter modal facility should be evaluated for their contribution to risk management and local economic benefits. It is suggested that DOE and DOE/contractor approaches should be considered against private development and operation. The County and City requested that options for shared use of

the facility by other government (i.e. defense) and private industries should be assessed for their contribution to regional economic development. Alternatives for management of throughout at the facility were suggested for evaluation for their relative contributions to risk management. Of particular concern to the County and City was the potential for buildup of loaded shipping containers at the inter modal transfer site. The County and City asked that the DEIS evaluate the exposure risks associated with alternative numbers of in-transit containers resident at the site. The DEIS Does not consider any of the specific inter modal operational issues raised by Lincoln County and the City of Caliente during EIS scoping.

RESPONSE-At present, DOE intends to purchase services and equipment from Regional Servicing Contractors who would perform waste acceptance and transportation operations. Section M.3 of the EIS contains more information on routing regulations and operational procedures and protocols DOE would use if the Yucca Mountain site received approval. Section M.3 also contains more detail on the proposed role of the Regional Servicing Contractor.

As discussed in Section 6.3, the EIS provides estimates of the number of shipments that would be received at an inter modal transfer station in a week. Actual rates of receipt, or throughput, would be determined once a mode and route for transportation has been selected. The throughput volumes were used to develop the preliminary inter modal transfer station design, as described in inter modal transfer Station Preliminary Design (DIRS 104849-CRWS M&O 1997).

8.5.1 (7076)

COMMENT-Lincoln County and the City of Caliente request that the SEIS consider the disposition of the intermodal transfer facility following cessation of waste emplacement at Yucca Mountain. Several alternatives were offered by the County and City for consideration by DOE including: (1) abandon the facility at the end of emplacement; (2) maintain the facility during the period of monitored Retrievability (i.e. 50-100 years) in case waste needs to be removed from the site; and (3) sell or deed the facility to another governmental or private party following emplacement of waste. The County and City request that consideration of these alternatives evaluate impacts upon local economies, impacts upon other public and private users, and barriers to effective relocation of waste from the site in the event removal is required. DEIS Does not consider the fate of an inter-modal facility following cessation of waste emplacement at Yucca Mountain.

RESPONSE-If the Yucca Mountain site was recommended and approved, DOE would issue at some future date, a Record of Decision to select a mode of transportation. If, for example, mostly rail was selected (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. In this example, DOE would announce a preferred corridor in the Federal Register and other media. No sooner than 30 days after the announcement of a preference, DOE would publish its selection of a rail corridor in a Record of Decision. A similar process would occur in the event that DOE selected heavy-haul truck as its mode of transportation in Nevada. Other transportation decisions, such as the selection of a specific rail alignment within a corridor or selection of a site for an inter model transfer station, would require additional field surveys, state and local government and Native American tribal consultations, environmental and engineering analyses, and appropriate National Environmental Policy Act reviews. These additional evaluations would include an assessment of the impact for alternate closure scenarios for the inter modal transfer station on local economies, impact upon other public and private users, and barriers to effective relocation of waste from the site in the event removal is required.

8.5.1 (7184)

COMMENT

Page 2-51 Section 2.1.3.3.3.1. The description of inter modal transfer station should be refined to address 1) the length of siding required to accommodate waste shipments as well as other materials destined for Yucca Mountain; 2) the number of locomotives required to perform operations in the; 3) whether the types of support facilities which would be required at the site include maintenance of rail equipment; 4) the number of tractors and trailers required; 5) when and where tractor and trailer inspection would occur; 6) what, if any, emergency first response capabilities would resident at the inter modal station.

RESPONSE

If the Yucca Mountain site was recommended and approved. DOE would issue at some future date, a Record of Decision to select a mode of transportation. If, for example, mostly rail was selected (both nationally and in Nevada), DOE would identify, a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. In this example, DOE would announce a preferred corridor in the *Federal Register* and other media. No sooner than 30 days after the announcement of a preference, DOE would publish its selection of a rail corridor in a Record of Decision. A similar process would occur in the event that DOE selected heavy-haul truck as its mode of transportation in Nevada. Other transportation decisions, such as the selection of a specific rail alignment within a corridor or selection of a site for an inter modal transfer station, would require additional field surveys, state and local government and Native American tribal consultations, environmental and engineering analyses, and appropriate National Environmental Policy Act reviews.

Preliminary designs were developed for the inter modal transfer station for the Draft EIS and tile impacts of construction and operation of the inter modal transfer station evaluated and presented in Section 6.3.3 of the EIS. The preliminary design requirements indicated that the length of a siding or passing track would be dependent on use of dedicated train(s) or general freight. In the case of general freight, a 1,400-meter (4,593-foot) passing track or siding would be necessary to allow general freight trains to pull off the mainline and switch to allow the cask cars to be pushed into the rail yard (DIRS 104849-CRWMS M&O 1997). The analysis assumed that one local locomotive would be necessary for operations at an inter modal station. An optional railcar maintenance building is shown in the conceptual design of tile inter modal transfer station (see DIRS 104849-CRWMS M&O 1997). DOE has estimated that a heavy-haul vehicle configuration with two tractors per trailer would be necessary for transportation of large rail casks (see Section 2.1.3.3.3.21, Two fleet sizes have been assumed for estimating purposes: a 12-transporter fleet all routes from Caliente, and an 8-transporter fleet for the Apex/Dry Lake and Sloan/Jean routes (see DIRS 154675-Aluher 1998). Locations and times of tractor and trailer inspections for all routes have been included in *Road Upgrades for Heavy Haul Truck Routes* (DIRS 154448-CRWMS M&O 1998). Determination of the need and scope for resident emergency first-response capabilities at the inter modal transfer station would be determined during subsequent environmental and engineering analyses.

8.5.2 (7186)

COMMENT

Page 2-54 Highway Routes for Heavy-Haul Shipments - It is unacceptable to Lincoln County that the DOE is only considering adding up to 4 feet to the existing shoulders. Some of the existing shoulders are only 2-3 feet wide which means at a maximum the shoulder would be only 7 feet wide. With the heavy-haul truck and cask being up to 10 t/2 feet wide. DOE should insure that the shoulders are at least 12 feet wide so that the vehicle could be safely and completely removed from the main part of the road. This section also discusses the routes from each of the inter modal transfer stations to Yucca Mountain. Having to modify intersections in the vicinity of Hiko. SR 375 and U.S. 6 to accommodate the 220 foot long heavy-haul tracks should be relatively easy, however, if any of the intersections at 1-15, the new beltway, U.S. 93 or U.S. 95 are inadequate to handle the transporter, both in terms of weight or geometry, this could be a show stopper. DOE needs to evaluate these [intersections] carefully before considering them to be feasible routes.

Also, DOE needs to consult with the Nevada Department of Transportation to determine if NDOT [Nevada Department of Transportation] would issue a heavy-haul permit on these routes.

Furthermore, turnouts located every 20 miles is not acceptable and would adversely impact commerce, tourism and general transportation in Lincoln County and create potentially unsafe passing conditions. This issue would be mitigated via construction of dual lanes in each direction on any highway in Lincoln County used for heavy-haul transport.

RESPONSE

DOE believes that the EIS provides the environmental impact information necessary to make certain broad transportation-related decisions, namely the choice of a national mode of transportation outside Nevada

(mostly rail or mostly legal-weight truck), the choice among alternative transportation modes in Nevada (mostly rail, mostly legal-weight truck, or heavy-haul truck with use of an associated intermodal transfer station), and the choice among alternative rail corridors or heavy-haul truck routes with use of an associated intermodal transfer station in Nevada. DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada.

Section J.3.1.2 of the EIS provides tables that list potential upgrades for roads in Nevada to handle heavy-haul trucks. This information is summarized from reference (DIRS 154448-CRWMS M&O 1998). The road widening proposed for the two lane roads includes widening two-lane roads to two 4.3-meter (14-foot)-wide lanes with a 0.6-meter (2-foot) shoulder on each side. Existing road widths along the candidate routes for heavy-haul trucks include two 3.7-meter (12-foot) lanes and shoulder widths ranging from 0.3 to 0.6 meter (1 to 2 feet). The existing 3.7-meter-wide lanes support maximum legal vehicle widths of 2.6 meters (8.5 feet). The proposed 4.3-meter lanes would be sufficient for a 3-meter (10-foot)-wide heavy haul transporter. The 0.6-meter shoulder width provides additional road width for the transporter in transit and would help reduce pavement "breakout" along the edge of the road. Truck turnouts would be used to remove a transporter from travel lanes, if needed. For details, see *Road Upgrades for Heavy Haul Routes* (DIP, S 154448-CRWMS M&O 1998).

Interstate System intersections were evaluated in the analysis discussed above. Costs associated with upgrading those intersections to support heavy-haul truck transport were included in costs assumed for analysis in the EIS [for additional information see *Cost Estimate Heavy Haul truck Transport Design* (DIRS 154675-Ahmer 1998)].

As described in the analysis *Road Upgrades for Heavy Haul Routes* (DIRS 154448-CRWMS M&O 1998), informal discussions were held with the Nevada Department of Transportation to identify preliminary road upgrade requirements. Permits for heavy-haul trucks have not been discussed with the Nevada Department of Transportation. However, the State routinely issues travel permits to operators of heavy-haul trucks.

Interstate System intersections were evaluated in the analysis discussed above. Costs associated with upgrading those intersections to support heavy-haul truck transport were included in costs assumed for analysis in the EIS [for additional information see *Cost Estimate Heavy Haul truck Transport Design* (DIRS 154675-Ahmer 1998)].

As described in the analysis *Road Upgrades for Heavy Haul Routes* (DIRS 154448-CRWMS M&O 1998), informal discussions were held with the Nevada Department of Transportation to identify preliminary road upgrade requirements. Permits for heavy-haul trucks have not been discussed with the Nevada Department of Transportation. However, the State routinely issues travel permits to operators of heavy-haul trucks.

Before the DOE used a heavy-haul truck transportation implementing alternative, it would work with the State of Nevada to conduct engineering and environmental studies that would support detailed design and construction of upgrades to highways. The studies would include traffic analysis to identify the specific turnout requirements for each road section based on the estimated increase in annual average daily traffic over the life of the project. Turnouts preliminarily identified by the analysis [see *Road Upgrades for Heavy Haul Routes* (DIRS 154448-CRWMS M&O 1998)] were included in estimating the cost for road upgrades. Although the installation of additional lanes for the proposed routes is not necessary to maintain level of service for the roads that are not heavily used, turnout locations and the number of turnouts could be adjusted to maximize their effectiveness.

8.5.2 (7069)

COMMENT-Lincoln County and the City of Caliente noted that the DEIS should evaluate alternatives for establishing and maintaining a highway system capable of withstanding repeated heavy-haul loads. They further suggested that where new road construction is required, improved yet unpaved surfaces should be evaluated against pavement. The County and City encouraged DOE to evaluate risk management benefits

associated with options for construction of dedicated travel lanes in area of excessive grades or poor sight distance. The DEIS Does not consider paved versus unpaved roadway improvement alternatives. Evaluation of the risk management benefits potentially associated with construction of dedicated travel lanes was not addressed within the DEIS.

The County and City recommended several operational alternatives for consideration within the DEIS including escorted versus unescorted shipments; time of day travel restrictions versus unrestricted transport; and use of local versus non local trucking firms. The first two were recommended for consideration for their contribution to risk management. DOE was encouraged to evaluate the third option set to determine regional economic benefits. The DEIS Does not consider specific heavy-haul operational alternatives offered by Lincoln County and City of Caliente during scoping.

RESPONSE

DOE believes that the EIS provides the environmental impact information necessary to make certain broad transportation-related decisions, namely the choice of a national mode of transportation outside Nevada (mostly rail or mostly legal-weight truck), the choice among alternative transportation modes in Nevada (mostly rail, mostly legal-weight truck, or heavy-haul with use of an associated inter modal transfer station), and the choice among alternative rail corridors or heavy-haul truck routes with use of an associated inter modal transfer station in Nevada. DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada.

An EIS reference (DIRS 154675-Almer 1998) includes a “Cost Estimate for Heavy Haul Truck Transport Design.” It includes a detailed cost estimate for the design, construction, and management of upgrades for public roads for each of the five candidate heavy-haul truck routes. DOE based the estimated costs presented in Section 6.3.3.2 of the EIS on those estimates, which include lane widening, truck lane and turnout construction, pavement upgrades, intersection upgrades, and shoulder upgrades. Cost estimates developed for highway upgrades associated with heavy-haul truck scenarios include costs for annual maintenance of the roads. Table J-89 summarizes road upgrades for a proposed Caliente Route.

Before DOE used a heavy-haul truck transportation implementing alternative, it would work with the State of Nevada to conduct engineering and environmental studies that would support detailed design and construction of upgrades to highways. The studies would include traffic analysis to identify the specific turnout requirements for each road section based on the estimated increase in annual average daily traffic over the life of the project. Turnouts preliminarily identified by the analysis (see Road Upgrades for Heavy Haul Routes (DIRS 154448-CRWMS M&O 1998)) were included in estimating the cost for road upgrades. Although the installation of additional lanes for the proposed routes is not necessary to maintain level of service for the roads that are not heavily used, turnout locations and the number of turnouts could be adjusted to maximize their effectiveness.

DOE would follow State of Nevada requirements for heavy-haul truck shipments. Such requirements include time-of-day travel restrictions and escorts. DOE has developed a draft Request for Proposal for Regional Servicing Contractors for waste acceptance and transportation. The contractor(s) would be responsible for shipping arrangements and transportation services in the servicing region(s). DOE plans for transportation operations are discussed in Section M.3 of the EIS.

8.5.3 (190)

COMMENT

Commenters stated that the Draft EIS did not adequately demonstrate either the feasibility of implementing a heavy-haul truck scenario or evaluate the impacts if such a scenario was implemented. Commenters stated that the implementation of such an approach is totally unprecedented in the United States and were concerned that, since heavy-haul trucks are slow moving oversized vehicles, their presence on the roads would cause more accidents and result in the effective loss of use of the major arterial roads. Commenters stated that DOE would need to consult with the Nevada Department of Transportation before considering

heavy-haul truck transport of spent nuclear fuel and high-level radioactive waste as a viable option. Commenters questioned whether the postulated routes would even be feasible for heavy-haul trucks and if additional highway lanes would have to be constructed to accommodate the size of the vehicles. They stated that detailed surveys of roads, bridges, and overpasses would be needed to ensure that heavy loads could be handled. Another commenter was concerned about the potential cost of having to build bypasses to either go around or through towns because the trucks would be so large they would not be able to make a right-angle turn.

Commenters stated that the heavy-haul truck analysis was deficient. Commenters stated that conclusions regarding changes in level of service in congested areas such as Las Vegas were not supported by the analysis and that no evidence was presented to support the speed assumptions [that is, 32 to 48 kilometers (20 to 30 miles) per hour] made for the heavy-haul truck scenario. If the actual speeds were less, traffic impacts would be exacerbated. Other commenters noted that the impacts to normal traffic flows on heavy-haul truck routes were grossly underestimated considering convoy length and frequency and slower travel speeds. Because disruptions on congested highways often continue after the removal of the cause, the duration of the traffic flow disruption would be longer than the time the vehicle would travel on the highways. Commenters also stated that because of the turning radius requirements for heavy-haul trucks, certain intersections and road segments might have to be shut down to allow passage of heavy-haul trucks. Commenters stated that the Draft EIS did not consider in-transit refueling requirements, safety, security, and the perceived risk of overnight parking for heavy-haul trucks.

Other commenters stated that the EIS did not include analysis of accident rates for this type of vehicle or of accident rates for other vehicles caused by the heavy-haul vehicle. Commenters were concerned that the cost to upgrade candidate heavy-haul truck routes in problem areas such as through Hancock Summit, Tonopah, and Goldfield could be 3 to 10 times greater than Draft EIS estimates. Another commenter said that the Nevada highway system as it now exists could not sustain the accumulation of axle loads this type of shipping campaign would produce and that infrastructure improvements, including lane construction and widening, would be required in both directions for almost the entire length of the heavy-haul truck routes evaluated in the Draft EIS.

Commenters were concerned that the use of heavy-haul trucks would increase traffic congestion in major metropolitan areas such as Las Vegas or in smaller communities along the route. Others were concerned that highway travel times could increase because of the use of these vehicles and questioned what the impact would be on local commerce and air quality. Some commenters stated that interstate System highways could not be used and that the roads might have to be closed to all other traffic.

RESPONSE

DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. If the Yucca Mountain site was approved, DOE would issue at some future date a Record of Decision to select a mode of transportation. If, for example, mostly rail was selected (both nationally and in Nevada) the DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. A similar process would occur if DOE selected heavy-haul truck as its mode of transportation in Nevada. Other transportation decisions, such as the selection of a specific rail alignment within a corridor, would require additional field surveys, State and local government and Native American tribal consultations, environmental and engineering analyses, and appropriate National Environmental Policy Act reviews.

At this time, the heavy-haul truck alternatives for transporting spent nuclear fuel and high-level radioactive waste to the proposed repository are in the conceptual stages of development, although preliminary design and engineering studies have been conducted for the heavy-haul truck options (see DIRS 154448-CRWMS M&O 1998; DIRS 154824-Ridilia et al. 1997). These studies identify potential upgrades for mitigating the potential impacts of the heavy-haul truck concept shown in Figure 2-29 of the EIS.

Based on the analysis mentioned above, heavy-haul truck transportation is technically feasible and its costs would be comparable to those for rail transportation. Sections of the Caliente route such as Hancock Summit and affected communities have been evaluated and are feasible options if the recommended road upgrades were completed. The basis for the cost of upgrading the Caliente heavy-haul truck roads are a

result of engineering analysis, limited discussions with the Nevada Department of Transportation, input from heavy-haul trucking companies, and actual cost estimates from highway contractors in Nevada. This information is presented in *Cost Estimate for Heavy-Haul Truck Transport Design* (DIRS 154675-Abmer 1998). This reference includes detailed cost estimates for the design, construction, and management of the initial road upgrades for public roads for each of the five heavy-haul truck routes. DOE believes this is an adequate technical basis to support the EIS cost estimates for the Caliente and other heavy-haul truck routes.

DOE has received input from heavy-haul truck companies on the estimated speed of the heavy-haul vehicle identified in the EIS. The speed depends on the highway grade. At 0-percent grade, the estimated speed is 68 kilometers (42 miles) per hour and at 4-percent grade, 24 kilometers (15 miles) per hour. Thus, an average speed of 32 to 48 kilometers (20 to 30 miles) per hour for an entire trip does not seem unreasonable. The State of Nevada restricts heavy-haul truck transport to daylight hours only. Thus, intermediate overnight stops would be necessary for the longest of the heavy-haul truck routes. Sections 6.3.3.2.1 through 6.3.3.2.3 of the EIS identify the heavy-haul truck routes that would require an overnight stop. The trucks would carry sufficient fuel to travel the entire one-way distance before refueling.

DOE calculated heavy-haul truck impacts using the Primary road rates in *State-Level Accident Rates of surface Freight Transportation: A Reexamination* (DIRS 103455-Sarleks and Tompkins 1999). Although the document does not explicitly address heavy-haul truck accident rates, DOE believes it provides the latest reasonably available data, as relevant to heavy-haul truck as it is to legal-weight truck transport. The accident rates used in the analysis are conservative because of the special precautions taken with heavy-haul truck shipments to prevent accidents, such as restricting travel to daylight hours and providing escort vehicles in front and behind the trucks. The heavy-haul trucks could affect the accident rates for other vehicles. However, the additional precautions described above in addition to the planned road improvements would mitigate these effects.

Section 6.3.3.1 of the EIS states that most of the highways that heavy-haul truck shipments would use are classified as having freely flowing traffic without delays and that the addition of 11 round trips each week should not affect the level of service. The EIS also states that the slow-moving heavy-haul trucks could present a traffic obstruction that increased congestion, delayed other vehicles, and caused short queues to form between turnout areas, even after the shipment passed.

However, given the low frequency of heavy-haul truck shipments, congestion would occur predominantly on relatively short segments of the heavy-haul truck routes and mitigation measures could be implemented to alleviate congestion concerns.

DOE would meet all Federal requirements for safety and security of the heavy-haul trucks and comply with the conditions of the Nevada Department of Transportation permits, including restrictions that lead to the need for overnight parking areas. The heavy-haul trucks would be escorted at all times, providing safety and security for the vehicles in transit, including warning other drivers on the highway of the slow-moving, oversized vehicles. Restricting the heavy-haul trucks to travel only during daylight hours is a safety-related requirement that would ensure the shipment was visible to other drivers. DOE anticipates that security systems and personnel would be provided at the overnight parking sites. Preliminary sites for the overnight parking areas are identified in Sections 6.3.3.2.1 to 6.3.3.2.3 of the EIS for each heavy-haul truck implementing alternative that would require overnight parking. As discussed in Section 6.3.3.1, workers at an overnight parking area would receive only small radiation doses because the vehicles would not be unloaded. Table 2-10 lists air quality impacts for all heavy-haul truck implementing alternatives. Section 6.3.3.1 discusses the derivation of the air quality impacts of heavy-haul truck transportation.

In light of the comments received on the Draft EIS concerning perceived risk, DOE examined relevant studies and literature on perceived risk and stigmatization of communities to determine whether the state-of-the-science in predicting future behavior based on perceptions had advanced sufficiently since the scoping process for the EIS to enable DOE to quantify impact of public risk perception on economic

development or property values in potentially affected communities {see Section 2.5.4 and Appendix N of the EIS). Of particular interest were those scientific and social studies carried out in the past few years that directly relate to either Yucca Mountain or to DOE actions such as the transportation of foreign research reactor spent nuclear fuel. In addition, DOE reevaluated the conclusions of previous literature reviews such as those conducted by the Nuclear Waste Technical Review Board and the State of Nevada, among others. DOE has concluded that:

- * While in some instances risk perceptions could result in adverse impacts on portions of a local economy, there are no reliable methods whereby such impacts could be predicted with any degree of certainty.
- * Much of the uncertainty is irreducible.
- * Based on a qualitative analysis, adverse impacts from perceptions of risk would be unlikely.

While stigmatization of southern Nevada can be envisioned under some scenarios, it is not inevitable or numerically predictable. Any such stigmatization would likely be an aftereffect of unpredictable future events, such as accidents, which would not be expected to occur. As a consequence, DOE addressed but did not attempt to quantify any potential for impacts from risk perceptions or stigma in this Final EIS.

If Yucca Mountain was approved as the site for the geologic repository, DOE would continue to provide clear, accurate information to the public regarding the potential risks of a repository at the site and of transporting spent nuclear fuel and high-level radioactive waste to the site.

8.5.3 (7187)
COMMENT

Page 2-51 Section 2.1.3.3.3.2. This section [should] provide an indication of maximum and minimum speeds that heavy-haul trucks will travel. The length of time to complete trip for each route should be discussed.

RESPONSE

The maximum and minimum speeds and route travel times are included in *Road Upgrades for Heavy Haul Routes (DIRS 154448-CRQMS M&O 1998)*. A review of information in this report indicates that the travel speeds would range from about 16 kilometers (10 miles) per hour on steep grades and through towns to about 65 kilometers (40 miles) per hour on open highways. Each table lists the mileage by road condition type, the speed over the section, and the time to travel the section. This information includes inspection stops and intersections to be navigated on each route and was used for estimating road upgrades and operating plans. Section 6.3.3.2 of the EIS presents estimated travel times for heavy-haul trucks for each of the five candidate routes for heavy-haul trucks in Nevada.

8.6.1 (223)
COMMENT

A number of commenters provided views on the type of train service that should be used for the transportation of spent nuclear fuel and high-level radioactive waste. There was a consensus among the commenters that dedicated trains should be used rather than general freight service; commenters listed the advantages of dedicated trains. The commenters stated that the Draft EIS Does not make a decision between dedicated trains and general freight service. Several commenters indicated that DOE should state in the EIS whether the EIS is intended to support the decision between dedicated and general freight trains. One commenter suggested DOE should include the use of general freight and dedicated trains as separate alternatives in the description of the Proposed Action in the EIS.

RESPONSE

As indicated in the EIS, DOE believes that the mostly rail case, in which more than 95 percent of spent

nuclear fuel and high-level radioactive waste would be shipped by rail, would most closely approximate the actual mix of truck and rail shipments. In addition, DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada.

DOE could decide to use a dedicated train that carried only the material being shipped to Yucca Mountain or could elect to move the spent nuclear fuel and high-level radioactive waste in general freight. If the material was shipped as general freight, the position of the spent nuclear fuel or high-level radioactive waste car in the train would be regulated by 49 CFR 174.85. This regulation requires that railcars placarded "radioactive" must be separated from a locomotive, occupied caboose, or carload of undeveloped film by at least one non placarded car, and it may not be placed next to other placarded railcars of other hazard classes. Section J.2.3 of the EIS presents an assessment of impacts of using dedicated trains to transport spent nuclear fuel and high-level radioactive waste. Based on current information from the U.S. Department of Transportation and the Association of American Railroads, it is the Department's opinion that there is no clear advantage for using either dedicated trains or general freight service.

DOE has not determined the commercial arrangements it would request from the railroads, including the use of dedicated or general freight trains, nor is the EIS intended to develop the scheduling and cost information necessary to make this determination. DOE recognizes the different attributes of dedicated trains and general freight service. DOE believes that general freight service, and dedicated train service are both capable of meeting the performance objectives of 10 CFR 73.37(a) (1) based on successful completion of past shipments of spent nuclear fuel by rail.

8.6.2 (186)

COMMENT

Commenters stated that the EIS did not provide sufficient information on branch rail line system specifications, construction activities, and operations to allow the complete assessment of impacts and risks as required under National Environmental Policy Act. Other commentaries asked what the costs would be to construct the five rail routes and which of the five could be constructed at the least cost. Commentaries stated that the EIS did not contain sufficient information on branch rail line system specifications, including rail weight, tie materials, grade crossing separations, road crossings and crossing signals, overpasses, administration and maintenance facilities (including any remote water supply and sanitation specifications), seismic standards, flood standards, train control signal systems, platform dimensions, ditch dimensions, bench dimensions, and ballast and sub-ballast requirements. Other commenters questioned what the fencing specifications would be, including location and type, because this would affect the ability of wildlife to cross the tracks. Commenters stated that the EIS did not contain sufficient information on branch rail line construction activities, including defining what the buffer zone would be during construction to protect human health and safety, defining cut and fill requirements, and identifying sources for ballast and sub-ballast material. Commenters stated that the quarrying of ballast and sub-ballast materials, the reclamation of ballast and sub-ballast source areas, the installation of water wells and their locations, and construction and safety oversight by State and Federal agencies were not addressed in the EIS. Finally, commenters stated that the EIS did not contain sufficient information on rail branch line operations, including safety oversight of rail line operations by Federal and State agencies, to allow the complete assessment of impacts and risks. Another commenter is interested in whether union labor would be required to construct the branch rail line.

RESPONSE

If the Yucca Mountain site was approved, DOE believes that the EIS provides the environmental impact information necessary to make certain broad transportation-related decisions, namely the choice of a national mode of transportation outside Nevada (mostly rail or mostly legal-weight truck), the choice among alternative transportation modes in Nevada (mostly rail, mostly legal-weight truck, or heavy-haul truck with use of an associated inter modal transfer station), and the choice among alternative rail corridors or heavy-haul truck routes with use of an associated inter modal transfer station in Nevada. However, follow-on implementing decisions, such as the selection of a specific rail alignment in a corridor, would

require additional field surveys, State and local government and Native American tribal consultations, environmental and engineering analyses, and appropriate National Environmental Policy Act reviews.

If the site was approved, transportation system specifications would be developed during detailed design activities. Specifications for items such as administration and maintenance facility and any associated remote water supply and sanitation needs, train control signal systems, and road crossing signals would be developed during these activities. Detailed field studies and ego-technical work would be required for development of specifications for seismic, flood, platform dimensions, ditch dimensions, bench dimensions, ballast requirements, and sub-ballast requirements. Specifications for grade crossing separations, road crossings, fencing locations, and fencing type would be developed in conjunction with government agency consultations, environmental analyses, and any necessary National Environmental Policy Act reviews, which would be conducted at the time of detailed design activities.

Based on standard engineering practices, DOE developed assumptions for the branch rail line conceptual designs analyzed in the EIS (DIRS 131242-CRWMS M&O 1997). In addition, conceptual engineering designs were developed for each of the rail corridors. These conceptual designs are referenced in the EIS and are available to the public. They incorporate assumptions based on regulatory requirements, established engineering practices, and existing railroad design. The documents contain sufficient design information to allow estimation of the environmental impacts of constructing and operating a branch rail line, but were not intended to provide specifications and detailed design descriptions, such as the information requested by the commentaries, for constructing, maintaining, and operating a branch rail line. Additional information on operational protocols is provided in Section M.3 of the EIS.

DOE assumed for the purpose of the EIS that operations of trains on a branch rail line and the maintenance of the line would be conducted in compliance with applicable regulations and standards for railroads and that the safety of operations would meet or exceed that of mainline railroads in the United States.

8.7 (142)

COMMENT

A number of commenters expressed concern about the safety of shipments by rail. Commenters expressed concern with both mainline and branch rail line shipments to the repository. Commenters expressed concern with adherence to Federal and state regulations (and allowing Nevada oversight on branch line operations). Other commenters suggested specific operational restrictions to insure safety. Commenters also expressed concern that privatization of rail operations would jeopardize the relationships and agreements that have been developed between DOE and states, tribes, and other responsible jurisdictions, including planning, operations (when, where, and how), training, technical assistance, and framing. A specific concern was having a low bidder planning and transporting spent nuclear fuel and high-level radioactive waste. Other commenters were concerned with the degraded conditions of railroads, including the inadequacies of rail crossings and increased collisions. Several commenters expressed concern with the rail maintenance programs and the need to switch from reactive maintenance to preventive maintenance programs to improve safety. Several commenters expressed concern with the placement of cars carrying spent nuclear fuel and high-level waste in a train indicating that cars near the front seem to be less affected by rail breaks and displacements than cars near the end of a train, Part of this concern was related to the signal systems on rail lines and data that indicate that rail malfunctions have occurred without a corresponding signal. All in all, the commenters' focus was on a recommendation that trains carrying spent nuclear fuel and high-level radioactive waste need to be operated in a different, more controlled mode than regular freight trains and that ownership and operational management of any new branch rail line should be evaluated against the contribution to risk management and regional economic benefit.

In response to these, and other public comments, DOE has added information on proposed transportation activities to the EIS (see Appendix M). Information added includes the regulations that govern spent nuclear fuel and high-level radioactive waste transportation, the proposed process that DOE would use to acquire commercial transportation services and the expected operational details and protocols DOE would follow if the Yucca Mountain site was approved.

Transportation of hazardous materials in the United States is a very highly regulated activity, and transportation to a repository would be conducted under the umbrella of these regulations with oversight, as applicable, of various local, Native American tribal, state, and Federal agencies. This would ensure that all shipments would be made safely (see Section M.2 of the ELS).

At this time, DOE plans to use private industry, including railroads, to the maximum extent possible, to accomplish its transportation mission. Such an arrangement, however, would not jeopardize the relationships and agreements that have been developed between DOE and its stakeholders. DOE would retain responsibility, for policy decisions, stakeholder relations, final route selection, and implementing Section 180(o) of the NWPA. DOE would award contracts for acceptance of spent nuclear fuel and high-level radioactive waste and transportation services to bidders whose proposals DOE considered to be most advantageous to DOE, with cost being only one of a variety of selection factors. One of the qualifications that must be met by a successful bidder would be to have performed a major transportation and logistics coordination project involving railroad, track, or inter modal carriage of radioactive, toxic, or other types of hazardous materials within the past 10 years. DOE would require the transportation contractor to provide for maximum use of dedicated train service and advanced rail equipment features where this type of service or equipment can be demonstrated to enhance operating efficiency, dependability, and cost-effectiveness or lessen the potential of adverse railroad equipment incidents. See Section M.3.1 of the EIS for more information on the acquisition of contractor services.

Oversight of branch rail line operations in Nevada, if there was a decision to build such a line, would depend on several factors not known at this time. Maintenance of rail lines is prescribed by Federal Railway Administration regulations and the maintenance is checked by the Administration. The U.S. Department of Transportation has issued regulations designating the placement of cars carrying spent nuclear fuel in the makeup of a train (49 CFR 174.85 and 49 CFR 174.700).

8.7 (7061)

COMMENT-Lincoln County and the City (Caliente) recommended that various options for rail spur be considered within the EIS. Operational alternatives affecting transportation safety which the County and City suggested for consideration included varying maintenance schedules and standards (i.e. for roadbed, track, and trains): options for coordinating train movements with Air Force over flights: train speeds: options for provision of security against sabotage or acts of terrorism: alternative locations for train maintenance and crew change facilities: the potential for and implications of allowing shared use of the rail spur by other government agencies (i.e. Air Force) industrial users (i.e. mining energy): and opinions for ownership and operational management of the rail spur. It was recommended that each of these operations should be evaluated against their contribution to risk management and regional economic benefit. The DEIS Does not consider operational alternatives affecting transportation safety including varying maintenance schedules and standards (i.e. for road bed, track and trains): options for coordinating train movements with Air Force over flights: train speeds: alternatives for provision of security against sabotage or acts of terrorism: alternative locations for train maintenance and crew change facilities: the potential for and implications of allowing shared use of the rail spur buy other government agencies (i.e. Air Force) and industrial users (i.e. mining and energy): and options for ownership and operational management of the rail spur.

RESPONSE

Should a decision to proceed with the development of a repository tit Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At this time, many years before shipments could begin, it is impossible to predict accurately which highway routes or rail lines DOE could use. Nor is possible to provide the detailed plans suggested by the commenter, however, these elements could be considered in the future.

At present, DOE intends to purchase services and equipment from Regional Servicing Contractors who would perform waste acceptance and transportation operations (see Section M.3.1 of the ELS). The contractor providing transportation services would be required to prepare a transportation plan that would

discuss the various steps it would take to ensure the shipments are conducted in a safe and efficient manner. 1) DOE's draft Request for Proposal requires the contractors selected to provide transportation services must demonstrate that they have had successful experience transporting hazardous materials. The transportation contractor would be required to prepare a transportation plan that would include protocols to implement the multitude of requirements promulgated the U.S. Department of Transportation and Nuclear Regulatory Commission regulations, including land use and ownership, maintenance, scheduling, risk management, security, safety, and communications, and require consultations with responsible agencies (see Section M.3).

DOE could decide to use a dedicated train that carries only the material to be shipped to Yucca Mountain, or could elect to move the spent nuclear fuel and high-level radioactive waste in general freight. DOE continues to evaluate the safety, cost, and schedule aspects of dedicated trains; however a decision on their use has not been made at this time. If the material was shipped as general freight, the position of the spent nuclear fuel or high-level radioactive waste car in the train is regulated by 49 CFR 174.85.

DOE identified the potential for shared use of a branch rail line in Section 8.4.2 of the EIS as a reasonably foreseeable future action. This section states "DOE would have to consider these impacts [of shared use] in any decision it made to allow shared use of tile branch rail line." If the site is approved, then decisions regarding ownership and shared use would be made. Line ownership, however, would not affect potential environmental impacts.

DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada. If the Yucca Mountain site was approved, DOE would issue at some future date, a Record of Decision to select a mode of transportation. If for example, mostly rail was selected (both nationally and in Nevada). DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. In this example, DOE would announce a preferred corridor in the Federal Register and other media. No sooner than 30 days after the announcement of a preference, DOE would publish its selection of a rail corridor in a Record of Decision. A similar process would occur in the event that DOE selected heavy-haul truck as its mode of transportation in Nevada. Other transportation decisions, such as the selection of a specific rail alignment a corridor, would require additional field surveys. State and local government and Native American tribal consultations, environmental and engineering analyses, and appropriate National Environmental Policy Act reviews.

8.7 (7176)

COMMENT

Page 2-43 Section 2.1.3.2.2, 2nd paragraph. The text here should indicate whether there will be any pre-notification of shipments given to state and local authorities and whether escorts will be used with each shipment.

RESPONSE

DOE would comply with Nuclear Regulatory Commission regulations requiring notification to the governor or the governor's designee by mail or messenger [10 CFR 73.37(f) 1. Governors would notify state and local safety officials, as appropriate, of the pending shipments. Tribes would receive notification also if the Commission amended the regulation to allow such notice. In response to comments, additional information on the notification process is included in Section M.3.2.5 of the EIS.

DOE believes that a shipment of spent nuclear fuel or high-level radioactive waste is an unlikely target in part due to the physical security measures imposed by the Nuclear Regulatory Commission regulations. Under certain conditions, armed escorts either follow or ride in the truck cab or all escort railcar. Requirements for escorts can be found in 10 CFR 73.37. Other security measures include devices that shut down or immobilize the transport vehicle in case of a sabotage attempt. DOE monitors its spent nuclear fuel and high-level radioactive waste shipments through a satellite-based tracking system (see Section M.7 and M.3.2.1.5 of the EIS for additional information).

In addition, because the purpose of the No-Action Alternative is to provide a basis for comparison with the Proposed Action, DOE has tried to be consistent with the analyses of the Proposed Action, as appropriate. Regarding long-term analyses, for example, Section K. 1 notes that DOE did not want to influence the results to favor the Proposed Action, and thus used assumptions for the No-Action Alternative that minimized predicted impacts. Section K.4 of the EIS discusses examples of these assumptions and their effects on the outcome of the impact analyses. Based on the above, DOE believes that the environmental impacts of the No-Action Alternative discussed in Chapter 7 and Appendix K are not overstated.

In addition, because the purpose of the No-Action Alternative is to provide a basis for comparison with the Proposed Action, DOE has tried to be consistent with the analyses of the Proposed Action, as appropriate. Regarding long-term analyses, for example, Section K. 1 notes that DOE did not want to influence the results to favor the Proposed Action, and thus used assumptions for the No-Action Alternative that minimized predicted impacts. Section K.4 of the EIS discusses examples of these assumptions and their effects on the outcome of the impact analyses. Based on the above, DOE believes that the environmental impacts of the No-Action Alternative discussed in Chapter 7 and Appendix K are not overstated.

8.8.1 (189)

COMMENT

Several commenters stated that the EIS was inadequate because it presented health impacts only in terms of deaths. There was no assessment of quality of life, traffic-related injuries, genetic effects, or other potential negative health, environmental, and economic impacts.

RESPONSE

As discussed in Section F. 1.1.5 of the EIS, cancer is the principal potential risk to human health from exposure to low or chronic levels of radiation. It is well accepted within the risk assessment and health physics community to use latent cancer fatalities as the measure of impact from radiation exposure; however, other health effects such as nonfatal cancers and genetic effects can occur as a result of chronic exposure to radiation. These are discussed in Section F. 1.1.5.

The transportation analyses in the EIS present the total impact of the Proposed Action and the No-Action Alternative. Fatalities were used as the measure of the total impact because non-radiation-related traffic fatalities can be combined with radiation-related latent cancer fatalities to yield all estimate of the total number of fatalities for the Proposed Action and the No-Action Alternative. In contrast, combining non-radiation-related measures of impact such as traffic-related injuries, illnesses, and other environmental impacts with radiation-related latent cancer fatalities would not yield an easily understandable estimate of total impacts. For the same reason, genetic effects, nonfatal cancers, and other radiation effects were not included in the estimates of the total impact.

Based on comments, a discussion of tile economic impacts of severe transportation accidents has been added to Section J. 1.4.2.5 of the EIS.

DOE believes that the EIS adequately analyze transportation-related impacts that could result from the Proposed Action. DOE also believes that the EIS provides the information necessary to make decisions on the basic approaches to transporting spent nuclear fuel and high-level radioactive waste (either rail or truck shipments), as well as the choice among alternative rail corridors in Nevada, if the site was recommended and approved. See the introduction to Chapter 8 of this Comment-Response Document for more information.

8.8.1 (7066)

COMMENT-The County (Lincoln) and City (Caliente) recommended that the DEIS consider operational alternatives including escorted versus unescorted shipments; time of day travel restrictions versus unrestricted transport; and use of local versus non-local trucking firms. The first two were suggested for consideration for their contribution to risk management. The third option set was recommended for evaluation to determine regional economic benefits. The DEIS Does not consider operational alternatives for legal weight trucks as recommended by the County and City during scoping.

RESPONSE-All legal-weight truck transport would have to meet the requirements of 10 CFR Part 73 for physical protection (including escorts) for shipment of regulated quantities of irradiated reactor fuel. Highway routes would be selected in accordance with U.S. Department of Transportation regulations (49 CFR 397.101) for transporting highway route controlled quantities of radioactive materials. Additional information on regulatory requirements, security requirements, and proposed operational protocols for spent nuclear fuel and high-level radioactive waste transportation to Yucca Mountain has been added to the EIS in Appendix M.

8.8.1 (7157)

COMMENT

The County [Lincoln] and City [Caliente] and comments to the scope of the EIS pointed out that risks associated with transportation of radioactive wastes through the County and City have been an important topic of local inquiry. The City and County pointed to research they sponsored which was performed by the University of Nevada, Las Vegas Transportation Research Center to evaluate the risks of transporting waste by highway and by rail through the area.* The study did conclude that the total accident risk (person rem) in the County for rail and highway transport was significantly greater than that estimated for other like areas around the United States. Total risk associated with rail and highway waste transport in rural areas of the County was also found to be significantly greater than that estimated for other like areas across the United States. In their comments, the County and City noted that although absolute levels of risk may be considered low, this study clearly indicates that residents of Lincoln County may be exposed to significantly greater levels of risk. The County and City urged DOE to recognize that the repository EIS must consider these differences as a means to ascertain viable options for reducing risk to levels commensurate with other regions of the United States. The DEIS Does not provide a comparative assessment of transportation risks through Nevada, or more importantly Lincoln County and other regions of the United States. As a consequence important differences between levels of risk are not revealed. Within Nevada, the DEIS Does demonstrate that risks of transporting waste through rural areas is riskier than through urban areas. However, the DEIS Does not provide sufficient identification and evaluation of measure to mitigate greater risk levels in rural areas.

*Sathisan, Shasi et. al., Risk Analysis for Spent Nuclear Fuel Transportation through Lincoln County Volume 1: Rail Shipments, Volume HA: Highway Shipments. Volume IIB: Technical Appendix, Transportation Research Center, Howard Hughes College of Engineering, University of Nevada, Las Vegas, February 1995.

RESPONSE

More than 9,000 rail shipments would pass through Caliente and Lincoln County over 24 years under the national mostly rail scenario. In addition, Caliente is under consideration as the location of an inter modal transfer station and is the starting point for several rail corridor and heavy-haul truck implementing alternatives. However, no shipments would pass through Caliente or Lincoln County under the mostly legal-weight truck scenario. The impacts from incident-free transportation and accidents would be low for either national transportation scenario (see Section 2.4.4.1 of the EIS). Therefore, the EIS demonstrates that the transportation of spent nuclear fuel and high-level radioactive waste would pose no undue risk to individuals or populations, either in Nevada or nationally.

DOE has not performed a comparative risk assessment of transportation through Caliente and Lincoln County with other areas of the country. The results of such an assessment are not necessary to support the comparison of alternatives and decisions to be made in the EIS. However, the Final EIS includes state-specific impacts, so this information is available on a state-by-state basis.

With regard to risk reduction and mitigation, DOE is committed to protecting human and environmental health as its first priority. Transportation of spent nuclear fuel and high-level radioactive waste would be conducted and risks would be managed in accordance with Federal regulations. These regulations are established to protect human health and safety. However, DOE will consider the costs and benefits of additional protective measures as it conducts more detailed transportation planning and studies to support the proposed repository. Section 9.3 of the EIS discusses potential measures under consideration to mitigate the impacts of transporting spent nuclear fuel and high-level radioactive waste to the proposed

repository. Section M.3 presents information about DOE's current planning for transportation of spent nuclear fuel and high-level radioactive waste.

8.8.1 (7209)

COMMENT

Pages 3-1 and 3-2 The listing of topics included in the description of the affected environment is not consistent with the topics assessed in the environmental consequence section. For example, under socioeconomic, housing and community services were considered as affected environment. In the environmental consequences section for Nevada transportation no estimates of the consequences to housing and community services is provided. This implies that the analysis of environmental consequences is incomplete in that it has not considered all aspects of the affected environment.

RESPONSE

Legal-weight truck shipments in Nevada would use existing highways. Because no new land acquisition or construction would be required, this EIS focuses on potential impacts to human health and safety and the potential for accidents involving legal-weight trucks.

For development of branch rail lines and heavy-haul truck capabilities, including an inter modal transfer station. Section 6.3.2 and 6.3.3 of the EIS have been modified to discuss impacts to the various aspects of the potentially affected environment, including housing and community services.

8.8.2 (135)

COMMENT-Several commenters identified the economic and multi-use benefits of sharing a branch rail line. The commentaries stated that rail routes could enhance access to mining and mineral resources areas. Several commentaries asked about ownership of the tracks and right-of-way, and the final disposition of the branch rail line. Others expressed concern about shared use negatively affecting the safety and environmental risk of transportation. The Draft EIS was a legally insufficient assessment of rail transportation risks and impacts because it provided incomplete and contradictory information on rail operating assumptions and failed to address the safety and environmental implications of potential shared use of the rail line for shipments of commercial explosives, military weapons and munitions, petroleum products, and other hazardous materials.

RESPONSE-If the Yucca Mountain site was approved, DOE believes that the EIS provides the environmental impact information necessary to make certain broad transportation-related decisions, namely the choice of a national mode of transportation outside Nevada (mostly rail or mostly legal-weight truck), the choice among alternative transportation modes in Nevada (mostly rail, mostly legal-weight truck, or heavy-haul truck with use of an associated inter modal transfer station in Nevada. However, follow-on implementing decisions, such as the selection of a specific rail alignment in a corridor, would require additional field surveys, State and local government and Native American tribal consultations, environmental and engineering analyses, and appropriate National Environmental Policy Act reviews. DOE identified the potential for shared use in Section 8.4.2 of the EIS as a reasonably foreseeable future action. This section states "DOE would have to consider these impacts (of shared use) in any decision it made to allow shared use of the branch rail line." If Yucca Mountain site was approved, then decisions regarding ownership and shared use would be made. Line ownership, however, would not affect potential environmental impacts.

Regarding rail corridor alignments different from those identified in the EIS, as discussed in Sections 6.3.2 and J.3.1.2 of the EIS. DOE has narrowed its consideration for a branch rail line to five candidate rail corridors through a process of screening rail alignments it has studied. The sections identify six earlier studies. For example, in the Nevada Potential Repository Preliminary Transportation Strategy, Study 2, February 1996, the Department evaluated a rail alternative called the Stewart Valley Alternate (DIRS 101214-CRWMS M&O 1996). This corridor alignment west of Pahrump was removed from further consideration because of the greater potential for land-use conflicts than in the corridors evaluated in the EIS. Chapter 4 of that report discusses potential operations of a branch rail line. Because use of the branch rail line to transport materials to Yucca Mountain would continue until 2034 under a Proposed

Action, it would be premature at this time for the Department to make a decision on the use or disposition of the branch rail line after emplacement operations were completed.

Impacts, including impacts to human health and safety, biological resources, land use, aesthetics, and multiple other resource areas, of constructing and using a branch rail line for transporting spent nuclear fuel and high-level radioactive waste to Yucca Mountain are discussed in Section 6.3.2 of the EIS. In response to public comments, DOE has enhanced and clarified its analyses and discussions of these impacts. The Department's Rail Alignment Analysis provides evaluations of branch rail lines in each of the five candidate rail corridors (DIRS 131242-CRWMS M&O 1997). The evaluations are based on requirements and standards contained in the American Railway Engineering Association and U.S. Department of Transportation regulations and Federal Railroad Administration Track Safety Standards. Included are standards for railroad crossings over highways.

8.8.2 (179)

COMMENT- Comments said that the EIS should discuss past and current impacts to Nevada residents from the transportation of radiological materials and hazardous materials along the candidate routes for spent nuclear fuel and high-level radioactive waste shipments to Yucca Mountain. By so doing, EIS can then determine the commutative impacts to populations in Nevada who have been repeatedly exposed to these materials.

RESPONSE

Section 8.4.1.2 of the EIS presents the commutative impacts of radioactive material transportation in the United States since 1943. These commutative impacts include the impacts of historic DOE shipments, which include shipments associated with the Nevada Test Site (see Table 8-58). Table 8-58 lists the impacts for expanded use of the Nevada Test Site. Even if all the impacts from historic DOE shipments were allocated to Nevada, the impacts would be extremely small, about a 0.1 chance of a latent cancer fatality among members of the affected population.

Section 8.4.2.7 of the EIS describes the Nevada transportation impacts and states that the estimated total collective worker dose from the entire DOE low-level radioactive waste inter modal shipping campaign, including transportation impacts, would be about 4.2 person-rem. The population dose associated with low-level radioactive waste shipments by truck would be about 7.6 person-rem for the entire shipping campaign. These impacts are extremely small, less than about a 0.01 chance of a single latent cancer fatality among members of the affected population.

8.8.2 (7141)

COMMENT

The County [Lincoln] and City [Caliente] recommended that an assessment of paleontologic resources within alternative rail corridors and a potential borrow pit sites within Lincoln County be conducted and reported on within the scope of the repository DEIS. The DEIS Does not identify potential borrow pits and therefore has not included an assessment of the paleontologic resources at such sites. Such an omission makes the document less useful as a decision-support tool, particularly in choosing among transportation corridor alternatives.

RESPONSE

As stated in Section 6.3 of the EIS, the evaluation of impacts of culture resources considered the potential for disrupting or modifying the character of archaeological or historical sites, artifacts, and other cultural resources. The region of influence for the analysis included the lands in the 400-meter (0.25-mile)-wide rail corridors. Culture resource impacts of each rail corridor implementing alternative are provided in Section 6.3.2.2. Should the mostly rail transportation scenario be selected and a preferred corridor identified, additional engineering and environmental studies would be initiated to select a specific alignment of the tracks within the selected corridor. Appropriate National Environmental Policy Act reviews would be conducted to support selection of a specific alignment and design. Borrow pits would not be identified and assessed for cultural resources until geotechnical surveys and other environmental studies were conducted in conjunction with subsequent design activities following the selection of a rail corridor

or inter modal transfer station location. An assessment of paleontologic resources at borrow pits would be included in such National Environmental Policy Act reviews for the specific rail alignment.

8.8.3 (7230)

COMMENT

Page 4-88. Section 4.1.15.4. Sites for cask manufacturing should have been considered within Nevada. The FEIS should consider sites along transportation corridors in Nevada. The description of environmental setting for these facilities belongs in Section 3, Affected Environment.

RESPONSE

DOE would not develop transportation casks, but plans to contract with the private sector to provide waste acceptance and transportation services, including equipment. All cask designs must contribute to overall efficiency and operability of the entire transport system and meet Nuclear Regulatory Commission regulations. Information on the process for acquisition of waste acceptance and transport services, including casks, through the Regional Servicing Contractors is provided in Section M.3.1 of the EIS.

Because there are existing manufacturing facilities that could meet the projected manufacturing requirements, the EIS assumed that new cask manufacturing facility construction would not be necessary and that there would be no change in land use for the manufacture of disposal containers and shopping casks. Therefore, it was not necessary to consider manufacturing sites in Nevada.

8.10 (145)

COMMENT

Commenters expressed concern about the impacts of contamination of surface water or groundwater from a transportation accident. Commenters expressed concern with impacts to surface-water bodies such as local rivers (for example, the Muddy and the Humboldt), major rivers (for example, the Mississippi and the Colorado), Lake Mead, and wellhead areas of public water supplies as well as groundwater systems. Other commenters expressed concern about comprehensive emergency planning and response capabilities, and their funding, and potential mitigation measures and who would implement them. Other commenters expressed concern about effects on food and natural resources affected by releases to surface- and groundwater bodies.

RESPONSE

The shipping casks used to transport spent nuclear fuel and high-level radioactive waste would be massive and tough with design features that complied with strict regulatory requirements that would ensure the casks performed their safety functions even when damaged. The casks would be designed to be watertight even after a severe accident. Furthermore, the high-level radioactive waste would be in a solid form that would not be easily dispersed (ceramics, metals, or glasses).

Numerous tests and extensive analyses, using the most advanced analytical methods available, have demonstrated that casks would provide containment and shielding even under the most severe kinds of accidents. Since the publication of the Draft EIS, the Nuclear Regulatory Commission published *Reexamination of Spent Fuel Shipment Risk Estimates* (DIRS 152476-Spruug et al. 2000). Based on the revised analyses, DOE has concluded in the EIS that casks would continue to contain spent nuclear fuel fully in more than 99.99 percent of all accidents (of the thousands of shipments over the last 30 years, none has resulted in an injury due to release of radioactive materials). This means that of the approximately 53,000 truck shipments, there would be an estimated 66 accidents, each having less than a 0.01-percent chance that radioactive materials would be released. The chance of a rail accident that would cause a release from a cask would be even less. The corresponding chance that such an accident would occur in any particular locale would be extremely low. Section J.1.4.2.1 of the EIS presents consequences for accidents that could release radioactive materials.

The EIS Does not specifically analyze a transportation accident involving contamination of surface water or groundwater. Analyses performed in previous EISs (see Section 1.5.3 and table 1-1 of this EIS) have consistently shown that the airborne pathway has the greatest potential for exposing large numbers of

people in the event of a release of radioactive materials during a severe transportation accident. All analysis of the potential importance of water pathway contamination for spent nuclear fuel transportation accident risk using a worst-case water contamination scenario (DIRS 157052-Ostmeyer 1986) showed that the impacts of the water contamination scenario were about one-fiftieth of the impacts of a comparable accident in an urban area. Thus, it is extremely unlikely that an accident that resulted in a cask falling into any body of water would result in surface-water contamination, let alone groundwater contamination.

As discussed in Section J. 1.1.4, the EIS Does not specifically analyze a transportation accident involving contamination of surface-water or groundwater. While small particles generated by the impact forces and driven out of the cask by a severe fire {which would be extremely unlikely because there would be no fuel to sustain an engulfing fire of the type required to release radioactive material) could ultimately end up contaminating soils and surface waters outside the cask, this would not be the dominant pathway for radiological exposure and uptake after an accident.

A state is the primary authority responsible for the health and safety of its population and therefore, generally has the primary responsibility in responding to accidents that occur in its jurisdiction. However, a state can request assistance from Federal agencies as it judges what would be appropriate and needed to effectively respond to an accident. DOE, along with other Federal agencies, has the ability to respond quickly to radiological emergencies in any state, if requested. In addition, under U.S. Department of Transportation regulations, shippers and transporters have responsibilities for emergency response and cleanup. More information on emergency response is provided in Appendix M of the EIS. In addition, Section M.8 discusses the broad indemnification for liability of all personal injury and property damage, including costs of emergency response, evacuation, and post accident recovery and re-mediation activities, under provisions of the Price-Anderson Act and state law.

8.10.1 (62)

COMMENT

A number of commenters expressed concern over terrorism and sabotage against shipments of spent nuclear fuel and high-level radioactive waste. Commentaries summarized the State of Nevada's petition to the Nuclear Regulatory Commission to modify 10 CFR Part 73 to increase the level of security for these shipments. One commenter noted that neither the Draft EIS nor the supporting Sandia National Laboratories report acknowledges Nevada's petition for rulemaking. The commenters asked if spent nuclear fuel and high-level radioactive waste shipments would have armed escorts along the entire shipment route rather than just while they were in urban or high-population areas. The commenters recommended that armed escorts be required for the entire route and that DOE go beyond Commission regulations that prescribe safeguards for fuel shipments. Several commentaries mentioned the shipment of plutonium and commented that this material would be a particularly attractive target for terrorists.

RESPONSE

Nuclear Regulatory Commission regulations (10 CFR Part 73) prescribe safeguards and security measures for spent nuclear fuel shipments. These measures are required to reduce the likelihood of a successful sabotage attack. DOE shipments to a repository would comply with these safeguards and security regulations.

Regulations in 10 CFR Part 73 require armed guards in heavily populated areas. Escorts, but not armed guards, are required in areas not considered heavily populated. The State of Nevada's petition to the Nuclear Regulatory Commission (PRM-73-10) requests that such a distinction based on population density be eliminated from the regulations. DOE is aware of the petition and, in its January 27, 2000, comments to the Commission, expressed the opinion that the current performance-based regulations are more than sufficient to permit consideration of all appropriate threat scenarios. However, if the regulations for safeguards and security measures that apply to spent nuclear fuel transportation were revised, DOE would comply with the revised regulations for shipments to a repository. Similarly, for shipments other than spent nuclear fuel, which are addressed in 10 CFR 73.37. DOE would comply with all applicable Nuclear Regulatory Commission safeguards and security requirements.

Recent terrorist attacks have involved high-profile symbols of the United States and produced a large

number of immediate fatalities. Sabotage of a spent nuclear fuel shipment would not achieve this result. Even a successful sabotage attempt would not likely release significant quantities of radioactive materials. Casks would be designed and built to prevent release of their contents in all but the most severe accidents.

8.10.2 (114)

COMMENT

Commenters stated that the Draft EIS did not examine what emergency response personnel, training, and equipment would be needed along transportation routes or what specific impacts of a transportation accident would be. Also who would respond in the event of an accident: would local responders be the first to arrive at the scene of an accident or would transport vehicles be escorted with a response team? Other commenters asked who would train people and what level of training would be received and when would the hospitals and personnel in their communities be trained and equipped to handle radiation victims.

RESPONSE

As discussed in Section 6.2.4.2 of the EIS, accidents involving the transportation of spent nuclear fuel or high-level radioactive waste shipments could occur. However, of the approximately 53,000 truck shipments, there would be an estimated 66 accidents, each having less than a 0.01-percent chance that radioactive material would be released. The chance of a rail accident that would cause a release from a cask would be even less. As a consequence, the likelihood that a first responder or other emergency personnel would become contaminated, even in very severe accidents, would be remote. As described in Section M.5 of the EIS, as with any transportation accident, state and tribal governments have primary responsibility to and protect the public health and safety in their jurisdictions in accidents involving radioactive materials.

This includes providing, managing, and maintaining responsibility for emergency response capabilities. Although DOE would originally provide the funding, each state and tribe determine how it would administer that funding. Section 180© of the NWSA requires DOE to provide technical assistance and funds to states for training of public safety officials of appropriate units of local government and tribes through whose jurisdictions it would transport spent nuclear fuel and high-level radioactive waste. DOE would provide the assistance based on the training needs of the states and tribes, as determined using a planning grant and based on viability of funds in annual Program budgets specified by Congress.

-If there was a decision to proceed with the development of a repository at Yucca Mountain, shipping routes would be identified at least 4 years before shipments began and Section 180© assistance would be made available approximately 4 years prior to shipments through a jurisdiction.

-If there was an accident involving a shipment to the proposed repository, the first responders and response time would be same as those for any transportation accident.

-In the unlikely event someone was contaminated as the result of an accident involving shipments to a repository, there are several means to deal with such incidences. The Department has several programs available to provide assistance to state, tribal, and local governments in response to radioactive material accidents. The Radiological Assistance Program (RAP) is one example. Additional Federal response capabilities, such as expert services from the Radiological Assistance Program Team or the DOE's Radiation Emergency Assistance Center/Training Site (REAC/TS) are available 24 hours a day.

-With respect to compensation for losses associated with an accident involving spent nuclear fuel and high-level radioactive waste, the Price-Anderson Act (discussed in Section M.8 of the EIS) establishes a system of financial protection for persons liable for and for persons injured by a nuclear accident of incident.

8.10.2 (200)

COMMENT

Commenters stated that no baseline emergency response capability was established along the potentially affected routes or in affected communities. Because no baseline was established in the affected communities, the impact on community emergency preparedness could not be determined; therefore, the Draft EIS failed to meet National Environmental Policy Act requirements. They stated that a credible evaluation would identify the adequacy or inadequacy of emergency response capacity along routes and

allow the state and local authorities to deploy the necessary resources. Commenters stated that emergency response capabilities must be described as part of the affected environment and that emergency services are all essential part of local public services. Other commenters questioned whether the emergency medical facilities, fire departments, and police departments in all affected community would be adequately equipped and trained to handle an emergency situation. Commenters stated that the EIS should identify what emergency response, equipment, facilities (for example, isolation rooms for radioactively contaminated individuals), and trained personnel are available in these communities. One commenter stated that radioactive materials can be shipped safely with no significant risk to any population, including emergency responders. If basic measures are taken, such as identifying the emergency response agency having jurisdiction over a specific route, providing that agency with a copy of the training materials, and providing each agency file opportunity to have personnel attend an instructor led class.

RESPONSE

In evaluating the potential impacts of transportation accidents in the EIS, DOE conservatively assumed that no emergency response would occur and evaluated the full impacts of the accident on the surrounding population. The analysis of impacts of transportation accidents in the EIS (Section J. 1.4.2.1) does not take credit for emergency response efforts to reduce exposures to individuals. Therefore, the impacts consider the range of what could happen regardless of the emergency response capabilities of jurisdictions along transportation routes. If responders followed standard emergency response procedures, such as avoiding the downwind smoke of a major fire, exposures would be low. However, because DOE could not predict what type of emergency response would be available, it could not factor any mitigation of impacts as a result of such measures into the EIS analysis.

Section 18t(c) of the NWPA requires DOE to provide technical assistance and funds to states for training of public safety officials of appropriate units of local government and Native American tribes through whose jurisdictions the Department would transport spent nuclear fuel and high-level radioactive waste. The training would cover procedures required for safe routine transportation of these materials, as well as procedures for addressing emergency response situations. DOE would provide the assistance based on the training needs of the states and tribes, as they determined using a planning grant and based on availability of funds in annual Program budgets specified by Congress. Additional Federal response capabilities, such as expert services from the Radiological Assistance Program Team, could be activated, as requested by states and tribes. See Section M.6 of the EIS for a discussion of the DOE Section 180(c) policy and procedures.

If there was a decision to proceed with the development of a repository at Yucca Mountain, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At present, DOE intends to purchase services and equipment from Regional Servicing Contractors who would perform waste acceptance and transportation operations. The Department has issued a draft Request for Proposals requiring each Regional Servicing Contractor to prepare a transportation plan that describes the contractor's operational strategy and delineates the steps it would implement to ensure compliance with all regulatory and other DOE requirements. This includes identification of proposed routes and associated routing considerations, coordination and communication with all participating organizations and agencies, including other Regional Servicing Contractors, DOE, state, tribal, and local governments, and interactions with appropriate Federal and state organizations. The route and mode determinations would be interactive. If, during the course of the mode or route determinations, one of the previously determined factors changed, the site-specific mode and route analysis would be reevaluated to ensure consistency. The Regional Servicing Contractor would consult with other Regional Servicing Contractors as appropriate to ensure continuity and consistency of routes and to ensure trained emergency response personnel capability. After identifying a specific route, the Regional Servicing Contractor would submit the route plan to DOE for approval prior to its submittal to the Nuclear Regulatory Commission in accordance with 10 CFR 73.37 [a] [7]. Additional mode and route selection factors are in a U.S. Department of Transportation report. *Identification of Factors for Selecting Modes and Routes for Shipping High-Level Radioactive Waste and Spent Nuclear Fuel* (DIRS 103718-DOT 1998).

DOE believes that the EIS adequately analyze transportation-related impacts that could result from the

Proposed Action. DOE also believes that the EIS provides the information necessary to make decisions on the basic approaches to transporting spent nuclear fuel and high-level radioactive waste (either rail or truck shipments), as well as the choice among alternative rail corridors in Nevada if the site was recommended and approved. See the introduction to Chapter 8 of this Comment-Response Document for more information.

8.10.2 (212)

COMMENT

Commenters stated that their communities would be totally unprepared for the consequences of an accident, sabotage, or terrorism and stated that all Native American tribal, state, and local jurisdictions must be fully prepared for spent nuclear fuel and high-level radioactive waste shipments and should be involved in the development of emergency preparedness plans. Others stated that acceptable emergency response plans should be developed and implemented before the initiation of shipments. Other commenters noted that transportation companies and railways would require emergency plans before any shipment could occur. Commenters wanted to know where radioactively contaminated victims would be taken and noted that many hospitals do not have isolation rooms for this type of situation. Others asked how many hospitals in this country would have the capability of handling such an emergency. Other commenters stated that the Draft EIS did not adequately evaluate the potential demands on affected local government related to public health and safety with respect to activities that could occur, such as identifying evacuation routes within city limits.

Commenters stated that the Draft EIS was inadequate because there was neither analysis of potential activities and cost during all phases of emergency management, nor were data given regarding the development of emergency action plans for any metropolitan area affected by potential transportation of spent nuclear fuel and high-level radioactive waste to the proposed repository. One commented that the Draft EIS did not specifically address emergency preparedness along rail spurs, heavy-haul and legal-weight truck routes, or at prospective inter modal transfer stations. Another commenter stated that the Draft EIS must describe specific responsibilities for providing, managing, and maintaining emergency response capabilities, including identifying responsibility for emergency management and response training, responsibility for mitigating accidents, and responsibility for administering funds for emergency response assistance. One commenter stated that the state agencies that would be responsible for overseeing shipments of radioactive spent nuclear fuel and high-level radioactive waste through their communities would ensure that the appropriate shipping standards would be met. Another commenter stated that DOE should seek to enter into a memorandum of understanding with each corridor state to spell out responsibilities, liability, compensation, response times, cleanup, and other duties connected with emergency situations.

RESPONSE

As discussed in Section 6.2.4.2 of the EIS, accidents involving the transportation of spent nuclear fuel or high-level radioactive waste shipments could occur. However, of the approximately 53,000 truck shipments, there would be an estimated 66 accidents, each having less than a 0.01-percent chance that radioactive materials would be released. The chance of a rail accident that would cause a release from a cask would be even less. As a consequence, the likelihood that a first responder or other emergency personnel would become contaminated, even in very severe accidents, would be remote. The only expected radiological exposure of first responders would be from gamma radiation and neutrons penetrating the shielding of the casks. These radiation levels would be low, easily measured, and controlled to meet the limits of Nuclear Regulatory Commission regulations. Additional information on cask safety and testing is provided in Section M.4 of the EIS. Additional information on emergency response following an accident is provided in Section M.5.

Section 180(c) of the NWSA requires DOE to provide technical assistance and funds to states for training of public safety officials of appropriate units of local government and Native American tribes through whose jurisdictions it would transport spent nuclear fuel and high-level radioactive waste. The training would cover procedures required for safe routine transportation of these materials, as well as procedures for addressing emergency response situations. DOE would provide the assistance based on the training needs of the states and tribes, as they determined using a planning grant and based on availability of funds

in annual program budgets specified by Congress. Additional Federal response capabilities, such as expert services from the Radiological Assistance Program Team, could be activated, as requested by states and tribes. The schedule in the proposed policy and procedures for implementation of Section 180(c) of the NWPA (63 FR 23753, April 30, 1998) is designed to provide adequate time for training of first responders in advance of the first shipments. If there was a decision to proceed with the development of a repository at Yucca Mountain, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. Additional information on Section 180(c) is provided in Section M.6 of the EIS.

Although I) OE and its contractors would develop their own emergency response plans, the preparation and implementation of emergency response and evacuation and contingency plans are a state or tribal responsibility for lands within their jurisdictions. Section 180© funding would be provided to eligible jurisdictions for the preparation of these plans, as well as emergency response and safe routine transportation planning and coordination activities.

DOE believes that the EIS adequately analyzes transportation-related impacts that could result from the Proposed Action. DOE also believes that the EIS provides the information necessary to make decisions on the basic approaches to transporting spent nuclear fuel and high-level radioactive waste (either rail or truck shipments), as well as the choice among alternative rail corridors in Nevada, if the site was recommended and approved. See the introduction to Chapter 8 of this Comment-Response Document for more information.

8.11.1 (1239)

COMMENT

Pages 25 and 26 of the County/City EIS Scoping Report note that construction and operation of a rail line may impair access to forage and water by domestic livestock. The DEIS indicates that rail corridors would cross grazing allotments but Does not describe the impacts construction and use of a rail line would have on domestic livestock operations in Lincoln County.

RESPONSE

Land use and ownership impacts common to the construction and operation of all five of the branch rail lines are discussed Section 6.3.2.1 of the EIS and impacts specific to the Caliente Corridor are discussed in Section 6.3.2.1. The EIS determines that a branch rail line could create a barrier to livestock movement and qualitatively addresses the acres of grazing lands potentially affected by candidate rail corridors. DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidates rail corridors in Nevada. If a corridor was selected for construction of a branch rail line, DOE would conduct field studies along the corridor that would identify specific land uses to be avoided. DOE would avoid land-use impacts and private land to the maximum possible extent.

8.11.1 (7150)

COMMENT

The County [Lincoln] and City [Caliente] urged DOE to assess rail construction related losses in forage for livestock grazing. While the DEIS recognizes that some forage might be lost and that livestock movements might be impeded, no estimate of lost animal unit months (AUM's) of forage is provided within the DEIS.

RESPONSE

Because definitive information is not available on specific tracts of land that could be required in a given transportation alternative, DOE did not quantify potential impacts to animal unit months. Input received from the Bureau of Land Management, however, indicated that dividing grazing lands would result in a small loss of animal unit months in large allotments but would be unlikely to affect ranch operations. The loss of animal unit months in small allotments could affect a permit's operation. The Bureau also indicated that if a branch rail line divided an allotment into separate pastures, this could provide grazing management

options, potentially benefiting livestock and vegetation management.

8.11.1 (7212)

COMMENT

Page 3-101 Table 3-33. This table Does not appear to reflect Bureau of Indian Affairs lands that would be crossed in the vicinity of U.S. 95 north of Las Vegas.

RESPONSE

Table 3-33 of the EIS Does not include the Bureau of Indian Affairs lands referred to in this comment because the DOE analysis was limited to lands within the candidate rail corridors. However, Figure 3-1 Does recognize lands controlled by Native American tribes in Nevada.

Section 6.3.2.2.5 of the EIS indicates that the Valley Modified Corridor would pass within about 106 kilometers (1 mile) of the Las Vegas Paiute Indian Reservation north of Las Vegas.

8.11.1 (7237)

COMMENT

Page 8-87 Section 8.4.2.1. This section should recognize that before the Caliente inter modal site could be used by DOE the existing City of Caliente wastewater treatment facilities would have to be relocated. A site for such relocation would need to be obtained by DOE.

RESPONSE

Section 6.3.3.2.1 of the EIS acknowledges that the northern site includes an existing wastewater treatment plant. The EIS has been revised by stating that a transfer of property from the Bureau, the City of Caliente, or other entities to DOE would be required.

DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada.

Nonetheless, should the heavy-haul truck implementing alternative be selected for transporting large rail casks to the Yucca Mountain site, and the Caliente Route implementing alternative be identified as preferred, additional engineering and environmental studies would be conducted as a basis for detailed design and for appropriate National Environmental Policy Act reviews. During this process, DOE would initiate consultations with responsible local, State, Federal, and tribal agencies, landowners, and other stakeholders to identify, acquire, and evaluate additional information and develop mitigate actions necessary to minimize potential impacts, including location of facilities.

8.11.2 (7082)

COMMENT

The County [Lincoln and City [Caliente] noted that the DEIS should include a description of ambient air quality conditions within potentially impacted basins of Lincoln County. Information regarding current air quality conditions in the County was provided to DOE during EIS scoping. The DEIS Affected Environment section on Air Quality Does not even refer to Lincoln County specifically and offers only very general observations not useful to determine impacts.

The County and City noted in scoping comments that although construction and operation of repository system components within Lincoln County will not likely affect regional climate, local climatic conditions may impact upon safe operation of tile repository system, particularly transportation. The County and City recommended that DEIS consider impacts of climate upon safe transport of radioactive wastes. Aspects of the climate recommended by the County and City for consideration included precipitation (particularly snow and ice), temperature (as may impact upon highway infrastructure and road surface conditions), and fog. The DEIS section on Affected Environment offers only a modest description of the climate within Lincoln County which provides insufficient information upon which to determine potential effects of climate upon safe transportation.

RESPONSE

With the exception of the Las Vegas Valley, all areas of Nevada potentially affected by transportation activities are unclassified for air quality and, therefore, "in attainment" with National Ambient Air Quality Standards. A change in air quality resulting from transportation activities associated with the proposed repository project would be unlikely. DOE has revised Section 3.1.2.1 of the EIS to note that these areas of Nevada are unclassified and, therefore, in attainment.

DOE used U.S. Department of Transportation accident and vehicle fatality rate data (DIRS 103455-Saricks and Tompkins 1999) to analyze the impacts presented in Chapter 6 of the EIS. These data include accident statistics for each state under the full range of climatic, road, and traffic conditions that occurred in the United States from 1994 to 1996. Thus, the EIS analysis considered the effects of weather and road conditions in Nevada such as those identified in the comment. In response to public comments, DOE has included Section M.3 to the EIS to discuss transportation protocols that would be implemented for the travel of vehicles carrying spent nuclear fuel or high-level radioactive waste in the event of inclement weather.

U.S. Department of Transportation regulations for routing shipments of Highway-Route Controlled Quantities of Radioactive Materials (49 CFR Part 397) include rules to minimize radiological risk and consider overall public safety. Highway shipments of spent nuclear fuel and high-level radioactive waste to Yucca Mountain would comply with these regulations. Preferred routes (see 49 CFI*, 397.103) that the State of Nevada might designate would comply with these regulations.

8.11.3 (7225)

COMMENT

Page 3-130 The text here implies that heavy-haul routes are in proximate parallel location to flowing surface waters. This is not the case at all. In most cases, these routes are 800 or meters from any flowing surface water, except for the occasional spring. Additional field work and revision to this section is needed.

REPOSENSE

The text on the cited page that appears to fit this comment is in the discussion of the candidate Caliente-Las Vegas heavy-haul truck route. The opening paragraph of this discussion states, "From Crystal Springs to Las Vegas, the route parallels the White River through Pahranaagat Valley, and then through Coyote Springs...." This statement Does not imply anything about the nature of the White River or its proximity to the route (U.S. Highway 93), only that the highway and the river both head southward through the Pahranaagat Valley. The White River flows only intermittently over much of its length. The important issue with respect to the White River in this area is that flow from Ash Springs is toward the White River channel and that U.S. 93 crosses the flow from the spring in the area between the spring and the river. Section 3.2.2.2.3.1 of the EIS identifies Ash Springs as a water resource associated with the Caliente-Las Vegas route, and Section 3.2.2.2.4 discusses biological resources, including the endangered White River springfish that occurs in the Ash Springs flow.

Before selecting a specific rail alignment in a corridor, the Department would conduct additional consultations, field surveys, analyses of water and biological resources, and appropriate National Environmental Policy Act reviews.

8.11.3 (12453)

COMMENT -The County [Lincoln] and City [Caliente] recommended that they include a description of wells and springs within Lincoln County hydrographic basins potentially hosting repository system construction activities, including rail or highway improvements. DOE was encouraged to include in said description depth to groundwater, flow attributes of existing springs, and existing water quality. While the DEIS Affected Environment section Does address surface and groundwater conditions along candidate transportation corridors in Lincoln County, the baseline data is not sufficient to enable conclusions about impact to hydrologic resources to be derived. For example, despite a request by the County and City for said information be included in the document, the DEIS Does not describe depth to groundwater, flow attributes of potentially impacted springs or existing water quality of potentially impacted water resources.

During scoping, the County and City suggested that surface hydrology might impair safe transport and/or handling of radioactive wastes and might be significantly altered by construction activities. The County and City recommended that for all areas within Lincoln County potentially impacted by repository system construction and operations (including transportation), mapping of surface hydrology and estimates of baseline flows should be included within the DEIS. The DEIS section on Affected Environment does not include any description of existing surface hydrologic conditions (particularly estimates of the duration and intensity of peak flows) within Lincoln County. This is despite the fact that the DEIS Does attempt to describe potential hydrologic impacts of transportation in Lincoln County (Section 6 of ELS).

RESPONSE

The EIS identifies surface-water resources along the candidate rail corridors and heavy-haul truck routes (see Sections 3.2.2.1.3 and 3.2.2.2.3 of tile EIS, respectively). The description in Section 3.2.2.2.3 of the Caliente sites DOE would consider for an inter modal transfer station includes a discussion of the candidate locations in relation to 100- and 500-year flood zones of Meadow Valley Wash. The floodplain/wetlands assessment in Appendix L of the EIS contains additional information on potential flooding areas along the Nevada transportation routes. Specifically, Appendix L identifies 100-year flood zones that rail corridors and their alternative alignment segments would cross, based on information from the Federal Emergency Management Agency. However, as noted in the EIS, these maps provide only limited coverage for Lincoln County.

DOE believes that the amount of detail in the EIS on water resources along candidate rail corridors and heavy-haul truck routes is appropriate. However, as stated in the EIS in Chapter 6 and Section 11.2.2 (subsection on Compliance with Floodplain/Wetlands Environmental Review Requirements), more detailed field surveys, government consultation, analyses, and appropriate National Environmental Policy Act reviews would be prepared if a decision was made to select a specific rail alignment within a corridor or a specific location of an inter modal transfer station or the need to upgrade the associated heavy-haul truck routes. These would include consultations with State wildlife management agencies, the Bureau of Land Management, the Army Corps of Engineers, and other applicable government agencies. They also would include field surveys (as applicable) and more detailed assessments and analyses of wetlands and other waters: floodplains: sensitive species: and other related issues.

8.11.4 (7223)

COMMENT

Page 3-129 2nd paragraph. The Caliente inter modal site is the location of the City of Caliente's wastewater treatment facility. Lands on the site are irrigated with effluent. The site is fully developed. Moist areas are likely the result of irrigation and are not spring or wetlands. This site has been previously cleared through NEPA [National Environmental Policy Act] for construction of wastewater treatment facilities using federal funding.

RESPONSE

Sections 3.2.2.2.1 and 6.3.3.2.1 of the EIS state that there is a wastewater treatment facility near the site of a candidate inter modal transfer station at Caliente. DOE has changed the text of Section 3.2.2.2.4 to clarify that moist areas within the site might be wetlands or other waters of the United States resulting from adjacent springs or they might be caused by irrigation from the treatment facility.

8.11.4.2 (7213)

COMMENT

Page 3-107 Section 3.2.1.4 [and Page 3-127 Section 3.2.2.4] This section should include reference to the Southwest Willow Flycatcher (*Empidonax trillii extimus*) which was listed by the U.S. Fish and Wildlife Service as endangered in February 1995. Habitat for this species may be found proximate to the Caliente, Caliente Chalk Mountain, Carlin, Jean and Valley Modified rail routes.

RESPONSE

DOE modified Sections 3.2.2.1.4 and 6.3.2.2.1 of the EIS to state that southwestern willow flycatchers have been observed in dense stands of riparian vegetation in Lincoln County; however, there is no suitable habitat for this species in the Caliente or Caliente-Chalk Mountain Corridor. DOE also modified Sections 3.2.2.2.4 and 6.3.3.2.1 to state that this species has been detected in Meadow Valley Wash, but there is no suitable habitat at the potential site of a Caliente intermodal transfer station. Finally, DOE modified Sections 3.2.2.2.4 and 6.3.3.2.3 to state that southwestern willow flycatchers occur in dense riparian vegetation in Pahrangat Valley, and that improvements of U.S. 93 along the candidate Caliente/Las Vegas heavy-haul truck route would not affect that habitat. These conclusions are based on the Biological Assessment of potential impacts of the Proposed Action on threatened and endangered species (DIRS 152511-Brocoum 2000).

8.11.4.2 (7231)

COMMENT

Page 9-19 Section 9.3.4.1. The 3rd and 4th bulleted actions are inconsistent with the recently adopted Clark County multi-species habitat conservation plan. Clearance surveys have come to be of marginal value since the disposition of collected tortoises is often euthanasia.

RESPONSE

The Proposed Action would be consistent with Section 7 of the Endangered Species Act, which covers Federal actions, not Section 10, which covers private actions and requires a plan such as the Clark County Multiple Species Habitat Conservation Plan. The two actions referred to in the comment are terms and conditions required by the U.S. Fish and Wildlife Service to mitigate the take of tortoises during repository construction and operation (see Appendix O of the EIS), and probably would be required for transportation-related construction. Clearance surveys are an effective method for protecting desert tortoises from linear (for example, a branch rail line) or relatively small disturbances in areas where tortoises are abundant. Moving tortoises or their eggs that are found to be in harm's way into suitable habitat adjacent to the proposed area is an effective mitigation measure compared with placing them in captivity or killing them as is done in the Clark County Multiple Species Habitat Conservation Plan.

8.11.4.3 (7089)

COMMENT

In scoping comments to the EIS, Lincoln County and the City of Caliente noted that baseline geology and soil conditions could impact upon construction and operation of repository system components, including transportation infrastructure. The County and City noted for example that fault and soil features might impair facility integrity and alteration of area soils might induce or exacerbate flooding, water quality, and air quality impacts. The County and City observed that construction of a rail spur through Lincoln County would require extensive quantities of ballast and other roadbed materials. The County and City recommended that the DEIS include an inventory of potentially suitable sites to borrow materials within Lincoln County and the DEIS include geologic and soils mapping for all candidate sites and corridors potentially hosting repository system components, including transportation, within Lincoln County. It was noted in the County and City scoping comments that such inventory of soils should be completed to also facilitate preparation of plans for re-vegetating areas disturbed by construction activities. To facilitate DOE consideration of soil conditions, the County offered to provide DOE county-wide digital soils map coverage at 1:100,000 scale, which had been developed by the County. The Affected Environment section of the DEIS provides no information on specific soil conditions within Lincoln County. This is despite analyses contained within Section 6 of the DEIS which attempt to describe impacts of transportation activities on soil.

RESPONSE

In response to this comment, DOE examined information from Natural Resources Conservation Service to determine if any of the candidate rail corridors would cross prime farmlands and to identify serious engineering constraints that soil conditions could cause. The results of that analysis have been added to Section 6.3.2.1 and 6.3.3.1 of the EIS to describe potential impacts of the construction of a branch rail line or heavy-haul truck route on soils. The Department agrees with this comment that more site-specific information on soils would be necessary before the construction of a branch rail line or road upgrade to support heavy-haul trucks. As indicated in Chapter 6 of the EIS, DOE would conduct more detailed field

surveys, government consultation, analyses, and appropriate National Environmental Policy Act review if there was a decision to select a specific rail alignment in a corridor, or a specific location of an inter modal transfer station and the need to upgrade the associated heavy-haul truck routes. These would include more detailed analyses of soils and reclamation methods.

8.11.4 (42)

COMMENT

The Draft EIS Does not adequately address the impacts of development of a rail line or heavy haul route on springs, streams, and other waters: floodplains; groundwater resources; soils; native vegetation; spread of noxious weeds; risk of wildfire; game and non game wildlife habitat and migration; loss of hunting revenue; and wild horses and burros. The EIS should include a detailed inventory of the biological and surface-water resources along the potential routes and conduct a species and site-specific analysis of impacts, particularly if DOE wishes to decide among rail corridors or heavy-haul truck routes.

RESPONSE

The Environmental Baseline File for Biological Resources (DIRS 104593-CRWMS M&O 1999, all) includes descriptions and maps of springs, riparian areas, and other potential wetlands; game habitat and migration corridors; sensitive species; and wild horse and burro herd management areas within 5 kilometers (3 miles) of the transportation alignments and routes considered within Nevada. Sections 3.2.2.1.3, 3.2.2.1.4. and 3.2.2.2.4 and associated tables of the EIS highlight the biological resources close to the corridors and routes that are most likely to be affected by Nevada transportation activities. Impacts on those resources are discussed in Chapter 6.

DOE agrees with file commenter that site-specific information would be necessary prior to construction of a branch rail line or road upgrades to support heavy-haul truck shipments; However, DOE believes that the EIS provides sufficient information on impacts to biological resources to make informed decisions regarding the basic approaches (for example, mostly rail or mostly truck shipments), as well as the choice among alternative transportation corridors and routes in Nevada. If the site was approved, DOE anticipates that the project plan and design will continue to evolve, creating additional opportunities for mitigation and potentially eliminating the need for some mitigation measures currently under consideration. Section 9.1.1 (and subsequent sections in Chapter 9) describes DOE's initial list of commitments available at this time and identifies DOE-determined impact reduction features, procedures and safeguards and mitigation measures under consideration for inclusion in the project plan and design. Chapter 9 identifies ongoing studies that could influence mitigation measures related to the project plan and design.

As noted in Chapter 6 and Section 11.2.2 of the EIS, if a repository was to be constructed at Yucca Mountain, more detailed field surveys, government consultations, analyses, and appropriate National Environmental Policy Act reviews would be conducted with regard to the transport of waste to Yucca Mountain. These activities would include consultations with State wildlife management agencies, the Bureau of Land Management, the Army Corps of Engineers, and other applicable government agencies. They also would include field surveys (as applicable) and more detailed assessments and analyses of wetlands and other waters; floodplains; sensitive species; effects of habitat fragmentation, interruption of movements, mortality, and harassment on wildlife, horses and burrows; loss of hunter-generated revenue, spread of noxious weeds, and soils.

8.11.5 (7216)

COMMENT

Page 3-113 Table 3-36. This table is misleading in that it only reflects the number of sites identified to date and does not make clear that not 100 percent of each corridor has been surveyed. The table should be revised to reflect the percent of each route surveyed to date.

RESPONSE

The second and third paragraphs of Section 3.2.2.1.5 of the EIS, which reference the table, discuss the archaeological site file search results and the approximate percentage of each corridor. The incorporation of these data in the table itself would be redundant.

8.11.5.1 (254)

COMMENT

Commenters noted that the Draft EIS did not identify any direct impacts to historic sites due the operations of heavy-haul trucks along any of the heavy-haul truck routes. Specifically, the commenters expressed disagreement because older historic buildings in Goldfield, Nevada, are within 10 feet of the highway. Commenters indicated that there is no room available to widen the highway through Goldfield and that it would be necessary to build a roadway around the business section of the town to address this impact.

RESPONSE

In response to these comments, DOE examined available literature on potential impacts from heavy-haul trucks on historic buildings. Based on current analyses, DOE believes that ground-level vibration would be well below that which could adversely affect such structures. Section 6.3 of the EIS now includes the results of this evaluation. DOE recognizes that if it selected a heavy-haul truck route that passed through a historic downtown district, such as that in the Town of Goldfield, additional evaluation of this situation of this situation could be necessary, including evaluation of the historic structures themselves. In addition, DOE continues to consider the use of bypass routes as an option.

8.11.5.1 (7142)

COMMENT

Lincoln County and the City of Caliente recommended that the repository EIS include field surveys of alternative rail corridors, material sites, and other areas where construction may occur to determine the location and significance of any archeological resources. The DEIS Does not identify potential borrow pits and therefore has not included all assessment of the archaeology resources at such sites. Such all omission makes the document less useful as a decision-support tool, particularly in choosing among transportation corridor alternatives.

Lincoln County and the City of Caliente recommended that the DEIS include an inventory of important historic resources within Lincoln County along transportation corridors and in the vicinity of construction material sites. The DEIS Does not identify potential construction material or man Camp sites and therefore no inventory of historic resources in the vicinity of such areas is included within the DEIS. The absence of this information makes the document less useful as a tool for discriminating among alternative transportation corridors.

RESPONSE

In response to public comments, DOE reevaluated available information on archaeological, historic, and Native American cultural resources in the Final EIS. The information used in the analyses is sufficient to enable DOE to assess the potential for impacts to cultural resources for each rail corridor, route for use by heavy-haul trucks, and site for construction of an inter modal transfer station.

DOE acknowledges that there have been no project area-specific cultural resource surveys for the candidate transportation corridors, routes, inter modal transfer station sites, and related project areas. The Department would complete archaeological surveys for all areas subject to ground-disturbing activities during transportation-related construction before such activities started. Federal regulations provide for phased identification and evaluation of cultural resources for projects in which alternatives under consideration consist of corridors or large land areas (36 CFR 800.4). Due to the overall length of the rail and heavy-haul truck scenarios considered in the EIS, extensive field surveys prior to selection of the final mode of transportation and route would be impractical. Before the cultural resource surveys, DOE would identify the corridor centerline and right-of-way boundaries. Moreover, until selection of the final route was complete, the Department would be unable to complete related engineering studies to identify potential access needs and material sites. After these activities, DOE would complete cultural resource surveys in accordance with the requirements of the National Historic Preservation Act and 36 CFR Part 800.

8.11.5.1 (7214)

COMMENT

Page 3-133 Section 3.2.2.2.5. The fourth line of the 2nd paragraph of this section should reflect that archaeological sites are “at or near” sites. The Caliente site has been developed as the City of Caliente’s wastewater treatment facility. The site has been wholly disturbed. The significance of cultural resources as an issue at this site needs to be reconsidered within the DEIS.

RESPONSE

DOE has revised Section 3.2.2.2.5 of the EIS to include the disturbance of the area that includes the two candidate inter modal transfer stations sites at Caliente due to the City’s wastewater treatment plant. Section 3.2.2.1 discusses the land disturbance in more detail. DOE believes that it has dealt with the significance of the cultural resources in this area in an appropriate manner.

Lincoln County Regional Development Authority Comments

8.11.6 (44)

COMMENT-3 comments summarized

Several commenters stated that the Draft EIS indicated new jobs will be created in the Caliente/Lincoln County area as a result of inter-modal activities. Commenters said the Final EIS should include an estimate of new residents by age and make a determination of how many school children will be in the school system and how new residents will impact the existing infrastructure.

RESPONSE-Section 3.1.7 of the EIS addresses the projected baseline conditions through 2035 for Lincoln County. Sections 6.3.2 and 6.3.3 provide an estimate of the changes in population and other economic measures for each relevant implementing alternative. The transportation analysis in the EIS includes a sensitivity analysis that assigns all potential impacts to Caliente. This analysis conservatively estimates impacts of potential transportation actions on a community level for what could be the most affected community in Nevada.

8.11.6 (1241)

COMMENT

Page 30 of the County/City EIS Scoping Report provided a range of estimates of the population and demand for housing which would be induced by a range of new jobs. While the DEIS estimates the number of jobs which might be associated with intermodal activities in Caliente, rail line construction in the County and operation of heavy-haul trucks across Lincoln County, no estimate of induced population and related demands for housing and other public services (i.e. schools) is provided.

RESPONSE

The document cited in this comment is one of many DOE reviewed before preparing the Draft EIS. DOE estimates provided in the EIS for employment and population growth (including indirect population) in Lincoln County associated with the Yucca Mountain Project align most closely with the upper-case estimates in the scoping report (DIRS 104630-YMP 1997). The Department estimated about 237 total operations jobs for the Caliente-Chalk Mountain options. Of this total, DOE assumed that half the drivers and private escorts and other indirect employees (about 133 total) would work in Lincoln County. In the Final EIS, DOE estimates a population increase of about 166 in Lincoln County. DOE does not believe, however, that this represents an impact that could stress local housing or infrastructure because it does not expect the need for in-migration to fill most of the jobs. DOE estimates of incremental changes in employment include direct and indirect jobs and population increases due to Yucca Mountain activities. DOE has revised its socioeconomic estimates for Lincoln County to reflect population estimates from the Nevada State Demographer. The Department has reviewed pertinent information and revised its analyses of demands for public services and infrastructure in light of the identified repository-induced population changes.

8.11.6 (7205)

COMMENT

Page 3-71 Section 3.1.7. The evaluation of impacts in Section 6 11 for transportation include impacts to real disposable income, gross regional product and government expenditures. In order to define magnitude

of impact data for these parameters need to be included in the Affected Environment section of the DEIS.

Page 3-71 Section 3.1.7. The factors considered under socioeconomic are not adequate to enable a comprehensive assessment of impacts. At a minimum other factors needing to be included are age distribution of residents: other community services including water and waste water, solid waste, and emergency management and emergency medical services. Local government expenditures for these services need to be considered. The baseline "without repository" projections of population, housing, employment, school enrollment, local government revenues and expenditures, and various community service capacities and demands should be at least through 2033 or better yet closure of the repository. Currently, the DEIS lacks sufficient information to enable a determination of the significance of impacts over projected without repository baseline to be determined.

Page 3-74 3rd paragraph. Text here indicates that Lincoln County had a 13 percent decline in employment between 1990 and 1995. The text should indicate what this was attributed to. This decline is inconsistent with the findings in Section 4, Environmental Consequences that a 1.9 to 5.8 percent increase in employment and in population would be "within the range of historic changes in the county". Either the data in Section 3-74 is not accurate or the finding in Section 4 is inappropriate.

Page 3-76 Section 3.1.7.3. To enable a comparison with projected levels of PETT [Payments-Equal-to-Taxes] and to enable the reader to understand how past and future PETT levels were determined; the text here needs to explain how past PETT payment levels were derived, by County. The text should also identify any inconsistencies between derivations of PETT payments from one jurisdiction to another. Without such information any projection of PETT in Section is unsupported. (Section 4 Does not provide any estimates of PETT payments and this is a deficiency in the DEIS.)

Page 3-77 Table 3-26. Because the text on Page 3-73 indicates that the population of Lincoln County will increase 2 to 4 percent per year during the next decade, an explanation is needed as to why school enrollments in Lincoln County are projected to decline between 1997 and 2001. These two trends appear inconsistent, unless there are extenuating factors (i.e. aging of the population, reduced birth rates, etc.). Because Section 3 includes school enrollment, Section 4 should include a projection of school age children resulting from population growth. In addition, Section 4 should consider the need for additional school facilities to accommodate enrollment growth.

Page 3-78 Table 3-27. The year 2000 population forecasts for Lincoln County are not consistent with those of the Nevada State Demographer (4,410).

Page 3-78 Health Care. The description of hospitals should indicate whether these facilities are currently capable of handling patients contaminated by radiation. In the case of the Grover C. Dils Medical Center in Caliente, that facility is currently not capable of effectively handling a patient contaminated with radiation.

Page 3-78 Law Enforcement. The description of law enforcement should indicate whether each police or sheriff department is currently trained and equipped to respond to emergencies involving radiation hazards. The Lincoln County Sheriff Department is not currently trained or equipped to respond to such a hazard.

Page 3-78 The description of fire protection and emergency management should indicate whether each department and/or jurisdiction is currently trained and equipped to respond to emergencies involving radiation hazards. None of the volunteer fire departments or emergency medical service providers in Lincoln are currently trained or equipped to respond to such a hazard.

Page 3-98 Section 3.2.1.1. The last sentence of this section indicates that population densities were derived to estimate health risks. The methodology used to estimate potentially impacted population as described on Page J-40 has resulted in an underestimation of population in rural areas such as Lincoln County. This results from the fact that population densities used were derived from Census Block data. In Lincoln County Census areas are very large relative to total population within the area. Most persons residing in the Census areas reside near to transportation infrastructure. As a result, it is necessary to adjust population

densities prior to multiplying each by the 1.6 kilometer region of influence. Research completed by the University of Nevada, Las Vegas, Transportation Research Center has documented the need to make such an adjustment in population density. [These comments also apply to Page 3-114, Section 3.2.2.1.6]

Sathisan, Shasi et. al., Risk Analysis for Spent Nuclear Fuel Transportation through Lincoln County Volume 1: Rail Shipments, Volume IIA: highway Shipments, Volume IIB: Technical Appendix. Transportation Research Center, Howard Hughes College of Engineering, University of Nevada, Las Vegas, Nevada, February 1995.

RESPONSE

DOE appreciates the breadth of this comment. The Final EIS reflects some of the issues and the following response categories or groups the issues by topic to better capture some of the commenter's diverse but related concerns. DOE has expanded its socioeconomic discussions in Section 3.1.7 of the EIS to provide a clarified basis for understanding the potential impacts described in Chapter 4. This discussion includes a projection of baseline parameters through 2035 based on the most recently available information and assumptions, information on Gross Regional Product, government spending, and real disposable income has been included. DOE incorporated State Demographer population information for Lincoln County in the Final EIS. DOE has revisited population estimates by age to determine potential impacts on specific services, particularly schools, in the Final EIS, DOE provides a quantified estimate, to the extent possible, of school changes in enrollment and the status of law enforcement and public service personnel requirements.

Employment Decline

Regarding Lincoln County employment, the decline between 1990 and 1995 is primarily attributed to file services sector possibly related to the Nevada Test Site employment reductions during that time period. The reference to a 1.9- to 5.8-percent increase in employment and population pertains to long-term trends going back to the 1980s and encompasses the identified employment declines of the 1990s. DOE has clarified the text in the EIS to make this distinction.

Payments-Equal-To-Taxes

Payments-Equal-To-Taxes (PETT) are made pursuant to Section 116(c)(3)(A) of the NWPA, which requires the Secretary of Energy to "...grant to the State of Nevada and any affected unit of government, an amount each fiscal year equal to the amount such State or affected unit of government, respectively, would receive if authorized to tax site characterization activities...." Nye County and the State of Nevada have been eligible to receive PETT since commencement of site characterization activities in May 1986. The other affected units of local government include Clark, Lincoln, Esmeralda, Eureka, White Pine, Churchill, Lander, and Mineral Counties in Nevada, and Inyo County, California. Potentially, they have been eligible to receive PETT since the enactment of the amendments to the Nuclear Waste Policy Act in 1987.

DOE acquires data from the Yucca Mountain Site project organizations that purchase or acquire property for use in Nevada, have employees in Nevada, or use property in Nevada. These organizations include Federal agencies, national laboratories, and private firms. Not all of these organizations have Federal exemption status so they pay the appropriate taxes. The purchases (sales and use tax), employees (business tax), and property (property or possessory use taxes) of the Yucca Mountain Project organizations that exercise a Federal exemption are subject to the Payment-Equal-To-Taxes Program (DIRS 103412-NLCB 1996).

The age group 6 to 18 estimate (school age) drops about 25 percent between 2002 to 2011 and rises again, reaching its 2002 level in about 2020. DOE believes the direct and indirect impacts of transportation activities would result in helping restore the school-age population back to its previous levels.

Emergency Response

Regarding possible agency support or emergency response to repository activities, DOE does not presume

To speculate on what agencies feel that they might need to do to serve their citizenry. If the proposed repository was approved for development, DOE would, however, enter into discussions with potentially affected units of local government and consider appropriate support and mitigation measures. As required by Section 180(c) of the NWPA, DOE would provide technical assistance and funds to states for training for public safety officials of appropriate units of local government and tribes through whose jurisdictions it would transport spent nuclear fuel and high-level radioactive waste. Training would cover procedures required for safe routine transportation of these materials, as well as procedures for dealing with emergency response situations. In addition, Sections 116(c) and 117(c) (5) of the NWPA set forth assistance guidelines covering a number of issues including emergency response, health baseline studies, and monitoring.

Population and Health Risks

The EIS used U.S. Census data to estimate the number of people in the general population who would live near the highway and rail routes that were selected for analysis. However, it was not possible or practical to identify each special population that would be in each of the thousands of Census blocks crossed by the routes and analyzed. However, the use of Census data for population along real routes selected for the analysis ensured that estimated impacts would be calculated for the health and safety of real people---not generic populations along generic routes. Because populations resident in care facilities for the elderly are included in Census data, the analysis included the impacts to these populations. Furthermore, impacts to temporary occupants of schools and hospitals that would be near routes and whose temporary occupancy is not included in Census data were included in the analysis, because the analysis assumed that adults, children, and hospital patients would be present in their homes when every shipment passed. Thus, while it is certain that the approach of using Census data to estimate the number of people who would be exposed to passing shipments leaves some uncounted, it is also certain that the analysis counted some who would not be affected. For the purpose of estimating health and safety risks to populations along routes, the approach provides reasonable estimates and does not exclude special populations.

8.11.6 (7242)

COMMENT

Page 6-96 Socioeconomic Section discusses the impacts of heavy-haul of the large rail casks. This Section fails to address potential impacts to the quality of life of residents living along highways in the rural communities resulting from 4-5 of these large trucks, along with their remaining convey, traveling communities every day for 24 years. This area needs to be addressed by DOE. One method to mitigate this impact would be to construct heavy haul by-passes around these communities wording with each community as to where by-pass should be located.

RESPONSE

If the repository was approved, subsequent environmental studies would assess route alignment in more detail to support decisions and identify possible mitigation measures.

8.11.6 (12069)

COMMENT

Page 12 of the County/City EIS Scoping Report presented evidence that a transportation accident characterized by extensive media reporting might result in stigmatization of tourist destinations in Lincoln County (including five state parks). A loss of tourism during peak season could pose significant economic and fiscal consequences in Lincoln County. Mitigation of such a potential impact might include a contingent tourism marketing plan which is ready to implement the instant an accident occurs.

RESPONSE

Assessing the perceived impact of stigma is generally problematic because it does not necessarily depend on actual physical effects or risks of the proposed action, but on the negative perception of those effects or risks by the public. While DOE agrees stigmatization could result in adverse impacts under some scenarios, it is not inevitable or measurable and stigmatization would likely be an aftereffect of unpredictable future events, such as a serious accident. As a consequence, DOE addressed but did not

attempt to quantify potential impacts from risk perceptions or stigma in the Final EIS. Section 2.5.4 and Appendix N of the EIS discuss this issue.

8.11.8 (10)

COMMENT

Expressed concern about the proximity of public buildings and residences to proposed heavy-haul truck routes and rail lines in the State of Nevada. Some expressed concerns about impacts to the quality of life due to noise during construction and operation of transportation facilities. Others expressed concern about impacts to structures from ground vibration associated with inter modal transfer stations and operation of heavy-haul trucks. Specific concern was expressed regarding the 640-meter (2,100-foot) region of influence established at the 45-decibel (dBA) level as it applies to Goldfield in Esmeralda County. Similar concerns were expressed regarding the assessment of noise associated with a railroad, an inter modal transfer station, and heavy-haul truck traffic in Caliente.

RESPONSE

Because of the need to differentiate among implementing alternatives (for example, among corridors), the noise analysis applied to the alternative corridors and heavy-haul truck routes was a reconnaissance-level screening analysis, rather than an examination of individual noise receptors or baseline levels of noise and traffic. As discussed in the introduction to Chapter 6 of the EIS, follow-on implementing decisions, such as the selection of a specific rail alignment within a rail corridor, would require additional field surveys. Buildings of historic significance, as well as public exposure to noise and vibration for example, would be addressed at that time.

Nevada Does not have noise regulations. DOE used 45 dBA for the EIS analysis to establish conservatively a region of influence that would include most receptors. For Comparison, residential noise standards in many other states generally use a level of 60 dBA for residential zones and 65 dBA for commercial zones. Residences located near highways along heavy-haul truck routes would be exposed to instantaneous levels of noise exceeding 60 dBA, which could elicit complaints that the noise was annoying. Annoyance levels are below levels that would be unsafe or could cause hearing damage. DOE has modified Section 3.1.9.2 of the EIS to include discussion of noise levels that are potentially unsafe or that could cause hearing damage compared to levels that merely results in annoyance.

8.11.8 (7217)

COMMENT

Page 3-134 Section 3.2.2.2.7. 3rd paragraph. The Caliente Route is located several miles from the community of Hiko. Reference to Hiko in this paragraph should be deleted.

RESPONSE

DOE has deleted the reference to Hiko.

8.11.9 (7139)

COMMENT

Lincoln County and the City of Caliente recommended that the DEIS, to facilitate an assessment of impacts view-shed, include an analysis of existing visual quality within basins potentially impacted by rail construction and operation. The County and City noted that such information can be used in developing measures for mitigation of impacts to view-shed within Lincoln County. The DEIS Does assess existing visual quality along rail corridors in Lincoln County. There is however, no description of measures to mitigate visual impacts of rail corridors within Section 9.3 of the EIS.

RESPONSE

Section 9.3.8 of the EIS has been modified to include several possible measures to mitigate visual impacts from a branch rail line. Potential mitigation measures could include (1) removing or contouring soil piles from construction activities to mimic the existing landscape; (2) minimizing the height of soil piles if they could not be removed or re-contoured; (3) plant native seedlings and other vegetation in specific locations

to screen or reduce texture and color contrasts from key observation points; and (4) implementing a water spray program during construction to minimize emissions of fugitive dust.

8.11.9 (7221)

COMMENT

Page 3-116 Section 3.2.2.1.8. This section needs to describe BLM [Bureau of Land Management] designated wilderness study areas (WSA) proximate to transportation corridors. Section 4, environmental consequence needs to consider visual impacts to and from designed WSA's.

RESPONSE

Section 4.1.10 of the EIS describes potential aesthetic impacts of the proposed repository. There are no Wilderness Study Areas near Yucca Mountain. Therefore, construction and operation of a repository at Yucca Mountain would not affect existing Wilderness Study Area.

The Caliente Corridor passed near Weepah Springs Wilderness Study Area in the Kawich and Reveille Mountains, and the Valley Modified Corridor passes near two Wilderness Study Areas near the Sheep Range Mountains, the Desert National Wildlife Refuge, and the Nellis Air Force Range. The Steiner Creek Alternate of the Carlin Corridor potentially encroaches on the Simpson Park Wilderness Study Area. DOE has modified Section 6.3.2.12 of EIS to include additional discussion of the visual impacts to these Wilderness Study Areas from construction and operation of a branch rail line.

9.1 (7192)

COMMENT

Page 2-74 Section 2.4.1. The use of the word "small" to describe impacts is not consistent with NEPA [National Environmental Policy Act] terminology. Although DOE considers impacts to be small they may yet be significant. For example, a small absolute change might represent a 50 percent increase or decrease in given parameter. The DEIS must evaluate impacts and risks on the basis of their significance not their absolute value. Further, NEPA requires that impacts, even if "small", be mitigated.

RESPONSE

The Council on Environmental Quality regulations requires consideration of all impacts (large and small) and of both "context" and "intensity" when assessing the significance of a proposed action (40 CFR 1508.27). Consistent with the regulations, DOE quantifies impact estimates in most cases. The regulations also require that EISs be written in plain language so that the widest audience can readily understand them. To be consistent with the regulations, the Department has used descriptive terms, such as "small," to help convey the relative impacts of various actions on the environment.

Moreover, consistent with these requirements and the standards established by the Nuclear Regulatory Commission (DIRS 101899-NRC 1996; DII-S 101900-NRC 1996), the department has determined, in general that "small" means potential environmental effects (with or without mitigation) that are not detectable or are so minor that they would neither destabilize nor noticeably alter any important attribute of the resource. For example, human health impacts that do not exceed permissible levels as defined in Federal or state regulations are generally considered small because adverse health effects would not be expected for exposure to these levels.

The Department is committed to identifying mitigation measures. Potential mitigation measures are discussed in Chapter 9 of the EIS. However, the commenter's assertion that the National Environmental Policy Act requires mitigation of impacts (large or small) is incorrect.

9.1 (12711)

COMMENT

Page 2-75 Table 2-7 [Section 2.4.11. This table should be revised to include a comparison of the population likely to accrue the risks associated with the No Action and Preferred alternatives. For example, what is the number of persons potentially exposed to risks associated with the No Action Alternative (i.e. population near on-site storage and transportation routes). This information would be helpful in evaluating

the extent to which the alternatives tend to concentrate risks among persons exposed to them. This concentration of risk is an important impact, which must be considered lot mitigation or compensation.

Page 2-76 Table 2-7. Under No Action Alternative estimates of Radiological Latent Cancer Fatalities why is not a range of estimates given similar to estimates for the Preferred Alternative. Absent a range, does this imply a lack of uncertainty in the estimates under the No Action alternative, which is not available for the Preferred Alternative. The presentation of comparative data in Table 2-7 for each parameter for each alternative should be consistent.

Page 2-76 Table 2-7. As the analysis in Table I of these comments illustrates, the number of fatalities associated with the Proposed Action [and] No Action alternatives. This is due to the fact that transportation is the key source of risk during the first 100 years. This analysis suggests that for at least 100 years the No Action serves to better protect public health and safety. The analysis in Table 1 also suggests that if the Preferred Action is implemented that during the first 100 years there will be an in-equitable distribution of risk from, " existing storage sites to primarily Nevada, and in particular, communities located along transportation routes. The DEIS must consider the temporal and geographic distributions of risk associated with the Preferred and No Action alternatives. The DEIS must consider methods to mitigate risks transferred to Nevada. The DEIS must recognize that the Preferred Action Does not minimize risk during tile first 100 years of repository operation.

Draft Yucca Mountain Environmental Impact Statement
Comparison of Proposed Action to No Action Alternatives Total Fatalities per Year
{ derived from data in Table 2-7 of Yucca Mtn. DEIS)

Alternative	0-24 yrs.	24 yr Total	25-100yrs.	75 yr Total	100yr Total	101-10,000 yrs.	9,900yr Total
Proposed	.75-2.69	18.70-67.13	04-.06	3014.53	12.70-71.66	5 X 10 ⁻⁸ -5.3 X 10 ⁻⁸	5 X 10 ⁻⁵ -53 X 10 ⁻⁴
No Action # 1	25	635	25	1906	254	.11	1-095
No Action #2	.25	635	25	1906	25.4	33	3,300

Table Conclusions¹

1. During the period 0-24 years Proposed Action is 3-10 times riskier than the No Action alternatives.
2. During the period 25-100 year No Action # 1 is 4-6 times riskier than the Proposed Action.
3. During the first 100 years Proposed Action is a little less to nearly three times riskier than No Action alternatives.

4. during the period 101 - 10,000 years No Action Alternative is 1,000 to 3,000 times riskier than the proposed Action.
5. During first 24 years of repository operation, transportation is the source of over 95 percent of all fatalities, with most being from highway accidents rather than exposure to radiation.

1/Proposed Action - disposal at Yucca Mountain

No Action Alternative # 1 - on-site storage of wastes with long-term institutional controls

No Action Alternative #2 - on-site storage of wastes without long-term institutional controls

RESPONSE

DOE agrees that detailed affected population information is important. However, because of space considerations in Chapter 2 of the EIS, this detailed information is in later chapters and technical appendixes (principally Chapter 4 for short-term impacts for the Proposed Action. Chapter 5 for long-term impacts of the Proposed Action, Chapter 6 for transportation impacts, and Chapter 7 for impacts from tire No-Action Alternative) rather than in the summary table in Section 2.4.1 which provides a broad overview of impacts.

The range of impacts to which the commenter refers in Table 2-7 was not meant to reflect uncertainty in the estimates, but rather to show the range of impacts of various implementation scenarios. For example, the range of radiological impacts for the repository given in the Draft EIS reflects the differences between

the high, intermediate, and low thermal load scenarios. Similarly, the range for transportation impacts reflects the range of impacts for accidents that could occur in areas with low and high population densities.

For the No-Action Alternative, impacts for each of the scenarios evaluated are in separate columns (that is, Short-term, Scenario 1, and Scenario 2), and ranges are, therefore, not shown. However, Section K.4 of the EIS discusses the uncertainties associated with the No-Action Alternative in detail.

The purpose of the EIS is to provide information on the potential environmental impacts that could result from the Proposed Action to construct, operate and monitor, and eventually close a geologic repository for the disposal of spent nuclear fuel and high-level radioactive waste at the Yucca Mountain site. The repository and transportation analyses have captured the geographic shift of risks, as discussed in Chapters 4 and 6. Respectively Chapter 9 discusses the potential for mitigation of these risks. The EIS also provides information on potential environmental impacts resulting from a No-Action Alternative that assumes that the spent nuclear fuel and high-level radioactive waste would continue to be stored at the generator sites for some time into the future. The EIS Does not, however, make judgments on whether the temporal and geographic distribution of impacts is equitable.

10 (7152)

COMMENT

In comments to the scope of the EIS Lincoln County and the City of Caliente urged DOE to consider the cumulative effects which may result from the incremental impact of the proposed action and alternatives thereto when added to other past, present, and reasonably foreseeable future actions. Of particular concern to the County and City was the cumulative effects of exposure to various source terms for radiation within the region. As a component to their comments, the County and City referenced research they had sponsored which determined that consideration of cumulative exposures to radiation is a scientifically defensible undertaking.⁽¹⁴⁾ The County and City recommended that the repository EIS consider the cumulative exposure risk associated with previous DOE weapons testing activities, on-going DOE weapons activities, on-going DOE low-level radioactive waste (LLRW) management activities, potential future LLRW management activities at NTS [Nevada Test Site], potential LLRW transportation activities through Lincoln County, proposed high-level waste transport and disposal in Nevada, and natural and other human-induced sources of background radiation. While the DEIS provides a generic assessment of cumulative risks, the analysis is not transportation corridor, county, or community specific. As a consequence, the assessment of cumulative risk is not useful in discriminating between routing alternatives. Nor does the analysis prove useful in determining where and in what manner risks might best be mitigated.

Consistent with requirements of NEPA [National Environmental Policy Act], the County and City recommended that the repository EIS consider how construction and operation of repository system components within Lincoln County will conflict with existing federal, state and local land use plans, policies, or controls. In particular, the County and City felt that conflicts with the Lincoln County Master plan and the City of Caliente Master plan should be evaluated. The DEIS Does not consider conflicts with plans developed by Lincoln County or the City of Caliente.

(14) Goble, Robert. Perspectives on Risks from the Nevada Test Site: Feasibility and Methods for Assessing Cumulative Radiological Exposure Risks Associated with Department of Energy Activities at the Nevada Test Site, Center for Technology, Environment and Development of the George Perkins Marsh Institute on the Human Dimensions of Global Environmental Change, Clark University, Worcester, MA. June 1994.

RESPONSE

Consistent with Council on Environmental Quality regulations (40 CFR 1508.7), DOE considered past, present, and reasonably foreseeable actions in its assessment of cumulative impacts and has reviewed a number of current and proposed actions to determine relevance. The expression "reasonably foreseeable" refers to future actions for which there is reasonable expectation that the action could occur, such as a proposed action under analysis, a project that has already started, or a future action that has obligated funding.

DOE structured the cumulative impact assessments presented in Chapter 8 of the EIS by identifying actions the effects of which could coincide in time and space with the effects from the proposed repository and associated transportation activities. The actions evaluated in Chapter 8 include some of those recommended by the commenter such as previous underground testing at the Nevada Test Site, low-level radioactive waste disposal at the Nevada Test Site and Beatty, and high-level radioactive waste shipments in Nevada.

The identification of the relevant actions was based on reviews of resource, policy, development, and land-use plans prepared by agencies at all levels of government and from private organizations, other environmental impact statements, environmental assessments, and Native American tribal meeting records. Pursuant to Council on environmental Quality regulations at 40 CFR 1502.16(c) and 1506.2, in addition to the assessment of potential environmental impacts, the potential conflicts with plans issued by various governmental entities were considered to the extent they provided relevant information. Of particular interest to the commenter, DOE reviewed and considered a number of documents submitted by or prepared for Lincoln County and communities within Lincoln County. Two of the documents reviewed were the City of Caliente Master Plan {prepared by Intertech Consultants and Sweetwater Consulting Services in 1990) and the Alamo Land Use Plan (prepared by Sweetwater Consulting Services and R.O. Anderson Engineering in 1992). While the Alamo plan deals primarily with zoning issues for the town, the Caliente plan discusses actions for dealing with potential population growth generated by the construction and operation of a repository at Yucca Mountain. The document generally expresses a need to annex lands that are contiguous to and south of the city within Meadow Valley Wash. The Caliente inter modal transfer station would be in Meadow Valley Wash (see Figure 6-17 of the EIS). The commenter is also referred to Sections 6.3.2 and 6.3.3 of the EIS, which provide estimates of changes in population and other economic measures for each relevant implementing alternative. The transportation analysis in the Final EIS includes a sensitivity analysis that assigns all potential impacts to Caliente. The analysis conservatively estimates the potential transportation actions on a community level. However, definitive information is not available on specific tracts of land that could be required for a specific transportation mode or route. Once DOE selected a transportation mode and specific transportation corridor, more definitive information would be developed on potential conflicts with land uses and various agency plans and policies and ultimately the mitigation measures that could resolve conflicts and impacts on a given area.

DOE agrees with the commenter that the cumulative impacts of radiological exposures can be scientifically based. Section 3.1.8.2 of the EIS estimates the annual radiation dose to a hypothetical individual in Springdale, Nevada, from airborne radioactive materials from past nuclear weapons testing at the Nevada Test Site, and indicates that DOE had made quantitative estimates of the offsite doses from releases from past weapons testing at the Nevada Test Site (DIRS 146592-Black and Townsend 1998). Section 6.3 of tile EIS describes the potential impacts of each transportation alternative in Nevada, including estimates of impacts to health and safety in Nevada from incident-free waste transport to Yucca Mountain and from transportation accidents, as well as regional socioeconomic impacts to potentially affected counties (see Figures 6-5 through 6-8).

Section 8.4 of the EIS analyzes potential cumulative impacts in Nevada from the Proposed Action and other past, present, and reasonably foreseeable future actions by Federal agencies and private groups. The analyses include transportation impacts from the Expanded Use Alternative (Alternative 3) for the Nevada Test Site. This alternative includes the shipment of low-level radioactive waste to the Nevada Test Site from offsite locations [based on the *Final Environmental Impact Statement for the Nevada Test Site and Off-Site Locations in the State of Nevada* (DIRS 101811-DOE 1996)]. Section 8.2.12.2 of the Yucca Mountain EIS discusses the cumulative impacts from storage of low-level waste and includes as a reasonably foreseeable action of the potential that the Nevada Test Site would be selected as a regional DOE low-level waste disposal site. Table 8-58 of tile EIS summarizes cumulative transportation-related radiological impacts from the Proposed Action. Inventory Modules I and 2. and other Federal, non-Federal, and private actions nationwide from 1943 to 2047. The table lists potential impacts from past, current, and projected Federal waste transport activities, including shipments of low-level waste to the Nevada Test Site, shipments of transuranic waste to the Waste Isolation Pilot Plant in New Mexico and shipments of spent nuclear fuel and high-level radioactive waste to various storage and disposal sites throughout the

Nation. In response to public comments, Appendix J of tile EIS now contains maps showing routes used in analyzing impacts and provides estimates of radiological and non radiological impacts for each state. This is in addition to the route maps that were included in the Draft EIS (see Section 2.1.3.2 of the EIS for national routes and Section 2.1.3.3 for Nevada maps). Based on this information, DOE has concluded that the cumulative impacts of future transportation activities, past nuclear-weapons testing, and other Federal and private programs involving transportation of radioactive materials in the State of Nevada would be small.

11.1 (97)

COMMENT

Commenters stated that DOE should document all mitigation commitments in a Record of Decision and should not issue a separate or standalone Mitigation Action Plan. They quoted the Council on Environmental Quality National Environmental Policy Act implementing regulations (40 CFR 1505.2) as saying the Record of Decision must include the following: a statement explaining the decision: an explanation of alternatives DOE considered and those that were environmentally preferable: factors DOE considered in making its decision: an explanation of mitigation measures, if any, that DOE adopted or, if there were no mitigation measures, an explanation; and a monitoring and enforcement program for any adopted mitigation measures. Commenters further stated that a Mitigation Action Plan would not fulfill the requirements of and would be outside the legal framework of the National Environmental Policy Act governing minimization of the effects of major Federal actions. Commenters placed great significance on the institutional and legal stature of the Record of Decision and contended that commitments to mitigation not contained in a Record of Decision would not be commitments at all.

RESPONSE

Section 114(a)(1) of the NWSA authorizes the Secretary of Energy to decide whether to recommend approval of the Yucca Mountain site to the President for development as a repository for the disposal of spent nuclear fuel and high-level radioactive waste. A comprehensive statement of the basis for the recommendation, including a Final EIS, must accompany such a recommendation.

However, the decision to approve the site rests not with the Secretary, but with the President. Because the President would make this decision, DOE does not anticipate issuing a Record of Decision if the Secretary recommends the site to the President.

DOE regulations (10 CFR 1021.33 1) require preparation of a Mitigation Action Plan when mitigation measures are identified in a Record of Decision. At this time DOE has not decided whether or not it would prepare a Mitigation Action Plan. However, the Yucca Mountain site, if approved in accordance with the NWSA, would be subject to licensing by the Nuclear Regulatory Commission. In submitting an application to construct and operate a repository would identify, relevant mitigation measures to the Commission for its consideration, and could reasonably expect a comprehensive set of mitigation measures or conditions of approval to be part of the licensing process.

DOE anticipates that the repository design would continue to evolve, creating additional opportunities for mitigation and potentially eliminating the need for some mitigation measures currently under consideration. Chapter 9 of the EIS, which provides DOE's initial list of possible mitigation measures available at this time, identifies DOE, determined impact reduction features, procedures, and safeguards; and mitigation measures under consideration for inclusion in the project plan and design. Section 9.1.3 identifies ongoing studies that could eventually influence mitigation measures related to the repository.

11.1 (102)

COMMENT

Commenters said that the Final EIS should identify which mitigation measures DOE is committed to and which it is considering. Specifically, commentaries asked for guarantees on what mitigation DOE would perform, asserting that the Federal Government has a history of claiming sovereign immunity and of not compensating victims of radiation "damage" from Federal activities. One commenter said the Draft EIS did not establish a basis for mitigation negotiations because it did not assign specific roles and responsibilities for actions that cause impacts or ameliorate impacts. Several commentaries stated that the EIS must, but

the Draft EIS did not, identify and evaluate all feasible alternatives and specific measures for mitigating all potential impacts of the repository system and potential accidents that are identified in the EIS, whether or not they would be "significant." Similarly, a commenter stated that DOE needs to identify the specific measures required to minimize the impacts associated with the flexible design. A commenter said that mitigation measures should not be eliminated from consideration in the EIS because they are outside the jurisdiction of DOE or because they are not likely to be accepted or enforced. One commenter said a Record of Decision and a Mitigation Action Plan should include a comprehensive identification and evaluation of measures to mitigate each repository system impact.

Some commentaries stated that monitoring avoidance, minimization rectification, and reduction or elimination must be considered, as well as consultation with other appropriate agencies, as opposed to promises to consult, conduct further studies, only monitor and request outside reviews. Further, commenters said the EIS must demonstrate that the mitigation measures would be sufficient to offset or otherwise minimize negative effects on the States of California and Nevada, local communities, and other states and communities along transportation routes. One commenter said that the EIS should present the full costs of re-mediation for a transportation accident and that DOE should establish an escrow fund to pay for such re-mediation and for compensation of affected parties.

RESPONSE

Chapter 9 of the EIS discusses mitigation measures DOE could implement or has identified for consideration. However, DOE has not yet made commitments to any specific mitigation measures. Section 116(c) of the NWPA provides for financial and technical assistance to mitigate likely economic, social, public health and safety, and environmental impacts. Within that broad framework, neither Section 116 nor any other provision of the NWPA limits the impacts that are subject to assistance to the environmental impacts considered in this EIS.

Any decision to provide assistance under Section 116 would be based on an evaluation of any reports submitted by an affected unit of local government or the State of Nevada that documented the potential impacts for which mitigation assistance might be required.

DOE regulations (10 CFR 1021.331) require preparation of a Mitigation Action Plan when mitigation commitments are defined in a Record of Decision. At this time DOE has not decided whether or not to prepare a Mitigation Action Plan. However, the Yucca Mountain site, if approved in accordance with provisions of the NWPA, would be subject to licensing by the Nuclear Regulatory Commission. DOE, in submitting an application to construct and operate a repository would identify relevant mitigation measures to the Commission for its consideration, and could reasonably expect a comprehensive set of mitigation measures or conditions of approval to be part of the licensing process.

Regarding compensation and re-mediation in the event of an accident, the Price-Anderson Act establishes a system of financial protection (compensation for damages, loss, or injury) for the public in a nuclear accident.

Responsibility for cleanup of released materials would be shared between DOE, owners of the material, and carriers under regulation of the Motor Carrier Act of 1980. Sections J.1.4.2.5 of the EIS provides information on the cost of cleanup and ecological restoration following a transportation accident.

11.1 (7182)

COMMENT

Page 2-44 Nevada Transportation - Transportation is the major source of interest/concern to the people living in Lincoln County. This is due to the extreme likelihood that shipments to Yucca Mountain will pass through our county. Based upon objections expressed by Nevada leaders and actions taken related to DOE low-level waste transportation routing it is unlikely that any of the final routes, rail or highway, will go through Clark County. Likely routes whether legal weight truck, heavy-haul truck or rail will be through the rural areas of the State. The Draft EIS identifies a number of impacts resulting from transportation of nuclear material. However, there is no mention of mitigation measures that will be taken to minimize these impacts. It is essential that the EIS address mitigation plans in detail.

RESPONSE

Section 9.3 of the EIS discusses mitigation measures that DOE could adopt to reduce potential impacts associated with the transportation of spent nuclear fuel and high-level radioactive waste to a repository at Yucca Mountain including measures to reduce the possibility of accidents. The Department would identify and implement more specific mitigation measures if the repository was approved and a particular transportation mode and route were selected.

In addition, DOE could fund mitigation measures that a local government sought to implement. Section 116(c) (2) (A) (i) and (ii) of the NWPA state that "the Secretary shall provide financial and technical assistance to the State of Nevada and any affected unit of local government...to mitigate the impact on such State [Nevada] or affected unit of local government of the development of [a] repository and the characterization of [the Yucca Mountain site." Such assistance can be given to mitigate likely "economic, social, public health and safety, and environmental impacts." DOE would base a decision to provide assistance under Section 116 on an evaluation of a report submitted by affected units of local government or the State of Nevada to document likely economic, social, public health and safety, or environmental impacts. If the proposed repository became operational, DOE would hold discussions with potentially affected units of local government and consider appropriate support and mitigation measures.

11.1 (7229)

COMMENT

Page 9-21 Section 9.3.4.2. This section does not include any measures to replace vegetation or animal unit months (AUM's) of forage lost to rail spur construction.

RESPONSE

As indicated in Section 9.3.1 of the EIS, DOE would evaluate appropriate mitigation measures that would minimize impacts to grazing lands. These actions could include providing access to lands on both sides of a rail line via underpasses, re-vegetation, and assisting in providing water should there be a need.

11.1 (12058)

COMMENT

Page 28 of the County/City EIS Scoping Report points out the need for the DEIS to consider unavoidable impacts which can not be mitigated (i.e., additional transportation risk) and that compensation for such impacts must be considered.

RESPONSE

The EIS Does consider additional transportation risk associated with the repository program. Further, DOE would implement the requirements of Section 180© of the NWPA, which requires the Secretary of Energy to provide technical assistance and funds to states for training for public safety officials of appropriate units of local government and Native American tribes through whose jurisdictions transportation of spent nuclear fuel or high-level radioactive waste would travel. The training would cover procedures for safe routine transportation and for dealing with emergency response situations.

11.2 (108)

COMMENT

Commentaries stated that, because the project serves a national purpose, it is important that Nevada, which has not been the direct beneficiary of nuclear power, not bear the undue burden attributed to this project. Commentaries further stated that it is important and entirely appropriate that state and local impacts of the project be offset through mitigating measures, financial and otherwise. Commentators stated that a great opportunity exists to derive maximum benefits not only during the repository study period but also during the waste isolation operation period as well.

RESPONSE

Section 116(c) (2) (A) (j) and (ii) of the NWPA states that “the Secretary shall provide financial and technical assistance to the State of Nevada and any affected unit of local government to mitigate the impact on such State (Nevada) or affected unit of local government of the development of (a) repository and the characterization of (the Yucca Mountain) site”. Such assistance can be given to mitigate likely “economic, social, public health and safety, and environmental impacts.” Within that broad framework, neither Section 116 nor any other provisions of the NEPA limits the impacts that are subject to assistance under Section 116 to the environmental impacts considered in the EIS. Any decision to provide assistance under Section 116 would be based on an evaluation of any reports submitted by an effected unit of local government or the State of Nevada pursuant to Section 116 to document likely economic, social, public health and safety, and environmental impacts. Neither Section 116(c) nor any other section of the NWPA gives DOE discretion to provide general financial assistance to individuals.

Section 9.3 discusses mitigation measures DOE is required to implement, has determined to implement, or has identified for consideration, to reduce potential impacts from the transportation of spent nuclear fuel and high-level radioactive waste. These measures address impacts from the possible construction of a branch rail line or and intermodal transfer station in Nevada; construction of other transportation routes; upgrading of existing Nevada highways to accommodate heavy-haul vehicles; transportation of spent nuclear fuel and high-level radioactive waste from existing storage sites to the proposed repository; and fabrication of casks and canisters.

11.2 (7191)

COMMENT

Page 2-69 Table 2-6. Comparison of Tables 2-5 and 2-6 suggests that the No-Action Alternative may be more costly to implement than the Preferred Alternative. The information in Table 2-7 suggests that the No Action Alternative is more risky than the Preferred Alternative. Collectively, these tables suggest that the Nation saves money by transferring risks from the 77 sites with waste inventories to Nevada. The savings to the Nation appears to be on the order of \$23 to \$28 billion. Given this magnitude of potential savings coupled with the transfer of risk to Nevada, the DEIS must discuss the issue of equity between locales where risk will be reduced and where risk will be concentrated. The concept of compensation of those areas to which risk will be concentrated by those areas in which risk will be reduced or eliminated must be discussed within the DEIS. Conceptually, up to 100 percent of the savings between the No Action and Preferred alternatives should be considered as compensation to those areas in which risk will be concentrated.

RESPONSE

The EIS Does not address the issue of equity as it pertains to risk or compensation for the Proposed Action through transfer of cost savings. It does, however, address the relative impacts of the Proposed Action and No-Action Alternative (see Section 2.4).

While these issues are not directly addressed in the Final EIS, DOE would address mitigation of impacts by entering into discussions with potentially affected units of local government to consider appropriate support and mitigation measures. Section 116(c) (2) (A) (i) and (ii) of the NWPA state that "the Secretary shall provide financial and technical assistance to the State of Nevada and any affected unit of local government to mitigate the impact on such State [Nevada] or affected unit of local government of the development of [a] repository and the characterization of the Yucca Mountain site." Such assistance can be given to mitigate likely "economic, social, public health and safety, and environmental impacts." Furthermore, under the NWPA, the Section 116 impact assistance review process and the EIS process are distinct from one another, and the implementation of one would not depend on the implementation of the other. Thus, the provision of assistance under Section 116 would not necessarily be limited either by the impacts identified in this EIS or by its findings on such impacts. Any decision to provide assistance under Section 116 would be based on an evaluation of a report submitted by an affected unit of local government or the STATE of Nevada pursuant to Section 116 that documented likely economic, social, public health and safety, and environmental impacts.

11.2 (7233)

COMMENT

Page 9-1 Section 9. In general, the treatment of mitigation in the DEIS is entirely insufficient. Many impacts identified within the DEIS have no mitigation measures identified for them at all (i.e., additional school enrollment in Lincoln County due to transportation activities). In preparing the FEIS, DOE needs to identify all impacts described within the DEIS and the FEIS must identify options for mitigation of all impacts.

Contrary to NEPA [National Environment Policy Act], the DEIS contains several proposed mitigation measures which are simply studies or simply describe studies which will lead to identification of mitigation measures. For most impacts identified within the DEIS, but characterized by DOE as non-significant (i.e., population growth in Lincoln County and [the] City of Caliente and related growth in government expenditures), the DEIS simply does not provide any suggested mitigation measures. In completing the FEIS, DOE should evaluate all listed mitigation measures against the types listed above to discern those which are of an unacceptable form under NEPA.

RESPONSE

DOE believes it has identified a reasonable range of mitigation measures it would consider for those impacts that could be minimized or avoided through mitigation actions. Because some decisions have yet to be made, such as transportation mode and specific transportation corridor, additional studies would be required and more definitions information on impacts or possible mitigation actions are not available.

Section 114(a) (1) of the NWPA authorizes the Secretary of Energy to determine whether to recommend approval of the Yucca Mountain site to the President for development as a repository for the disposal of spent nuclear fuel and high-level radioactive waste. A comprehensive statement of the basis for the recommendation, including a Final EIS, must accompany such a recommendation. However, because the decision to approve the site rests not with the Secretary, but with the President. DOE does not anticipate issuing a Record of Decision if the Secretary recommends the site to the President. Consequently, DOE does not anticipate issuing a Record of Decision.

DOE regulations (10 CFR 1021.331) require preparation of a Mitigation Action Plan when mitigation measures are identified in a Record of Decision. At this time, DOE has not decided whether it would prepare a Mitigation Action Plan. However, the Yucca Mountain site, if approved in accordance with provisions of the NWPA would be subject to licensing by the Nuclear Regulatory Commission. DOE, in submitting its application to construct and operate the repository, would identify relevant commitments, including those identified in the Final EIS, to the Commission for its consideration, and could reasonably expect a comprehensive set of mitigation measures or conditions of approval to be part of the licensing process.

DOE will enter discussions with potentially affected units of local government and consider appropriate support and mitigation measures. Chapter 9 of the EIS, which provides DOE's initial list of commitments available at this time, describes management actions that DOE would consider to reduce or mitigate adverse impacts to the environment that could occur if it implemented the Proposed Action. Chapter 9 states that Section 116 of the NWPA requires the Secretary to provide financial and technical assistance to mitigate impacts of the development of a repository and the characterization of the site. The Section 116 mitigation assistance review process and the EIS process are distinct from one another and the implementation of one does not depend on the implementation of the other. Thus, the provision of assistance under Section 116 would not necessarily be limited either by the impacts identified in the EIS or by its findings on such impacts. Beyond the Payments-Equal-to-Taxes program that DOE has implemented under the requirements of Section 116(cX3), a decision to provide financial and technical assistance under Section 116(cX2) would be based on an evaluation of a report submitted by an affected unit of local government or the State of Nevada that documented probable economic, social, public health and safety, and environmental impacts.

Appendix A

Comments Submitted By Lincoln County

**To the Department of Energy on the Final Yucca Mountain
Environmental Impact Statement**

Margaret Chu
U.S. Department of Energy
Office of Civilian Radioactive Waste Management
1000 Independence Avenue
Washington, D.C.

RE: Review Comments to Final Yucca Mountain Environmental Impact
Statement

Dear Ms. Chu:

In keeping with the National Environmental Policy Act (NEPA), Lincoln County
(County) and the City of Caliente (City), through their Joint City/County Impact

Alleviation Committee, have reviewed the Final Yucca Mountain Environmental Impact Statement (FEIS) and offers the following comments thereto. The County and City realize that because a Notice of Availability (NOA) has not been published in the Federal Register (FR) by the Environmental Protection Agency (EPA), the FEIS is not officially "final" and the 30-day review period for the "final" Yucca Mountain EIS pursuant to NEPA has not actually began. However, because it is not clear if the Department of Energy (DOE) intends to submit, and/or whether EPA intends to formally recognize through a FR notice a "final" FEIS for the Yucca Mountain Project, these comments are being submitted to comply with the spirit of NEPA. In addition, the County and City intend that these comments be used by DOE in preparing a mitigation plan as required by the Department's own regulations for implementing NEPA (10 CFR 1021.331).

Our review of the Final Yucca Mountain EIS indicates that DOE the document is a significant improvement over the draft and as a consequence is an improved decision support document. As the following comments suggest however, certain of DOE's responses to comments raise new questions and concerns. We are particularly concerned about the potential for unanticipated, and therefore unmitigated, consequences.

Comment Response Document - 3.2 (80), 3.2 (84)

Notwithstanding DOE's response to this comment, failure of inclusion in the list of references cited of any of the many County and City sponsored research documents leaves doubt as to what extent DOE considered local perspectives in the FEIS. The County and City would appreciate learning to what extent, if any, various documents provided to DOE during preparation of the EIS were considered and/or will be considered in subsequent transportation and mitigation planning initiatives.

Comment Response Document - 3.2 (1299)

To facilitate stakeholder understanding of the costs and risks of implementing the Proposed Action and the No Action Alternative the County and City would appreciate DOE providing a summary chart comparing the costs and risks for each alternative considered in the FEIS. Such information would aid local public information programs.

Comment Response Document - 3.2 (1240)

The consideration of distributional equity in the FEIS does not adequately respond to the County/City comment. The analysis should have demonstrated current risk at source site areas and near Yucca Mountain and future risk as a means to quantify distributional equity issues. The County and City would appreciate DOE providing an assessment of the distribution of repository system risks and benefits as a basis for considering mitigation options regarding distributional equity.

Comment Response Document - 3.2 (1242)

Sec. 116 of NWPA is intended to address impacts not identified within and is not limited to consideration of impacts considered within the FEIS. Alternatively, DOE's regulations for implementing NEPA require the Department to develop a mitigation action plan to address impacts identified within the EIS. Does DOE intend to develop a mitigation plan to address impacts identified within the EIS, and if so, what process and schedule will apply to said planning initiative?

Comment Response Document - 3.2 (7030)

DOE's response suggests that because the Department does not anticipate issuing a Record of Decision (ROD), it may not develop a mitigation plan; as such plan typically is tied to mitigation committed to within the ROD. On what basis and under what schedule will DOE decide whether or not to prepare a mitigation plan? A definitive decision by DOE regarding its intentions relative to mitigation planning is needed.

Comment Response Document - 3.2 (7146)

DOE's response here states, "It would not be appropriate for the Department to speculate on how the repository could influence the political structure of a given community." The County and City comments gave ample evidence of how the project has already influenced and resulted in impacts on local socio-political institutions. DOE's failure in the FEIS to recognize such impacts upon the social fabric of communities raises the specter for such impacts to occur in the future and for there to have been no mechanisms for related mitigation to have been identified or implemented. The County and City request that DOE develop a mitigation plan and that socio-political impacts be addressed within said plan.

Comment Response Document - 3.2 (7163)

Despite a recommendation to the contrary by the County and City, in preparing the FEIS DOE has elected not to categorize prospective repository impacts according to their probability of occurrence and degree of consequence. As an early activity in any subsequent mitigation planning, such categorization is encouraged as a means to focus future initiatives to identify reasonable mitigation measures. The County and City can not afford to allocate limited human and financial resources to mitigate low probability/low consequence impacts. Rather, the County and City desire to focus first upon high probability/high consequence effects. Please provide DOE's perspective on how best to prioritize mitigation planning initiatives.

Comment Response Document - 3.2 (7174)

Although DOE acknowledges receipt from the County and City and use of various documents in preparing the EIS, references cited in the EIS do not include any documents submitted by the County and City. The County and City would appreciate learning from DOE in what ways submitted documents were utilized and to what extent, if any, such information aided DOE in preparing the

FEIS. Further, the County and City request that DOE indicate how such information may be used in subsequent mitigation planning initiatives to be undertaken by DOE. The County and City will consider DOE's response in determining the feasibility of providing such information to the Department in the future.

Comment Response Document - 3.7 (7165)

The County and City appreciate DOE's commitment to meet with affected units of local government to obtain feedback on alternative mitigation measures. Please provide the County and City with DOE's plan and schedule for engaging local entities in such discussions. Please note that the County and City do not believe the twice a year Affected Unit of Government meetings will suffice for considering mitigation alternatives.

Comment Response Document 3.3 (178)

In response to County/City comments DOE assessed a truck cask on railcar scenario. DOE concluded this scenario to be feasible but not practical. The reasons for impracticality appear to be cost and risk, both being relatively high compared to other options (ie. heavy-haul or legal weight truck). It does not appear that DOE considered the institutional uncertainty (ie. state permitting) and related risks (stalled shipments) associated with heavy haul. The County and City would appreciate additional information from DOE regarding its understanding of state permitting requirements for heavy-haul shipments and how such requirements may or may not pose unanticipated disruptions in movement of nuclear waste through Nevada.

In addition, DOE response to Comment 3.1 (7179) notes, "Rail-to-legal weight truck is not one of the defined alternatives for transporting waste." Does this statement imply that in order for DOE to operationalize this alternative that additional NEPA analysis would be required. If so, what level (ie. EA, EIS) would be required?

Comment Response Document - 8.3 (161)

The document states, "In addition, DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada." The FEIS is not conclusive however, as to whether any of the five candidate rail corridors could ultimately be developed and used. In fact, the FEIS notes that a great deal of additional corridor specific work would be required. How then can DOE reach a conclusion that mostly rail is preferred? Please provide the County with an explanation as to the factors that were considered by DOE in arriving at the mostly rail conclusion. The County would appreciate being provided the analysis of various modes which resulted in the mostly rail preference.

Comment Response Document - 8.3 (201)

DOE's commitment to identify routes at least 4 years before shipments begins is inconsistent with Appendix M in which the text there states the Regional

Servicing Contractor with identify routes at least 1 to 4 years prior to use of said route. The County would appreciate a definitive clarification and commitment from DOE regarding 1) who will select routes (ie. RSC or DOE) and 2) when routes will be identified. This response also indicates that DOE would make final route selections and provide them to the Nuclear Regulatory Commission (NRC). Please clarify why routing information is to be provided to NRC and what role DOE envisions NRC playing with respect to routing.

Comment Response Document - 8.3.1 (4240)

Here the response notes that certain affected local governments would be eligible for technical assistance and funds provided by Section 180(c). Previously, the FEIS and comment responses indicate that states and American Indian Tribes would be eligible. Please clarify if, and under what circumstances, Lincoln County would be eligible for technical assistance and funds pursuant to Section 180(c). The County requests that DOE consider promulgating a rule making clear under what circumstances counties such as Lincoln, would be eligible to receive Section 180(c) assistance and funds.

Comment Response Document - 8.3.2 (136)

DOE's response here states, "At this time, DOE is not aware of any modifications to the corridor or route (Chalk Mountain) that would mitigate the concerns of the Air Force." This response suggests little consideration of measures to mitigate Air Force concerns was given. For example, opportunities for operational mitigation (ie. timing of shipments to avoid conflicts with Air Force overflights) would appear quite apparent. The County and City request that DOE provide additional information on the specific nature of Air Force concerns and further details on the methods to mitigate such concerns. The FEIS simply provides insufficient consideration of methods to mitigate Air Force concerns.

Comment Response Document - 8.7 (153)

The text here states, "If the repository was approved, DOE would discuss transport details with stakeholders, including financial support, before the start of shipments." The County would appreciate clarification as to what the term "approved" means. Does it mean passage by Congress of a resolution approving the President's nomination of the Yucca Mountain site, approval by NRC of a license to construct the repository, or some other approval?

Comment Response Document - 8.7 (3427)

How does the contractor developed transportation plan referred to here relate to DOE's commitment to transportation planning described in Comment Response 8.7 (153) which is addressed above? Would the contractor also be required to discuss transportation plan details (ie. locations of emergency parking areas) with stakeholders?

Comment Response Document - 8.8.2 (4300)

The County appreciates DOE's commitment to work with local communities and

tribal nations to understand and mitigate potential negative perceptions of DOE operations. The County cautions however, that the "development and presentation of factual information regarding the actual (rather than the perceived) risks..." does not address the lag in time between when perceived risk related impacts might accrue and when mitigation relating to public education could become effective. Other forms of mitigation will be required and should be addressed in a comprehensive mitigation plan for the Yucca Mountain Project.

Comment Response Document - 8.10.2 (114)

DOE's response here assumes that trained and properly equipped personnel would be located at all locations where existing first responders are located. Absent final guidelines for implementing Sec. 180(c) and actual implementation of said guidelines, such an assumption appears premature. The County and City would appreciate DOE's current perspectives on the process and schedule for completion of the Sec. 180 (c) guidelines.

Comment Response Document - 8.11.6 (12069)

The County and City appreciate DOE's recognition in the FEIS of the potential for stigmatization to "result in adverse impacts under some scenarios...". Given this recognition, the FEIS fails to consider potential methods to mitigate stigma related impacts. The County and City encourage DOE to develop a mitigation plan which considers methods to effectively avoid and otherwise mitigate the potential impacts from stigma.

Comment Response Document - 11.1 (97 and 102)

DOE does not anticipate issuing a Record of Decision because the President makes the decision to approve the site. DOE regulations (10 CFR 1021.331) require preparation of a Mitigation Action Plan when mitigation measures are identified in a Record of Decision. At this time DOE has not decided whether or not it would prepare a Mitigation Action Plan.

The County requests that DOE explain its intent to develop and issue a Mitigation Action Plan thereby complying with the spirit of its own regulations. If DOE intends to develop a mitigation plan, please describe how affected units of local government will be participants in the planning process.

I look forward to DOE's answers to the many questions posed in this letter.

Sincerely,

Tim Perkins
Chairman

Board of Lincoln County Commissioners